

ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT

**NEW CHARCOAL STORAGE AND PACKAGING PLANT,
Portion 13 Extension 1 (Industrial Area) Of Arandis Town
Lands No.170, Arandis, Namibia**

SCOPING REPORT

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“We don’t have to sacrifice a strong economy for a healthy environment.” – Dennis Weaver

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“The only way forward, if we are going to improve the quality of the environment, is to get everybody involved”. – **Richard Rogers**

1. EXECUTIVE SUMMARY

On behalf of the proponent, KPM Environmental Consultants has been contracted to develop an Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP), in order to obtain an Environmental Clearance Certificate for the construction and operation of a charcoal processing and packaging plant on Portion 13 Extension 1 (Industrial Area), Arandis Industrial in the Erongo Region of Namibia. This is as per the requirements of the Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012).

KPM is a competent provider of environmental and related consulting services. We specialize in environmental consulting i.e. compilation of environmental impact assessments, natural resources management plans and formulation and implementation of health and safety plans as well as project evaluations.

KPM Environmental is a dynamic consultancy offering sustainable solutions to the private sector, non-governmental organisations, government and the donor community. KPM have experiences in the fields of environmental assessments and have qualified and experienced environmental professionals.

The proposed development is meant to improve the standards of the living conditions of the Arandis community in line with Namibia's Vision 2030. The layouts of the proposed development are based on the environmental parameters, economic restraints, availability of land and connection points of existing bulk services infrastructure, therefore based on that no alternatives were considered. The proposed development seeks to realistically support acceleration of MDG 1, as well as the Presidential Infrastructure Initiative. The proposed development is an activity that requires an Environmental Clearance Certificate (ECC), as promulgated under the Environmental Management Act 7 of 2007 and its regulations.

The aim of the Scoping exercise was to:

- Assess and evaluate the suitability of the proposed development - New Charcoal Storage and Packaging Plant and related infrastructure against the biophysical and socio-economic sensitivities of the area;
- Minimize the negative environmental impacts brought about by the proposed development and the supporting infrastructure during construction and operational phases;
- Consult all Interested and Affected Parties (I&AP's), with specific emphasis on the communities in the affected area to ensure that their needs and concerns are taken into account and above all;
- Conform to and meet the stipulated Namibian Environmental legislation requirements (EMA, 2007)

As part of the EIA application for the proposed development, a scoping phase has to be exercised. The scoping exercise therefore identified the issues that the Environmental Impact Assessment will examine and the scope of the assessment required to ensure that the EIA will conform to the requirements of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012).

1.1. Legal Requirements

This EIA exercise was undertaken in terms of section 58 of this Act, the Environmental Management Act, which came into force on the 6th of February 2012, as determined by the Minister of Environment and Tourism (Government Notice No. 28 of 2012)¹.

The proposed plant is situated on an arid piece of land. In terms of the Regulations of the Environmental Management Act (No 7 of 2007) an Environmental Impact Assessment has to be done to address the following 'Listed Activities':

Activity	Description
Energy Generation, Transmission And Storage Activities	1. The construction of facilities for - (a) the generation of electricity. (b) the transmission and supply of electricity.
Waste Management, Treatment, Handling and Disposal Activities	2.1 The construction of facilities for waste sites, treatment of waste and disposal of waste. 2.2 Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976.
Forestry Activities	4. The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorisation in term of the Forest Act (No. 12 of 2001) or any other law.
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. 9.2 Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation in terms of a law governing the generation or release of emissions, pollution, effluent or waste.
Water Resource Developments	8.1 The abstraction of ground or surface water for industrial or commercial purposes. 8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems.

Under section 56 of the Environmental Management Act, 2007 (Act No.7 of 2007), the Minister has made the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012)². These regulations require that all projects, plans, programmes and policies that have a detrimental effect on the environment must be accompanied by an EIA.

Under section 27 of the Environmental Management Act, 2007 (Act No. 7 of 2007), and after following the consultative process referred to in section 44 of that Act, the Minister lists in the Annexure to the above mentioned Schedule, activities that may not be undertaken without an environmental clearance certificate (Government Notice No. 29 of 2012).

As such, the proposed project will likely have an impact on sensitive aspects of the receiving environment, both biophysical and socio-economic. Key environmental sensitivities include those pertaining to municipal service provision³⁴.

¹ <https://www.elaw.org/eialaw/namibia>

² Ibid.

³ <https://www.etu.org.za/toolbox/docs/localgov/munservice.html>

⁴ Municipal services or city services refer to basic services that residents of a city expect the city government / local authority to provide in exchange for the taxes, which citizens pay.

1.2 Public Consultation

Public participation was carried out in accordance with the EIA Regulations. Various I&APs at local level were identified and their input solicited. Particular effort was exerted to involve I&APs at a local level – those living in Arandis proper and the Greater Erongo Region. Stakeholder’s Meeting was carried out on 24th of February 2022 at the Arandis Town Hall.

The following impacts were identified and evaluated during the Scoping Phase:

- Strong winds
- Potential habitat of the infrastructure on the socio-economic structure of the area.
- Job creation - looking at employment of local community;
- Excessive noise generation during construction;
- Potential damage or destruction to undiscovered heritage sites of the area;
- Traffic congestion during construction;
- Potential impact of sensitive habitat destruction; and
- Potential impact of destruction on red data plants.

1.3 Impact Assessment

The issues identified by the EAP, KPM Environmental Consultants, and along with those identified during the public consultation process were assessed using a range of assessment criteria. The application of these criteria involves a balanced consideration of duration, extent, and intensity/magnitude, modified by probability, cumulative effects, and confidence in order to determine significance. Mitigation measures are outlined for each impact.

The identified impacts were assessed using the **Significance Assessment Methodology**⁵, which have the severity rating, extent rating, frequency, probability and the duration. The extents of the above impacts after mitigation are mostly site specific and local. Mitigation measures were outlined to reduce the impacts to a greater extent and a draft environmental management plan compiled to ensure contractor operates his construction activities in environmental sensitive manner.

1.4 Need and Desirability

The proposed development will create the following impacts:

Positive impacts	Negative impacts
If Phase 1 is successful, the proponent expects to create about 57 permanent jobs in the town of Arandis. These jobs will be sustainable and would assist with the current unemployment crisis Namibia faces	Generation of noise due to the handling and processing of charcoal during operations, and
These appointed employees will receive the correct formal training and these costs would be covered by the company at no expense of the employee.	Generation of dust due to the handling and processing of charcoal fines (dust control system will be installed).
Economic upliftment of the local community / Arandis	Increase in sewage waste generated from the increase in employee numbers on-site.
Infrastructure development of the Arandis town	Land clearing of the area for site infrastructure

⁵ Determining the significance of predicted impacts is one of the most important decisions in the environmental impact assessment (EIA) process. Good EIA should focus on the impacts that matter most, and, as a result, EIA systems involve systematic steps to determine whether the likely adverse impacts of proposed projects are significant (Ehrlich & Ross 2015)

1.5 Conclusions and Recommendations

With the information provided, the Scoping Exercise is of the opinion that the proposed - should be duly authorised by the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism. The development will contribute immensely towards the socio-economic development of Arandis Town Council its surrounding communities and Namibia at large. There are as well limited environmental impacts.

“We have forgotten how to be good guests, how to walk lightly on the earth as its other creatures do.” – **Barbara Ward**

2 PROJECT DESCRIPTION

The proponent, Green Charcoal Namibia (GCN) intends to put up a charcoal collection, sorting, processing, packaging warehouse facility in the town of Arandis in Erongo Region.

The following select activities and related infrastructure will be associated with the project:

- initial stage: erection of the warehouse, ablution facilities, utilities – water and electricity
- receiving or collection of Bulk charcoal from farms
- sieving, sorting and packaging of charcoal into bags for shipment to Europe.
- Containers will be loaded at the warehouse facility
- Water will be sourced from an existing borehole on site.

The infrastructure will include:

- Charcoal processing, packaging, storage facility;
- loading and offloading bays;
- Administrative block;
- Water storage facilities



Figure 2.1: Locality Map of the Property Location, Arandis Industrial

2.1 Site Preparation

The identified site sits on Portion 13 Extension 1 (Industrial Area) of Arandis town lands No.170, and measures – 29174 sq.m. The area is currently zoned as industrial. Since the area is arid, no vegetation will be cleared or affected during site clearance, and construction phase.

Steps in Site Preparation for Construction Projects

- (1) Site observation and evaluation. First, you need to find out all of the peculiarities of the site. ...
- (2) Soil Testing. ...
- (3) Demolition. ...
- (4) Underground utility mapping. ...
- (5) Removing Asbestos. ...
- (6) Site surveying and set out. ...

- (7) Clearing the site. ...
- (8) Site excavation and earthwork.

The construction phase all starts with site preparation that entails a number of essential phases: from site evaluation to demolition, from site set out to excavation.

2.2 Creating a Fire Prevention Plan

Fire extinguishers and sprinkler systems are essential for every workplace and manufacturing floor. However, the biggest tool in the plant’s firefighting arsenal is prevention. The proponent will ensure that fire prevention plan will be developed, and circulated to all the workers.

The following tips will be used to develop the Fire Prevention Plan:

Tip	Description
Knowing the charcoal plant hazards	Every fire prevention plan starts with a list of possible hazards and their location. This includes storage of hazardous materials, potential ignition sources and areas where fires may have occurred previously. This part of the plan should also include fire suppression options near those locations. The proponent will keep in mind that the type of fire risk determines the suppression method, so he will make sure those are in line (e.g. having the right type of extinguisher for a chemical fire).
Outlining procedures	Since the plant will be dealing with hazardous materials, the proponent needs plans for how they are handled. This includes controlling their accumulation and proper disposal in order to reduce risk. The Plan should include routines for disposing of items or rendering them less flammable or hazardous. Once established, there will be scheduled regular safety meetings with employees to ensure compliance.
Keeping a maintenance schedule	Equipment is often the largest fire hazard under the plant. the fire prevention plan must include care and maintenance of heat-producing equipment to keep it from accidentally igniting combustible materials. The proponent, through a consultant, must list safeguards for keeping equipment safe and indicate the fire suppression solution nearby. If equipment is unsafe to use, complete a backup plan so there are no desperate situations where dangerous equipment remains in use despite the fire risk.
Assigning maintenance duties:	The fire safety plan should also name employees and supervisors in charge of carrying out its procedures. This includes names and job titles of those who are in charge of maintaining equipment. Not only does this help narrow down responsibility if something happens, but it indicates to whom employees can turn if they have questions. There should also be a clear reporting plan for employees to inform supervisors if equipment overheats easily or if there are any close calls.
Centralizing hazard control	A floor supervisor or other manager should be in charge of controlling fuel source hazards and ensuring everyone else complies with those routines. If not, the proponent shall need a hazardous material plan that outlines these procedures.

2.3 Process (Construction, Collection, Processing, and Packaging)

The proponent will undertake the following select activities during site preparation stage or phase:

Phase	Description
Construction of the plant	<ul style="list-style-type: none"> • The plant will be constructed or put up and will entail receiving bay, handling facilities, processing, packaging and shipping of the charcoal overseas via the Walvis Bay Namport • The plant will as well have an administrative arm, security facility, ablution facilities, • Municipal services like the sewer system will be connected to the local authority main system • Water will as well be connected to the Arandis Town Council mains. • The plant will be secured by a security fence, access control and security boom • No personnel will stay on the plant, workers will work on shifts
Wood collection	<ul style="list-style-type: none"> • The plant will accept only the Acacia mellifera tree type from local wood harvesters • Only sustainably harvested wood will be collected • Wood will be harvested by an excavator which has been converted to clamp and cut off the tree just above the surface of the soil.

Collection, transportation, storage, and preparation of wood	<ul style="list-style-type: none"> The plant will collect wood from local producers, and it will be stored in rows at the plant. Here it will be dried and then sawn (cut) into the right sizes before insertion into kilns at the plant
Conversion of wood to charcoal	<ul style="list-style-type: none"> The proponent intends to use kilns/pots to convert wood to charcoal. 50 – 100 kilns/pots will be used. Once the kiln has cooled down, the charcoal is removed and temporarily stored on site to be sieved and graded.
Sieving, and grading of charcoal	<ul style="list-style-type: none"> A manually operated moveable rotational table and sieve (19mm) will be used to separate sand, stones, charcoal dust, and undersize charcoal from the marketable charcoal. The table and sieve will move from kiln to kiln and the charcoal will be fed into the sieve manually.
Collection and temporary storage of charcoal dust and below grade charcoal	<ul style="list-style-type: none"> All charcoal dust and pieces below 20mm in diameter will go from the sieve directly into bulk bags which will be stored on the premises until collection. This 'below grade charcoal/waste' will be delivered to designated briquette manufactures in Namibia for processing into briquettes to be exported.
Bagging of charcoal	<ul style="list-style-type: none"> Sifted and graded charcoal will be collected in bags (50kg and bulk bags) and stored on the plant
Closing of the bags (sewing)	<ul style="list-style-type: none"> charcoal bags will be closed at the plants manually by the workers
Transportation and packing of finished products in containers	<ul style="list-style-type: none"> the packaged charcoal will be transported by trucks or railway to the port of Walvis Bay. the proponent will make use of licensed and registered logistics service providers

2.4 Municipal Services

The identified piece of land is strategically located and easily accessible to the residential areas, and it can be easily connected to the existing municipal services / infrastructure like roads, electricity, sewer and electricity and other amenities.

• Infrastructure and Services

Municipal Infrastructure means the roadbed and road area, street and sidewalk paving, curbing, associated drainage Facilities, bike paths and other construction or improvements pertaining to public travel⁶.

• Roads

Access to the site will be through gazette roads, see Figure 2.1, which have since been constructed to get to the site. All the roads will be constructed according to the Arandis Town Council engineering standards and specifications. This will be complemented with relevant road / traffic signs and markings.

• Storm water drainage system

The Storm water drainage system is defined as a "network of structures, channels and underground pipes that carry storm water (rainwater) to ponds, lakes, streams and rivers"⁷. This will be an integral part of the system that will be designed to control the quantity, quality, timing and distribution of storm runoff. This will help address potential waterlogging, flooding of the proposed development

• Water Reticulation

A water reticulation system helps water move from the original source to the consumer. Considering the volume of water required is another factor when planning and designing the system. The water moves with the help of energy and must overcome any resistance it encounters when changing elevations⁸.

⁶ <https://www.lawinsider.com/dictionary/municipal-infrastructure>

⁷ <https://www.platinumlakemanagement.com/blog/what-is-a-stormwater-drainage-system>

⁸ <https://www.hydroserv.com.au/water-reticulation/>

The proposed development internal water reticulation network will be directly connected to the existing municipal network. The water reticulation design will be done in close consultation with the Arandis Town Council relevant departments including the Engineering Department

- **Sanitation**

Sanitation refers to public health conditions related to clean drinking water and adequate treatment and disposal of human excreta and sewage. The proposed development will be directly connected to the Arandis Town Council Public Sewerage System Network (PSSN). The entire network of sewer pipes, manholes, pumping stations, force mains, inverted siphons, and other appurtenances is called a sewerage system

- **Electricity Distribution Network**

Electricity distribution networks carry electricity from the high voltage transmission grid to industrial, commercial and domestic users⁹. The proposed site boasts of existing Erongo Red electricity kiosks and lines passing through the area, thereby making connection to the site easier. The core business of Erongo RED is to distribute and supply safe, reliable, sustainable and accessible electricity. Erongo RED received a distribution and supply license, which is valid until 2030¹⁰.

- **Municipal Waste**

Municipal waste is defined as waste collected and treated by or for municipalities¹¹. It covers waste from households, including bulky waste, similar waste from commerce and trade, office buildings, institutions and small businesses, as well as yard and garden waste, street sweepings, the contents of litter containers, and market cleansing waste if managed as household waste. The definition excludes waste from municipal sewage networks and treatment, as well as waste from construction and demolition activities. This indicator is measured in thousand tonnes and in kilograms per capita. The proponent will directly work with the Arandis Town Council for waste collection.

2.5 Baseline Information

- **Baseline data collection required for EIA**

Collection of baseline information serves two purposes: It provides a description of the status and trends of environmental factors (e.g., air pollutant concentrations) against which predicted changes can be compared and evaluated in terms of importance.

A baseline study is essential in order to be able to determine the level of impact expected and to enable the monitoring of impacts after the development has occurred. In some cases, baseline information will need to be gathered in the field, and in others it will already be available and need only be collated. Where a project has a number of alternative sites, each of the sites should undergo a baseline study so that the relative severity of the impacts for each alternative can be assessed¹².

It is essential that the baseline information which is collected represents both the temporal and spatial trends of the parameters in question. Understanding how the baseline environment may change in the absence of the proposed project is therefore important in order to understand what difference the project will make. This obviously becomes more difficult the longer the timescale over which you are considering impacts, as issues like climate change may become important in altering the baseline state of the environment.

⁹ <https://www.ofgem.gov.uk/electricity/distribution-networks/gb-electricity-distribution-network>

¹⁰ <https://www.erongored.com/about-us/>

¹¹ <https://data.oecd.org/waste/municipal-waste.htm>

¹² https://www.soas.ac.uk/cedep-demos/000_P507_EA_K3736-Demo/unit1/page_19.htm

- **Climate and Average Weather Year Round in Arandis Namibia**

In Arandis, the summers are short, warm, and mostly clear; the winters are cool, windy, and clear; and it is dry year round. Over the course of the year, the temperature typically varies from 47°F to 84°F and is rarely below 39°F or above 94°F. Based on the tourism score, the best time of year to visit Arandis for warm-weather activities is from mid-September to early July.

Table 2.1: Climate and Average Weather Year Round in Arandis

Aspect	Description
Average Temperature Arandis in	The warm season lasts for 1.4 months, from March 13 to April 25, with an average daily high temperature above 83°F. The hottest month of the year in Arandis is March, with an average high of 83°F and low of 60°F. The cool season lasts for 3.2 months, from June 6 to September 13, with an average daily high temperature below 78°F. The coldest month of the year in Arandis is August, with an average low of 48°F and high of 76°F.
Clouds	In Arandis, the average percentage of the sky covered by clouds experiences significant seasonal variation over the course of the year. The clearer part of the year in Arandis begins around March 15 and lasts for 9.1 months, ending around December 19. The clearest month of the year in Arandis is May, during which on average the sky is clear, mostly clear, or partly cloudy 92% of the time. The cloudier part of the year begins around December 19 and lasts for 2.9 months, ending around March 15. The cloudiest month of the year in Arandis is January, during which on average the sky is overcast or mostly cloudy 30% of the time.
Precipitation	Arandis does not experience significant seasonal variation in the frequency of wet days (i.e., those with greater than 0.04 inches of liquid or liquid-equivalent precipitation). The frequency ranges from 0% to 9%, with an average value of 2%. Among wet days, we distinguish between those that experience rain alone, snow alone, or a mixture of the two. The month with the most days of rain alone in Arandis is February, with an average of 2.2 days. Based on this categorization, the most common form of precipitation throughout the year is rain alone, with a peak probability of 9% on February 17
Humidity	We base the humidity comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night. The perceived humidity level in Arandis, as measured by the percentage of time in which the humidity comfort level is muggy, oppressive, or miserable, does not vary significantly over the course of the year, staying within 1% of 1% throughout.
Sun	The length of the day in Arandis varies over the course of the year. In 2022, the shortest day is June 21, with 10 hours, 46 minutes of daylight; the longest day is December 21, with 13 hours, 31 minutes of daylight. The earliest sunrise is at 6:07 AM on November 28, and the latest sunrise is 1 hour, 34 minutes later at 7:40 AM on July 5. The earliest sunset is at 6:23 PM on June 7, and the latest sunset is 1 hour, 27 minutes later at 7:50 PM on January 15. Daylight saving time (DST) is not observed in Arandis during 2022.
Rainfall	To show variation within the months and not just the monthly totals, we show the rainfall accumulated over a sliding 31-day period centered around each day of the year. Arandis experiences some seasonal variation in monthly rainfall. Rain falls throughout the year in Arandis. The month with the most rain in Arandis is February, with an average rainfall of 0.4 inches. The month with the least rain in Arandis is August, with an average rainfall of 0.0 inches.
Topography	For the purposes of this report, the geographical coordinates of Arandis are -22.417 deg latitude, 14.967 deg longitude, and 1,870 ft elevation. The topography within 2 miles of Arandis contains only modest variations in elevation, with a maximum elevation change of 282 feet and an average elevation above sea level of 1,880 feet. Within 10 miles contains only modest variations in elevation (1,663 feet). Within 50 miles contains very significant variations in elevation (6,335 feet). The area within 2 miles of Arandis is covered by bare soil (99%), within 10 miles by bare soil (74%) and sparse vegetation (15%), and within 50 miles by bare soil (70%) and grassland (14%).

2.6 Need for the development

Charcoal production is an important activity for managing bush encroachment in Namibia with an estimated 160,000 tons of export volume annually, making it the largest exporter of charcoal in the Southern African region. The charcoal industry in Namibia is experiencing an unprecedented boom with a growth of 42 percent in tonnages, according to the latest year-to-year figures. The blossoming industry also recorded a dramatic increase of 66 percent in production value, the State of Namibian Agriculture, a study by the Namibia Agricultural Union (NAU) has revealed (New Era, 16 July 2019).

Normally the industry is the supplier of some 10 000 jobs, but the current increased activities have pushed this figure up to between 10 000 and 15 000 workers. Considering different and connected factors such as current market demand and the industry's ability to respond to such demand, it is estimated that Namibian charcoal exports could increase to 300 000 tons by 2022.

Charcoal – also called Namibia's black gold – is mainly an export product with valuable contributions towards the GDP of the Namibian economy. Numerous farmers, who have entered this industry due to drought, stated that this is an excellent farming diversification with quick cash income.

The global demand for Namibian charcoal exceeds the offer and thus there is big growing potential. In order to do so, the association facilitates a series of group schemes to conduct the audits for validating standards to be met through collective cooperation among a larger portion of land owners and processors in a given vicinity. This approach to create economies of scale among the harvesters and processors supports improved coordination and reduced costs for individuals seeking to meet the rigorous certification requirements.

Charcoal production is an important activity for managing bush encroachment in Namibia with an estimated 160,000 tonnes of export volume annually, making it the largest exporter of charcoal in the Southern African region.

“Plans to protect air and water, wilderness and wildlife are in fact plans to protect man.” - Stewart Udall

3 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The Government of the Republic of Namibia wants to ensure that the aims and objectives of sustainable development are achieved and maintained. Policies and statutes, and structures within Ministries, such as the Directorate of Environmental Affairs in the Ministry of the Environment, Forestry and Tourism, have been established to deal with environmental issues.

The environmental legislation, provisions and implications are summarised below:

Table 3.1: Namibian Legislation relevant to the project

LEGISLATION/ GUIDELINE	RELEVANT PROVISIONS	IMPLICATIONS FOR THIS PROJECT
Namibian Constitution First Amendment Act 34 of 1998	<ul style="list-style-type: none"> - “The State shall actively promote... maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future” (Article 95(l)). 	<ul style="list-style-type: none"> - Ecological sustainability should inform and guide this EA and the proposed development.
Environmental Management Act EMA (No 7 of 2007)	<ul style="list-style-type: none"> - Requires that projects with significant environmental impact are subject to an environmental assessment process (Section 27). - Details principles that are to guide all EAs. 	<ul style="list-style-type: none"> - The EMA and its regulations should inform and guide this EA process.
Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878)	<ul style="list-style-type: none"> - Details requirements for public consultation within a given environmental assessment process (GN 30 S21). - Details the requirements for what should be included in a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15). 	
Forestry Act 12 of 2001 Nature Conservation Ordinance 4 of 1975	<ul style="list-style-type: none"> - Prohibits the removal of any vegetation within 100 m from a watercourse (Forestry Act S22(1)). - Prohibits the removal of and transport of various protected plant species. 	<ul style="list-style-type: none"> - Even though the Directorate of Forestry has no jurisdiction within townlands, these provisions will be used as a guideline for conservation of vegetation.
Labour Act 11 of 2007	<ul style="list-style-type: none"> - Details requirements regarding minimum wage and working conditions (S39-47). 	<ul style="list-style-type: none"> - The Arandis Town Council and the proponent should ensure that all contractors involved during the construction, operation and maintenance of the proposed project comply with the provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety of labourers.	
Public Health Act 36 of 1919	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	
National Heritage Act 27 of 2004	Section 48(1) states that “A person may apply to the [National Heritage] Council [NHC] for a permit	Any heritage resources (e.g. human remains etc.) discovered during

LEGISLATION/ GUIDELINE	RELEVANT PROVISIONS	IMPLICATIONS FOR THIS PROJECT
	to carry out works or activities in relation to a protected place or protected object".	construction requires a permit from the NHC for relocation.
Burial Place Ordinance 27 of 1966	Prohibits the desecration or disturbance of graves and regulates how bodies may be unearthed or dug up.	Regulates the exhumation of graves.
Water Resources Management Act 11 of 2013.	To provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters.	The protection of ground and surface water resources should be a priority. The main threats will most likely be concrete and hydrocarbon spills during construction and hydrocarbon spills during operation and maintenance.
Namibia Water Corporation Act 12 of 1997	To establish the Namibia Water Corporation Limited; to regulate its powers, duties and functions; to provide for a more efficient use and control of water resources; and to provide for incidental matters.	
Town Planning Ordinance 18 of 1954 (Repealed and replaced by the Urban and Regional Planning Act (No. 5 of 2018).	- Subdivision of land situated in any area to which an approved Town Planning Scheme applies must be consistent with that scheme (S31).	- The proposed use of the project site must be consistent with the Town Planning Scheme
Townships and Division of Land Ordinance 11 of 1963	- Details the functions of the Township Board including what they consider when receiving an application for Township Establishment (S3).	- The proposed layout and land uses should be informed by environmental factors such as water supply, soil etc. as laid out in Section 3.
Road Ordinance 1972 (Ordinance 17 of 1972)	- Width of proclaimed roads and road reserve boundaries (S3.1) - Control of traffic on urban trunk and main roads (S27.1) - Rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads (S36.1) - Infringements and obstructions on and interference with proclaimed roads. (S37.1) - Distance from proclaimed roads at which fences are erected (S38)	- The limitations applicable on RA proclaimed roads should inform the proposed layout and zonings where applicable.
Arandis Town Planning Scheme (TPS)	This statutory document provides land use regulations and development.	Land uses and developments should be in accordance with the TPS.
Sustainable Urban Energy Planning: A handbook for cities and towns in developing countries (SUEP:2004)	Provides a comprehensive list and case studies to implement energy saving measures.	Implementing energy-efficiency and carbon mitigation measures. Conserve natural resources with city planning.

“It is our collective and individual responsibility ... to preserve and tend to the world in which we all live.” — Dalai Lama

4 THE RECEIVING ENVIRONMENT

The receiving environment is defined as “the environment upon which a proposed activity might have effects”.¹³

4.1 Biophysical Environment

The biophysical environment is the biotic and abiotic surrounding of an organism or population, and consequently includes the factors that have an influence in their survival, development and evolution¹⁴. The biophysical environment can vary in scale from microscopic to global in extent. It can also be subdivided according to its attributes. Examples include the marine environment, the atmospheric environment and the terrestrial environment. The number of biophysical environments is countless, given that each living organism has its own environment¹⁵.

4.1.1 Geography

The Erongo Region covers an area of 63,586 km², which comprises 7.7 per cent of Namibia’s total area of about 823,680 km².¹⁶

Figure 4.1: Sociopolitical Map of Erongo Region, Courtesy: Erongo Regional Council, 2021



The political regions of Kunene (to its north), Otjozondjupa (northeast), Khomas (southeast) and Hardap (south) surround the Erongo Region.

The Erongo Region stretches from the Central Plateau westwards across the Central-Western Plains and Escarpment to the Central Namibian coast, roughly over a distance between 200 and 350 km. Northwards the stretches from the Ugab River in the north to the Kuiseb River in the south over a distance of up to 300 km. On the west it is flanked by the Atlantic Ocean.

The Central-Western Plains were largely formed by erosion cutting eastwards into the higher ground, thereby forming the catchment area of several major ephemeral rivers such the Khan, Omaruru, Swakop and Ugab, which waters would all reach the sea when in full flood during a good rainy season.

On its southern border the Kuiseb River, distinctively divides the large sea of dunes to the south and gravel plains to the north. Interestingly, this river does not reach the sea when in flood but the water disappears into the sand at the Kuiseb Delta, from which Walvis Bay extracts underground water supplies

¹³ <https://www.qualityplanning.org.nz/index.php/search/node?keys=receiving+environment>

¹⁴ <https://www.tandfonline.com/action/showCitFormats?doi=10.1080%2F08941929809381114>

¹⁵ <http://nwrn.eu/concept/3944>

¹⁶ <http://www.erc.com.na/maps/erongo-region/>

The Brandberg, with its tallest peak Königstein at 2,606 m above sea level, is Namibia's highest mountain. It is composed of a single mass of granite that rose through the earth's crust some 120 million years ago. The Brandberg has one of the richest selections of rock paintings, including the world-famous 'White Lady'. The Damara/Nama name for the mountain is Dâures, which means 'burning mountain', and Otjiherero name, 'Omukuruvaro' means 'mountain of the Gods'.

The Region was named after the Erongo Mountain range, of which the western peaks rise 2,302 m above sea level. The mountain is an eroded relic of a volcano that was active some 140 – 150 million years ago. It dominates the flat plains west of Omaruru, which is flanked by the Namib Desert to the west and a mixed, woodland savannah to the east.

The Namib Desert covers the whole Namibian coastline of 1,570 km. It is 55-80 million years old and considered to be the oldest desert in the world. Namib in Damara/Nama means 'vast place'. The desert geology consists of sand seas near the coast, while gravel plains and scattered mountain outcrops occur further inland. Here some of the highest sand dunes can be found, of which some are 300 m high.

The hyper-arid Namibian coastal ecosystem, which encompasses Arandis, is home to a significant and unique array of biological and ecological diversity, including uniquely adapted plants and animals, rich estuarine fauna and a high diversity of migratory shore and seabirds. Namibia's coastal zones are considered as refuge for a number of endangered species.

The waters of the Namibian coast, with its icy and nutrient-rich Benguela current, support some of the greatest concentrations of marine life found anywhere in the world. It is one of the world's most productive marine environments, not only in terms of fishery resources but also mineral deposits.

4.2 Socio Economic Environment

Social and environmental determinants are the full set of social and physical conditions in which people live and work, including socioeconomic, demographic, environmental and cultural factors, along with the health system.¹⁷

4.2.1 Demographics

A total 150,400 people were counted in the Erongo Region during the 2011 National Census, which is 7.1 percent of the total population of Namibia of 2,500,900. During the 2001 National Census the Erongo Region had 107,656 people, accounting for 5.9 percent of the total population of 1,830,293¹⁸.

Figure 4.3: Population distribution by Sex and Area by Constituency

Constituency	Total Population	Total Male	Total Female	Area in km ²	Population density
Arandis	10,200	4,900	5,300	13,490	0.8
Daures	11,300	5,300	6,000	17,752	0.6
Karibib	13,300	6,400	6,900	14,521	0.9
Omaruru	8,500	4,100	4,400	8,425	1.0
Swakopmund	44,700	21,000	23,700	196	228.0
Walvis Bay Rural	26,900	12,700	14,200	9,134	2.9
Walvis Bay Urban	35,500	16,300	19,200	19	1886.2
TOTAL	150,400	70,700	79,700	63,539	2.4

¹⁷ <https://www.healthandenvironment.org/environmental-health/environmental-risks/socioeconomic-environment>

¹⁸ <http://www.erc.com.na/maps/population/>

The Erongo Region counted 44,900 households in 2011 at an average size of 2.6 people per household, while in 2001, while in 2001 the region had 27,496 households at an average size of 3.8.

Figure 4.4: Population by major municipalities and towns

Urban Locality	Total Population	Total Male	Total Female	Area in km ²	Population density
Arandis	5,100	2,400	2,700	33.4	152.6
Henties Bay	4,800	2,400	2,400	133.5	36.0
Karibib	5,100	2,500	2,600	103.6	49.2
Usakos	3,600	1,900	1,700	60.8	59.2
Omaruru	6,000	3,000	3,000	206.6	29.0
Swakopmund	44,700	21,000	23,700	213.0	209.9
Walvis Bay	61,300	28,600	32,700	32.5	1,889.1
TOTAL	130,600	61,800	68,800		

According to the 2011 Census the population density was 2.1 persons per km², compared to 1.7 persons per km² in 2001. In 2001 the Erongo Region had 50,040 females and 57,616 males, or 115 males for every 100 females, growing at an annual rate of 1.3 percent. The fertility rate was 3.2 children per woman. Then 80 percent of the population lived in urban areas while 20 percent lived in rural areas. The figures for 2011 are not available as yet.

In 2001 by age, 11 percent of the population was under 5 years old, 18 percent between 5-14 years, 64 percent between 15-59 years, and 6 percent 60 years and older. The most commonly spoken languages at home in 2001 were Oshiwambo (37 percent of households), Afrikaans (22 percent), and Damara>Nama (21 percent).

For those 15 years and older, in 2001 the literacy rate was 92 percent. In terms of education, 89 percent of girls and 86 percent of boys between the ages of 6 -15 were attending school, and of those older than 15, 79 percent had left school, 9 percent were currently at school, and 8 percent had never attended. The employment rate for the labour force (71 percent of those 15+) was 66 percent employed and 34 percent unemployed. For those 15+ years old and not in the labour force (24 percent), 35 percent were students, 34 percent homemakers, and 31 percent retired.

4.5 Mining

The Mining Sector in the Erongo Region has been characterised by the establishment and expansion of a number of Uranium mines over the past decade due to an increased demand for this energy source. The Erongo Region also accommodates the mining of commodities such as gold, marble, granite, salt and semi-precious stones¹⁹. Mining and quarrying contributes about 8,8 percent to national GDP, 51 percent to foreign exchange earnings, of which diamonds, ores and minerals are the most important.

- **Uranium**

In 2011, Namibia delivered 6.9 percent of the world's primary produced uranium, after Kazakhstan, Canada, Australia, Russia and Niger. The uranium oxide extracted from deposits is one of Namibia's key exports and makes the country the sixth largest exporter of uranium in the world. Namibia currently has two significant uranium mines capable of providing 10 percent of world mining output. The other mines are busy setting up their operations although some are experiencing setbacks due to the recent uranium price fluctuations.

If the Uranium industry would develop as initially expected, it could employ 5,483 people, which would cause an influx to towns such as Walvis Bay, Swakopmund, Karibib and Arandis. These towns act as dormitory towns to the mining sector.

¹⁹ <https://neweralive.na/posts/moderate-growth-and-subdued-supply-to-gradually-increase-uranium-prices>

Other mining activities are tabulated below:

Salt	Salt is a direct product from the extraction by evaporation of seawater in natural pans or ponds. The salt works at Walvis Bay produces about 700,000 tonnes a year. A further salt producer, just north of Swakopmund, delivers about 75,000 tonnes and at Cape Cross 30,000 tonnes per year. The bulk of the salt is exported to South Africa while West Africa is a growing market.
Petroleum	Petroleum exploration companies have obtained the rights to drill holes along the Namibian coast. The four sedimentary basins off the coast, that developed during the breaking up of the Gondwana continent, seem to hold the promise of oil reserves. HRT from Brazil are preparing to drill holes in two prospecting blocks on the northern fringe of the so-called Orange basin. Thus far, Chariot Oil, listed on the London Stocks Exchange, drilled two holes without success.
Small-scale Mining	Small-scale mining, as a sub-sector of the mining sector, provides a livelihood to a quite number of people and their dependents, alleviating poverty. It is estimated that there are about 2,000 small-scale miners in the Erongo Region, operating in cooperatives of about ten people each. These cooperatives can be found mining semi-precious stones at Arandis, Omatjete, Uis, Okombahe, Omaruru, Tsubusis, Otjimbingwe, Usakos and Walvis Bay.

4.6 Fishing

Along the Namibian coast the nutrient-rich cold Benguela Current and its upwelling system in the Atlantic Ocean supports a vibrant fishing industry. Namibia's fishing grounds is one of the most productive and stretches along the total coastline of 1,570 km and 200 nautical miles westwards into the sea.

More than 20 species of fish, lobsters and crabs are commercially harvested in these waters. The fishing industry is the third largest economic sector, and contributed about 6.6 percent cent to the Gross Domestic Product (GDP). The value of fishing, onshore and offshore processing accounted for N\$3,410 million in 2008. It is also the largest employer at the coast. The industry at Walvis Bay, and Lüderitz in the Karas Region, employs about 14,000 workers, of which about 43 percent work on vessels at sea while 57 percent are involved in onshore processing. Namibia's fishing industry is the country's second biggest export earner of foreign currency after mining. In total, 90 percent of the national output is exported.

4.7 Tourism

The Erongo Region offers some of the most spectacular and popular tourist destinations as well as a variety eco-, wildlife, cultural and adventure tourism opportunities. Erongo Region is home to the Dorob National Park between the Kuiseb Delta, south of Walvis Bay, and the Ugab River in the north. A part of the Namib-Naukluft Park covers its southern border, where one also finds the ephemeral Kuiseb River and the Topnaar people, who make their living off from what the Namib Desert offers.

Some of the most unique flora such as the Welwitschia plant that can become as old as two thousand years, and a huge variety of lichens, living fossil plants that live from the coastal fog. Various other creatures, large and small are also living in the desert near the coast. The small ones include the Palmato Gecko, Fitzsimons burrowing skink, Shovel-snouted lizard, Fog basking beetle, White lady spider and the Namaqua chameleon. Larger animals such as Oryx, Zebra, Springbok and Ostriches can be found at the coast, and the occasional Desert elephant and lion at places such as the Messum Crater.

4.8 Arandis in detail

Arandis (Khoekhoe: the place where people cry) is a town in the Erongo Region of western central Namibia. It has been called the Uranium Capital of the World as it is located just 15 km outside the world's largest open-pit uranium mine, the Rössing Uranium Mine.

Established for the workers of Rössing Uranium in 1978, Arandis was granted self-administration and "town" status in 1994. Currently it has 7,600 inhabitants, most of whom are somehow connected to the mine, and owns 29 square kilometres (11 sq mi) of land. Besides Rössing, Arandis also serves the Husab and Trekkopje uranium mines. It is the home of the Namibian Institute of Mining and Technology, a technical institute focusing on training skilled industrial workers

“To cherish what remains of the Earth and to foster its renewal is our only legitimate hope of survival.”

– **Wendell Berry**

5. PUBLIC CONSULTATION

Even a cursory glance at the literature on environmental impact assessment (EIA) reveals that public participation is being considered as an integral part of the assessment procedure. Public participation in EIA is commonly deemed to foster democratic policy-making and to render EIA more effective²⁰.

5.1 Interested and Affected Persons (I&APs)

Public consultation is an important component of an Environmental Assessment (EA) as it provides potential Interested and Affected Parties (I&APs) with a platform whereby they can raise any issues or concerns relevant to the proposed project. This assists the environmental consultant in considering the full spectrum of potential impacts and to what extent further investigations are required²¹.

In addition, the public consultation process also granted I&APs an opportunity to review and comment on all the documents produced throughout the EA process. This is done in accordance with both the Environmental Management Act's EIA Regulations, as well as international best practice principles.

Stakeholders' involvement was formalised by scheduling public hearings, and periodically distributing information / notices in the daily newspapers concerning the proposed development. Stakeholders' involvement in the EIA process gave all interested and affected parties such as local communities and individuals a voice in issues that bear directly on their health, welfare, and quality of life.

An open flow of environmental information fostered objective consideration of the full range of issues involved in project planning and can allow communities and citizens to make reasoned choices about the benefits and risks of proposed actions.

Figure 5.1: EIA Consultations Timeline

Date	Stakeholder Consulted	Notes / Comments
December 2021	Green Charcoal Namibia(GCN) / Representative	Induction / Technical Overview of the proposed development
January 2022	Arandis Town Council	Input received
February 2022	Registration with Ministry of Environment, Forestry & Tourism.	Accepted
February 2022	Newspaper Adverts calling for I&APS to participate in the EIA process	Adverts appeared in both the New Era and Namib Times Newspapers
February 2022	Putting up of Site Notice and Other Notices in Arandis	The EAP put up the Notices
February 2022	BID Shared with the Arandis Town Council for their acquaintance and input	BID received and acknowledged

²⁰ <https://www.sciencedirect.com/science/article/abs/pii/S0195925513000711>

²¹ Ibid.

Table 5.2: Summary of Comments / Issues Received

Theme	Issue Raised by IAPs
Economic	- Creation of jobs and local people being employed
Infrastructure	- Waste Management in the area - Type of plant to be built in the area
Environmental	- Strong Winds - Dust

Figure 5.3: Public Meeting at Arandis Town Hall, 24 February 2022



Figure 5.4: Notices on the Arandis Town Council Hall and Council Hall



“The Earth does not belong to us: we belong to the Earth.” – Marlee Matlin

6. ALTERNATIVES

The proponent and Council has considered one site, which is portion 13, on Extension 1 in the industrial areas of Arandis. Portion 13 was considered the best alternative as it was available.

In the planning process of the proposed project, the proponent and other project consultants had several consultation meetings with the Arandis Local Authority in order to determine the best sites for the proposed development.

6.1 No-Go Alternative (Do Nothing Alternative)

Should the proposed development not take place, serious consequences can be expected, as there will be a backlog in housing, which may lead to service protests as the community’s needs are not addressed or met. Due to the location of the proposed sites to the existing residential development, it could attract undesirable land use, e.g. become a hub for criminals, and there could be establishment of informal settlements.

6.2 Technology Alternative 1:

Due to the type of project, no alternative technology can be considered.

6.3 Selection Process

Consultation meeting has been held with the Local Municipality and relevant role-players to determine the most suitable area available for the establishment of residential townships. Economic restraints, existing infrastructure and available land were major constraints on the selection process.

“If we do not permit the earth to produce beauty and joy, it will in the end not produce food, either.” – Joseph Wood Krutch

7. IMPACT ASSESSMENT

7.1 Methodology employed for assessment

The EIA Regulations require “a description of the significance of any significant effects, including cumulative effects, which may occur as a result of the undertaking of the activity”. In order to determine significance each of the potential impacts identified have been subjected to the following questions displayed graphically below.

Table 7:1 Impact Assessment Criteria

Impact Assessment Criteria	
NATURE	Reviews the type of effect that the proposed activity will have on the relevant component of the environment and includes “what will be affected and how?”
EXTENT	Geographic area: Indicates whether the impact will be within a limited area: <ul style="list-style-type: none"> - Immediate area (on site where construction is to take place); - local (limited to within 25km of the area); - regional (limited to ~200km radius); - national (limited to the coastline of Namibia); or - International (extending beyond Namibia’s borders).
DURATION	Whether the impact will be: <ul style="list-style-type: none"> - temporary (during construction only), - short term (1-5 years), medium term (5-10 years), - long term (longer than 10 years, but will cease after operation) or permanent.
INTENSITY	Establishes whether the magnitude of the impact is destructive or innocuous and whether or not it exceeds set standards, and is described as: <ul style="list-style-type: none"> - none (no impact); - low (where natural/ social environmental functions and processes are negligibly affected); - medium (where the environment continues to function but in a noticeably modified manner); or - high (where environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standards/requirements).
PROBABILITY	Considers the likelihood of the impact occurring and is described as: <ul style="list-style-type: none"> - uncertain, - improbable (low likelihood), - probable (distinct possibility), - highly probable (most likely) or - definite (impact will occur regardless of prevention measures).
SIGNIFICANCE	Significance is given before and after mitigation. <ul style="list-style-type: none"> - <u>Low</u> if the impact will not have an influence on the decision or require to be significantly accommodated in the project design, - <u>Medium</u> if the impact could have an influence on the environment which will require modification of the project design or alternative mitigation (the project components can be used, but with deviations or mitigation). - <u>High</u> where it could have a “no-go” implication regardless of any possible mitigation (an alternative should be used).
STATUS OF THE IMPACT	A statement of whether the impact is: <ul style="list-style-type: none"> - positive (a benefit), - negative (a cost), or - neutral
DEGREE OF CONFIDENCE IN PREDICTIONS	Indicate in each case who is likely to benefit and who is likely to bear the costs of each impact. Is based on the availability of specialist knowledge and other information.

Table 7.2: Screening and Assessment Criteria

SIGNIFICANCE RATING	CRITERIA
LOW	- Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given development description. This would be allocated to impacts of any intensity/ magnitude, if at a local scale/ extent and of temporary duration/time.
MEDIUM	- Where the impact could have an influence on the environment, which will require modification of the development design and/or alternative mitigation. This would be allocated to impacts of medium intensity/magnitude, locally to regionally, and in the short term.
HIGH :	- Where the impact could have a significant influence on the environment and, in the event of a negative impact the activity(ies) causing it, should not be permitted (i.e. there could be a 'no-go' implication for the development, regardless of any possible mitigation). This would be allocated to impacts of high intensity, locally for longer than a month, and/or of high intensity regionally and beyond.

Figure 7.1: Screening and Assessment of Impacts
The impacts are tabulated below:

POTENTIAL IMPACT	DESCRIPTION	EXTENT	DURATION	INTENSITY	PROBABILITY	CONFIDENCE/ SUFFICIENT INFORMATION AVAILABLE?	SIGNIFICANCE	SIGNIFICANT MITIGATION DEEMED POSSIBLE?	NEXT STEP
Aesthetic issues	The change in the existing landscape may be an eye sour to existing residents due to blockage of open views.	Immediate area	Temporary	Low	Improbable	Yes	Low	Yes	EMP
Employment creation	The construction activities associated with the project is due to create local employment opportunities.	Local	Temporary	Medium	Definite	Yes	Low	Yes	EMP
Noise (construction phase)	Construction activities can create noise for local nearby residents	Local	Temporary	Low	Highly probable	Yes	Low	Yes	EMP
Dust (construction phase)	The ingress and egress of construction vehicles can create dust.	Local	Temporary	Low	Highly probable	Yes	Low	Yes	EMP
Traffic (Operational phase)	Increase in traffic in the area is expected due to construction activities and establishment of a township, clinic and other amenities.	Local	Permanent	Medium	Definite	Yes	Low	Yes	EMP
Effluent generation	Once the township & its related infrastructure are established, effluent will be generated from the households	Local	Long-term	Medium	Definite	Yes	Low	Yes	EMP
Impact on scarce water resources	The Municipality has to make provision for providing additional water to the newly formed township	Local	Long-term	Low	Improbable	Yes	Low	Yes	EMP

POTENTIAL IMPACT	DESCRIPTION	EXTENT	DURATION	INTENSITY	PROBABILITY	CONFIDENCE/ SUFFICIENT INFORMATION AVAILABLE?	SIGNIFICANCE	SIGNIFICANT MITIGATION DEEMED POSSIBLE?	NEXT STEP
Increase generation of domestic waste	the development will generate domestic waste.	Local	Long-term	Medium	Definite	Yes	Medium	Yes	EMP
Impact on existing properties	The proposed development is believed to impact on existing property values in the area.	Local	Long-term	Low	Probable	Yes	Low	Yes	EMP
Flooding	NO Flooding is expected.	Local	Temporary	Medium	Definite	Yes	Medium	Yes	EMP
Public open space encroachment	The proposed development may encroach in public beach area.	Local	Temporary	Low	Probable	Yes	Low	Yes	EMP

*"We learned that economic growth and environmental protection can and should go hand in hand." –
Christopher Dodd*

8. ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE

8.1 Assumptions:

- The scope is limited to assessing the potential impacts associated with the proposed development; therefore, the effect on the surrounding environment is based on the current land use.
- All information provided by KPM Environmental Consultants, as the EAP and other parties involved are deemed valid and correct at the time it was provided.
- Since during the public participation process, no indigenous local knowledge came forth, it is assumed that there are no sensitive cultural, e.g. initiation school's sites on the proposed site.

8.2 Assumptions from Specialists:

- The Outline Scheme Report is based on the bulk services information received from the Arandis Town Council.

8.3 Limitations/Gaps in Knowledge: None

“Human subtlety will never devise an invention more beautiful, more simple or more direct than does nature because in her inventions nothing is lacking, and nothing is superfluous.” – Leonardo da Vinci

9. EIA / SCOPING RECOMMENDATION

The EIA / Scoping is of the opinion that the development should be authorized because the negative impacts can be mitigated to a satisfactory level. However, the following recommendations should be considered:

1. Loss of topsoil during construction should be avoided to a greater extent.
2. The proponent should consider planting of grasses and trees, especially at the park erven to promote greening and to minimize soil exposure, which could result in accelerated soil erosion process.
3. Proper maintenance of roads and streets.
4. Proper management procedures and mitigation measures must be implemented as outlined in the EMP.
5. Environmental Officer should be appointed for monthly environmental compliance monitoring during the construction phase.
6. Recommendations from specialists should be considered and adhered to.

10. ENVIRONMENTAL MANAGEMENT PLAN OR STATEMENT

It should be recognized that no development could be completed without impacting in some way on the environment; therefore, it is imperative that negative impacts are minimized to a greater extent.

During the scoping phase of the EIA process, the environmental issues that were identified were for both the construction and operation phase.

The identified impacts are summarized below:

1. Loss of topsoil;
2. Potential habitat of the infrastructure on the socio-economic structure of the area.
3. Job creation looking at employment of local community;
4. Excessive noise generation during construction;
5. Potential damage or destruction to undiscovered heritage sites of the area;
6. Traffic congestion during construction;
7. Potential impact of sensitive habitat destruction; and
8. Potential impact of destruction on red data plants.

From the evaluation identified impacts using the assessment methodology, the significance ratings of negative impacts were reduced to low with outlined mitigation measures and the positive impacts were accentuated. The extent with mitigation ranged between site specific and local. Adherence to the draft EMP will also ensure that impacts occurring due to the development will be reduced to a greater extent.

To determine the ability of the municipality to provide basic services to the proposed development, a Consent Letter is herewith attached. In terms of the findings, the municipality has the ability to accommodate the proposed site provided the outfall sewer is upgraded.

Specialists' studies that were undertaken as part of the EIA process included a **Heritage Impact Assessment** to inspect the site for any possible archaeological and historical material and Paleontological Investigation to determine the likelihood of fossil preservation in the area. The site has no major paleontological and archaeological grounds to suspend the proposed development, therefore no mitigation measures are required but mitigation is provided in the EMP in case there is unearthing of fossils, grave sites, etc. during earthmoving activities.

The proposed site is suitable for the proposed plant or development because it is compatible with the surrounding area, easily accessible and availability of connection points to services, e.g. water, electricity.

During the public participation, no objections were received.

A no-go option for this project is not feasible because the site has been earmarked for residential development and it is an extension of existing residential areas therefore connections to basic amenities like water and sewerage are economically feasible.

It is therefore recommended that Environmental Clearance be granted for the proposed development.

The Environmental Management Plan (EMP) identifies possible impacts of the project on the environment and the mitigation thereof. It gives guidelines to the responsible person(s) to follow appropriate contingency plans in the case of various possible impacts, thus the copy of the EMP should be given to the contractor to ensure adherence. The Draft EMP is attached hereto and should it be approved, it will serve as the final EMP.

“Our observation of nature must be diligent, our reflection profound, and our experiments exact. We rarely see these three means combined; and for this reason, creative geniuses are not common.” – Denis Diderot

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