Environmental Impact Assessment for Halliburton's proposed Liquid Mud Treatment and Completion Fluid Plant

Environmental Management Plan

Halliburton Industries Limited

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Prepared by:

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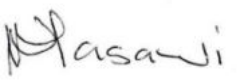
Report Sign Off and Approvals



Ndomupei Masawi **Sue Reuther**

Basis of Report

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Acronyms and Abbreviations

AQMP	Air Quality Management Plan
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act, 2007 (No. 7 of 2007)
EMP	Environmental Management Plan
LMTP	Liquid Mud Treatment and Completion Fluid Plant
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
NAMPORT	Namibian Ports Authority
SLR	SLR Environmental Consulting (Namibia) (Pty) Ltd

1.0 Introduction

This section provides a brief description of the proposed Project background, summarises the legislative authorisation requirements, and describes the structure and purpose of the report.

1.1 Project background

Halliburton Industries Limited (Halliburton) provides a range of products and services to the energy industry, specialising in oil and gas exploration, drilling, and production, as well as engineering and construction services. Halliburton is proposing to construct and operate a Liquid Mud Treatment and Completion Fluid Plant (LMTP) at Berth 8 in the Port of Walvis Bay, Namibia (hereafter referred to as the proposed Project) (Figure 1-1andFigure 1-2). The LMTP will provide drilling and completion fluids to the operators currently exploring for oil and gas offshore southern Namibia.

The proposed Project triggers activities listed in Government Notice (GN) No. 29 of the Environmental Impact Assessment (EIA) Regulations of 2012, promulgated in terms of Section 56 of the Environmental Management Act, 2007 (GN No. 30 of 2007) (EMA) and, therefore, requires an Environmental Clearance Certificate (ECC) from the Ministry of Environment, Forestry and Tourism (MEFT) (regulatory authority) before these activities can commence. An EIA process must be undertaken in order for MEFT, and the Ministry of Mines and Energy (MME) (as the competent authority), to consider an ECC application.

Halliburton has appointed SLR Environmental Consulting (Namibia) (Pty) Ltd (SLR) as the independent Environmental Assessment Practitioner (EAP) to undertake the ECC application and associated EIA process for the proposed Project.

1.2 Purpose of this document

The purpose of the EMP is to ensure that impacts associated with the proposed Project are avoided and, where they cannot be avoided, are kept to a minimum and rehabilitated. This EMP, which has as its basis the mitigation measures listed in the Scoping Report, sets environmental targets for Halliburton and is Contractors and reasonable standards against which their performance can be measured. It is also designed to ensure compliance and alignment with legal standards and current EMP for the Port of Walvis Bay (Faul and Botha 2023).

During construction and decommissioning, this document will form the basis for the environmental specifications that the Contractor, in terms of the construction / decommissioning contract, will be obliged to adhere to during construction and decommissioning. This document will be included in the contract documentation for both the construction and decommissioning s and will thus form a binding agreement between the Contractor and Halliburton.

Any conditions of authorisation contained in the ECC that contradict specifications included in this EMP, supersede the specifications in this document. Thus, this EMP should be read together with the ECC, and should be updated to contain all conditions of authorisation contained in the ECC that are relevant to environmental management.

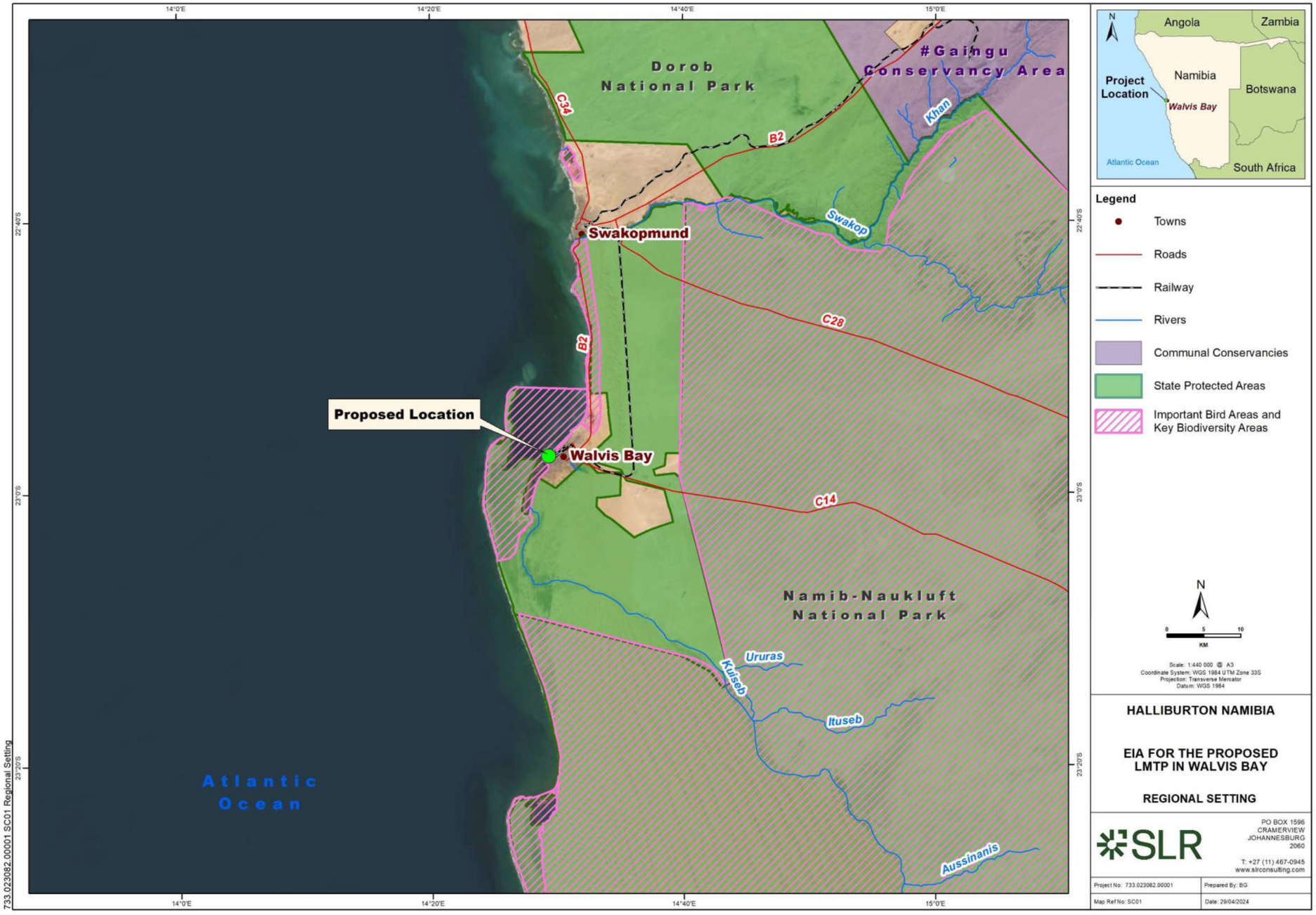


Figure 1-1: Regional setting

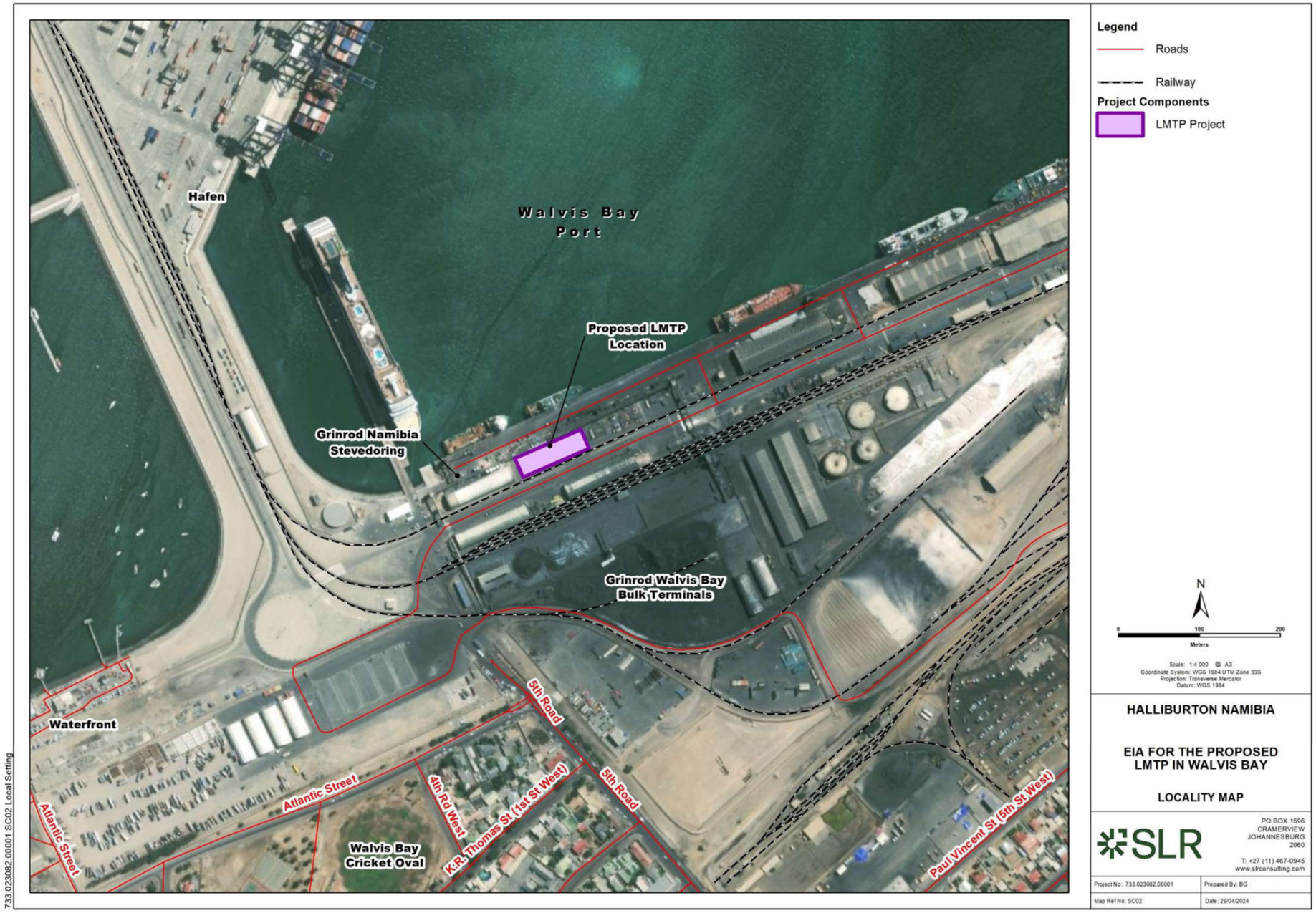


Figure 1-2: Local setting

1.3 Environmental Aspect and Impact Identification

The geographical, physical, biological, social, economic, heritage and cultural aspects associated with the proposed Project have been described in Section 7.0 of the Scoping Report. In summary, the Project site is situated within the Port of Walvis Bay, which is a commercial harbour. As such, the site and much of the immediate environment are entirely artificial comprising concrete walls (berths), protective rock armour and compacted / sealed reinforced concrete overlain by interlocked paving.

Potential environmental, social and cultural impacts have been identified, described and assessed in Section 8.0 of the Scoping Report. In summary, the impact assessment found that all the potential impacts can be mitigated to be within **LOW, VERY LOW AND INSIGNIFICANT SIGNIFICANCE** rating. A summary of the Environmental Impact Assessment is provided in Table 1-1.

Table 1-1: Summary of the EIA Findings

Environmental Aspect	Issue/Benefit	Relevant Project Phase			Significance Rating Impact Assessment	
		Construction	Operation	Decommissioning and Closure	Unmitigated Scenario	Mitigated Scenario
BIOPHYSICAL	Coastal and underwater noise and vibration levels impacting marine communities	X	X	X	**Very low**	**Insignificant**
	Contamination of marine waters	X	X	X	**Medium**	**Very low**
	The smothering of macrofauna by barite and bentonite		X		**Very low**	**Insignificant**
	Biochemical impacts of accidental spillage of drilling muds on benthic communities		X		**Very low**	**Insignificant**
	Impacts of increased turbidity on marine ecology	X	X	X	**Insignificant**	**Insignificant**
	Indirect biochemical impacts in the sediments		X		**Low**	**Insignificant**
	Increase in ambient air concentrations affecting sensitive receptors	X			**Medium**	**Low**
			X		**Medium**	**Low**
				X	**Low**	**Very low**
	Increase in disturbing noise levels affecting sensitive receptors	X	X	X	**Low**	**Insignificant**

Environmental Aspect	Issue/Benefit	Relevant Project Phase			Significance Rating Impact Assessment	
		Construction	Operation	Decommissioning and Closure	Unmitigated Scenario	Mitigated Scenario
SOCIO-ECONOMIC	Alteration of the visual environment affecting sense of place	X			**Very low**	**Very low**
			X		**Low**	**Very low**
				X	**Very low**	**Insignificant**
	Contribution to the national, regional, and local economy	X	X	X	**Medium**	**Medium**
	Job creation and skills development and transfer	X	X	X	**Medium**	**Medium**
	Impacts relating to traffic	X	X	X	**Low**	**Very low**
	Impacts relating to improper waste management				**Medium**	**Very low**
	Impacts relating to decommissioning and closure	X	X	X	**Low**	**Very low**

1.4 Status of this Document

The development and implementation of environmental specifications is an on-going process that is iterative in nature. Thus, this EMP should be seen as a "living document" which will be amended as required, based on new information (e.g. environmental data), authority feedback, changes to or new policies, technologies and activities, or ECC renewal processes. In this regard, the EMP should be regularly reviewed and amended, as required, to ensure that the management and mitigation measures are relevant to the operation and effective in limiting negative impacts and enhancing positive impacts.

However, should a listed activity(s) as defined in the EIA Regulations 2012 be triggered (as a result of future modifications/changes at the mine), this EMP will be required to be updated through another EIA process, as stipulated in the EMA and the EIA Regulations 2012. Further to this, the EMP will need to be reviewed and amendment, where necessary, as part of any ECC renewal process (normally every three years).

1.5 Details of the EAP who prepared this EMP

SLR, the independent firm of consultants who compiled the Scoping Report for the proposed LMTP Project, has also compiled this EMP.

Table 1-2: Details of the EAPs

Team	Name	Designation	Tasks and roles
SLR Environmental Project Team	Stephanie Strauss	Project Technical Assistant	Report and process review, technical assistance
	Ndomupei Masawi	Project Manager	Management of the process, team members, and other stakeholders. Report compilation and process review.
	Sue Reuther	Project Director	Report review and approval (Quality Control and Assurance)
	Njabulo Mzilikazi	Project Technical Assistant	Report compilation and process review.
	Jeremy Blood	Project Technical Assistant	Report review and approval (Quality Control and Assurance)

2.0 Scope of the EMP

The scope of the LMTP Project to which this EMP relates is described in Section 4.0 of this document. The assessment of the environmental impacts of the project is documented in the Scoping Report, to which this document is attached. The components of the EMP are per the requirements of Section 8 of the EMA and are described in Table 2-1 below.

Table 2-1: Content of the EMP

EIA Regulation requirement	EMP Reference
Details of the persons who prepared the EMP and the expertise of those persons to prepare an environmental management plan.	Section 1.5
A description of the aspects of the activity that are covered by the EMP.	Section 4.0
Information on any proposed management or mitigation measures to address the environmental impacts that have been identified in a report contemplated by these regulations, including environmental impacts or objectives in respect of – • Planning and design • Construction activities • Operation or undertaking of the activity Closure, where relevant	Section 6.0
An identification of the persons to be responsible for the implementation of the mitigation measures.	Section 7.0
Proposed mechanisms for monitoring compliance with the EMP and reporting on it.	Section 9.0

3.0 Legal requirements

Section 4.2 of the Scoping Report provides a summary of the relevant legislation applicable to the LMTP Project.

The EIA Regulations 2012, promulgated in terms of EMA, identify certain activities which could have a substantially detrimental effect on the environment. These listed activities require an ECC clearance from MEFT (Department of Environmental Affairs) prior to commencing. The Project triggers such listed activities in terms of waste management, treatment, handling, and disposal activities as well as hazardous substance treatment, handling, and storage.

The following legislation has also been considered in the preparation of the Scoping Report and EMP documents:

- Namibian Constitution First Amendment Act (Act No. 34 of 1998);
- Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995);
- Water Act, 1956 (No. 54 of 1956);
- Water Resources Management Act, 2013 (No. 11 of 2013);
- Nature Conservation Ordinance (No. 4 of 1975) – Nature Conservation Amendment Act (Act No. 5 of 1996);
- Soil Conservation Act, 1969 (No. 76 of 1969);
- Hazardous Substances Ordinance 14 of 1974; and
- Atmospheric Pollution Prevention Ordinance 11 of 1976.

3.1 Environmental Clearance Certificate

As noted in Section 1.1, since the proposed Project involves a number of waste-related activities listed in terms of the EIA Regulations 2012, an ECC is required prior to these activities being undertaken.

If approved, an ECC will be issued for the proposed project and Halliburton will be held responsible for the implementation and management of the EMP. An ECC is valid for three years and may be renewed. Application for renewal must be lodged prior to the expiry date of the ECC.

3.1 Other permits

No other specific environmental permits are foreseen for the proposed LMTP.

4.0 Description of the proposed Project

This section provides a description of the proposed LMTP Project with respect to construction, operations, decommissioning, and closure phases.

4.1 Project overview

The Proposed LMTP will provide drilling and completion fluids to the operators currently exploring for oil and gas offshore southern Namibia. Drilling fluid is a complex mixture of fluids, solids and chemicals that are carefully tailored to provide the correct physical and chemical characteristics required to safely drill the well. The main functions of drilling fluid or drilling mud (terms used interchangeably) are to:

- Maintain a stable wellbore and preventing the open hole from collapsing;
- Provide sufficient hydrostatic pressure to control subsurface pressures and prevent kicks or blow-outs;
- Transport the cuttings to the surface;
- Cool and lubricate the drill bit and drill string (reduce friction);
- Power the mud motors / downhole tools during the drilling process;
- Regulate the chemical and physical characteristics of returned mud slurry on the drilling unit; and
- Displace cements during the cementing process.

The LMTP and associated components will occupy an area of approximately 2 000 m^2 and will be comprised of the following four components:

- A warehouse, where inputs required in the processes (fluid mixing, reconditioning and bulking operations) and resulting products will be stored.Photo 1 shows an example of a typical warehouse structure with storage areas.
- A liquid bulk area, which will be for mixing new drilling fluids (or drilling muds) and reconditioning used fluids (treatment of "waste"), where these fluids will be stored in horizontal tanks. The types of fluids housed include synthetic and water-based drilling fluids, brine completion and base fluids. An example of fluid mixing tanks typically used is shown in Photo 2. The liquid bulk area will consist of 38 horizontal stackable tanks and two mixing fluid tanks as summarised in Table 4-1.
- A dry bulk area, where the bulking of raw materials (chemicals), such as barite, bentonite, and calcium carbonate, will be undertaken. These raw materials will be stored in large bags and then emptied into vertical bulk storage silos from where they will be transferred into supply vessel storage tanks (see Photo 3) through hoses. The

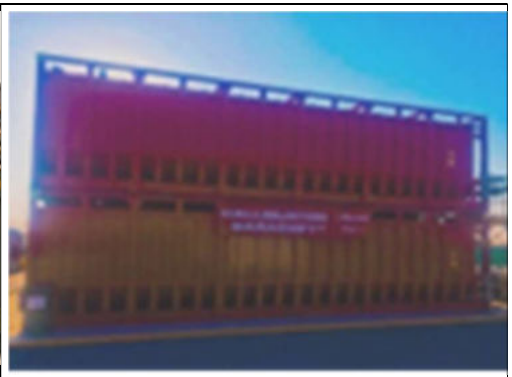
products are then transferred from supply vessel storage tanks to the drilling unit's bulk tanks for offshore mixing of drilling fluids. The dry bulk area will consist of 4 x Dry Bulk Silos with a combined capacity of approximately 12 600 ft^3 (approximately 357 m^3).

- A laboratory unit, where the fluids mixed at the LMTP and those received back from the drilling unit are analysed and quality controlled. The laboratory also provides engineering and support to operations offshore. The laboratory will be in a form of a dedicated lab container with a footprint of approximately 40 m².

Table 4-1: Tank Capacities at the liquid bulk area

Tanks	Capacity
Stackable tanks	
Synthetic Based Mud	18 x of approximately 70m^3 each
Brine	8 x tanks of 70m^3 each
Base oil	12 x tanks of 60 m^3 each
Total	**(38 tanks) 2 544m^3**
Mixing Tanks	
Synthetic base fluid	1 x 70m^3
Brine	1 x 70m^3

Technical drawings showing the layout plan of the proposed Project are provided in Appendix G of the Scoping Report.

		
Photo 1: Example of a warehouse (Source: Halliburton, 2024)	**Photo 2: Example of fluid mixing tanks (Source: Halliburton, 2024)**	**Photo 3: Example of horizontal storage tanks (Source: Halliburton, 2024)**

4.2 Construction Phase

It must be noted that no heavy construction will be required for the proposed LMTP as only a slab on the ground is required and the LMTP is a modular equipment and is mobile.

4.2.1 Construction Facilities

During construction, the following facilities will be required:

- Contractors site office and lay down areas, which will be located next to the LMTP office;
- Ablution facilities such as mobile chemical toilets near the work area;
- Handling and storage area for construction material and waste, near the work area; and
- Generators for temporary power supply, as required.

These facilities will be removed at the end of the four-month construction phase.

4.2.2 Construction Activities

The following activities are expected to take place during construction:

- Appoint contractors, labourers, etc.;
- Clearing of existing infrastructure;
- Foundation excavations and ground improvements;
- Setting up temporary contractors laydown areas;
- Delivery of materials – storage and handling of materials such as sand, rock, cement, chemical additives, etc;
- General building/construction activities including, amongst others: mixing of concrete; steel fixing, high-density polyethylene (HDPE) welding, operation of construction vehicles and machinery; refuelling of machinery; civil, mechanical, and electrical works; painting; grinding; welding; etc;
- Handling, storage, and disposal of non-hazardous and general waste:
    - Domestic waste;
    - Other construction waste; and
    - Packaging, e.g., plastic wrapping, Styrofoam.

4.2.3 Construction Workforce

All construction workers are expected to be based in Walvis Bay and no construction camp will be established on the site. However, the necessary hygiene and workplace facilities will be provided on site.

The construction phase of the project will be approximately 4 months and will result in limited employment opportunities. It is expected that Halliburton and its contractor(s) will favour employment of local people during the construction, particularly for unskilled and semi-skilled labour.

It is estimated that 6 – 10 unskilled and semi-skilled local persons will be employed for the duration of the construction activities.

4.2.4 Transport of Construction Materials

The components of the LMTP will be delivered and offloaded on site. Materials required for the construction phase will be brought to site via the existing road network that surrounds the proposed Project site.

4.2.5 Water and Power Supply

It is assumed that water required during the construction phase will be supplied through existing water supply infrastructure provided by NamWater and ultimately, Namport, to its tenants until a permanent water supply system is established. Approximately 100 m^3 of water will be required per day during the construction phase.

During the construction phase, diesel power generation will constitute the primary power source.

4.2.6 Waste Management

During construction, portable chemical toilets will be provided on site for staff. The portable toilets will be supplied by an appropriate contractor and will be serviced on a regular basis.

The types of waste that could be generated during construction include non-hazardous waste (e.g. builders' rubble) and domestic waste (such as plastic bags, tins, bottles, paper, and packaging waste will be generated during construction. These wastes will be temporarily handled and stored on site prior to removal for recycling and/or final disposal at permitted waste disposal facilities by WESCO.

4.3 Operational Phase

The Proposed LMTP will provide drilling and completion fluids to the operators currently exploring for oil and gas offshore southern Namibia. Drilling fluid is a complex mixture of fluids, solids and chemicals that are carefully tailored to provide the correct physical and chemical characteristics required to safely drill the well. The main functions of drilling fluid or drilling mud (terms used interchangeably) are to:

- Maintain a stable wellbore and preventing the open hole from collapsing;
- Provide sufficient hydrostatic pressure to control subsurface pressures and prevent kicks or blow-outs;
- Transport the cuttings to the surface;
- Cool and lubricate the drill bit and drill string (reduce friction);
- Power the mud motors / downhole tools during the drilling process;
- Regulate the chemical and physical characteristics of returned mud slurry on the drilling unit; and
- Displace cements during the cementing process.

The operational process at the LMTP is summarised in Figure 4-1.

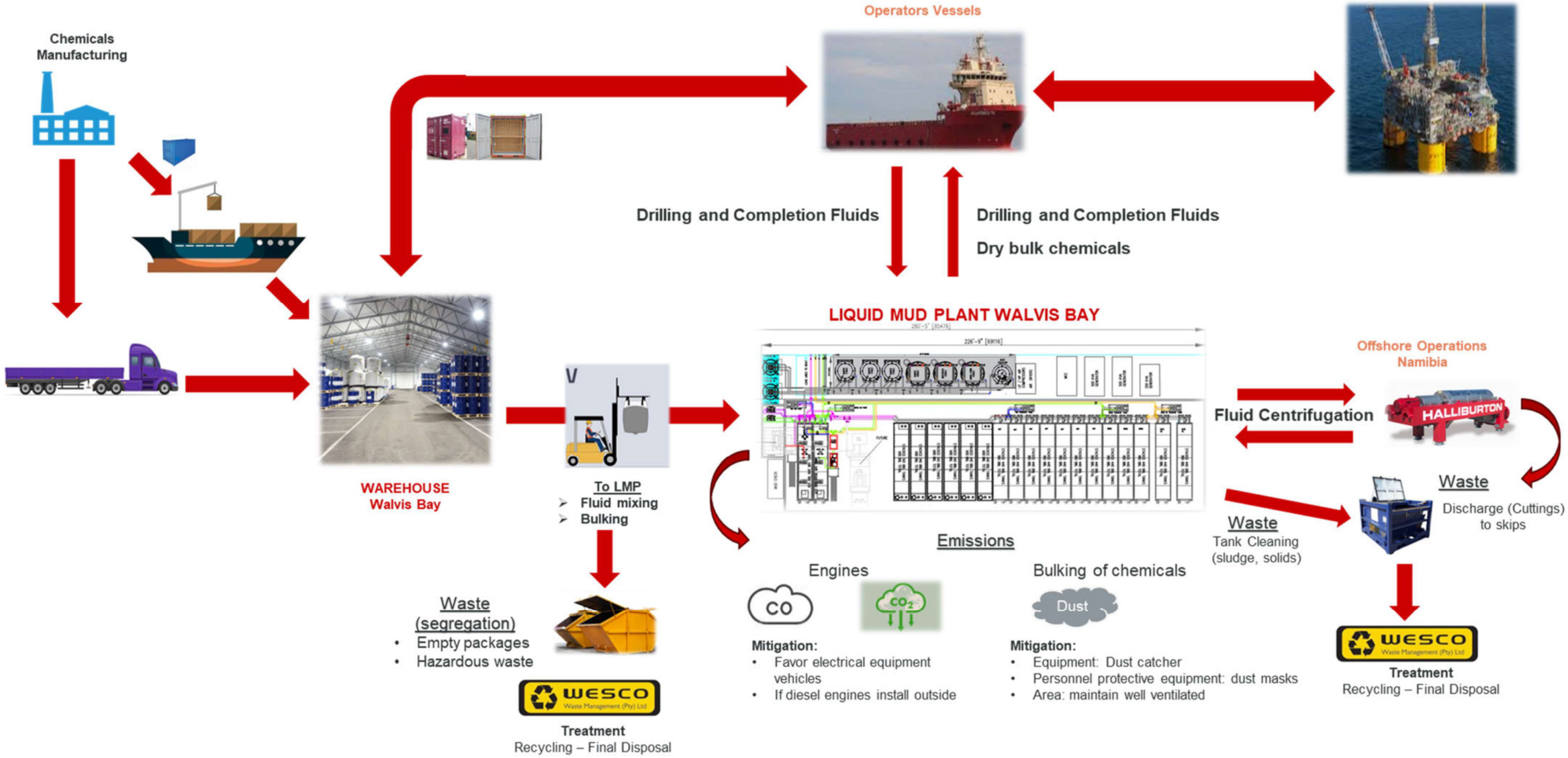


Figure 4-1: LMTP process flow diagram (Source: Halliburton, 2024)

4.3.1 Delivery of Raw Materials to the Warehouse

Chemicals to be used for mixing at the LMTP will be delivered and stored in the warehouse. The chemicals will be sourced locally or where not locally available, will be imported into Namibia. The chemicals required will include:

- Synthetic-Based Drilling Fluid (synthetic / water / salt / chemicals);
- Water-Based Drilling Fluid (water / salt / chemicals);
- Brine Completion Fluid (salt / water); and
- Base fluid: mineral oil.

Liquids will generally be supplied to the warehouse in 55-gallon (208-litre) drums or 1 000-litre intermediate bulk containers (IBCs). The drums / containers will be stored in a bunded storage area of the warehouse. The dry chemicals will be supplied either in large bags (1 – 1.5 Metric Ton) or palletized sacked material (25 kg sacks). All chemicals required will be transported from the warehouse to the LMTP, as required for fluid mixing and reconditioning, and the dry bulk plant for bulking operations.

Three different types of brines, sodium chloride, calcium chloride and bromide, are used in the manufacturing of the drilling muds at the LMTP. Sodium chloride will be sourced locally, close to Walvis Bay and the remaining brines which are not available locally, will be imported.

4.3.2 Fluid Mixing and Reconditioning

Fluid mixing and reconditioning will include:

- Fluid mixing: Base fluid (water, mineral oil) is transferred to the mixing tanks. The base fluids are circulated on a mixing line via the mixing hopper where chemicals are added either in sacked, drums or large bag units.
- Fluid Storage: Batches of the mixed fluid is then be transferred to the horizontal storage tanks for storage.
- Fluid Shipment: Fluids are then transferred to storage tanks on supply vessels via transfer pumps and hoses as required for offshore drilling operations.
- Fluid backload: Excess or used drilling fluids from offshore operations are sent back to shore and received at the LMTP where they are stored in onshore horizontal storage tanks.
- Fluid reconditioning: Depending on fluid conditions, chemical treatment (similar operation to mixing) and cleaning (using centrifuges) is performed to ensure the drilling fluid can be re-used and waste is reduced.

Different types of mud for different depths of drilling will be produced as follows:

- Riserless Drilling Phase or Top hole drilling: water-based solutions or brines (Calcium chloride, Barite, Sodium Chloride)
- Risered Drilling Phase or Bottom hole drilling: synthetic fluids, base oil, emulsifiers, lime, brine.

4.3.3 Dry Bulking Operations

In addition to the drilling fluids, dry chemicals are required for offshore operations. These raw materials required will be stored initially in large bags at warehouse. The bags are emptied into bulk storage silos via cutting hopper using pressurised vessels. Powder is then transferred (blown through a hose) from the LMTP bulk powder storage tanks on to supply

vessel storage tanks, from where it will be transferred to the drilling unit's bulk tanks for mixing offshore.

Bentonite is mixed for initial drilling, barite and calcium carbonate are added for density and bridging. During this process, all dust emissions are collected in industry approved dust collectors engineered to minimize personnel and environmental exposure to dust emissions.

4.3.4 Dispatch of Products from the Warehouse

All drilling fluids, bulk powders and other chemicals will be stored in the warehouse from where they will be dispatched to offshore operations by the supply vessels. The fluids, bulk powders and palletized chemicals to be used on offshore drilling operations will be stored initially at the LMTP and will include bulk fluids and palletized materials (i.e. offshore treatment chemicals for maintaining fluid stability).

Bulk fluids and powders the will be supplied from the LMTP storage tanks to supply vessels include barite, BARACARB (calcium carbonate), bentonite, BaraXcel (Synthetic Fluid), Base Fluid (Mineral Oil) and Brines. Estimated quantities of bulk fluids to be supplied from the LMTP are provided in Table 4-2.

Table 4-2: Bulk fluids and powders to be suppled from the LMTP

Bulk Product Volume / Quantities		
Product	**Unit**	**Quantity (Estimated)**
Barite	Metric Ton	140 MT
BARACARB (Calcium Carbonate)	Metric Ton	140 MT
Bentonite	Metric Ton	50 MT
BaraXcel (Synthetic Fluid)	m^3	1 500 m^3
Base Fluid (Mineral Oil)	m^3	800 m^3
Brines	m^3	1 000 m^3

Palletized material, including BARAZAN / BARAZAN D, Guar Gum, PAC-RE, STARCIDE, EZ-MUL NT, Lime, ADAPTA, Baravis IE 489, RHEMOD L, and TAU MOD, will also be produced at the plant. These chemicals will be containerized at the warehouse and dispatched to the drilling unit as deck cargo on the supply vessel. Table 4-3 provides a summary of the quantities of palletised materials that will be produced at the LMTP.

Table 4-3: Palletised materials produced at the LMTP

Palletized Material		
Product	**Unit**	**Quantity (Estimated)**
BARAZAN / BARAZAN D	25 kg sack	500
Guar Gum	25 kg sack	400
PAC-RE	25 kg sack	400
STARCIDE	25 kg sack	100
EZ-MUL NT	970 kg intermediate bulk containers (IBC)	80
Lime	25 kg sack	500
ADAPTA	25 kg sack	400
Baravis IE 489	25 kg sack	800
RHEMOD L	960 kg IBC	20

Palletized Material		
Product	**Unit**	**Quantity (Estimated)**
TAU MOD	50 lb sack	1 500

4.3.5 Water and Power Supply

It is estimated that the LMTP will require approximately 3.8 mega litres of water and 115 000 litres of diesel on a quarterly basis (every 3 months). Requirements at the LMTP are highly dependent on the activity levels and the types of fluids being produced for a particular customer (drilling contractor). These utility requirements will, therefore, fluctuate depending on the varying output from the LMTP.

Diesel and electricity usage will depend on access to the local grid or whether onsite generation through the two dedicated LMTP generators is required. It is currently estimated that 45 000 kilowatt hours (kWh) of electricity will be required quarterly (every 3 months).

4.3.6 Waste and Waste Management

The following waste sources are anticipated:

- Empty packaging: oil drums, aerosol cans, big bags, sacks, etc.
- Wash water from cleaning the tanks (sludge oily water); and
- Synthetic contaminated waste from the centrifugal reconditioning of Synthetic-Based Mud.

Halliburton will make use of an external service provider for waste management. The company will be responsible for the collection of waste (hazardous and general) and disposing of the waste at the appropriately registered waste disposal sites.

4.3.7 Operation Workforce

The standard workforce for the operation of the LMTP is estimated at 14 (skilled and unskilled). However, when the LMTP is operating at full capacity an additional 8 people will be required, resulting a total of 22 people. The following is required:

- Skilled employees
  - Plant Manager
  - Plant supervisor: trained to operate the equipment and have a technical knowledge of drilling fluids systems that will be produced in the facility.
  - Technician / Mechanic / Electrician: to provide preventative maintenance and repairs for the specialized equipment included in the plant.
  - Lab technicians
- Unskilled workers
  - Laborers who will be handling bulk hose, cutting sacks and general maintenance of the facility.

Experienced employees of Halliburton will be brought in initially to support the operations set up and train personnel.

4.4 Decommissioning and Closure

The conceptual plan at this stage is to remove surface infrastructure, and to restore the area to pre-construction state. At a conceptual level, decommissioning can be considered a reverse of the construction phase with the demolition and removal of the majority of surface infrastructure and activities similar to those described with respect to the construction phase.

The site will then open up to Namport and others for other potential uses.

4.5 Project Timelines

The project will be implemented in three phases as follows:

- Pre-construction phase (approximately 2 to 3 months), which included site selection, permitting and design. Halliburton is currently in this phase.
- Construction phase (approximately 4 months), subject to regulatory approvals.
- Operational phase (approximately 5 years per the Namport contract with Halliburton), after which the plant will be decommissioned.

5.0 Overall Environmental Objectives

For the proposed Project, Halliburton and its Contractors will also adhere to the existing EMP for the Port of Walvis Bay, overseen by Namport. Consequently, this EMP is aligned with Namport's current EMP and Environmental Management System (EMS). This alignment provides a sturdy framework for the execution of the EMP and, crucially, ensures that the environmental management function is consistently evaluated with an aim for ongoing improvement.

All related procedures and work instructions must be developed with an awareness of the pertinent commitments in this EMP, as well as Namport's EMP.

The following environmental objectives have been set for the proposed LMTP Project:

- Ensure adherence to this EMP, the existing Namport EMP, and other relevant ECC conditions or approvals (other relevant permits), as well as all national laws and standards for environmental protection.
- Comply with corporate sustainable development policies and objectives.
- Keep key stakeholders updated on the project's activities, where applicable.
- Encourage continuous environmental awareness.
- Enforce responsibility by applying the precautionary principle throughout – by supporting and training all employees and service providers to ensure that all employees and contractors comply with the relevant management commitments.
- Integrate the relevant requirements outlined in this EMP into the designs, contracts, work instructions, procedures, and other relevant documents.
- Prohibit unauthorised access.
- During construction:
    - formal induction is required before any person is allowed to enter the construction site; and
    - warning signs will be put up to alert third parties of potential hazards.
- Manage the movements of workers and establish rules for behaviour, without violating their rights, with a particular focus on preventing violations and enforcing consequences for violators.
- Prevent pollution through basic infrastructure design and equipment maintenance.
- Take appropriate measures to clean up in the event of incidents.
- Ensure the legal and appropriate management and disposal of general and hazardous waste, through the execution of a strategy for minimising, sorting, recycling (where possible), managing, temporarily storing, and removing waste.
- Develop, implement, and manage monitoring systems as needed to ensure good environmental performance and reporting.
- In the event of incidents, the Site Manager should be notified, and the necessary action taken (including reporting incidents to Namport and the relevant authorities e.g. MEFT).

6.0 Environmental Specifications

This section contains the environmental specification and commitments that Halliburton will adhere to. The EMP has been categorised according to the Project Controls (i.e. those measures that are built into the design or operation of a Project, which serves to mitigate potential consequences on the environment) and an environmental and social mitigation management commitment register (i.e. those mitigation measures (construction, operations, and decommissioning / closure) identified as part of the EIA process).

6.1 Project Controls

Project Controls are the physical or procedural measures that are built into the design or operation of a Project and required by law or standard for good international industry practice and which serves to mitigate potential consequences on the environment (e.g., spill prevention measures and installation of dust collectors). These measures are typically incorporated into the project description and should not be considered additional mitigation measures in the evaluation of post-mitigation impact significance.

6.1.1 Spill Prevention Measures

Halliburton has global standards with regards to LMTP operations including spill prevention and control that will be implemented at the Walvis Bay LMTP site during operation. These include:

- All installed tanks will be leak tested prior to use.
- All storage areas containing liquids shall conform with the global industry standard of bunding.
- All bunding will have the capacity to hold as a minimum, 110% of the largest storage vessel capacity.

Although Halliburton is not permitted to build permanent bunding structures on the quayside, moveable concrete bunding slabs (Photo 4) will be install around each liquid storage area covered by impermeable leak proof membranes.

Photo 4: Moveable concrete bunding slabs

Daily inspections will be conducted to identify any damage potentially reducing efficiency and spill kits and personnel trained to use them efficiently and safely will be present to clear up any spillage. Spill kits will include absorbent pads, squeegees, brushes and shovels. The operations at the LMTP do not, however, constitute a high risk of spills and no tanks will be filled before the plant is completed together with bund wall, which by itself represent effective spill prevention measure.

Drilling fluids and bulk powders will be transferred from the bulk storage areas to the offshore supply vessels via bulk transfer hoses. Bulk transfer hose management will comply with global industry standards, namely:

- All hoses will be certified thorough visual inspection and pressure testing on a yearly basis and this certification will be documented and/or held within a site hose certification tracker.
- All hoses will be visually reinspected prior to every transfer in order to check for signs of wall damage of wear.
- All transfers will be preceded by hose pressure test between the LMTP and supply vessel to 50 PSI for 5 minutes prior to any transfer commencing.
- In the event of minor fluid leak within the bunded area, spill kits will be present to safely clear up any spillage.

6.1.2 Air Quality Impact Controls

In terms of emission sources, the following are anticipated:

- Exhaust fumes from diesel generators, compressors, and transfer pumps. All diesel driven units will conform to global industry standards in relation to diesel fume emissions.
- Dust from bulking of barite and bentonite powders, which will be controlled through the presence of dust collector vessels installed within the bulk powder system.
- Minor fumes while mixing sacks and fluids. Minor dust/fume emissions will be minimised through the venturing mixing systems. All personnel within the vicinity are required to wear FFP-3 masks as a minimum.

6.1.3 Waste Management

Halliburton will make use of an external service provider for waste management. The service provider will be responsible for the collection of waste (hazardous and general) and disposal of the waste at the appropriately registered waste disposal sites.

Waste related complaints and any actions arising from a complaint must be recorded in the complaints register maintained by site management. The investigation of complaints and the outcomes thereof must be recorded for reporting at the relevant authority's request. Halliburton's waste management protocol summarised in Figure 6-1 shall be followed during the implementation of the project.

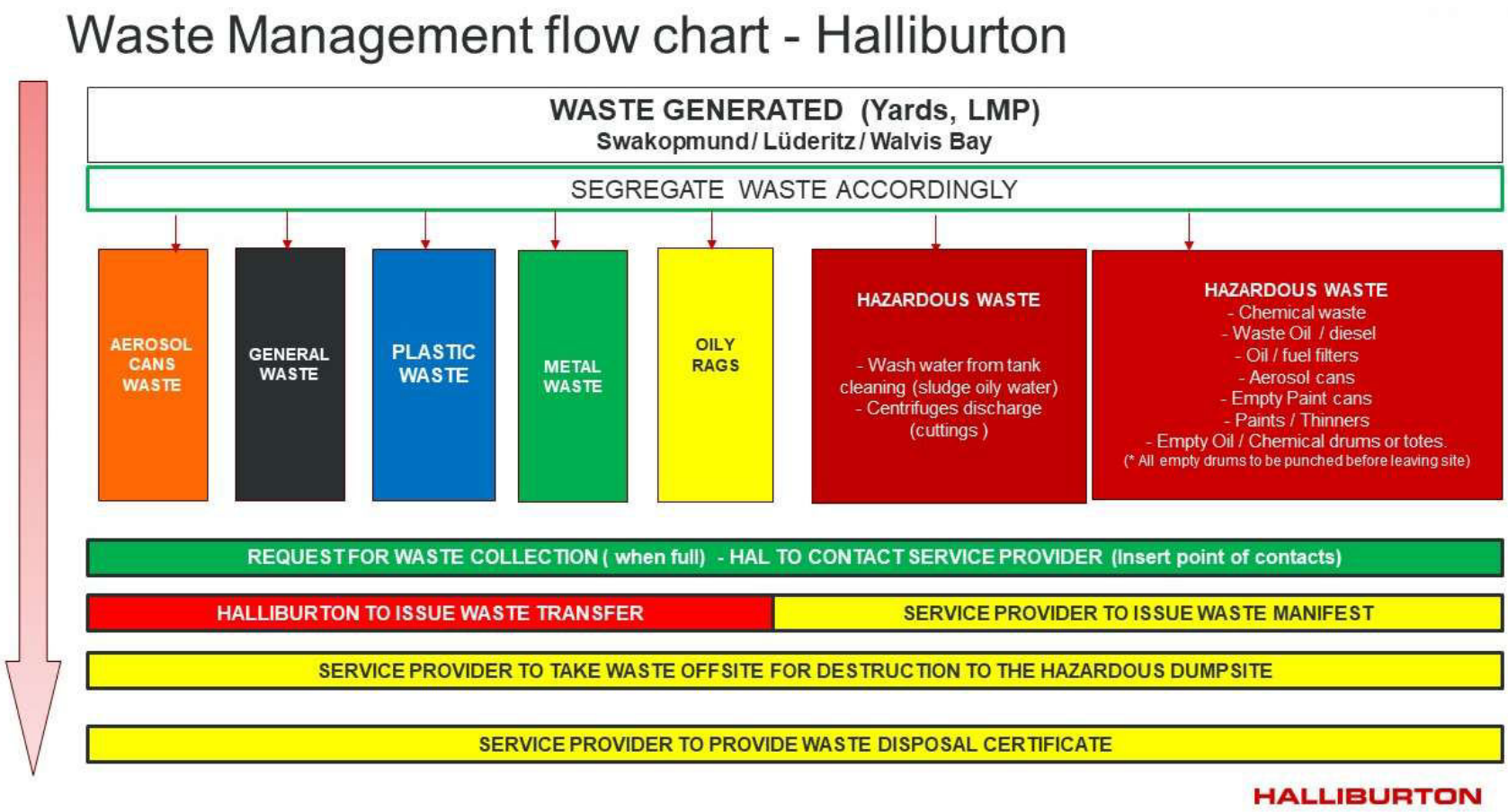


Figure 6-1: Waste Management Protocol at the LMTP

6.2 Environmental and Social Mitigation Management Commitment Register

Table 6-1 details the commitments that Halliburton must implement as part of the LMTP Project. The description of impacts corresponds to those assessed in the Scoping Report.

Table 6-1: Environmental and Social Mitigation Management Commitment Register

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
1. CONSTRUCTION PHASE					
Marine ecology	1.1. Coastal and underwater noise and vibrations levels impacting marine communities	• Vehicle movement • General construction activities • Drilling • Placement of temporary infrastructure • Presence and interactions of construction personnel	Avoid accidental spills and disturbances affecting marine biology.	• Mixing of concrete in contained areas only; • Regularly clean up concrete spilled during construction; • No dumping of excess concrete or mortar into the sea; • Place drip trays under all vehicles parked on the site; • Maintain vehicles and equipment to ensure that no oils, diesel, fuel or hydraulic fluids are spilled; • Vehicle maintenance and refuelling must occur under controlled conditions only; • Bund all fuel storage areas; • Place a spill kit (peatsorb/ drip trays) onboard all in the event of a spill; • Clean up accidental diesel and hydrocarbon spills accordingly;	• Construction Supervisor • Contractors
	1.2. Contamination of marine waters	• Uncontained runoff water from cement mixing • Contaminated stormwater runoff • Fuel and lubricant leaks from vehicles and plant • Accidental spills during storage and handling of materials and chemicals • Inappropriate waste management resulting in marine litter		• Provide and manage appropriate, wind proof waste disposal facilities; • Implement an oil spill contingency plan for accidental oil spills (see Section 6.3); • Ensure regular collection and removal of refuse and litter from the construction site; • Ensure appropriate stormwater management measures are in place to divert and collect dirty water from within the construction and demolition areas. • Ensure that the contracted waste management company is accredited by law to handle all construction wastes.	• Site Manager
	1.3. Increased turbidity	• Stormwater runoff of dirty water • Uncontained runoff water from spills during storage and handling of materials and chemicals.		• Keep vehicle traffic associated with the development to a minimum and restrict to clearly demarcated access routes and parking areas only.	• Construction Supervisor • Contractors
Noise	1.4. Increase in noise levels disturbing sensitive receptors	• Vehicle movement • General construction activities • Drilling • Placement of temporary infrastructure • Presence and interactions of construction personnel	Limit noise nuisance and disturbance to third parties.	General measures:	
				• Undertake observational monitoring and noise checks of the identified noise source, to assess the effectiveness of control measures following a noise-related community complaint/ grievance,	• ECO
				• Engage communities around upcoming potential noisy activities associated with future works to inform them of control measures to minimise adverse impacts.	• Site Manager
				Use of machinery / equipment:	
				• Keep vehicles, equipment and machinery on site in optimum working condition. This includes compressed air and hydraulic systems. A preventative maintenance program involving regular inspections must be developed and implemented.	• Construction Supervisor • Contractors

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
				• Consider the use of broadband "buzzer", not tonal "beeper", reversing alarms on all new plant equipment.	• Construction Supervisor • Contractors
				• Operate equipment within specification and capacity, i.e., ensure machines are not overloaded.	• Construction Supervisor • Contractors
				• Use equipment as intended. The operators should be trained and certified by external or internal programs to qualify.	• Construction Supervisor • Contractors
				• Fit engine exhausts with appropriate quality silencers. Silencers as supplied by original equipment manufacturers (OEMs) are generally deemed acceptable. Consider retrofitting existing equipment / plant with additional acoustic measures (e.g., silencers on exhausts).	• Construction Supervisor • Contractors
				• Keep engine or radiator maintenance access panels closed during operation.	• Construction Supervisor • Contractors
				• Limit noise to a minimum when night-time work is required, particularly those involving power tools or highly impulsive noise-generating activities such as hammering.	• Construction Supervisor • Contractors
				• Locate noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area/s as possible.	• Construction Supervisor • Contractors
				• Orient equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise, preferably using site obstacles to enable shielding of the source/s.	• Construction Supervisor • Contractors
				• Turn off any equipment idling or not in use.	• Construction Supervisor • Contractors
				• Withdraw equipment from service immediately for maintenance if a change in noise emission characteristics is noticeable.	• Construction Supervisor • Contractors
				• Shutdown equipment when not in use.	• Construction Supervisor • Contractors
				Site power:	
				• Use temporary screens or mobile acoustic shelters to screen generators and other noisy equipment where existing structures do not provide any benefit. Screens should be free from gaps and provide a combined surface density of at least 15 kg/m2.	• Construction Supervisor • Contractors
				• Select equipment/ plant with lower sound power levels where possible during planning and maintenance upgrades.	• Site Manager
				• Install silencers for fans where possible or for new fans install lower sound power. This is achieved by design of system including airflow velocities, fan and blade types, and equipment selected appropriately for system duty.	• Construction Supervisor • Contractors

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
				• Install suitable mufflers at points where compressed air is intentionally discharged.	• Construction Supervisor • Contractors
				• Improve the acoustic performance of constructed buildings, apply sound insulation, where possible.	• Construction Supervisor • Contractors
				Transportation of material	
				• Enforce strict speed limits for vehicles travelling along haulage roads.	• Site Manager
				• Materials to be handled in a manner that minimises noise, e.g., minimisation of drop heights, and no unnecessary revving of engines.	• Construction Supervisor • Contractors
Air quality	1.5. Increase in ambient air concentrations of pollutants affecting sensitive receptors	• General construction activities • Storage and handling of new and used materials and chemicals (including cement) • Use of vehicles and equipment that emit exhaust fumes	Reduce the risk and impacts of chemical releases.	General:	
				• Maintain appropriate operational controls and adhere to repair and maintenance requirements for all equipment (including vehicles and emission abatement).	• Construction Supervisor • Contractors
				• Conduct training of the workforce at all levels (i.e. workers, foremen, managers) in awareness of air emissions. This can be included in site induction courses and should focus on promoting understanding as to why operational controls are in place and should be adhered to.	• ECO; • Construction Supervisor
				• Record complaints and any actions arising from a complaint in the complaints register maintained by site management. The investigation of complaints and the outcomes thereof must be recorded for reporting at the relevant authority's (MEFT) request.	• Site Manager
				• Develop and implement standard operating procedures, accident prevention policies and emergency response plans to prevent and efficiently manage emergency situations that could result in emission incidents (e.g. product spills, fires, ventilation/abatement equipment failure, etc.).	• Site Manager
				Fugitive dust:	
				• Maintain general housekeeping, including the regular maintenance and sweeping of roads, machinery, and their surrounding areas to remove deposited dust and minimise the load available for entrainment during high wind speed events.	• Construction Supervisor • Contractors
Visual	1.6. Alteration of the visual environment affecting sense of place	• Large construction vehicles, equipment and construction material stockpiles will expose visual receptors to impacts associated with construction. • Construction activities may be perceived as an unwelcome visual intrusion. • Dust generation from surface disturbance during construction may result in visual pollution.	Limit the visual disturbance on receptors.	• Carefully plan to minimise the construction period and avoid construction delays.	• Site Manager
				• Maintain a neat construction site by removing rubble and waste materials regularly (good housekeeping).	• Construction Supervisor
				• Position storage/stockpile areas in unobtrusive positions on the site, where possible.	• Construction Supervisor
				• Limit the number of vehicles and trucks travelling to and from the construction site, where possible.	• Construction Supervisor

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
		• Litter on the construction site may result in visual pollution		• Ensure that dust suppression techniques are implemented.	• Construction Supervisor
				• Ensure that visual management measures are monitored by an ECO. This will include monitoring activities associated with visual impacts such as the siting and management of storage/stockpiles of construction materials and management of waste materials/rubble.	• ECO
Socio-economic	1.7. Contribution to the national, regional, and local economy	• General construction activities • Supply chain of goods and services	Enhance positive benefits of the Project's contribution to the economy.	• Halliburton will make use of locals as much as possible, particularly where unskilled labour is required. • Halliburton must develop and implement a skills development and transfer plan that will be implemented during the project, • Where possible, Halliburton will enforce a requirement for contractors to commit to a recruitment process that includes preference to local recruitment. • The use of local businesses is recommended, especially in occasions where they can provide what is needed for the project.	• Site Manager • Contractors
	1.8. Job creation and skills development and transfer	• General construction activities • Supply chain of goods and services	Promote the creation of skilled labour and knowledge transfer.		
Waste	1.9. Improper waste management	• General construction activities • Cement mixing • Management of dirty water • Storage and handling of new and used materials and chemicals (including hydrocarbons) • Waste management (hazardous and non-hazardous) • Equipment servicing • Use of vehicles and equipment that may leak lubricants and fuel	Manage all classes of waste appropriately	Separation of waste:	
				• Separate all waste into general waste and hazardous waste.	• Contractors
				• Do not mix hazardous waste with general waste	• Contractors
				• Sperate general waste further into waste that can be recycled and/or reused, if possible	• Contractors
				• No littering shall be allowed in and around the site, and enough bins shall be provided for the disposal of waste	• Contractors
				• Dedicate a storage area on site for collection of waste.	• Site Manager
				Storage and disposal of general and non-hazardous waste:	
				• Collect general waste in an adequate number of litter bins located throughout the site.	• Contractors
				• Bins must have lids in order to keep rainwater out.	• Site Manager; and • Contractors
				• Empty bins regularly to prevent the bins from overflowing.	• Contractors
				• Keep all work areas clean and tidy.	• Contractors
				• Maintain all waste management facilities in good working order.	• Contractors
				• Store waste in demarcated areas according to the type of waste.	• Contractors
				• Keep flammable substances away from sources of ignition and from oxidizing agents.	• Contractors
				• No builder's rubble shall be disposed of in the marine environment.	• Contractors
				• Stockpile builders' rubble outside the sensitive wetland areas if it is not removed immediately.	• Contractors
				• Re-use, recycle, or dispose of (last resort) demolition waste and surplus concrete responsibly.	• Contractors
				• Do not bury or burn waste on site.	• Contractors
				Storage and disposal of hazardous waste:	
				• No dumping of hazardous waste shall be allowed in or near the site.	• Waste management contractor

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
				• Reuse, recycle, or dispose of (last resort) hazardous containers at an appropriate licensed site.	• Waste management contractor
				• Remove and manage hazardous waste using an approved service provider.	• Waste management contractor
				• A safe disposal certificate will be provided by the approved service provider as proof of responsible disposal of hazardous waste.	• Waste management contractor
				• The safe disposal certificates shall be stored and provided on request.	• Site Manager
Traffic	1.10. Increase in traffic and congestion	• General construction activities • Delivery of construction materials • Use of vehicles and machinery to transport construction materials between construction areas	Limit disturbance to traffic/road safety within the port and access roads	• Restrict vehicle traffic to demarcated access routes and parking areas.	• Construction Supervisor; and • Contractors
				• No vehicles may be allowed to obstruct any traffic or access points to other businesses and facilities on the routes through Walvis Bay.	• Construction Supervisor; and • Contractors
				• Undertake transportation of any hazardous cargo in compliance with Namport's operating procedures for Handling and Storage of Dangerous Cargo.	• Waste management contractor
				• Undertake maintenance on all the vehicles on a regular basis.	• Construction Supervisor; and • Contractors
				• Make use of the rail system, where possible, to alleviate loads on the roads.	• Site manager
				• Ensure drivers have regular training;	• Construction Supervisor; and • Contractors
				• Inspect vehicles for compliance with applicable road safety requirements and ensure compliance.	• Construction Supervisor; and • Contractors
				• Conduct regular driver alcohol/drug tests regularly.	• Site manager
				• Ensure that speed limits and any other applicable rules of the roads used for the LMTP are strictly followed.	• Construction Supervisor; and • ECO
2. OPERATION PHASE					
Marine ecology	2.1. Coastal and underwater noise and vibrations levels impacting marine communities	• Vehicle movement • Operation of LMTP equipment (e.g. mixing tanks)	Avoid accidental spills and disturbances affecting marine biology.	• Install drip trays under all vehicles parked on the site;	• Contractors
	2.2. Contamination of marine waters	• Uncontained runoff water from cement mixing • Contaminated stormwater runoff		• Maintain vehicles and equipment to ensure that no oils, diesel, fuel or hydraulic fluids are spilled;	• Contractors
				• Vehicle maintenance and refuelling must occur under controlled conditions only;	• Contractors

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
		• Fuel and lubricant leaks from vehicles and plant • Accidental spills during storage and handling of materials and chemicals • Accidental loss of liquid, powder and palleted products during transfer to/from vessels • Accidental loss of liquid and powder product due to overflow/rupture of storage tanks and silos • Inappropriate waste management resulting in marine litter		• Bund all fuel storage areas;	• Contractors
				• Implement an oil spill contingency plan for accidental oil spills (see Section 6.3);	• Site Manager
				• Place a spill kit (peatsorb/ drip trays) onboard all in the event of a spill;	• Contractors
				• Clean up accidental diesel and hydrocarbon spills accordingly;	• Contractors
				• Provide and manage appropriate, wind proof waste disposal facilities;	• Site Manager
				• Ensure regular collection and removal of refuse and litter from the construction site;	• Site Manager
				• Ensure that the contracted waste management company is accredited by law to handle all wastes from the LMTP;	• Site Manager
	2.3. Smothering of macrofauna by barite and bentonite	• Accidental loss of liquid, powder and palleted products during transfer to/from vessels. • Accidental loss of liquid and powder product due to overflow/rupture of storage tanks and silos		• Ensure appropriate stormwater management measures are in place to divert and collect dirty water from within the construction and demolition areas.	• Site Manager
	2.4. Accidental biochemical impacts of spilt drilling muds on benthic communities			• Ensure that all project controls are strictly complied with. In addition, install laser volume indicators on tanks and maximum fill level alarms to accurately track fluid volumes on all tanks and silos; and	• Site Manager
	2.5. Increased turbidity	• Stormwater runoff of dirty water • Uncontained runoff water from spills during storage and handling of materials and chemicals • Uncontrolled loss of liquid, powder and paletted products during transfer to/from vessels • Uncontrolled loss of liquid and powder product due to overflow/rupture of storage tanks and silos			
	2.6. Indirect biochemical effects in the sediments	• Accidental loss of liquid, powder and paletted products during transfer to/from vessels • Accidental loss of liquid and powder product due to overflow/rupture of storage tanks and silos		• Ensure an emergency preparedness and response plan (see Section 6.3) is in place for potential product loss.	• Site Manager

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
Noise	2.7. Increase in noise levels disturbing sensitive receptors	• Vehicle movement • Operation of LMTP equipment (e.g. mixing tanks)	Avoid unnecessary increase ambient noise levels and nuisance in and around the proposed Project area	General measures: • Undertake observational monitoring and noise checks of the identified noise source, to assess the effectiveness of control measures following a noise-related community complaint/ grievance, • Engage communities around upcoming potential noisy activities associated with future works to inform them of control measures to minimise adverse impacts.	• Site Manager
				Use of machinery / equipment:	
				• Keep vehicles, equipment and machinery on site in optimum working condition. This includes compressed air and hydraulic systems. A preventative maintenance program involving regular inspections must be developed and implemented.	• Contractors
				• Consider the use of broadband "buzzer", not tonal "beeper", reversing alarms on all new plant equipment	• Contractors
				• Operate equipment within specification and capacity, i.e., ensure machines are not overloaded	• Contractors
				• Use equipment as intended. The operators should be trained and certified by external or internal programs to qualify.	• Contractors
				• Fit engine exhausts with appropriate quality silencers. Silencers as supplied by original equipment manufacturers (OEMs) are generally deemed acceptable. Consider retrofitting existing equipment / plant with additional acoustic measures (e.g., silencers on exhausts).	• Contractors
				• Keep engine or radiator maintenance access panels closed during operation.	• Contractors
				• Limit noise to a minimum when night-time work is required, particularly those involving power tools or highly impulsive noise-generating activities such as hammering.	• Contractors
				• Locate noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area/s as possible.	• Contractors
				• Orient equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise, preferably using site obstacles to enable shielding of the source/s.	• Contractors
				• Turn off any equipment idling or not in use.	• Contractors
				• Withdraw equipment from service immediately for maintenance if a change in noise emission characteristics is noticeable.	• Contractors
				• Shutdown equipment when not in use.	• Contractors
				Site power	
				• Use temporary screens or mobile acoustic shelters to screen generators and other noisy equipment where existing structures do not provide any benefit. Screens should be free from gaps and provide a combined surface density of at least 15 kg/m^2.	• Contractors

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
				• Select equipment/ plant with lower sound power levels where possible during planning and maintenance upgrades.	• Site Manager
				• Install silencers for fans where possible or for new fans install lower sound power. This is achieved by design of system including airflow velocities, fan and blade types, and equipment selected appropriately for system duty.	• Contractors
				• Install suitable mufflers at points where compressed air is intentionally discharged.	• Contractors
				• Improve the acoustic performance of constructed buildings, apply sound insulation, where possible.	• Contractors
				Transportation of material	
				• Enforce strict speed limits for vehicles travelling along haulage roads	• Site Manager
				• Materials to be handled in a manner that minimises noise, e.g., minimisation of drop heights, and no unnecessary revving of engines.	• Contractors
Air quality	2.8. Increase in ambient air concentrations of pollutants affecting sensitive receptors	• Movement of vehicles to and from site (dust) • Storage and handling of materials and chemicals (including hydrocarbons and chemicals required for the process) • Exhaust fumes from diesel generators, diesel Compressors and Diesel transfer pumps • Use of vehicles and equipment that emit exhaust fumes • Dust/fume Emissions while mixing/reconditioning fluids • Dust emissions from the process of bulking powders (Barite / Bentonite)	Limit unacceptable increase in ambient air concentrations of pollutants that could affect sensitive receptors	General:	
				• Maintain appropriate operational controls and adhere to repair and maintenance requirements for all equipment (including vehicles and emission abatement).	• Site Manager; and • Contractors
				• Record complaints and any actions arising from a complaint in the complaints register maintained by site management. The investigation of complaints and the outcomes thereof must be recorded for reporting at the relevant authority's request.	• Site Manager
				• Develop and implement standard operating procedures, accident prevention policies and emergency response plans to prevent and efficiently manage emergency situations that could result in emission incidents (e.g. product spills, fires, ventilation/abatement equipment failure, etc.).	• Site Manager; and • Contractors
				Fugitive dust:	
				• General housekeeping, including the regular maintenance and sweeping of roads, machinery, and their surrounding areas to remove deposited dust and minimise the load available for entrainment during high wind speed events.	• Site Manager; and • Contractors
				• Ensure the ventilation and dust collector/filtering system installed at the dry bulk warehouse is suitably designed with adequate control efficiency.	• Site Manager
				• Keep warehouse doors and windows closed as far as practicable.	• Contractors
				Storage tanks:	
				• Maintain appropriate operational controls (e.g. appropriate temperature and pressure settings for storage vessels and loading operations).	• Site Manager

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
				• Develop risk-based inspection schedules requiring regular equipment inspections for visible/audible/odorous leaks.	• Site Manager; and • Contractors
				• Develop a proactive maintenance plan requiring regular checks and periodic replacement of components including pump seals, compressor seals, pipeline valves, open-ended valves, flanges, and other connections (as applicable). At a minimum, this must align with manufacturer specifications.	• Site Manager; and • Contractors
				• Ensure tanks storing volatile substances are suitably coloured (i.e. 70% reflectivity for thermal or light radiation) or are fitted with a solar shield.	• Site Manager
				• Fit tanks storing base oils and NADF with pressure vacuum relief valves set at the highest possible value consistent with the tank design.	• Site Manager
				• Maintain meticulous record keeping of all inputs, throughputs, and production rates, including loading and dispatch quantities for each tank to allow for an accurate accounting of evaporative losses should this be required for future impact assessment.	• Site Manager
Visual	2.9. Alteration of the visual environment affecting sense of place	• Storage tanks • Large machinery and equipment • Lighting • Litter on the site may result in visual pollution	Limit the extent of visual disturbance	• Paint buildings on the site with natural tones that fit with the surrounding environment.	• Site Manager
				• Use non-reflective surfaces where possible.	• Site Manager
				• Ensure that visual management measures are monitored by an internal Environmental Specialist. This will include monitoring activities associated with visual impacts.	• Site Manager
				• Ensure proper waste management practises are implemented on site and ensure a neat and tidy site	• Contractors; and • Site Manager
Socio-economic	2.10. Contribution to the national, regional, and local economy 2.11. Job creation and skills development and transfer	• Supply chain of goods and services including waste management • Operating the LMTP • Maintenance of LMTP	Enhance positive benefits of the Project's contribution to the economy. Promote the creation of skilled labour and knowledge transfer.	• Halliburton will make use of locals as much as possible, particularly where unskilled labour is required. • Halliburton must develop and implement a skills development and transfer plan that will be implemented during the project, • Where possible, Halliburton will enforce a requirement for contractors to commit to a recruitment process that includes preference to local recruitment. • The use of local businesses is recommended, especially in occasions where they can provide what is needed for the project.	• Site Manager
Waste	2.12. Improper waste management	• Storage and handling of materials and chemicals (including hydrocarbons and chemicals required for the process) • Management of dirty water/effluent • Waste management (hazardous and non-hazardous) • Use of vehicles and equipment that may leak lubricants and fuel	Manage all classes of waste appropriately	Separation of waste:	
				• Separate all waste into general waste and hazardous waste.	• Contractors
				• Do not mix hazardous waste with general waste	• Contractors
				• Sperate general waste further into waste that can be recycled and/or reused, if possible	• Contractors
				• No littering shall be allowed in and around the site, and enough bins shall be provided for the disposal of waste	• Contractors
				• Dedicate a storage area on site for collection of waste.	• Site Manager
				Storage and disposal of general and non-hazardous waste:	

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
		• Storage of products in the storage tanks that may overflow		• Collect general waste in an adequate number of litter bins located throughout the site.	• Contractors
				• Bins must have lids in order to keep rainwater out.	• Site Manager; and • Contractors
				• Empty bins regularly to prevent the bins from overflowing.	• Contractors
				• Keep all work areas clean and tidy.	• Contractors
				• Maintain all waste management facilities in good working order.	• Contractors
				• Store waste in demarcated areas according to the type of waste.	• Contractors
				• Keep flammable substances away from sources of ignition and from oxidizing agents.	• Contractors
				• No builder's rubble shall be disposed of in the marine environment.	• Contractors
				• Stockpile builders' rubble outside the sensitive wetland areas if it is not removed immediately.	• Contractors
				• Re-use, recycle, or dispose of (last resort) demolition waste and surplus concrete responsibly.	• Contractors
				• Do not bury or burn waste on site.	• Contractors
				Storage and disposal of hazardous waste:	
				• No dumping of hazardous waste shall be allowed in or near the site.	• Waste management contractor
				• Reuse, recycle, or dispose of (last resort) hazardous containers at an appropriate licensed site.	• Waste management contractor
				• Remove and manage hazardous waste using an approved service provider.	• Waste management contractor
				• A safe disposal certificate will be provided by the approved service provider as proof of responsible disposal of hazardous waste.	• Waste management contractor
				• The safe disposal certificates shall be stored and provided on request.	• Site Manager
Traffic	2.13. Increase in traffic and congestion	• Movement of vehicles to and from site • Loading and offloading raw materials for operations	Limit disturbance to traffic/road safety within the port and access roads	• Restrict vehicle traffic to demarcated access routes and parking areas.	• Construction Supervisor; and • Contractors
				• No vehicles may be allowed to obstruct any traffic or access points to other businesses and facilities on the routes through Walvis Bay.	• Construction Supervisor; and • Contractors
				• Undertake transportation of any hazardous cargo in compliance with Namport's operating procedures for Handling and Storage of Dangerous Cargo.	• Waste management contractor
				• Undertake maintenance on all the vehicles on a regular basis.	• Construction Supervisor; and

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
					• Contractors
				• Make use of the rail system, where possible, to alleviate loads on the roads.	• Site manager
				• Ensure drivers have regular training;	• Construction Supervisor; and • Contractors
				• Inspect vehicles for compliance with applicable road safety requirements and ensure compliance.	• Construction Supervisor; and • Contractors
				• Conduct regular driver alcohol/drug tests regularly.	• Site manager
				• Ensure that speed limits and any other applicable rules of the roads used for the LMTP are strictly followed.	• Construction Supervisor; and • Contractors
3. DECOMMISSIONING AND CLOSURE					
Marine ecology	3.1. Coastal and underwater noise and vibrations levels impacting marine communities	• Vehicle movement • Stripping of buildings and equipment	Prevent and manage accidental spills to avoid contamination of marine biology	• Install drip trays under all vehicles parked on the site; • Maintain vehicles and equipment to ensure that no oils, diesel, fuel or hydraulic fluids are spilled; • Vehicle maintenance and refuelling must occur under controlled conditions only; • Implement an oil spill contingency plan for accidental oil spills (see Section 6.3); • Place a spill kit (peatsorb/ drip trays) onboard all in the event of a spill; • Clean up accidental diesel and hydrocarbon spills accordingly; • Provide and manage appropriate, wind proof waste disposal facilities;	• Construction Supervisor; and • Contractors
	3.2. Contamination of marine waters	• Contaminated stormwater runoff • Fuel and lubricant leaks from vehicles and plant • Accidental spills during storage and handling of materials and chemicals • Inappropriate waste management resulting in marine litter			
	3.3. Increased turbidity	• Stormwater runoff of dirty water • Uncontained runoff water from spills during storage and handling of materials and chemicals.		• Ensure appropriate stormwater management measures are in place to divert and collect dirty water from within the active decommissioning area; • Ensure that the contracted waste management company is accredited by law to handle all wastes from the LMTP and associated infrastructure to be decommissioned; • Ensure that all project controls are strictly complied with; and • Have an emergency preparedness and response plan (see Section 6.3) in place for all phases of the development	• Site Manager
Noise	3.4. Increase in noise levels disturbing sensitive receptors	• Vehicle movement • Stripping of buildings and equipment	Prevent unacceptable noise disturbance and nuisance to surrounding receptors.	General measures:	
				• Undertake observational monitoring and noise checks of the identified noise source, to assess the effectiveness of control measures following a noise-related community complaint/ grievance.	• ECO
				• Engage communities around upcoming potential noisy activities associated with future works to inform them of control measures to minimise adverse impacts.	• Site Manager
				Use of machinery / equipment:	

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
				• Keep vehicles, equipment and machinery on site in optimum working condition. This includes compressed air and hydraulic systems. A preventative maintenance program involving regular inspections must be implemented.	• Construction Supervisor; and • Contractors
				• Consider the use of broadband "buzzer", not tonal "beeper", reversing alarms on all new plant equipment.	• Site Manager
				• Operate equipment within specification and capacity, i.e., ensure machines are not overloaded.	• Construction Supervisor; and • Contractors
				• Use equipment as intended. The operators should be trained and certified by external or internal program to qualify.	• Construction Supervisor; and • Contractors
				• Fit engine exhausts with appropriate quality silencers. Silencers as supplied by OEMs are generally deemed acceptable. Consider retrofitting existing equipment / plant with additional acoustic measures (e.g., silencers on exhausts).	• Construction Supervisor; and • Contractors
				• Avoid unnecessary manoeuvring on site.	• Construction Supervisor; and • Contractors
				• Limit noise to a minimum when night-time work is required, particularly those involving power tools or highly impulsive noise-generating activities such as hammering.	• Construction Supervisor; and • Contractors
				• Locate noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area/s as possible.	• Construction Supervisor; and • Contractors
				• Orient equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise, preferably using site obstacles to enable shielding of the source/s.	• Construction Supervisor; and • Contractors
				• Turn off any equipment idling or not in use.	• Construction Supervisor; and • Contractors
				• Withdraw equipment from service immediately for maintenance if a change in noise emission characteristics is noticeable.	• Construction Supervisor; and • Contractors
				• Shutdown equipment when not in use.	• Construction Supervisor; and • Contractors
				Site power:	
				• Use temporary screens or mobile acoustic shelters to screen generators and other noisy equipment where existing structures do not provide any benefit. Screens should be free from gaps and provide a combined surface density of at least 15 kg/m^2	• Construction Supervisor; and • Contractors
				• Install silencers for fans where possible or for new fans install lower sound power. This is achieved by design of system including airflow velocities, fan and blade types, and equipment selected appropriately for system duty.	• Construction Supervisor; and • Contractors

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
				• Install suitable mufflers at points where compressed air is intentionally discharged.	• Construction Supervisor; and • Contractors
				Transportation of material	
				• Enforce strict speed limits for vehicles travelling along haulage roads.	• Construction Supervisor; and • Contractors
				• Handle materials in a manner that minimises noise, e.g., minimisation of drop heights, and no unnecessary revving of engines.	• Construction Supervisor; and • Contractors
Air quality	3.5. Increase in ambient air concentrations of pollutants affecting sensitive receptors	• General demolition activities • Removal of mobile LMTP • Use of vehicles and equipment that emit exhaust fumes	Limit unacceptable increase in ambient air concentrations of pollutants that could affect sensitive receptors	• Record complaints and any actions arising from a complaint in the complaints register maintained by site management. The investigation of complaints and the outcomes thereof must be recorded for reporting at the relevant authority's request.	• Site Manager
				• Develop and implement standard operating procedures, accident prevention policies and emergency response plans to prevent and efficiently manage emergency situations that could result in emission incidents (e.g. product spills, fires, ventilation/abatement equipment failure, etc.).	• Site Manager; and • ECO
				• Develop risk-based inspection schedules requiring regular equipment inspections for visible/audible/odorous leaks.	• Site Manager
				• Undertake general housekeeping, including the regular maintenance and sweeping of roads, machinery, and their surrounding areas to remove deposited dust and minimise the load available for entrainment during high wind speed events.	• Construction Supervisor; and • Contractors
Visual	3.6. Alteration of the visual environment affecting sense of place	• Vehicles and equipment required for decommissioning will alter the visual character of the study area and expose visual receptors to visual impacts. • Decommissioning activities may be perceived as an unwelcome visual intrusion. • Temporary stockpiling of waste during decommissioning may be an unwelcome intrusion. • Potential visual pollution resulting from littering on the decommissioning site.	Minimise aesthetic impacts associated with decommissioning the LMTP and associated infrastructure.	• Remove all infrastructure that is not required post-decommissioning. • Carefully plan to minimize the decommissioning period and avoid delays. • Maintain a neat decommissioning site by removing rubble and waste materials regularly. • Position storage / stockpile areas in unobtrusive positions in the landscape, where possible. • Return all cleared areas to original asphalt as soon as possible.	• Construction Supervisor; and • Contractors

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
Socio-economic	3.7. Limited employment and procurement opportunities.	• Supply chain of goods and services • Dismantling and cleanup	N/A	• While the end of life of the LMTP Project is inevitable Halliburton should aim to use local unemployed people, where possible, for the decommissioning and closure activities.	• Site Manager
Waste	3.8. Improper waste management	• General demolition activities • Management of dirty water • Storage and handling of materials and chemicals (including hydrocarbons) • Waste management (hazardous and non-hazardous) • Use of vehicles and equipment that may leak lubricants and fuel	Manage all classes of waste appropriate to ensure clean closure	General: • All work areas shall always be kept clean and tidy. Separation of waste: • All waste shall be separated into general waste and hazardous waste. Storage and disposal of general and non-hazardous waste • Demolition waste and surplus concrete shall be re-used, recycled, or disposed of (last resort) responsibly. • Ensure waste is not buried or burned on site. • Ensure no dumping is taking place in or near the project site. • Use demolition waste and builder's rubble as cover material at an appropriate licensed landfill site.	• Construction Supervisor; and • Contractors
				Storage and disposal of hazardous waste • Remove and manage hazardous waste by an approved service provider. • Provide a safe disposal certificate as proof of responsible disposal of hazardous waste.	• Waste management contractor
				Keep safe disposal certificates and provide on request. All cleared areas should be returned to original asphalt as soon as possible.	• Site Manager
Traffic	3.9. Increase in traffic and congestion	• General demolition activities • Use of vehicles and equipment	Limit disturbance to traffic/road safety within the port and access roads	• Restrict vehicle traffic to demarcated access routes and parking areas.	• Construction Supervisor; and • Contractors
				• No vehicles may be allowed to obstruct any traffic or access points to other businesses and facilities on the routes through Walvis Bay.	• Construction Supervisor; and • Contractors
				• Undertake transportation of any hazardous cargo in compliance with Namport's operating procedures for Handling and Storage of Dangerous Cargo.	• Waste management contractor
				• Undertake maintenance on all the vehicles on a regular basis.	• Construction Supervisor; and • Contractors
				• Make use of the rail system, where possible, to alleviate loads on the roads.	• Site manager

Issue (Aspect)	Description of impact	Project activity associated with the impact	Objectives and goals	Management and Mitigation or Enhancement Measures	Responsible Person
				• Ensure drivers have regular training;	• Construction Supervisor; and • Contractors
				• Inspect vehicles for compliance with applicable road safety requirements and ensure compliance.	• Construction Supervisor; and • Contractors
				• Conduct regular driver alcohol/drug tests regularly.	• Site manager
				• Ensure that speed limits and any other applicable rules of the roads used for the LMTP are strictly followed.	• Construction Supervisor; and • ECO

6.3 Emergency Response Plan

Overall, Halliburton must ensure that an Emergency Response Plan (ERP), which includes a plan for firefighting and for hazardous substance spills and leaks, in conjunction with Namport's ERP is developed and implemented during operations. The ERP should be made available to Namport for review and signoff.

An effective, comprehensive, well-considered and tested ERP has the potential to save lives, prevent unnecessary damage to the company and other property and to manage environmental risk in the event of incidents such as flooding, a large chemical spill, fuel spill, sewerage spill or a vehicle accident.

Environmental emergencies require an immediate response. Thus, the ERP must be disseminated to all employees and contractors and in the event of an emergency, the ERP should be consulted. The ERP should be placed around the LMTP operation areas where it will be easily accessible and viewed. The ERP should contain a list of procedures, evacuation routes and a list of emergency contact numbers.

If the emergency has the potential to affect surrounding communities, they should be alerted via alarm signals or contacted in person. Communication is vital in an emergency and thus communication devices, such as mobile phones, two-way radios, pagers or telephones, must be placed around the site. A checklist of emergency response units must be consulted and the relevant units notified. The checklist includes:

- Fire department;
- Police;
- Emergency health services such as ambulances, paramedic teams, poisons centres;
- Hospitals, both local and further afield, for specialist care;
- Public health authorities;
- Environmental agencies, especially those responsible for air, water and waste issues;
- Other industrial facilities in the vicinity with emergency response facilities;
- Public works and highways departments, port authorities; and
- Public information authorities and media organisations.

Procedures and protocols for emergencies, inclusive of firefighting and hazardous substance spill and leak contingency plans, in conjunction with Namport must be developed and implemented.

Should an environmental emergency occur, the following procedure will be followed:

- The Site Manager must immediately be notified of the incident.
- Steps must immediately be taken to minimize the spread of pollution or other risks through remedial actions and clean-up according to an ERP, in conjunction with Namport's ERP.
- The Site Manager must report the incident to the respective authorities (depending on the nature of the incident).

Incidents and non-conformances will be documented and reported to the Site Manager. The report must include details such as the reason, responsible persons, consequences, the remedial action taken, and the follow-up activities. In addition, the cause of incidents

and non-conformances shall be investigated and recommendations to prevent recurrence formulated.

7.0 Roles and Responsibilities

Halliburton is ultimately responsible for the implementation of the EMP and the financial cost of all environmental control measures. The successful implementation of the EMP is, however, dependent on clearly defined roles and responsibilities for each of the management actions given. This section describes the roles and responsibilities for implementation of the various management actions.

7.1 Site Manager

The Site Manager has overall responsibility for environmental management on the LMTP site and for ensuring this EMP is implemented. During the construction period, the overall responsibility for environmental management may be delegated to a Construction Manager.

The Site Manager must ensure the EMP is included in all tender documents and that compliance with the EMP is included as a contractual condition in all contracts. The Site Manager is responsible to ensure that contractors and subcontractors adhere to the conditions of the EMP.

The Site Manager is tasked with the responsibility of conducting suitable environmental risk assessments and developing and executing an environmental risk management plan. They must also ensure that there is sufficient protection and indemnity insurance coverage for incidents. Furthermore, the Site Manager is accountable for creating and implementing the necessary procedures and protocols for emergencies, including firefighting and oil spill contingency plans, in partnership with Namport.

Halliburton shall address any site problems pertaining to the environment at the request of the MEFT, Namport and/or the ECO.

7.2 Construction Supervisor

The Construction Supervisor bears the primary responsibility for managing environmental concerns during the construction and decommissioning phase and ensuring the EMP is put into action. To support the Construction Supervisor, it is advised to designate a person who will focus solely on managing and overseeing the environmental aspects related to the construction activities on site. The Construction Supervisor is required to make certain that all workers comply with the stipulations of the EMP, the ECC, and other pertinent permits. It should be considered to include penalties in the contract documents for non-compliance with the EMP, or to connect the final approval of the contract to a retainer clause. The Construction Supervisor is tasked with addressing any real environmental emergencies/incidents that arise, as outlined in the procedures and protocols. Furthermore, the Construction Supervisor must ensure that there are ample financial and human resources to carry out emergency procedures, and to take preventative corrective measures when environmental risks are apparent beforehand.

The Construction Supervisor will have the following duties in relation to the adherence of this EMP:

- To implement all provisions of the EMP. If the Contractor encounters difficulties with specifications, he / she must discuss alternative approaches with the Site Manager and / or the ECO prior to proceeding;
- To ensure that all staff, including Sub-contractors, are familiar with the EMP;
- Monitoring and verifying that the environmental impacts are kept to a minimum;

- Conducting routine inspections and audits to ensure compliance with this EMP and any other pertinent legal requirements, such as permits and authorisations.
- Making sure that environmental awareness training is provided during the initial training and on a need-to basis thereafter.
- Ensuring adherence to this EMP and permits and authorisations granted to Halliburton by the appropriate authorities.
- Report any incidents of non-compliance with the EMP to the Site Manager and / or the ECO.
- Providing necessary information to the relevant authorities, such as reports on compliance with the EMP (see Section 10.0), permits, and relevant authorisations.

Coordinating with the Site Manager on matters related to environmental management, as needed.

7.3 Environmental Control Officer

Halliburton is responsible for the appointment of an Environmental Control Officer (ECO) during the construction period to oversee compliance to the EMP. The ECO must:

- conduct regular inspections and auditing compliance to this EMP and any other relevant legal requirements e.g.: permits and authorisations.
- develop and implement an environmental awareness and training program and conduct.
- environmental awareness training during induction training and on an ad hoc basis thereafter.
- conduct scheduled monitoring as outlined in various sections in the EMP (Section 8.0) as well as any compliance monitoring required by permit and authorisations issued by the relevant authorities, or in collaboration with Namport as implied.
- ensure compliance to this EMP and permits and authorisations issued to Halliburton by relevant authorities. Ensure responsibilities and target dates are developed for each one of the commitments in this EMP.
- ensure compliance with legislation by all employees and contractors through awareness training, and engagement with authorities, where relevant.
- submit required information to relevant authorities such as reporting related monitoring and about compliance with the EMP, permit and relevant authorisations.

The Site Manager must be responsible for the above duties during the operation, decommissioning and closure phases.

7.4 Contractors

All contractors, sub-contractors and their employees will be contractually required to comply with the commitments in this EMP.

The Contractor shall have the following responsibilities:

- To implement all provisions of the EMP. If the Contractor encounters difficulties with specifications, he / she must discuss alternative approaches with the Site Manager and / or the ECO prior to proceeding;
- To ensure that all staff, including Sub-contractors, are familiar with the EMP;

- Monitoring and verifying that the environmental impacts are kept to a minimum;
- To make personnel aware of environmental issues and to ensure they show adequate consideration of the environmental aspects of the project;
- To report any incidents of non-compliance with the EMP to the Site Manager and / or the ECO; and
- To rehabilitate any sensitive environments damaged due to his / her negligence. This shall be done in accordance with the Site Manager's specifications.

Failure to comply with the EMP may result in fines and reported non-compliance may result in the suspension of work or termination of the contract by the Site Manager.

8.0 Environmental Induction and Awareness Training

Before the commencement of any work on site, the Contractor's site management staff shall attend an environmental awareness-training course presented by the ECO. The Contractor shall liaise with the ECO prior to the commencement date of construction to fix a date and venue for the training.

The information presented at the course shall be communicated by the Contractor to all employees on the site through regular toolbox talks, to any new employees coming onto site after the initial training course and to any suppliers that are required to enter the site. The presentation shall be conducted, as far as is possible, in the employees' language of choice. As a minimum, training shall include:

- Explanation of the importance of complying with the EMP.
- Discussion of sensitive environmental features and the potential impacts of construction activities.
- Explanation of the management structure of individuals responsible for EMP implementation.
- Employees' roles and responsibilities, including emergency preparedness.
- Description of the mitigation measures that must be implemented when carrying out different activities.
- Explanation of the specifics of the EMP and its specifications.

The Contractor shall keep records of all environmental training sessions, including names, contact details and signatures of attendees, dates of their attendance and the information presented to them.

In addition, all site staff will be required to sign a Code of Conduct to ensure staff are well informed and commit to abiding by Namport restrictions and relevant environmental controls relating to work force behaviour.

9.0 Monitoring

A monitoring plan shall be established to ensure that the standards and procedures as stipulated in this EMP are implemented and complied with. A reporting system shall be

maintained reflecting any incidents and non-conformances and the results of the monitoring programme.

The following monitoring is recommended:

- Air quality:
  - Undertake an air quality screening survey to measure benzene, toluene, ethylbenzene and xylene (BTEX) along the facility fenceline to confirm that offsite impacts are within internationally accepted ambient limits. Should the findings of this survey indicate that concentrations beyond the LMTP boundary are cause for concern, a full air quality impact assessment (including dispersion modelling) and the development of an air quality management plan (AQMP) will be necessary.
  - Undertake a leak detection and repair (LDAR) survey on an annual basis to guide repair and maintenance (over and above the minimum manufacturer specifications) and prevent leaks.
  - The installation of an onsite weather station will provide site specific meteorological data that can assist with the interpretation of monitoring results and source identification for investigating air quality complaints.
- Visual:
  - Ensure that visual management measures are monitored by an Environmental Control Officer (ECO). This will include monitoring activities associated with visual impacts such as the siting and management of storage / stockpiles of construction materials and management of waste materials / rubble.
  - Ensure that visual management measures are monitored by an internal Environmental Specialist. This will include monitoring activities associated with visual impacts.
  - Ensure that procedures for the removal of structures and stockpiles during decommissioning are implemented, including recycling of materials.

10.0 Reporting

Documentation is necessary to inform the continuous development of the EMP. The Site Manager must keep the following documentation must be kept on site to reflect compliance with the EMP:

- A copy of the ECC;
- Copies of all other permits or licences;
- A copy of this EMP;
- Waste disposal certificates;
- Grievance/complaint registers and procedures;
- Incident reports.

This list is not exhaustive as the ECC issued by the MEFT may have additional requirements for reporting. This EMP must be updated to reflect the additional measures, monitoring and reporting as required by the Competent Authority.

11.0 Auditing compliance with the EMP

Once the ECC has been obtained, the commitments in this EMP will be legally binding and Halliburton's contractual agreement with the Namibian authorities for effective environmental management. All employees, contractors, subcontractors and visitors to site will be required to comply with the commitments contained in this EMP.

The EMP is legally binding, and non-compliance could result is fines, penalties, legal action, withdrawal of permits and licences and or the suspension of work.

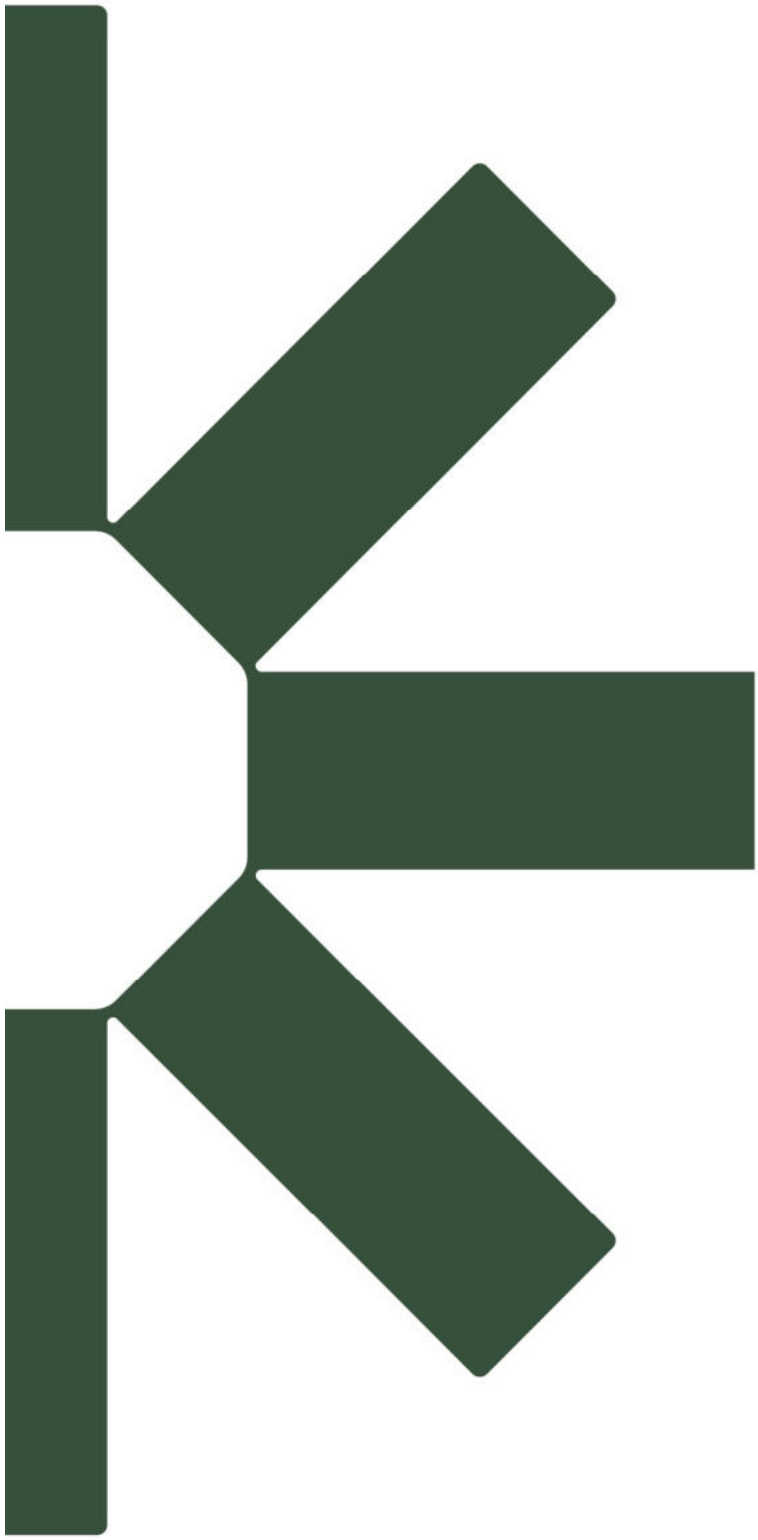
11.1 Internal audits and inspections

During the construction, operation and decommissioning, Halliburton's designated ECO will undertake internal environmental management audits against the EMP monthly. The findings of the audits will be documented for record-keeping purposes and for continual improvement of the EMP. These reports must be submitted to the MEFT.

During construction, the Environmental Specialist will conduct daily site-wide inspections.

11.2 External Environmental Performance Assessment

It is recommended that an independent, qualified EAP conduct external performance assessment at the end of the construction and operation phases. This report must be submitted to the MEFT and Namport.



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