(UPDATED) ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE EXISTING SEAL SKIN AND TROPHY PROCESSING PLANT IN LUDERITZ ON ERF 751 INDUSTRIAL ROAD (KARAS REGION)

Assessed by:
NYEPEZ CONSULTANCY CC

Assessed for:
NAMIBIA SEAL GARMENT & ACCESSORIES (PTY) LTD
PO BOX TO 911 LUDERITZ

July 2021

TABLE OF CONTENT

1. INTRODUCTION

Namibia Seal Garment Accessories Pty Ltd is a 100% Namibian entity initiated by young Namibians to participate in and benefit from Namibia's fishing & marine industry through fishing rights and quota allocations. In December 2011, Namibia Seal Garment Accessories Pty Ltd (through Uukumwe Youth Empowerment Consortium) was awarded a seven (7) year seal harvesting right in Wolf and Atlas Bay in Luderitz. In order to fully realise the business potential of this right, the company established a seal processing facility in Luderitz enabling processing of pelts, meat, blubber and other by-products.

The Ministry of Fisheries and Marine Resources allocates a Total Allowable Catch (TAC) for seals on an annual basis. In 2012, Namibia Seal Garment Accessories Pty Ltd received its first quota allocation of 5000 units of pups and 356 units of adult bulls. Value will be added to all the products derived from the seals. There are mainly 4 different groups of products that area and/or will be commercialised; Skins, Oil, Meat and Organs. Namibia Seal Garment Accessories Pty Ltd has been appointed by Nyepez Consultant cc to apply for the renewal of the Clearance Certificate which has expired. The Environmental Impact Assessment (EIA) was conducted under the requisites of the Environmental Management Act (EMA) (Act 7 of 2007) and its Regulations (2012).

1.2 MAIN OBJECTIVE

- To apply for the renewal of the Environmental Clearance Certificate (ECC) for existing and operating Seal skin & trophy processing plant in Luderitz, a clearance that was obtained in 2017 (the initial first ECC was acquired by Enviro Leap Consulting cc on behalf of Namibia Seal Garment Accessories Pty Ltd).
- To provide a brief background of the existing project and its proponents;
- To provide for the updated Environmental Management Plan (EMP) of the project activities
- Explain the need for this project; The enforcement and Compliance of the EMP during the operational course and decommissioning of the project;
- The monitoring and evaluation of the project in line with the environmental health protocols outlined in the EMP

1.3 THE PROCESSING PLANT

The plant was erected to accommodate the different processes needed to produce the bulk products. Products produced are likely to stay in its primary form, but with added elements to diversify usage. For example,

- Skins will be and/or are pelted then sold.
- Oil from the blubber is made fit for human and animal consumption, as well as create biodiesel.
- The meat is usually processed and placed on the local and international markets.
- Organ processing and market set-off is still in the early planning stage.

1.4 AIMS OF THIS STUDY

- Comply with Namibia's Environmental Assessment Policy, Environmental Management Act (2007) and its February 2012 EIA Regulations;
- Compile a management plan in line with the 2012 EIA Regulations of the Environmental Management Act (2007) and terms of reference.

1.5 LOCALITY

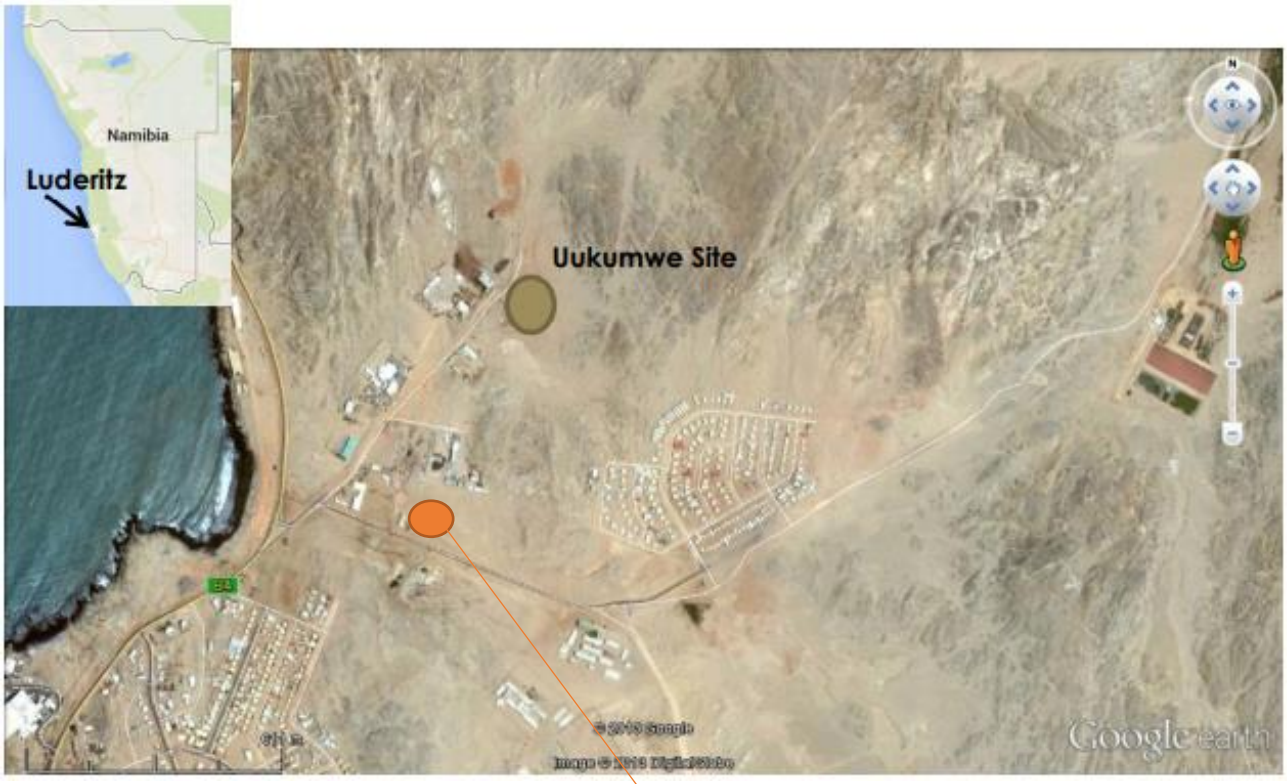

Figure 1: Project locality area

Project site area, Erf 751 Luderitz_Existing Seal Processing Plant Namibia Seal Garment Accessories

The processing plant is built in the nautilus Industrial Area of Luderitz. The “site” is situated on a 3363 m² serviced erf (erf nr 751) see attached fitness certificate for business. The site was previously used as a factory.

Namibia Seal Garment Accessories seal processing plant was built in the Nautilus Industrial Area in Luderitz (Figure 1 above). The site is located opposite an existing seal processing plant, and approximately 0.5 km northeast of the closest residential area

The plant was designed and erected to accommodate the different processes needed to produce the bulk products. The products have likely stayed in their primary form, but with added elements to diversify their usage. For example, skins are pelted and oil from the blubber are made fit for human and animal consumption and to create biodiesel. The meat is processed and placed on the local and international markets. Organ processing and market set-off is still in the early planning stage.

1.5.1 The project and air emissions

A flow diagram of the process is provided in Figure 2. Below. The main source of emission of air pollutants are the boilers used to generate heat for the cookers, to render the blubber to oil. Odours, which are a nuisance rather than a classic air pollutant, may emanate from different areas of the plant including the animal preparation area, from meat processing, skin and blubber splitting, skin cleaning and organ processing and from the storage of the animal carcasses.

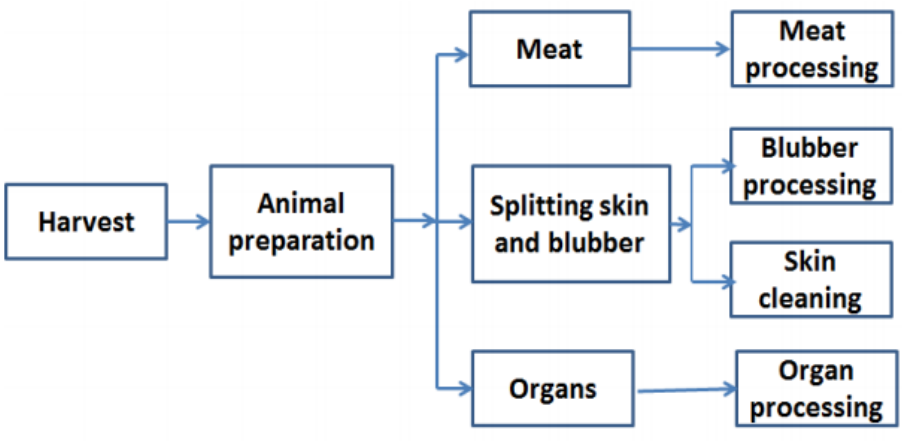

Figure 2: Seal process flow diagram (adopted from Enviro dynamics)

1.5.2 The Boiler

The boiler at the Namibia Seal Garment Accessories plant is diesel-fired. The by-products (or waste) from diesel combustion, as with all fossil fuels, include sulphur dioxide (SO2), oxides

of nitrogen (NOX) and particulate matter inducing respirable particulates (PM10). SO2 is produced from the combustion of sulphur that is bound in coal. NOX is produced from thermal fixation of atmospheric nitrogen in the combustion flame and from oxidation of nitrogen bound in the coal. The quantity of NOX produced is directly proportional to the temperature of the flame. SO2 and NOX are released to the atmosphere via the boiler stack. The non-combustible portion of the fuel remains as solid waste or ash which is entrained in the flue gas and released via the stack as particulates.

1.5.3 Odour

Odours from animal processing plants are typically caused by the decomposition of animal by-products. Odours generated at Namibia Seal Garment Accessories seal processing are expected to be minimised due to the daily process. The process is designed to minimise the time length for each part of the animal and assure the food, nutraceutical or pharmaceutical grade. The turnaround time between the harvest and the processing is anticipated to be less than 10 hours which will significantly reduce the spread of odours. The two places where odours may result are when the carcasses are left for up to eight hours being processed and when meat is cooked after a longer delay.

To minimise the potential of odours from the process, it is proposed that no drying of meat or bones will be done in open air, no sun drying will be done, and exhaust fans will be placed over the tables when skins are removed from the carcasses and in the cooking area.

2. LEGAL AND REGULATORY REQUIREMENTS

The Namibian Environmental Management Act (Act No. 7 of 2007) promotes the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment. With regard to managing ambient air quality in a sustainable way and limiting impacts, health-based ambient standards, emission standards, and ambient monitoring are considered the most appropriate approaches.

2.1 Emission standards and guidelines

Emission standards may be set for industrial processes so that the resultant ambient air quality concentrations will not exceed the air quality standards. Namibia does not have emission standards for industrial processes. The International Finance Corporation (IFC) provides emission guidelines for SO2, NOx and particulate matter for small combustion

facilities (IFC, 2007). The World Bank provides emission and effluent guidelines for a variety of industrial processes that are normally accepted by the World Bank (World Bank, 1998).

2.2 Monitoring

Emissions and ambient air quality monitoring provide the necessary information to assess the effectiveness of emissions management. There are no specifications regarding monitoring of either in the Namibian environmental legislation. The IFC provides guidelines for monitoring programmes (IFC, 2007) which include parameters to be monitored, the type of monitoring and frequency, the location of sampling equipment and the sampling methods.

3. IMPACT ASSESSMENT

3.1 Identification of key impacts

Project components that may have impacts on air quality and were assessed in the air quality specialist study are listed in Table below:

Project Component	**Potential Impacts**
Construction	None as the construction was already completed
Operations: Processing plant	Potential impacts on air quality from emissions from the boiler stack increasing concentrations of SO2, NOx and PM10. Potential impact on air quality from emissions of odour from the processing of seal meat, skins and organs
Decommissioning	Nuisance dust generated from demolition equipment and general decommissioning activities

3.2 Methodology for impact assessment

The assessment was conducted in terms of the significance of direct air quality impacts from the proposed development. Factors that were considered are the source strength, the characteristics of the pollutants, predicted ambient concentrations and the nature of the receiving environment. The predicted ambient concentrations are compared with ambient air quality standards or guidelines and recognised dust deposition limits. The assessment

considered the extent, duration, intensity, probability, status of the impact and degree of confidence in predictions, which will lead to the determination of the significance of the impacts.

Criteria for the air quality assessment

Aspect	**Scale**	**Definition**
Extent	Site specific	Limited to the facility
	Local	Limited to within a radius of 15 km of the site
	Regional	Limited to within a radius of 100 km of the site
	National	Limited to Namibia
	International	Extends beyond Namibia
Duration	Very short term	Limited to 3 days
	Short term	3 days to 1 year
	Medium term	1 to 5 years
	Long term	5 to 20 years
	Permanent	Beyond the lifetime of the process
	No lasting effect	Predicted ambient concentrations are well below WHO ambient guidelines and no complaints are received.
	Minor effect	Predicted ambient concentrations occasionally exceed WHO guidelines in sensitive areas and complaints are rarely received.
Intensity/ Magnitude	Moderate effect	Predicted ambient concentrations frequently exceed WHO guidelines in sensitive areas and complaints are often received.
	Serious effect	Predicted ambient concentrations always exceed WHO guidelines in sensitive areas and complaints are always received
Probability	Improbable	Impacts are improbable
	Possible	Impacts may possibly occur
	Probable	Impacts will probably occur
	Highly probably/definite	Impacts will definitely occur
	Improbable	Impacts are improbable

Status	Positive	Project will lead to an improvement in current air quality
	Negative	Project will lead to a deterioration in current air quality
Degree of confidence	High	Good data and proven techniques are used
	Medium	Reasonable data and techniques are used
	Low	Data is poor or limited
		Good data and proven techniques are used
Significance	None	A concern or potential impact that, upon evaluation, is found to have no significant impact at all.
	Low	Any impacts will be localised and temporary. Accordingly the impact is not expected to require amendment to the project design
	Medium	Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation
	High	Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a 'no go' implication for the project unless mitigation or re-design is practically achievable

3.3 Construction

Consequently, the project will not have any impact from activities of construction as there is no construction to be undertaken. The plant already exists and operational, hence the application for renewal of the Clearance Certificate.

3.4 operations

3.4.1 Assessment for the Boiler

The existing boiler is a Thompson Compac TC250 3-pass wetback reverse flame steam boiler (pers. comm. Gordon Slater, Dryden Combustion) with a rating of 1 000 to 5 000 kg steam

production per hour. It is fired by diesel or heavy fuel oil. It has a design fuel consumption of 162 l/h. The emission rates and stack parameters for the boiler are provided.

Estimated emissions from the Thompson T250 boiler

Emission rate

	kg/day	**g/s**
NO_x	25.60	0.29
SO_2	146.17	1.69
Particulate matter (PM_{10})	4.65	0.054
Benzene	0.0001	0.0000012
Stack Dimensions		
Height above floor level (m)	10m	
Inside nominal diameter (m)	0.394 m	
Gas exit temp (K)	493 k	
Gas exit velocity (m/s)	12.5 m/s	

The emission and stack data in the table, above are used as input to SCREEN 3 as described in Section to predict the maximum ambient concentration downwind of the boiler. Points to note when assessing the predicted concentration are:

- These are predicted maximum concentrations. By definition, a maximum occurs once. It is not possible to assess the frequency of similar events using the SCREEN 3 model;
- It is assumed that all dust emitted from the stack is PM10 as the fraction of dust in the flue gas is not known. This assumption therefore provides a worst-case scenario;
- SCREEN 3 produces maximum predicted 1-hour concentrations. In order to compare predicted concentrations of PM10 with the daily guideline a multiplying factor is applied (CDPHE, 2002)

For NOX, the maximum predicted 24-hour ambient concentration of 43 µg/m3 occurs immediately at the stack, and concentrations decrease with increasing distance from the source (Figure 5-1). The predicted concentrations are significantly below the WHO 24-hour ambient guideline value of 200 µg/m3 for NO2. Considering that NOX = NO + NO2, and that not all NO converts to NO2, the predicted concentrations are conservative and are likely to be lower than those shown. Because of the low predicted NOX concentrations and the fact that dispersion with the prevailing winds will be away from any sensitive receptors, the impact is

expected to be very low. It will occur only when the boiler is in operation, and it will be limited to the immediate plant site.

Assessment of air quality impacts of the boiler

Activities	**Mitigation**	**Extent**	**Duration**	**Intensity/ Magnitude**	**Probability**	**Status**	**Confidence**
Boiler	Without	Local	Long term	No lasting effect	Improbable	Negative	Medium
	With	Site specific	Long term	No lasting effect	Improbable	Negative	Medium
Significance	Low for the standard stack height of 10 m, but very low if this is increased to 15 m or higher						

The higher stack, 15 m instead of the designed 10 m stack, provides better dilution and lower predicted ambient concentration. However, the impact as a result of the design stack is very low and installing a higher stack in not necessary. The predicted ambient concentrations of pollutants from the boiler are well below guideline values and ambient air quality is considered unnecessary.

3.4.2 Qualitative Odour Impact Assessment

Odours from animal processing plants are typically caused by the decomposition of animal by-products. While they are seldom harmful to human health, they may be offensive and result in a nuisance impact and in some cases impact on quality of life. Odours may result from different parts of the seal processing process, particularly if delays of eight hours of longer occur from the time carcasses arrive to the time they are processed. Odour may also result from meat after such delays.

The process is designed to minimise the time length for each part of the animal to be processed to assure the food, nutraceutical or pharmaceutical grade of the products, i.e. that quality of the products. The animals will be processed in batches and the turnaround time between the harvest and the processing of a batch is anticipated to be less than 10 hours. This approach significantly.

This approach significantly reduces the time that carcasses may be unattended and that decomposition may occur. In turn the potential the generation of offensive odours is significantly reduced. Furthermore, it is proposed to minimise the potential of odours from the process by:

- Ensuring no drying of meat or bones in the open air;
- Ensuring no sun drying will be done;
- Installing and placing exhaust fans over the tables when skins are removed from carcass; and
- Installing and operating exhaust fans in the cooking area.

The seal harvest and subsequent processing of seals is seasonal and odours will only be present during the harvest and when animals are processed. The health impacts of odour under normal operating conditions are expected to be low for a number of reasons. The health risk associated with odours is generally low, there are proposed measures to minimise odours at the seal processing plant, the processing is seasonal, and the prevailing winds that will disperse odours away from any sensitive receptors. However, the nuisance impact of potentially offensive odours cannot be discounted if the normal processing regime is upset and animals are not processed in the desired time, or the installed odour control mechanisms do not function adequately. In this case, the impact may be significant. It was therefore important that the best available techniques be considered in the design, operation and management of the plant. The following is and/or were recommended over-and-above the measures that have been proposed by the developer:

- Provision is made in the plant design and process management to refrigerate a batch of harvested carcasses in the event of a delay in processing;
- The plant design ensures that exhaust fans in the area where skins are removed from carcasses and in the cooking, area are ducted to collect odours for treatment before being released to the atmosphere. Treatment of odours may be done by bio-filters, activated carbon, or the release via a stack (EC, 2005).
    - Biofilters comprise an air distribution system and a carrier medium, often made from an organic material, which can support growing micro-organisms which feed on malodorous substances and thereby remove odours form the air. The malodorous substances must be caught on the micro-organism carrier, which must have a sufficiently high surface area.
    - Activated carbon is used for odour abatement, based on the very large specific surface area, in the form of micro-pores, which bind the odour molecules. The

efficiency falls as the pores become saturated and the carbon must be replaced or regenerated.

- Malodorous air from various sources may be collected into one or more chimney stacks for emission at a suitable height to ensure sufficient dilution and dispersion of the odour thereby reducing perception of odour problems.

As a result of the proposed efficient processing of seals, the fact that seals are not processed all year, and the commitment to odour management measures such as extractors and no open drying, the intensity of the impact is expected to be medium in the immediate surroundings, and downwind under the prevailing south-south-easterly winds. The intensity of the impact may be reduced considerably if best available techniques are practiced throughout the process, refrigeration is available and malodours air is treated before being released to the atmosphere.

Assessment of air quality impacts of the TSF

Activities	**Mitigation**	**Extent**	**Duration**	**Intensity/ Magnitude**	**Probability**	**Status**	**Confidence**
Odour	Without	Local	Long term	Medium	probable	Negative	Medium
	With	Site specific	Long term	low	Possible	Negative	Medium
Significance	Medium without mitigation and without due process, but low with mitigation and best available techniques						

Odour is subjective and is perceived differently by different people. It is therefore difficult to measure odour in a cost-effective manner. Rather than a measuring programme for odour, it is recommended that complaints register and committee be established to log and attend to odour complaints. Importantly, the record of complaints should include the date and time so that it may be associated with the odour generating activity. With identification of the odour source (or activity) management intervention can brought about to eliminate the activity as a future source.

4. CONCLUSIONS AND RECOMMENDATIONS

Namibia Seal Garment Accessories Pty Ltd was awarded seal harvesting right in Wolf and Atlas Bay in Luderitz in December 2011. The seals will be acquired through the annual seal quota allocation system of the Ministry of Fisheries and Marine Resources. In order to fully realise the business potential of this right, the company proposes to establish a seal processing facility enabling processing of pelts, meat, blubber and other by-products.

Potential air quality impacts were identified as a key environmental issue through the scoping process. The main source of emission of air pollutants are the boilers used to generate heat for the cookers to render the blubber to oil. Odours, which are a nuisance rather than a classic air pollutant, may emanate from different areas of the plant including the animal preparation area, from meat processing, skin and blubber splitting, skin cleaning and organ processing and from the storage of animal.

The atmospheric dispersion potential in Luderitz is expected to be effective for a lot of the time due
to the frequent moderate or strong wings. As a result, pollutants are expected to disperse effectively. Poor dispersion conditions can occur when cool temperatures coincide with light or calm winds such, particularly between May and November when the coldest night time temperatures occur. Current air quality in Luderitz is perceived to be good, although odours were experienced in the Nautilus Industrial Area during the site visit, emanating from an effluent pool adjacent to the existing seal processing plant. The significance of impacts on air quality from construction activities at the seal
processing facility is zero as there are no construction activities to be conducted.

The significance of impacts on air quality as a result of emissions from the boiler stack is expected to be low. A small boiler was proposed (during the scoping report) that will only operate during the harvest and the prevailing winds are orientated away from any sensitive receptors. There are no predicted exceedances of ambient NOX and PM10 guidelines. While there are predicted exceedances of the WHO 24-hour SO2 guideline at the plant site, the guideline is very low compared to the interim target values of 125 and 50 µg/m3 that are typically adopted. As the direction of dispersion with the prevailing winds will be away from any sensitive receptors and the predicted concentrations are well below the interim target values, the impact of SO2 from the boiler is expected to be low.

Odours may result from different parts of the seal processing process, particularly if delays of eight hours of longer occur from the time carcasses arrive to the time they are processed. Odour may also result from meat after such delays. While they are seldom harmful to human

health, they may be offensive and result in a nuisance impact and in some cases impact on quality of life.

The process is designed to minimise the time length for each part of the animal to be processed to assure the food, nutraceutical or pharmaceutical grade of the products, i.e. the quality of the products. The animals will be processed in batches and the turnaround time between the harvest and the processing of a batch is anticipated to be less than 10 hours. This approach significantly reduces the time that carcasses may be unattended and that decomposition may occur and the potential for offensive odours to generate. It is proposed to further minimise the potential of odours from the process by ensuring no sun drying or drying of meat or bones in the open air and to installing and placing exhaust fans over the tables when skins are removing from carcass and the cooking area.

The health impacts of odour under normal operating conditions are expected to be low for a number of reasons. They may only result during the harvest, the health risk associated with odours is generally low, there proposed measures to minimise odours. However, the nuisance impact of potentially offensive odours cannot be discounted if normal processing procedures are upset and animals are not processed in the desired time, or the installed odour control mechanisms do not function adequately, in this case, the nuisance impact may be significant.

It is therefore important that the best available techniques are considered in the design, operation and management of the plant. Over-and-above the proposed measures to control odours, it is recommended that provision is made in the plant design and process management to refrigerate a batch of harvested carcasses in the event of a delay in processing. It is also recommended that the plant design ensures that exhaust fans in the area where skins are removed from carcasses and in the cooking area are ducted to collect odours for treatment before being released to the atmosphere. Dispersion from the designed 10 m stack is effective and ensures ambient concentrations are well below ambient guideline values. Installing a higher stack in not necessary and ambient air quality is considered unnecessary.

Odour is subjective and perceived differently by different people. It is therefore difficult to measure odour in a cost-effective manner. Rather than a measuring programme for odour, it is recommended that complaints register and committee be established to log and attend to odour complaints. Importantly, the record of complaints should include the date and time so that it may be associated with the odour generating activity. With identification of the odour

source (or activity) management intervention can brought about to eliminate the activity as a future source.

5. REFERENCE

Colorado Department of Public Health and Environment (CDPHE). (2002): SCREEN3 Stationary Source Modeling Guidance, Colorado Department of Public Health and Environment - Air Pollution Control Division (CDPHE/APCD) Technical Guidance Series: Air Quality Modeling, January 1, 2002

European Commission (2005): Integrated Pollution Prevention and Control, Reference Document on Best Available Techniques in the Slaughterhouses and Animal By-products Industries, May 2005, http://eippcb.jrc.ec.europa.eu/reference/sa.html

Enviro Dynamics, (2013): Background Information Document (BID), Proposed seal processing plant in Luderitz, September 2013.

World Bank Group, (1998): Pollution Prevention and Abatement Handbook, General Environmental Conditions and Summary of Air Emissions and Effluent Discharge Requirements, July 1998.

World Health Organisation, (2005): WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide, Global update 2005, WHO/SDE/PHE/OEH/06.02