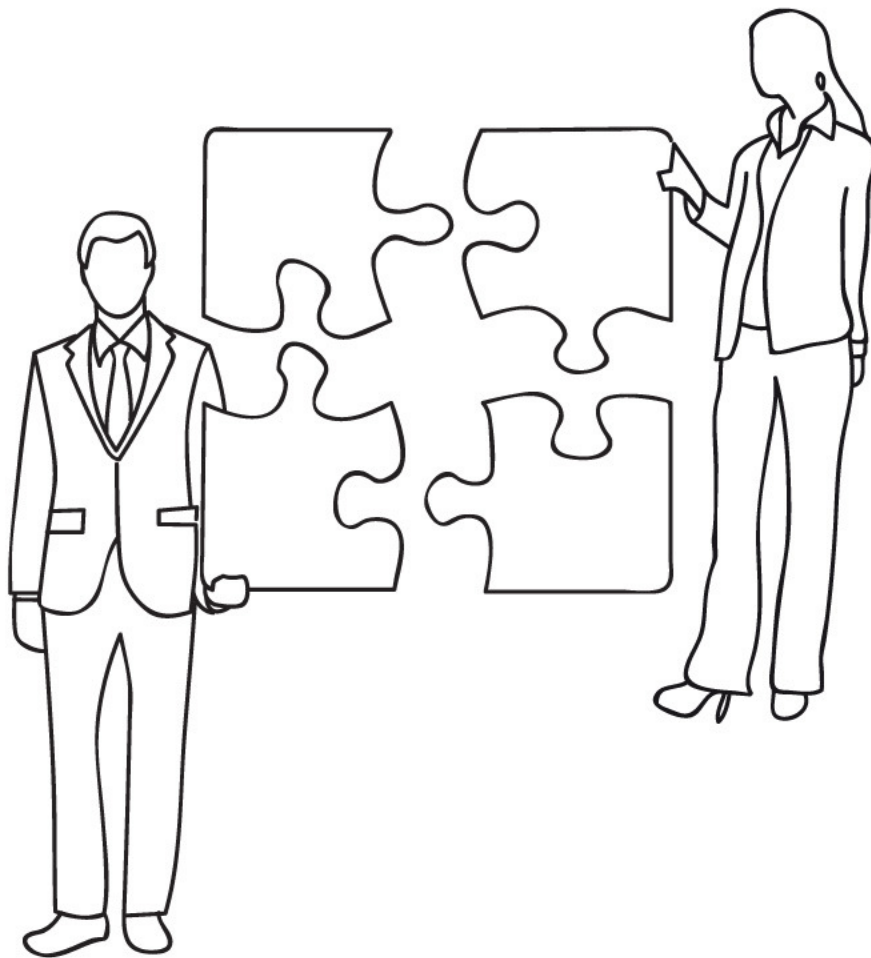


Plan

plan ms hse 011 eni Ghana - "Offshore Hazardous Material Management Plan"



TITLE:

OFFSHORE HAZARDOUS MATERIAL MANAGEMENT PLAN

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1. Purpose

Eni Ghana has developed this Offshore Hazardous Materials Management Plan (OHMMP) as part of its HSE-IMS and in line with its Environmental, Social and Health Management Plan (ESHMP).

This Plan aims to ensure the management and control of activities that may pose offshore pollution related risks during the construction phase. This Plan sets out potential impacts and consequences and describes how they will be mitigated. eni Ghana will use reasonable efforts to require contractors, to apply comparable standards. eni Ghana remains the ultimate responsible party for compliance with ESHIA commitments, and will establish means for monitoring/supervision of contractor's performance.

The specific objectives of the Offshore Hazardous Materials Management Plan are to:

- Avoid the use of chemicals and hazardous materials subject to international bans or phase-outs;
- Ensure the use of the lowest feasible chemical contents in the Non-Aqueous Drilling Fluids (NADF), prioritising those included in the PLONOR (substances that Pose Little or No Risk to the Environment) list and those with lowest hazard according to the CHARM (Chemical Hazard Risk Management) methodology developed.
- Prevent the uncontrolled release of any hazardous materials during transportation, handling, storage and use; and
- Control that routine liquid discharges remain below harmful and legally accepted levels.

Hazardous Materials Management and gaseous and liquid pollution related impacts can be mitigated by the implementation of standard best industry practices in terms of environmental controls and management practices during construction and development drilling. The measures to be implemented are detailed in this document are described.

The OHMMP is intended to be a 'live' document and therefore shall be regularly updated according to the needs as the construction evolves.

The Offshore Hazardous Materials Management Plan should be read in conjunction with other Company plans, in particular the most relevant ones are:

- HSE-PLAN-005 Waste Management Plan;
- HSE-PLAN-002 Emergency Response Plan;



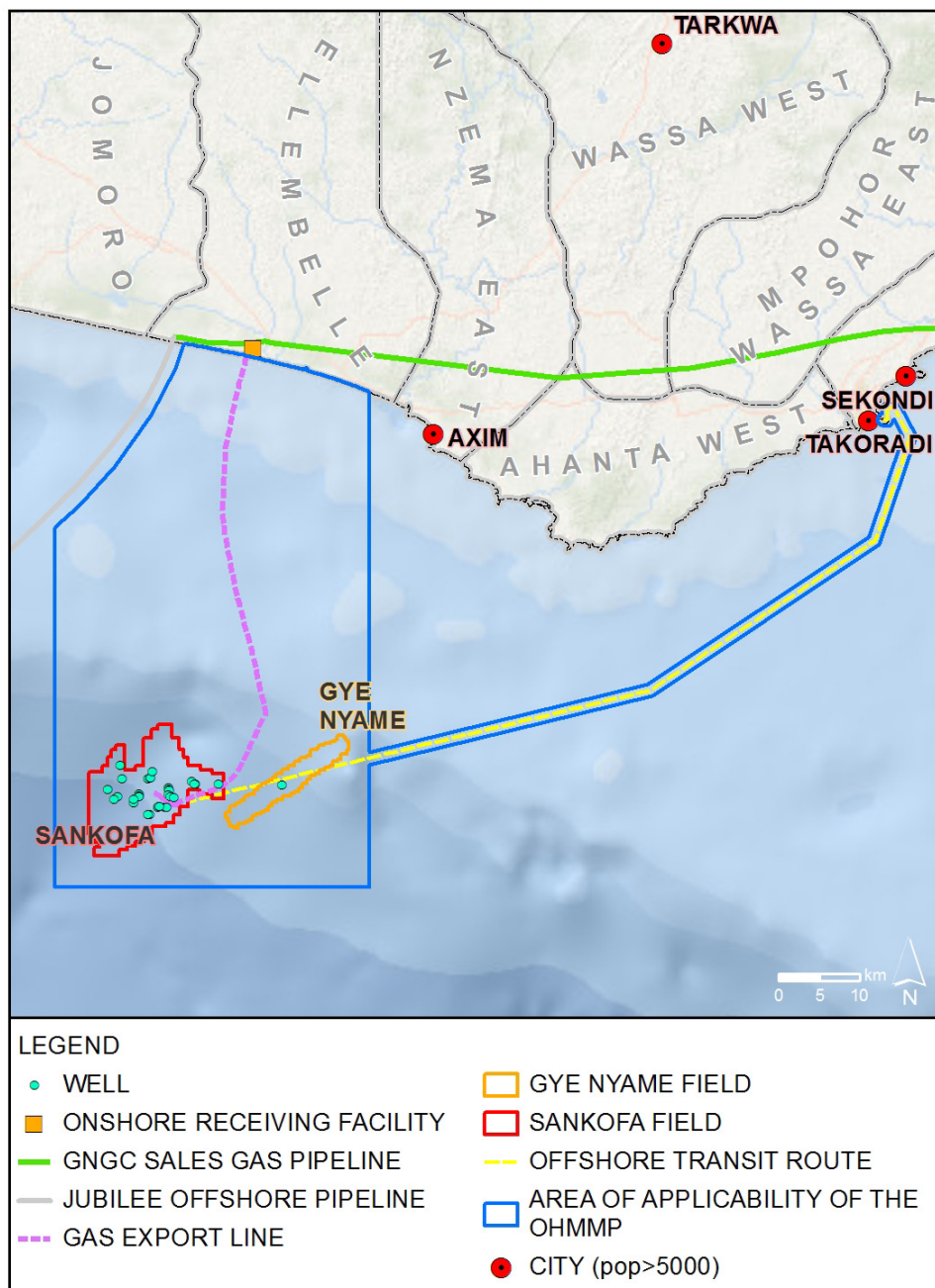
- HSE-PLAN-003 Development Drilling and Production Operations Oil Spill Contingency Plan – OCTP Block; and
- plan ms hse 009 eni Ghana - "Environmental, Social and Health Management Plan - Construction and Development Drilling Phase";
- plan ms hse 010 eni Ghana - "Onshore Pollution Prevention and Control Management Plan";
- plan ms hse 013 eni Ghana - "Marine Traffic Management Plan".
- plan ms hse 018 eni Ghana – "Offshore and Onshore Environmental Monitoring Program".

Communications undertaken with the community within the AoI and relevant for this plan will be managed through the Stakeholder Engagement Plan and its associated Action Plans.

The geographical scope of the OHMMP is shown in *Figure 1.1*.



Figure 1.1 Geographical scope of the OHMMP



Source: ERM, 2015

2. Applicability

This Plan describes the requirements with regard to hazardous materials management, and liquid and discharges and associated pollution, applicable to the offshore construction and development drilling phase of the Offshore Cape Three Points (OCTP) Project.

Health	Safety	Environment	Social/Sustainability
X	X	X	



3. References

3.1 Internal References

- Ghana OCTP Block Phase 1 Environmental, Social and Health Impact Assessment, ESL, June 2015. Doc. 000415_DV_CD.HSE.0208.000_00, Rev 04;
- Ghana OCTP Block Phase 2 Environmental, Social and Health Impact Assessment, ERM, Doc. 000415_DV_EX.HSE.0304.000_01, Rev 05.

eni and its subsidiary eni Ghana, has established an HSE IMS, apart from the Plans mentioned in Section 1, other Guidelines, Protocols, Manuals, Standards, Procedures, Work Instructions, Programs and Plans that are relevant to managing and implementing this Plan, including but not limited to:

- HSE-PLAN-005 Waste Management Plan;
- HSE-PLAN-002 Emergency Response Plan;
- HSE-PLAN-003 Development Drilling and Production Operations Oil Spill Contingency Plan – OCTP Block;
- HSE-INSTR-009.00 Offshore Periodical HSE Inspection Instruction,
- Procedure HSE-PRO-005 on Incident Notification, Investigation and Reporting.
- HSE Bridging Documents with the main offshore contractors.

Table 3.1 presents a summary of the mentioned documents.

Table 3.1 Summary of related eni documents

Title	Document	Purpose
HSE-PRO-005.02	Incident Notification, Investigation and Reporting	To set the basic procedures that must be followed by all eni Ghana employees to ensure all types of incidents (including near misses, accidents and incidents) are reported and investigated.
HSE-INSTR-009.00	Offshore Periodical HSE Inspection Instruction	To detail the modalities by which periodical HSE inspections are systematically carried out on board of eni Ghana’s drilling rigs



3.2 External References

- Ghana Legal, 2015, on <http://laws.ghanalegal.com/>, last accessed in November 2015 (see section 5 for details);
- WBG EHS Guidelines for Offshore Oil and Gas Development, June 2015
- WB/IFC Performance Standard 3: Resource Efficiency and Pollution Prevention and Guidance Note 3. International Finance Corporation/World Bank Group, January 1, 2012;
- Legal Requirements provided by the Environmental Protection Agency (EPA):
 - Legal Requirement for offshore drilling of 13 development wells dated 8th June 2015;
 - Legal Requirement for Phase 1 commissioning of infrastructure for the OCTP dated 9th July 2015; and
 - Legal Requirement for Phase 2 installation and commissioning of offshore and onshore (gas receiving facility) infrastructure for the OCTP block date 24th July 2015.



4. Acronyms

CHARM	Chemical Hazard Risk Management
DAoI	Direct Area of Influence
ERP	Emergency Response Plan
ESHIA	Environmental, Social and Health Impact Assessment
ESHMP	Environmental, Social and Health Management Plan
HSE	Health and Safety and Environment
KPI	Key Performance Indicator
MARPOL	Marine Pollution International Agreement
NADF	Non-Aqueous Drilling Fluids
OHMMP	Offshore Hazardous Materials Management Plan
OSRP	Oil Spill Response Plan
PLONOR	Pose Little or No Risk to the Environment
WBM	Water-Based Muds

5. Requirements

5.1 Legal requirements

Ghana Government Department of Environment and Conservation

Three permits were provided by the Environmental Protection Agency (EPA). The permit for offshore drilling of 13 development wells dated 8th June 2015; the permit for Phase 1 commissioning of infrastructure for the OCTP dated 9th July 2015; and the permit for Phase 2 installation and commissioning of offshore and onshore (gas receiving facility) infrastructure for the OCTP block date 24th July 2015. The conditions included in these permits are considered as legal requirements for this plan.

Additional requirements for an ESHMP and guidance on scope and application are given in the Ghana environmental regulations. In particular, they are contained in the Environmental Assessment Regulations of 1999 (Part II, Section 9), where a 'provisional environmental management plan' is a required element of an ESHIA. Further detail is provided in Chapter 3 of the Phase 2 EIS document (Doc. 000415_DV_EX.HSE.0304.000_01, Rev 05).

Ghana laws, regulations and guidelines of particular relevance for managing and implementing this Plan include, but are not limited to:

- Environmental Protection Agency Act (Act 490 of 1994): in place to establish the authority responsible for the formulation of environmental policy, issue of environmental permits and pollution abatement notices as well as to develop standards and guidelines. It also establish the Hazardous Chemicals Committee, which plays a vital role in the management of chemicals in Ghana;
- International Conventions: The most relevant for this Plan is the International Convention for the Prevention of Marine Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) and its Annexes (see Attachment A);

5.2 Lender Group

International standards such as those outlined in the IFC/WB Performance Standards provide further guidance on Plan scope and application.

The IFC Performance Standards considered relevant to this Plan are:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.
- Performance Standard 3: Resource Efficiency and Pollution Prevention.



The WBG's EHS Guidelines serves as a technical reference document to support the implementation of the WB/IFC PS, in this case in particular the EHS Guidelines for Offshore Oil and Gas Development of June 2015.

5.3 Eni Ghana HSE Integrated Management System

This Plan is intended to be consistent with the elements and in line with eni Ghana HSE IMS. Appropriate plans (including this plan), procedures and programs will be implemented during the course of the project to ensure that the all elements of the HSE IMS expectations are met.

eni Ghana policies, guidelines and programs that are relevant to managing and implementing this Plan have been listed in Section 3.1, Internal References.



6. Management Plan

6.1 Management and Monitoring

Management and Monitoring measures are defined on the basis of the ESHIA outcomes, combined with applicable legal requirements and other relevant industry good practice.

eni Ghana and its contractors are required to implement and comply with the management and monitoring requirements described in the following *Table 6.1* as appropriate to their scope of work in order to avoid, minimize and control impacts and risks with regard to hazardous materials management and liquid discharges.



Table 6.1 Management and Monitoring

Potential ESH Impact	IMPACT MANAGEMENT				IMPACT MONITORING			
	ESH Commitment	Responsible Party	Type	Source	Compliance Monitoring	Timing/ Frequency	Responsible Party	Key Performance Indicator
Hydrotesting discharge	Development of an Offshore Hydrotest Disposal Plan, where the specific measures in terms of chemicals to be used are included.	Company	Management		Inspection/ Audit	Before commencement of hydrotesting activities	eni HSEQ Manager	Record of audit
Drilling Materials Potential Disturbance of Marine Fauna Wastes and Decreased Water Quality,	Additives to be used in the water based muds WBM will be inert and eco-friendly, preferably included in the PLONOR list (Pose little or No Risk to the environment)(OSPAR, 2013) Use the lowest feasible chemical contents in the NADF, prioritising those included in the PLONOR list and those with lowest hazard according to the CHARM methodology developed.	eni HSE and Procurement managers to include requirements in tendering documents. Contractor to adopt and implement requirements accordingly	Avoidance Management	ESHIA Phase 2 Annex G Section G.5.1.3	Inspection/ Audit	Once before drilling, then when muds formulation change	eni HSEQ Manager	Record of additives purchased and used.
	eni Ghana shall employ chemicals with lowest toxicity levels in all its operations Use of chemicals suspected to cause taint or known endocrine disruptors should be avoided; Use of Ozone Depleting Substances should be avoided; <i>Chemicals known to contain heavy metals, other than in trace quantities, should be</i>	eni HSEQ and Procurement managers to include requirements in tendering documents. Contractor to adopt and implement such requirements	Avoidance Management	ESHIA Phase 1 Annex G Section G.8.1.1 <i>IFC HSE Offshore Oil&Gas Guidelines</i>	Inspection/ Audit	Once before drilling, then when new chemicals are purchased	eni HSEQ Manager	Record of chemicals purchased and used



Potential ESH Impact	IMPACT MANAGEMENT				IMPACT MONITORING			
	ESH Commitment	Responsible Party	Type	Source	Compliance Monitoring	Timing/ Frequency	Responsible Party	Key Performance Indicator
	<i>avoided.</i>							
	Material safety data sheets (MSDS) shall be provided for chemicals on site.	Contractor, eni HSEQ and eni Procurement			Inspection/ Audit	Once before drilling, then when new chemicals are purchased	eni HSEQ manager, eni HSE Company Man on board	
Potential Disturbance to Ecosystem due to Introduction of Alien Species due to the Discharge of Ballast Water	The Project will adhere to IMO Guidelines for the Control and Management of Ship's Ballast Waste and Sediments (Ballast Water Management Convention). As a result all vessels involved in the Project, including the FPSO, will develop a Ballast Water Management Plan and carry a Ballast Water Record Book where all ballasting operation will be registered. No ballast activities will take place in the near shore area and over the continental shelf, being limited to deep offshore waters (see Attachment A for details).	Contractor	Management	ESHIA Phase 1 Annex G Section G.8.1.1 ESHIA Phase 2 Annex G Section G.5.6.3	Inspection/ Audit	Once before drilling and monthly	Vessel master, eni HSEQ Company Man on board and eni HSE manager	Record of Audit
Contamination from Routine Discharges from Vessel Operations and Occasional Spills	Chemical, fuels and oil storage will be kept or stored in bunded areas on board the vessels to contain leaks and spills. Other sources will have drip trays to contain accidental spills or leaks.	Contractor	Avoidance	ESHIA Phase 2 Annex G Section G.5.1.3	Inspection/ Audit	Once before start of construction and drilling activities, and then monthly	eni HSEQ Company Man on board	Record of Audit
	During the refuelling processes, the fuel will be pumped into the ships' tanks via the tanker and	Contractor			Inspection/ Audit	During re-fuelling operations	eni HSEQ Company Man on board	Spills from re-fueling



Potential ESH Impact	IMPACT MANAGEMENT				IMPACT MONITORING			
	ESH Commitment	Responsible Party	Type	Source	Compliance Monitoring	Timing/ Frequency	Responsible Party	Key Performance Indicator
	all precautions will be taken to prevent spills. The vessels will include sufficient mops, pads and absorbents available during the fueling process, whereby in the unlikely event of any spill occurring it will be dealt with immediately(see Oil Spill Contingency Plan for details). In addition, no refueling will take place in bad weather conditions so as to limit the risk, and will be supervised at all times. Spill drills will also take place every month on each vessel involved in the Project to ensure an efficient response in case such an event occurs.							
Routine Operational Discharges	The decks on the drilling rig and support vessels will be equipped with a drainage system to collect run off for treatment prior to discharge overboard. <i>Deck drainage water: Drainage water generated from precipitation, sea spray, or routine operations, such as deck and equipment cleaning and fire drills, should be routed to separate drainage systems on offshore facilities. This includes drainage water from process areas that could be contaminated with oil (closed</i>	eni Development Project and Procurement Managers, and Contractor r	Reduction on/off site	ESHIA Phase 2 Annex G Sections G.5.1.3, G.6.1.3. MARPOL Annex I IFC HSE Offshore Oil&Gas Guidelines	Inspection/ Audit	Once before start of operations	eni HSEQ Company Man on board	Record of Audit



Potential ESH Impact	IMPACT MANAGEMENT				IMPACT MONITORING			
	ESH Commitment	Responsible Party	Type	Source	Compliance Monitoring	Timing/ Frequency	Responsible Party	Key Performance Indicator
	<i>drains) and drainage water from non-process areas (open drains). All process areas should be bunded to ensure drainage water flows into the closed drainage system. Drip trays should be used to collect run-off from equipment that is not contained within a bunded area and the contents routed to the closed drainage system.</i>							
	A bilge pump and a bilge water separator will be installed for draining the bilge water tank (fitted with a high oil alarm to meet IMO requirements), which discharges to sea. Separated oil will be contained in dedicated tanks (bilge holding tank; dirty oil tank and contaminated drain holding tank).	eni Development Project Manager and Contractor			Inspection/ Audit	Once before start of operations, monthly	eni HSEQ Company Man on board	Record of Audit
	Water collected from the bilge, engine spaces and drainage will be treated to MARPOL Annex I requirements, that is to a level lower than 15 ppm oil content in water. To achieve this, water will be treated in an oil/water separator and continuously monitored by an automatic oil content meter.	eni Development Project Manager and Contractor			Inspection/ Audit Testing and calibration of automatic oil content meter	Once before start of operations Testing/calibration once a month	eni HSEQ Company Man on board	Record of Audit Record of Testing and calibration of automatic oil content meter.



7. Roles and Responsibilities

eni Ghana responsibilities for implementation and monitoring of activities indicated in this plan are indicated in *Table 6.1* and in the documents referenced therein.

eni Ghana shall ensure sufficient resources are allocated on an ongoing basis to achieve effective implementation of Company's responsibilities in this Plan.

Contractors shall ensure sufficient resources are allocated on an ongoing basis to achieve effective implementation of this Plan.

The Contractor's Plans shall describe the resources allocated to the execution of each task and requirement contained therein, and shall describe how roles and responsibilities are communicated to relevant personnel.

The Contractor and eni Ghana HSE team will be the main responsible of the correct implementation of the requirements of this OHMMP. Their responsibilities are described in the following *Table 7.1*.



Table 7.1 Roles and Responsibilities

Name/Title	Responsibilities	Duties
<i>Contractor</i>	Provide overall direction for project construction. Ultimately responsible that the work is conducted in accordance with all of the related commitments.	- Control and supervise the correct implementation of the measures and commitments included within this plan and assigned under the responsibility of the contractor. - Identify the contractor personnel responsible for carrying out and managing each of the commitments. - Provide adequate training to the personnel in line with the requirements and responsibilities assigned to each position. - Provide support to the audit, monitoring and assessment processes performed by eni Ghana or third parties. - Provide early notification of any incident or near miss related to pollution to eni Ghana HSE Team as well as the subsequent formal report of the incident - The contractor selected by eni Ghana will be required to undertake regular inspections to ensure adherence to the Hazardous Materials Management Plan.
<i>eni HSEQ Manager</i>	Provide overall HSE management and guidance on the implementation of this HMMP. Coordinate overall verification, assessment, monitoring and auditing related to the HMMP. Ensure that Contractors are complying with: - The HSE-IMS, HMMP, the ESHMP and the Contractor's HSE plan; - Applicable discharges and hazardous materials handling and storage government regulations; and - Project requirements, specifications, and commitments for Hazardous Materials Management matters.	- Oversee Contractor programs for construction monitoring and audits as specified in this HMMP; generate the appropriate reports; and oversee any corrective actions; - Coordinate control related activities in response to routine or emerging issues; - Collect Contractor monitoring and assessment reports in a timely manner; - Communicate with Contractors regarding compliance issues (including permitting); - Communicate with government authorities (i.e. EPA) as required on pollution issues; - Call in specialists to consult on specific problems or to conduct third-party audits as needed; - Ensure the effective implementation and use of the trainings programs with respect to Hazardous Materials Management issues.



Name/Title	Responsibilities	Duties
<i>eni Logistics Manager and Team</i>	To participate in the definition and preparation of the technical documents for all logistic services tenders; to cooperate with the concerned department/s to the tender evaluation and final recommendation for the contracts award	Ensure, with the collaboration of HSE team, the technical requests in the tender documents for contractors are aligned with the requirements set within this HMMP.
<i>eni Contracts and Procurement Manager and Team</i>	To manage the company procurement process and coordinate the purchase contract awarding process, by receiving the request of material/services, arranging the tendering process, preparing the purchase order/contract to be awarded and relevant amendments.	Ensure, with the collaboration of HSE team, that the technical requests in the tender documents prepared for contractors or to acquire any supply are aligned with the requirements set within this HMMP.
<i>eni Ghana HSEQ Company Man on Board</i>	- Coordinate environmental activities on board; - Communicate the results of verification, assessment, monitoring and auditing inspections to appropriate offices via transmittal of copies of original reports, summaries of reports, or periodic formal and informal reports as appropriate; - Communicate with HSE team (HSE coordinator and HSE Manager) regarding emerging issues and areas of concern; - Communicate (informally) with the Contractors regarding compliance issues; - Implement community engagement and awareness campaigns;	- Work with Contractor HSE personnel: oversee activities performed, review monitoring compliance and reports, and conduct site visits. - Plan and Conduct the independent verification, assessment, monitoring and auditing to ensure compliance with OHMMP requirements and communicate the results to both eni Ghana HSE manager and contractor HSE personnel; - Oversee project requirements, specifications, and commitments for matters related to the scope of this plan. - Communicate through verbal and written reports to the HSE Manager regarding compliance issues and areas of concern. - Advise the Contractor on board personnel concerning issues related the contents of this plan, including implementation of commitments, their verification, assessment, monitoring and auditing and the interpretation of related regulatory requirements. - Revise, in collaboration with Procurement and Contracts teams, the tendering and contracting documents for/with contractors to ensure all technical requirements set within this OHMMP are included and properly reflected in the documents.



8. Training Awareness and Competency

Project shall ensure that personnel responsible for the execution of tasks and requirements in the Offshore Hazardous Materials Management Plan are competent on the basis of education, training and experience. The Contractor Plan shall describe the training and awareness requirements necessary for its effective implementation.

Section 13 of the ESHMP provides details on the training, awareness and competency procedures for the project. Minimum environmental, social and health training requirements per role within the Project are presented in section 13.3 of the ESHMP. Additional training requirements for this specific management plan are presented in *Table 8.1* below.

Project training activity associated with the implementation of the Offshore Hazardous Materials Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Table 8.1 Specific training requirements

Position (from all companies involved)	Training Topic	Frequency
eni HSE Company man on board. Contractor Personnel in charge of implementing the HMMP	Detailed training on the commitments and mitigations measures of the HMMP.	Prior to start any of the activities. Refreshers and updates every year and after any change or update in the plan.
All personnel dealing with hazardous materials (including fuel)	Handling and storage of hazardous materials.	Prior to start any of the activities. Refreshers and updates every year.



9. Performance Indicators

Performance indicators are used to measure and track performance against the effectiveness of mitigation and control measures described in this Plan. General performance indicators may also be relevant, such as training and awareness numbers.

Performance indicators must be measurable against a specified target. The performance indicators outlined in *Table 6.1* apply to this Plan. Details regarding how they will be measured, target/benchmark and frequency of control are described in *Table 9.1*.

However Contractors may, subject to agreement with Company, modify or add to these indicators to enhance the Contractor’s plan, based on lessons from the performance indicators.

Table 9.1 Performance Indicators

Performance Indicator	Measurement	Target/Benchmark	Frequency OF Monitoring
Spills from re-fuelling	Number of spills	No spills	Every re-fuelling operation
Record of substances purchased and used: chemicals and additives	Number of substances used in offshore operations that do not comply with eni standards on the use of chemicals with lowest toxicity levels	Full compliance with eni standards for chemicals and additives	Prior start of activities and at each new purchase of chemicals and additives



10. Reporting

10.1 eni Ghana

Throughout the project, eni Ghana will keep regulatory authorities informed of the performance with respect to HSE matters (as indicated in the ESHMP Section 11). The HSE status report will include performance details of the OHMMP.

In the HSE report that eni will prepare monthly, the content will at least include:

- Details and results of all monitoring and assessment undertaken during the reporting period following the requirements of this HMMP;
- Detail of the audits undertaken during the reporting period;
- Results of the performance indicators applicable during the reporting period detailed this HMMP;
- Summary and latest status of the incidents, Non-Conformance and Observations having occurred or being detected during the reporting period (including those not closed in previous reports) together with the corrective and remedial actions undertaken or the planned response;
- Summary and status of Non-Conformities and Findings/Observations and corrective actions undertaken or planned in response, as described in the ESHMP Framework Section 11.4;
- Records of liquid discharges, ballast operations, spills if applicable.

10.2 Contractor

Periodic reports related to the implementation and operation of the OHMMP.

Two types of reports have been considered and defined in the ESHMP Section 11.2: A Weekly Site Inspections Report and a Monthly Construction Report. These reports will be created by the Contractor manager and sent to eni Ghana HSE manager for review.

The Weekly Site Inspections Report will include the compiled results of a daily check of conditions with respect to hazardous materials liquids discharge and control commitments and the implementation of mitigation measures.

The contractor's monthly report shall include, in relation to this HMMP, at least the following content:



- Any additional management and mitigation measure applied where applicable;
- Results and details of monitoring undertaken by Contractor during the reporting period.
- Results of the Performance Indicators defined in this Plan that are applicable during the reporting period and any other performance indicator considered;
- Summary and status of incidents, non-Conformities and Findings/Observations documented as part of Contractors' verification and monitoring, as described in the ESHMP Framework Section 11.4;
- Assessment and audit reports and summary and status of all Non-Conformities that had been identified therein;
- Copies of all related written communications from official authorities of Ghana;
- Records of liquid discharges, ballast operations, spills if applicable.

10.3 Incident notification and reporting

All incident notification and reporting related to incidents arising as a result of construction activities will be appropriately recorded, documented and notified as per eni Ghana HSE IMS requirements and in accordance with ESHMP, as detailed in its section 11.

In any case Contractor shall immediately notify Company of all unplanned liquid discharge and hazardous material spills detailing material released, volume, location, cause and proposed corrective measures, where appropriate.

For all uncontained releases, Contractor shall provide the following additional information:

- Response time
- Clean up requirements
- Outcome and initial assessment of environmental and social impact

10.4 Reporting of non-conformities

The reporting of non-conformities related to construction pollution prevention will follow eni Ghana HSE IMS requirements and in line with Section 11.4 of the ESHMP.



10.5 Document Control

The document control procedure related to Offshore Hazardous Material Management Plan will follow the eni Ghana HSE IMS requirements and in line with Section 11.6 of the ESHMP.



11. Appendices

Appendix A. Summary of MARPOL Annexes I regulations

Appendix B. Main Requirements of the international Ballast Water Management Convention

Appendix C. 2015 WBG EHS Guidelines Effluent Levels for Offshore Oil and Gas Development

Appendix D. 2013 OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment (PLONOR)

Appendix E. January 2016 Ranked List of Registered Products According to the CHARM Methodology



Appendix A. Summary of MARPOL Annex I regulations

Table A.11.1 MARPOL Annex I - Applies to all vessels

Vessel/Voyage type/Area	Sub-Category	Discharge Conditions
All vessels $\geq$ 400 gross tons All waters	Machinery space bilges	Proceeding en route; and - Oil content less than 15 parts per million; and - Oil discharge monitoring and control system and oil filtering equipment to be operating In some circumstances, oil or oily mixtures, may be retained on board for discharge to port reception facilities – see MARPOL Annex I, Regulation 14. Note: 15ppm discharges can be anywhere at sea (not within port limits) .Vessel must not be stationary when undertaking discharge.
All vessels <400 gross tons All waters	Machinery space bilges	- Oil and all oily mixtures retain onboard for on shore disposal OR - Proceeding en route; and - Has in operation equipment of a design approved by the administration that ensures oil content less than 15 parts per million. Note: 15ppm discharges can be anywhere at sea (not within port limits). Vessel must not be stationary when undertaking discharge.



Appendix B. Main Requirements of the international Ballast Water Management Convention

Annex - Section B Management and Control Requirements for Ships

Ships are required to have on board and implement a Ballast Water Management Plan approved by the Administration (Regulation B-1). The Ballast Water Management Plan is specific to each ship and includes a detailed description of the actions to be taken to implement the Ballast Water Management requirements and supplemental Ballast Water Management practices.

Ships must have a Ballast Water Record Book (Regulation B-2) to record when ballast water is taken on board; circulated or treated for Ballast Water Management purposes; and discharged into the sea. It should also record when Ballast Water is discharged to a reception facility and accidental or other exceptional discharges of Ballast Water.

The specific requirements for ballast water management are contained in regulation B-3 Ballast Water Management for Ships:

Ships constructed before 2009 with a ballast water capacity of between 1500 and 5000 cubic metres must conduct ballast water management that at least meets the ballast water exchange standards or the ballast water performance standards until 2014, after which time it shall at least meet the ballast water performance standard.

Ships constructed before 2009 with a ballast water capacity of less than 1500 or greater than 5000 cubic metres must conduct ballast water management that at least meets the ballast water exchange standards or the ballast water performance standards until 2016, after which time it shall at least meet the ballast water performance standard.

Ships constructed in or after 2009 with a ballast water capacity of less than 5000 cubic metres must conduct ballast water management that at least meets the ballast water performance standard.



Ships constructed in or after 2009 but before 2012, with a ballast water capacity of 5000 cubic metres or more shall conduct ballast water management that at least meets the standard described in regulation D-1 or D-2 until 2016 and at least the ballast water performance standard after 2016.

Ships constructed in or after 2012, with a ballast water capacity of 5000 cubic metres or more shall conduct ballast water management that at least meets the ballast water performance standard.

Other methods of ballast water management may also be accepted as alternatives to the ballast water exchange standard and ballast water performance standard, provided that such methods ensure at least the same level of protection to the environment, human health, property or resources, and are approved in principle by IMO's Marine Environment Protection Committee (MEPC).

Under Regulation B-4 Ballast Water Exchange, all ships using ballast water exchange should whenever possible, conduct ballast water exchange at least 200 nautical miles from the nearest land and in water at least 200 metres in depth, taking into account Guidelines developed by IMO.

In cases where the ship is unable to conduct ballast water exchange as above, this should be as far from the nearest land as possible, and in all cases at least 50 nautical miles from the nearest land and in water at least 200 metres in depth.

When these requirements cannot be met areas may be designated where ships can conduct ballast water exchange. All ships shall remove and dispose of sediments from spaces designated to carry ballast water in accordance with the provisions of the ships' ballast water management plan (Regulation B-4).

Annex - Section C Additional measures

A Party, individually or jointly with other Parties, may impose on ships additional measures to prevent, reduce, or eliminate the transfer of Harmful Aquatic Organisms and Pathogens through ships' Ballast Water and Sediments.



In these cases, the Party or Parties should consult with adjoining or nearby States that may be affected by such standards or requirements and should communicate their intention to establish additional measure(s) to the Organization at least 6 months, except in emergency or epidemic situations, prior to the projected date of implementation of the measure(s). When appropriate, Parties will have to obtain the approval of IMO.

Annex - Section D Standards for Ballast Water Management

There is a ballast water exchange standard and a ballast water performance standard. Ballast water exchange could be used to meet the performance standard:

Regulation D-1 Ballast Water Exchange Standard - Ships performing Ballast Water exchange shall do so with an efficiency of 95 per cent volumetric exchange of Ballast Water. For ships exchanging ballast water by the pumping-through method, pumping through three times the volume of each ballast water tank shall be considered to meet the standard described. Pumping through less than three times the volume may be accepted provided the ship can demonstrate that at least 95 percent volumetric exchange is met.

Regulation D-2 Ballast Water Performance Standard - Ships conducting ballast water management shall discharge less than 10 viable organisms per cubic metre greater than or equal to 50 micrometres in minimum dimension and less than 10 viable organisms per millilitre less than 50 micrometres in minimum dimension and greater than or equal to 10 micrometres in minimum dimension; and discharge of the indicator microbes shall not exceed the specified concentrations.

The indicator microbes, as a human health standard, include, but are not be limited to:

- a. Toxicogenic *Vibrio cholerae* (O1 and O139) with less than 1 colony forming unit (cfu) per 100 millilitres or less than 1 cfu per 1 gram (wet weight) zooplankton samples ;
- b. *Escherichia coli* less than 250 cfu per 100 millilitres;
- c. Intestinal Enterococci less than 100 cfu per 100 millilitres.



Ballast Water Management systems must be approved by the Administration in accordance with IMO Guidelines (Regulation D-3 Approval requirements for Ballast Water Management systems). These include systems which make use of chemicals or biocides; make use of organisms or biological mechanisms; or which alter the chemical or physical characteristics of the Ballast Water.

Prototype technologies

Regulation D-4 covers Prototype Ballast Water Treatment Technologies. It allows for ships participating in a programme approved by the Administration to test and evaluate promising Ballast Water treatment technologies to have a leeway of five years before having to comply with the requirements.

Review of standards

Under regulation D-5 Review of Standards by the Organization, IMO is required to review the Ballast Water Performance Standard, taking into account a number of criteria including safety considerations; environmental acceptability, i.e., not causing more or greater environmental impacts than it solves; practicability, i.e., compatibility with ship design and operations; cost effectiveness; and biological effectiveness in terms of removing, or otherwise rendering inactive harmful aquatic organisms and pathogens in ballast water. The review should include a determination of whether appropriate technologies are available to achieve the standard, an assessment of the above mentioned criteria, and an assessment of the socio-economic effect(s) specifically in relation to the developmental needs of developing countries, particularly small island developing States.

Annex- Section E Survey and Certification Requirements for Ballast Water Management

Gives requirements for initial renewal, annual, intermediate and renewal surveys and certification requirements. Appendices give form of Ballast Water Management Certificate and Form of Ballast Water Record Book.



Appendix C. 2015 WBG EHS Guidelines Effluent Levels for Offshore Oil and Gas Development

Parameter	Guideline
Drilling fluids and cuttings - NADF	1) NADF: Reinject or ship-to-shore, no discharge to sea 2) Drilled cuttings: Reinject or ship-to-shore, no discharge to sea except: - Facilities located beyond 3 miles (4.8 km) from shore; - For new facilities: a Organic Phase Drilling Fluid concentration lower than 1% by weight on dry cuttings; - For existing facilities: Use of Group III non-aqueous base fluids and treatment in cutting dryers. Maximum residual Non Aqueous Phase Drilling Fluid (NAF) 6.9% (C16 -C18 internal olefins) or 9.4% (C12-C14 ester or C8 esters) on wet cuttings; - Hg: max 1 mg/kg dry weight in stock barite; - Cd: max 3 mg/kg dry weight in stock barite; - Discharge via a caisson (at least 15 m below surface is recommended whenever applicable; in any case, a good dispersion of the solids on the seabed should be demonstrated).
Drilling fluids and cuttings – WBDF	1) WBDF: Reinject or ship-to-shore, no discharge to sea except: - In compliance with 96 hr. LC-50 of Suspended Particulate Phase (SPP)-3% vol. toxicity test first for drilling fluids or alternatively testing based on standard toxicity assessment species (preferably site-specific species) 2) WBDF cuttings: Reinject or ship-to-shore, no discharge to sea except: - Facilities located beyond 3 miles (4.8 km) from shore; - Hg: 1 mg/kg dry weight in stock barite; - Cd: 3 mg/kg dry weight in stock barite; - Maximum chloride concentration must be less than four times the ambient concentration of fresh or brackish receiving water; - Discharge via a caisson (at least 15 m below sea surface is recommended whenever applicable; in any case, a good dispersion of the solids on the seabed should be demonstrated).
Produced water	Reinject. Discharge to sea is allowed if oil and grease content does not exceed 42 mg/l daily maximum; 29 mg/L monthly average
Flow-Back Water	Reinject or reuse. Discharge to sea is allowed if oil and grease content does not exceed 42 mg/L daily maximum; 29 mg/L monthly average. An environmental risk assessment to determine the maximum site-specific allowable concentrations should be conducted for all other chemicals



Parameter	Guideline
Completion and Well Work-Over Fluids	Ship-to-shore or reinject. No discharge to sea except: - Oil and grease content does not exceed 42 mg/L daily maximum; 29 mg/L monthly average; - Neutralize to attain a pH of 5 or more; - In compliance with 96 hr. LC-50 of SPP-3% vol. toxicity test first for drilling fluids or alternatively testing based on standard toxicity assessment species (preferably site-specific species).
Produced sand	Ship-to-shore or reinject: No discharge to sea except when oil concentration lower than 1% by weight on dry sand
Hydrotest Water	- Send to shore for treatment and disposal; - Discharge offshore following environmental risk analysis, careful selection of chemicals; - Reduce use of chemicals.
Cooling Water	The effluent should result in a temperature increase of no more than 3°C at edge of the zone where initial mixing and dilution take place. Where the zone is not defined, use 100 m from point of discharge.
Desalination Brine	Mix with other discharge waste streams, if feasible.
Sewage	Compliance with MARPOL 73/78h
Food Waste	Compliance with MARPOL 73/78h
Bilge water	Compliance with MARPOL 73/78h
Storage Displacement Water	Compliance with MARPOL 73/78h
Deck drainage	Compliance with MARPOL 73/78h

Source: WBG EHS Guidelines Effluent Levels for Offshore Oil and Gas Development, June 2015



Appendix D. 2013 OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment (PLONOR)



Appendix E. January 2016 Ranked List of Registered Products According to the CHARM Methodology

The list of chemicals commonly used in offshore exploration and production activities ranked according to a Hazard Quotient (HQ), calculated using the Chemical Hazard and Risk Management (CHARM) model, is frequently updated and can be consulted in the following webpage:

<https://www.cefas.co.uk/cefas-data-hub/offshore-chemical-notification-scheme/>

This list uses the OSPAR Harmonised Mandatory Control Scheme (HMCS) developed through the OSPAR Decision 2000/2 on a Harmonised Mandatory Control System for the Use and Discharge of Offshore Chemicals (as amended by OSPAR Decision 2005/1) and its supporting Recommendations.

