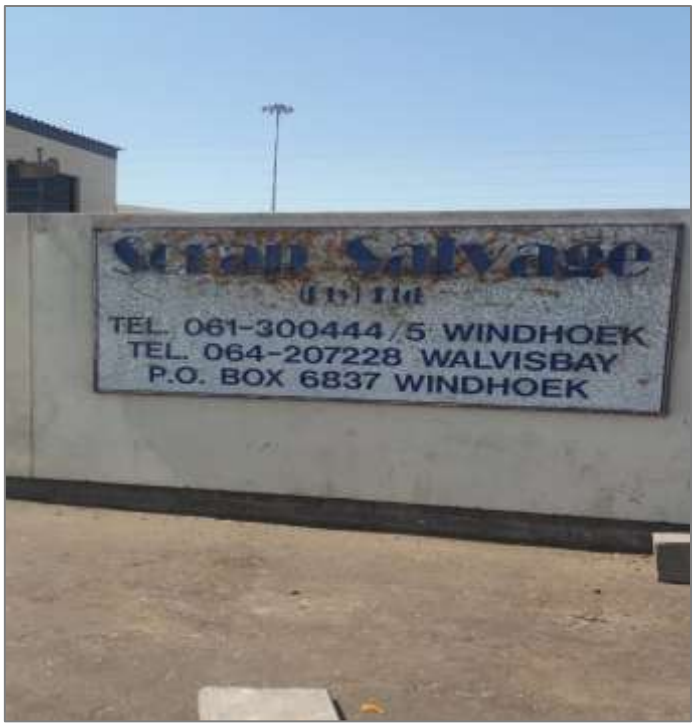
SCRAP RECYCLING, FLAME CUTTING AND SALVAGE OPERATIONS OF SCRAP SALVAGE (PTY) LTD

ENVIRONMENTAL MANAGEMENT PLAN



Assessed by:

Gea Source Investment
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Assessed for:

Scrap Salvage (Pty) Ltd
Walvis Bay

September 2020

DOCUMENT STATUS

Project:	ENVIRONMENTAL MANAGEMENT PLAN FOR SCRAP RECYCLING, FLAME CUTTING AND SALVAGE OPERATIONS OF SCRAP SALVAGE (PTY) LTD
Report Version/Date	FINAL 18 September 2020
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Cite this document as:	Namupala, F. (2020). Environmental Management Plan for the scrap recycling, flame cutting and salvage operations of Scrap Salvage (Pty) Ltd
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1. OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PLAN

Scrap Salvage (Pty) Ltd appointed Gea Source Investment cc to conduct an environmental risk assessment of their operational activities which are scrap recycling, flame cutting and salvage operations in Walvis Bay. Scrap Salvage (Pty) Ltd requires an EMP for their scrap recycling, flame cutting and salvage operations in Walvis Bay. The EMP provides management options to ensure impacts of the normal operations are minimised. Scrap Salvage (Pty) Ltd operational activities require an Environmental Clearance Certificate (ECC) in terms of Environmental Management Act No. 7 of 2007 and the Environmental Impact Assessment Regulations for the following activities:

- the import, processing, use and recycling, temporary storage, transit or export of waste and,
- the manufacture, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.

An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The EMP acts as a stand-alone document, which can be used during the various phases (planning, construction, operational and decommissioning) of any proposed activity or development. The main aim of this EMP is to ensure that the project complies with the goals of the Namibian Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations.

The objectives of the EMP are:

- To include all components of the various activities;
- To prescribe the best practicable control methods to lessen the environmental impacts associated with the operations;
- To monitor and audit the performance of the operational personnel in applying such controls; and
- To ensure that appropriate environmental training is provided to responsible operational personnel.

Scrap Salvage (Pty) Ltd may choose to implement an Environmental Management System. At the heart of an Environmental Management System (EMS) is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following elements:

- A stated environmental policy which sets the desired level of environmental performance;
- An environmental legal register;
- An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- Identification of environmental, safety and health training needs;

- An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy; and
- Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS.

2. DESCRIPTION OF THE SITE

2.1 SITE LOCATION

Scrap Salvage (Pty) Ltd is located on at 59 Circumferential Road in the industrial area of Walvis Bay and is zoned as light industrial (-22.947160°; 14.514718°) (Figure 1 and Figure 2). The neighbours of Scrap Salvage are Magic Discounters, Quali-Tim, Wesbank Transport and DFT Transport. The B2 highway is approximately 1.2 km from Scrap Salvage (Pty) Ltd.

The facility is in line with developments on industrial properties. No residential areas are situated nearby and neighbours constitute like industry. Scrap Salvage, a scrap metal and material dealer, has applied for a renewal of their fitness certificate from the Municipality of Walvis Bay (see renewal application receipt from the Municipality of Walvis Bay in Appendix A). The former fitness certificate from the Municipality of Walvis Bay is also attached in Appendix A.

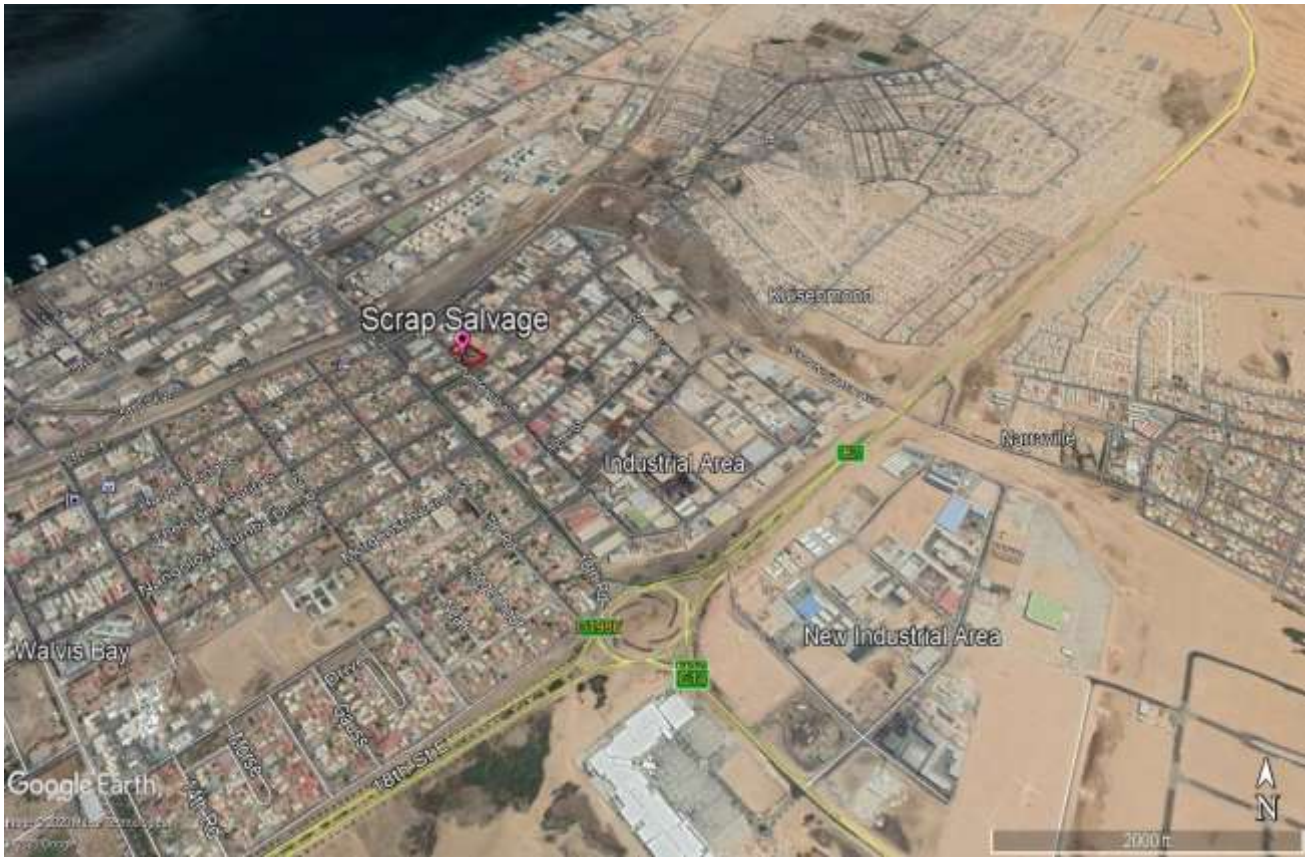


Figure 1. Location of Scrap Salvage premises

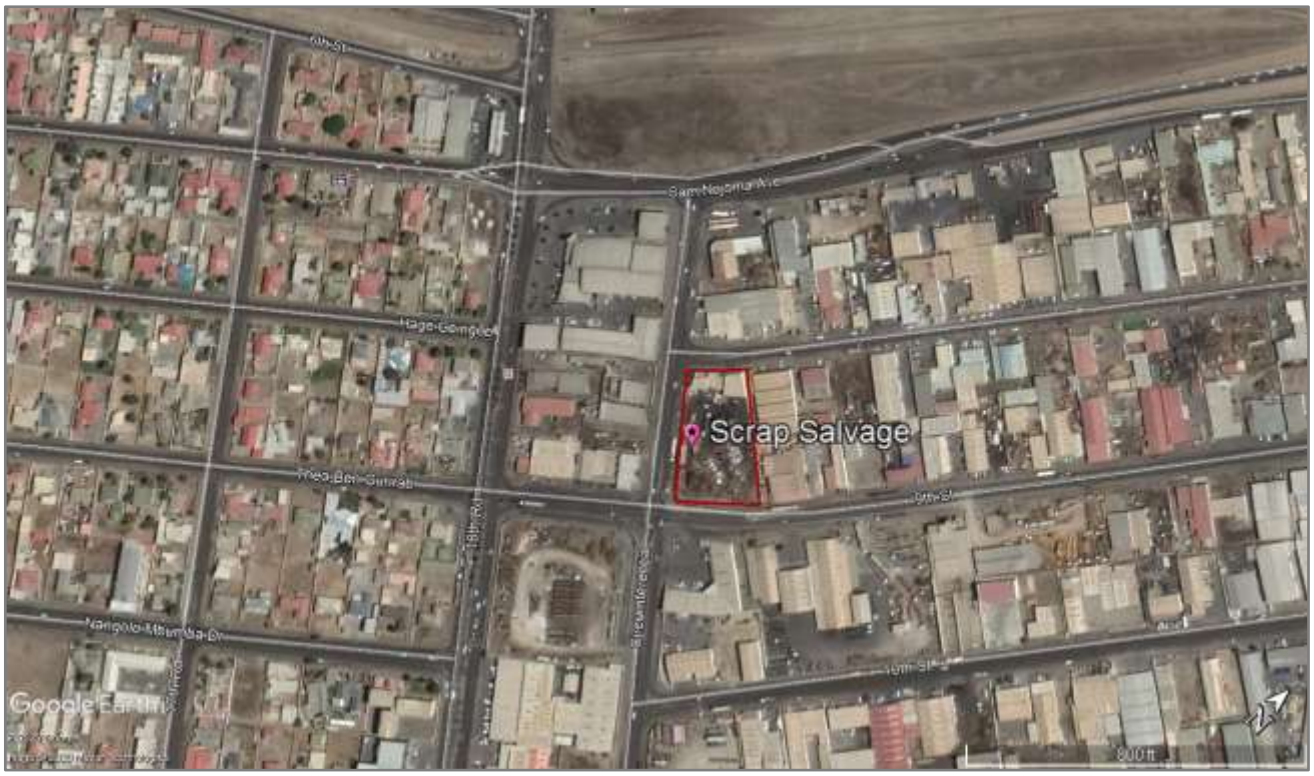


Figure 2. Existing Site Layout

2.2 CLIMATE

Walvis Bay is situated in the most arid part of the Namib Desert and is characterised by mild summers and cool winters. On the basis of the Koppen system it can be classified as a west coast desert climate, with fog being the principle form of precipitation along the coastal strip. These arid conditions are a result of the influence of several dominant climatic factors. These are as follows:

- the sub-tropical South Atlantic Anticyclone;
- the absence of convection with temperature inversion in the lower atmosphere;
- the divergence of the South East Trade Winds;
- the cool north-flowing Benguela Current with its associated cold water upwelling system.

The main climatic components that influence the topography and ecology of the study area include precipitation (rainfall and fog), temperature and wind. Each of these components is discussed in more detail below.

Precipitation

The rainfall in the study area is low, seasonal and highly variable. Showers that give measurable amounts of rain occur mainly at the beginning and the end of summer, with a maximum in March, and originate from convectional thunderstorms of high intensity and short duration. In general less than 15 mm of rain falls per annum in the Walvis Bay area (Mendelsohn et al. 2002).

Winds generated from the high-pressure cell over the Atlantic Ocean blow from a southerly direction when they reach the Namibian coastline. As the Namibian interior is warm (particularly in summer), localised low pressure systems are created which draws the cold southerly winds towards the inland desert areas (Mendelsohn et al. 2002).

Adventive sea fog is a characteristic feature and the dominant form of precipitation along the Walvis Bay coast. Adventive fog can extend inland for about 110 km and provides an important source of moisture to plants and animals in the Narnib Desert (Soboil, 1996). Here in Walvis Bay an average of 146 fog days per annum has been recorded over the long term (Tinley, 1985). The greatest fog frequency occurs in spring and autumn, and the heaviest fogs are associated with coastal low conditions and south-westerly winds. This fog results from the upwelling of cool water along the Namibian coast, leading to sea temperatures that are on average 7°C colder than those further offshore. As warmer air passes over these cold waters it forms a layer of stratus and strata-cumulus clouds at fairly low levels. This cloud is generally described as fog, and often results in heavy drizzle along the coast (Soboil 1996).

Variation in annual rainfall is very high and most communities within this environment are dependent on regular fog occurrences. January to April is the months with the highest likelihood of rainfall. The long term mean annual rainfall for Walvis Bay is less than 20 mm per annum, with annual totals ranging from 0 mm to 100 mm. Annual evaporation in the area is fairly high and evenly spread throughout the year. Although the evaporation is reduced by fog and low mean daily temperature range, the high mean wind speed increases the evaporation considerably. With minimal rainfall, most of the waste stream is expected to dry out, rather than decomposing (Mendelsohn et al. 2002).

Water is a scarce and valuable resource in Namibia and especially in the Namib Desert. Rainfall events are scarce and regular occurrences of fog conditions supply many desert adapted species with the water they require (Mendelsohn et al. 2002).

Temperature

The Walvis Bay area is characterised by mild summers and cool winters, with average minimum and maximum temperatures ranging between I0°C and 24°C. The area experiences little seasonal fluctuation in temperature compared to areas further inland, due to the moderating maritime effect of the Benguela Current and the associated fog conditions (Mendelsohn et al. 2002).

Wind

With the relatively large amount of unconsolidated sands in both the Kuiseb Channel and Delta, and the adjacent Namib Sand Sea, wind is an important environmental factor in sand transportation and dune development.

These winds manifest themselves in the form of strong prevailing south-westerly winds, which range from an average of 20 knots (37 km/h) during winter months to as high as 60 knots (110 km/h) during the summer (Christian, 2006). Winds near Walvis Bay display two main trends namely; high

velocity and frequency south to south-westerly winds in summer and high velocity, low frequency east to north-easterly winds during winter. During winter, the east winds generated over the hot Namib Desert have a strong effect on temperature, resulting in temperatures in the upper 30's degrees Celsius and tend to transport plenty of sand (Christian, 2006).

The climatic conditions at the scrap recycling site should not pose any significant problems related to the operations of the facility.

2.3 TOPOGRAPHY AND DRAINAGE

Topography in the study area is characterised by a relatively flat land surface with a gentle downwards slope towards the west. The site is not situated in a catchment area of any major rivers or channels. The premises is covered with interlocks and a cement slab which means that surface drainage on site would be limited to pooling or small streams.

Overall runoff in the Walvis Bay is poorly developed and infiltration into the ground is fast, but rainfall frequency and volumes are typically very low. Storage and use of hazardous materials must be strictly controlled according to MSDS specifications to prevent any pollutants from reaching nearby receptors such as the ocean. The ground water table is shallow. Flooding is not normally a concern in the area.

2.4 GEOLOGY AND GROUNDWATER QUALITY

The central Namib desert tract developed in response to the formation of the Great Escarpment following the break-up of Godwanaland in the Early Cretaceous period, approximately 130-135 million years (Ma) ago (Soboil, 1996). This desert was formed primarily across rocks of the Damaran Orogenic Belt that occupies much of northern Namibia. Marine conditions predominated around 80 Ma ago, resulting in the formation of a relatively level surface. This surface acted as a platform for the accumulation of Cenozoic sediments (Soboil, 1996).

Deep unconsolidated sediments of Tertiary to Recent age underlie the Walvis Bay area. The deposits have been formed by a combination of fluvial, estuarine, coastal and aeolian processes. Bedrock is estimated to occur at depths of between 40 to 60 m below surface (Mendelsohn et al. 2002).

The Homeb Silt Formation, of at least 30 m thickness, provides information of floodplain overbank deposits from an aggrading Kuiseb River. These silts, deposited 19 000 – 23 000 years ago, testify to the importance of the Kuiseb River as a barrier to the generally northerly migration of the main Narnib Sand Sea throughout the Pleistocene (ca 1800 000 - 10 000 years before present) (Soboil, 1996). During the last 6000 years the Kuiseb has maintained itself as an effective northern boundary to the encroachment of the Narnib Sand Sea, except along the coastal tract where high energy, south – south westerly winds have transported sands across the Kuiseb Delta to form the narrow Walvis Bay/Swakopmund Dune Field (Soboil, 1996).

The landscapes in the Walvis Bay area are the result of a complex geomorphic interplay between fluvial, marine and aeolian processes. These processes are further complicated by the influence of sea-level fluctuation. The prominent landform features of the region include the Kuiseb Valley and Delta, the various dunes of the Namib, Sand Sea (including the dune field between Walvis Bay and Swakopmund), and the extensive gravel plains and exposed bedrock surfaces that extend north.

Groundwater is a scarce and valuable source in Namibia and must be protected at all costs. Although groundwater is not used for human consumption in the vicinity of the site (due to high salinity) it must still be protected from pollutants since it can act as a conduit for the transfer of pollutants to secondary receptors such as the ocean.

3. THE OPERATIONAL COMPONENTS

Scrap Salvage (Pty) Ltd operations consist of three components, namely:

- The salvage and recycling of scrap metals obtained from engineering and manufacturing industry in Walvis Bay
- The export of the recyclable scrap metal to other countries

3.1 The Salvage and Recycling of Scrap Metals

The scrap metal recycling industry encompasses a wide range of metals. Some of the most commonly recycled metals (by volume) are iron and scrap steel, copper, aluminum, lead, zinc, and stainless steel. Scrap metals, in general, are divided into two basic categories: ferrous and nonferrous. Ferrous scrap is metal that contains iron. Iron and steel (which contains iron) can be processed and re-melted repeatedly to form new objects.

Common nonferrous metals are copper, brass, aluminum, zinc, magnesium, tin, nickel, and lead. Nonferrous metals also include precious and exotic metals. Precious metals are metals with a high market value in any form, such as gold, silver, and platinum. Exotic metals contain rare elements such as cobalt, mercury, titanium, tungsten, arsenic, beryllium, bismuth, cerium, cadmium, niobium, indium, gallium, germanium, lithium, selenium, tantalum, tellurium, vanadium, and zirconium.

The scrap metals that are used for processing (sorting and cutting) at Scrap Salvage (Pty) Ltd are ferrous and non-ferrous scrap metals which are sourced from various sources such as:

- Scrap from manufacturing and engineering industry in Walvis Bay.
- Used construction beams, plates, pipes, tubes, wiring, and shot.
- Old automobiles and other automotive scraps.
- Railroad scrap and railcar scrap.
- Miscellaneous scrap metal.

The salvage and recycling process techniques at Scrap Salvage (Pty) Ltd fall into these basic categories:

- Loading and unloading
- Separating and sorting
- Breaking of scrap
- Baling and Compacting of scrap
- Gas flame cutting

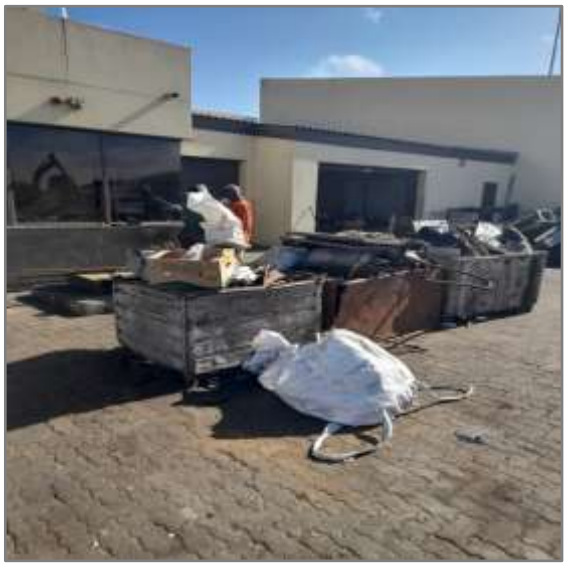
Each category is an individual component of the recycling process and may pose a wide range of safety hazards that are common to many industrial and material handling processes. Such hazards may include flying pieces of material, exposed moving parts, fire hazards, and noise hazards.

Hazardous chemical exposures to employees are most likely to result from hot processes that produce fumes (such as torching and welding) or processes that produce dust (such as cutting). Each of these processes is discussed in detail below:

3.1.1 Loading and Unloading

The first step in the metal scrap recycling operation is getting the metal scrap to the recycling operation and collecting or sorting materials to be processed in groups. The process starts with the loading and unloading of the scrap metal materials from customers. Then the scrap metal is inspected to determine the types of metal and the weighing of the scrap metals.

At Scrap Salvage (Pty) Ltd premises the loading and unloading of scrap materials involve the operation of light or heavy trucks, mobile cranes, and a forklift truck. Working with this equipment poses hazards typical for material handling equipment. Currently, the loading and unloading of scrap materials require more space and therefore the schedule for the clean-up campaign must include clearing up with space at the entrance to ensure the safety of loading and unloading operations.



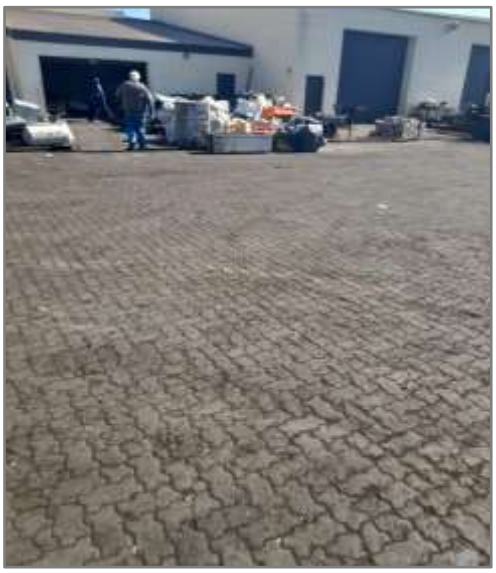


Photo 1. The weighing scale of scrap materials upon arrival. Photo 2. The entrance for loading and unloading of trucks.

3.1.2 Separating and Sorting

The next step in the scrap recycling phase at Scrap Salvage (Pty) Ltd is to separate the according to the different types of metals and other materials. The other materials that are not able to be processed by Scrap Salvage will be disposed of at the appropriate recycling facility, hazardous waste facility or landfill. At Scrap Salvage all of the separating of scrap is done by hand.

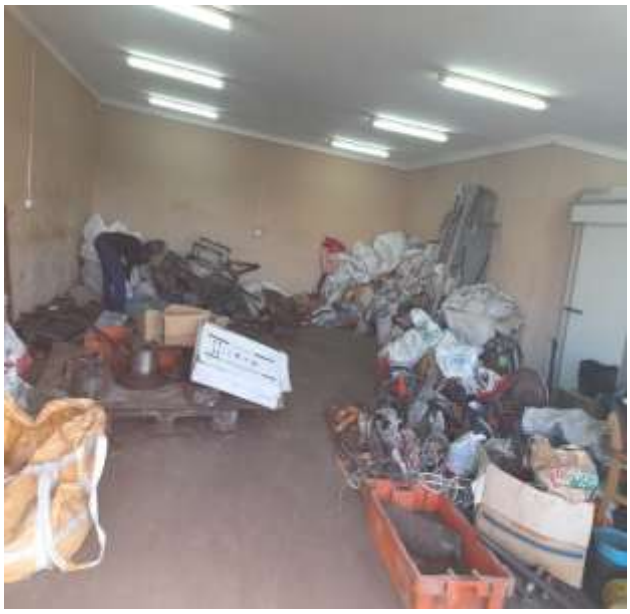
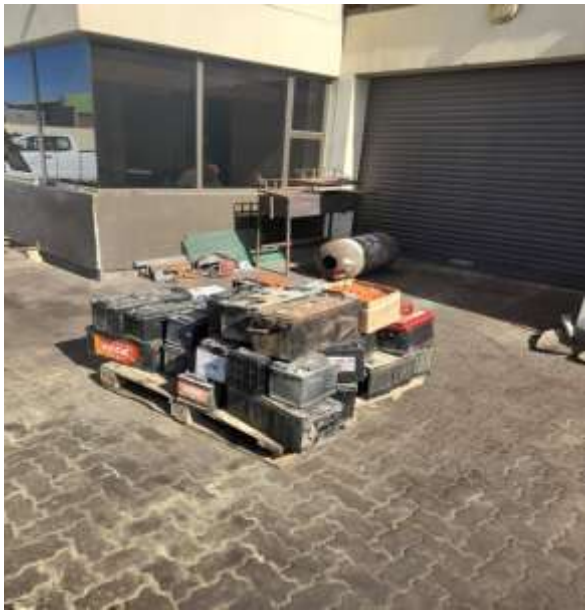



Photo 3 & 4. The separating and sorting of waste materials

When sorting metal scrap by hand, employees must wear personal protective equipment such as gloves if there is a possibility of encountering any metal or other substance for which skin contact could result in adverse health effects. Even for metals that do not irritate the skin, handling sharp or pointed pieces of scrap metal poses cut or abrasion hazards to hands or bodies. Employers are required to ensure that employees wear proper personal protective equipment such as gloves and durable clothing to guard against cuts and scrapes. It is advisable for employees to wear protective eye wear (goggles) when separating of the scrap because there scrap metals do have various sharp ends.

Employees also need to be aware of the proper first aid, medical, and reporting procedures if they receive a cut or scrape. Similar concerns apply to other scenarios where employees work with scrap by hand.

3.1.3 Breaking of Scrap

The next step in the scrap recycling phase at Scrap Salvage (Pty) Ltd is to make use of basic metal breaking processes to size reduce the scrap metals. Basic metal breaking processes often involve heavy manual labour to break up large or complex assemblies of scrap metal, or to cut or break the pieces into smaller sizes.

Employees involved in activities of this type may be exposed to flying object hazards as the material breaks apart from the impact of manual breaking. Employers must ensure that employees are protected from these hazards by either performing the task remotely; placing a barrier or protective

shield around the task; or using PPE such as face and body protection. Breaking may also create a noise hazard, requiring the employer to implement feasible engineering or administrative controls. If these controls do not sufficiently reduce the noise hazard, employers must provide appropriate hearing protection such as earplugs, canal plugs, earmuffs, or other protective devices as required by OSHA's Occupational Noise Exposure standard.

3.1.4 Baling and Compacting of Scrap

At Scrap Salvage (Pty) Ltd the baling and compacting of especially larger scrap metals are done to reduce the size of scrap metal. Baling of scrap metal is often compacted using balers to promote efficient melting by allowing more metal into a furnace than would be possible for a random assortment of sheeting and other scrap objects. Balers use powerful hydraulic systems to compact scrap metal. Moving parts of balers must be shielded to prevent body parts from coming in contact with the machine. Car flatteners work on many of the same principles as balers and present similar hazards. Balers are typically automated machines. This allows operators to stay a safe distance from the machinery, however employees must still exercise caution when feeding raw material into a baler using a hopper or conveyor belt. Again, some sort of physical restraint such as railings may be appropriate to keep employees from falling onto these machines.

Some paper balers and shredders have sensors or heat detectors installed that react to human body heat and automatically stop all machine operations. For others, employees may wear magnetic or other devices on their belts that are linked to a safety interlock system (Nijkerk 2001). Systems such as these could be applied to some metal balers and shredders to provide additional protection to employees (both from metal and from contaminants in the scrap). Employees must be trained to understand the functioning and safety procedures of their equipment, and must follow procedures for adequate control of hazardous energy, particularly when performing maintenance procedures on equipment.

For all equipment where pieces of scrap metal are fed into a machine directly, or using a hopper, or even via conveyor belt, employees must be trained in the proper use of the equipment. In addition guards must be installed to prevent employees from coming into contact with hazardous moving parts of the machinery. This applies to the alligator and guillotine shears discussed above, and also to other similar machines such as rotary shears and rotary shredders. For such equipment, employees need to stay a safe distance away from working machinery and take adequate safety precautions to minimize risks. Employers must install shields to block stray pieces of metal scraps from flying out from these machines and employees must be trained to know what materials can or cannot be fed into the machine to prevent malfunctioning.

In addition to the physical hazards associated with baling, compacting and shredding, these processes also produce significant amounts of dusts. These dusts, if not controlled, can present both explosion hazards and inhalation hazards. Some ways to control these hazards include:

• Installing explosion sensors where appropriate to inject water to suppress explosions.

• Operating machinery at lower speeds to reduce dust generation.

• Introducing an inert gas to rotary shears to reduce the risk of explosion. (Nijkerk 2001)

• Providing supplemental ventilation where needed and perhaps respiratory protection to protect employees from exposure to hazardous dusts.

Some scrap materials such as scrap vehicles or refrigerators may contain fuels or other materials that introduce additional hazards to the process. Operators must be sure to remove these materials before introducing the scrap to process machinery. For example, gasoline must be removed from the gas tank of scrap automobiles before compacting or shredding the automobile. In addition, chloroflourocarbons (CFCs) and ammonia must be removed from air conditioning systems to prevent employee exposure to these irritants and to prevent the release of these gases to the atmosphere.

Many of the processes above use large amounts of electricity to operate. Employees must be aware of the hazards of working in high-voltage environments and should take appropriate precautions. All equipment power systems must be covered with non-conducting covers that require a tool to remove. High-voltage areas must be protected to prevent access to unauthorized individuals. Employers must create a lockout/tagout program and train employees on proper implementation of these procedures.

At Scrap Salvage the baling machines are used for shredding and compacting (pressing) the scrap metals into smaller pieces. The schedule for the clean-up campaign should include clearing up space for the operators operating the baling machinery to move around safely as well as clearing up walkways to and from the baling machine.

Photo 3. The baling machine used to cut scrap metal. **Photo 4.** The baling machine for compacting and shredding

3.1.5 Gas Torch (Flame) Cutting

The next step in the scrap recycling process at Scrap Salvage (Pty) Ltd is to cut the scrap metal into smaller sized squares of approximately 1.5 x 1.5 m using gas torches (Photo 5). Size-reduction of metal scrap is a necessary component of scrap recycling operations. The most common tool used to break apart large metal pieces is the gas cutting torch, often used for cutting steel scrap.

Thermal (gas) torches expose employees to sprays of sparks and metal dust particles, to high temperatures, to bright light that could damage eyes (light both inside and outside of the visible spectrum), and to various gases. Older gas cutting torches used pure hydrogen and oxygen while newer torches often use acetylene, propane, carbide, gasoline-oxygen or other mixtures.

Compressed gases may be flammable and/or explosive or may present toxic or asphyxiant hazards if leaks occur. Compressed gas cylinders can also present explosion or missile hazards if exposed to excessive heat or physical damage. OSHA standards establish general and selected substance-specific requirements for proper storage, handling, and use of compressed gasses. Additional requirements for compressed gasses used in certain types of welding and cutting operations are provided in the OSHA standards.

The use of torches presents an obvious fire hazard. This hazard is of particular concern when working on materials that have combustible or explosive components such as motor vehicles with plastics and fuel tanks, or objects with wooden interiors. Gas torches also involve storage of flammable and explosive gases on site.

Currently, at Scrap Salvage (Pty) Ltd the storage, handling and use of compressed gases are up to standard according to OSHA standards (Photo 6). Furthermore, the implementation of an effective Health, Safety and Environmental Management System would ensure the improvement of the storage, handling and use of compressed gases.

Employees involved in activities of this type may be exposed to metal fumes, smoke, hot environments, and hot material when working near furnaces, and may come in contact with metals that present hazards through both skin contact and inhalation. Employers must ensure that employees use appropriate eye and face protection such as a welder's helmet and heatproof and or aluminum lined clothing to protect their bodies from the output of these cutting operations, which have similar hazards to welding.

Photo 5. Workers cutting scrap metal using flame torch. **Photo 6.** Gas bottles use and storage

3.2 The export of scrap metal materials

The final step in the scrap recycling process at Scrap Salvage (Pty) Ltd is the loading of the processed (sorted, cut and/or compacted) scrap metal in a shipping container for export purposes. A final inspection is done to ensure all requirements are met for export. The final inspection will check the weight, contents and supporting documents of the scrap metal materials before the container is sealed in the presence of a Namibia Ports Authority (NAMPORT) official. Then the container is transported by truck operated by Scrap Salvage (Pty) Ltd to the Walvis Bay Harbour Container Terminal for storage, loading and shipping to our clients 'destinations.

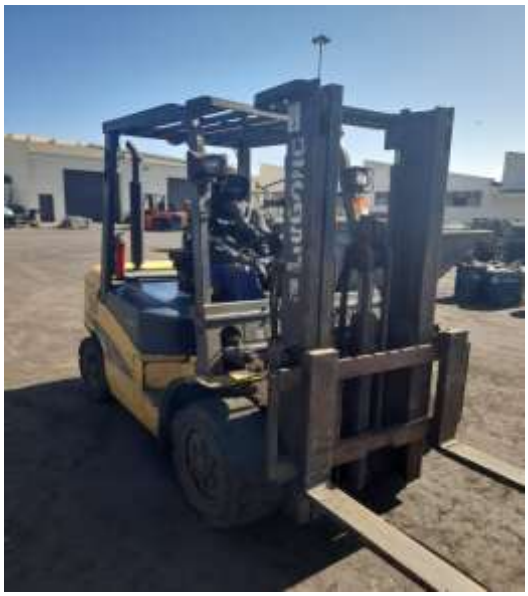


Photo 7. The loading of scrap metal in containers for export. **Photo 8.** Forklift and operator

4. THE EMP

The following general guidance for the EMP is based on the findings of the risk assessment carried out by GEA Source Investment at Scrap Salvage (Pty) Ltd site.

4.1 Land Use, Planning, Design, and Operations – Identified Impacts and Mitigating Measures

The following is the summary of the identified impacts and mitigation measures:

- The current zoning designates the area as suitable for the operations of scrap recycling, flame cutting and salvage activities;
- The risk of an accident/incident causing fires or explosions is possible with the use of compressed gas cylinders. Safety training of workers to ensure the safe use of compressed gas cylinders, safe storage of gas cylinders and fitting the gas cylinders with flashback arrestors are necessary to mitigating measures to ensure a safe facility. If a fire or explosion was to occur and the necessary mitigating and management measures were not in place there would be a significant possible impact on the adjoining industrial properties.

- Accidental spills and releases of vehicle fluids are the most common cause of environmental damage found at automobile salvage yards. Spills can occur if fluids are left in the vehicle when stored in the yard, when the fluids are intentionally removed from the vehicle, and when the fluids are transferred into or out of storage containers and tanks. The best way to minimize your environmental impact is to prevent spills and accidental releases from occurring by adopting good housekeeping practices.

4.2 Responsibilities and Implementation of the EMP

- Scrap Salvage (Pty) Ltd has overall responsibility for environmental management during the operations and decommissioning phases of their scrap recycling flame cutting and salvage activities.
- Scrap Salvage (Pty) Ltd will be responsible to ensure that the commitments set out in this EMP are implemented during the planning, operations and decommissioning phases. Scrap Salvage (Pty) Ltd is to ensure that contractors involved with their activities comply with the EMP and will monitor contractor activities.

The EMP gives the environmental commitments, which will be implemented by Scrap Salvage (Pty) Ltd and their Contractors. Table 4.1 to Table 4.2 outline the management of the environmental elements that may be affected by the different activities, grouped in each phase of their operations. These groups are as follows:

- Planning Phase
- Operational Phase
- Decommissioning Phase

Contents of these tables should be incorporated into a Health, Safety and Environmental (HSE) Management System.

Table 1. Planning Phase

Activity	Objective	Action	Timing	Proof of Compliance	Responsible Body
Compliance	To comply with all legal requirements for the operations of the facility in Namibia.	Ensure that all the necessary permits from the various ministries, local authorities and any other bodies that govern the operations are available.	During operations.	All contracts, permits, certificates and other legal documents on file.	Proponent
Appointments	To appoint reputable contractors and operational personnel and establish the EMP, a legal requirement that forms part of the contract with the contractor and employees.	When appointing a contractor and employees ensure the EMP is agreed with as well. Ensure that the contents of the EMP are understood by the contractor, subcontractors, employees and all personnel who will be present on site.	During operations.	Contracts on file.	Proponent, Contractors
Management	Establish a management system to implement and monitor Health, Safety and Environment.	Make provisions to have a Health, Safety and Environmental Coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site. Have the following emergency plans, equipment and personnel in place to deal with all emergencies: Risk Management / Mitigation / Environmental Management Plan/ Emergency Response Plan and HSE Manuals Adequate protection and indemnity insurance cover for incidents; Comply with the provisions of all relevant safety standards; Procedures, equipment and materials required for emergencies.	During operations.	Documentation on file Personal Protection Equipment (PPE) on site. Document the operational procedures. Signage related to restricted areas, dangerous areas, and PPE requirements on site. Emergency response material on site.	Proponent, Independent Specialist Consultant

Activity	Objective	Action	Timing	Proof of Compliance	Responsible Body
Restoration Fund/Insurance	To establish a fund/ insurance for future environmental restoration or pollution remediation if ever required.	To establish a fund for future ecological restoration of the site should operational activities cease and the site is decommissioned and environmental restoration or pollution remediation is required.	During operations.	Insurance or warranty statement of restoration fund/insurance	Proponent
Reporting	To establish a reporting system to report on monitoring aspects of operation and decommissioning as outlined in the EMP	Establish a reporting system to report on aspects of construction, operation and decommissioning as outlined in the EMP. Keep monitoring reports on file for submission with Environmental Clearance Certificate renewal applications where needed.	During operations.	Monitoring Reports.	Proponent; Contractor
Environmental Clearance Renewal	To renew the Environmental Clearance Certificate every three years	Appoint a specialist environmental consultant to update the EMP and apply for renewal of the Environmental Clearance Certificate.	Prior to expiry of Environmental Clearance Certificate	Renewed Environmental Clearance Certificate	Proponent; Independent Specialist Consultant

Table 2. Operational Phase

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Enhanced skills transfer and technology transfer to Walvis Bay and subsequent promotion of economic development	People need skills to perform their jobs. The technology to do something is often not found locally. Development of people and technology are key to economic development.	None required.	Annual summary report based on actual training and the enhancement of skills and transfer of technology should be compiled.	Proponent
Increased spread of HIV/ AIDS; Increased influx to Walvis Bay; Increased informal settlement and associated problems; Reduced property values	Even existing operations attract people who seek work. This in turn can increase the extent of informal settlements and its associated problems. The increased trucking and distribution of goods from Walvis Bay could contribute to the spread of HIV / AIDS.	The implementation of an educational program on HIV /AIDS for all the staff, in particular the truck drivers, are imperative. Restricted employment for Walvis Bay dwellers only should be practiced. Deviations from this practice should be justified appropriately. Training of local people should be considered from the start. These measures will reduce the influx of newcomers to the town and thereby reduce growth in the informal settlement.	Annual summary report based on educational programmes and training conducted. Annual report and review of employee demographics	Proponent
Employment, secure steel supply and scrap recycling	The continued operation of the facility aid in securing steel supply to the marine, manufacturing and engineering industry. A recycling metal facility reduces pollution, saves resources, reduces waste going to landfills and prevents the destruction of habitats from mining new ore. The facility provides employment to locals.	None required.	Annual summary report based on employee records.	Proponent

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Traffic	The site is located in the town's industrial area. Due to the nature of the neighbouring industries trucks will frequent the areas around the site. This may cause traffic disruptions and impact on nearby businesses when trucks are parked in the street.	Careful planning and directing of trucks arriving for loading and unloading events might be required. Trucks should not be allowed to park, outside the premises, for extended periods of time. The speed limit imposed on the area must be adhered to.	A complaints register must be maintained, in which any traffic related complaints from the community must be logged. Complaints must be investigated and if appropriate, acted upon.	Proponent
Security	Unauthorised entry leading to theft of equipment and/or product and/or fire hazard (not intentional arson).	Security procedures and proper security measures must be in place. Strict security that prevents unauthorised entry. Patrolling perimeter fence. Alarm systems and security personnel should be utilised. Strict security at the entry points must be adhered to. Fitness for work certificates for every security officer to be issued on a monthly basis.	A report should be compiled containing all security related incidents.	Proponent, Security Contractor
Fire and Explosion Hazard	Products such as the compressed gas cylinders stored on site are flammable and therefore a fire risk exists. Workers use compressed gas cylinders for Gas Torch (Flame) Cutting activities. The primary causes of fire and explosion accidents may include human error, technical failures and inadequate maintenance. If preventative measures for fire and explosions are not taken safety risks become more probable.	Storage and handling of flammable products in particular gas cylinders should be according to their MSDS instructions. Regular maintenance, good housekeeping and training of personnel reduce the risk of fire. Further measures to be taken are: • Site inspection and maintenance • Operational procedures and training • Mechanical and electrical inspections • Fire extinguishers • Trained personnel • Good housekeeping • Reporting of leaks/spills ***Fire Fighting and Fire Prevention:*** All fire precautions and fire control at the site	A report should be compiled containing all incidents. The report should contain dates when fire drills were conducted and when fire equipment was tested and replaced.	Proponent

Criteria	Nature	Mitigation	Monitoring	Responsible Body
		must be up to date. Fire fighting measures as per the Material Safety Data Sheets of the product should be adhered to.In addition to this, all personnel have to be sensitised about responsible fire protection measures and good housekeeping such as the removal of flammable materials including rubbish, dry vegetation, and hydrocarbon-soaked soil from the vicinity of the flame cutting activities. Regular inspections should be carried out to check for these materials at the site. It must be assured that sufficient water is available for fire fighting purposes. A holistic fire protection and prevention plan is needed. This holistic plan must include an emergency response, fire fighting plan and spill recovery. Regular inspections of the fire-fighting equipment and water supply should be carried out as per the EMP. Employers must ensure that employees use appropriate eye and face protection such as a welder's helmet and heatproof and or aluminium lined clothing to protect their bodies from the output of the flame cutting operations, which have similar hazards to welding. Experience has shown that the best chance to rapidly put out a major fire is in the first 5 minutes. It is important to recognise that a responsive fire prevention plan does not solely include the availability of fire fighting equipment, but more importantly, it involves premeditated measures and activities to timeously prevent, curb and avoid conditions that may result in fires.		

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Health & Safety	During operational times all procedures for loading and unloading, storage and gas flame cutting are subject to various risks to human beings. These risks are assessed in terms of the predicted impact if realised. Typical examples are:- *Loading and Unloading/ Breaking and Separating:* • Material handling hazards such as flying pieces of material, exposed moving parts, • Slipping on wet surfaces • Scrap metal contact with eyes, hands, feet and skin • Staff not wearing protective clothing • Staff operating light or heavy vehicles, forklift trucks and cranes without the adequate training *Storage:* • Slipping on wet surfaces • Trip and fall • Product contact with eyes and skin • Staff not wearing protective clothing • Working at heights • Muscular injury from incorrect lifting technique *Baling and Compacting* • Electrical hazards • Trip and fall • Dust	All Health and Safety standards specified in the Labour Act should be complied with. The responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site. It is imperative that adequate measures must be brought in place to ensure safety of staff on site at all times. Typical mitigating measures within the health and safety management systems are:- ➢ Adhere to Health and Safety Regulations pertaining to personal protective clothing, first aid kits being available on site, warning signs, etc. ➢ Equipment that will be locked away on site must be placed in a way that does not encourage criminal activities ➢ Ensure suitable personal protective equipment is in place for workers as well as permit to work systems ➢ Forklift and crane operators must be properly trained in the use of such equipment. Operators must conduct pre- or post-shift vehicle inspections depending on vehicle use. Employers must consider equipping vehicles with guarding to protect any vulnerable brake lines from incidental damage during operation ➢ Baling machinery operators must be properly trained in the use of the equipment. ➢ Proponent should install guards on machinery to prevent any employees from contacting moving parts. ➢ Flame cutting activities must be supervised and operators should have received necessary training on how to use, handling and storage of compressed gases.	A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat itself. The proponent must ensure that adequate emergency facilities, including first aid kits are available on site. Selected personnel should be trained in first aid. The numbers of all emergency services must be readily available.	Proponent

Criteria	Nature	Mitigation	Monitoring	Responsible Body
	Gas Flame Cutting: • Trip and fall hazards • Slipping on wet surfaces • Staff not wearing protective clothing • Working at heights • Working in confined spaces • Fire hazards	➢ Employees must follow lockout/tag out procedures to de-energize all equipment prior to cleaning or performing maintenance.		
Waste Production	The ability of products to act as a waste which must be cleaned up or removed off-site to an appropriate waste disposal facility. These can be soils that become contaminated with fuel. Domestic waste from bins, offices and ablution facilities and other scrap material.	The contractor must ensure that adequate temporary disposal facilities are available at on-site. Products that can be re-used or re-cycled should be kept separate. Waste should be disposed of regularly and at appropriate disposal facilities. Due to the nature of some hazardous materials they should be disposed of in an appropriate way at an appropriately classified waste disposal facility. Make use of the Material Safety Data Sheets available from suppliers if the user is not sure how to dispose of the substance.	A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility. Hazardous waste disposal receipts should be kept on file. Any complaints received regarding waste should be recorded with notes on action taken. All data to be compiled in a monitoring report.	Proponent
Groundwater, Surface Water and Soil Contamination	Soil may become contaminated over time by the slow accumulation of many small drips and spills, or all at once by a single spill event. Spills can occur if fluids are left in the vehicle when stored in the yard, when the fluids are intentionally removed from the vehicle, and when the fluids are transferred into or out of storage containers and	Using good housekeeping practices can avoid potentially costly remediation of contaminated soil due to accidental drips and spills. When spills do occur, the release should be stopped and cleaned up immediately. If the spilled material was hazardous waste, then the contaminated soil will likely be a hazardous waste as well. If hazardous, you must dispose of it as hazardous waste: • the contaminated soil must be stored in containers labelled "Hazardous Waste –	Mitigation measures for handling and storage of hydrocarbon and hazardous materials onsite and offsite. Make use of spill kits (spill clean-up material), spill drip trays and funnels to transfer hydrocarbons. Should any spills occur, contaminated soil is to be removed and rehabilitated or replaced with uncontaminated soil and a spill report form must be completed by the	Proponent

Criteria	Nature	Mitigation	Monitoring	Responsible Body
	tanks. Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table table either at the site of spill or after being washed away by surface flow. Leakages from accidental spills of hydrocarbons (fuel and oil) from scrap vehicles might occur. Groundwater might spread pollutants to neighbouring receptors and may create an impact on underground infrastructure. However, due to the small scale of the project and the scarcity of surface water and groundwater in the area, the risk of hazardous spills can be effectively managed. Groundwater is not utilized in the area for human consumption but should still be protected at all costs. Limited surface runoff from the site is expected.	Contaminated Soil;" • all hazardous wastes count toward your monthly hazardous waste generator accumulation total; • Contaminated soil should be containerized or stored covered on plastic sheeting until a decision is made on how it will be managed. DO NOT store contaminated soils indefinitely. If the spilled material was non-hazardous waste, then the contaminated soil will also be non-hazardous.	contractor. The spill report form must include the nature, extent and location of the hazardous spill and the actions taken to contain it.	
Ecological Impact	The effect of operational activities on the ecosystem functioning and biodiversity. Bright lights may impact on birds flying in the area at night. This may lead to collisions.	The operations take place within an industrial area where most biodiversity has been removed long ago. To prevent the impact of lighting on birds all lighting at the premises must be directed downwards and the minimum lighting required must be used at night. The nesting of birds should be discouraged. Rodents and other infestation should be	A record should be kept of any extraordinary fauna sightings or encounters on site. Complaints register must be maintained, in which all complaints from the community must be logged.	Proponent

Criteria	Nature	Mitigation	Monitoring	Responsible Body
		discourage and effectively managed. Regular inspection must be performed to monitor for fauna impacts and mitigation measures investigated if required.	All data to be compiled in the monitoring report.	
Visual Impact	This is an impact that affects the aesthetic appearance. The infrastructure does not have a significant effect on the visual horizon as it will be similar to the other structures in the industrial area and to that which is already present at the scrap metal recycling premises.	No specific measures need to be implemented to maintain a similar visual impact to other industrial buildings. Routine maintenance on infrastructure will ensure that the longevity of structures is maximised. However, it is important that the real integrity of the structures is considered in the long term and not just appearances.	A complaints register must be maintained, in which all complaints from the community must be logged. Complaints must be investigated and if appropriate, acted upon.	Proponent
Cumulative Impact	These are impacts on the environment, which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of who 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 itself may not be significant, may 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 operational	Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact. Reviewing biannual and annual reports for any new or reoccurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient.	Annual summary report based on all other impacts must be created to give an overall assessment of the impact of the Operational Phase.	Proponent

Criteria	Nature	Mitigation	Monitoring	Responsible Body
	phase include increase in traffic frequenting the site and along the sections of roads near the facility. An increase in emissions from these vehicles will decrease the air quality around the facility. Wear and tear on the roads and increased risks of road traffic incidences could increase. Additional traffic and operational noise would further increase noise impacts in the area. Other companies are using the roads to access the area. The cumulative effect of lighting on birds due to industrial developments may increase the risk of collisions and interference with bird flight paths at night.			

Table 3. Decommissioning Phase

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Employment	Decommissioning of the site premises may lead to retrenchments or re-location of staff no longer required.	Plan in advance for meeting the Labour Acts requirements for retrenching of staff if required. Where possible staff can be relocated to another facility or town where business continues in the same way.	During normal operations of the facility an annual report must be compiled that includes the appropriate plans for handling of employees should the facility be decommissioned. The report should include budgeting for retrenchments and possible alternative positions elsewhere.	Proponent
Ecological Impact	Operations spanning many years may create new habitat for fauna and flora. Upon decommissioning these habitats will be destroyed	The Applicant would have to take into consideration any new flora and fauna habitats created. Before decommissioning, the HSE officers would need to inspect every structural facility to ensure that the dismantling and removal of any structure would not affect any organism that has become dependent on those structures for survival, shelter or breeding. Where new habitats were created and occupied by fauna or flora, The Applicant must contact MET or other appropriate organizations to establish the conservation status. The possibility of relocating the fauna or flora must be investigated and executed. Should the species be listed as vulnerable to extinction, a meeting should be held with MET in order to determine the appropriate handling of the situation.	A report should be compiled of any fauna and flora that established itself on the premises. The report should include all actions taken to relocate or deal with the situation**.**	Proponent, Contractor
Dust	Dust will be generated during the Decommissioning Phase and might be aggravated during periods of strong winds. This occurs regularly in Walvis Bay during the	It is recommended that regular dust suppression be included in the Decommissioning Phase, when dust becomes an issue. Personnel should be issued with dust masks for health and safety reasons.	Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and,	Proponent, Contractor

Criteria	Nature	Mitigation	Monitoring	Responsible Body
	winter months when easterly winds occur.	Accumulation of rubble should not be allowed and must be taken to the dumpsite within reasonable time.	if appropriate, acted upon.	
Waste Production	The ability of product to act as a waste which must be cleaned up. Upon decommissioning waste will be produced in the form of building rubble, obsolete equipment and structures, obsolete or residual products and equipment or structures that can be used elsewhere or sold as scrap.	To reduce the amount of waste all re-usable pipelines, pumps, tanks, valves and other equipment must be removed to another site owned by Scrap Salvage (Pty) Ltd or sold. Those items that cannot be used again must be scrapped in the appropriate manner. Upon demolition of the buildings and concrete the rubble must be removed from the property and taken to an approved dumpsite designated by the Walvis Bay Municipality. Rehabilitation if necessary is to be done using funds designated for the purpose.	Regular visual inspection. A register of waste produced and disposal methods should be maintained.	Proponent; Contractor
Noise	Noise pollution will exist due to heavy vehicles accessing the site to collect rubble from demolished building materials.	The facility is situated in an industrial area so there is no restriction on the times of operation. The Walvis Bay Municipality does not have any guidelines with respect to noise levels but the World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment is followed. This limits noise levels in industrial areas to an average of 70 dB over a 24 hour period with maximum noise levels not exceeding 110 dB during the period. During decommissioning noise levels might be higher. This will however be short lived. All personnel must be issued with hearing protectors and neighbours must be notified of the time and duration of decommissioning. Notice of the start of the decommissioning should be given to the local authorities with an invitation to give feedback at any time with regards the noise impact.	A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and if appropriate, acted upon.	Proponent, Contractor

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Groundwater, Surface Water and Soil Contamination	Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table.	All precautions are to be taken to prevent contamination of the soil as this could enter the ecosystem. Leakages from vehicles might occur especially if they are serviced on site. Care must be taken to avoid contamination of soil and groundwater. Groundwater might spread pollutants to neighbouring receptors and may create an impact on underground utilities (i.e. fresh water supply to buildings, sewerage system). Pollutants in the soil and building rubble must be transported away from the site to an approved, appropriately classified waste disposal site. Confirm MSDS information for any remaining fuels, oils or lubricants that must be discarded. Regulations on sewerage discharge and the chemicals that may be put into the sewerage system must be followed.	Mitigation measures for handling and storage of hydrocarbon and hazardous materials onsite and offsite. Should any spills occur, contaminated soil is to be removed and rehabilitated or replaced with uncontaminated soil and a spill report form must be completed by the contractor. The spill report form must include the nature, extent and location of the hazardous spill and the actions taken to contain it.	Proponent, Contractor
Health, Safety and Security	During decommissioning times all procedures for loading and unloading and demolishing of buildings are subject to various risks to human beings. Different excavation, earthmoving and transport equipment will be onsite. This increases the possibility of injuries. A high risk to site security and personnel health and safety exists during this period.	All Health and Safety standards specified in the Labour Act should be complied with. The responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site. The Contractor should be obliged to adhere to the ➢ following:encourage criminal activities ➢ Adhere to Health and Safety Regulations pertaining to personal protective clothing, first aid kits, warning signs, etc.; Ensure that adequate emergency facilities, including first aid kits, are available on site; ➢ The contractor must use local media to make the public aware of construction activities that may pose safety risks; ➢ Proper barricades and signage must be in	Receive a weekly planning sheet from Contractor to know when traffic authorities and the general public need to be informed of construction areas to avoid. A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents are not repeated. All information and reporting to be included in a final report once construction finishes and the site is handed over to MME.	Proponent, Contractor

Criteria	Nature	Mitigation	Monitoring	Responsible Body
		place to warn and direct pedestrian and vehicle traffic away from construction site; ➢ Equipment that must be locked away on site and must be placed in a way that does not encourage criminal activities (e.g. theft); ➢ Induction training for all who enter the site is required; and ➢ Security personnel to prevent unauthorised entry of the site		
Fire and Explosion Hazard	Residual Hydrocarbons could be present and might pose a risk to the teams dismantling the various structures. Fire and/or explosion events are still possible.	All relevant regulations and precautions should be in place before commencing with decommissioning activities. All personnel have to be sensitised about responsible fire protection measures and good housekeeping such as the removal of flammable materials including rubbish, dry vegetation, and hydrocarbon-soaked soil from the vicinity of the site. Regular inspections should still be carried out to inspect and test fire fighting equipment and pollution control materials at the scrap recycle premises. All fire precautions and fire control at the fuel storage facility must be in accordance with SANS, or better. The holistic fire protection and prevention plan should still be utilised. Experience has shown that the best chance to rapidly put out a major fire is in the first 5 minutes. It is important to recognise that a responsive fire prevention plan does not solely include the availability of fire fighting equipment, but more importantly, it involves premeditated measures and activities to timeously prevent, curb and avoid conditions that may result in fires.	A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat.	Proponent; Contractor

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Rehabilitation	Should the premises ever be decommissioned the entire premises must be rehabilitated as much as possible to its original condition.	Removal of all infrastructure and waste produced after decommissioning is crucial. Any residual hydrocarbon polluted soil must be removed to a classified waste disposal site.	During normal operations a rehabilitation fund must be established to prepare for possible decommissioning	Proponent

5. CONCLUSION

The above Environmental Management Plan, if properly implemented will help minimise adverse impacts on the environment. Where impacts occur, immediate action must be taken to reduce the escalation of effects associated with these impacts. To ensure the relevance of this document to the specific stage of project, it needs to be reviewed throughout all phases.

The Environmental Management Plan should be used as an on-site reference document during all phases of the proposed project, and auditing should take place in order to determine compliance with the EMP for the proposed site, and Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

Monitoring reports must be kept available for possible submission with future renewal applications for environmental clearance certificates.

Provided that the recommended mitigation measures are successfully implemented, there is no environmental reason not to issue an environmental clearance certificate for the existing scrap recycling, flame cutting and salvage operations.

Gea Source Investment cc
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Project Manager

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Appendix A: Scrap Salvage (Pty) Ltd Fitness Certificate

i. **Previous Fitness Certificate**

ii. **Fitness Certificate Renewal Application Receipt**

Appendix B: Notified Neighbours

Appendix C: Environmental Practitioners CV