ENVIRONMENTAL AND SOCIAL REQUIREMENTS FOR CONTRACTORS: ANNEX 4 – HAZARDOUS MATERIALS

ROVUMA LNG PROJECT

MZLN-EL-RBENV-00-0001

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1. PURPOSE AND SCOPE

This document is one of a series of topic-specific supporting annexes contained in the overarching document: Environmental and Social Requirements for Contractors: Environmental and Social Management System (ESMS).

These annexes define the processes that need to be followed and the control measures that must be applied to ensure the delivery and approval of a topic-specific Contractor Implementation Plan (CIP) and other implementation deliverables ahead of commencing activity.

Where the final design basis or execution strategy has not been determined and alternatives exist, an analysis of alternatives (taking environmental and social (E&S) factors into account) shall be undertaken. This analysis shall be based on an accurate characterisation of the local setting using up-to-date baseline data and an assessment of the risks and impacts related to each alternative.

Where the project base case has already been determined, additional baseline information may be required to inform an up-to-date / site-specific E&S risks and impacts evaluation. This evaluation may result in a refinement of control measures relative to the local conditions and licensing requirements.

1.1. Objectives

The overall objective of this document is to set out all the E&S requirements that need to be fulfilled in order to prevent and manage potential E&S risks and impacts associated with Hazardous Materials.

1.2. Scope

For the purposes of this document, the assessment and management of E&S impacts and risks associated with hazardous materials encompasses the following activities: selection, procurement, transportation, storage, and transfer (includes vehicle refuelling); accidental spill response and clean-up; and monitoring (including inspection) of hazardous materials. The scope does not include activities associated with weed or pest management, safety of workers using hazardous materials, or the disposal of hazardous materials.

1.3. Linkage to Other Contractor Requirements

This document is an overarching document which is supported by a number of topic-specific annexes. It also needs to be read in conjunction with Section D (Scope of Work) and Section F (Coordination Procedure) to provide a holistic view of E&S requirements.

This document should be read specifically in conjunction with the Waste Management Annex.

1.4. Background Context

The Company has stipulated general principles designed to prevent or reduce unnecessary hazardous chemicals from being procured (and imported into the country). These general principles need to be supported by control measures in order to reduce potential environmental and social risks and impacts.

1.5. E&S Risks and Potential Impacts

Table 1-1 outlines the E&S risks and potential impacts identified to date associated with Hazardous Materials. This table is meant to provide insight to the risks and potential impacts which are possible and a guide for additional assessment activities required by Section 2.1 of this document. It also provides a reference to the control measures table (Table 2-1).

Table 1-1: A Guide to Activities, Consequences, Risks and Potential Impacts

Activity	Potential Consequence	Risks and Potential Impacts
Inappropriate selection (and subsequent use) of Hazardous Materials	Chemical residues Spills	Degradation or destruction of natural seed bank and soil quality (P10)
		Contamination of surface water or groundwater (P5)
		Pollution of marine environment (P4)
		Contravention of international conventions (O1)
		Waste disposal legacy (P9)
		Worker Health (LAB4)
Inappropriate storage and transfer	Spills	Degradation or destruction of natural seed bank and soil quality (P10)
		Contamination of surface water or groundwater (P5)
Inappropriate disposal	Leachate	Degradation or destruction of natural seed bank and soil quality (P10)
	Spills	Contamination of surface water or groundwater (P5)
		Detrimental impact on community health (C2)
		Detrimental impact on community safety (C3)
		Worker Health (LAB4)

2. REQUIREMENTS

2.1. E&S Assessment and Evaluation and CIP Development

As discussed in the overarching Environmental and Social Requirements for Contractors: Environmental and Social Management System (Section 2), due to the further refinement of the design since the EIA was prepared, and due to the Project seeking finance (which requires compliance with the International Finance Corporation (IFC) E&S requirements), it is anticipated that additional E&S assessment will be required for some topics which may result in the addition or refinement of E&S controls specified to date. This assessment, as outlined in the overarching ESMS document, includes three stages:

- Stage 1: Analysis of Alternatives
- Stage 2: E&S risk and impact evaluation of the project base case and refinement of control measures
- Stage 3: CIP development (based on the refined control measures).

For Hazardous Materials, only stage 3 is required.

Stage 3 – Contractor Implementation Plan

The Contractor shall develop a CIP which outlines how they propose to implement the control measures in the Table 2-1 (including any proposed additions or refinements as applicable to the update and finalisation of the design and execution strategy), and how they propose to implement the management system requirements (as outlined in the E&S Management System Requirements for Contractors) which relate specifically to the topic of this document, in a way that conforms to E&S requirements.

2.2. E&S Control Measures

The control measures in Table 2-1 have been defined ahead of the site-specific risk / impact evaluations defined in Section 2.1. The Contractor shall apply these or seek agreement to apply a refined list, with justification for all changes based on the outcomes of assessments described in Section 2.1.

Where these requirements originate from the Anadarko / Eni EIA (2014), henceforth called the EIA, the EIA section reference is included. Similarly, the Government-approved Environmental Management Plans (EMPs) references are included for those relevant controls. As noted in the overarching ESMS requirements document, a number of additional controls have been identified as being required to meet lender expectations. As such, the EIA / EMP controls have been supplemented by good practice design and control requirements where practicable and appropriate, however, where any overlap is present, the EMP (and EIA) commitments should be considered paramount over good practice guidance in the hierarchy of adoption of such controls.

Table 2-1: E&S Control Measures

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	IMPACT / RISK BEING ADDRESSED	SOURCE			Notes
			EIA	EMP	Other	
Overarching Requirements						
General	Care should be taken to ensure that hazardous materials are procured only from responsible and verified suppliers				A	
	When hazardous materials are needed, the least hazardous shall be chosen				A	
	Only procure the appropriate quantity of chemicals or hazardous materials needed.				A	
	Evaluate chemicals for environmental, safety and technical performance prior to procurement. As far as practical, least hazardous chemicals will be selected.	P10, P5, P4, O1, P9	EIA 14.3.7	Area 4 UE 5 LNGMT UE 5, 18 MOF UE 5, 18 Shared UE 1		
	Avoid the use of chemicals and hazardous materials subject to international bans or phase-outs consistent with the following agreements: · Stockholm Convention on Persistent Organic Pollutants · Montreal Protocol on Substances that Deplete the Ozone Layer · Rotterdam Convention of Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade. · Any chemicals prohibited by Mozambique Law or International Conventions. In all cases, consider the use of less hazardous chemicals.	O1			A	
	The use of substances and products classified as very toxic, carcinogenic, allergenic, mutagenic, teratogenic, or strongly corrosive shall be identified and substituted by less hazardous alternatives, wherever reasonably practicable.	C2, C3			A	

	There shall be no purchase, storage, use, manufacture or trade in Class II (moderately hazardous) pesticides, unless the project has appropriate controls on manufacture, procurement or distribution and/or use of these chemicals.	O1, P9			A	
	There shall be no purchase, storage, use, manufacture or trade in products that fall in the WHO Recommended Classification of Pesticides by Hazardous Class I (a) (extremely hazardous); or I (b) (highly hazardous).	O1, P9			A	
Design Requirements						
General	All chemicals used will be Gold or Silver rated (or equivalent) by Cefas's Offshore Chemical Notification Scheme (OCNS), and/or be contained on OSPARs PLONOR (pose little or no risk) list of substances, unless no such alternative is commercially available.	P9		Area 4 ME 7	A	
Execution Requirements						
Development and implementation	Implement a Company-developed Refuelling Procedure for where refuelling occurs on site at the machine (i.e. by tanker direct to the machine). This procedure shall include as a minimum: · Fuel attendants shall observe the refuelling operation throughout the process · Avoid spillage when replacing the fuel nozzle (i.e. inverting the nozzle) · Drip trays shall be used for all onshore refuelling.	P10, P5			A	
Risk Assessment	A risk assessment shall be undertaken for chemicals, fuels and oils used in significant quantities	P9			A	
Storage and handling	Create and maintain a hazardous materials register that includes the following: · Name · Description (e.g. composition of the chemical) · Classification if applicable · Characteristics that make the material hazardous (e.g. flammable, irritant, etc.) · Quantity of material held on site · Maximum quantity held on site · Quantity used per month.	LAB4, O1			A	

Carry out an environmental risk assessment for each chemical used on site, performed by competent persons trained to recognized international standards where applicable.	P10, P5, P4, O1, P9, C2, C3			A	
Safety Data Sheets (SDS) shall be: · Available close to storage place and point of use · Retained by the driver during transportation · Retained in a waterproof box adjacent to the area of storage · At the site offices and in emergency response rooms · An SDS register shall be developed and maintained.	LAB4			A	
Containers used for storage and transportation shall be labelled (in English and Portuguese) in accordance with applicable regulations; when regulations are minimal or absent then containers shall be labelled according to the following characteristics when applicable: · Contents of drum or container · Flammability · Reactivity · Corrosive · Toxicity · Radioactivity.	LAB4, O1			A	
Containers used for storage or transportation of chemical and hazardous materials shall be compatible with the material being transported and be in good physical condition (no severe rusting or structural defects).	P10, P5, P4, O1, P9, C2, C3			A	
Ensure that loading and unloading operations, as well as transportation and storage of hazardous substances outside the perimeter of the plant is performed during daytime, in accordance with the regulation for transportation and handling of dangerous cargoes (CMDS). This does not apply to natural gas or LNG.	P10, P5, P4, O1, P9, C2, C3	EIA Approval Letter S10 26	Area 4 UE 20 Shared UE 7		
Develop and maintain an inventory of all hazardous materials.	LAB4, O1			A	
Test new storage vessels and containers intended for hazardous materials storage for leaks prior to installation and operation.	P10, P5			A	
Where appropriate material specific storage shall be provided for extremely hazardous or reactive chemicals including hazardous wastes.	P10, P5			A	

Storage of fuel and chemicals will be contained within bunded areas, and spill kits will be kept in storage areas.	P10, P5	EIA 12.12.4	Area 4 AV 14 LNGMT AV 13 MOF AV 13		Spill kits typically include: sand or absorbent granules or sawdust, absorbent pads, oil booms, shovels, bags, liners, drip cans.
Spill containment and clean-up kits will be available onsite. Clean-up will occur as soon as possible after the spill. If required, impacted soil will be removed and disposed of appropriately			Area 4 SO 11, SW 33 Shared SO 11, SW 30 LNGMT SO 11, SW 20 MOF SO 11, SW 20		
Fuels, lubricants, hydrocarbon liquids and other chemical storage site will be secured by bunded facilities			Area 4 SO 12 Shared SO 12 LNGMT SO 12 MOF SO 12		
Fuel and chemical storage and transfer will be contained within bunded areas, and spill kits will be kept in storage areas and consistent with GIIP.	P10, P5, O1, P9, C2, C3	EIA 12.6.3 EIA 12.11.4 EIA 12.12.4	Area 4 HE 21		
Any storage facilities containing hazardous substances will be lined, bunded or otherwise designed to prevent seepage and impact to surface or groundwaters.	P10, P5	EIA 12.9.4	Area 4 SW 31 Shared SW 28 LNGMT SW 18		

				MOF SW 18		
	Incorporate overfill protection into primary storage tanks and transfer systems where appropriate such as: · Use of dripless hose connections where reasonably practicable · Provision for overfill shutoff valves · Inclusion of an overfill catch basin around the fill pipe to collect spills · Use of piping connections with automatic overfill protection (float valve) · Provision of overfill or overpressure vents that allow controlled release to a capture point.	P10, P5			A	
	As an alternative to the provision of secondary containment, use double skinned tanks for the storage of hazardous materials. Where double skinned tanks are used then leak detection systems shall be used to detect leaks between the two skins.	P10, P5			A	
	Hazardous materials will be stored on an impervious surface within a bunded area capable of retaining 110% of the volume of the largest container or 25% of the volume of the total volume of stored material, whichever is greater.	P10, P5			A	
	Drainage water from any hazardous waste storage area will be tested and treated if necessary and as appropriate prior to discharge to the environment.	P10, P5			A	
	Hazardous waste storage areas will be clearly labelled as such, in Portugese and English, and emergency contact details will be posted in a prominent position easily read from outside of the storage area.	P10, P5			A	
	Hazardous waste storage areas shall be equipped with spill clean-up kits and emergency showers.	P10, P5			A	
Transportation of hazardous materials	Loading and transportation of hazardous materials can take place inside the build / construction / operations zone without restrictions at 24 hours a day, providing that safety precautions measures will be in place.	P10, P5, P4, O1, P9,	EIA Approval Letter S10 26	Area 4 UE 21 Shared UE 8		

	Restrictions for transporting hazardous materials during night time will apply outside the project area, where access roads are also used by the general public.	P10, P5, O1, P9, C2, C3	EIA Approval Letter S10 26	Area 4 UE 22 Shared UE 9		
	Undertake due diligence on any fuel and chemical supplier bringing in chemicals by road and avoid the transportation of hazardous materials through villages and towns by using alternative routes where reasonably practicable.	P10, P5, O1, P9, C2, C3			A	
Control of access	Access to centralised waste facilities to be restricted and controlled at all times.	P10, P5			A	
Hazardous waste disposal	Disposal of waste from the use, handling and storage of hazardous chemicals and fuels shall be in accordance with the Waste Management CIP.	P10, P5, P9, O1			A	
	Storage and management of any hazardous wastes shall be in accordance with the requirements of the Hazardous Materials CIP.	P10, P5, P9, O1			A	
Spills and clean-up	Incorporate hydrocarbon spill prevention measures into operational procedures for construction, operation and decommissioning.	P10, P5	EIA 14.3.7	Area 4 UE 9 LNGMT UE 9 MOF UE 9 Shared UE 3		
	Prepare and implement a Pollution and Hazardous Materials Management Plan and Emergency Response Plan that addresses spill prevention, clean up and response.			Area 4 SO 8, UE 6 LNGMT SO 8, UE 6 MOF SO 8, UE 6 Shared SO 8, UE 2		The Pollution and Hazardous Materials Management Plan can be incorporated within the Hazardous Materials CIP as appropriate.
	The Project ERP includes procedures for response to chemical spills, including the locations of spill containment and recovery equipment. The Oil Spill Contingency Plan within the ERP includes a detailed spill model to ensure that the plan is adequate to address potential spills within the marine environment.			LNGMT UE 19 MOF UE 19		

	Implement the ERP, including an OSCP for offshore and near shore spills, and follow appropriate guidelines such as those produced by the OGP and the United Nations Environment Programme (UNEP).			LNGMT UE 20 MOF UE 20		
	An Emergency Response and/or spill contingency plan will be in place for any accidental spillage. Spill containment and clean-up kits will be available onsite, and clean-up from any spill must be in place and executed at the time of a spillage, with appropriate disposal as necessary.	P10, P5	EIA 12.6.3 EIA 12.9.4	Area 4 SO 8, SW 33 Shared SO 8, SW 30 LNGMT SO 8, SW 20 MOF SO 8, SW 20		
	Report all incidents (including spills, fires explosions and any other incident) to Company as per the predefined Incident Reporting procedure.	P10, P5, P4, P6, C2, C3			A	
	Soil shall not be used as an absorbent material in the event of hydrocarbon or chemical releases	P10, P5			A	
	Any topsoil or subsoil contaminated by accidental hydrocarbon or chemical releases shall be collected, managed, labelled and transferred to the waste storage/management area for treatment or disposal in accordance with the Waste CIP.	P10, P5			A	
Monitoring and inspection	Maintain a documented record of preventative maintenance inspections and all maintenance that is carried out on Hazardous Material storage facilities including secondary containment structures.	P10, P5, P9			A	
	Regularly (e.g. daily or weekly) inspect storage tanks and bunds containing hazardous materials for leaks and flaws. Volumes will be reviewed for evidence of losses, as losses may indicate leakages.	P10, P5, P9			A	
	Ensure that all secondary containment bunds are inspected weekly for deterioration, or directly following a storm. Any collected stormwater is to be monitored for contamination; contaminated stormwater in the bund shall be pumped or drained to the appropriate treatment plant.	P10, P5			A	

	Monitor chemical control and container/waste management programs. Implement materials control program to address proper disposal and/or improper use of containers	P10, P5			A	
Refuelling and transfer	Where refuelling takes places in a fixed facility location (e.g. a camp), the location shall include: · A concrete hard stand or similar impervious structure · A collection/interceptor around the refuelling pad · An oily water separator or sump regularly emptied	P10, P5			A	
	Hazardous chemical and fuel transfer pumps shall be equipped with an emergency shut off control.	P10, P5			A	
	Safety procedures for the loading and unloading of product to transport systems (e.g. tanker trucks and vessels) will be implemented, including the use of failsafe control valves and ESD/D equipment.	LAB4	EIA 14.5.1	Area 4 UE 34		
Vehicles and machinery	Oil and chemical handling facilities and associated maintenance shall be situated as far from sensitive receptors as reasonably practicable e.g. mangroves, wetlands, etc.	P10, P5, P4			A	
	For any non-routine maintenance or repair, drip trays, use of an impermeable membrane or bunding shall be used to avoid spillage to the ground.	P10, P5			A	
	Vehicle wash down shall take place on hardstand and wastewater shall drain to a settlement trap (for sediment drop out) and an oil separator chamber or appropriate treatment for oil and grease retention prior to discharge.	P10, P5			A	
	Concrete and cement mixers shall only be washed out in designated areas (i.e. away from sensitive water bodies) on hard standing with wash water being treated prior to discharge in accordance with Mozambique and Lender requirements.	P10, P5			A	
	Minimize concrete and cement spillages and / or discharges to both land and seabed to the extent reasonably practicable.	P10, P5, P4			A	
Marine Based Hazardous Materials	Store, use and handle hazardous materials, chemicals and waste on project vessels in accordance with IMO MARPOL (1973/1978) requirements and/or applicable port policies and procedures.	P4, O1			A	
	Vessel painting and stripping activities shall not be undertaken at Project location.	P4			A	
	Ensure that hazardous materials are adequately secured on deck.	P4			A	

	Provide pollution control, spill and emergency response measures for all activities carried out within or immediately adjacent to open water (for example foundation piling, dredging, bridge or jetty structures, pumping, concrete pours).	P4			A	
	In the event of a spill to the marine environment use biodegradable dispersants, in accordance with the Company-approved Contractor Emergency Response Plan.	P4			A	
	if required, apply only biodegradable dispersants that have previously been approved by the relevant authority in Mozambique			Area 4 UE 17 LNGMT UE 17 MOF UE 17 Shared UE 5		
Training	Train personnel involved in the handling, transportation and storage of hazardous materials in hazardous materials management and spill prevention and response.	P4			A	
Procurement	Vendors and suppliers must ensure compliance with the contractor environmental requirements.	P4			A	

3. DELIVERABLES

The following deliverables are associated with Hazardous Materials. Contractor deliverables shall be submitted to the Company for Company approval.

Table 3-1: Summary of Deliverables

Section Reference	Deliverable	Responsibility	Deliverable Date
STAGE 3			
Section 2.2	Hazardous Materials Inventory	Contractor	To be agreed on contract award
Section 2.2	Topic-Specific CIP, which as a minimum includes: 1) Approved list of E&S control measures 2) Details of how the approved control measures will be implemented (including linkage to other Project plans and procedures, where necessary, to demonstrate the implementation of the E&S controls committed to) 3) Details of the monitoring, reporting and assessment.	Contractor	To be agreed on contract award