# RENEWAL OF THE ENVIRONMENTAL CLEARANCE FOR THE OPERATION OF A FUEL RETAIL FACILITY ON ERVEN 63 AND 64, KATIMA MULILO, ZAMBEZI REGION

**June 2022** 

App - 0010323



Project Name:	RENEWAL OF THE ENVIRONMENTAL CLEARANCE FOR THE OPERATION OF A FUEL RETAIL FACILITY ON ERVEN 63 AND 64, KATIMA MULILO, ZAMBEZI REGION
The Proponent:	P O Box 591 Katima Mulilo
Prepared by:	Green Earth  ENVIRONMENTAL CONSULTANTS  1st floor Bridgeview Offices & Apartments, No. 4 Dr Kwame Nkrumah Avenue, Klein Windhoek, Namibia PO Box 6871, Ausspannplatz, Windhoek
Release Date:	June 2022
Consultant:	C. Du Toit C. Van Der Walt Cell: 081 127 3145 Email: charlie@greenearthnamibia.com

## **EXECUTIVE SUMMARY**

Green Earth Environmental Consultants were appointed by the proponent, Zambezi Auto City, to conduct the Environmental Impact Assessment renewal for the operation of the fuel retail facility on Erf 63 and 64, Katima Mulilo, Zambezi Region.

An Environmental Impact Assessment was conducted 16 July 2018 and therefore the Environmental Clearance is due for renewal.

In accordance with the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007), the activities listed below, which forms part of the proposed operations, may not be undertaken without a renewed Environmental Clearance:

#### ENERGY GENERATION. TRANSMISSION AND STORAGE ACTIVITIES

The construction of facilities for the refining of gas, oil and petroleum products.

## HAZARDOUS SUBSTANCE TREATMENT. HANDLING AND STORAGE

- The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.
- 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 environmental impacts during the operational phase of the proposed project:

IMPACTS DURING OPERATIONAL PHASE			
Aspect	Impact Type	Significance	Significance
		of impacts	of impacts
		Unmitigated	Mitigated
Ecology Impacts	-	L	M
Dust and Air Quality	-	L	M
Groundwater Contamination	-	L	M
Waste Generation	-	L	M
Failure of Reticulation Pipeline	-	L	M
Fires and Explosions	-	L	M
Safety and Security	-	L	M

IMPACT EVALUATION CRITERION (DEAT 2006):			
Criteria	Rating (Severity)		
Impact Type	+	Positive	
	0	No Impact	
	•	Negative	
	L	Low (Little or no impact)	

Significance	М	Medium (Manageable impacts)
of impacts	of impacts H High (Adverse impact)	

The type of activities that is carried out on the site does not negatively affect the amenity of the locality and the activities will not adversely affect the environmental quality of the area. None of the potential impacts identified are regarded as having a significant impact to the extent that the proposed project should not be allowed. However, the operational activities further on need to be controlled and monitored by the assigned managers and the proponent. Mitigation measures will be provided that can control the extent, intensity, and frequency of these named impacts in order not to have substantial negative effects or results. It is believed that the overall cumulative impact on the biophysical environment will be low and there will be a positive impact on the socio-economic environment.

The Environmental Impact Assessment which follows upon this paragraph was conducted in accordance with the guidelines and stipulations of the Environmental Management Act (No 7 of 2007) meaning that all possible impacts have been considered and the details are presented in the report.

Based upon the conclusions and recommendations of the renewed Environmental Impact Assessment Report and Environmental Management Plan, the Environmental Commissioner of the Ministry of Environment, Forestry and Tourism is herewith requested to:

- 1. Accept and approve the Environmental Impact Assessment Renewal.
- 2. Accept and approve the renewed Environmental Management Plan.
- Issue an Environmental Clearance Renewal for the operation of the fuel retail facility on Erf 63 and 64, Katima Mulilo, Zambezi Region and for the following listed activities:

## ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- The construction of facilities for the refining of gas, oil and petroleum products.

## HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE

- The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.
- 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.

# **TABLE OF CONTENTS**

EXEC	UTIVE SUMMARY	3
LIST	OF FIGURES	7
LIST	OF TABLES	7
LIST	OF ABBREVIATIONS	8
1.	INTRODUCTION	9
2.	TERMS OF REFERENCE	9
3.	PROJECT DESCRIPTION/SITE INFORMATION	10
3.1.	LOCALITY OF SITE	10
4.	BULK SERVICES AND INFRASTRUCTURE	16
4.1.	ACCESS	16
4.2.	WATER SUPPLY	16
4.3.	ELECTRICITY SUPPLY	16
4.4.	SEWAGE DISPOSAL	17
4.5.	SOLID WASTE DISPOSAL	17
5.	APPROVALS OBTAINED	18
6.	APPROACH TO THE STUDY	19
7.	ASSUMPTIONS AND LIMITATIONS	19
8.	ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS	19
9.	AFFECTED NATURAL AND SOCIAL ENVIRONMENT	30
9.1.	CLIMATE	30
9.2.	GEOLOGY, SOILS AND GEOHYDROLOGY	30
9.3.	BIODIVERSITY AND VEGETATION	31
9.4.	SOCIAL-ECONOMIC COMPONENT	32
9.5.	CULTURAL HERITAGE	32
9.6.	SENSE OF PLACE	33
9.7.	HEALTH	33
10.	INCOMPLETE OR UNAVAILABLE INFORMATION	34
11.	IMPACT ASSESSMENT AND EVALUATION	34
11.1.	IMPACTS DURING THE OPERATIONAL PHASE	35
11.1.1	. ECOLOGICAL IMPACTS	35
11.1.2	DUST POLLUTION AND AIR QUALITY	35
11.1.3	CONTAMINATION OF GROUNDWATER	35
11.1.4	GENERATION OF WASTE	36
11.1.5	. FAILURE IN RETICULATION PIPELINES	36
11.1.6	i. FIRES AND EXPLOSIONS	36
11.1.7	. HEALTH, SAFETY AND SECURITY	37

11.2.	CUMULATIVE IMPACTS	37
12.	CONCLUSION	37
13.	RECOMMENDATION	38
APPE	NDIX A: CURRICULUM VITAE OF CHARLIE DU TOIT	40
APPE	NDIX B: CURRICULUM VITAE OF CARIEN VAN DER WALT	42
APPE	NDIX C: ENVIRONMENTAL MANAGEMENT PLAN	43

6

# **LIST OF FIGURES**

Figure 1: Locality Plan of Erf 63 and 64, Katima Mulilo	11
Figure 2: Locality Plan	12
Figure 3: Project Site area	13
Figure 4: Photo of operations on site	13
Figure 5: Site Layout Plan	15
Figure 6: Position of dispensing point and tanks	16
Figure 7: Flowchart of the assessment Process	29
Figure 8: Katima Mulilo Climate Data	30
Figure 9: Geology of Namibia (Atlas of Namibia Project, 2002)	31
Figure 10: Biomes in Namibia (Atlas of Namibia, 2002)	31
LIST OF TABLES	
Table 1: Other laws, acts, regulations and policies	22
Table 2: Impact Evaluation Criterion (DEAT 2006)	34

# LIST OF ABBREVIATIONS

EC Environmental Clearance

ECO Environment Control Officer

EIA Environmental Impact Assessment
EMP Environmental Management Plan

I&APs Interested and Affected Parties

MAWLR Ministry of Agriculture, Water and Land Reform

MEFT Ministry of Environment, Forestry and Tourism

## 1. INTRODUCTION

Green Earth Environmental Consultants were appointed by the proponent, Zambezi Auto City, to obtain an environmental clearance renewal for the operation of a fuel retail facility on Erf 63 and 64, Katima Mulilo, Zambezi Region.

An Environmental Impact Assessment was conducted 16 July 2018 and therefore the Environmental Clearance is due for renewal.

In accordance with the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007), the activities listed below, which forms part of the proposed operations, may not be undertaken without an Environmental Clearance:

## ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- The construction of facilities for the refining of gas, oil and petroleum products.

#### HAZARDOUS SUBSTANCE TREATMENT. HANDLING AND STORAGE

- The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.
- 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 following Environmental Impact Assessment Renewal contains information on the project and the surrounding areas and activities.

## 2. TERMS OF REFERENCE

To be able to continue with the operations of the project, an Environmental Clearance Renewal is required. For this environmental impact exercise, *Green Earth Environmental Consultants* followed the terms of reference as stipulated under the Environmental Management Act.

The aim of the initial environmental impact assessment was:

- To ascertain existing environmental conditions on the site to determine its environmental sensitivity.
- To inform I&APs and relevant authorities of the details of the proposed activities and to provide them with an opportunity to raise issues and concerns.
- To assess the significance of issues and concerns raised.
- To compile a report detailing all identified issues and possible impacts, stipulating the way forward and identify specialist investigations required.
- To outline management guidelines in an Environmental Management Plan (EMP) to minimize and/or mitigate potentially negative impacts.
- To comply with Namibia's Environmental Management Act (2007) and its regulations (2012).

The tasks that were undertaken for the Environmental Impact Assessment Renewal included the evaluation of the following: climate, water (hydrology), vegetation, geology, soils, social, cultural heritage, groundwater, sedimentation, erosion, biodiversity, sense of place, socio-economic environment, health, safety and traffic.

The EIA and EMP from the assessment will be submitted to the Environmental Commissioner for consideration. An Environmental Clearance Renewal will only be obtained (from the DEA) once the renewed EIA and EMP has been examined and approved for the listed activities.

The public consultation process as per the guidelines of the Act has been followed. The methods that were used to assess the environmental issues and alternatives included the collection of data on the project site and area from the proponent and identified stakeholders. All other permits, licenses or certificates that are further on required for the operation of the proposed project still needs to be applied for by the proponent.

## 3. PROJECT DESCRIPTION/SITE INFORMATION

## 3.1. LOCALITY OF SITE

Katima Mulilo is the commercial centre of the East Caprivi region and Namibia's far northeast extension into central Southern Africa. It lies at the southern riverbanks of the slow-flowing Zambesi. The town is located on the national road B8 on the banks of the Zambesi River. The town has an airport with a tarred landing strip, a modern hospital, schools, supermarkets and petrol stations. Since the completion of the Sesheke Bridge over the Zambesi in 2004, Katima became important for the Zambia traffic.

Zambezi Auto City constructed and is now operating a fuel retail facility on Erf 63 and 64, Katima Mulilo. See below locality maps of the project area namely Erf 63 and 64, Katima Mulilo:

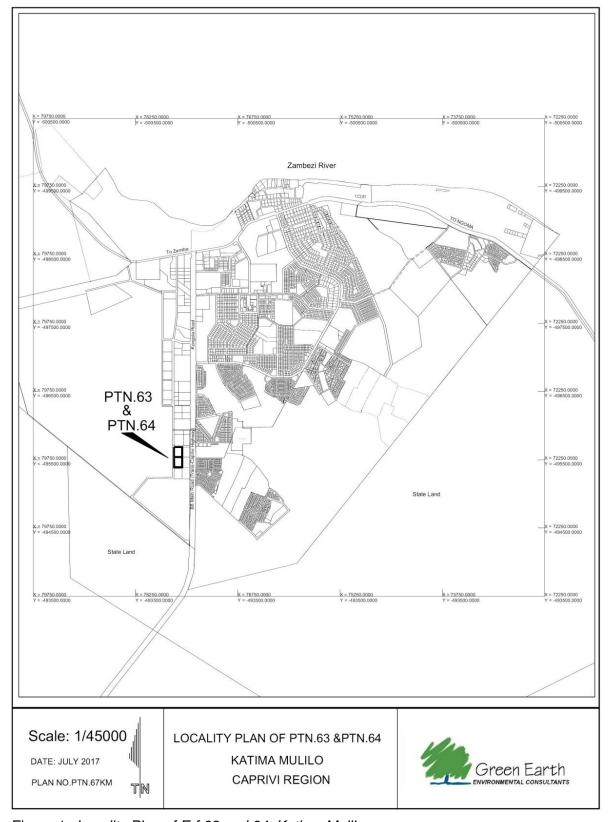


Figure 1: Locality Plan of Erf 63 and 64, Katima Mulilo

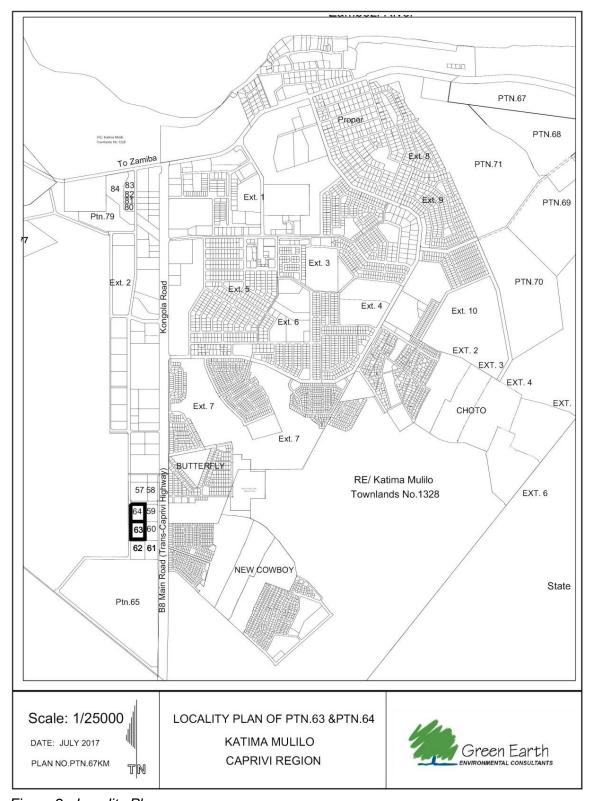


Figure 2: Locality Plan



Figure 3: Project Site area



Figure 4: Photo of operations on site

# Infrastructure on the site:

- Facilities for the storage, handling and selling of Diesel 500ppm and Diesel 50ppm.
- The total tank capacity on the site is 129 000L. Storage capacity will be increased to 138 000L.
- The current tanks will be removed and replaced by new tanks.
- Underground tanks with the following capacities will be installed:
  - 3 x 46 000 Diesel tanks
  - 3 x pumps with 2 x nozzles each
  - Six dispensing points

- Spill containment infrastructure, with an oil/water separator was installed to protect against spillages.
- A concrete slab was constructed around the island.
- The refuelling area is covered by an overhead canopy.
- The entire driveway area, the area surrounding the dispensing points and area below the canopy was raised by land infill and sloped and landscaped and provided with proper drainage in order not to be subject to storm water damage/flooding.
- The site is operating 24h per day.
- A small convenience shop (quick spar shop) including ablution facilities is in the process of being constructed and operated on site to provide in the basic requirements of the truck drivers/clients.

## The operational activities on the site are:

- Entrance and exit of heavy and light vehicles to and from the service station.
- Circulation and parking of vehicles on the site, at the filling points, the kiosk, shops and offices.
- Movement of people on the site, including pedestrians visiting the kiosk, shops and offices.
- Filling of trucks with fuel.
- Filling of fuel into the aboveground tanks by direct closed transfer.
- Delivery of supplies for the shops, offices and kiosk.
- Administrative activities related to the businesses.

## The site layout:

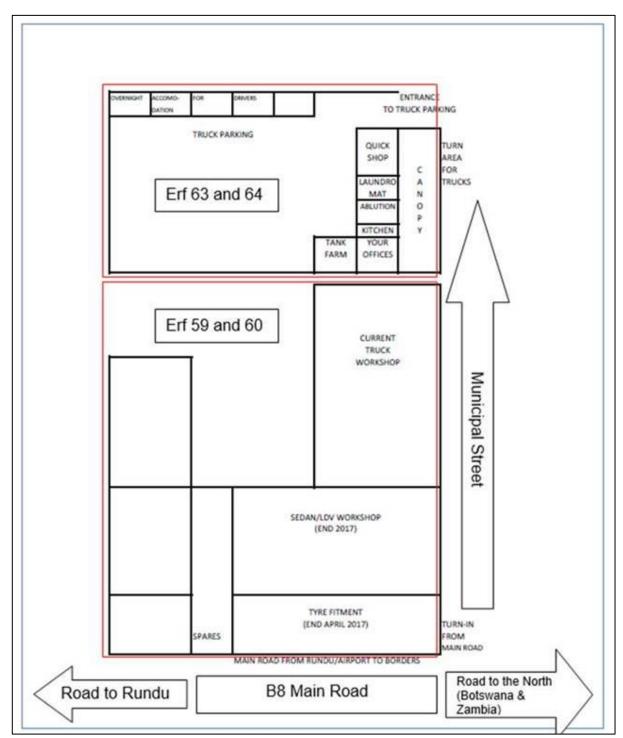


Figure 5: Site Layout Plan

## Photo of site:



Figure 6: Position of dispensing point and tanks

## 4. BULK SERVICES AND INFRASTRUCTURE

Erf 63 and 64, Katima Mulilo are located in an area which is fully serviced by all municipal bulk services. The bulk services were provided as follows:

# 4.1. ACCESS

Access to Erf 63 and 64, Katima Mulilo is from the street directly to the west of the site.

## 4.2. WATER SUPPLY

The erven are already linked to the existing municipal water supply network.

## 4.3. ELECTRICITY SUPPLY

The erven obtain electricity from the existing electrical network supplying the town.

## 4.4. SEWAGE DISPOSAL

The erf is connected to the existing sewer connection which is linked with the Municipal sewer system.

# 4.5. SOLID WASTE DISPOSAL

The solid waste generated on the site is collected by the Municipal waste management collection system and be disposed of at the landfill site. Hazardous Waste which might be generated on the site will be dealt with in accordance with the waste procedures for hazardous waste.

## 5. APPROVALS OBTAINED

See below previous Environmental Clearance Certificate obtained 16 July 2018:



## 6. APPROACH TO THE STUDY

The assessment included the following activities:

## a) Desktop sensitivity assessment

Literature, legislation, and guidance documents related to the natural environment and land use activities available on the area in general were reviewed in order to determine potential environmental issues and concerns.

## b) Site assessment (site visit)

A site visit was conducted in the immediate neighbourhood and the surrounding area was assessed. Previous site visits to investigate the environmental parameters on site to enable further understanding of the potential impacts on site also took place.

## c) Public participation

Public notices, informing the general public of the proposed project and inviting Interested and Affected Parties to provide comments on the proposed development, appeared in the Namibian and Republikein of 6 and 13 July 2017. A notice was also displayed on site. No objections or comments were received in respect of these notices.

## c) Scoping

Based on the desk top study, site visit and public participation, the environmental impacts were determined in five categories: nature of project, expected duration of impact, geographical extent of the event, probability of occurring and the expected intensity. The findings of the scoping have been incorporated in the environmental impact assessment report below.

## 7. ASSUMPTIONS AND LIMITATIONS

It is assumed that the information provided by the proponent/client is accurate. A limitation is that no alternative site for assessment was provided. Erf 63 and 64, Katima Mulilo is owned by the client and ideally located for fuel storage and sales and will complement the existing operations on the site. The proponent has no alternative site in this area for the proposed fuel facility and therefore has to use this site. The assessment is based on the prevailing environmental conditions and not on future happenings on the site. However, it is assumed that there will be no significant changes to the proposed project, and the environment will not adversely be affected between the compilation of the assessment and the implementation of the proposed construction activities.

## 8. ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programs and policies deemed to have adverse impacts on the environment require an

EIA according to Namibian legislation. The administrative, legal and policy requirements to be considered during the Environmental Assessment for the proposed project are the following:

- The Namibian Constitution
- The Environmental Management Act (No. 7 of 2007)
- Other Laws, Acts, Regulations and Policies

#### THE NAMIBIAN CONSTITUTION

Article 95 of Namibia's constitution provides that:

"The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the following:

Management of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory." This article recommends that a relatively high level of environmental protection is called for in respect of pollution control and waste management.

Article 144 of the Namibian Constitution deals with environmental law and it states:

"Unless otherwise provided by this Constitution or Act of Parliament, the general rules of public international agreements binding upon Namibia under this Constitution shall form part of the law of Namibia". This article incorporates international law, if it conforms to the Constitution, automatically as "law of the land". These include international agreements, conventions, protocols, covenants, charters, statutes, acts, declarations, concords, exchanges of notes, agreed minutes, memoranda of understanding, and agreements (*Ruppel & Ruppel-Schlichting*, 2013).

## **CONCLUSION AND IMPACT**

In considering the environmental rights, Zambezi Auto City should consider the following in devising an action plan in response to the articles:

- Implement a "zero-harm" policy that would guide decisions.
- Ensure that no management practice or decision result in the degradation of future natural resources.
- Take a decision on how this part of the Constitution will be implemented as part of Zambezi Auto City's Environmental Control System (ECS).

## **ENVIRONMENTAL MANAGEMENT ACT (NO. 7 OF 2007)**

The Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007) that came into effect in 2012 requires/recommends that an Environmental Impact Assessment Renewal and an Environmental Management Plan (EMP) be conducted for the following listed activities in order to obtain an Environmental Clearance Certificate:

## ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- The construction of facilities for the refining of gas, oil and petroleum products.

## HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE

- The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.
- 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.

Cumulative impacts associated with the project must be included as well as public consultation. The Act further requires all major industries to prepare waste management plans and present these to the local authorities for approval.

The Act, Regulations, Procedures and Guidelines have integrated the following sustainability principles. They need to be given due consideration, particularly to achieve proper waste management and pollution control:

## **Cradle to Grave Responsibility**

This principle provides that those who handle or manufacture potentially harmful products must be liable for their safe production, use and disposal and that those who initiate potentially polluting activities must be liable for their commissioning, operation and decommissioning.

## **Precautionary Principle**

If there is any doubt about the effects of a potentially polluting activity, a cautious approach must be adopted.

## The Polluter Pays Principle

A person who generates waste or causes pollution must, in theory, pay the full costs of its treatment or of the harm, which it causes to the environment.

## **Public Participation and Access to Information**

In the context of environmental management, citizens must have access to information and the right to participate in decisions making.

## **CONCLUSION AND IMPACT**

The proposed activities have been assessed in terms of the Environmental Management Act (No. 7 of 2007) and the Regulations (2012). From the assessment, it can be concluded that the activities will have impacts on the prevailing environment but that the negative impacts can be sufficiently mitigated and managed by the Environmental Management Plan which is part of this document.

Table 1: Other laws, acts, regulations and policies

Table 1: Other laws, acts, regulations and policies			
	Laws, Acts, Regulations & Policie		
Electricity Act	In accordance with the Electricity	•	
(No. 4 of 2007)	Act (No. 4 of 2007) which provides	the Electricity Act.	
	for the establishment of the		
	Electricity Control Board and		
	provide for its powers and functions;		
	to provide for the requirements and		
	conditions for obtaining licenses for		
	the provision of electricity; to		
	provide for the powers and		
	obligations of licenses; and to		
	provide for incidental matters: the		
	necessary permits and licenses will		
Pollution	be obtained.	The Duna continue to the continue to	
	The Pollution Control and Waste	The Proponent must adhere to	
Control and	Management Bill is currently in	the Pollution Control and	
Waste	preparation and is therefore	Waste Management Bill.	
Management Bill (guideline	included as a guideline only. Of reference to the mining, Parts 2, 7		
only)	and 8 apply. Part 2 provides that		
Offig)	no person shall discharge or cause		
	to be discharged, any pollutant to		
	the air from a process except		
	under and in accordance with the		
	provisions of an air pollution		
	license issued under section 23.		
	Part 2 also further provides for		
	procedures to be followed in		
	license application, fees to be paid		
	and required terms of conditions		
	for air pollution licenses. Part 7		
	states that any person who sells,		
	stores, transports or uses any		
	hazardous substances or products		
	containing hazardous substances		
	shall notify the competent		
	authority, in accordance with sub-		

	section (2), of the presence and	
	quantity of those substances. The	
	competent authority for the	
	purposes of section 74 shall	
	1	
	maintain a register of substances	
	notified in accordance with that	
	section and the register shall be	
	maintained in accordance with the	
	provisions. Part 8 provides for	
	emergency preparedness by the	
	person handling hazardous	
	substances, through emergency	
	response plans.	
Water	The Water Resources	The Act must be consulted.
Resources	Management Act (No. 11 of 2013)	Fresh water abstraction and
Management	stipulates conditions that ensure	waste-water discharge permits
Act	effluent that is produced to be of a	should be obtained when
	certain standard. There should	required.
	also be controls on the disposal of	
	sewage, the purification of effluent,	
	measures should be taken to	
	ensure the prevention of surface	
	and groundwater pollution and	
	water resources should be used in	
	a sustainable manner.	
Solid and	Provides for management and	The Proponent must abide to
Hazardous	handling of industrial, business and	the solid waste management
Waste	domestic waste.	provisions.
Management	domestic waste.	provisions.
Regulations:		
Local		
Authorities		
1992	The Coefficient and the factor	The December of acceptable to
Hazardous	The <b>Ordinance</b> applies to the	The Proponent must abide to
Substances	manufacture, sale, use, disposal	the Ordinance's provisions.
Ordinance	and dumping of hazardous	
(No. 14 of	Lauratanaga ag wall ag thair ingnant	
40=4\	substances, as well as their import	
1974)	and export and is administered by	
1974)	and export and is administered by the Minister of Health and Social	
1974)	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to	
1974)	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances	
1974)	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the	
1974)	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances	
1974) Atmospheric	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the	The proponent should adhere
,	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.	The proponent should adhere to the stipulations of the
Atmospheric	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.  Part 2 of the <b>Ordinance</b> governs	
Atmospheric Pollution	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.  Part 2 of the <b>Ordinance</b> governs the control of noxious or offensive	to the stipulations of the
Atmospheric Pollution Prevention	and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.  Part 2 of the <b>Ordinance</b> governs the control of noxious or offensive gases. The Ordinance prohibits	to the stipulations of the Atmospheric Pollution

Namibia (No. registration certificate in a	
11 of 1976) controlled area. The registration	
certificate must be issued	
be demonstrated that the	
practical means are being	•
for preventing or reducing	
escape into the atmosphe	
noxious or offensive gases	
produced by the schedule	od
process.	
Nature The Nature Conservation	,
Conservation Ordinance (No. 4 of 1975	•
Ordinance game parks and nature re	
the hunting and protection	
animals, problem animals,	
indigenous plant species.	
Ministry of Environment, F	
and Tourism (MEFT) adm	
and provides for the estab	
of the Nature Conservation	
Forestry Act The Forestry Act (No. 12	e of 2001) No removal of protected tree
specifies that there be a g	eneral species or removal of mature
protection of the receiving	and trees should happen. The
surrounding environment.	The Ministry of Environment,
protection of natural veget	tation is Forestry and Tourism should
of great importance, the F	orestry be consulted when required.
Act especially stipulates the	nat no
living tree, bush, shrub or	
indigenous plants within 1	00m from
any river, stream or water	course,
may be removed without t	he
necessary license.	
<b>EU Timber</b> Forest Stewardship Counc	cil (FSC) The Proponent is advised to
<b>Regulation:</b> came into effect in March	2013, adhere to the regulation.
FSC (2013) with the aim of preventing	sales of
illegal timber and timber p	roducts
in the EU market. Now, ar	ny actor
who places timber or timber	er
products on the market for	
time must ensure that the	
used has been legally har	vested
and, where applicable, ex	ported
legally from the country of	harvest.
Labour Act (No. 11 o	of 2007) The proponent and contractor
contains regulations relation	ng to the should adhere to the Labour
Health, Safety and Welfare	e of Act.
employees at work. These	9
regulations are prescribed	l for

	among others safety relating to	
	hazardous substances, exposure	
	limits and physical hazards.	
	Regulations relating to the Health	
	and Safety of Employees at Work	
	are promulgated in terms of the	
	Labour Act 6 of 1992 (GN156,	
	GG1617 of 1 August 1997).	
Communal	Communal land is land that	Consent should be obtained
Land Rights	belongs to the State and is held in	from Traditional Authorities,
	trust for the benefit of the	Communal Boards, Chiefs,
	traditional communities living in	Kings, Queens etc. if required.
	those areas. Communal land	
	cannot be bought or sold, but one	
	can be given a customary land	
	right or right of leasehold to a part	
	of communal land in accordance	
	with the provisions of the	
	Communal Land Reform Act	
	(No. 5 of 2002) and Communal	
	Land Reform Amendment Act	
	(No. 13 of 2013). The Communal	
	Land Reform Act provide for the	
	allocation of rights in respect of	
	communal land to establish	
	Communal Land Boards to provide	
	for the powers of Chiefs and	
	Traditional Authorities and boards	
	in relation to communal land and to	
	make provision for incidental	
	matters. Consent and access to	
	land for the proposed project	
	should be requested from the	
	relevant traditional authority	
	through the Regional Council and	
	Regional Communal Land Boards.	
Traditional	The Traditional Authorities Act	Traditional Authorities should
Authorities	(No. 17 of 1995) provide for the	be consulted when required.
Act (No. 17 of	establishment of traditional	
1995)	authorities, the designation and	
	recognition of traditional leaders; to	
	define their functions, duties and	
	powers; and to provide for matters	
	incidental thereto.	
Public and	The Public and Environmental	The proponent and contractor
Environmental	Health Act (No. 1 of 2015) provides	should adhere to the Public
Health Act	with respect to matters of public	and Environmental Health Act.
	health in Namibia. The objects of	

Coronavirus (Covid-19) Pandemic	this Act are to: (a) promote public health and wellbeing; (b) prevent injuries, diseases and disabilities; (c) protect individuals and communities from public health risks; (d) encourage community participation in order to create a healthy environment; and (e) provide for early detection of diseases and public health risks.  The current global Coronavirus (Covid-19) pandemic and the associated State of Emergency and health restrictions globally may result in some delays and logistic disruptions. The pandemic might have an impact on obtaining equipment, specialist workforce mobilisation and implementation of the project. The health restrictions may have an impact on campsite set-up, traveling of personal/workers and building of the infrastructure. The proponent, contractor and subcontractors should adhere to all the international, regional and local Covid-19 health restrictions and protocols.	The proponent, contractor and workforce should adhere to the restrictions and regulations.
National Heritage Act (No. 27 of 2004)	All protected heritage resources discovered need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before it may be relocated. This should be applied from the NHC.	The National Heritage Council should be consulted when required.
National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia:  (a) any meteorite or fossil; or (b) any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by any people who inhabited or visited Namibia before the year 1900 AD; or	The proposed site for development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission.

	(c) any implement, ornament or	
	structure known or commonly	
	believed to have been used as a	
	mace, used or erected by people	
	referred to in paragraph; or	
	(d) the anthropological or	
	archaeological contents of graves,	
	caves, rock shelters, middens,	
	shell mounds or other sites used	
	by such people; or	
	(e) any other archaeological or	
	palaeontological finds, material or	
	object; except under the authority	
	of and in accordance with a permit	
Dublic Health	issued under this section.	The proposest will ensure that
Public Health	Under this act, in section 119: "No person shall cause a nuisance or	The proponent will ensure that
Act (No. 36 of 1919)	shall suffer to exist on any land or	all legal requirements of the project in relation to protection
1919)	premises owned or occupied by him	of the health of their
	or of which he is in charge any	employees and surrounding
	nuisance or other condition liable to	residents is protected and will
	be injurious or dangerous to health."	be included in the EMP.
		Relevant protective equipment
		shall be provided for
		employees in construction.
		The development shall follow
		requirements and
		specifications in relation to
		water supply and sewerage
		handling and solid waste
		management so as not to
		threaten public health of future
		residents on this piece of land.
Soil	The objectives of this Act are to:	Only the area required for the
Conservation	Make provisions for the combating	operations should be cleared
Act (No. 76 of	and prevention of soil erosion;	from vegetation to ensure the
1969)	Promote the conservation,	minimum impact on the soil
	protection and improvement of the	through clearance for
	soil, vegetation, sources and	construction.
Air Ouglitus Act	resources of the Republic;	The proposest and servicest
Air Quality Act	The Air Quality Act (No. 39 of	The proponent and contractor should adhere to the Air
(N0. 39 of 2004)	2004) intends to provide for national norms and standards	Quality Act.
2004)	regulating air quality monitoring,	Quality Act.
	management and control by all	
	spheres of government; for specific	
	air quality measures; and for	
	matters incidental thereto.	
	matters molderital thereto.	

Vision 2030
and National
<b>Development</b>
Plans

Namibia's overall development ambitions are articulated in the Nation's Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.

The proposed project is an important element in employment creation.

## **CONCLUSION AND IMPACT**

It is believed the above administrative, legal and policy requirements which specifically guide and governs the activity will be followed and complied with in the planning, implementation and operations process.

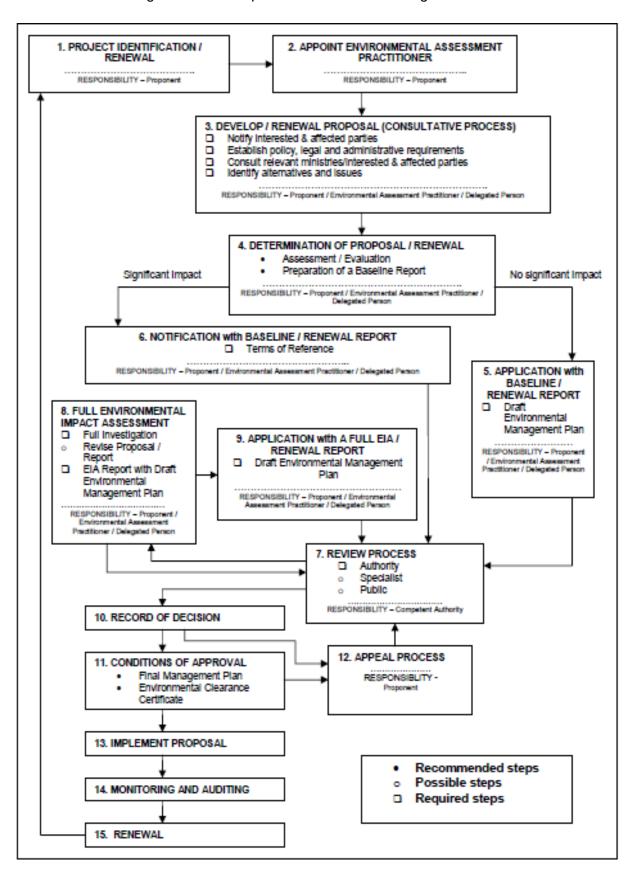


Figure 7: Flowchart of the assessment Process

## 9. AFFECTED NATURAL AND SOCIAL ENVIRONMENT

## 9.1. CLIMATE

The Caprivi belongs to the tropical climate zone and receives high rainfalls during the rainy season (December to March). High humidity is most often experienced in this region. The Caprivi is the wettest region in Namibia with its high annual rainfall of ±700 mm. Rainfall however can also be variable and drought years are common. The majority of rain appears in summer especially between January and February. The hottest months in Katima Mulilo are September, October and November with temperatures of 30°C. The prevailing wind in the area is southeast and eastern winds. The prevailing wind direction is expected to prevent the spread of any nuisance namely noise and smell.

Strong winds during certain times of the year may aggravate dust impacts during the construction phase. The fuel storage and handling facilities as well as the supporting structures to be constructed must meet all prescribed Municipal requirements and therefore should not pose any environmental threat due to Katima Mulilo's climatic conditions. The climate of the study area is summarized in the table below:

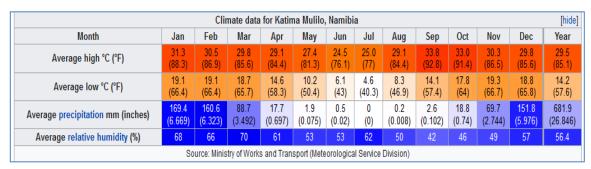


Figure 8: Katima Mulilo Climate Data

## **CONCLUSION AND IMPACT**

The activities will not have an impact on the climate.

# 9.2. GEOLOGY, SOILS AND GEOHYDROLOGY

The surface geology of the area consists of formations of the Kalahari Group which has a thickness of up to 30m in the study area. Within the Kalahari Group the following six lithological classifications are recognized: Duricrusts, Kalahari sand, Alluvium and lacustrine deposits, Sandstone, Marl, Basal conglomerate and gravel.

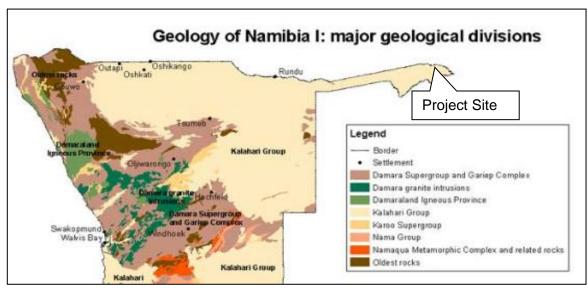


Figure 9: Geology of Namibia (Atlas of Namibia Project, 2002)

## **CONCLUSION AND IMPACT**

The activities will not impact on the geology, soils and geohydrology of the area. The surface drainage canals will be kept open in order that water can flow through.

## 9.3. BIODIVERSITY AND VEGETATION

Erf 63 and 64, Katima Mulilo is located in the Tree and Scrub Savannah Biome which is characterized by woodland vegetation structure type with extremely high green vegetation biomass. However, the project site is located in the build-up Municipal Area which means that it has been cleared of vegetation and is thus showing evidence of serious human inference namely informal tracks, lacking vegetation and gravel roads.

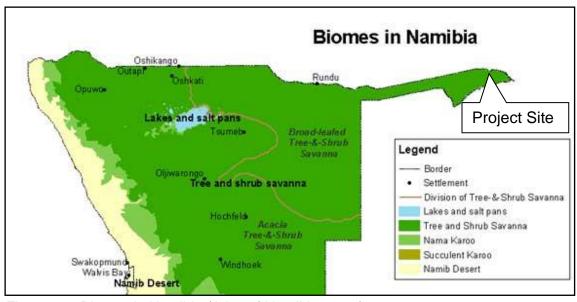


Figure 10: Biomes in Namibia (Atlas of Namibia, 2002)

The proposed construction and operation of the service station is expected to have a low impact on the natural environment.

## **CONCLUSION AND IMPACT**

The activities will have a low impact on vegetation, shrubs and trees.

## 9.4. SOCIAL-ECONOMIC COMPONENT

A large amount of the town's economy relies on the farming community (game, cattle, sheep and goat farming), over border trading from neighbouring countries like Zambia, Botswana and Angola which includes grocery stores, banks, schools, hospitals and other service industries. Katima Mulilo will benefit from more employment opportunities, skills and technology transfer during construction and operations of the development. The spending power of locals is likely to increase because of employment during the construction and operational phase.

The area where Erf 63 and 64, Katima Mulilo is located has already been partially developed and is fully serviced with municipal bulk services. The buildings erected in this area are mainly used for warehousing, business, retail and residential purposes. The proposed service station will not have a negative impact on the social environment as it is in line with the current uses in this area. It will thus have a positive impact on the social environment. The socio-economic characteristics of the area are continuously changing as more economic activities are established within the area.

## **CONCLUSION AND IMPACT**

The activities will have a positive impact on the community since employment will be created and fuel will be made available.

## 9.5. CULTURAL HERITAGE

The proposed project site is not known to have any historical significance prior to or after Independence in 1990. The specific area does not have any National Monuments and the specific site has no record of any cultural or historical importance or on-site resemblance of any nature. No graveyard or related article was found in the area. However, the Namibian National Heritage Act (No. 27 of 2004) provides for the protection and conservation of places and objects of heritage significance and the registration of such places and objects and to provide for incidental matters.

## CONCLUSION AND IMPACT

No heritage resources or graveyards were observed on the site or in the area.

## 9.6. SENSE OF PLACE

Erf 63 and 64, Katima Mulilo is located inside the already established industrial area of the town. The site is also situated in reaching distance to bulk infrastructural networks consisting of roads and electricity. The proposed activities will not have a negative impact on the sense of place in the area. An untidy or badly managed site can detract from the ecological well-being and individuality of the area. Unnecessary disturbance to the surroundings could be caused by poorly planned or poorly managed operational activities. The project site should be kept neat and clean where possible. Vegetation should not be removed or harmed if not necessary since it covers topsoil which prevents erosion. Noise and dust should be limited in the construction phase because of the neighbouring industrial and business activities.

#### **CONCLUSION AND IMPACT**

The impact on the sense of place will be low.

## 9.7. HEALTH

The safety, security and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Personal Protective Equipment). A health and safety officer are employed to manage, coordinate and monitor risk and hazard and report all health and safety related issues in the workplace. The introduction of external workers into the area is sometimes accompanied with criminal activities posing security risks for neighbours. However, the proponent will take certain measures to prevent any activity of this sort. The welfare and quality of life of the neighbours and workforce needs to be considered for the project to be a success on its environmental performance. Conversely, the process should not affect the overall health of persons related to the project including the neighbours.

## **CONCLUSION AND IMPACT**

The proposed activities will have a low impact on the health of the community.

## 10. INCOMPLETE OR UNAVAILABLE INFORMATION

The number of people that will be employed on the site will depend on the type and scope of the activities.

## 11. IMPACT ASSESSMENT AND EVALUATION

The Environmental Impact Assessment sets out potential positive and negative environmental impacts associated with the project site. The following assessment methodology will be used to examine each impact identified, see *Table* below:

Table 2: Impact Evaluation Criterion (DEAT 2006)

Table 2. Impact Evaluation Chtenon (DEAT 2000)								
Criteria	Rating (Severity)							
Impact Type	+	Positive						
	O	No Impact						
	-	Negative						
Significance of impact being either	L	Low (Little or no impact)						
	М	Medium (Manageable impacts)						
	Н	High (Adverse impact)						

Probability:	Duration:
5 – Definite/do not know	5 - Permanent
4 – Highly probable	4 - Long-term (impact ceases)
3 – Medium probability	3 - Medium term (5 - 15 years)
2 – Low probability	2 – Short-term (0 – 5 years)
1 - Improbable	1 - Immediate
0 - None	
Scale:	Magnitude:
5 – International	10 – Very high/do not know
4 - National	8 - High
3 – Regional	6 - Moderate
2 – Local	4 - Low
1 – Site only	2 - Minor
	0 - None

The impacts on the receiving environment are discussed in the paragraphs below:

## 11.1. IMPACTS DURING THE OPERATIONAL PHASE

## 11.1.1. ECOLOGICAL IMPACTS

Staff, workers and visitors should only make use of walkways and existing roads to minimise the impact on the environment. Minimise the area of disturbance by restricting movement to the designated working areas during maintenance.

## Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
						Unmitigated	Mitigated
Ecology Impacts	-	2	2	4	2	L	M

## 11.1.2. DUST POLLUTION AND AIR QUALITY

Vehicles transporting goods and staff will contribute to the release of hydrocarbon vapours, carbon monoxide and sulphur oxides into the air. Possible release of sewer odour, due to sewer system failure of maintenance might also occur. All maintenance of bulk services and infrastructure at the project site has to be designed to enable environmental protection.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
	,					Unmitigated	Mitigated
Dust & Air Quality	-	2	2	4	3	L	M

## 11.1.3. CONTAMINATION OF GROUNDWATER

Spillages might also occur during maintenance. This could have impacts on groundwater especially in cases of large sewer spills. Proper containment should be used in cases of sewerage system maintenance. Oil and chemical spillages may have a health impact on groundwater users. Potential impact on the natural environment from possible polluted groundwater also exits.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater contamination	-	2	2	4	2	L	M

## 11.1.4. GENERATION OF WASTE

Household waste from the activities at the site and from the staff working at the site will be generated. The waste will be collected, sorted to be recycled and stored in on site for transportation and disposal at an approved landfill site.

## Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significa	ance
	,,,,					Unmitigated	Mitigated
Waste Generation	-	1	2	2	2	L	M

## 11.1.5. FAILURE IN RETICULATION PIPELINES

There may be a potential release of sewage, stormwater or water into the environment due to pipeline/system failure. As a result, the spillage could be released into the environment and could potentially be a health hazard to surface and groundwater. Proper reticulation pipelines and drainage systems should be installed. Regular bulk services infrastructure and system inspection should be conducted.

## Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significa	nce
	,,					Unmitigated	Mitigated
Failure of Reticulation Pipeline	-	2	2	4	2	L	М

## 11.1.6. FIRES AND EXPLOSIONS

There should be sufficient water available for firefighting purposes. Ensure that all firefighting devices are in good working order and are serviced. All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Regular inspections should be carried out to inspect and test firefighting equipment by the contractor.

## Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	,,,					Unmitigated	Mitigated
Fires and Explosions	-	2	2	4	2	L	M

## 11.1.7. HEALTH, SAFETY AND SECURITY

The safety, security and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Personal Protective Equipment). No open flames, smoking or any potential sources of ignition should be allowed at the project location. Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises.

## Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
						Unmitigated	Mitigated
Safety & Security	-	1	2	4	2	L	M

## 11.2. CUMULATIVE IMPACTS

These are impacts on the environment, which results from the incremental impacts when added to other past, present, and reasonably foreseeable future actions regardless of which person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In relation to an activity, it means the impact of an activity that in it may not become significant when added to the existing and potential impacts resulting from similar or diverse activities or undertakings in the area.

Possible cumulative impacts associated with the proposed project include sewer damages/maintenance, uncontrolled traffic and destruction of the vegetation or the environment. These impacts could become significant especially if it is not properly supervised and controlled. This could collectively impact on the environmental conditions in the area.

## Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
	1,75					Unmitigated	Mitigated
Cumulative Impacts	-	2	3	4	2	L	М

## 12. CONCLUSION

In line with the Environmental Management Act (No 7 of 2007), *Green Earth Environmental Consultants* have been appointed to conduct an Environmental Impact Assessment Renewal for the operation of the fuel retail facility on Erf 63 and 64, Katima Mulilo, Zambezi Region for Zambezi Auto City. It is believed that the proposed activities can largely benefit the employment needs and fuel supply.

The negative environmental impacts that may be visible in the operational phase of the project include: increases in solid waste generation for example food and plastics, etc., increased stress on waste disposal facilities, increase in water consumption and waste water generation, possibility of fuel spillages, can result in an increase in traffic on the nearby roads and there can be an impact on the occupational health and safety of workers. However, this project is believed to be an asset to this area.

After assessing all information available on this project, *Green Earth Environmental Consultants* believe that the activities will not have a large negative effect on the environment if operations are conducted in accordance with the Environmental Management Plan.

## 13. RECOMMENDATION

It is therefore recommended that the Ministry of Environment, Forestry and Tourism through the Environmental Commissioner support and approve the Environmental Clearance Renewal for the operation of the fuel retail facility on Erf 63 and 64, Katima Mulilo, Zambezi Region for Zambezi Auto City and for the following listed activities:

## ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- The construction of facilities for the refining of gas, oil and petroleum products.

## HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE

- The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.
- 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.

## LIST OF REFERENCES

Commencement of the Environmental Management Act, 2012. *Ministry of Environment, Forestry and Tourism.* Windhoek. Namibia, pp. 3 – 22.

Constitution of the Republic of Namibia, 1990. National Legislative Bodies. Namibia, pp. 6 – 63.

Environmental Management Act, 2007. *Ministry of Environment, Forestry and Tourism*. Windhoek. Namibia, pp. 4 - 32.

Forestry Act, 2001. Office of the Prime Minister. Windhoek. Namibia, pp. 9 – 31.

Mannheimer, C. & Curtis, B. 2009. *Le Roux and Muller's Guide to the Trees & Shrubs of Namibia*. Windhoek: Macmillan Education Namibia, pp. 249 – 439.

Namibian Environmental Assessment Policy, 1995. *Ministry of Environment, Forestry and Tourism.* Windhoek. Namibia, pp. 3 – 7.

Nature Conservation Ordinance, 1975. Windhoek. Namibia, pp. 4 – 47.

Soil Conservation Act, 1969. Office of the Prime Minister. Windhoek. Namibia, pp. 1 – 14.

Water Resource Management Act, 2004. *Office of the Prime Minister*. Windhoek. Namibia, pp. 6 – 67.

## APPENDIX A: CURRICULUM VITAE OF CHARLIE DU TOIT

1. Position: **Environmental Practitioner** 

2. Name/Surname: Charl du Toit 3. Date of Birth: 29 October 1960

4. Nationality: Namibian

5. Education: Name of Institution University of Stellenbosch, South Africa

> Degree/Qualification Hons B (B + A) in Business

> > Administration and Management

Daadiaa

**Date Obtained** 1985-1987

University of Stellenbosch, South Africa Name of Institution BSc Agric Hons (Chemistry, Agronomy Degree/Qualification

and Soil Science)

**Date Obtained** 1979-1982

Name of Institution Boland Agricultural High School, Paarl,

South Africa

Cooldon

Degree/Qualification Grade 12 **Date Obtained** 1974-1978

6. Membership of

**Professional** 

Association:

1 ------

EAPAN Member (Membership Number: 112)

7.	Languages:		<u>Sp</u>	<u>eaking</u>	Reading	<u>Writing</u>	
		English	Go	bod	Good	Good	
		Afrikaans	Go	ood	Good	Good	
8.	Employment	<u>From</u>	<u>To</u>	<u>Employer</u>		Position(s) held	
	Record:	2009	Present	Green Eart	h	Environmental	
				Environme	ntal	Practitioner	
				Consultant	S		
		2005	2008	Elmarie Du	Toit	Manager	
				Town Plan	ning		
				Consultant	S		
		2003	2005	Pupkewitz		General Manager	
				Megabuild			
		1995	2003	Agra Coop	erative	Manager Trade	
				Limited			
						Chief Agricultural	
		1989	1995			Consultant	

Namibia Development

Agricultural

1985

Corporation

Researcher

Ministry of Agriculture

## Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

1988

\_\_\_\_\_

Charl du Toit

## APPENDIX B: CURRICULUM VITAE OF CARIEN VAN DER WALT

1. Position: Environmental Consultant

2. Name/Surname: Carien van der Walt

3. Date of Birth: 6 August 1990

**4. Nationality:** Namibian

## 5. Education:

Institution	Degree/Diploma	Years	
University of Stellenbosch	B.A. (Degree) Environment and	2009 to 2011	
	Development		
University of South Africa	B.A. (Honours) Environmental	2012 to 2013	
	Management		

## 6. Membership of Professional Associations:

EAPAN Member (Membership Number: 113)

## 7. Languages:

Language	Speaking	Reading	Writing
English	Good	Good	Good
Afrikaans	Good	Good	Good

## 8. Employment Record:

From	То	Employer	Positions Held
07/2013	Present	Green Earth Environmental Consultants	Environmental
			Consultant
06/2012	03/2013	Enviro Management Consultants Namibia	Environmental
			Consultant
12/2011	05/2012	Green Earth Environmental Consultants	Environmental
			Consultant

## 9. Detailed Tasks Assigned:

Conducting the Environmental Impact Assessment, Environmental Management Plan, Public Participation, Environmental Compliance and Environmental Control Officer

#### Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly de-	scribes
myself, my qualifications, and my experience. I understand that any wilful misstatement des	scribed
herein may lead to my disqualification or dismissal, if engage.	

Carien van der Walt		

# APPENDIX C: ENVIRONMENTAL MANAGEMENT PLAN