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Établissements Classés

Greater Tortue / Ahmeyim
Phase 1 Gas Production Project
**Environmental and Social
Impact Assessment**

Consolidated Final Report
Including Regulatory Reviews
from Mauritania and Senegal

June 2019

Volume 7 of 7



In partnership with



ESIA report produced by



The report on the environmental and social impact assessment for the Greater Tortue/Ahmeyim Phase 1 Gas Production Project is divided into 7 volumes as follows:

- Volume 1: The Non-Technical Summary, the list of Main Contributors to the ESIA, the Table of Contents, the list of Abbreviations and Acronyms, as well as Chapters 1 to 6
- Volume 2: Chapter 7
- Volume 3: Chapters 8 to 11 as well as the Bibliography and References
- Volume 4: Appendices A to J
- Volume 5: Appendices K to O
- Volume 6: Appendices P to R
- Volume 7: Appendices S to Y

The present document is **Volume 7** which contains:

- Appendix S - Preliminary Waste Management Plan
- Appendix T - Preliminary Decommissioning Plan
- Appendix U - Monitoring Plan of the ESMP and SMP by the Mauritanian and Senegalese Authorities
- Appendix V - Technical Committee Meetings for the Pre-Validation of the ESIA (Senegal)
- Appendix W - Public Hearing (Senegal)
- Appendix X - Public Enquiry (Mauritania)
- Appendix Y - Environmental Authorizations

**APPENDIX S: PRELIMINARY WASTE
MANAGEMENT PLAN**

GREATER TORTUE/AHMEYIM - PHASE 1 GAS PRODUCTION PROJECT

Preliminary Waste Management Plan

**Prepared for the Environmental and Social
Impact Assessment of the GTA - Phase 1
Project**

Golder Associates

October 2018

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ABBREVIATIONS

ALARP	As Low as Reasonably Practicable
BACT	Best Available Control Technology
BAT	Best Available Techniques
BP	BP Group of Companies
BPEO	Best Practicable Environmental Option
E&S	Environmental and Social
EHS	Environmental, Health and Safety
ESIA	Environmental and Social Impact Assessment
FLNG	Floating Liquefied Natural Gas
FPSO	Floating Production, Storage and Offloading
GDP	Group Defined Practice
GIIP	Good International Industry Practice
GPO	Global Project Organization
GRP	Group Recommended Practice
GTA	Greater Tortue/Ahmeyim
HSSE	Health, Safety, Security and Environment
IFC	International Finance Corporation
IMO	International Maritime Organization
LNG	Liquefied Natural Gas
MARPOL	International Convention for the Prevention of Pollution from Ships (1973 as modified by the Protocol of 1978)
MEPC	Marine Environment Protection Committee
MSDS	Material Safety Data Sheet
OPDF	Organic-Phase Drilling Fluids
SBDF	Synthetic Based Drilling Fluids
ULQ	Utilities and Living Quarters
WBG	World Bank Group
WMP	Waste Management Plan
WMS	Waste Management System

1.0 INTRODUCTION

1.1 Background

BP is developing the Greater Tortue/Ahmeyim (GTA) Phase 1 project. It comprises a subsea production system tied back to a pre-treatment Floating Production, Storage and Offloading (FPSO) unit, which subsequently transfers gas to a near-shore hub for Liquefied Natural Gas (LNG) production and export. Details of the project description are provided in Chapter 2 of the project's ESIA report.

1.2 Purpose

Waste will be generated during the GTA Phase 1 project, including hazardous and non-hazardous waste.

The purpose of the Preliminary Waste Management Plan is to define the key principles to be adopted for waste management for the full GTA Phase 1 project. The preliminary plan builds on work already undertaken and ongoing, including the Environmental and Social (E&S) screening process, Environmental Value Improving Programme on Waste Minimization, and the Environmental and Social Impact Assessment (ESIA).

This Preliminary Waste Management Plan has been prepared for the ESIA of the GTA Phase 1 project based on the Waste Management Strategy document developed by KBR (2017).

1.3 Scope

This Preliminary Waste Management Plan is applicable to the GTA Phase 1 project facilities (FPSO, Hub - including FLNG and Utilities and Living Quarters (ULQ) - and subsea infrastructure).

2.0 REGULATIONS, STANDARDS AND GUIDELINES

Storage, handling and disposal of the GTA Phase 1 project wastes shall be managed in accordance with relevant legislation, international and BP standards as well as demonstrating best industry practice. In case of conflicting requirements in the governing documents, the most stringent requirements shall be applied.

2.1 National Regulations

Regulatory requirements of Mauritania and Senegal, in relation to waste segregation, storage, transport, treatment and disposal, shall be observed including all permits, licenses, authorizations, notifications and consents requirements.

Permits and approvals shall be obtained in advance of the activity taking place.

The Management of Change Procedure shall describe the process by which new regulatory requirements are identified, assessed and complied with, if relevant.

2.1.1 Mauritania

In Mauritania, there are various bodies with responsibilities for environmental protection, including:

- Ministry of Petroleum, Energy and Mines which implements and formulates government policies, laws and regulations regarding oil and gas, energy and mining;
- Ministry of Environment and Sustainable Development which, with departments including the Department of Environmental Control, is the national authority responsible for the preparation, coordination, implementation, monitoring and assessment of the government's environmental and sustainable development policy; and

- Ministry of Fisheries and Maritime Economy which is in charge of designing, coordinating, promoting and ensuring the monitoring of the government's policy implementation in the areas of fisheries, oceanography, merchant marine activities, and maritime training.

Mauritania's regulatory framework relating to the environment is defined by the Environment Code (Law N° 2000-45); the decrees relating to impacts assessments, including Decrees N° 2004-094 and 2007-105; the Crude Hydrocarbons Code (Law N° 2010-033); and the Prevention and Fight against Marine Pollution Act (Law N° 2011-022) which includes requirements for the prevention and repression of marine pollution by dumping and incineration of waste.

2.1.2 Senegal

The project will comply with requirements of all relevant bodies in Senegal with responsibilities for environmental protection, including those listed below (bearing in mind that this list is not exhaustive):

- Ministry of Oil and Energies which implements and enforces the state's regulation and policy regarding land and sea energy resources, both during exploration and production activities;
- Ministry of Environment and Sustainable Development which develops, implements, and enforces national regulations and policies on environmental protection and sustainable development, and the Department of Environment and Classified Establishments which is responsible for implementing Senegal's governmental regulation regarding the environment and classified establishments, specifically to protect the natural environment and people against pollution and nuisance; and
- Ministry of Fisheries and Maritime Economy which is in charge of developing and implementing national regulations and policies on the fishing industry, the exploitation of seabed, aquaculture, port infrastructure, and maritime transport.

Senegal's regulatory framework relating to the environment is primarily defined by Law N° 2001-01 of January 15, 2001 covering the Environmental Act, as well as by Decree N° 2001-282 of April 12, 2001 on application of the Environmental Act.

2.1.3 ESIA Requirement

Given the specific features of the GTA Phase 1 project, BP is required by both Mauritania and Senegal to commission an ESIA. The purpose of the ESIA is to assess environmental and social potential impacts from all project activities during all phases before any activities are carried out and to define mitigations measures which then become commitments for the project.

The ESIA will include commitments in relation to waste generated during drilling and during construction, operations and decommissioning phases. The project shall comply with these commitments.

2.2 International Conventions and Treaties

Mauritania and Senegal have signed up to a number of conventions, protocols and bilateral regional and international agreements. The project shall comply with relevant waste management requirements raised in those Conventions and Treaties.

International conventions and treaties relevant to the project include the following (bearing in mind that this list is not exhaustive):

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal;
- Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movements and Management of Hazardous Wastes within Africa; and
- MARPOL, in particular Annex I Regulations for the Prevention of Pollution by Oil and Annex V Regulation for the Prevention of Pollution by Garbage from Ships.

2.3 IFC WBG Performance Standards and Guidelines

The GTA Phase 1 project ESIA takes into account the International Finance Corporation (IFC) standards and the World Bank Group (WBG) Environmental, Health and Safety guidelines.

2.3.1 Performance Standards

The IFC Performance Standards provide objectives and requirements in order to minimize the adverse environmental and social impacts of developments projects it supports and to optimize the benefits of these projects. They are designed to help avoid, mitigate and manage risks and impacts in a sustainable way. Performance Standard 3 aims to promote more sustainable use of resources and to prevent pollution.

2.3.2 Guidelines

The WBG Guidelines (general and specific to facilities) provide guidance on waste management and identify Good International Industry Practice (GIIP). Relevant guidelines include the following:

- General EHS Guidelines;
- Specific guidelines for Construction Materials Extraction;
- Specific guidelines for Offshore Oil and Gas development;
- Specific guidelines for Onshore Oil and Gas development (with regard to onshore disposal of offshore-generated drill cuttings); and
- Specific guidelines for LNG Facilities.

2.4 BP Policy, Procedures and Guidelines

The GTA Phase 1 project shall comply with BP Health, Safety, Security and Environment (HSSE) requirements mandated by BP Operating Management System and described in the contained in Group Practices including the BP Code of Conduct.

2.5 Best Practicable Environmental Option

In addition to meeting all regulatory requirements, the GTA Phase 1 project will adopt Best Available Techniques (BAT) / Best Available Control Technology (BACT) to determine the Best Practicable Environmental Option (BPEO) so that potential impacts are reduced to As Low As Reasonably Practicable (ALARP).

2.6 Standards Applicable to Wastes from the GTA Phase-1 Project

2.6.1 Drilling Waste

Drill Cuttings

Discharge to sea without treatment is not permitted. SBDF cuttings will only be discharged once the performance targets of 6.9 g/100 g retained “synthetic on cuttings” on wet solids averaged over the whole well discharge can be satisfied. The concentration of SBDF on cuttings will be monitored on the drillship. No excess or spent SBDF will be discharged to the sea. Spent or excess SBDF that cannot be re-used during drilling operations will be brought back to shore for disposal.

If mineral oil base drilling fluid (OPDF) were to be selected, cuttings contaminated with mineral oil base drilling fluid at a concentration greater than 1% by weight mineral oil on dry cuttings will not be discharged. No OPDF will be discharged as whole fluid.

Drill Fluids

Completion and well workover fluids to be discharged overboard will be tested to confirm the fluids are suitable for discharge as required by applicable national and international regulations. Fluids that do not meet the specification would either be treated offshore or transported onshore for transfer to an approved disposal facility (in-country or an international provider).

2.6.2 Solid / Food Waste (MARPOL)

Ships shall be certified for compliance with offshore requirements for waste, including in particular the latest International Maritime Organization (IMO) requirements as given in Annex V of MARPOL and resolutions issued by the IMO Marine Environment Protection Committee (MEPC).

Relevant requirements will be observed, including the need for a Garbage Record Book (whether as part of the ship's official log book or otherwise) which shall record details of all discharge operations.

In line with requirements for the GTA Phase 1 project:

- All solid wastes shall be separated by category and stored in appropriate, labelled containers before being shipped to shore for reuse, recycling or disposal; and
- Food waste will be ground prior to discharge (i.e., comminuted) to <25 mm diameter to meet discharge requirements, in accordance with MARPOL (i.e., for vessels 400 gross tonnage and above). When ground to these specifications, food waste discharges are allowed if the vessel is 3 nmi (5.6 km) or more from land, or 12 nmi (22.2 km) or more from land when within special areas.

3.0 DETAILS OF THE PRELIMINARY WASTE MANAGEMENT PLAN

The Preliminary Waste Management Plan defines the approach and requirements which shall be implemented for the GTA Phase 1 project to allow wastes generated to be:

- Reduced to ALARP; and
- Disposed of in a manner that complies with regulatory and BP requirements and that does not harm people or result in a significant impact to the environment.

The approach and requirements shall be implemented within a Waste Management System (WMS) that systematically addresses all issues linked to waste minimization, generation, transport, disposal and monitoring.

3.1 Roles and Responsibilities

Roles and responsibilities with regards to waste management shall be clearly defined, documented and communicated to relevant personnel. Typically, these roles and responsibilities are described in the Waste Management Plan (WMP) or in the HSSE Management Plan.

3.2 Waste Management Hierarchy

The waste management hierarchy outlined below shall be adopted for the project:

- 1) Avoid or minimize the generation of waste materials, as far as practicable;
- 2) Where waste generation cannot be avoided but has been minimized, recover and reuse / recycle waste; and
- 3) Where waste cannot be recovered or reused, treat and dispose of it in an environmentally sound manner.

3.2.1 Waste Prevention

The most desirable strategy for dealing with waste is the first i.e. avoid generating waste in the first place. Waste prevention / minimization will be an environmental consideration in early design so that construction and operational wastes and the hazards associated with them can be identified and minimized.

The following strategies will be adopted, where possible:

- Minimization of waste by design (e.g. use of wax inhibitor to minimize the generation of wax in a pipeline);
- Substitution of raw materials or inputs with less hazardous or toxic;
- Procedures for good procurement processes i.e. avoiding disposable materials, procuring products with a long life-time;
- Return of spent chemicals and residues and empty packaging to suppliers as much as possible;
- Good housekeeping and operating practices, including inventory control;
- Minimization of hazardous waste generation by implementing stringent waste segregation to prevent the commingling of non-hazardous and hazardous waste; and
- Preventive maintenance of equipment.

3.2.2 Waste Re-use / Recycling

Once all opportunities for waste prevention / minimization have been adopted, recycling options shall be explored, including:

- Identification of materials for potential re-use;
- Identification of potentially recyclable materials;
- Recycling of products within internal processes, where possible;
- Identification of external recycling options;
- Tracking of waste generation and recycling rates; and
- Training and incentives of employees to meet recycling objectives.

3.2.3 Waste Treatment / Disposal

If waste materials are still generated after the implementation of feasible waste prevention, reduction, reuse, recovery and recycling measures, waste shall be treated and disposed of in a way that minimizes potential impacts to human health and the environment and complies with local regulations and requirements with due regard to Duty of Care.

The project will adopt the Proximity Approach, which is based on the principle of disposal of waste at source, or as close to source as possible, in order to reduce risk and provide a cost-effective approach to the management of waste. The disposal facility shall be approved by BP.

3.3 Waste Management Plan

A WMP which complies with all relevant regulatory requirements and standards shall be developed prior to the commencement of construction work in order to define the storage, collection and

evacuation of waste, including liquid, solid, hazardous and non-hazardous waste while also taking into account their packaging.

The plan shall describe waste sorting, its transfer and disposal in appropriate places and include a procedure to monitor the performance of all sub-contractors involved. It shall consider the capacity constraints of local storage and treatment centres in order to select the most suitable destination for disposal.

The WMP shall include the following, as appropriate:

- Consideration of country or region-specific waste management strategies;
- Review and understanding of the receiving environment and possible risks associated with operation of the existing or proposed waste management facilities;
- Implementation of the Proximity Principle in order to reduce risk and provide a cost-effective approach;
- Application of avoidance and minimization, (e.g. return to vendor, reuse and recycling measures, toxicity reduction);
- Identification and characterization of all potential waste streams;
- Details of how each waste stream will be managed in accordance with the waste hierarchy, including personnel responsible;
- Recording and manifesting system requirements;
- Segregation, labelling and storage requirements;
- Process for assessment, selection, management and monitoring of waste management contractors and facilities;
- Reporting systems, including waste management, key performance indicators for reduction or recycling;
- Training and awareness program;
- Details of proposed continual improvement measures; and
- Review period.

3.4 Waste Inventory

In accordance with BP HSSE requirements, a waste inventory shall be developed and maintained throughout the life of the field.

A preliminary inventory shall be developed and refined and updated as the design develops and the level of engineering provides greater accuracy of information and management options for each of these waste streams are identified.

The inventory shall include a waste forecast that includes the nature, quantity and characteristics of the anticipated waste streams from all phases of the project.

3.4.1 Waste Classification

Waste products shall be categorized as hazardous or non-hazardous according to their properties and potential risks that they may pose to human health and / or the environment if improperly managed.

3.4.2 Waste Storage

Hazardous wastes shall always be segregated from non-hazardous wastes and stored so as to prevent or control accidental releases to air, soil, and local water resources.

Volume-reducing measures shall be considered and applied prior to storage. The manner of storage shall also prevent the commingling or contact between incompatible wastes and allow for inspection between containers to monitor leaks or spills.

Procedures relating to hazardous waste storage and handling shall only be conducted by employees who have received specific training. Good storage housekeeping practice shall be applied, including the following:

- Layout shall make provision for suitable waste collection areas.
- Collection bins shall be located, in sufficient numbers, in all waste-producing areas. Bins shall be labelled appropriately.
- Containers shall be suitable for the nature and hazard of the waste being stored.
- All hazardous materials such as highly reactive, oxidizable, volatile and flammable chemicals shall be clearly labelled, segregated and stored in appropriate, secured areas as detailed by the Material Safety Data Sheets (MSDSs). Hazard signs will be placed at appropriate locations to warn construction personnel from straying into hazardous areas.
- All main waste storage receptacles shall be replaced promptly in the event of damage or excessive weathering.

The project shall avoid waste accumulation; however, if wastes are to be stored temporarily other than at the point of generation, such as at an onshore base, a risk assessment shall be conducted to assess:

- Suitability of the containment area (proximity to surface or ground water, soil and air receptors);
- Suitability of storage conditions that take account of the characteristics of the waste;
- Design of storage facilities with regard to concrete standing / bunded areas - covered if appropriate;
- Risk of exposure to environment and people;
- Availability of MSDSs and waste manifest information;
- Emergency response considerations (e.g. eyewash and emergency shower, fire extinguisher, waste type and hazard nature);
- Secure protection from unauthorized access; and
- Provision, where appropriate, of a base that will prevent migration of spilled materials into soil, surface water and groundwater.

Under national legislation governing hygiene, medical waste shall be collected separately from domestic waste, packed so as to avoid any kind of contamination and be disposed of by a government-approved facility.

3.5 Waste Tracking

A waste tracking system governing waste transfers from the project directly to third parties and / or to storage, reuse, recycling, treatment and transfer disposal sites shall be developed, described in the WMP and maintained throughout the project.

Projects shall include the following in the waste tracking documentation:

- Unique identification reference;
- Waste type;
- Waste quantity;
- Producer, transporter, storage and disposal details;
- Verification that applicable national or local legal and regulatory requirements are met; and
- Periodic assessment of the waste management chain of custody documentation (from storage through to disposal, recycling or reuse) of project wastes being handled and disposed of by third parties.

3.6 Transportation of Waste

The handling and transportation of waste shall be minimized wherever possible. When required, off-site transportation of waste shall be conducted so as to prevent or minimize spills, releases, and exposure to employees and the public.

Transportation shall be subject to a risk assessment, which shall include the following:

- Identification of potential hazards posed by transportation;
- Suitability of containers;
- Provision of suitable spill containment measures and spill kit;
- Use of appropriate labelling;
- Transportation documentation;
- Remedial clean-up capability;
- Provision of information to the transporter of any potential risks associated with the waste consignment; and
- Provision of information on hazardous waste (i.e. MSDS) which documents the potential hazards, physical properties and human exposure limits.

All waste containers designated for off-site shipment shall be secured and labelled with the contents and associated hazards, be properly loaded on transport vehicles suitable for the waste being transported before leaving the site, and be accompanied by a shipping paper that describes the load and its associated hazards.

Transboundary transportation of hazardous wastes and their disposal shall be compliant with limitations applicable to its transboundary movement.

3.7 Use of Onshore Waste Handling Service Providers

The project shall conduct a review of in-country or regional waste management infrastructure in order to assess its ability to meet the requirements described in Section 2.0 and to identify actions to close potential gaps.

The project shall establish and implement a process for the selection and monitoring of waste management contractors and facilities, which shall be described in the WMP.

Where possible, in-field methods shall be adopted to treat and dispose of waste without the use of third parties to minimize exposure to risk. Where it is necessary to use third-party service providers, the following control measures shall be implemented:

- Use of service providers that are reputable and legitimate enterprises licensed by the relevant government regulatory agencies;
- Requirement for chain of custody documentation to the final destination; and
- Performance reviews to ascertain whether licensed disposal sites are being operated to acceptable standards.

3.7.1 Duty of Care

Under the 'Duty of Care' principle, BP shall control that it handles all of its waste safely and in compliance with the appropriate regulations, and shall verify that its contractors do the same. This includes verifying that organization collecting, transporting or receiving BP waste has the required authorization and competence.

Monitoring of third-party environmental performance will include periodic audits, including site visits to treatment, storage and disposal locations. Any actions recorded as a result of these inspections will be tracked by BP.

3.8 Monitoring

Hazardous and non-hazardous waste management activities shall be monitored by the following:

- Regular visual inspections of all waste storage collection and storage areas for evidence of accidental releases and to verify that wastes are properly labelled and stored;
- Documentation of any changes to storage arrangements and any significant changes in the type and / or quantity of materials in storage;
- Reviews of waste segregation and collection practices;
- Tracking of waste generation trends by type and amount of waste generated;
- Characterization of waste at the beginning of generation of a new waste stream, and documentation of management procedures, with special attention to hazardous waste;
- Maintenance of records that document the amount of waste generated and its destination; and
- Periodic audits of third parties, including site visits.

3.9 Training and Awareness

The WMP shall describe training requirements for personnel involved in waste management activities.

3.10 Records

Systematic recording of transport forms detailing the type of waste, the amount and its destination, and indicating the carrier's identity the traceability of waste evacuation and processing shall be established and maintained for audit purposes.

4.0 REFERENCE DOCUMENTS

- Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movements and Management of Hazardous Wastes within Africa (1991)
- Basel Convention on the Control of Transboundary movements of Hazardous Wastes and their Disposal (1992)
- International Finance Corporation (IFC) World Bank Group (WBG) Environmental, Health and Safety (EHS) Performance Standard 3: Resource Efficiency and Pollution Prevention (2012)
- IFC WBG EHS Guidelines: Construction Materials Extraction (2007)
- IFC WBG EHS Guidelines: Liquefied Natural Gas (LNG) Facilities (2017)
- IFC WBG EHS Guidelines: Offshore Oil and Gas Development (2015)
- IFC WBG EHS Guidelines: Onshore Oil and Gas Development (2007)
- IFC WBG General EHS Guidelines (2007)
- KBR (2017). Tortue Development Project – Waste Management Strategy. October 24, 2017. 17 pages
- MARPOL, International Convention for the Prevention of Pollution from Ships (1973/1978)
- Mauritania – Decree N° 2004-094 on application of the Environment Code (2004)
- Mauritania – Decree N° 2007-105 on application of the Environment Code (2007)
- Mauritania – Environment Code Law N° 2000-45 (2000)
- Mauritania – Crude Hydrocarbons Code Law N° 2010-033 (2010)
- Mauritania - Prevention and Fight against Marine Pollution Act Law N° 2011-022 (2011)
- Senegal - Decree N° 2001-282 on application of the Environmental Act (2001)
- Senegal – Decree N° 2001-01 covering the Environmental Act (2001)

**APPENDIX T: PRELIMINARY
 DECOMMISSIONING PLAN**

GREATER TORTUE/AHMEYIM PHASE 1 GAS PRODUCTION PROJECT

PRELIMINARY DECOMMISSIONING PLAN

Prepared for the Environmental and Social
Impact Assessment of the GTA Phase 1
Project



In partnership with:



October 2018

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1.0 INTRODUCTION

The subject document is a preliminary plan that establishes the objectives of the decommissioning phase of the project and provides a description of the general steps and activities that will be conducted after cessation of production. It has been prepared for the Environmental and Social Impact Assessment of the GTA Phase 1 Project based on the Unit Development Plan developed by BP in partnership with Kosmos Energy, SMHPM and Petrosen¹.

Pursuant to Article 23 of the Block C8 Hydrocarbon Exploration and Production Contract (EPC) and Article 20 of the Saint-Louis Offshore Profond Hydrocarbon Exploration and Production Sharing Contract (EPSC), a Remediation/Abandonment Plan will be prepared and submitted for approval in accordance with the timeline specified in these contracts. The plan will include the operations and measures that will be implemented to reduce impact on the marine environment and other sea users. Decommissioning activities will be undertaken in compliance with regulatory requirements in force, and Good International Industry Practice, at the time of decommissioning.

2.0 OBJECTIVES

The decommissioning goal set for the GTA Phase 1 Project is to return the site to its original condition, as far as is practicable, unless environmental benefits warrant leaving redundant items in situ. All materials removed from site should in order of preference be:

- Reused;
- Recycled; or
- Disposed of safely.

3.0 DECOMMISSIONING STEPS

In the current document, no additional phase of the project is considered and thus, it is assumed that the GTA Phase 1 Project will be decommissioned in its entirety at a future date. Should additional phases of the project be developed, it is more likely that multiple part-decommissioning phases may be required to progressively remove equipment as design life is exceeded or the facilities cease to be viable.

The general decommissioning steps include:

- Planning, inspection, permitting;
- Engineering; and
- Cease production.

¹ BP, 2018. Unit Development Plan. Prepared in partnership with Kosmos Energy, SMHPM and Petrosen, June 22, 2018, 186 pages.

4.0 CEASING PRODUCTION ACTIVITIES

The ceasing production activities are described below for the main components of the project.

4.1 Wells

The well abandonment philosophy is to ensure restoration of the cap rock by setting laterally extensive barriers which will extend rock to rock.

The material, number, position, length and placement method of barriers will be based on assessment of well condition, formation fluids, pressures, formation strength, potential flow rates, sustainability of potential flow, and environmental impact at the time of well abandonment.

It should be noted that the market is rapidly evolving in the development of new well abandonment methods and technologies and these will be evaluated at the time of well abandonment planning.

The current assumptions are made for the permanent abandonment of the Phase 1 development wells. The Phase 1 wells will be abandoned as per the following high-level sequence:

- Given the water depth in the region (~3,000 m) it is assumed that an ultra-deep water Mobile Offshore Drilling Unit (MODU) will be used to complete all plugging and abandonment activities and that the asset infrastructure will be designed to facilitate the positioning of a rig for well abandonment at a later date.
- Subsea infield hardware will be out of service at the time of well abandonment. Consideration therefore needs to be made to how well fluid returns at surface (including hydrocarbons), subsea Christmas Tree valve control etc. will be managed.
- Conformant annular cement has been placed at depths where permanent abandonment barriers will be set and verified. It is therefore assumed that no annulus cement remediation work will be required at the time of well abandonment.
- Production/injection tubing will be recovered due to the presence of control lines on the outside of production tubing.
- Wellheads will be left in place following common industry practice for these water depths. It is also assumed Christmas trees will be left in place although this is still to be confirmed.
- Analysis of the Ahmeyim-2 formation water by both BP and KEM has indicated no potential BaSO₄ and SrSO₄ are naturally present in the formation water and therefore radioactive scale is not expected.

4.2 Subsea Production System

This scope includes the Subsea facilities from the wells to the FPSO; and from the FPSO to the Hub/Terminal. Subsea decommissioning will consist of cleaning / flushing followed by a combination of equipment recovery and abandonment, depending on type and water depth.

After production ceases, water will be pumped into the in-field MEG lines from the FPSO to flush these lines back to the FPSO. When the system is clear of MEG it can be shutdown.

The Subsea facilities from the wells to the FPSO will initially be flushed from the FPSO via one of the two dual production in-field flowlines together with the crossover facility, with displaced fluids, debris and wax returning along the other flowline to the FPSO after commercial production is halted, but the trees and production infrastructure are still in place. Clean-up and disposal of flushed fluids and debris will take place via the FPSO, including return to shore for disposal.

Thereafter, a final subsea pig run along each flowline will deliver the residual liquids and wax back to the FPSO for clean-up. Reservoir gas will be used to drive the pigs at the lowest acceptable pressure

back to the FPSO. Methanol will be retained as mitigation in case there is some hydrate formation / blockage at the low pigging pressure. The export pipeline will also need to be made hydrocarbon free and flushed to remove any surface waxing.

The current base case for recovery and abandonment of Subsea Production System scope is as follows:

- The deep-water Subsea equipment (>2000 m depth) will be left in place. This includes:
 - Manifolds;
 - Interconnecting jumpers;
 - Flying leads;
 - MEG distribution structure; and
 - Subsea Distribution Assembly.
- Subsea pipelines will be left in place or recovered depending on water depth as follows:
 - Production flowlines >800 m water depth will be left in place on the basis of typical decommissioning legislation allowing subsea facilities to be cleaned, capped and left in place below this depth.
 - Production flowlines between 120 m – 800 m water depth will also be left in place on the basis that all pipelines must be buried / rock dumped down to a depth of 800 m.
 - MEG line will be left in place as it is buried. The section from the pipeline termination to the FPSO will be disconnected and recovered.
 - Export gas pipeline from FPSO to Hub/Terminal will be removed due to shallow water depth.
- The five risers and one dynamic umbilical from Pipeline End Manifold (PLEM) to FPSO will be removed and recovered. This includes tethers but not pin piles (if required). Piles will be cut off at the seabed.
- The PLEM and other Subsea equipment (such as the Umbilical Termination Assembly and any over-trawl protection structures) near to the FPSO will be removed.
- Export pipeline subsea isolation valve (SSIV) and associated over-trawl protection structures at the Hub/Terminal location will be removed.
- The main umbilical and fibre optic cable will be left in place as they will be buried.

4.3 FPSO

The FPSO will have residual export and utility fluids transferred as appropriate to shuttle tankers and service vessels, where relevant. Residual vapours will be routed to flare for disposal. It is important to ensure functioning washing system for cargo tanks to provide appropriate level of cleaning prior to tow away.

The FPSO mooring chains will be removed at the nearest connector above the seabed and the mooring chain tail and driven anchor pike left in place.

Removal of the FPSO could be by either: wet manned tow, wet unmanned tow, or transport lift vessel. As a wet manned tow is considered the most likely scenario, the marine support systems, including ballast, bilge, emergency and key service power generation and LQ hotel services will be maintained in working order for this phase.

It is assumed that the FPSO can be taken to third party site for clean-up and transfer to a disposal contractor or future owner.

4.4 Hub/Terminal Marine Structures and Topsides

4.4.1 Topsides

The topsides structures comprise:

- Riser platform;
- Fuel gas platform;
- FLNG valve access platform;
- LNG transfer piperacks;
- LNGC valve access platform;
- LNGC loading arms; and
- QU platform.

The total weight is assumed as 3,500 tonnes.

Initially the topsides will be prepared for decommissioning, as follows:

- Flushing pipework and removing residual hydrocarbons as part of ceasing production.
- Items to be removed for recovery or weight reduction, including the Hub/Terminal flare on the riser platform, are prepared in advance by disconnecting pipework, cables and structural connections. It is assumed that lifting points will be left in place.
- Pipework and cables within the topsides will be cut at joints between neighbouring structures to allow structures to be lifted out with pipework and cables left in situ.
- Weight reduction is expected to take place at appropriate time of the year weather wise to minimize weather downtime. Only easily accessible equipment with no impact on the trestle / platform structural integrity will be removed.

The current decommissioning plan is to deconstruct the topsides structures in reverse order to their construction, which will require craneage that can be supported on a heavy lift vessel, a crane barge or a jack-up platform.

The loading arms and platforms will be lifted off their supporting structures using a suitably sized crane. These equipment and structures will be taken off site for recycling.

The QU platform will be removed from location as a complete unit. With tugs connected to the platform the jack up legs will be withdrawn from the seabed and the platform floated. It is assumed the platform will be loaded onto a semi-submersible vessel for transportation to an offsite location for recycling or reuse.

4.4.2 Marine Structures

The marine structures comprise:

- Access trestles and interconnecting walkways;
- Riser platform and riser bridge platform;
- Feed gas platform and FLNG stern access platform;
- Mooring and breasting dolphins;
- LNG transfer platforms; and
- Support vessel facilities.

The current decommissioning plan for marine structures is to deconstruct the marine structures and topsides in reverse order to their construction, which will require craneage that can be supported on a heavy lift vessel, a crane barge or a jack-up platform.

The steel platforms, trestles and walkways, which can be lifted off their supporting structures using a suitably sized crane, will be taken off site for recycling or for possible reuse depending on their size and residual life.

The LNG transfer platforms are expected to be constructed with concrete decks, which can be cut up into suitably sized pieces and lifted off the pile caps. Pile caps and tops of piles can then be cut off the piles and lifted out in one or more pieces. Concrete items will be taken off site for recycling.

The support vessel facilities floating structures, pontoons, will be disconnected from their supports, taken offsite and recycled or reused depending upon their residual life.

Several hundred steel pipe piles will have been installed as part of the marine structures. It will not be possible to pull out the piles and it is assumed that they will be cut off 1 to 3 m below the seabed; reducing the chance of fishing nets being snagged on the pile stumps. This operation will preferably involve the use of internal cutting tools deployed down the pile bore. In addition to specialist cutting equipment, a suitably sized offshore crane will be required. Flat barges and tugs would be used to transfer the pile sections to shore. The pile sections could then be recycled or reused.

4.4.3 Hub/Terminal Breakwater

The breakwater comprises:

- Rock berm (approximately 10 m high);
- Concrete caissons (approximately 25 each 50 m long); and
- Sand infill to concrete caissons.

The current decommissioning plan is to deconstruct the breakwater caissons in reverse order to their construction.

Caisson lid breakout and removal of top capping structure will be performed. This will require a hydraulic breaker to be established on the breakwater with front loader / backhoe machines to load broken material into skips and a crane barge to remove broken-out concrete. The material will be taken to land for recycling.

The caisson ballast sand fill will be removed to facilitate the removal of each breakwater caisson section, which will require specialist equipment to liquefy the sand fill inside each caisson and pump it into a bottom dump barge. The sand will be taken offshore to a suitable disposal site, expected to be the same location as the sand was originally sourced. Through field life the risk of sand contamination is considered to be low as there are no production facilities on top of the breakwater.

During the removal of the sand fill, it will be necessary to use seawater to maintain adequate weight in the caisson for stability. When all or sufficient sand fill has been removed the seawater can be pumped out to float the caisson.

Once each caisson is afloat, temporary hatches can be used to cover the cells. Each caisson would be towed or transported by semi-submersible vessel to an offsite location and it is assumed they will be reused. Opportunities to optimize the caisson design for refloat and floating integrity include the use of internal sub-division to help control draft and stability will be investigated.

As evacuation and removal of the caissons is expected to be performed after decommissioning of the marine structures, alternative accommodation of the workforce will need to be provided. However, given that the decommissioning phase could span multiple weather windows, the Hub/Terminal facilities will be decommissioned in stages and it is likely the QU platform will be deferred to the latter stages, minimizing the requirement for alternative accommodation.

It is expected that the rock berm will be left in place as this is likely to be environmentally preferable given the marine life which will have inhabited it. This is considered normal practice for a marine structure although would be non-compliant with the IMO guidelines which require a 55 m clear draft. As this may present a navigational hazard, marine hazard buoys would be deployed on site to mark location of the breakwater at abandonment.

4.5 FLNG

The FLNG will have its export and utility fluids transferred as appropriate to shuttle tankers and service vessels, where relevant. Residual vapours will be routed to flare for disposal.

The FLNG will then be towed away by the owner.

4.6 Communications

The fibre optic cable, which is run in-field between the FPSO and the Hub/Terminal will be left as it is buried.

**APPENDIX U: MONITORING PLAN OF THE
ESMP AND SMP BY THE
MAURITANIAN AND
SENEGALESE
AUTHORITIES**

Appendix U

Monitoring Plan of the ESMP and SMP by the Mauritanian and Senegalese Authorities

The present appendix contains the Monitoring Plan of the Environmental and Social Management Plan (ESMP) and the Surveillance and Monitoring Plan (SMP) by the Mauritanian and Senegalese authorities. The purpose of this plan is to provide a monitoring tool to the authorities, detachable from the rest of the ESIA if needed. The plan covers both the monitoring of the ESMP implementation, presented in Chapter 9 of the present report, and the monitoring of the SMP implementation, presented in Chapter 10.

The monitoring plan presents five tables consisting of operational tools for the authorities:

- Table U-1: ESMP Monitoring ESMP by the Mauritanian and Senegalese Authorities - Construction Phase;
- Table U-2: ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase;
- Table U-3: ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase;
- Table U-4: ESMP Monitoring by the Mauritanian and Senegalese Authorities - Accidental Events;
- Table U-5: SMP Monitoring by the Mauritanian and Senegalese Authorities.

The following information is detailed in the first four tables regarding the monitoring of the ESMP:

- Potential impacts, by biophysical and social resource;
- Country where the impact could occur;
- Project Design & Operation Controls measures to mitigate impacts;
- Mitigation measures to avoid or reduce non-negligible negative impacts;
- Residual impact Assessment;
- Operator monitoring elements(as a reminder);
- Authorities monitoring indicator;
- Monitoring activity to be carried out by the authorities;
- Authorities monitoring schedule;
- Potential institution responsible for monitoring in Mauritania;
- Potential institution responsible for monitoring in Senegal; and
- Cost of the monitoring activity by the authorities.

The following information is provided in Table U-5 regarding monitoring of the SMP:

- Potential impacts, by biophysical and social resource;
- Operator Monitoring measures;
- Operator monitoring elements (as a reminder);

- Authorities monitoring indicator;
- Monitoring activity to be carried out by the authorities;
- Authorities monitoring schedule;
- Potential institution responsible for monitoring in Mauritania;
- Potential institution responsible for monitoring in Senegal; and
- Cost of the monitoring activity by the authorities.

In Mauritania, potential monitoring authorities may be identified by the DCE. In Senegal, potential monitoring authorities include the Technical Committee, including ANAM, DEEC, HASSMAR and the Ministry of Fisheries and Maritime Economy.

The monitoring activities to be carried out by the authorities include reading of monitoring reports and management plans provided by the GTA Phase 1 project as well as other project documents, and project facilities inspections and visits¹. There are no monitoring costs associated with document reading. For inspections and visits, the GTA Phase 1 project plans for the transportation by boat or helicopter as used by the project personnel to reach the project facility and accommodation at the facility depending on the duration of the inspection/visit. The cost of this transportation and accommodation will be covered by the GTA Phase 1 project.

¹ A set of visits are planned in the monitoring plan. Inspections will be ad hoc visits by the authorities to verify information provided in the documents produced by the GTA Phase 1 project after review of these documents.

Table U-1: ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase.

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ²	
Air Quality and Greenhouse Gases										
Impact: IMP01: Reduction in ambient air quality (NO _x and SO _x only) (Residual impact: 2 – Low)							Countries: Mauritania and Senegal			
M01	Maintaining routine maintenance procedures to help ensure that engines are operating at defined operational performance and specified emissions levels.	Maintenance Program for project vessels	Maintenance record books or system	Regular checks for offshore project vessels as per maintenance program	Project vessels implementing a maintenance program for project vessels	Visit of project vessels confirming the implementation of a maintenance program	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M02	Monitoring fuel consumption as a proxy for measuring performance and emissions. When practical, or as required by applicable regulations, vessel operators will be expected to utilize low-sulfur fuels to limit SO _x production.	Contractor Environmental Management Plan to include monitoring of fuel consumption by fuel type	Emissions reporting system	Quarterly checks for offshore project vessels	BP ESMP Compliance Report confirming the monitoring of the fuel consumption of the applicable vessels as a proxy for measuring performance and emissions	Reading of BP ESMP Compliance Report confirming the monitoring of the fuel consumption of the applicable vessels as a proxy for measuring performance and emissions	Annual	To be determined by the DCE	Technical Committee	None (desktop work)
Sediment Quality										
Impact: IMP06: Changes in bottom contours, grain size, and some chemical parameters from dredging activities and discharge of drilling muds and cuttings discharges (Residual impact: 2 – Low)							Countries: Mauritania and Senegal			
M03	Dredged material and drill cuttings will not be disposed on or near carbonate mounds and away from coastal areas. The proposed pipeline route will avoid sensitive carbonate mounds.	Pre- and post-dredging survey reports	Survey report results	Once, following completion of the post-dredging survey when the survey report becomes available	Report confirming that dredged material and drill cuttings have not be disposed on or near carbonate mounds	Reading of report demonstrating the disposal location of dredged material and drill cutting	When report becomes available (after dredging)	To be determined by the DCE	Technical Committee	None (desktop work)
		Results of the geophysical and geotechnical surveys	Survey report results	Once, before construction / drilling	Report confirming that the pipeline route has avoided sensitive carbonate mounds.	Reading of report demonstrating the pipeline route	Before construction / drilling	To be determined by the DCE	Technical Committee	None (desktop work)

¹ In this table, monitoring activities include the reading of reports and other documents. The BP ESMP Compliance Report will be submitted by BP to the authorities according to the agreed periodicity. The other documents identified in the column "Monitoring Activity to be Carried Out by the Authorities" will be submitted to authorities upon request.

² In this table, providing for the transportation and accommodation by the GTA Phase 1 project will be done by the same means of transport and accommodation as those used by the project staff to reach the facilities, and notably for transportation, the boat or helicopter used for the transfer of staff.

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
Benthic Communities										
Impacts: IMP08: Disturbance to benthic communities from resuspension and deposition of sediments in close proximity to dredging activities (Residual impact: 1 - Negligible) IMP09: Introduction of aquatic invasive species (Residual impact: 2 – Low)							Countries: Mauritania and Senegal			
M03	Dredged material and drill cuttings will not be disposed on or near carbonate mounds and away from coastal areas. The proposed pipeline route will avoid sensitive carbonate mounds.	Pre- and post-dredging survey reports	Survey report results	Once, following completion of the post-dredging survey when the survey report becomes available	Report confirming that dredged material and drill cuttings have not be disposed on or near carbonate mounds.	Reading of report demonstrating the disposal location of dredged material and drill cutting	When report becomes available (after dredging)	To be determined by the DCE	Technical Committee	None (desktop work)
		Results of the geophysical and geotechnical surveys	Survey report results	Once, before construction / drilling	Report confirming that the pipeline route has avoided sensitive carbonate mounds.	Reading of report demonstrating the pipeline route	Avant la construction / le forage	To be determined by the DCE	Technical Committee	None (desktop work)
Birds										
Impact: IMP11: Incineration of individual birds from well stem test flaring at the drillship (Residual impact: 2 – Low)							Country: Mauritania and Senegal			
None	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Marine Mammals										
Impacts: IMP15: Auditory impairment due to sound from construction activities, particularly pile driving and VSP survey (Residual impact: 1 – Negligible) IMP16: Potential vessel strike resulting in marine mammal injury or mortality (Residual impact: 1 – Negligible)							Countries: Mauritania and Senegal			
M04	Seismic survey mitigation measures to be implemented during VSP survey(s) with the aim of minimizing the acoustic exposures to marine mammals (e.g. gradually increasing seismic source elements over a period of approximately 30 minutes until the operating level is achieved before any VSP activity begins).	Data Acquisition Plan will include procedures around soft start and marine mammal / turtle observations if required	Data Acquisition Plan	Once, before each VSP survey	Part of the Data Acquisition Plan or equivalent confirming inclusion of procedures around soft start and marine mammal / turtle observations if required	Reading of part of the Data Acquisition Plan or equivalent demonstrating inclusion of procedures around soft start and marine mammal / turtle observations if required.	Once, before each VSP survey	To be determined by the DCE	Technical Committee	None (desktop work)
M05	Sound mitigation measures will be implemented during pile driving (e.g. soft-starting [gradually increasing hammer power]).	Procedure for sound mitigation for pile driving	Construction Noise Management Plan	Once, before pile driving activities	Construction noise management plan confirming presence of procedure for sound mitigation for pile driving	Reading of construction noise management plan demonstrating procedure for sound mitigation for pile driving	Once, before pile driving activities	To be determined by the DCE	Technical Committee	None (desktop work)
M06	Vessel operators will implement vessel strike avoidance protocols to reduce the potential for vessel strike with marine mammals and sea turtles (including injured/dead protected species reporting).	Induction program of vessel masters covers vessel strike avoidance protocol	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts	Interviews with vessel captains confirming implementation of vessel strike avoidance protocols	Visit to project vessels to interview vessel captains and demonstrate implementation of vessel strike avoidance protocols	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

³ In this table, monitoring activities include the reading of reports and other documents. The BP ESMP Compliance Report will be submitted by BP to the authorities according to the agreed periodicity. The other documents identified in the column "Monitoring Activity to be Carried Out by the Authorities" will be submitted to authorities upon request.

⁴ In this table, providing for the transportation and accommodation by the GTA Phase 1 project will be done by the same means of transport and accommodation as those used by the project staff to reach the facilities, and notably for transportation, the boat or helicopter used for the transfer of staff.

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
M07	Collection and analysis of acoustic data from the area to determine background sound levels and marine mammal presence/absence, and underwater sound modeling to determine distances to various thresholds.	Underwater sound modeling report	Underwater sound modeling report	Once, following completion of the underwater sound modeling report	Underwater sound modeling report determining background sound levels and marine mammal presence/absence, and determining distances to various thresholds based on underwater sound modeling	Reading of underwater sound modeling report determining distances to various thresholds based on underwater sound modeling	When underwater sound modeling report becomes available	To be determined by the DCE	Technical Committee	None (desktop work)
Sea Turtles										
Impacts: IMP18: Avoidance or displacement from areas under construction for some species; attraction to other species as a foraging strategy; Noise disturbances from construction activities, particularly pile driving and VSP surveys; loss of foraging habitats from proposed construction (Residual impact: 1 – Negligible) IMP19: Potential vessel strike resulting in sea turtle injury or mortality (Residual impact: 1 – Negligible)							Countries: Mauritania and Senegal			
M04	Seismic survey mitigation measures to be implemented during VSP survey(s) with the aim of minimizing the acoustic exposures to marine mammals (e.g. gradually increasing seismic source elements over a period of approximately 30 minutes until the operating level is achieved before any VSP activity begins).	Data Acquisition Plan will include procedures around soft start and marine mammal / turtle observations if required	Data Acquisition Plan	Once, before each VSP survey	Part of the Data Acquisition Plan or equivalent confirming inclusion of procedures around soft start and marine mammal / turtle observations if required	Reading of part of the Data Acquisition Plan or equivalent demonstrating inclusion of procedures around soft start and marine mammal / turtle observations if required	Once, before each VSP survey	To be determined by the DCE	Technical Committee	None (desktop work)
M05	Sound mitigation measures will be implemented during pile driving (e.g. soft-starting [gradually increasing hammer power]).	Procedure for sound mitigation for pile driving	Construction Noise Management Plan	Once, before pile driving activities	Construction noise management plan confirming presence of procedure for sound mitigation for pile driving	Reading of construction noise management plan demonstrating procedure for sound mitigation for pile driving	Once, before pile driving activities	To be determined by the DCE	Technical Committee	None (desktop work)
M06	Vessel operators will implement vessel strike avoidance protocols to reduce the potential for vessel strike with marine mammals and sea turtles (including injured/dead protected species reporting).	Induction program of vessel masters covers vessel strike avoidance protocol	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts	Interviews with vessel captains confirming implementation of vessel strike avoidance protocols	Visit to project vessels to interview vessel captains and demonstrate implementation of vessel strike avoidance protocols	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M07	Collection and analysis of acoustic data from the area to determine background sound levels and marine mammal presence/absence, and underwater sound modeling to determine distances to various thresholds.	Underwater sound modeling report	Underwater sound modeling report	Once, following completion of the underwater sound modeling report	Underwater sound modeling report determining background sound levels and marine mammal presence/absence, and determining distances to various thresholds based on underwater sound modeling	Reading of underwater sound modeling report determining distances to various thresholds based on underwater sound modeling	When underwater sound modeling report becomes available	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
Threatened Species and Protected Areas										
Impacts: IMP22: Physical injuries and disturbances to threatened species (Residual impact: 2 – Low) IMP23: Disturbance, possible auditory injury, vessel strike to threatened species from vessels, operations (Residual impact: 2 – Low) IMP24: Introduction of non-native or invasive species (Residual impact: 2 – Low)							Countries: Mauritania and Senegal			
M04	Seismic survey mitigation measures to be implemented during VSP survey(s) with the aim of minimizing the acoustic exposures to marine mammals (e.g. gradually increasing seismic source elements over a period of approximately 30 minutes until the operating level is achieved before any VSP activity begins).	Data Acquisition Plan will include procedures around soft start and marine mammal / turtle observations if required	Data Acquisition Plan	Once, before each VSP survey	Part of the Data Acquisition Plan or equivalent confirming inclusion of procedures around soft start and marine mammal / turtle observations if required	Reading of part of the Data Acquisition Plan or equivalent demonstrating inclusion of procedures around soft start and marine mammal / turtle observations if required	Once, before each VSP survey	To be determined by the DCE	Technical Committee	None (desktop work)
M05	Sound mitigation measures will be implemented during pile driving (e.g. soft-starting [gradually increasing hammer power]).	Procedure for sound mitigation for pile driving	Construction Noise Management Plan	Once, before pile driving activities	Construction noise management plan confirming presence of procedure for sound mitigation for pile driving	Reading of construction noise management plan demonstrating procedure for sound mitigation for pile driving	Once, before pile driving activities	To be determined by the DCE	Technical Committee	None (desktop work)
M06	Vessel operators will implement vessel strike avoidance protocols to reduce the potential for vessel strike with marine mammals and sea turtles (including injured/dead protected species reporting).	Induction program of vessel masters covers vessel strike avoidance protocol	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts	Interviews with vessel captains confirming implementation of vessel strike avoidance protocols	Visit to project vessels to interview vessel captains and demonstrate implementation of vessel strike avoidance protocols	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M07	Collection and analysis of acoustic data from the area to determine background sound levels and marine mammal presence/absence, and underwater sound modeling to determine distances to various thresholds.	Underwater sound modeling report	Underwater sound modeling report	Once, following completion of the underwater sound modeling report	Underwater sound modeling report determining background sound levels and marine mammal presence/absence, and determining distances to various thresholds based on underwater sound modeling	Reading of underwater sound modeling report determining distances to various thresholds based on underwater sound modeling	When underwater sound modeling report becomes available	To be determined by the DCE	Technical Committee	None (desktop work)
Biodiversity										
See Mitigation Measures listed to mitigate impacts on Marine Mammals, Sea Turtles, Threatened Species and Protected Areas: M04, M05, M06 and M07										

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
Maritime Navigation										
Impact: IMP28: Risk of collision between project vessels and pirogues due to project vessels movements (Residual impact: 2 – Low)							Countries: Mauritania and Senegal			
M08	Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Training and awareness program records	Once, before the Construction Phase starts and Semi-annually thereafter	BP ESMP Compliance Report confirming implementation of training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Reading of BP ESMP Compliance Report demonstrating implementation of training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Once, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M09	Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Construction Phase starts and Quarterly thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once per year, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M10	Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time.	Project vessels equipped with radar or infrared systems	Project vessels equipment listing	Once, for offshore project vessels before mobilization	Project vessels equipped with radar or infrared systems	Visit of project vessels to confirm that these vessels are equipped with radar or infrared systems	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M11	Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling.	Vessels well-lit during poor visibility or at night and equipped with searchlights	Project vessels equipment listing	Once, before offshore project vessel mobilization	Vessels well-lit during poor visibility or at night and equipped with searchlights	Visit of project vessels to confirm that these vessels are well-lit during poor visibility or at night and equipped with searchlights.	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-agreed training materials / vessel contractors' training logs	Once, before offshore project vessel mobilization	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M12	Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones.	Project patrol boat in place	Project vessels logs	Once, before the Construction Phase starts and Semi-annually	Project patrol boat in place	Visit of the Hub to verify presence of a patrol boat to monitor the exclusion safety zones	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
M13	Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.	FLOs in place aboard the project patrol boats, if and when necessary.	Project patrol boats Person on Board records	Once, at the beginning of the Construction Phase and Quarterly	BP ESMP Compliance Report confirming mobilization of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Reading of BP ESMP Compliance Report demonstrating mobilization of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Once per year, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M14	Equipping the support vessels and the project patrol boat with lifesaving appliances approved by the Convention for Safety of Life at Sea (SOLAS) and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel. Assist with the rescue of any fishermen involved in a collision with a project vessel or following the capsizing of their vessel due to ship wake associated with project vessels.	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Project vessels equipment listings	Once, before the Construction Phase starts	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Visit of project vessels demonstrating presence of lifesaving appliances approved by the Convention for Safety of Life at Sea (SOLAS) and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel.	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Records of maritime safety incidents	Project vessels HSSE incident reports	After a reported incident	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once per year	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)
M15	In case of a collision, BP will inform as soon as possible the relevant national authorities: the Mauritanian Coast Guard (Garde Côte Mauritanienne) in Mauritania and HASSMAR in Senegal.	National authorities informed in case of a collision	Records of information provided by the project to national authorities	After a reported collision	Part of communication documents reporting a collision	Reading of part of communication documents reporting a collision	After a reported collision	To be determined by the DCE	HASSMAR	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
M16 Ensuring that each project vessel keeps records of maritime safety incidents with pirogues and other vessels, including near misses, and that these are subsequently shared with the project. BP will monitor maritime safety incidents and adjust, if required, project specific maritime safety rules, security and search & rescue arrangements in place.	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)	
	Records of maritime safety incidents	Project vessel HSSE incident reports	Quarterly	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once per year	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)	
M17 Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Construction Phase starts and Quarterly	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)	
M18 Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities.	CLOs in place for N'Diago and Saint-Louis	Project Human Resources records	Once, before the Construction Phase starts and Quarterly	Community liaison officers (CLOs) in place for N'Diago and Saint-Louis	Site visit at the office of the Community liaison officers (CLOs) in place for N'Diago and Saint-Louis	Once, during the Construction Phase	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)	
M19 Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Construction Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once per year, after community councils formally set up	To be determined by the DCE	Technical Committee	None (desktop work)	
Artisanal Fisheries and Related Activities										
Impact: IMP29: Potential loss of artisanal fishing gears (nets and buoys) due to project vessels movements in artisanal fishing areas (Residual impact: 2 – Low)							Countries: Mauritania and Senegal			
M09	Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Construction Phase starts and Quarterly thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once per year, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
M12	Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones.	Project patrol boat in place	Project vessels logs	Once, before the Construction Phase starts and Semi-annually	Project patrol boat in place	Visit of the Hub to verify presence of a patrol boat to monitor the exclusion safety zones	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M13	Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.	FLOs in place aboard the project patrol boats, if and when necessary	Project patrol boats Person on Board records	Once, at the beginning of the Construction Phase and Quarterly	BP ESMP Compliance Report confirming mobilization of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Reading of BP ESMP Compliance Report demonstrating mobilization of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Once per year, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M17	Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Construction Phase starts and Quarterly	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M18	Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities.	CLOs in place for N'Diago and Saint-Louis	Project Human Resources records	Once, before the Construction Phase starts and Quarterly	Community liaison officers (CLOs) in place for N'Diago and Saint-Louis	Site visit at the office of the Community liaison officers (CLOs) in place for N'Diago and Saint-Louis	Once, during the Construction Phase	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Construction Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances.	Once per year, after community councils formally set up	To be determined by the DCE	Technical Committee	None (desktop work)
M20	Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers.	Framework for interaction with artisanal fisheries developed and implemented	Framework documentation	Once, before the Construction Phase starts	BP ESMP Compliance Report confirming development of a framework for interaction with artisanal fisheries	Reading of BP ESMP Compliance Report demonstrating development of a framework for interaction with artisanal fisheries	Once, during the Construction Phase	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
			Evidence of follow-up activities in conformance with Framework documentation	Annually	BP ESMP Compliance Report confirming implementation of follow-up activities compliant with framework documentation	Reading of BP ESMP Compliance Report demonstrating implementation of follow-up activities compliant with framework documentation	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴
M21 Project vessels to record incidents with fishing gears and report them to the project.	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Records of maritime incidents with other sea users kept by contractors	Contractor records of incidents with other sea users'	Quarterly	BP ESMP Compliance Report demonstrating recording of maritime incidents with other sea users	Reading of BP ESMP Compliance Report demonstrating recording of maritime incidents with other sea users	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M22 To the extent feasible, establish a maritime corridor or speed restrictions for project vessels within artisanal fishing areas.	Induction program of vessel masters covers speed restrictions in areas of artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts and Semi-annually if needed	Interviews with project vessel captains or pilots confirming establishment of a maritime corridor or speed restrictions for project vessels within artisanal fishing areas, to the extent feasible.	Visit of project vessels to interview project vessel captains or pilots and demonstrate establishment of a maritime corridor or speed restrictions for project vessels within artisanal fishing areas, to the extent feasible.	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M23 Implement an environmental awareness building program in association with local schools and community groups.	Environmental awareness program implemented in local schools and community groups	Environmental awareness program records	Once, during or after the program is implemented	BP ESMP Compliance Report confirming implementation of an environmental awareness program in local schools and community groups	Reading of BP ESMP Compliance Report demonstrating the implementation of an environmental awareness program in local schools and community groups.	Once, during the Construction Phase	To be determined by the DCE	Saint-Louis Regional Department of Environment and Classified Establishments	None (desktop work)
M24 Provide technical assistance to mutually agreed marine resource research programs notably with the national oceanographic research centers of both countries (CRODT and IMROP).	Technical assistance provided to marine resource research program with CRODT and IMROP	BP technical assistance records	Once, during or after the technical assistance is provided	Documentation confirming technical assistance provided to mutually agreed marine resource research programs, notably CRODT and IMROP	Reading of documentation demonstrating technical assistance provided to mutually agreed marine resource research programs, notably CRODT and IMROP	Once, during or after the technical assistance is provided	To be determined by the DCE	Technical Committee	None (desktop work)
M27 Developing a social investment program to enhance project benefits for the directly affected N'Diogo and Saint-Louis communities, including livelihood enhancement activities.	Social investment program to enhance project benefits for the communities of N'Diogo and Saint-Louis developed	Social investment program documentation	Once, before the Construction Phase starts and Annually	BP ESMP Compliance Report confirming implementation of a social investment program to enhance project benefits for the directly affected N'Diogo and Saint-Louis communities, including livelihood enhancement activities	Reading of BP ESMP Compliance Report demonstrating implementation of a social investment program to enhance project benefits for the directly affected N'Diogo and Saint-Louis communities, including livelihood enhancement activities.	Once per year	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
Community Health, Safety and Security										
Impact: IMP30: Risk of conflicts between artisanal fishermen and public security forces if some fishermen need to be escorted out of the exclusion safety zones (Residual impact: 2 – Low)							Countries: Mauritania and Senegal			
M08	Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Training and awareness program records	Once, before the Construction Phase starts and annually thereafter	BP ESMP Compliance Report confirming implementation of training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Reading of BP ESMP Compliance Report demonstrating implementation of training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Once, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M17	Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Construction Phase starts and Quarterly	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Construction Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once per year, after community councils formally set up	To be determined by the DCE	Technical Committee	None (desktop work)
M25	The project will seek to work with the public security forces to establish an appropriate response and security framework which may include resource, equipment, training and response protocols.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
M26	Include in the security stakeholder engagement plan, provisions around response, management and interface with Public security forces for security incidents scenario such as act of terrorism and unlawful entry in the exclusion safety zones.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
Public Infrastructure and Services										
Impact: IMP32: Placing additional demands on the public security forces limited resources since they will be required to be available 24/7 to handle a safety incident with artisanal fishermen or a search and rescue operation if needed (Residual impact: 1 – Negligible)							Countries: Mauritania and Senegal			
M08	Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Training and awareness program records	Once, before the Construction Phase starts and annually thereafter	BP ESMP Compliance Report confirming implementation of training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Reading of BP ESMP Compliance Report demonstrating implementation of training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities.	Once, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M09	Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Construction Phase starts and Quarterly thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once per year, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M10	Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time.	Project vessels equipped with radar or infrared systems	Project vessels equipment listing	Once, for offshore project vessels before mobilization	Project vessels equipped with radar or infrared systems	Visit of project vessels to confirm that these vessels are equipped with radar or infrared systems	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M11	Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling.	Vessels well-lit during poor visibility or at night and equipped with searchlights	Project vessels equipment listing	Once, before offshore project vessel mobilization	Vessels well-lit during poor visibility or at night and equipped with searchlights.	Visit of project vessels to confirm that these vessels are well-lit during poor visibility or at night and equipped with searchlights.	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-agreed training materials / vessel contractors' training logs	Once, before offshore project vessel mobilization	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
M12	Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones.	Project patrol boat in place	Project vessels logs	Once, before the Construction Phase starts and Semi-annually	Project patrol boat in place	Visit of the Hub to verify presence of a patrol boat to monitor the exclusion safety zones	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M13	Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.	FLOs in place aboard the project patrol boats, if and when necessary	Project patrol boats Person on Board records	Once, at the beginning of the Construction Phase and Quarterly	BP ESMP Compliance Report confirming mobilization of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Reading of BP ESMP Compliance Report demonstrating mobilization of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Once per year, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M14	Equipping the support vessels and the project patrol boat with lifesaving appliances approved by the Convention for Safety of Life at Sea (SOLAS) and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel. Assist with the rescue of any fishermen involved in a collision with a project vessel or following the capsizing of their vessel due to ship wake.	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Project vessels equipment listings	Once, before the Construction Phase starts	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Visit of project vessels demonstrating presence of lifesaving appliances approved by the Convention for Safety of Life at Sea (SOLAS) and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel.	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Records of maritime safety incidents	Project vessels HSSE incident reports	After a reported incident	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once per year	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴
M16 Ensuring that each project vessel keeps records of maritime safety incidents with pirogues and other vessels, including near misses, and that these are subsequently shared with the project. BP will monitor maritime safety incidents and adjust, if required, project specific maritime safety rules, security and search & rescue arrangements in place.	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Construction Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Records of maritime safety incidents	Project vessel HSSE incident reports	Quarterly	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once per year	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)
M25 The project will seek to work with the public security forces to establish an appropriate response and security framework which may include resource, equipment, training and response protocols.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
M26 Include in the security stakeholder engagement plan, provisions around response, management and interface with Public security forces for security incidents scenario such as act of terrorism and unlawful entry in the exclusion safety zones.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
Social Climate									
Impact: IMP34: Social discontent in N'Diago and Saint-Louis due to the potential perception of loss of fishing grounds and fishing catches combined with the limited employment opportunities, the perception of unsatisfied grievances and/or compensation claims (e.g. for lost gear), and elevated safety risk for fishermen at sea due to presence of project vessels (Residual impact: 2 – Low)							Countries: Mauritania and Senegal		
M09 Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Construction Phase starts and Quarterly thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once per year, after the Construction Phase starts	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M17 Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Construction Phase starts and Quarterly	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
M18	Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities.	CLOs in place for N'Diago and Saint-Louis	Project Human Resources records	Once, before the Construction Phase starts and Quarterly	Community liaison officers (CLOs) in place for N'Diago and Saint-Louis	Site visit at the office of the Community liaison officers (CLOs) in place for N'Diago and Saint-Louis	Once, during the Construction Phase	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Construction Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once per year, after community councils formally set up	To be determined by the DCE	Technical Committee	None (desktop work)
M20	Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers.	Framework for interaction with artisanal fisheries developed and implemented	Framework documentation	Once, before the Construction Phase starts	BP ESMP Compliance Report confirming development of a framework for interaction with artisanal fisheries	Reading of BP ESMP Compliance Report demonstrating development of a framework for interaction with artisanal fisheries	Once, during the Construction Phase	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
			Evidence of follow-up activities in conformance with Framework documentation	Annually	BP ESMP Compliance Report confirming implementation of follow-up activities compliant with framework documentation	Reading of BP ESMP Compliance Report demonstrating implementation of follow-up activities compliant with framework documentation	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M23	Implement an environmental awareness building program in association with local schools and community groups.	Environmental awareness program implemented in local schools and community groups	Environmental awareness program records	Once, during or after the program is implemented	BP ESMP Compliance Report confirming implementation of an environmental awareness program in local schools and community groups	Reading of BP ESMP Compliance Report demonstrating the implementation of an environmental awareness program in local schools and community groups.	Once, during the Construction Phase	To be determined by the DCE	Saint-Louis Regional Department of Environment and Classified Establishments	None (desktop work)
M24	Provide technical assistance to mutually agreed marine resource research programs notably with the national oceanographic research centers of both countries (CRODT and IMROP).	Technical assistance provided to marine resource research program with CRODT and IMROP	BP technical assistance records	Once, during or after the technical assistance is provided	Documentation confirming technical assistance provided to mutually agreed marine resource research programs, notably CRODT and IMROP	Reading of documentation demonstrating technical assistance provided to mutually agreed marine resource research programs, notably CRODT and IMROP	Once, during or after the technical assistance is provided	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
M27	Developing a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities.	Social investment program to enhance project benefits for the communities of N'Diago and Saint-Louis developed	Social investment program documentation	Once, before the Construction Phase starts and Annually	BP ESMP Compliance Report confirming implementation of a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities	Reading of BP ESMP Compliance Report demonstrating implementation of a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities	Once per year	To be determined by the DCE	Technical Committee	None (desktop work)
M28	Engaging in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities in order to help identify and support, if needed, ad hoc measures to prevent social discontent linked to project activities and its escalation into conflicts.	Periodic meetings between project representatives and national, regional and local authorities to monitor the social climate and, if needed, identification of support to ad hoc measures to prevent social discontent linked to project activities	Project meeting records	Once, before the Construction Phase starts and semi-annually	BP ESMP Compliance Report confirming engagement in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities	BP ESMP Compliance Report demonstrating engagement in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities	Once per year	To be determined by the DCE	Technical Committee	None (desktop work)
Multiple Resources of the Biophysical and Social Environment - Design and Operational Control Measures										
D01	Contractors will be expected to comply with the contract terms that have been established, including HSSE standards and performance requirements.	Bridging document between BP HSSE and contractors HSE/HSSE requirements	Bridging document	Once, at contract execution	Section of contract describing HSSE requirements	Reading of the section of the contract describing HSSE requirements	Once	To be determined by the DCE	Technical Committee	None (desktop work)
D02	Compliance with applicable national and international regulations (MARPOL 73/78 Annex VI) and guidelines regarding emissions of nitrogen oxides (NOx) and sulphur oxides (SOx) from main project vessels.	Valid International Air Pollution Prevention Certificate (IAPPC) confirming compliance with both the equipment and operational requirements of Annex VI	Main vessels documentation	Once, before mobilization to site	Valid International Air Pollution Prevention Certificate (IAPPC) confirming compliance with both the equipment and operational requirements of Annex VI	Visit of project vessels to verify their possession of a valid International Air Pollution Prevention Certificate (IAPPC) confirming compliance with both the equipment and operational requirements of Annex VI	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D03	An efficient flare burner head equipped with an appropriate combustion enhancement system will be selected with the intent of minimizing incomplete combustion, black smoke, and hydrocarbon fallout to the sea.	Flare burner head equipped with combustion enhancement system	Flare burner head/combustion enhancement system specifications documentation	Once, before start-up	Flare burner head/combustion enhancement system specifications documentation confirming that the flare burner head is equipped with combustion enhancement system	Reading of the documentation demonstrating flare burner head and combustion enhancement system specifications	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
D04	Volumes of hydrocarbons flared will be recorded.	Emissions monitoring system installed	Drilling: Emissions monitoring system specifications	Drilling: Once, before execution of well flowback	Documentation confirming that an emissions monitoring system is installed	Reading of the documentation demonstrating the installation of an emissions monitoring system	Once, before execution of well flowback	To be determined by the DCE	DEEC	None (desktop work)
		Flare metering system installed	Flare metering system specifications described in the Basis of Design for the FLNG	FLNG: Once, before start-up	Documentation confirming that a flare metering system is installed	Reading of the documentation demonstrating that a flare metering system is installed	Once, before start-up	To be determined by the DCE	DEEC	None (desktop work)
	See Chapter 10: Surveillance and Monitoring Plan									
D05	Compliance with applicable national and international regulations (MARPOL 73/78, Annex IV and V) for waste and wastewater discharges from offshore project vessels.	Valid International Sewage Pollution Prevention Certificate	Offshore project vessel documentation	Once, each for offshore project vessels before mobilization	Valid International Sewage Pollution Prevention Certificate	Visit of project vessels to verify their possession of a valid International Sewage Pollution Prevention Certificate	Once, after vessel mobilization	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Waste management plan and waste record book	Offshore project vessel documentation	Once, each for offshore project vessels before mobilization	Waste management plan and waste record log for vessel projects	Reading of the waste management plan	Once, before the Construction Phase starts	To be determined by the DCE	DEEC	None (desktop work)
		Certificates for type approval of oil pollution prevention equipment, such as oily-water separating equipment, oil filtering equipment, process units and oil content meters	Offshore project vessel documentation	Once, each for offshore project vessels before mobilization	Certificates for type approval of oil pollution prevention equipment, such as oily-water separating equipment, oil filtering equipment, process units and oil content meters	Visit of project vessels to verify their possession of certificates for type approval of oil pollution prevention equipment, such as oily-water separating equipment, oil filtering equipment, process units and oil content meters	Once, after the mobilization of applicable vessels	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D06	A waste management plan will be developed and implemented to avoid unauthorized waste discharges and transfers, with written procedures for collection, segregation, storage, processing and disposal of waste, including use of equipment and record keeping.	Waste Management Plan (WMP) in place for both onshore and offshore facilities/vessels	WMP documentation	Before commencement of project construction	Waste management plan in place for both onshore and offshore facilities/vessels developed and implemented to avoid unauthorized waste discharges and transfers, with written procedures for collection, segregation, storage, processing and disposal of waste, including use of equipment and record keeping	Reading of the waste management plan demonstrating the procedures to avoid unauthorized waste discharges and transfers, with written procedures for collection, segregation, storage, processing and disposal of waste, including use of equipment and record keeping	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
D07	Waste not permitted to be discharged at sea (such as waste chemicals, cooking oils or lubricating oils, biomedical waste) will be transported onshore for transfer to an approved disposal facility ⁵ (in-country or an international provider).	Waste management plan with approved disposal route and management practices for each waste stream	WMP documentation	Before commencement of project construction	Waste management plan with approved disposal route and management practices for each waste stream	Reading of the waste management plan with approved disposal route and management practices for each waste stream	Once	To be determined by the DCE	DEEC	None (desktop work)
D08	Ballast water will be discharged according to IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM), where applicable.	Project vessels ballast water management procedures, and use of a record book, as appropriate (vessels >400 GT)	Project vessels documentation	Once, each for offshore project vessels	Where applicable, project vessels ballast water management procedures, and use of a record log, as appropriate (vessels >400 GT)	Visit of applicable project vessels (vessels >400 GT) to verify their use of ballast water management procedures, and use of a record log	Once, for applicable vessels	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D09	Discharges of SBDF ⁶ mud and cuttings will be managed. SBDF cuttings will only be discharged once the performance targets of 6.9 g/100 g retained "synthetic on cuttings" on wet solids averaged over the whole well discharge can be satisfied. The concentration of SBDF on cuttings will be monitored on the drillship. No excess or spent SBDF will be discharged to the sea. Spent or excess SBDF that cannot be re-used during drilling operations will be brought back to shore for disposal. If mineral oil base drilling fluid (OPDF ⁷) were to be selected, cuttings contaminated with mineral oil base drilling fluid at a concentration greater than 1% by weight mineral oil on dry cuttings will not be discharged. No OPDF will be discharged as whole fluid.	Drilling: Waste management plan describing equipment in place, specifications, and procedures for drill cuttings, muds and fluids management.	Drilling: Waste management plan.	Before drillship mobilization	Waste management plan confirming equipment in place, specifications, and procedures for drill cuttings, muds and fluids management consistent with the commitments of Measure D09	Reading of the waste management plan demonstrating equipment in place, specifications, and procedures for drill cuttings, muds and fluids management consistent with the commitments of Measure D09	Once	To be determined by the DCE	DEEC	None (desktop work)

⁵ In this document, a treatment center can mean either a center for waste treatment or for final disposal.

⁶ SBM: Synthetic Based Muds; SBDF: Synthetic Based Drilling Fluids.

⁷ OPDF: Organic-phase drilling fluids.

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴
D10	Selection of drilling chemicals will be in accordance with the BP chemical selection and waste management standards to reduce potential for environmental effect. Where feasible, lower toxicity drilling muds and biodegradable and environmentally friendly additives within muds, cements and completion fluids will be preferentially used. If barite is used as weighting agent, it will not contain more than: <ul style="list-style-type: none"> ▪ Hg: max 1 mg/kg dry weight in stock barite and ▪ Cd: max 3 mg/kg dry weight in stock barite. 	Drilling chemicals chemical composition specifications included in Drilling and Completion Fluids Basis of Design	Drilling and Completion Fluids Basis of Design	Once, for similar wells, or following a change of vendor or system	Relevant excerpt from the engineering document Drilling and Completion Fluids Basis of Design or a similar document, indicating drilling chemicals chemical composition specifications	Reading of the relevant excerpt from the engineering document Drilling and Completion Fluids Basis of Design or a similar document, demonstrating drilling chemicals chemical composition specifications	Once	To be determined by the DCE	DEEC	None (desktop work)
D11	Completion and well workover fluids to be discharged overboard will be tested to confirm the fluids are suitable for discharge as required by applicable national and international regulations. Fluids that do not meet the specification would either be treated offshore or transported onshore for transfer to an approved disposal ⁸ facility (in-country or an international provider).	Specifications included in Drilling and Completion Fluids Basis of Design or Well Workover Plan	Drilling and Completion Fluids Basis of Design or Well Workover Plan	Once, for similar wells, or following a change of vendor or system	Relevant excerpt from the engineering document Drilling and Completion Fluids Basis of Design or an excerpt from the Well Workover Plan or a similar document, indicating completion and well workover fluids specifications	Reading of the relevant excerpt from the engineering document Drilling and Completion Fluids Basis of Design or an excerpt from the Well Workover Plan or a similar document, demonstrating completion and well workover fluids specifications	Once	To be determined by the DCE	DEEC	None (desktop work)

⁸ In this document, a treatment center can mean either a center for waste treatment or for final disposal.

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴
D12 A pipeline and FLNG hydrotesting plan will be developed and implemented, detailing hydrotesting requirements, and demonstrating, based on an environmental risk assessment approach, the chemical additives to be selected as well as likely concentrations, volumes and frequencies of discharges. The plan will include a strategy to minimize environmental impact.	Subsea: Pre-commissioning execution plan includes environmental-risk based chemical selection and management.	Subsea: Pre-commissioning execution plan	Prior to operations phase (commissioning)	Relevant excerpt from the subsea systems commissioning execution plan or similar document indicating environmental-risk based chemical selection and management	Reading of the relevant excerpt from the subsea systems commissioning execution plan or similar document indicating environmental-risk based chemical selection and management	Once	To be determined by the DCE	DEEC	None (desktop work)
	FPSO: Chemical selection specifications in Basis of Design	FPSO: Chemical Selection Plan	Prior to operations phase (commissioning)	Relevant excerpt from the engineering document Basis of Design or similar document indicating chemical selection specifications	Reading of the relevant excerpt from the engineering document Basis of Design or similar document indicating chemical selection specifications	Once	To be determined by the DCE	DEEC	None (desktop work)
	FLNG: Chemical selection specifications in Basis of Design	FLNG: Basis of Design	Prior to operations phase (commissioning)	Relevant excerpt from the engineering document Basis of Design or similar document indicating chemical selection specifications	Reading of the relevant excerpt from the engineering document Basis of Design or similar document indicating chemical selection specifications	Once	To be determined by the DCE	DEEC	None (desktop work)
	See Chapter 10: Surveillance and Monitoring Plan								
D13 A dredging management plan will be developed for large dredging works (breakwater, disposal areas, potential sand borrow areas offshore) and implemented that defines the dredging methodology, identifies and assesses dredged materials disposal options and sites, characterizes the composition and behavior of the sediment to be dredged, and defines the area of influence and the potential mitigation and monitoring measures. In addition, pre- and post-dredged survey will be performed.	Dredging management plan	Dredging management plan	Once, prior to each large dredging operation	A dredging management plan developed for large dredging works and implemented that defines the dredging methodology, identifies and assesses dredged materials disposal options and sites, characterizes the composition and behavior of the sediment to be dredged, and defines the area of influence and the potential mitigation and monitoring measures	Reading of a dredging management plan developed for large dredging works and implemented that defines the dredging methodology, identifies and assesses dredged materials disposal options and sites, characterizes the composition and behavior of the sediment to be dredged, and defines the area of influence and the potential mitigation and monitoring measures	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴
D14	Commitment to building Hub at approximately 10 to 11 km from shore with an intended benefit of limiting impact on the seagrass beds.	Final engineering documentation	Final engineering documentation	Once, prior to initiation of Hub construction	Geographical location of Hub approximately 10 to 11 km from shore	Visit to Hub	Once	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D15	The FLNG and FPSO will be designed, constructed, and operated to avoid routine flaring ⁹ .	Flaring and Blowdown Philosophy for FPSO	Flaring and Blowdown Philosophy for FPSO	Once, prior to initiation FPSO construction	Relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FPSO or a similar document indicating that the FPSO will be designed, constructed, and operated to avoid routine flaring	Reading of the relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FPSO or a similar document indicating that the FPSO will be designed, constructed, and operated to avoid routine flaring	Once	To be determined by the DCE	DEEC	None (desktop work)
		Fuel Gas and flaring Philosophy for FLNG	Fuel Gas and flaring Philosophy for FLNG	Once, prior to FLNG mobilization	Relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FLNG or a similar document indicating that the FLNG will be designed, constructed, and operated to avoid routine flaring	Reading of the relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FLNG or a similar document indicating that the FLNG will be designed, constructed, and operated to avoid routine flaring	Once	To be determined by the DCE	DEEC	None (desktop work)
D16	Lighting will be reduced to the extent that worker safety and safe & secure operations is not compromised. Reduction of light may include avoiding use of unnecessary lighting, shading, and downward lighting where possible.	Final engineering documentation	Final engineering documentation	Once, prior to initiation of hub, FLNG and FPSO construction	BP ESMP Compliance Report confirming that lighting has been reduced to the extent that worker safety and safe & secure operations is not compromised	Reading of the BP ESMP Compliance Report confirming that lighting has been reduced to the extent that worker safety and safe & secure operations is not compromised.	Once	To be determined by the DCE	DEEC	None (desktop work)

⁹ Routine flaring is defined in Section 7.3.1.

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴
D17	Development and implementation of a wildlife handling and rescue protocol for the FLNG and FPSO vessels and project patrol boats.	Wildlife handling and rescue protocol available on FLNG and FPSO and project patrol boats	Vessel documentation	Once, prior to initiation of FLNG, FPSO and patrol boats mobilization	Wildlife handling and rescue protocol available on FLNG and FPSO and project patrol boats	Visit to FLNG and FPSO vessels and project patrol boats to verify that a wildlife handling and rescue protocol is available on FLNG and FPSO and project patrol boats	Once, after vessels mobilization	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers wildlife handling and rescue protocol	BP-provided training materials / vessel contractors' training logs	Once, prior to initiation of, FPSO and patrol boats mobilization	Interviews with captains of applicable vessels confirming the establishment of a wildlife handling and rescue protocol	Visit of applicable project vessels to conduct interviews with captains of applicable vessels and demonstrate the establishment of a wildlife handling and rescue protocol	Once, after vessels mobilization	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D18	The seabed in the project areas has been mapped as part of an extensive geophysical and geotechnical survey carried out by the project. The survey has confirmed that the project seabed infrastructure does not pose a risk to the submarine telecommunication cables.	Results of the geophysical and geotechnical survey	Geophysical and geotechnical survey reports	Once, before the Construction Phase starts	Report confirming that the seabed in the project areas has been mapped through an extensive survey and that the project seabed infrastructure does not pose a risk to the submarine telecommunication cables	Reading of the report indicating that the seabed in the project areas has been mapped through an extensive survey and that the project seabed infrastructure does not pose a risk to the submarine telecommunication cables	Once	To be determined by the DCE	DEEC	None (desktop work)
D19	The relevant maritime, port or shipping authorities will be notified of all permanent offshore facilities as safety zones and routine shipping routes to be used by project-related vessels. Permanent facility locations will be demarcated on nautical charts.	Relevant maritime, port or shipping authorities notified of all permanent offshore facilities, as well as safety zones and routine shipping routes to be used by project-related vessels	Notification sent by the project to relevant maritime, port or shipping authorities	Once, before the Construction Phase starts and following changes in zoning	Notification sent by the project to relevant maritime, port or shipping authorities of all permanent offshore facilities, as well as safety zones and routine shipping routes generally used by project-related vessels	Reading of communication documents to verify that the notification to relevant maritime, port or shipping authorities was sent	Once, before the Construction Phase starts	To be determined by the DCE	ANAM	None (desktop work)
D20	Project vessels will follow the Convention on International Regulations for Preventing Collisions at Sea (COLREGs) adopted by the IMO.	Project vessels procedures indicating that they follow COLREG	Project vessel documentation	Once, before the Construction Phase starts	Project vessels procedures indicating that they follow COLREG	Visit of project vessels to verify that they follow COLREG	Once	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴	
D21	Main project vessels will be equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels.	Main project vessels with AIS equipment	Project vessel documentation	Once, before the Construction Phase starts	Main project vessels equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels	Visit to project vessels to verify that main project vessels are equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels	Once	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D22	Where there is a risk of vessel interaction, standard communication procedures will be used in international maritime traffic and shipping, aided by project patrol boats or standby vessels near the drilling, pipelay and Nearshore Hub/Terminal Area to prevent collision with larger vessels.	Communication procedures used by project vessels	Project vessel documentation	Once, before the Construction Phase starts	Interviews with captains of applicable vessels confirming the use of standard international maritime shipping procedures where there is a risk of vessel interaction, aided by project patrol boats when required	Visit to project vessels to conduct interviews with captains of applicable vessels and determine the use of standard international maritime shipping procedures where there is a risk of vessel interaction, aided by project patrol boats when required	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Proper demarcation of the exclusion safety zones	Documentary evidence of the demarcation of the exclusion safety zones	Once, before the Construction Phase starts and quarterly	Observation confirming the proper demarcation of the exclusion safety zones	Observation during Hub visit confirming the proper demarcation of the exclusion safety zones	Once, during the Construction Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D23	Information will be provided to the national industrial fishing fleet of both Mauritania and Senegal to communicate and record the exclusion safety zones and applicable navigational charts.	Information provided to national industrial fishing fleets on permanent exclusion safety zones and applicable navigational charts	Notification sent by the project to authorities in charge of or organizations representing national industrial fishing	Once, before the Construction Phase starts and following permanent changes in zoning	BP ESMP Compliance Report confirming that information has been provided to national industrial fishing fleets on permanent exclusion safety zones and applicable navigational charts	Reading of the BP ESMP Compliance Report indicating that information has been provided to national industrial fishing fleets on permanent exclusion safety zones and applicable navigational charts	Once, before the Construction Phase starts	To be determined by the DCE	ANAM and/or Ministry of Fisheries and Maritime Economy	None (desktop work)
D24	Exclusion safety zones will be demarcated on applicable navigational charts, and a communication procedure will be developed to communicate the location of the exclusion safety zones to the local fishing communities. This is intended to allow pirogues avoid the exclusion safety zones.	Location of exclusion safety zones communicated to local fishing communities	Records of information provided by the project to local fishing communities	Once, before the Construction Phase starts and Quarterly or as adjusted based on monitoring of exclusion zone breaches	BP ESMP Compliance Report confirming that a communication procedure has been developed to communicate the location of the exclusion safety zones to the local fishing communities, to allow pirogues to avoid the exclusion safety zones	Reading of the BP ESMP Compliance Report indicating that a communication procedure has been developed to communicate the location of the exclusion safety zones to the local fishing communities, to allow pirogues to avoid the exclusion safety zones	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴
D25	The seabed has been mapped as part of an extensive geophysical and geotechnical survey carried out by the project. The survey has not identified any shipwrecks or other maritime heritage on the seabed. Further seabed surveys are foreseen prior to dredging taking place.	Results of the geophysical and geotechnical surveys	Geophysical and geotechnical survey reports	Once, before the Construction Phase starts	Report confirming that the seabed has been mapped and no shipwreck or other maritime heritage was found	Reading of the report confirming that the seabed has been mapped and no shipwreck or other maritime heritage was found	Once	To be determined by the DCE	DEEC	None (desktop work)
		Dredging management plan specifying pre-dredge survey	Dredging management plan	Once, before the dredging takes place						
D26	A site security plan will be developed that considers the security arrangements for each of the facilities including the modalities of support provided by government.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
D27	Expat workers and national workers will undergo a briefing to raise awareness on health risks, prevention and available treatment and their responsibilities. There will be an active screening and medical treatment program for workers.	Briefing of workers on health risks, prevention, treatment and responsibilities and medical screening and treatment program for workers	Workers health program documentation	Once, before and/or at the start of the Construction Phase starts	BP ESMP Compliance Report confirming that expat workers and national workers have been briefed on health risks, prevention and available treatment and their responsibilities, and that they have been through an active screening and have access to a medical treatment program	Reading of the BP ESMP Compliance Report indicating that expat workers and national workers have been briefed on health risks, prevention and available treatment and their responsibilities, and that they have been through an active screening and have access to a medical treatment program	Once	To be determined by the DCE	Ministry of Health and Social Action	None (desktop work)
D28	The nature of the drilling, pipelay, FPSO and FLNG Construction Phase activities will reduce the need for onshore stay-overs of personnel.	Offshore workers accommodation arrangements for drilling and pipelay activities and construction of FPSO and FLNG minimize any onshore stay-overs in Saint Louis and N'Diogo	Workers accommodation arrangements in contractors' documentation	Once, before the Construction Phase starts	Observation of applicable vessels confirming that the nature of the drilling, pipelay, FPSO and FLNG Construction Phase activities will reduce the need for onshore stay-overs of personnel	Observation through visits to applicable vessels to determine that the nature of the drilling, pipelay, FPSO and FLNG Construction Phase activities will reduce the need for onshore stay-overs of personnel	Once	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-1. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Construction Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ³	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ⁴
D29	Develop and implement a flaring protocol with the intention to meet defined operational combustion performance.	Drilling: Provisions for flaring specified in Completion and Well Flowback Basis of Design	Drilling: Completion and Well Flowback Basis of Design document	Once, before initial flaring is initiated	Relevant excerpt from the Completion and Well Flowback Basis of Design document or similar document for drilling indicating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Reading of the relevant excerpt from the Completion and Well Flowback Basis of Design document or similar document for drilling demonstrating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Once	To be determined by the DCE	DEEC	None (desktop work)
		Specifications in Flaring and Blowdown Philosophy for FPSO	Specifications in Flaring and Blowdown Philosophy for FPSO	Once, before initial flaring is initiated	Relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FPSO or a similar document indicating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Reading of the relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FPSO or a similar document demonstrating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Once	To be determined by the DCE	DEEC	None (desktop work)
		Specifications in Flaring and Blowdown Philosophy for FLNG	Specifications in Flaring and Blowdown Philosophy for FLNG	Once, before initial flaring is initiated	Relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FLNG or a similar document indicating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Reading of the relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FLNG or a similar document demonstrating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-2: ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase.

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹⁰	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹¹	
Air Quality and Greenhouse Gases										
Impact: IMP02: Reduction in ambient air quality (Residual Impact: 2 – Low)							Countries: Mauritania and Senegal			
M01	Maintaining routine maintenance procedures to help ensure that engines are operating at defined operational performance and specified emissions levels.	Maintenance Program for project vessels	Maintenance record books or system	As determined by each respective inspection and maintenance program and as adjusted following monitoring performance	Project vessels implementing a maintenance program for project vessels	Visit of project vessels confirming the implementation of a maintenance program	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M02	Monitoring fuel consumption as a proxy for measuring performance and emissions. When practical, or as required by applicable regulations, vessel operators will be expected to utilize low-sulfur fuels to limit SOx production.	Fuel consumption records by fuel type and vessel	Emissions reporting system	Annual checks for offshore project vessels	BP ESMP Compliance Report confirming the monitoring of the fuel consumption of the applicable vessels as a proxy for measuring performance and emissions	Reading of BP ESMP Compliance Report confirming the monitoring of the fuel consumption of the applicable vessels as a proxy for measuring performance and emissions	Annual	To be determined by the DCE	Technical Committee	None (desktop work)
M29	Use of dry low emissions (DLE) gas turbine drivers for the main refrigeration compressors on the FLNG.	Use of dry low emission technology on the FLNG	Basis of Design documentation for FLNG	Once, prior to initiation of operations	Relevant excerpt from the engineering document Basis of Design or a similar document, indicating the use of dry low emissions (DLE) gas turbine drivers for the main refrigeration compressors on the FLNG	Reading of the relevant excerpt from the engineering document Basis of Design or a similar document, indicating the use of dry low emissions (DLE) gas turbine drivers for the main refrigeration compressors on the FLNG	Once	To be determined by the DCE	DEEC	None (desktop work)
M30	Conduct monitoring of baseline air quality prior to the Construction Phase at receptor level to establish ground-level ambient air concentrations. Update air dispersion modelling if necessary when equipment specifications from vendors are available in detailed design phase.	See Chapter 10: Surveillance and Monitoring Plan								

¹⁰ In this table, monitoring activities include the reading of reports and other documents. The BP ESMP Compliance Report will be submitted by BP to the authorities according to the agreed periodicity. The other documents identified in the column "Monitoring Activity to be Carried Out by the Authorities" will be submitted to authorities upon request.

¹¹ In this table, providing for the transportation and accommodation by the GTA Phase 1 project will be done by the same means of transport and accommodation as those used by the project staff to reach the facilities, and notably for transportation, the boat or helicopter used for the transfer of staff.

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M31	Tug boats and other project support vessels not in operational use and moored at the Hub facility will be connected to electrical power provided by the Hub to the extent practical.	Tug boats and other project support vessels not in operational use and moored at the hub facility to be connected to electrical power provided by the QU platform Induction program of tug vessel masters covers mooring arrangements	BP-provided training materials / vessel contractors' training logs	Once, prior to initiation of operations and before mobilization of new tug vessels	Interviews with a Hub manager confirming that tug boats and other project support vessels not in operational use and moored at the Hub facility will be connected to electrical power provided by the Hub to the extent practical	Visit of the Hub to interview a Hub manager to demonstrate that that tug boats and other project support vessels not in operational use and moored at the Hub facility will be connected to electrical power provided by the Hub to the extent practical	Once, during the Operations Phase	To be determined by the DCE	DEEC or ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
Water Quality										
Impacts: IMP03: Reduction in ambient water quality from produced water and FLNG cooling water discharges and associated chemicals (Residual Impact: 2 – Low) IMP04: Changes in water quality from accidental loss of trash and debris (Residual Impact: 1 – Negligible)								Countries: Mauritania and Senegal		
M32	The seawater intake depth at the FLNG will be optimized to reduce the heated water plume. Cooling water effluent will not result in a temperature change of more than 3°C at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors, and assimilative capacity.	Seawater temperature change of less than 3°C at the edge of the mixing zone	FLNG Seawater cooling system philosophy	Once, before performance acceptance test	Relevant excerpt from the engineering document FLNG Seawater cooling system philosophy or a similar document, indicating that the cooling water effluent will not result in a temperature change of more than 3°C at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors, and assimilative capacity	Reading of the relevant excerpt from the engineering document FLNG Seawater cooling system philosophy or a similar document, indicating that the cooling water effluent will not result in a temperature change of more than 3°C at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors, and assimilative capacity	Once	To be determined by the DCE	DEEC	None (desktop work)
M33	Monitoring use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants).	Quantity of added chemicals to the produced water discharge	Chemical dosage specifications and records	Annually	Observation, in situ, of the implementation of a monitoring system for the use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants)	Visit of the FPSO to observe, in situ, the implementation of a monitoring system for the use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants)	Once during the first year after starting the FPSO, then annually as needed	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

¹² In this table, monitoring activities include the reading of reports and other documents. The BP ESMP Compliance Report will be submitted by BP to the authorities according to the agreed periodicity. The other documents identified in the column "Monitoring Activity to be Carried Out by the Authorities" will be submitted to authorities upon request.

¹³ In this table, providing for the transportation and accommodation by the GTA Phase 1 project will be done by the same means of transport and accommodation as those used by the project staff to reach the facilities, and notably for transportation, the boat or helicopter used for the transfer of staff.

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M34 Verifying compliance with MARPOL Convention and implementation of a waste management plan, with the intent of reducing the likelihood of accidental loss.	Compliance with MARPOL restrictions for accidental solid waste loss, including implementation of a Waste Management Plan (WMP)	Project vessels contractors WMP	Annually for each project vessel	Waste management plan	Reading of the waste management plan	Reading once at the beginning of the Operations Phase	To be determined by the DCE	DEEC	None (desktop work)
				Observation of the implementation of a waste management plan on board applicable project vessels	Visit of applicable project vessels to observe the implementation of a waste management plan	Visit in the first year of the Operations Phase, then annually as needed	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M35 The seawater intake depth at the FPSO will be designed with the intent to reduce the need for use of antifoulant chemicals.	Seawater intake depth at the FPSO optimized to reduce the need for use of antifoulant chemicals	Final FEED documentation	Once, prior to initiation of operations	Relevant excerpt from the final engineering document or a similar document indicating that seawater intake depth at the FPSO was optimized to reduce the need for use of antifoulant chemicals	Reading of the relevant excerpt from the final engineering document or a similar document demonstrating that seawater intake depth at the FPSO was optimized to reduce the need for use of antifoulant chemicals	Once	To be determined by the DCE	DEEC	None (desktop work)
M36 Free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm).	Residual chlorine sampling point installed	FLNG Basis of Design documentation	Once, prior to initiation of operations	Reading of the relevant excerpt from the engineering document Basis of Design or a similar document, demonstrating that the free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm)	Reading of the relevant excerpt from the engineering document Basis of Design or a similar document, indicating that the free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm)	Once	To be determined by the DCE	DEEC	None (desktop work)
M37 Produced water will be treated prior to discharge with sufficient treatment. Oil and grease content of the produced water effluent discharge at sea will be compliant with applicable regulation and not exceed 42 mg/L daily maximum; 29 mg/L monthly average.	Produced water treatment system meeting specifications installed with in-line oil-in-water monitor	FPSO Basis of Design documentation	Once, prior to initiation of operations	Observation, in situ, of the produced water treatment system before discharge from aboard the FPSO	Visit of the FPSO to observe the implementation of the produced water treatment system before discharge	Once	To be determined by the DCE	DEEC	None (desktop work)
M38 Produced water effluent quality will be monitored. The first 18 months of monitoring data will be used to assess the likely impacts of the effluent upon the receiving water body using an Environmental Risk Assessment approach, which is to be repeated following a material change in effluent composition or volume.	See Chapter 10: Surveillance and Monitoring Plan								

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M39	The discharge of cooling water will be designed to reduce recirculation.	Optimization of cooling water discharge to reduce recirculation	FLNG Thermal recirculation study report	Once, prior to initiation of operations	Relevant excerpt from the FLNG Thermal recirculation study report or a similar document indicating that the discharge of cooling water was designed to reduce recirculation	Reading of the relevant excerpt from the FLNG Thermal recirculation study report or a similar document indicating that the discharge of cooling water was designed to reduce recirculation	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
Coastal Erosion									
Impact: IMP05: Accretion or reduction in natural erosion of the Langue de Barbarie (relative to the case without the breakwater) of up to 13 m over 10 years near the Mauritania-Senegal border and extending southward approximately 8 km, accompanied by a maximum increase in coastal erosion rate (relative to the case without the breakwater) of approximately 6 m over 10 years further south, along approximately 2 km of coast, starting from the south end of the Hydrobase neighborhood (Residual Impact: 2 – Low)							Country: Senegal		
M40	<p>a) To improve understanding of the long-term coastal dynamic equilibrium, the project will develop and implement a coastline monitoring plan during the project life cycle. Coastline monitoring will commence prior to breakwater construction, i.e. before 2020. This will include the collection of further bathymetric data along the Saint-Louis shore, including the Senegal River mouth. The project will aim to involve local academics in the implementation of the coastline monitoring plan. The relevant authorities and local communities will be informed of the monitoring results.</p> <p>b) The data collected as part of the implementation of the coastline monitoring plan will be used to update the coastline modeling (in Appendix I-3) to be completed before the construction of the breakwater in 2020. Additional modeling updates will be conducted at key stages of the project life cycle when new information with the potential to have a significant impact on the modeling results will become available.</p> <p>c) BP will seek the necessary authorizations to share relevant data for government led morphological studies initiatives and local academics.</p> <p>d) a contingency plan for the coastline will be developed by the project in consultation with the relevant authorities if the results of the coastline monitoring and modeling clearly and systematically demonstrate, over the duration of the project, negative impacts related to the GTA Phase 1 project which exceeds those currently identified in the GTA Phase 1 project ESIA report (in particular Section 7.3.3).</p>								

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M41 Provide specialist assistance to studies led by local or national authorities on Saint-Louis coastal management.	Specialist assistance provided to improve local coastal management processes	Project documentation	Once, after technical assistance is provided	Documentation demonstrating the specialist assistance to studies led by local or national authorities on Saint-Louis coastal management	Reading of the documentation demonstrating the specialist assistance to studies led by local or national authorities on Saint-Louis coastal management	Once, during or after the specialist assistance is provided	To be determined by the DCE	Technical Committee	None (desktop work)
Sediment Quality									
Impact: IMP07: Potential chemical leaching of solid waste materials and localized organic loading from epibiota (Residual Impact: 1 – Negligible)							Countries: Mauritania and Senegal		
M34 Verifying compliance with MARPOL Convention and implementation of a waste management plan, with the intent of reducing the likelihood of accidental loss.	Compliance with MARPOL restrictions for accidental solid waste loss, including implementation of a Waste Management Plan (WMP)	Project vessels contractors WMP	Annually for each project vessel	Waste management plan	Reading of the waste management plan	Reading once at the beginning of the Operations Phase	To be determined by the DCE	DEEC	None (desktop work)
				Observation of the implementation of a waste management plan on board applicable project vessels	Visit of applicable project vessels to observe the implementation of a waste management plan	Visit in the first year of the Operations Phase, then annually as needed	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
Plankton & Fish and Other Fishery Resources									
Impact: IMP10: Entrainment and impingement of plankton and adult fish in FLNG cooling water at Nearshore Hub/Terminal. Entrainment and impingement of plankton and adult fish by FPSO (Residual Impact: 1 – Negligible)							Countries: Mauritania and Senegal		
M42 The seawater intake of the cooling water systems will be positioned taking into account technical constraints and appropriate screens or velocity caps will be fitted, if safe and practical, with the intent of avoiding entrainment and impingement of marine flora and fauna. The intake velocity will be below 1.0 m/s.	Seawater intake optimized to minimize entrainment, safety considerations withstanding as per FLNG seawater cooling system philosophy	FLNG Seawater cooling system philosophy	Once, before performance acceptance test	Relevant excerpt from the engineering document FLNG Seawater cooling system philosophy or a similar document, indicating how seawater intake has been optimized to avoid entrainment and impingement of marine flora and fauna, safety considerations withstanding	Reading of the relevant excerpt from the engineering document FLNG Seawater cooling system Philosophy or a similar document, indicating how seawater intake has been optimized to avoid entrainment and impingement of marine flora and fauna, safety considerations withstanding	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³	
Birds										
Impacts: IMP12: Incineration of birds during flaring from the FPSO and FLNG during non-routine conditions (Residual Impact: 2 – Low) IMP13: Potential vessel strike resulting in bird injury or mortality (Residual Impact: 2 – Low) IMP14: Effects of routine vessel and facility discharges during operations impacting birds directly or indirectly (Residual Impact: 1 – Negligible)							Countries: Mauritania and Senegal			
M33	Monitoring use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants).	Quantity of added chemicals to the produced water discharge	Chemical dosage specifications and records	Annually	Observation, in situ, of the implementation of a monitoring system for the use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants)	Visit of the FPSO to observe, in situ, the implementation of a monitoring system for the use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants)	Once, during the first year after starting the FPSO, then annually as needed	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M35	The seawater intake depth at the FPSO will be designed with the intent to reduce the need for use of antifoulant chemicals.	Seawater intake depth at the FPSO optimized to reduce the need for use of antifoulant chemicals	Final FEED documentation	Once, prior to initiation of operations	Relevant excerpt from the final engineering document or a similar document indicating that seawater intake depth at the FPSO was optimized to reduce the need for use of antifoulant chemicals	Reading of the relevant excerpt from the final engineering document or a similar document demonstrating that seawater intake depth at the FPSO was optimized to reduce the need for use of antifoulant chemicals	Once	To be determined by the DCE	DEEC	None (desktop work)
M36	Free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm).	Residual chlorine sampling point installed	FLNG Basis of Design documentation	Once, prior to initiation of operations	Relevant excerpt from the engineering document Basis of Design or a similar document, indicating that the free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm)	Reading of the relevant excerpt from the engineering document Basis of Design or a similar document, demonstrating that the free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm)	Once	To be determined by the DCE	DEEC	None (desktop work)
M37	Produced water will be treated prior to discharge with sufficient treatment. Oil and grease content of the produced water effluent discharge at sea will be compliant with applicable regulation and not exceed 42 mg/L daily maximum; 29 mg/L monthly average.	Produced water treatment system meeting specifications installed with in-line oil-in-water monitor	FPSO Basis of Design documentation	Once, prior to initiation of operations	Observation, in situ, of the produced water treatment system before discharge from aboard the FPSO	Visit of the FPSO to observe the implementation of the produced water treatment system before discharge	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M38 Produced water effluent quality will be monitored. The first 18 months of monitoring data will be used to assess the likely impacts of the effluent upon the receiving water body using an Environmental Risk Assessment approach, which is to be repeated following a material change in effluent composition or volume.	See Chapter 10: Surveillance and Monitoring Plan								
M39 The discharge of cooling water will be designed to reduce recirculation.	Optimization of cooling water discharge to reduce recirculation	FLNG Thermal recirculation study report	Once, prior to initiation of operations	Relevant excerpt from the FLNG Thermal recirculation study report or a similar document indicating that the discharge of cooling water was designed to reduce recirculation	Reading of the relevant excerpt from the FLNG Thermal recirculation study report or a similar document indicating that the discharge of cooling water was designed to reduce recirculation	Once	To be determined by the DCE	DEEC	None (desktop work)
Marine Mammals									
Impacts: IMP16: Potential vessel strike resulting in marine mammal injury or mortality (Residual Impact: 1 – Negligible) IMP17: Avoidance or displacement from vessel traffic or the FPSO; Noise disturbances from operations (liquefaction of LNG and transfer operations) (Residual Impact: 2 – Low)							Countries: Mauritania and Senegal		
M06 Vessel operators will implement vessel strike avoidance protocols to reduce the potential for vessel strike with marine mammals and sea turtles (including injured/dead protected species reporting).	Induction program of vessel masters covers vessel strike avoidance protocol	BP-provided training materials / vessel contractors' training logs	Once, before mobilization of vessels	Interviews with vessel captains confirming implementation of vessel strike avoidance protocols	Visit to project vessels to interview vessel captains and demonstrate implementation of vessel strike avoidance protocols	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
Sea Turtles									
Impacts: IMP19: Potential vessel strike resulting in sea turtle injury or mortality (Residual Impact: 1 – Negligible) IMP20: Avoidance or displacement from vessel traffic or the FPSO; Noise disturbances from operations (liquefaction of LNG and transfer operations) (Residual Impact: 2 – Low) IMP21: Direct and indirect effects of routine vessel discharges during operations (Residual Impact: 1 – Negligible)							Countries: Mauritania and Senegal		
M06 Vessel operators will implement vessel strike avoidance protocols to reduce the potential for vessel strike with marine mammals and sea turtles (including injured/dead protected species reporting).	Induction program of vessel masters covers vessel strike avoidance protocol	BP-provided training materials / vessel contractors' training logs	Once, before mobilization of vessels	Interviews with vessel captains confirming implementation of vessel strike avoidance protocols	Visit to project vessels to interview vessel captains and demonstrate implementation of vessel strike avoidance protocols	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M33 Monitoring use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants).	Quantity of added chemicals to the produced water discharge	Chemical dosage specifications and records	Annually	Observation, in situ, of the implementation of a monitoring system for the use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants)	Visit of the FPSO to observe, in situ, the implementation of a monitoring system for the use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants)	Once, during the first year after starting the FPSO, then annually as needed	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M35 The seawater intake depth at the FPSO will be designed with the intent to reduce the need for use of antifoulant chemicals.	Seawater intake depth at the FPSO optimized to reduce the need for use of antifoulant chemicals	Final FEED documentation	Once, prior to initiation of operations	Relevant excerpt from the final engineering document or a similar document indicating that seawater intake depth at the FPSO was optimized to reduce the need for use of antifoulant chemicals	Reading of the relevant excerpt from the final engineering document or a similar document demonstrating that seawater intake depth at the FPSO was optimized to reduce the need for use of antifoulant chemicals	Once	To be determined by the DCE	DEEC	None (desktop work)
M36 Free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm).	Residual chlorine sampling point installed	FLNG Basis of Design documentation	Once, prior to initiation of operations	Relevant excerpt from the engineering document Basis of Design or a similar document, indicating that the free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm)	Reading of the relevant excerpt from the engineering document Basis of Design or a similar document, demonstrating that the free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm)	Once	To be determined by the DCE	DEEC	None (desktop work)
M37 Produced water will be treated prior to discharge with sufficient treatment. Oil and grease content of the produced water effluent discharge at sea will be compliant with applicable regulation and not exceed 42 mg/L daily maximum; 29 mg/L monthly average.	Produced water treatment system meeting specifications installed with in-line oil-in-water monitor	FPSO Basis of Design documentation	Once, prior to initiation of operations	Observation, in situ, of the produced water treatment system before discharge from aboard the FPSO	Visit of the FPSO to observe the implementation of the produced water treatment system before discharge	Once	To be determined by the DCE	DEEC	None (desktop work)
M38 Produced water effluent quality will be monitored. The first 18 months of monitoring data will be used to assess the likely impacts of the effluent upon the receiving water body using an Environmental Risk Assessment approach, which is to be repeated following a material change in effluent composition or volume.	See Chapter 10: Surveillance and Monitoring Plan								
M39 The discharge of cooling water will be designed to reduce recirculation.	Optimization of cooling water discharge to reduce recirculation	FLNG Thermal recirculation study report	Once, prior to initiation of operations	Relevant excerpt from the FLNG Thermal recirculation study report or a similar document indicating that the discharge of cooling water was designed to reduce recirculation	Reading of the relevant excerpt from the FLNG Thermal recirculation study report or a similar document indicating that the discharge of cooling water was designed to reduce recirculation	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³	
Threatened Species and Protected Areas										
Impacts: IMP23: Disturbance, possible auditory injury, vessel strike to threatened species from vessels, operations (Residual Impact: 1 – Negligible) IMP24: Introduction of non-native or invasive species (Residual Impact: 2 – Low) IMP25: Behavioral disturbances to fauna within protected areas or other areas of conservation interest (Residual Impact: 2 – Low) IMP26: Behavioral disturbances to threatened species (Residual Impact: 2 – Low) IMP27: Increase in airborne contaminants in protected areas or other areas of conservation interest (Residual Impact: 1 – Negligible)							Countries: Mauritania and Senegal			
M01	Maintaining routine maintenance procedures to help ensure that engines are operating at defined operational performance and specified emissions levels.	Maintenance Program for project vessels	Maintenance record books or system	As determined by each respective inspection and maintenance program and as adjusted following monitoring performance	Project vessels implementing a maintenance program for project vessels	Visit of project vessels confirming the implementation of a maintenance program	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M02	Monitoring fuel consumption as a proxy for measuring performance and emissions. When practical, or as required by applicable regulations, vessel operators will be expected to utilize low-sulfur fuels to limit SOx production.	Fuel consumption records by fuel type and vessel	Emissions reporting system	Annual checks for offshore project vessels	BP ESMP Compliance Report confirming the monitoring of the fuel consumption of the applicable vessels as a proxy for measuring performance and emissions	Reading of BP ESMP Compliance Report demonstrating the monitoring of the fuel consumption of the applicable vessels as a proxy for measuring performance and emissions	Annual	To be determined by the DCE	Technical Committee	None (desktop work)
M06	Vessel operators will implement vessel strike avoidance protocols to reduce the potential for vessel strike with marine mammals and sea turtles (including injured/dead protected species reporting).	Induction program of vessel masters covers vessel strike avoidance protocol	BP-provided training materials / vessel contractors' training logs	Once, before mobilization of vessels	Interviews with vessel captains confirming implementation of vessel strike avoidance protocols	Visit to project vessels to interview vessel captains and demonstrate implementation of vessel strike avoidance protocols	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M43	Implement a program of support to local protected area management initiatives through mutually agreed capacity building.	Support local protected area management via capacity building	Report on support provided to protected area management	Once, after support provided	BP ESMP Compliance Report confirming the support for local protected area management via capacity building	BP ESMP Compliance Report demonstrating the support for local protected area management via capacity building	Once, after support provided	To be determined by the DCE	DEEC	None (desktop work)
Biodiversity										
See Mitigation Measures listed to mitigate impacts on Plankton & Fish and Other Fishery Resources, Birds, Marine Mammals, Sea Turtles, Threatened Species and Protected Areas: M01, M02, M06, M33, M35, M36, M37, M38, M39, M42.										

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³	
Maritime Navigation										
Impact: IMP28: Risk of collision between project vessels and pirogues due to project vessels movements (Residual Impact: 2 – Low)							Countries: Mauritania and Senegal			
M08	Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Training and awareness program records	Once, before the Operations Phase starts and Annually thereafter or as adjusted as informed by monitoring of offshore safety incidents and near-misses	BP ESMP Compliance Report confirming the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Reading of the BP ESMP Compliance Report demonstrating the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Once, after the start of operations and as needed	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M09	Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Operations Phase starts and Annually thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once per year, after the start of operations and as needed	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M10	Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time.	Project vessels equipped with radar or infrared systems	Project vessels equipment listing	Once, before the Operations Phase starts and before mobilization of new vessels	Project vessels equipped with radar or infrared systems	Visit of project vessels to confirm that these vessels are equipped with radar or infrared systems	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M11	Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling.	Vessels well-lit during poor visibility or at night and equipped with searchlights	Project vessels equipment listing	Once, before the Operations Phase and before mobilization of new vessels	Vessels well-lit during poor visibility or at night and equipped with searchlights	Visit of project vessels to confirm that these vessels are well-lit during poor visibility or at night and equipped with searchlights	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-agreed training materials / vessel contractors' training logs	Once, before the Operations Phase and before mobilization of new vessels	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M12	Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones.	Project patrol boat in place	Project vessels logs	Once, before the Operations Phase starts and Annually thereafter	Project patrol boat in place	Visit of the Hub to verify presence of a patrol boat to monitor the exclusion safety zones	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M13 Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.	FLOs in place aboard the project patrol boats, if and when necessary	Project patrol boats Person on Board records	Once, before the Operations Phase starts and Annually thereafter	BP ESMP Compliance Report confirming mobilization of local FLOs aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Reading of BP ESMP Compliance Report demonstrating mobilization of local FLOs aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M14 Equipping the support vessels and the project patrol boat with lifesaving appliances approved by the Convention for Safety of Life at Sea (SOLAS) and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel. Assist with the rescue of any fishermen involved in a collision with a project vessel or following the capsizing of their vessel due to ship wake.	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Project vessels equipment listings	Once, before the Operations Phase starts	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Visit of project vessels demonstrating presence of lifesaving appliances approved by the Convention SOLAS and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel.	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Operations Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Records of maritime safety incidents	Project vessels HSSE incident reports	After a reported incident	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once per year	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)
M15 In case of a collision, BP will inform as soon as possible the relevant national authorities: the Mauritanian Coast Guard (Garde Côte Mauritanienne) in Mauritania and HASSMAR in Senegal.	National authorities informed in case of a collision	Records of information provided by the project to national authorities	After a reported collision	Part of communication documents reporting a collision	Reading of part of communication documents reporting a collision	After a reported collision	To be determined by the DCE	HASSMAR	None (desktop work)
M16 Ensuring that each project vessel keeps records of maritime safety incidents with pirogues and other vessels, including near misses, and that these are subsequently shared with the project. BP will monitor maritime safety incidents and adjust, if required, project specific maritime safety rules, security and search & rescue arrangements in place.	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Operations Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Records of maritime safety incidents	Project vessel HSSE incidents reports	Annually	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once per year	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M17 Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M18 Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities.	CLOs in place for N'Diago and Saint-Louis	Project Human Resources records	Once, before the Operations Phase starts and Annually	CLOs in place for N'Diago and Saint-Louis	Site visit at the office of the CLOs in place for N'Diago and Saint-Louis	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M19 Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once per year, after community councils formally set up	To be determined by the DCE	Technical Committee	None (desktop work)
Artisanal Fisheries and Related Activities									
Impact: IMP29: Potential loss of artisanal fishing gears (nets and buoys) due to project vessel movements in artisanal fishing areas (Residual Impact: 2 – Low)							Countries: Mauritania and Senegal		
M09 Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Operations Phase starts and Annually thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once per year, after the start of operations and as needed	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M12 Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones.	Project patrol boat in place	Project vessels logs	Once, before the Operations Phase starts and Annually thereafter	Project patrol boat in place	Visit of the Hub to verify presence of a patrol boat to monitor the exclusion safety zones	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M13 Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.	FLOs in place aboard the project patrol boats, if and when necessary	Project patrol boats Person on Board records	Once, before the Operations Phase starts and Annually thereafter	BP ESMP Compliance Report confirming mobilization of local FLOs aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Reading of BP ESMP Compliance Report demonstrating mobilization of local FLOs aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³	
M17	Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M18	Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities.	CLOs in place for N'Diago and Saint-Louis	Project Human Resources records	Once, before the Operations Phase starts and Annually	CLOs in place for N'Diago and Saint-Louis	Site visit at the office of the CLOs in place for N'Diago and Saint-Louis	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once per year, after community councils formally set up	To be determined by the DCE	Technical Committee	None (desktop work)
M20	Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers.	Framework for interaction with artisanal fisheries developed and implemented	Framework documentation Evidence of follow-up activities in conformance with Framework documentation	Once, before the Operations Phase starts and Annually thereafter	BP ESMP Compliance Report confirming development of a framework for interaction with artisanal fisheries	Reading of BP ESMP Compliance Report demonstrating development of a framework for interaction with artisanal fisheries	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
					BP ESMP Compliance Report confirming implementation of follow-up activities compliant with framework documentation	Reading of BP ESMP Compliance Report demonstrating implementation of follow-up activities compliant with framework documentation	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M21	Project vessels to record incidents with fishing gears and report them to the project.	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Operations Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Records of maritime incidents with other sea users	Records of incidents with other sea users'	Annually	BP ESMP Compliance Report demonstrating recording of maritime incidents with other sea users	Reading of BP ESMP Compliance Report demonstrating recording of maritime incidents with other sea users	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³	
M22	To the extent feasible, establish a maritime corridor or speed restrictions for project vessels within artisanal fishing areas.	Induction program of vessel masters covers speed restrictions in areas of artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Operations Phase starts and Annually if needed	Interviews with project vessel captains or pilots confirming establishment of a maritime corridor or speed restrictions for project vessels within artisanal fishing areas, to the extent feasible	Visit of project vessels to interview project vessel captains or pilots and demonstrate establishment of a maritime corridor or speed restrictions for project vessels within artisanal fishing areas, to the extent feasible	Once	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M23	Implement an environmental awareness building program in association with local schools and community groups.	Environmental awareness program implemented in local schools and community groups	Environmental awareness program records	Once, before the Operations Phase starts and thereafter adjusted as needed following an assessment of program effectiveness	BP ESMP Compliance Report confirming implementation of an environmental awareness program in local schools and community groups	Reading of BP ESMP Compliance Report demonstrating the implementation of an environmental awareness program in local schools and community groups.	Once	To be determined by the DCE	Saint-Louis Regional Department of Environment and Classified Establishments	None (desktop work)
Community Health, Safety and Security										
Impacts:							Countries: Mauritania and Senegal			
IMP30: Risk of conflicts between artisanal fishermen and public security forces if some fishermen need to be escorted out of the exclusion safety zones (Residual Impact: 2 – Low)										
IMP31: Risk of terrorism act targeting the gas production facilities which in turn will raise the level of terrorism risk at a national level (Residual Impact: 2 – Low)										
M08	Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Training and awareness program records	Once, before the Operations Phase starts and Annually thereafter or as adjusted as informed by monitoring of offshore safety incidents and near-misses	BP ESMP Compliance Report confirming the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Reading of the BP ESMP Compliance Report demonstrating the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Once, after the start of operations and as needed	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M17	Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diogo and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diogo and in Saint-Louis	Project meeting records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diogo and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diogo and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once per year, after community councils formally set up	To be determined by the DCE	Technical Committee	None (desktop work)
M25	The project will seek to work with the public security forces to establish an appropriate response and security framework which may include resource, equipment, training and response protocols.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M26 Include in the security stakeholder engagement plan, provisions around response, management and interface with Public security forces for security incidents scenario such as act of terrorism and unlawful entry in the exclusion safety zones.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
Public Infrastructure and Services									
Impacts: IMP32: Placing additional demands on the public security forces limited resources since they will be required to be available 24/7 to handle a safety incident with artisanal fishermen or a search and rescue operation if needed (Residual Impact: 2 – Low) IMP33: Placing additional demands on National security authorities who will need to prevent and be available 24/7 to handle a national security incident at sea resulting from the presence of offshore gas production infrastructures (Residual Impact: 2 – Low)							Countries: Mauritania and Senegal		
M08 Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Training and awareness program records	Once, before the Operations Phase starts and Annually thereafter or as adjusted as informed by monitoring of offshore safety incidents and near-misses	BP ESMP Compliance Report confirming the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Reading of the BP ESMP Compliance Report demonstrating the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Once, after the start of operations and as needed	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M09 Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Operations Phase starts and Annually thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once per year, after the start of operations and as needed	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M10 Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time.	Project vessels equipped with radar or infrared systems	Project vessels equipment listing	Once, before the Operations Phase starts and before mobilization of new vessels	Project vessels equipped with radar or infrared systems	Visit of project vessels to confirm that these vessels are equipped with radar or infrared systems	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M11 Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling.	Vessels well-lit during poor visibility or at night and equipped with searchlights	Project vessels equipment listing	Once, before the Operations Phase and before mobilization of new vessels	Vessels well-lit during poor visibility or at night and equipped with searchlights	Visit of project vessels to confirm that these vessels are well-lit during poor visibility or at night and equipped with searchlights	Once after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-agreed training materials / vessel contractors' training logs	Once, before the Operations Phase and before mobilization of new vessels	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M12 Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones.	Project patrol boat in place	Project vessels logs	Once, before the Operations Phase starts and Annually thereafter	Project patrol boat in place	Visit of the Hub to verify presence of a patrol boat to monitor the exclusion safety zones	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M13 Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.	FLOs in place aboard the project patrol boats, if and when necessary	Project patrol boats Person on Board records	Once, before the Operations Phase starts and Annually thereafter	BP ESMP Compliance Report confirming mobilization of local FLOs aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Reading of BP ESMP Compliance Report demonstrating mobilization of local FLOs aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M14 Equipping the support vessels and the project patrol boat with lifesaving appliances approved by the Convention for Safety of Life at Sea (SOLAS) and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel. Assist with the rescue of any fishermen involved in a collision with a project vessel or following the capsizing of their vessel due to ship wake.	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Project vessels equipment listings	Once, before the Operations Phase starts	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Visit of project vessels demonstrating presence of lifesaving appliances approved by the Convention SOLAS and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Operations Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Records of maritime safety incidents	Project vessels HSSE incident reports	After a reported incident	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once per year	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)
M16 Ensuring that each project vessel keeps records of maritime safety incidents with pirogues and other vessels, including near misses, and that these are subsequently shared with the project. BP will monitor maritime safety incidents and adjust, if required, project specific maritime safety rules, security and search & rescue arrangements in place.	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Operations Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Records of maritime safety incidents	Project vessel HSSE incidents reports	Annually	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once per year	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³	
M25	The project will seek to work with the public security forces to establish an appropriate response and security framework which may include resource, equipment, training and response protocols.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
M26	Include in the security stakeholder engagement plan, provisions around response, management and interface with Public security forces for security incidents scenario such as act of terrorism and unlawful entry in the exclusion safety zones.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
Social Climate										
Impact: IMP34: Social discontent in N'Diago and Saint-Louis due to the potential perception of loss of fishing grounds and fishing catches combined with the limited employment opportunities, the perception of unsatisfied grievances and/or compensation claims (e.g. for lost gear), and elevated safety risk for fishermen at sea due to presence of project vessels (Residual Impact: 2 – Low)							Countries: Mauritania and Senegal			
M09	Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Operations Phase starts and Annually thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once per year, after the start of operations and as needed	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M17	Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M18	Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities.	CLOs in place for N'Diago and Saint-Louis	Project Human Resources records	Once, before the Operations Phase starts and Annually	CLOs in place for N'Diago and Saint-Louis	Site visit at the office of the CLOs in place for N'Diago and Saint-Louis	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once per year, after community councils formally set up	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M20 Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers.	Framework for interaction with artisanal fisheries developed and implemented	Framework documentation Evidence of follow-up activities in conformance with Framework documentation	Once, before the Operations Phase starts and Annually thereafter	BP ESMP Compliance Report confirming development of a framework for interaction with artisanal fisheries	Reading of BP ESMP Compliance Report demonstrating development of a framework for interaction with artisanal fisheries	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
				BP ESMP Compliance Report confirming implementation of follow-up activities compliant with framework documentation	Reading of BP ESMP Compliance Report demonstrating implementation of follow-up activities compliant with framework documentation	Once per year	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M23 Implement an environmental awareness building program in association with local schools and community groups.	Environmental awareness program implemented in local schools and community groups	Environmental awareness program records	Once, before the Operations Phase starts and thereafter adjusted as needed following an assessment of program effectiveness	BP ESMP Compliance Report confirming implementation of an environmental awareness program in local schools and community groups	Reading of BP ESMP Compliance Report demonstrating the implementation of an environmental awareness program in local schools and community groups.	Once	To be determined by the DCE	Saint-Louis Regional Department of Environment and Classified Establishments	None (desktop work)
M24 Provide technical assistance to mutually agreed marine resource research programs notably with the national oceanographic research centers of both countries (CRODT and IMROP).	Technical assistance provided to marine resource research program with CRODT and IMROP	BP technical assistance records	Once, before the Operations Phase starts adjusted as needed following an assessment of program effectiveness	Documentation confirming technical assistance provided to mutually agreed marine resource research programs, notably CRODT and IMROP	Reading of documentation demonstrating technical assistance provided to mutually agreed marine resource research programs, notably CRODT and IMROP	Once, during or after the technical assistance is provided	To be determined by the DCE	Technical Committee	None (desktop work)
M27 Developing a social investment program to enhance project benefits for the directly affected communities N'Diago and Saint-Louis communities, including livelihood enhancement activities.	Social investment program to enhance project benefits for the communities of N'Diago and Saint-Louis developed	Social investment program documentation	Once, before the Operations Phase starts and Annually thereafter adjusted as needed following an assessment of program effectiveness	BP ESMP Compliance Report confirming implementation of a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities	Reading of BP ESMP Compliance Report demonstrating implementation of a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities	Once per year	To be determined by the DCE	Technical Committee	None (desktop work)
M28 Engaging in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities in order to help identify and support, if needed, ad hoc measures to prevent social discontent linked to project activities and its escalation into conflicts.	Periodic meetings between project representatives and national, regional and local authorities to monitor the social climate and, if needed, identification of support to ad hoc measures to prevent social discontent linked to project activities	Project meeting records	Once, before the Operations Phase starts and Annually	BP ESMP Compliance Report confirming engagement in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities	BP ESMP Compliance Report demonstrating engagement in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities	Once per year	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
M44	Review the social climate in N'Diago and in Saint-Louis prior to the Operations Phase to adjust as needed the mitigation measures identified to avoid or reduce social discontent.	Report on social climate in N'Diago and Saint-Louis with adjusted mitigation measures if needed	Report on social climate	Once, before the Operations Phase starts	BP ESMP Compliance Report confirming the review of the social climate in N'Diago and Saint-Louis with adjusted mitigation measures if needed	Reading of the BP ESMP Compliance Report confirming the review of the social climate in N'Diago and Saint-Louis with adjusted mitigation measures if needed	Once, after the Operations Phase starts	To be determined by the DCE	Technical Committee	None (desktop work)
Multiple Components of the Biophysical and Social Environment - Design and Operational Control Measures										
D01	Contractors will be expected to comply with the contract terms that have been established, including HSSE standards and performance requirements.	Bridging document between BP HSSE and contractors HSE/HSSE requirements	Bridging document	Once, at contract execution	Section of contract describing HSSE requirements	Reading of the section of the contract describing HSSE requirements	Once	To be determined by the DCE	Technical Committee	None (desktop work)
D02	Compliance with applicable national and international regulations (MARPOL 73/78 Annex VI) and guidelines regarding emissions of nitrogen oxides (NOx) and sulphur oxides (SOx) from main project vessels.	Valid International Air Pollution Prevention Certificate (IAPPC) confirming compliance with both the equipment and operational requirements of Annex VI	Main vessels documentation	Once, before mobilization to site	Valid IAPPC confirming compliance with both the equipment and operational requirements of Annex VI	Visit of project vessels to verify their possession of a valid IAPPC confirming compliance with both the equipment and operational requirements of Annex VI	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D04	Volumes of hydrocarbons flared will be recorded.	See Chapter 10: Surveillance and Monitoring Plan								
D05	Compliance with applicable national and international regulations (MARPOL 73/78, Annex IV and V) for waste and wastewater discharges from offshore project vessels.	Valid International Sewage Pollution Prevention Certificate	Offshore project vessel documentation	Once each for offshore project vessels before mobilization	Valid International Sewage Pollution Prevention Certificate	Visit of project vessels to verify their possession of a valid International Sewage Pollution Prevention Certificate	Once, after vessel mobilization	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Waste management plan and waste record book	Offshore project vessel documentation	Once each for offshore project vessels before mobilization	Waste management plan and waste record log for vessel projects	Reading of the waste management plan	Once	To be determined by the DCE	DEEC	None (desktop work)
		Certificates for type approval of oil pollution prevention equipment, such as oily-water separating equipment, oil filtering equipment, process units and oil content meters	Offshore project vessel documentation	Once each for offshore project vessels before mobilization	Certificates for type approval of oil pollution prevention equipment, such as oily-water separating equipment, oil filtering equipment, process units and oil content meters	Visit of project vessels to verify their possession of certificates for type approval of oil pollution prevention equipment, such as oily-water separating equipment, oil filtering equipment, process units and oil content meters	Once, after the mobilization of applicable vessels	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
D06 A waste management plan will be developed and implemented to avoid unauthorized waste discharges and transfers, with written procedures for collection, segregation, storage, processing and disposal of waste, including use of equipment and record keeping.	Waste Management Plan (WMP) in place for both onshore and offshore facilities/vessels	WMP documentation	Before commencement of project operations followed by regular Duty of Care audits as required by law or based on monitoring performance	Waste management plan in place for both onshore and offshore facilities/vessels developed and implemented to avoid unauthorized waste discharges and transfers, with written procedures for collection, segregation, storage, processing and disposal of waste, including use of equipment and record keeping	Reading of the waste management plan demonstrating the procedures to avoid unauthorized waste discharges and transfers, with written procedures for collection, segregation, storage, processing and disposal of waste, including use of equipment and record keeping	Once	To be determined by the DCE	DEEC	None (desktop work)
D07 Waste not permitted to be discharged at sea (such as waste chemicals, cooking oils or lubricating oils, biomedical waste) will be transported onshore for transfer to an approved disposal facility ¹⁴ (in-country or an international provider).	Waste management plan with approved disposal route and management practices for each waste stream	WMP documentation	Before commencement of project operations followed by regular Duty of Care audits as required by law or based on monitoring performance	Waste management plan with approved disposal route and management practices for each waste stream	Reading of the waste management plan with approved disposal route and management practices for each waste stream	Once	To be determined by the DCE	DEEC	None (desktop work)
D11 Completion and well workover fluids to be discharged overboard will be tested to confirm the fluids are suitable for discharge as required by applicable national and international regulations. Fluids that do not meet the specification would either be treated offshore or transported onshore for transfer to an approved disposal ¹⁵ facility (in-country or an international provider).	Specifications included in Drilling and Completion Fluids Basis of Design or Well Workover Plan	Drilling and Completion Fluids Basis of Design or Well Workover Plan	Once for similar wells, or following a change of vendor or system	Monitoring will be done during the Construction Phase, see Table U-1					
D15 The FLNG and FPSO will be designed, constructed, and operated to avoid routine flaring ¹⁶ .	Flaring and Blowdown Philosophy for FPSO	Flaring and Blowdown Philosophy for FPSO	Once, prior to initiation FPSO construction	Monitoring will be done during the Construction Phase, see Table U-1					
	Fuel Gas and flaring Philosophy for FLNG	Fuel Gas and flaring Philosophy for FLNG	Once, prior to FLNG mobilization	Monitoring will be done during the Construction Phase, see Table U-1					
D16 Lighting will be reduced to the extent that worker safety and safe & secure operations is not compromised. Reduction of light may include avoiding use of unnecessary lighting, shading, and downward lighting where possible.	Vessel operational procedures restrict unnecessary lighting	Project Vessel operational procedures	Once, prior to initiation of FLNG and FPSO operations	BP ESMP Compliance Report confirming that lighting has been reduced to the extent that worker safety and safe & secure operations is not compromised	Reading of the BP ESMP Compliance Report confirming that lighting has been reduced to the extent that worker safety and safe & secure operations is not compromised	Once	To be determined by the DCE	DEEC	None (desktop work)

¹⁴ In this document, a treatment center can mean either a center for waste treatment or for final disposal.

¹⁵ In this document, a treatment center can mean either a center for waste treatment or for final disposal.

¹⁶ Routine flaring is defined in Section 7.3.1

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
D17	Development and implementation of a wildlife handling and rescue protocol for the FLNG and FPSO vessels and project patrol boats.	Wildlife handling and rescue protocol available on FLNG and FPSO and project patrol boats	Project Vessel documentation	Once, prior to initiation of FLNG, FPSO and patrol boat operations	Wildlife handling and rescue protocol available on FLNG and FPSO and project patrol boats	Visit to FLNG and FPSO vessels and project patrol boats to verify that a wildlife handling and rescue protocol is available on FLNG and FPSO and project patrol boats	Once, after vessels mobilization	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers wildlife handling and rescue protocol	BP-provided training materials / vessel contractors' training logs	Once, prior to initiation of, FPSO and patrol boats mobilization	Interviews with captains of applicable vessels confirming the establishment of a wildlife handling and rescue protocol	Visit of applicable project vessels to conduct interviews with captains of applicable vessels and demonstrate the establishment of a wildlife handling and rescue protocol	Once, after vessels mobilization	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D19	The relevant maritime, port or shipping authorities will be notified of all permanent offshore facilities as safety zones and routine shipping routes to be used by project-related vessels. Permanent facility locations will be demarcated on nautical charts.	Relevant maritime, port or shipping authorities notified of all permanent offshore facilities, as well as safety zones and routine shipping routes to be used by project-related vessels	Notification sent by the project to relevant maritime, port or shipping authorities	Once, before the Operations Phase starts and following changes in zoning	Notification sent by the project to relevant maritime, port or shipping authorities of all permanent offshore facilities, as well as safety zones and routine shipping routes generally used by project-related vessels	Reading of communication documents to verify that the notification to relevant maritime, port or shipping authorities was sent	Once	To be determined by the DCE	ANAM	None (desktop work)
D20	Project vessels will follow the Convention on International Regulations for Preventing Collisions at Sea (COLREGs) adopted by the IMO.	Project vessels procedures indicating that they follow COLREG	Project vessel documentation	Once, before the Operations Phase starts and before mobilization of new vessels	Project vessels procedures indicating that they follow COLREG	Visit of project vessels to verify that they follow COLREG	Once	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D21	Main project vessels will be equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels.	Main project vessels with AIS equipment	Project vessel documentation	Once, before the Operations Phase starts and before mobilization of new vessels	Main project vessels equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels	Visit to project vessels to verify that main project vessels are equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels	Once	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
D22 Standard communication procedures will be used in international maritime traffic and shipping, aided by project patrol boats or standby vessels near the drilling, pipelay and Nearshore Hub/Terminal Area to prevent collision with larger vessels.	Communication procedures used by project vessels	Project vessel documentation	Once, before the Operations Phase starts and before mobilization of new vessels	Interviews with captains of applicable vessels confirming the use of standard international maritime shipping procedures where there is a risk of vessel interaction, aided by project patrol boats when required	Visit to project vessels to conduct interviews with captains of applicable vessels and determine the use of standard international maritime shipping procedures where there is a risk of vessel interaction, aided by project patrol boats when required	Once	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
	Proper demarcation of the exclusion safety zones	Visual recognition of the demarcation of the exclusion safety zones	Once, before the Operations Phase starts and Annually	Observation confirming the proper demarcation of the exclusion safety zones	Observation during Hub visit confirming the proper demarcation of the exclusion safety zones	Once	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D23 Information will be provided to the national industrial fishing fleet of both Mauritania and Senegal to communicate and record the exclusion safety zones and applicable navigational charts.	Information provided to national industrial fishing fleets on permanent exclusion safety zones and applicable navigational charts	Notification sent by the project to authorities in charge of or organizations representing national industrial fishing	Once, before the Operations Phase starts and following permanent changes in zoning	BP ESMP Compliance Report confirming that information has been provided to national industrial fishing fleets on permanent exclusion safety zones and applicable navigational charts	Reading of the BP ESMP Compliance Report indicating that information has been provided to national industrial fishing fleets on permanent exclusion safety zones and applicable navigational charts	Once	To be determined by the DCE	ANAM and/or Ministry of Fisheries and Maritime Economy	None (desktop work)
D24 Exclusion safety zones will be demarcated on applicable navigational charts, and a communication procedure will be developed to communicate the location of the exclusion safety zones to the local fishing communities. This is intended to allow pirogues to avoid the exclusion safety zones.	Location of exclusion safety zones communicated to local fishing communities	Records of information provided by the project to local fishing communities	Once, before the Operations Phase starts and Annually or as adjusted based on monitoring of exclusion zone breaches	BP ESMP Compliance Report confirming that a communication procedure has been developed to communicate the location of the exclusion safety zones to the local fishing communities, to allow pirogues to avoid the exclusion safety zones	Reading of the BP ESMP Compliance Report indicating that a communication procedure has been developed to communicate the location of the exclusion safety zones to the local fishing communities, to allow pirogues to avoid the exclusion safety zones	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
D25 The seabed has been mapped as part of an extensive geophysical and geotechnical survey carried out by the project. The survey has not identified any shipwrecks or other maritime heritage on the seabed. Further seabed surveys are foreseen prior to dredging taking place.	Results of the geophysical and geotechnical surveys	Geophysical and geotechnical survey reports	Once, before the Construction Phase starts	Monitoring will be done during the Construction Phase, see Table U-1					
	Pre-dredge surveys do not reveal any unidentified shipwrecks or other maritime heritage	Pre-dredging seabed-survey reports	Once, before the Operations Phase starts						
D26 A site security plan will be developed that considers the security arrangements for each of the facilities including the modalities of support provided by government.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
D27	Expat workers and national workers will undergo a briefing to raise awareness on health risks, prevention and available treatment and their responsibilities. There will be an active screening and medical treatment program for workers.	Briefing of workers on health risks, prevention, treatment and responsibilities + medical screening and treatment program for workers	Workers health program documentation	Once, before and/or at the start of the Operation Phase starts or as adjusted based on outcome of screening program.	BP ESMP Compliance Report confirming that expat workers and national workers have been briefed on health risks, prevention and available treatment and their responsibilities, and that they have been through an active screening and have access to a medical treatment program	Reading of the BP ESMP Compliance Report indicating that expat workers and national workers have been briefed on health risks, prevention and available treatment and their responsibilities, and that they have been through an active screening and have access to a medical treatment program	Once	To be determined by the DCE	Ministry of Health and Social Action	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
D29 Develop and implement a flaring protocol with the intention to meet defined operational combustion performance.	Drilling: Provisions for flaring specified in Completion and Well Flowback Basis of Design	Drilling: Completion and Well Flowback Basis of Design document	Once, before initial flaring is initiated	Relevant excerpt from the Completion and Well Flowback Basis of Design document or similar document for drilling indicating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Reading of the relevant excerpt from the Completion and Well Flowback Basis of Design document or similar document for drilling demonstrating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Once	To be determined by the DCE	DEEC	None (desktop work)
	Specifications in Flaring and Blowdown Philosophy for FPSO	Specifications in Flaring and Blowdown Philosophy for FPSO	Once, before initial flaring is initiated	Relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FPSO or similar document indicating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Reading of the relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FPSO or similar document demonstrating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Once	To be determined by the DCE	DEEC	None (desktop work)
	Specifications in Flaring and Blowdown Philosophy for FLNG	Specifications in Flaring and Blowdown Philosophy for FLNG	Once, before initial flaring is initiated	Relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FLNG or similar document indicating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Reading of the relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FLNG or similar document demonstrating the development and implementation of a flaring protocol with the intention to meet defined operational combustion performance	Once	To be determined by the DCE	DEEC	None (desktop work)
D30 Implementation of leak detection and repair programs for fugitive emissions.	Leak detection and repair programs for fugitive emissions	Leak detection and repair programs documentation	Specific to equipment	Observation of the implementation of leak detection and repair programs for fugitive emissions on applicable vessels	Visit of applicable vessels to observe the implementation of leak detection and repair programs for fugitive emissions	Once during the Operations Phase, then annually as needed	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
D31	Implementation of technically feasible and cost-effective measures to optimize energy efficiency and air emissions on the FPSO and FLNG. This could include where feasible waste heat recovery, flare gas recovery, vapor recovery and selected method of export compression on the FPSO, and boil-off gas recovery and control of fugitive emissions through design of the FPSO and FLNG.	Energy efficiency and air emissions measures adopted for the FLNG as specified in Basis of Design documentation	Basis of Design documentation for FLNG	Once, before the Operations Phase starts	Observation on board the FLNG of the implementation of energy efficiency and air emissions measures adopted for the FLNG	Visit of the FLNG to observe the implementation of energy efficiency and air emissions measures adopted for the FLNG	Once	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		BPEO for energy efficiency highlights energy efficiency measures Energy efficiency and air emissions measures adopted for the FPSO as specified in Basis of Design documentation	BPEO for energy efficiency for FPSO Basis of Design documentation for FPSO	Once, before the Operations Phase starts	Observation on board the FPSO of the implementation of energy efficiency and air emissions measures adopted for the FPSO	Visit of the FPSO to observe the implementation of energy efficiency and air emissions measures adopted for the FPSO	Once	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D32	Use of project-produced gas as preferred fuel for FLNG, FPSO and QU processes instead of diesel or crude oil.	Preferential use of project-produced gas specified in Basis of Design of FPSO	Basis of Design of FPSO	Once, before the Operations Phase starts	Observation on board the FPSO of the preferential use of project-produced gas as preferred fuel for FPSO processes instead of diesel or crude oil	Visit of the FPSO to observe the preferential use of project-produced gas as preferred fuel for FPSO processes instead of diesel or crude oil	Once	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		QU Functional Specifications addresses preference for fuel gas	QU Functional Specifications	Once, before the Operations Phase starts	Observation on board the QU of the preferential use of project-produced gas as preferred fuel for QU processes instead of diesel or crude oil	Visit of the QU to observe the preferential use of project-produced gas as preferred fuel for QU processes instead of diesel or crude oil	Once	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Fuel gas philosophy for FLNG	Fuel gas philosophy for FLNG	Once, before the Operations Phase starts	Relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FLNG or similar document indicating the preferential use of project-produced gas as preferred fuel for FLNG processes instead of diesel or crude oil	Reading of the relevant excerpt from the engineering document Flaring and Blowdown Philosophy for FLNG or similar document demonstrating the preferential use of project-produced gas as preferred fuel for FLNG processes instead of diesel or crude oil	Once	To be determined by the DCE	DEEC	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities								
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³			
D33 Aggregate greenhouse gas emissions from all offshore project facilities will be quantified annually in accordance with internationally recognized methodologies. The FPSO and FLNG will have fuel flow or emissions metering systems installed for equipment rated at 10 MW thermal or above. A predictive emission monitoring system (PEMS) will be used on equipment rated 10 MW thermal or above for the calculation of emissions of GHG, SOx and NOx.	See Chapter 10: Surveillance and Monitoring Plan			Fuel flow or emissions metering systems and PEMS installed on relevant equipment on the FPSO and FLNG	Basis of Design documentation for FPSO and FLNG (or equivalent)	Annually	BP ESMP Compliance Report confirming that aggregate greenhouse gas emissions from all offshore project facilities are quantified annually in accordance with internationally recognized methodologies	Reading of the Lecture BP ESMP Compliance Report confirming that aggregate greenhouse gas emissions from all offshore project facilities are quantified annually in accordance with internationally recognized methodologies	Annually	To be determined by the DCE	Technical Committee	None (desktop work)
D34 LNG and condensate carriers are expected to discharge ballast water according to the IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM).	Compliance with ballast water management procedures, and use of a record book, as appropriate (vessels >400 GT)	LNG and condensate carrier vessel documentation	As per contractual obligation	Relevant excerpt of the LNG and condensate carrier vessel documentation or similar document indicating that they are discharging ballast water according to the IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM)	Reading of the relevant excerpt of the LNG and condensate carrier vessel documentation or similar document indicating that they are discharging ballast water according to the IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM)	Once	To be determined by the DCE	ANAM	None (desktop work)			
D35 FPSO and FLNG vessel will be certified according to Class and Flag requirements before leaving the shipyard. The vessels will be double-hulled.	Compliance with IMO inspection and certification requirements Subject to FLNG classification requirement during Operations Phase	FPSO and FLNG certification as maintained in vessel documentation	Once, prior to vessel arrival on site	FPSO and FLNG certification or a similar document indicating that they comply with inspection and certification requirements according to Class and Flag requirements	Visit of applicable vessels to verify they comply with inspection and certification requirements according to Class and Flag requirements	Once, after the arrival of applicable vessels to site	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)			
D36 An inspection and maintenance program will be developed and implemented with the intent of maintaining mechanical integrity of equipment, piping, relief and vent systems and devices, emergency shutdown systems, controls, pumps and instrumentation, and prevent uncontrolled releases of hazardous or polluting materials from the project.	Inspection and maintenance program for mechanical integrity and prevention of uncontrolled releases	Inspection and Maintenance Strategy	As frequently as determined by each respective inspection and maintenance program	Observation, in situ, of applicable vessels to confirm the implementation of an inspection and maintenance program for mechanical integrity and prevention of uncontrolled releases	Visit of applicable vessels to observe the implementation of an inspection and maintenance program for mechanical integrity and prevention of uncontrolled releases	Once, during the Operations Phase and as needed	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)			

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
D37	Chemicals used in the production process, flow assurance, maintenance, well intervention and management, desalination and fire management systems will be selected and managed with the intent to reduce the potential for environmental effects.	Selection and management of chemicals with reduced environmental effect potential	Chemical management procedure for FPSO	Once, before start-up	Relevant excerpt from the document on the chemical management procedure for FPSO or similar document for FPSO presenting the measures of selection and management of chemicals with reduced environmental effect potential	Reading of the relevant excerpt from the document on the chemical management procedure for FPSO or similar document for FPSO presenting the measures of selection and management of chemicals with reduced environmental effect potential	Once	To be determined by the DCE	DEEC	None (desktop work)
		Selection and management of chemicals with reduced environmental effect potential	Basis of design for FLNG	Once, before start-up	Relevant excerpt from the engineering document Basis of Design or similar document for FLNG presenting the measures of selection and management of chemicals with reduced environmental effect potential	Reading of the relevant excerpt from the engineering document Basis of Design or similar document for FLNG presenting the measures of selection and management of chemicals with reduced environmental effect potential	Once	To be determined by the DCE	DEEC	None (desktop work)
D38	If dredging activities are required for maintenance during the Operations Phase, a dredging management plan will be developed and implemented that defines the maintenance dredging methodology, identifies and assesses dredged materials disposal options and sites, characterized the chemical and physical composition and behavior of the sediment to be dredged, and defines the area of influence and the potential mitigation and monitoring measures.	Adherence to proper dredging methodology; selection of appropriate disposal options/sites; characterization of dredged sediment; identification of area of influence and potential mitigation and monitoring	Dredging management plan	Prior to any scheduled dredging operation	If dredging activities are required for maintenance during the Operations Phase, a report indicating adherence to proper dredging methodology, selection of appropriate disposal options/sites, characterization of dredged sediment, identification of area of influence and potential mitigation and monitoring	If dredging activities are required for maintenance during the Operations Phase, reading of a report demonstrating adherence to proper dredging methodology, selection of appropriate disposal options/sites, characterization of dredged sediment, identification of area of influence and potential mitigation and monitoring	When the report will be available (after dredging) if dredging activities are required for maintenance during the Operations Phase	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-2. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Operations Phase ... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹²	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹³
D39 Given the principle of the need for parity either side of the border, the project has selected a location and design for the Nearshore/Hub terminal that has both the most beneficial and least potential adverse effect on the shoreline morphology of the options reviewed, while meeting the required conditions for safe approach of LNG carriers, subsequent mooring and operation of the facility (see Section 5.2.6).	Location and design of the Nearshore Hub/Terminal	Final FEED documentation	Once, prior to initiation of operations	Appendix I-2 of the GTA Phase 1 ESIA demonstrating that the location and design of the Nearshore Hub/Terminal, given the principle of the need for parity either side of the border, has both the most beneficial and least potential adverse effect on the shoreline morphology of the options reviewed, while meeting the required conditions for safe approach of LNG carriers, subsequent mooring and operation of the facility	Reading of Appendix I-2 of the GTA Phase 1 ESIA indicating that the location and design of the Nearshore Hub/Terminal, given the principle of the need for parity either side of the border, has both the most beneficial and least potential adverse effect on the shoreline morphology of the options reviewed, while meeting the required conditions for safe approach of LNG carriers, subsequent mooring and operation of the facility	Once	To be determined by the DCE	Technical Committee	None (desktop work)
D40 The location of project facilities at some distance offshore from the protected areas avoids most direct and indirect impacts from routine activities.	Location of project facilities	Final FEED documentation	Once, prior to initiation of operations	Appendix I-2 of the GTA Phase 1 ESIA demonstrating that the location of project facilities at some distance offshore from the protected areas avoids most direct and indirect impacts from routine activities	Reading of Appendix I-2 of the GTA Phase 1 ESIA indicating that the location of project facilities at some distance offshore from the protected areas avoids most direct and indirect impacts from routine activities	Once	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-3: ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase.

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ¹⁷	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ¹⁸	
Coastal Erosion										
Impact: IMP05: Accretion or reduction in natural erosion of the Langue de Barbarie (relative to the case without the breakwater) of up to 13 m over 10 years near the Mauritania-Senegal border and extending southward approximately 8 km, accompanied by a maximum increase in coastal erosion rate (relative to the case without the breakwater) of approximately 6 m over 10 years further south, along approximately 2 km of coast, starting from the south end of the Hydrobase neighborhood (Residual Impact: 2 – Low)							Country: Senegal			
M40	<p>a) To improve understanding of the long-term coastal dynamic equilibrium, the project will develop and implement a coastline monitoring plan during the project life cycle. Coastline monitoring will commence prior to breakwater construction, i.e. before 2020. This will include the collection of further bathymetric data along the Saint-Louis shore, including the Senegal River mouth. The project will aim to involve local academics in the implementation of the coastline monitoring plan. The relevant authorities and local communities will be informed of the monitoring results.</p> <p>b) The data collected as part of the implementation of the coastline monitoring plan will be used to update the coastline modeling (in Appendix I-3) to be completed before the construction of the breakwater in 2020. Additional modeling updates will be conducted at key stages of the project life cycle when new information with the potential to have a significant impact on the modeling results will become available.</p> <p>c) BP will seek the necessary authorizations to share relevant data for government led morphological studies initiatives and local academics.</p> <p>d) a contingency plan for the coastline will be developed by the project in consultation with the relevant authorities if the results of the coastline monitoring and modeling clearly and systematically demonstrate, over the duration of the project, negative impacts related to the GTA Phase 1 project which exceeds those currently identified in the GTA Phase 1 project ESIA report (in particular Section 7.3.3).</p>			See Chapter 10: Surveillance and Monitoring Plan						

¹⁷ In this table, monitoring activities include the reading of reports and other documents. The BP ESMP Compliance Report will be submitted by BP to the authorities according to the agreed periodicity. The other documents identified in the column "Monitoring Activity to be Carried Out by the Authorities" will be submitted to authorities upon request.

¹⁸ In this table, providing for the transportation and accommodation by the GTA Phase 1 project will be done by the same means of transport and accommodation as those used by the project staff to reach the facilities, and notably for transportation, the boat or helicopter used for the transfer of staff.

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M41	Provide specialist assistance to studies led by local or national authorities on Saint-Louis coastal management.	Specialist assistance provided to improve local coastal management processes	Project documentation	Before the Decommissioning Phase	Documentation demonstrating the specialist assistance and relevant project data to studies led by local or national authorities on Saint-Louis coastal management	Reading of the documentation demonstrating the specialist assistance and relevant project data to studies led by local or national authorities on Saint-Louis coastal management	Once, during or after the specialist assistance is provided	To be determined by the DCE	Technical Committee	None (desktop work)
M45	A final decommissioning plan will be developed for approval by the authorities near the end of the operational lifetime, which takes into consideration further morphological studies and data collection as applicable.	Regulatory approval of the final decommissioning plan	Final decommissioning plan documentation and regulator approval	Once, before the Decommissioning Phase starts	Letter or similar document issued by the relevant authorities confirming the approval of the final decommissioning plan	Verifying the approval document for the final decommissioning plan	Once, before the start of the Decommissioning Phase	To be determined by the DCE	Technical Committee	None (desktop work)
Marine Mammals, Sea Turtles, Threatened Species and Protected Areas and Biodiversity										
Impacts: IMP16: Potential vessel strike with mortality to individual marine mammal (Residual Impact: 1 – Negligible) IMP19: Potential vessel strike with mortality to individual turtle (Residual Impact: 1 – Negligible) IMP23: Disturbance, possible auditory injury, vessel strike to threatened species from vessels, operations (Residual Impact: 1 – Negligible) IMP24: Introduction of non-native or invasive species (Residual Impact: 2 – Low) IMP25: Behavioral disturbances to fauna within protected areas or other areas of conservation interest (Residual Impact: 2 – Low) IMP26: Behavioral disturbances to threatened species (Residual Impact: 2 – Low)								Countries: Mauritania and Senegal		
M06	Vessel operators will implement vessel strike avoidance protocols to reduce the potential for vessel strike with marine mammals and sea turtles (including injured/dead protected species reporting).	Vessel strike avoidance protocol Induction program of vessel masters covers vessel strike avoidance protocol	BP-provided training materials / vessel contractors' training logs	Once, before the Decommissioning Phase starts	Interviews with vessel captains confirming implementation of vessel strike avoidance protocols	Visit to project vessels to interview vessel captains and demonstrate implementation of vessel strike avoidance protocols	Once, after vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
Maritime Navigation										
Impact: IMP28: Risk of collision between project vessels and pirogues due to project vessels movements (Residual Impact: 1 – Negligible)								Countries: Mauritania and Senegal		
M08	Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Training and awareness program records	Once, before the Decommissioning Phase starts and Semi-annually thereafter	BP ESMP Compliance Report confirming the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Reading of the BP ESMP Compliance Report demonstrating the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M09	Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Notification to mariners in the appropriate form and language provided to artisanal fishermen	Records of notification provided by the project to artisanal fishermen	Once, before the Decommissioning Phase starts and Quarterly thereafter or as adjusted based on schedule of project activities	BP ESMP Compliance Report confirming transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Reading of BP ESMP Compliance Report demonstrating transmission of notifications to mariners in the form and language appropriate for artisanal fishermen	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M10	Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time.	Project vessels equipped with radar or infrared systems	Project vessels equipment listing	Once for offshore project vessels before mobilization or as adjusted based on advances in technology at the time of decommissioning	Project vessels equipped with radar or infrared systems	Visit of project vessels to confirm that these vessels are equipped with radar or infrared systems	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M11	Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling.	Vessels well-lit during poor visibility or at night and equipped with searchlights	Project vessels equipment listing	Once, before offshore project vessel mobilization	Vessels well-lit during poor visibility or at night and equipped with searchlights	Visit of project vessels to confirm that these vessels are well-lit during poor visibility or at night and equipped with searchlights	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Operations Phase and before mobilization of new vessels	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M12	Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the safety exclusion zones.	Project patrol boat in place	Project vessels logs	Once, before the Decommissioning Phase starts and Semi-annually	Project patrol boat in place	Visit of the Hub to verify presence of a patrol boat to monitor the exclusion safety zones	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M13	Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.	FLOs in place aboard the project patrol boats, if and when necessary	Project patrol boats Person on Board records	Once, before the Decommissioning Phase starts and Quarterly or as adjusted based on advances in technology at the time of decommissioning	BP ESMP Compliance Report confirming mobilization of local FLOs aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Reading of BP ESMP Compliance Report demonstrating mobilization of local FLOs aboard the project patrol boats in the areas of artisanal fishing, where there is a risk of vessel interaction	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M14	Equipping the support vessels and the project patrol boat with lifesaving appliances approved by the Convention for Safety of Life at Sea (SOLAS) and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel. Assist with the rescue of any fishermen involved in a collision with a project vessel or following the capsizing of their vessel due to ship wake.	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Project vessels equipment listings	Once, before the Decommissioning Phase starts	Lifesaving appliances in place in project vessels and assistance to fishermen provided in the event of an accident with a project vessel	Visit of project vessels demonstrating presence of lifesaving appliances approved by the Convention SOLAS and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel.	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Decommissioning Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Records of maritime safety incidents	Project vessels HSSE incident reports	After a reported incident	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)
M15	In case of a collision, BP will inform as soon as possible the relevant national authorities: the Mauritanian Coast Guard (Garde Côte Mauritanienne) in Mauritania and HASSMAR in Senegal.	National authorities informed in case of a collision	Records of information provided by the project to national authorities	After a reported collision	Part of communication documents reporting a collision	Reading of part of communication documents reporting a collision	After a reported collision	To be determined by the DCE	HASSMAR	None (desktop work)
M16	Ensuring that each project vessel keeps records of maritime safety incidents with pirogues and other vessels, including near misses, and that these are subsequently shared with the project. BP will monitor maritime safety incidents and adjust, if required, project specific maritime safety rules, security and search & rescue arrangements in place.	Induction program of vessel masters covers protocol for reporting on interaction with artisanal fishing	BP-provided training materials / vessel contractors' training logs	Once, before the Decommissioning Phase starts	Interviews with project vessel captains confirming implementation of a protocol for reporting on interaction with artisanal fishing	Visit of project vessels to interview project vessel captains and demonstrate implementation of a protocol for reporting on interaction with artisanal fishing	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Records of maritime safety incidents	Project vessels HSSE incident reports	Quarterly	BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Reading of BP ESMP Compliance Report confirming presence of project vessels HSSE incident reports record	Once	To be determined by the DCE	ANAM and/or HASSMAR	None (desktop work)

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M17	Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Decommissioning Phase starts and Quarterly	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M18	Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities.	CLOs in place for N'Diago and Saint-Louis	Project Human Resources records	Once, before the Decommissioning Phase starts and Quarterly	CLOs in place for N'Diago and Saint-Louis	Site visit at the office of the CLOs in place for N'Diago and Saint-Louis	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Decommissioning Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once	To be determined by the DCE	Technical Committee	None (desktop work)
Community Health, Safety and Security										
Impacts: IMP30: Risk of conflicts between artisanal fishermen and public security forces if some fishermen need to be escorted out of the exclusion safety zones (Residual Impact: 1 – Negligible) IMP31: Risk of terrorism act targeting the gas production facilities which in turn will raise the level of terrorism risk at a national level (Residual Impact: 2 – Low)								Countries: Mauritania and Senegal		
M08	Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Training and awareness program records	Once, before the Decommissioning Phase starts and Semi-annually thereafter	BP ESMP Compliance Report confirming the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Reading of the BP ESMP Compliance Report demonstrating the training and awareness program on the specific maritime safety rules associated with the project implemented in local fishing communities	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M17	Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Decommissioning Phase starts and Quarterly	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Decommissioning Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once	To be determined by the DCE	Technical Committee	None (desktop work)
M25	The project will seek to work with the public security forces to establish an appropriate response and security framework which may include resource, equipment, training and response protocols.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
M26	Include in the security stakeholder engagement plan, provisions around response, management and interface with Public security forces for security incidents scenario such as act of terrorism and unlawful entry in the exclusion safety zones.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
Social Climate										
Impact: IMP34: Social discontent in N'Diago and Saint-Louis due to the potential perception of loss of fishing grounds and fishing catches combined with the limited employment opportunities, the perception of unsatisfied grievances and/or compensation claims (e.g. for lost gear), and elevated safety risk for fishermen at sea due to presence of project vessels (Residual Impact: 1 – Negligible)								Countries: Mauritania and Senegal		
M17	Establishing a grievance mechanism easily accessible to fishing communities' members that includes monitoring of claims and the resolution thereof.	Accessible grievance mechanism in place including monitoring of claims and resolutions	Project grievance mechanism records	Once, before the Decommissioning Phase starts and Quarterly	BP ESMP Compliance Report confirming presence of a grievance mechanism	Reading of BP ESMP Compliance Report demonstrating presence of a grievance mechanism	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
M18	Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities.	CLOs in place for N'Diago and Saint-Louis	Project Human Resources records	Once, before the Decommissioning Phase starts and Quarterly	CLOs in place for N'Diago and Saint-Louis	Site visit at the office of the CLOs in place for N'Diago and Saint-Louis	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Meetings between the project representatives and community councils in N'Diago and in Saint-Louis	Project meeting records	Once, before the Decommissioning Phase starts and Annually	BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Reading of BP ESMP Compliance Report presenting support measures provided at community council of N'Diago and Saint-Louis formally nominated to review local fishing communities' concerns and grievances	Once	To be determined by the DCE	Technical Committee	None (desktop work)
M24	Provide technical assistance to mutually agreed marine resource research programs notably with the national oceanographic research centers of both countries (CRODT and IMROP).	Technical assistance provided to marine resource research program with CRODT and IMROP	BP technical assistance records	Once, before the end of the Decommissioning Phase adjusted as needed following an assessment of program effectiveness during the Decommissioning Phase	Documentation confirming technical assistance provided to mutually agreed marine resource research programs, notably CRODT and IMROP	Reading of documentation demonstrating technical assistance provided to mutually agreed marine resource research programs, notably CRODT and IMROP	Once, during or after the technical assistance is provided	To be determined by the DCE	Technical Committee	None (desktop work)
M27	Developing a social investment program to enhance project benefits for the directly affected communities N'Diago and Saint-Louis communities, including livelihood enhancement activities.	Social investment program to enhance project benefits for the communities of N'Diago and Saint-Louis developed	Social investment program documentation	During the Decommissioning Phase	BP ESMP Compliance Report confirming implementation of a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities	Reading of BP ESMP Compliance Report demonstrating implementation of a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities	Once	To be determined by the DCE	Technical Committee	None (desktop work)
M28	Engaging in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities in order to help identify and support, if needed, ad hoc measures to prevent social discontent linked to project activities and its escalation into conflicts.	Periodic meetings between project representatives and national, regional and local authorities to monitor the social climate and, if needed, identification of support to ad hoc measures to prevent social discontent linked to project activities	Project meeting records	During the Decommissioning Phase	BP ESMP Compliance Report confirming engagement in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities	BP ESMP Compliance Report demonstrating engagement in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities	Once	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M46	Review the social climate in N'Diago and in Saint-Louis prior to the Decommissioning Phase to adjust as needed the mitigation measures identified to avoid or reduce social discontent.	Report on social climate in N'Diago and Saint-Louis with adjusted mitigation measures if needed	Report on social climate	Once, before the Decommissioning Phase starts	BP ESMP Compliance Report confirming the review of the social climate in N'Diago and in Saint-Louis with the mitigation measures adjusted if needed	Reading of the BP ESMP Compliance Report confirming the review of the social climate in N'Diago and in Saint-Louis with the mitigation measures adjusted if needed	Once, before the start of the Decommissioning Phase	To be determined by the DCE	Technical Committee	None (desktop work)
Multiple Resources of the Biophysical and Social Environment - Design and Operational Control Measures										
D19	The relevant maritime, port or shipping authorities will be notified of all permanent offshore facilities as safety zones and routine shipping routes to be used by project-related vessels. Permanent facility locations will be demarcated on nautical charts.	Relevant maritime, port or shipping authorities notified of all permanent offshore facilities, as well as safety zones and routine shipping routes to be used by project-related vessels	Notification sent by the project to relevant maritime, port or shipping authorities	Once, before the Decommissioning Phase starts and following permanent changes in zoning during the decommissioning phase	Notification sent by the project to relevant maritime, port or shipping authorities of all permanent offshore facilities, as well as safety zones and routine shipping routes generally used by project-related vessels	Reading of communication documents to verify that the notification to relevant maritime, port or shipping authorities was sent	Once	To be determined by the DCE	ANAM	None (desktop work)
D20	Project vessels will follow the Convention on International Regulations for Preventing Collisions at Sea (COLREGs) adopted by the IMO.	Project vessels procedures indicating that they follow COLREG	Project vessel documentation	Once, before the Decommissioning Phase starts and before mobilization of new vessels	Project vessels procedures indicating that they follow COLREG	Visit of project vessels to verify that they follow COLREG	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D21	Main project vessels will be equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels.	Equipment of the main project vessels with AIS	Project vessel documentation	Once, before the Decommissioning Phase starts and before mobilization of new vessels subject to advances in communication technology at time of decommissioning	Main project vessels equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels	Visit to project vessels to verify that main project vessels are equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
D22	Standard communication procedures will be used in international maritime traffic and shipping, aided by project patrol boats or standby vessels near the drilling, pipelay and Nearshore Hub/Terminal Area to prevent collision with larger vessels.	Communication procedures used by project vessels	Project vessel documentation	Once, before the Decommissioning Phase starts and before mobilization of new vessels	Interviews with captains of applicable vessels confirming the use of standard international maritime shipping procedures where there is a risk of vessel interaction, aided by project patrol boats when required	Visit to project vessels to conduct interviews with captains of applicable vessels and determine the use of standard international maritime shipping procedures where there is a risk of vessel interaction, aided by project patrol boats when required	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Proper demarcation of the exclusion safety zones	Visual recognition of the demarcation of the exclusion safety zones	Once, before the Decommissioning Phase starts and before mobilization of new vessels	Observation confirming the proper demarcation of the exclusion safety zones	Observation during Hub visit confirming the proper demarcation of the exclusion safety zones	Once, after vessels mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D23	Information will be provided to the national industrial fishing fleet of both Mauritania and Senegal to communicate and record the exclusion safety zones and applicable navigational charts.	Information provided to national industrial fishing fleets on exclusion safety zones and applicable navigational charts	Notification sent by the project to authorities in charge of or organizations representing national industrial fishing	Once, before the Decommissioning Phase starts and following permanent changes in zoning during the decommissioning phase	BP ESMP Compliance Report confirming that information has been provided to national industrial fishing fleets on permanent exclusion safety zones and applicable navigational charts	Reading of the BP ESMP Compliance Report indicating that information has been provided to national industrial fishing fleets on permanent exclusion safety zones and applicable navigational charts	Once	To be determined by the DCE	ANAM and/or Ministry of Fisheries and Maritime Economy	None (desktop work)
D24	Exclusion safety zones will be demarcated on applicable navigational charts, and a communication procedure will be developed to communicate the location of the exclusion safety zones to the local fishing communities. This is intended to allow pirogues to avoid the exclusion safety zones.	Location of exclusion safety zones communicated to local fishing communities	Records of information provided by the project to local fishing communities	Once, before the Decommissioning Phase starts and quarterly or as adjusted based on monitoring of exclusion zone breaches during the decommissioning phase	BP ESMP Compliance Report confirming that a communication procedure has been developed to communicate the location of the exclusion safety zones to the local fishing communities, to allow pirogues to avoid the exclusion safety zones	Reading of the BP ESMP Compliance Report indicating that a communication procedure has been developed to communicate the location of the exclusion safety zones to the local fishing communities, to allow pirogues to avoid the exclusion safety zones	Once	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
D26	A site security plan will be developed that considers the security arrangements for each of the facilities including the modalities of support provided by government.	BP will not be in a position to share any details due to their sensitive nature. National officials responsible for monitoring will be the Ministry of Armed Forces and/or the Ministry of Internal Affairs.								
D41	Contractors will be expected to comply with the applicable legal requirements and standards at the time of decommissioning, including HSSE standards and performance requirements.	Contractor compliance with applicable legal requirements and standards	Bridging document between BP HSSE and contractors HSE/HSSE requirements	Once, at contract execution	Contract section describing HSEE legal requirements	Reading of the contract section describing HSEE legal requirements	Once	To be determined by the DCE	Technical Committee	None (desktop work)
D42	A preliminary decommissioning plan will be developed for the offshore project facilities, which considers well abandonment, removal of hydrocarbons from flowlines, facility and subsea decommissioning along with disposal options ¹⁹ for equipment and materials.	Preliminary decommissioning plan	Preliminary decommissioning plan documentation	Once following completion of the preliminary plan	Preliminary decommissioning plan as an appendix in the ESIA report	Reading of the preliminary decommissioning plan as an appendix in the ESIA report	Once	To be determined by the DCE	Technical Committee	None (desktop work)
D43	A final detailed decommissioning plan will be developed closer to the Decommissioning Phase for the offshore project facilities, which considers well abandonment, removal of hydrocarbons from flowlines, facility and subsea decommissioning along with disposal options ²⁰ for equipment and materials.	Detailed decommissioning plan	Detailed decommissioning plan documentation	Once, before the Decommissioning Phase starts	Final decommissioning plan	Reading of the final decommissioning plan	After the start of the Decommissioning Phase	To be determined by the DCE	Technical Committee	None (desktop work)
D44	Well abandonment will be carried out in line with applicable good industrial practice and applicable legislation. A seabed survey will be conducted at the end of the well abandonment program to survey the seabed for debris.	Well abandonment conducted in compliance with applicable good industrial decommissioning practices and applicable legislation; survey wells following abandonment	Well Plug and Abandon Basis of Design, plus a seabed survey report	Once following completion of the plan and following completion of survey	Excerpt from the document Well Plug and Abandon Basis of Design and excerpt from a seabed survey report or similar documents indicating that well abandonment was conducted in compliance with applicable good industrial practices and applicable legislations and a well survey was conducted after abandonment to survey the state of the seabed	Reading of the excerpt from the document Well Plug and Abandon Basis of Design and excerpt from a seabed survey report or similar documents indicating that well abandonment was conducted in compliance with applicable good industrial practices and applicable legislations and a well survey was conducted after abandonment to survey the state of the seabed	After well abandonment, when the documents are available	To be determined by the DCE	Technical Committee	None (desktop work)

¹⁹ In this case, disposal includes treatment, reuse, recycling and final disposal practices.

²⁰ In this case, disposal includes treatment, reuse, recycling and final disposal practices.

Table U-3. ESMP Monitoring by the Mauritanian and Senegalese Authorities - Decommissioning Phase... cont'd

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
D45	The relevant maritime, port or shipping authorities will be notified of all offshore facilities that remain in situ following decommissioning, as well as corresponding safety zones. The presence of these permanent facility locations will be demarcated on nautical charts.	Relevant maritime, port or shipping authorities notified of all permanent offshore facilities that remain in situ following decommissioning, as well as corresponding safety zones	Notification sent by the project to relevant maritime, port or shipping authorities	Once, before the end of the Decommissioning Phase	Notification sent by the project to relevant maritime, port or shipping authorities of all offshore facilities that remain in situ following decommissioning, as well as corresponding safety zones	Reading of communication documents to verify that the notification to relevant maritime, port or shipping authorities was sent	Once	To be determined by the DCE	ANAM	None (desktop work)

Table U-4: ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events.

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ²¹	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ²²	
Water Quality										
Impacts: IMP101 Changes in water quality from elevated hydrocarbon concentrations in both water column and at the sea surface from a well blowout (Residual Impact: 2 – Low) IMP102 Changes in water quality from elevated hydrocarbon concentrations in both water column and at the sea surface from FPSO failure due to a ship collision (Residual Impact: 2 – Low) IMP103: Changes in water quality within the Senegal River estuary from elevated hydrocarbon concentrations in the water column from FPSO failure due to a ship collision (Residual Impact: 2 – Low) IMP104: Changes in water quality from elevated hydrocarbon concentrations in both water column and at the sea surface from pipelaying vessel collision (Senegal waters) (Residual Impact: 2 – Low)							Countries: Mauritania and Senegal			
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and lodging costs according to the length of stay (transportation and lodging assumed by the GTA Phase 1 project)

²¹ In this table, monitoring activities include the reading of reports and other documents. The BP ESMP Compliance Report will be submitted by BP to the authorities according to the agreed periodicity. The other documents identified in the column "Monitoring Activity to be Carried Out by the Authorities" will be submitted to authorities upon request.

²² In this table, providing for the transportation and accommodation by the GTA Phase 1 project will be done by the same means of transport and accommodation as those used by the project staff to reach the facilities, and notably for transportation, the boat or helicopter used for the transfer of staff.

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and lodging costs according to the length of stay (transportation and lodging assumed by the GTA Phase 1 project)
M103	In the unlikely event of a spill reaching the shoreline, a Shoreline Clean-up and Assessment Technique (SCAT) program will be implemented to inform shoreline clean-up and remediation as applicable.	SCAT program implemented if oil is likely to reach the shoreline	SCAT program implementation documentation	Following the accidental event	In the unlikely event of a spill, observe, in situ, the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	In the unlikely event of a spill, visit of site to observe the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and lodging costs according to the length of stay (transportation and lodging assumed by the GTA Phase 1 project)
M104	In the unlikely event of a spill reaching the shoreline, a shoreline clean-up and remediation team will be mobilized to the affected areas. BP will also engage specialized expertise to mitigate impacts to sensitive areas and wildlife species as needed.	A shoreline clean-up and remediation team mobilized to the affected areas in the event that oil reaches the shoreline	Mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	In the unlikely event of a spill, visit of affected areas for observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and lodging costs according to the length of stay (transportation and lodging assumed by the GTA Phase 1 project)
		Specialized expertise engaged to mitigate impacts to sensitive areas and wildlife species as needed	Specialized expertise mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species, as needed	In the unlikely event of a spill, visit of affected areas to confirm the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species	After a spill affecting the shoreline (unlikely event) and as needed according to the nature of the spill	To be determined by the DCE	DEEC	Transportation and lodging costs according to the length of stay (transportation and lodging assumed by the GTA Phase 1 project)
M105	In the unlikely event of a spill, follow national regulatory requirements for reporting and notification, using established protocols, which extends to all relevant external stakeholders.	Incident reported and notified	Incident notification records	Following the accidental event	Excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	Reading of the excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	After the accidental event (unlikely event)	To be determined by the DCE	HASSMAR	None (desktop work)
M112	In the unlikely event of a spill of high intensity, specific monitoring (e.g., environmental effects monitoring) may be required and developed in consultation with applicable national authorities.	See Chapter 10: Surveillance and Monitoring Plan								

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities									
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities				
Birds, Marine Mammals and Sea Turtles													
<p>Impacts:</p> <p><i>Birds</i></p> <p>IMP105: Exposure of birds to elevated hydrocarbons within a regional area; some lethal impacts and numerous sublethal impacts from direct and indirect effects from exposure to oil from a blowout (Residual Impact: 3 – Medium)</p> <p>IMP106: Exposure of birds to elevated hydrocarbons within a regional area; some lethal impacts and numerous sublethal impacts from direct and indirect effects from exposure to oil from FPSO failure due to a ship collision (Residual Impact: 3 – Medium)</p> <p>IMP107: Exposure of birds to elevated hydrocarbons within a regional area; some lethal impacts and numerous sublethal impacts from direct and indirect effects from exposure to oil from pipelaying vessel collision (Residual Impact: 3 – Medium)</p> <p><i>Marine Mammals</i></p> <p>IMP108: Exposure of Mediterranean monk seals to elevated hydrocarbons within a regional area; assuming lethal impact(s) from direct and indirect effects from exposure to oil from the blowout spill (Residual Impact: 3 – Medium)</p> <p>IMP109: Exposure of Mediterranean monk seals to elevated hydrocarbons within a regional area; assuming lethal impact(s) from direct and indirect effects from exposure to oil from FPSO failure due to a ship collision (Residual Impact: 3 – Medium)</p> <p>IMP110: Exposure of Mediterranean monk seals to elevated hydrocarbons within a regional area; assuming lethal impact(s) from direct and indirect effects from exposure to oil from pipelaying vessel collision (Residual Impact: 3 – Medium)</p> <p><i>Sea Turtles</i></p> <p>IMP111: Exposure of sea turtles to elevated hydrocarbons within a regional area; some lethal impacts to turtles of all age groups and numerous sublethal impacts to turtles from direct and indirect effects from exposure to oil from FPSO failure due to a ship collision (Residual Impact: 3 – Medium)</p> <p>IMP112: Exposure of sea turtles to elevated hydrocarbons within a regional area; some lethal impacts to turtles of all age groups and numerous sublethal impacts to turtles from direct and indirect effects from exposure to oil from pipelaying vessel collision (Residual Impact: 3 – Medium)</p>							Countries: Mauritania and Senegal						
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and lodging costs according to the length of stay (transportation and lodging assumed by the GTA Phase 1 project)			
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)			

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M103	In the unlikely event of a spill reaching the shoreline, a Shoreline Clean-up and Assessment Technique (SCAT) program will be implemented to inform shoreline clean-up and remediation as applicable.	SCAT program implemented if oil is likely to reach the shoreline	SCAT program implementation documentation	Following the accidental event	In the unlikely event of a spill, observe, in situ, the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	In the unlikely event of a spill, visit of site to observe the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M104	In the unlikely event of a spill reaching the shoreline, a shoreline clean-up and remediation team will be mobilized to the affected areas. BP will also engage specialized expertise to mitigate impacts to sensitive areas and wildlife species as needed.	A shoreline clean-up and remediation team mobilized to the affected areas in the event that oil reaches the shoreline	Mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	In the unlikely event of a spill, visit of affected areas for observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Specialized expertise engaged to mitigate impacts to sensitive areas and wildlife species as needed	Specialized expertise mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species, as needed	In the unlikely event of a spill, visit of affected areas to confirm the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species	After a spill affecting the shoreline (unlikely event) and as needed according to the nature of the spill	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M105	In the unlikely event of a spill, follow national regulatory requirements for reporting and notification, using established protocols, which extends to all relevant external stakeholders.	Incident reported and notified	Incident notification records	Following the accidental event	Excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	Reading of the excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	After the accidental event (unlikely event)	To be determined by the DCE	HASSMAR	None (desktop work)
M112	In the unlikely event of a spill of high intensity, specific monitoring (e.g., environmental effects monitoring) may be required and developed in consultation with applicable national authorities.	See Chapter 10: Surveillance and Monitoring Plan								

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Threatened Species and Protected Areas										
Impacts: IMP113: Oiling of water column or coastline including impacts to areas designated as marine or onshore protected areas. Impacts could include, loss of vegetation, habitat destruction, and injury or death to marine or terrestrial fauna from a blowout (Residual Impact: 2 – Low) IMP114: Oiling of threatened species resulting in mortality from a blowout (Residual Impact: 1 – Negligible to 3 – Medium) IMP115: Oiling of water column or coastline including impacts to areas designated as marine or onshore protected areas. Impacts could include, loss of vegetation, habitat destruction, and injury or death to marine or terrestrial fauna from FPSO failure due to a ship collision (Residual Impact: 2 – Low) IMP116: Oiling of threatened species resulting in mortality from FPSO failure due to a ship collision (Residual Impact: 1 – Negligible to 3 – Medium) IMP117: Oiling of water column or coastline including impacts to areas designated as marine or onshore protected areas. Impacts could include, loss of vegetation, habitat destruction, and injury or death to marine or terrestrial fauna from pipelaying vessel collision (Residual Impact: 2 – Low) IMP118: Oiling of threatened species resulting in mortality from pipelaying vessel collision (Residual Impact: 1 – Negligible to 3 – Medium)							Countries: Mauritania and Senegal			
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M103	In the unlikely event of a spill reaching the shoreline, a Shoreline Clean-up and Assessment Technique (SCAT) program will be implemented to inform shoreline clean-up and remediation as applicable.	SCAT program implemented if oil is likely to reach the shoreline	SCAT program implementation documentation	Following the accidental event	In the unlikely event of a spill, observe, in situ, the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	In the unlikely event of a spill, visit of site to observe the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M104	In the unlikely event of a spill reaching the shoreline, a shoreline clean-up and remediation team will be mobilized to the affected areas. BP will also engage specialized expertise to mitigate impacts to sensitive areas and wildlife species as needed.	A shoreline clean-up and remediation team mobilized to the affected areas in the event that oil reaches the shoreline	Mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	In the unlikely event of a spill, visit of affected areas for observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Specialized expertise engaged to mitigate impacts to sensitive areas and wildlife species as needed	Specialized expertise mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species, as needed	In the unlikely event of a spill, visit of affected areas to confirm the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species	After a spill affecting the shoreline (unlikely event) and as needed according to the nature of the spill	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M105	In the unlikely event of a spill, follow national regulatory requirements for reporting and notification, using established protocols, which extends to all relevant external stakeholders.	Incident reported and notified	Incident notification records	Following the accidental event	Excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	Reading of the excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	After the accidental event (unlikely event)	To be determined by the DCE	HASSMAR	None (desktop work)
M112	In the unlikely event of a spill of high intensity, specific monitoring (e.g., environmental effects monitoring) may be required and developed in consultation with applicable national authorities.	See Chapter 10: Surveillance and Monitoring Plan								
M113	Provide training in oil spill response planning and techniques to management staff of the designated National Parks and Marine Protected Areas that based on the ESIA spill modelling results could potentially be affected.	Training in oil spill response planning and techniques provided to designated National Parks and Marine Protected Areas	Training reports	Once, after the training	BP ESMP Compliance Report confirming the provision of training in oil spill response planning and techniques to management staff of the designated National Parks and Marine Protected Areas that based on the ESIA spill modelling results could potentially be affected	Reading of the BP ESMP Compliance Report confirming the provision of training in oil spill response planning and techniques to management staff of the designated National Parks and Marine Protected Areas that based on the ESIA spill modelling results could potentially be affected	Once, after the training	To be determined by the DCE	Technical Committee	None (desktop work)
Biodiversity										
See Mitigation Measures listed to mitigate impacts on Marine Mammals, Sea Turtles, Birds, Threatened Species and Protected Areas: M101, M102, M103, M104, M105, M112, M113.										

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Land & Seabed Occupation and Use										
Impacts: IMP119: Oil spill of coastline on close to 400 km, from approximately Legweichich in Mauritania to Dakar in Senegal due to a well blowout (Residual Impact: 1 – Negligible) IMP120: Oil spill of coastline on close to 400 km, from approximately Legweichich in Mauritania to Dakar in Senegal, and on the shore of <20 km along the Senegal River estuary, due to a failure of FPSO due to a ship collision (Residual Impact: 1 – Negligible) IMP121: Oil spill of coastline on about 200 km, from approximately PK 144 in Mauritania to Fass Boye in Senegal due to a pipelaying vessel collision (Residual Impact: 1 – Negligible)							Countries: Mauritania and Senegal			
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M103	In the unlikely event of a spill reaching the shoreline, a Shoreline Clean-up and Assessment Technique (SCAT) program will be implemented to inform shoreline clean-up and remediation as applicable.	SCAT program implemented if oil is likely to reach the shoreline	SCAT program implementation documentation	Following the accidental event	In the unlikely event of a spill, observe, in situ, the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	In the unlikely event of a spill, visit of site to observe the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M104	In the unlikely event of a spill reaching the shoreline, a shoreline clean-up and remediation team will be mobilized to the affected areas. BP will also engage specialized expertise to mitigate impacts to sensitive areas and wildlife species as needed.	A shoreline clean-up and remediation team mobilized to the affected areas in the event that oil reaches the shoreline	Mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	In the unlikely event of a spill, visit of affected areas for observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Specialized expertise engaged to mitigate impacts to sensitive areas and wildlife species as needed	Specialized expertise mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species, as needed	In the unlikely event of a spill, visit of affected areas to confirm the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species	After a spill affecting the shoreline (unlikely event) and as needed according to the nature of the spill	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M105	In the unlikely event of a spill, follow national regulatory requirements for reporting and notification, using established protocols, which extends to all relevant external stakeholders.	Incident reported and notified	Incident notification records	Following the accidental event	Excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	Reading of the excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	After the accidental event (unlikely event)	To be determined by the DCE	HASSMAR	None (desktop work)
M106	In the unlikely event of a spill, establish a grievance mechanism easily accessible to affected stakeholders that includes monitoring of claims and the resolution thereof.	Grievance mechanism in place	Grievance mechanism documentation	Before the project starts	Excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	Reading of the excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M107	In the unlikely event of a spill, work with national authorities as requested, to inform relevant stakeholders (including artisanal fishermen) on: 1) the location of the spill; 2) cleanup operations; 3) applicability of temporary exclusion zones; and 4) grievance mechanism, as applicable. In relation to fishermen, this will include providing timely communication, offering them the opportunity to remove gear from affected areas, reducing impact on fishing gear.	Crisis Communication plan implemented	Crisis Communication plan documentation	Following the accidental event	BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	Reading of the BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M108	In the unlikely event of a spill, in coordination with national authorities if requested, monitor and support ways to address the concerns of stakeholders regarding potential impacts of the spill.	Concerns of stakeholders regarding potential impacts of the spill recorded	CLO records Grievance mechanism	Following the accidental event	BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	Reading of the BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
Industrial Fisheries										
Impacts: IMP122: Temporary loss of industrial fishing catches due to spill impacts on plankton, fish and other fishery resources (Residual Impact: 2 – Low) IMP123: Temporary preclusion of industrial fishing in the spill response area for up to >450 industrial vessels (2017 numbers) (2017 numbers) (Residual Impact: 2 – Low) IMP124: Temporary loss of catches and revenues for industrial fishing operators (Residual Impact: 2 – Low) IMP125: Temporary loss of revenues for national economies due to the temporary disruption of industrial fisheries (Residual Impact: 2 – Low)								Countries: Mauritania and Senegal		
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill in place	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M105	In the unlikely event of a spill, follow national regulatory requirements for reporting and notification, using established protocols, which extends to all relevant external stakeholders.	Incident reported and notified	Incident notification records	Following the accidental event	Excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	Reading of the excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	After the accidental event (unlikely event)	To be determined by the DCE	HASSMAR	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M106	In the unlikely event of a spill, establish a grievance mechanism easily accessible to affected stakeholders that includes monitoring of claims and the resolution thereof.	Grievance mechanism in place	Grievance mechanism documentation	Before the project starts	Excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	Reading of the excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M107	In the unlikely event of a spill, work with national authorities as requested, to inform relevant stakeholders (including artisanal fishermen) on: 1) the location of the spill; 2) cleanup operations; 3) applicability of temporary exclusion zones; and 4) grievance mechanism, as applicable. In relation to fishermen, this will include providing timely communication, offering them the opportunity to remove gear from affected areas, reducing impact on fishing gear.	Crisis Communication plan implemented	Crisis Communication plan documentation	Following the accidental event	BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	Reading of the BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M108	In the unlikely event of a spill, in coordination with national authorities if requested, monitor and support ways to address the concerns of stakeholders regarding potential impacts of the spill.	Concerns of stakeholders regarding potential impacts of the spill recorded	CLO records Grievance mechanism	Following the accidental event	BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	Reading of the BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Artisanal Fisheries and Related Activities										
Impacts: IMP126: Temporary loss of artisanal fishing catches due to spill impacts on plankton, fish and other fishery resources (Residual Impact: 2 – Low) IMP127: Temporary preclusion of artisanal fishing in the spill response area for up to over 25,000 artisanal fishing units (2017 numbers) (Residual Impact: 2 – Low) IMP128: Temporary loss of revenues for up to about 80,000 artisanal fishermen (2017 numbers) (Residual Impact: 2 – Low) IMP129: Temporary loss of revenues for up to about 700,000 people involved in activities related to artisanal fisheries (2017 numbers) (Residual Impact: 2 – Low) IMP130: Temporary loss of revenues for national economies due to the temporary disruption of artisanal fisheries (Residual Impact: 2 – Low)							Countries: Mauritania and Senegal			
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill in place	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M105	In the unlikely event of a spill, follow national regulatory requirements for reporting and notification, using established protocols, which extends to all relevant external stakeholders.	Incident reported and notified	Incident notification records	Following the accidental event	Excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	Reading of the excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	After the accidental event (unlikely event)	To be determined by the DCE	HASSMAR	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M106	In the unlikely event of a spill, establish a grievance mechanism easily accessible to affected stakeholders that includes monitoring of claims and the resolution thereof.	Grievance mechanism in place	Grievance mechanism documentation	Before the project starts	Excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	Reading of the excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M107	In the unlikely event of a spill, work with national authorities as requested, to inform relevant stakeholders (including artisanal fishermen) on: 1) the location of the spill; 2) cleanup operations; 3) applicability of temporary exclusion zones; and 4) grievance mechanism, as applicable. In relation to fishermen, this will include providing timely communication, offering them the opportunity to remove gear from affected areas, reducing impact on fishing gear.	Crisis Communication plan implemented	Crisis Communication plan documentation	Following the accidental event	BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	Reading of the BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M108	In the unlikely event of a spill, in coordination with national authorities if requested, monitor and support ways to address the concerns of stakeholders regarding potential impacts of the spill.	Concerns of stakeholders regarding potential impacts of the spill recorded	CLO records Grievance mechanism	Following the accidental event	BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	Reading of the BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M109	In the unlikely event of a spill, implement, in coordination with national authorities if requested, an emergency fund to assist affected vulnerable households in artisanal fishing communities if needed.	Emergency fund implemented to assist affected vulnerable households in artisanal fishing communities if needed	Emergency fund documentation	Following the accidental event until normal activities in affected communities can resume	Excerpt from the documentation on the emergency fund confirming the implementation of these funds to assist affected vulnerable households in artisanal fishing communities if needed	Reading of the excerpt from the documentation on the emergency fund confirming the implementation of these funds to assist affected vulnerable households in artisanal fishing communities if needed	If needed, after the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M110	In the unlikely event of a spill, prepare and implement, in coordination with national authorities if requested, a Livelihood Restoration Plan for affected communities.	Livelihood Restoration Plan implemented for affected communities	Livelihood Restoration Plan documentation	Following the accidental event until normal activities in affected communities can resume	Excerpt from the documentation on the Livelihood Restoration Plan confirming the implementation of this plan for the restoration of livelihoods for affected communities	Reading from the excerpt from the documentation on the Livelihood Restoration Plan confirming the implementation of this plan for the restoration of livelihoods for affected communities	If needed, after the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M111	In the unlikely event of a spill, implement, in coordination with national authorities if requested, an emergency plan to ensure food security of affected vulnerable households and groups if needed.	Food security emergency plan implemented for affected vulnerable households and groups if needed	Food security emergency plan documentation	Following the accidental event and once a month until normal activities in affected communities can resume	Excerpt from the documentation on the food security emergency plan confirming the implementation of this plan to ensure food security of affected vulnerable households and groups if needed	Reading of the excerpt from the documentation on the food security emergency plan confirming the implementation of this plan to ensure food security of affected vulnerable households and groups if needed	If needed, after the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M112	In the unlikely event of a spill of high intensity, specific monitoring (e.g., environmental effects monitoring) may be required and developed in consultation with applicable national authorities.	See Chapter 10: Surveillance and Monitoring Plan								
Community Livelihoods										
Impacts: IMP131: Temporary decrease of the capacity of the coastal communities to cover day to day needs due to the disruption of their revenues, with a risk of sliding into poverty and vulnerability (Residual Impact: 2 – Low) IMP132: Temporary shortage of the main staple of coastal communities due to the disruption of artisanal fish catches, with potential ramifications on the diet of the households at a national level (Residual Impact: 2 – Low)								Countries: Mauritania and Senegal		
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M103	In the unlikely event of a spill reaching the shoreline, a Shoreline Clean-up and Assessment Technique (SCAT) program will be implemented to inform shoreline clean-up and remediation as applicable.	SCAT program implemented if oil is likely to reach the shoreline	SCAT program implementation documentation	Following the accidental event	In the unlikely event of a spill, observe, in situ, the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	In the unlikely event of a spill, visit of site to observe the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M104	In the unlikely event of a spill reaching the shoreline, a shoreline clean-up and remediation team will be mobilized to the affected areas. BP will also engage specialized expertise to mitigate impacts to sensitive areas and wildlife species as needed.	A shoreline clean-up and remediation team mobilized to the affected areas in the event that oil reaches the shoreline	Mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	In the unlikely event of a spill, visit of affected areas for observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Specialized expertise engaged to mitigate impacts to sensitive areas and wildlife species as needed	Specialized expertise mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species, as needed	In the unlikely event of a spill, visit of affected areas to confirm the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species	After a spill affecting the shoreline (unlikely event) and as needed according to the nature of the spill	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M105	In the unlikely event of a spill, follow national regulatory requirements for reporting and notification, using established protocols, which extends to all relevant external stakeholders.	Incident reported and notified	Incident notification records	Following the accidental event	Excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	Reading of the excerpt from documentation demonstrating that the project followed national regulatory requirements for reporting and notification, using established protocols	After the accidental event (unlikely event)	To be determined by the DCE	HASSMAR	None (desktop work)
M106	In the unlikely event of a spill, establish a grievance mechanism easily accessible to affected stakeholders that includes monitoring of claims and the resolution thereof.	Grievance mechanism in place	Grievance mechanism documentation	Before the project starts	Excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	Reading of the excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M107	In the unlikely event of a spill, work with national authorities as requested, to inform relevant stakeholders (including artisanal fishermen) on: 1) the location of the spill; 2) cleanup operations; 3) applicability of temporary exclusion zones; and 4) grievance mechanism, as applicable. In relation to fishermen, this will include providing timely communication, offering them the opportunity to remove gear from affected areas, reducing impact on fishing gear.	Crisis Communication plan implemented	Crisis Communication plan documentation	Following the accidental event	BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	Reading of the BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M108	In the unlikely event of a spill, in coordination with national authorities if requested, monitor and support ways to address the concerns of stakeholders regarding potential impacts of the spill.	Concerns of stakeholders regarding potential impacts of the spill recorded	CLO records Grievance mechanism	Following the accidental event	BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	Reading of the BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M109	In the unlikely event of a spill, implement, in coordination with national authorities if requested, an emergency fund to assist affected vulnerable households in artisanal fishing communities if needed.	Emergency fund implemented to assist affected vulnerable households in artisanal fishing communities if needed	Emergency fund documentation	Following the accidental event until normal activities in affected communities can resume	Excerpt from the documentation on the emergency fund confirming the implementation of these funds to assist affected vulnerable households in artisanal fishing communities if needed	Reading of the excerpt from the documentation on the emergency fund confirming the implementation of these funds to assist affected vulnerable households in artisanal fishing communities if needed	If needed, after the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M110	In the unlikely event of a spill, prepare and implement, in coordination with national authorities if requested, a Livelihood Restoration Plan for affected communities.	Livelihood Restoration Plan implemented for affected communities	Livelihood Restoration Plan documentation	Following the accidental event until normal activities in affected communities can resume	Excerpt from the documentation on the Livelihood Restoration Plan confirming the implementation of this plan for the restoration of livelihoods for affected communities	Reading from the excerpt from the documentation on the Livelihood Restoration Plan confirming the implementation of this plan for the restoration of livelihoods for affected communities	If needed, after the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M111	In the unlikely event of a spill, implement, in coordination with national authorities if requested, an emergency plan to ensure food security of affected vulnerable households and groups if needed.	Food security emergency plan implemented for affected vulnerable households and groups if needed	Food security emergency plan documentation	Following the accidental event and once a month until normal activities in affected communities can resume	Excerpt from the documentation on the food security emergency plan confirming the implementation of this plan to ensure food security of affected vulnerable households and groups if needed	Reading of the excerpt from the documentation on the food security emergency plan confirming the implementation of this plan to ensure food security of affected vulnerable households and groups if needed	If needed, after the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M112	In the unlikely event of a spill of high intensity, specific monitoring (e.g., environmental effects monitoring) may be required and developed in consultation with applicable national authorities.	See Chapter 10: Surveillance and Monitoring Plan								
Women and Vulnerable Groups										
Impact: IMP133: Increased vulnerability of women and vulnerable groups of fishing communities, and in particular, those of the Langue de Barbarie (Residual Impact: 2 – Low)								Countries: Mauritania and Senegal		
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M103	In the unlikely event of a spill reaching the shoreline, a Shoreline Clean-up and Assessment Technique (SCAT) program will be implemented to inform shoreline clean-up and remediation as applicable.	SCAT program implemented if oil is likely to reach the shoreline	SCAT program implementation documentation	Following the accidental event	In the unlikely event of a spill, observe, in situ, the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	In the unlikely event of a spill, visit of site to observe the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M104	In the unlikely event of a spill reaching the shoreline, a shoreline clean-up and remediation team will be mobilized to the affected areas. BP will also engage specialized expertise to mitigate impacts to sensitive areas and wildlife species as needed.	A shoreline clean-up and remediation team mobilized to the affected areas in the event that oil reaches the shoreline	Mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	In the unlikely event of a spill, visit of affected areas for observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Specialized expertise engaged to mitigate impacts to sensitive areas and wildlife species as needed	Specialized expertise mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species, as needed	In the unlikely event of a spill, visit of affected areas to confirm the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species	After a spill affecting the shoreline (unlikely event) and as needed according to the nature of the spill	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M108	In the unlikely event of a spill, in coordination with national authorities if requested, monitor and support ways to address the concerns of stakeholders regarding potential impacts of the spill.	Concerns of stakeholders regarding potential impacts of the spill recorded	CLO records Grievance mechanism	Following the accidental event	BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	Reading of the BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M109	In the unlikely event of a spill, implement, in coordination with national authorities if requested, an emergency fund to assist affected vulnerable households in artisanal fishing communities if needed.	Emergency fund implemented to assist affected vulnerable households in artisanal fishing communities if needed	Emergency fund documentation	Following the accidental event until normal activities in affected communities can resume	Excerpt from the documentation on the emergency fund confirming the implementation of these funds to assist affected vulnerable households in artisanal fishing communities if needed	Reading of the excerpt from the documentation on the emergency fund confirming the implementation of these funds to assist affected vulnerable households in artisanal fishing communities if needed	If needed, after the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M111	In the unlikely event of a spill, implement, in coordination with national authorities if requested, an emergency plan to ensure food security of affected vulnerable households and groups if needed.	Food security emergency plan implemented for affected vulnerable households and groups if needed	Food security emergency plan documentation	Following the accidental event and once a month until normal activities in affected communities can resume	Excerpt from the documentation on the food security emergency plan confirming the implementation of this plan to ensure food security of affected vulnerable households and groups if needed	Reading of the excerpt from the documentation on the food security emergency plan confirming the implementation of this plan to ensure food security of affected vulnerable households and groups if needed	If needed, after the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure	Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities						
	Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Social Climate										
Impact: IMP134: Risks of social unrest in coastal communities and escalating opposition to oil and gas activities nationwide, with a risk of violence in fishing communities in Senegal (Residual Impact: 1 – Negligible)							Countries: Mauritania and Senegal			
M101	In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response.	Tactical responses methods in place in the event of an oil spill	Documentation covering tactical response	Once, before the project starts and if and when required	In the unlikely event of a spill, observe, in situ, the implementation of the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	In the unlikely event of a spill, visit of site to observe the tactical response methods that may be considered under the OSCP and which include surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response	Once, in the unlikely event of a spill	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M102	All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort.	Monitoring of response measures ensuring their effectiveness in place	Monitoring system documentation	Following the accidental event, regular verification will be conducted until the incident is closed	In the unlikely event of a spill, observe, in situ, the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	In the unlikely event of a spill, visit of site to observe the monitoring system indicating whether all response measures have been continuously monitored to ensure they remain effective	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M103	In the unlikely event of a spill reaching the shoreline, a Shoreline Clean-up and Assessment Technique (SCAT) program will be implemented to inform shoreline clean-up and remediation as applicable.	SCAT program implemented if oil is likely to reach the shoreline	SCAT program implementation documentation	Following the accidental event	In the unlikely event of a spill, observe, in situ, the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	In the unlikely event of a spill, visit of site to observe the implementation of a Shoreline Clean-up and Assessment Technique (SCAT) program to inform shoreline clean-up and remediation as applicable	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
M104	In the unlikely event of a spill reaching the shoreline, a shoreline clean-up and remediation team will be mobilized to the affected areas. BP will also engage specialized expertise to mitigate impacts to sensitive areas and wildlife species as needed.	A shoreline clean-up and remediation team mobilized to the affected areas in the event that oil reaches the shoreline	Mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	In the unlikely event of a spill, visit of affected areas for observation, in situ, of the mobilization of a shoreline clean-up and remediation team for affected areas	After a spill affecting the shoreline (unlikely event)	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Specialized expertise engaged to mitigate impacts to sensitive areas and wildlife species as needed	Specialized expertise mobilization documentation	Following the accidental event	In the unlikely event of a spill, observation, in situ, of the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species, as needed	In the unlikely event of a spill, visit of affected areas to confirm the use of specialized expertise to mitigate impacts on sensitive areas and wildlife species	After a spill affecting the shoreline (unlikely event) and as needed according to the nature of the spill	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
M106	In the unlikely event of a spill, establish a grievance mechanism easily accessible to affected stakeholders that includes monitoring of claims and the resolution thereof.	Grievance mechanism in place	Grievance mechanism documentation	Before the project starts	Excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	Reading of the excerpt from the documentation presenting a grievance mechanism and monitoring of claims and the resolution thereof established following an accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M107	In the unlikely event of a spill, work with national authorities as requested, to inform relevant stakeholders (including artisanal fishermen) on: 1) the location of the spill; 2) cleanup operations; 3) applicability of temporary exclusion zones; and 4) grievance mechanism, as applicable. In relation to fishermen, this will include providing timely communication, offering them the opportunity to remove gear from affected areas, reducing impact on fishing gear.	Crisis Communication plan implemented	Crisis Communication plan documentation	Following the accidental event	BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	Reading of the BP ESMP Compliance Report confirming the implementation of a Crisis Communication plan following the accidental event (unlikely event)	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)
M108	In the unlikely event of a spill, in coordination with national authorities if requested, monitor and support ways to address the concerns of stakeholders regarding potential impacts of the spill.	Concerns of stakeholders regarding potential impacts of the spill recorded	CLO records Grievance mechanism	Following the accidental event	BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	Reading of the BP ESMP Compliance Report confirming that the concerns of stakeholders regarding potential impacts of the spill are recorded	After the accidental event (unlikely event)	To be determined by the DCE	Technical Committee	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
Multiple Resources of the Biophysical and Social Environment - Design and Operational Control Measures										
D101	Wells are designed to documented BP engineering practices and procedures related to well design and construction in line with recognized international standards. A number of these practices and procedures relate specifically to blowout preventers (BOPs and subsea X-mas trees), other well control barriers and isolation of any permeable zone.	Design of the wells complies with documented BP engineering practices and the construction is in line with recognized international standards	Well Basis of Design documentation Well handover documentation	Once, before the approval of the well design and the construction process Following handover of well construction to well production	Excerpt from the Well Basis of Design Documentation or similar document indicating the design of the wells complies with documented BP engineering practices and the construction is in line with recognized international standards	Reading of the excerpt from the Well Basis of Design Documentation or similar document indicating the design of the wells complies with documented BP engineering practices and the construction is in line with recognized international standards	Once	To be determined by the DCE	Ministry of Oil and Energies	None (desktop work)
D102	BP will perform assurance audits prior to drillship acceptance to confirm all critical systems such as subsea BOP and well control surface equipment are meeting performance standards.	Assurance audits confirming that all critical systems such as subsea BOP and well control surface equipment are meeting performance standards	Rig intake and start-up operating practice documentation	Once, before the de-mobilization of the drillship	Observation on board the drillship indicating that all critical systems such as subsea BOP and well control surface equipment are meeting performance standards	Visit of the drillship to observe that all critical systems such as subsea BOP and well control surface equipment are meeting performance standards	Once	To be determined by the DCE	Ministry of Oil and Energies	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D103	Design measures will be incorporated into the FPSO and FLNG to contain minor spills, e.g. bunded areas on the process decks to contain any small oil spills, spill containment connected to the drains and slop tanks, and minimization of potential spills or overflows from diesel storage and transfer systems through good tank design and metering. The FPSO and FLNG vessel will be double-hulled.	Design measures to contain minor spill incorporated into the new FPSO and FLNG and both are double-hulled	FPSO and FLNG Basis of Design documentation	Once, before the approval of the FPSO and FLNG designs.	Observation on board the FPSO and FLNG indicating that design measures have been incorporated into the FPSO and FLNG to contain minor spills and that both vessels are double-hulled	Visit of the FPSO and FLNG to observe that design measures have been incorporated into the FPSO and FLNG to contain minor spills and that both vessels are double-hulled	Once	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
D104	Management and mitigation measures will be in place to prevent and/or minimize the likelihood of a spill from the installation and operation of the subsea facilities. This may include flowline design specification, use of appropriate design codes (e.g. for corrosion allowance), use of corrosion inhibitor. BP will also implement a risk-based proactive pipeline inspection and maintenance program.	Management and mitigation measures in place for prevention and/or minimization of the likelihood of a spill for the installation and operation of the subsea facilities	Subsea Basis of Design Leak test records included in Completion Database Final as Built Verification International Oil Pollution Prevention Certificate	Once, prior to start-up Marine assurance on-going	Relevant excerpt from the documentation indicating the implementation of management and mitigation measures to prevent and/or minimize the likelihood of a spill from the installation and operation of the subsea facilities. These may include flowline design specification, use of appropriate design codes (e.g. for corrosion allowance), and use of corrosion inhibitor.	Reading of the relevant excerpt from the documentation indicating the implementation of management and mitigation measures to prevent and/or minimize the likelihood of a spill from the installation and operation of the subsea facilities. These may include flowline design specification, use of appropriate design codes (e.g. for corrosion allowance), and use of corrosion inhibitor.	Once	To be determined by the DCE	DEEC	None (desktop work)
		Risk-based proactive pipeline monitoring and inspection program in place	Risk-based proactive pipeline monitoring and inspection program documentation	Once, before the approval of design and operational procedures	Excerpt from the operational documentation indicating the establishment of a risk-based proactive pipeline monitoring and inspection program	Reading of the excerpt from the operational documentation indicating the establishment of a risk-based proactive pipeline monitoring and inspection program	Once, during the Operations Phase	To be determined by the DCE	DEEC	None (desktop work)
D105	Reels and hoses used for hydrocarbon and chemical transfer will be designed, operated and maintained to prevent spills. Operational procedures will be put in place to prevent spill risk, including the use of drip trays and other measures to prevent spillages from, for instance valves, or lubricant changes.	Design, operation and maintenance of reels and hoses for hydrocarbon and chemical transfers and operational procedure in place prevent spills	Project documentation with information on design, operation and maintenance of reels and hoses and operational procedures Vendor Data Sheets	As determined by each respective inspection and maintenance program	Observation during a visit of the facilities indicating that the operational procedures are implemented to prevent spill risk, including the use of drip trays and other measures to prevent spillages from, for instance valves, or lubricant changes	Visit of facilities allowing for observing that operational procedures are implemented to prevent spill risk, including the use of drip trays and other measures to prevent spillages from, for instance valves, or lubricant changes	Once, during the Operations Phase	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D106	Fuels, chemicals and lubricating oil will be stored in designated containment areas/storage tanks on board project vessels.	Fuels, chemicals and lubricating oil stored in designated containment areas/storage tanks on board project vessels	Visual recognition of location of fuels, chemicals and lubricating oil storage Procedures for chemicals and fuel handling and storage	Once, before the project vessels start their operations	Observation, in situ, that fuels, chemicals and lubricating oil are stored in designated containment areas/storage tanks on board applicable project vessels	Visit of applicable project vessels to observe, in situ, that fuels, chemicals and lubricating oil will be stored in designated containment areas/storage tanks on board project vessels	Once, after the start of activities on applicable project vessels	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
D107	Conduct routine maintenance and inspection of safety critical equipment during construction and operation.	Routine maintenance and inspection of safety critical equipment conducted	Reports of routine maintenance and inspections	Once, before the project starts and subsequently as determined by each respective inspection and maintenance program	Observation of facilities confirming that routine maintenance and inspection of safety critical equipment is conducted	Visit of facilities confirming that routine maintenance and inspection of safety critical equipment is conducted	Once, during Construction and Operation Phases, and as needed	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D108	Processes and procedures will be in place with the intent of maintaining navigational safety at all times during the project. Obstruction lights, navigation lights and foghorns will be kept in working condition on board the drillship, PSVs, FPSO and breakwater/hub. Radio communication systems will be in place and in working order for contacting other marine vessels as necessary.	Navigational safety processes and procedures in place on board the drillship, PSVs, FPSO and breakwater/hub	Project vessels navigation safety processes and procedures documentation	Once, before the project starts and before mobilization of new vessels	Observation on the Hub and applicable vessels, and interviews with the captain or qualified staff confirming that processes and procedures are in place with the intent of maintaining navigational safety at all times during the project	Visit of the Hub and applicable vessels, and interviews with the captain or qualified staff confirming that processes and procedures are in place with the intent of maintaining navigational safety at all times during the project	Once, during the Operations Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Induction program of vessel masters	BP-provided training materials / vessel contractors' training logs	Once, before the project starts and before mobilization of new vessels	Interviews with captains of applicable vessels confirming that their induction program includes processes and procedures for navigational safety	Visit of applicable vessels to interview vessel captains and confirm that their induction program (training) includes processes and procedures for navigational safety	Once, during the Operations Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Navigational safety equipment and communication systems in working order on board the drillship, PSVs, FPSO and breakwater/hub	Visual recognition of navigational safety equipment on board	Once, before each project phase starts and subsequently as determined by marine assurance program	Navigational safety equipment and communication systems in working order on board the drillship, PSVs, FPSO and breakwater/hub	Visit of applicable vessels and breakwater/hub to confirm their possession of navigational safety equipment and communication systems in working order	Once, during the Operations Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
D109	An exclusion safety zone (estimated to be a 500-m wide radius) will be established around the drillship, FPSO and hub/breakwater within which non-project related vessels are prohibited. Operational procedures will be put in place to further reduce vessel collision risk for instance by a restriction on visiting vessels in bad weather, defined vessel no-go areas within the exclusion safety zone, agreed approach procedures to drillship, FPSO and FLNG/breakwater.	Exclusion safety zones applied around the drillship, FPSO and hub/breakwater	Documentary evidence of the exclusion safety zones Applicable navigational charts	Once, before each project phase starts and following changes in zoning	Observation on the Hub and applicable vessels confirming exclusion safety zones applied around the drillship, FPSO and hub/breakwater	Visit of the Hub and applicable vessels confirming exclusion safety zones applied around the drillship, FPSO and hub/breakwater	Once, during the Operations Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
		Operational procedures in place to further reduce vessel collision risk	Operational procedures to reduce vessel collision risk documentation	Once, before each project phase starts	Observation on the Hub and applicable vessels and interviews with the captains or qualified staff confirming the implementation of operational procedures in place to further reduce vessel collision risk for instance by a restriction on visiting vessels in bad weather, defined vessel no-go areas within the exclusion safety zone, agreed approach procedures to drillship, FPSO and FLNG/breakwater	Visit of the Hub and applicable vessels and interviews with the captains or qualified staff confirming the implementation of operational procedures in place to further reduce vessel collision risk for instance by a restriction on visiting vessels in bad weather, defined vessel no-go areas within the exclusion safety zone, agreed approach procedures to drillship, FPSO and FLNG/breakwater	Once, during the Operations Phase	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
D110	Measures will be implemented aimed at reducing the risk of oil spills from supply, patrol and installation vessels, including selection of vessels which comply with IMO codes for prevention of oil pollution; all vessels will have onboard Shipboard Oil Pollution Emergency Plans (SOPEPs), as required.	Measures aimed at reducing the risk of oil spills implemented on supply, patrol and installation vessels	Project vessels oil spill risk reduction documentation International Oil Pollution Prevention Certificate	Once, before the project vessels start their operations	Excerpt from documentation confirming that supply, patrol and installation vessels comply with IMO codes for prevention of oil pollution	Reading of the excerpt from documentation confirming that supply, patrol and installation vessels comply with IMO codes for prevention of oil pollution	Once, after applicable vessel mobilization	To be determined by the DCE	ANAM	None (desktop work)
		SOPEP on board all project vessels	International Oil Pollution Prevention Certificate	Once, before the project vessels start their operations	Interviews with captains of applicable vessels confirming the presence of a SOPEP on board the vessel	Visit of applicable vessels to interview vessel captains and to demonstrate the presence of a SOPEP on board the vessel	Once, after applicable vessel mobilization	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D111	Develop a Source Control Emergency Response Plan (SCERP), with provisions for well containment and capping and relief well planning.	SCERP developed	SCERP documentation	Once, before the project starts	Documentation on the Source Control Emergency Response Plan (SCERP) provisioning for well containment and capping and relief well planning	Reading of the documentation on the Source Control Emergency Response Plan (SCERP) provisioning for well containment and capping and relief well planning	Once	To be determined by the DCE	HASSMAR and DEEC	None (desktop work)
D112	Develop an Oil Spill Contingency Plan (OSCP), which will cover a range of response strategies for different spill scenarios.	OSCP developed	OSCP documentation	Once, before each project phase starts and Annually thereafter	Oil Spill Contingency Plan (OSCP) covering a range of response strategies for different spill scenarios	Reading of the Oil Spill Contingency Plan (OSCP) covering a range of response strategies for different spill scenarios	Once	To be determined by the DCE	HASSMAR and DEEC	None (desktop work)
D113	Tier 1 spill response equipment will be available and maintained in conformance with internal procedures and good international industry practice throughout construction, operations and decommissioning.	Tier 1 spill response equipment will be available and maintained	Visual recognition and inspection records	Once, before the project starts and annually	Observation, in situ, of the availability and maintenance of Tier 1 spill response equipment	Visit of applicable infrastructures to observe, in situ, the availability and maintenance of Tier 1 spill response equipment	Once, after the start of operations and then annually	To be determined by the DCE	HASSMAR and DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
D114	Contractual arrangements will be in place with specialist contractors who can support spill response. This includes procedures for verifying their availability and capability.	Contractual arrangements with specialist contractors who can support spill response in place	Contracts	Once, before the project starts and subsequently as per renewal schedule	Emergency plan or similar document describing the capacities of specialist contractors who can support spill response in place	Reading of the emergency plan or similar document describing the capacities of specialist contractors who can support spill response in place	Once, after the start of facilities	To be determined by the DCE	DEEC	None (desktop work)

Table U-4. ESMP Monitoring by the Mauritanian and Senegalese Authorities – Accidental Events ... cont'd.

D&OC and Mitigation Measure		Operator Monitoring Elements (as a reminder)			Monitoring by the Mauritanian and Senegalese Authorities					
		Objectively Verifiable Indicator	Source for Verification	Frequency of Verification	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
D115	Conduct routine spill response drills and training.	Routine spill response drills and training conducted	Drills and training reports	Once, before the project starts and subsequently as per agreed exercise program	BP ESMP Compliance Report confirming conductance of routine spill response drills and training	Reading of the BP ESMP Compliance Report demonstrating the conductance of routine spill response drills and training	Annually, after the start of facilities	To be determined by the DCE	HASSMAR and DEEC	None (desktop work)
D116	Development of an oil spill sensitivity map highlighting resources at risk.	Oil spill sensitivity map highlighting resources at risk	Map	Once, before the project starts	Oil spill sensitivity map highlighting resources at risk	Reading of the oil spill sensitivity map highlighting resources at risk	Once, when the map is available	To be determined by the DCE	HASSMAR and DEEC	None (desktop work)
D117	BP will undertake an assessment (e.g. Spill Impact Mitigation Assessment (SIMA)) to evaluate the risks and benefits of different response tools or techniques before implementation.	Assessment evaluating the risks and benefits of different response tools or techniques	Assessment report	Once, before drilling starts	Excerpt from the assessment report evaluating the risks and benefits of different response tools or techniques confirming the completion of such an assessment	Reading of the excerpt from the assessment report evaluating the risks and benefits of different response tools or techniques confirming the completion of such an assessment	Once, when available	To be determined by the DCE	DEEC	None (desktop work)
D118	BP will seek regulatory approval for any use of dispersants or in-situ burning as required as per provisions in the OSCP.	Regulator's approval for use of dispersants or in-situ burning	Correspondence	Once, before the project starts	Complying with provisions in the OSCP, and if a request has been made for this purpose, approval document for the use of dispersants or in-situ burning issued by the applicable national regulator	Reading of the approval document for the use of dispersants or in-situ burning issued by the applicable national regulator, if a request has been made by BP for this purpose	Once, before the project start and in the event of a spill	To be determined by the DCE	DEEC	None (desktop work)
D119	Contractor will be required to reports all incidents, including near-misses to BP using established protocols.	Incidents including near-misses reported to BP	Contractors HSSE incident reports	After a reported incident	BP ESMP Compliance Report indicating that all incidents, including near-misses, were reported	Reading of the BP ESMP Compliance Report indicating that all incidents, including near-misses, were reported	Annually	To be determined by the DCE	DEEC	None (desktop work)

Table U-5: SMP Monitoring by the Mauritanian and Senegalese Authorities.

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities.

Abbreviations:

Co: Construction Phase De: Decommissioning Phase D: Design & Operational Control Measure MON: Monitoring Measure
 Op: Operations Phase IMP: Impact M: Mitigation Measure

Monitoring Measure	Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities						
		Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring ²³	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities ²⁴	Authorities Monitoring Schedule	Potential Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities ²⁵	
Air Quality and Greenhouse Gases												
<i>Corresponding to the impacts:</i>												
<i>IMP01: Reduction in ambient air quality (NOx and SOx only). (Residual impact: 2 – Low) / Co Phase</i>			<i>D and M Measures: D01, D02, D03, D04, M01, M02</i>									
<i>IMP02: Reduction in ambient air quality. (Residual impact: 2 – Low) / Op Phase</i>			<i>D and M Measures: D01, D02, D04, D15, D29, D30, D31, D32, D33, M01, M02, M29, M30, M31</i>									
MON1	Monitoring of baseline air quality before start of significant construction	Co	Obtaining specific data on air quality at receptor level before the project	Air quality measurements	Air quality baseline report	Once before construction	Annual ESMP and SMP Compliance Report presenting results from baseline air quality measurements at receptor level before the start of major construction before the project	Reading of the annual ESMP and SMP Compliance Report presenting results from baseline air quality measurements at receptor level before the start of major construction before the project	Once, when the report is available	To be determined by the DCE	DEEC	None (desktop work)
MON2 (also M02)	Recording fuel consumption and type of fuels used	Co, Op	Reduction in SOx emissions, resulting in no significant reduction of ambient air quality	Fuel volumes and types of fuels	Fuel consumption records	Quarterly	Annual ESMP and SMP Compliance Report presenting results from annual fuel consumption and the type of fuel used	Reading of the annual ESMP and SMP Compliance Report presenting results from annual fuel consumption and the type of fuel used	Annually	To be determined by the DCE	DEEC	None (desktop work)
MON3 (also D04)	Recording of flaring events	Co, Op	Reduction in volume of hydrocarbons flared	Flare emissions (volume of hydrocarbons flared)	Emissions records	Quarterly	Annual ESMP and SMP Compliance Report summarizing flare events over the course of the year	Reading of the annual ESMP and SMP Compliance Report summarizing flare events over the course of the year	Annually	To be determined by the DCE	DEEC	None (desktop work)

²³ Monitoring frequency is for internal purpose only. The frequency of reporting on the monitoring results will be as per regulatory requirements or as agreed with the regulator.

²⁴ In this table, monitoring activities include the reading of reports and other documents. The BP ESMP Compliance Report will be submitted by BP to the authorities according to the agreed periodicity. The other documents identified in the column "Monitoring Activity to be Carried Out by the Authorities" will be submitted to authorities upon request.

²⁵ In this table, providing for the transportation and accommodation by the GTA Phase 1 project will be done by the same means of transport and accommodation as those used by the project staff to reach the facilities, and notably for transportation, the boat or helicopter used for the transfer of staff.

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure		Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities					
			Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
MON4 (also D33)	Predictive emission monitoring system (PEMS) used on both the FLNG and FPSO	Op	Regular monitoring of emissions on both the FLNG and FPSO	emissions of GHG, SOx and NOx	PEMS records	Quarterly	Annual ESMP and SMP Compliance Report presenting annual emissions resulting from the predictive emission monitoring system (PEMS) used on both the FLNG and FPSO and allowing for the monitoring of GHG, SOx and NOx emissions	Reading of the annual ESMP and SMP Compliance Report presenting annual emissions resulting from the predictive emission monitoring system (PEMS) used on both the FLNG and FPSO and allowing for the monitoring of GHG, SOx and NOx emissions	Annually	To be determined by the DCE	DEEC	None (desktop work)
Water Quality												
<i>Corresponding to the impacts:</i>												
<i>IMP03: Reduction in ambient water quality from FPSO produced water and FLNG cooling water discharges and associated chemicals. (Residual impact: 2 – Low) / Op Phase</i>					<i>D and M Measures: D01, D05, D06, D07, D11, D34, D35, D36, D37, D38, M32, M33, M35, M36, M37, M38, M39</i>							
<i>IMP04: Changes in water quality from accidental loss of trash and debris. (Residual impact: 1 – Negligible) / Op Phase</i>					<i>D and M Measures: D01, D05, D06, D07, D11, D34, D35, D36, D37, D38, M34</i>							
MON5 (also M33)	Monitor use of added chemicals to overall process system (corrosion inhibitors, scale inhibitors, coagulants/flocculants)	Op	Reduce use of added chemicals to the overall process system to a level that maintains defined performance criteria without compromising installations safety	Record of chemical additions to process system	Chemical use / purchase records	Annual review of chemical use / purchase records	Observation, in situ, of the implementation of a monitoring system for added chemicals to the overall process system	Visit of the facilities to observe the implementation of a monitoring system for added chemicals to the overall process system	Annually, during the Operations Phase	To be determined by the DCE	DEEC	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)
MON6 (also M36)	Monitor free chlorine in FLNG cooling water discharge	Op	Maintain free chlorine below 0.2 ppm in FLNG cooling water discharge	Monthly average of free chlorine measurements in FLNG cooling water discharge	FLNG cooling water sampling records	Daily and monthly	Annual ESMP and SMP Compliance Report presenting annual results of the free chlorine monitoring in FLNG cooling water discharges and allowing for the monitoring of the maintaining of free chlorine below 0.2 ppm in FLNG cooling water discharge	Reading of the annual ESMP and SMP Compliance Report presenting annual results of the free chlorine monitoring in FLNG cooling water discharges and allowing for the monitoring of the maintaining of free chlorine below 0.2 ppm in FLNG cooling water discharge	Annually, during the Operations Phase	To be determined by the DCE	DEEC	None (desktop work)

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure		Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities					
			Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
MON7 (also M37)	Monitoring of oil and grease content of the produced water effluent	Op	Effluent quality not to exceed 42 mg/L daily maximum; 29 mg/L monthly average	Daily and monthly records of discharge quality	FPSO discharge monitoring records	Daily and monthly	Annual ESMP and SMP Compliance Report presenting annual results of oil and grease content of the produced water effluent and allowing for the monitoring for the effluent quality not to exceed 42 mg/L daily maximum, 29 mg/L monthly average	Reading of the annual ESMP and SMP Compliance Report presenting annual results of oil and grease content of the produced water effluent and allowing for the monitoring for the effluent quality not to exceed 42 mg/L daily maximum, 29 mg/L monthly average	Annually, during the Operations Phase	To be determined by the DCE	DEEC	None (desktop work)
MON8 (also M38)	Monitor quality of the produced water effluent from the FPSO, to inform and complete an Environmental Risk Assessment during the first 18 months of the FPSO operation phase or following a material change in effluent composition or volume ²⁶	Op	Confirm environmental impact (risk) of produced water discharge using a risk-based approach	Record of naturally occurring compounds of produced water Record of chemical additions to process system Result of a WET test done as per the OSPAR methodology 2012/5	Produced water naturally occurring compounds analysis report(s) Chemical use / purchase records Laboratory report for the WET test	One analysis of naturally occurring compounds and one WET test during the first 18 months, or following a material change in effluent composition or volume	Annual ESMP and SMP Compliance Report presenting annual analysis results of naturally occurring compounds of produced water (and one WET test, as needed), confirming the monitoring of the quality of the produced water effluent from the FPSO to evaluate environmental impacts (risks) of produced water discharge using a risk-based approach	Reading of the annual ESMP and SMP Compliance Report presenting the annual analysis results of naturally occurring compounds of produced water confirming the monitoring of the quality of the produced water effluent from the FPSO to evaluate environmental impacts (risks) of produced water discharge using a risk-based approach	Once, during the first 18 months of the FPSO Operations Phase or after a significant change in effluent composition, when the ESMP and SMP Compliance Report is available	To be determined by the DCE	DEEC	None (desktop work)

²⁶ Given the limited added value of biomarkers in these types of monitoring, and noting that effective use of biomarkers in monitoring programs in Senegalese waters would require significant development and application of region-specific methods in key species and associated assessment criteria, it can be argued that an environmental risk based modelling approach as proposed in the ESIA offers the best method for assessing potentially significant effects of produced water discharges at the population and ecosystem levels.

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure	Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities						
		Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Coastal Erosion												
<i>Corresponding to the impact:</i>												
IMP05: Accretion or reduction in natural erosion of the Langue de Barbarie (relative to the case without the breakwater) of up to 13 m over 10 years near the Mauritania-Senegal border and extending southward approximately 8 km, accompanied by a maximum increase in coastal erosion rate (relative to the case without the breakwater) of approximately 6 m over 10 years further south, along approximately 2 km of coast, starting from the south end of the Hydrobase neighborhood (Residual impact: 2 – Low) / Op and De Phases			D and M Measures: D39, D42, M40, M41, M45									
MON9 (also M40)	Develop and implement a coastline monitoring plan ^{27, 28} .	Co, Op, De	Provide bathymetric and oceanographic data for further modeling during project detailed design. Verification of predicted morphological change based on additional site-specific bathymetry and oceanography data along the coastline from Saint-Louis to the Senegal River mouth	Completion of data collection and use of data in modeling conducted as part of project detailed design Monitoring plan	Bathymetric and oceanographic data and modeling report Monitoring plan developed based on modelling results	Once during the project detailed design stage to inform the modelling and then as informed by the monitoring plan during operations and decommissioning	Annual ESMP and SMP Compliance Report presenting the shoreline monitoring results	Reading of the annual ESMP and SMP Compliance Report presenting the shoreline monitoring results	Annually after the start of the Construction Phase	To be determined by the DCE	Technical Committee	None (desktop work)
Sediment Quality												
<i>Corresponding to the impacts:</i>												
IMP03: Reduction in ambient water quality from FPSO produced water and FLNG cooling water discharges and associated chemicals. (Residual impact: 2 – Low) / Op Phase			D and M Measures: D01, D05, D06, D07, D11, D34, D35, D36, D37, D38, M32, M33, M35, M36, M37, M38, M39									
IMP06: Changes in bottom contours, grain size, and some chemical parameters from dredging activities and discharge of drilling muds and cuttings discharges. (Residual impact: 2 – Low) / Co Phase			D and M Measures: D01, D05, D06, D09, D10, D13, M03									
MON10	Sediment sampling in the Offshore Area, near the FPSO for physico-chemical analysis of sediments (EBS)	Co, Op	Assessment of the potential spread of constituents of concern arising from produced water	Measured levels of produced water tracer compounds in sediments	EBS follow-up reports	FPSO: two surveys (one before FPSO installation; one within 6 years following start-up), with any subsequent monitoring strategy to be determined based on survey results	Annual ESMP and SMP Compliance Report confirming the sediment sampling in the Offshore Area, near the FPSO for physico-chemical analysis of sediments	Reading of the annual ESMP and SMP Compliance Report confirming the sediment sampling in the Offshore Area, near the FPSO for physico-chemical analysis of sediments	Once, when the reports are available, i.e. once before FPSO installation (report already available, see Appendix D of the GTA Phase 1 project ESIA report) and once in the 6 years following its start	To be determined by the DCE	DEEC	None (desktop work)

²⁷ The monitoring plan will include nearshore bathymetric survey, beach profile and coastline position surveys. The survey measurements will be sufficient to identify key coastline features and support additional coastline modelling if necessary. Surveys will be set up to allow repeatability so that changes over time can be assessed.

²⁸ It is to be noted that the currently proposed beach profile monitoring (included in the coastline monitoring plan) covers the Mauritania and Senegal coastline from North of N'Diogo (latitude 1,800,000 - WGS84/UTM 28N) to South of the breach (latitude 1,756,200 - WGS84/UTM 28N).

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure		Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities					
			Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
MON11	ROV visual survey of epibenthic community and seabed at drill sites	Co, Op	Evaluate recovery of benthic communities and seabed at drilling sites	Observed recovery of benthic communities at one or two offshore drilling sites during well workover operations / well interventions	ROV survey report	Offshore Area: one post-drill survey for one well	Annual ESMP and SMP Compliance Report presenting results from the ROV survey for one or two offshore drilling sites	Reading of the annual ESMP and SMP Compliance Report presenting results from the ROV survey for one or two offshore drilling sites	Once, after the post-drill survey for one well	To be determined by the DCE	DEEC	None (desktop work)
MON12	Survey pre- and post-dredging	Co	Establish extent of seabed disturbance from dredging activity	Difference between pre- and post-dredging, where applicable	Post-Dredging report	Before and after dredging.	Annual ESMP and SMP Compliance Report presenting results from dredging reports indicating the extent of seabed disturbance from dredging activity	Reading of the annual ESMP and SMP Compliance Report presenting results from dredging reports indicating the extent of seabed disturbance from dredging activity	Once	To be determined by the DCE	DEEC	None (desktop work)
Benthic Communities												
<i>Corresponding to the impacts:</i>												
<i>IMP08: Disturbance to benthic communities from resuspension and deposition of sediments in close proximity to dredging activities. (Residual impact: 1 – Negligible) / Co Phase</i>					<i>D and M Measures: D01, D05, D06, D08, D09, D10, D13, M03</i>							
<i>IMP09: Introduction of aquatic invasive species. (Residual impact: 2 – Low) / Co Phase</i>					<i>D and M Measures: D01, D05, D06, D08, D09, D10, D13</i>							
MON12	Survey pre- and post-dredging	Co	Establish extent of seabed disturbance from dredging activity	Difference between pre- and post-dredging, where applicable	Dredging report	Before and after dredging.	Annual ESMP and SMP Compliance Report presenting results from dredging reports indicating the extent of seabed disturbance from dredging activity	Reading of the annual ESMP and SMP Compliance Report presenting results from dredging reports indicating the extent of seabed disturbance from dredging activity	Once	To be determined by the DCE	DEEC	None (desktop work)
MON13	Review main project vessel records to ensure compliance with ballast water management procedures	Co	Reducing the potential introduction of alien invasive species into Mauritania and Senegal waters via ballast water discharges of main project vessels	Compliance by project vessel operators to ballast water management procedures	Vessel ballast water management records	Immediately prior to project vessel entrance into local waters	Observation of the main applicable project vessel records indicating, where applicable, the compliance to ballast water management procedures	Visit of applicable vessels to observe the main records indicating, where applicable, the compliance to ballast water management procedures	Once per applicable vessel	To be determined by the DCE	ANAM	Transportation and accommodation costs on site depending on the visit duration (transportation and accommodation taken care by the GTA Phase 1 project)

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure	Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities						
		Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Plankton & Fish and Other Fishery Resources												
<i>Corresponding to the impact:</i>												
<i>IMP10: Entrainment and impingement of plankton and adult fish in FLNG cooling water at Nearshore Hub/Terminal. Entrainment and impingement of plankton and adult fish by FPSO. (Residual impact: 1 – Negligible) / Op Phase</i>				<i>D and M Measures: D01, D05, D06, D34, M42</i>								
MON14	Ichthyoplankton surveys at and near the FLNG and at a reference station	Op	Monitor the seasonal variability of ichthyoplankton potentially entrained into the FLNG cooling water systems	Collection of ichthyoplankton from the source water body at and near the FLNG to establish seasonal species diversity and abundance and estimated number of entrained ichthyoplankton	Ichthyoplankton survey reports	Quarterly during the first 3 years of FLNG operation, to be adjusted depending upon quarterly findings	Annual ESMP and SMP Compliance Report presenting results from ichthyoplankton surveys at and near the FLNG and at a reference station confirming the monitoring of seasonal variability of ichthyoplankton potentially entrained into the FLNG cooling water systems and allowing for the determination of species diversity and abundance and estimated number of entrained ichthyoplankton	Reading of the annual ESMP and SMP Compliance Report presenting results from ichthyoplankton surveys at and near the FLNG and at a reference station confirming the monitoring of seasonal variability of ichthyoplankton potentially entrained into the FLNG cooling water systems and allowing for the determination of species diversity and abundance and estimated number of entrained ichthyoplankton	Annually during the first 3 years of FLNG operation	To be determined by the DCE	Ministry of Fisheries and Maritime Economy	None (desktop work)
MON15	Monitoring of fish fauna associating with the Nearshore Terminal/Hub	Op	Monitor structure-associated fish diversity near the Nearshore Hub/Terminal structure (relative to water column and seafloor habitat in similar water depths)	Collection of fish fauna data from the Nearshore Terminal/Hub to determine species composition and relative abundance of fishes associating with the structure	Assessment reports	Once before installation, and then every year in same season for up to 5 years, with any subsequent monitoring strategy to be determined based on survey results	Annual ESMP and SMP Compliance Report confirming the monitoring of fish fauna associating with the Nearshore Terminal/Hub and indicating the fish fauna associating with the Nearshore Terminal/Hub	Reading of the annual ESMP and SMP Compliance Report confirming the monitoring of fish fauna associating with the Nearshore Terminal/Hub and indicating the fish fauna associating with the Nearshore Terminal/Hub	Once, after installation, then each year for a maximum duration of 5 years	To be determined by the DCE	Ministry of Fisheries and Maritime Economy	None (desktop work)

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure		Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities					
			Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
Birds												
<i>Corresponding to the impacts:</i>												
<i>IMP13: Potential vessel strike resulting in bird injury or mortality. (Residual impact: 2 – Low) / Op Phase</i>			<i>D and M Measures: D01, D05, D06, D15, D16, D17, D29</i>									
MON16	Monitor and record project vessel collisions with marine mammals, sea turtles, and birds	Op	Monitor project vessel collisions with marine mammals, sea turtles, and birds	Record project vessel collisions with marine mammals, sea turtles, and birds	Project vessel collision records; protected species reporting	Continuously during vessel operations	Annual ESMP and SMP Compliance Report indicating the monitoring and recording of project vessel collisions with marine mammals, sea turtles, and birds	Reading of the annual ESMP and SMP Compliance Report indicating the monitoring and recording of project vessel collisions with marine mammals, sea turtles, and birds	Annually	To be determined by the DCE	DEEC	None (desktop work)
Marine Mammals and Sea Turtles												
<i>Corresponding to the impacts:</i>												
<i>IMP15: Auditory impairment [of marine mammals] due to sound from construction activities, particularly pile driving and VSP survey. (Residual impact: 1 – Negligible) / Co Phase</i>			<i>D and M Measures: M04, M05, M07</i>									
<i>IMP16: Potential vessel strike resulting in marine mammal injury or mortality. (Residual impact: 1 – Negligible) / Co, Op and De Phases</i>			<i>D and M Measures: D41, D42, D43, M06</i>									
<i>IMP18: Avoidance or displacement [of sea turtles] from areas under construction for some species; attraction to other species as a foraging strategy; Noise disturbances from construction activities, particularly pile driving and VSP surveys; loss of foraging habitats from proposed construction. (Residual impact: 1-Negligible) / Co Phase</i>			<i>D and M Measures: M04, M05, M07</i>									
<i>IMP19: Potential vessel strike resulting in sea turtle injury or mortality. (Residual impact: 1 – Negligible) / Co, Op and De Phases</i>			<i>D and M Measures: D41, D42, D43, M06</i>									
MON17	Pile driving mitigation monitoring program during pile driving operations;	Co	Reduce acoustic-related injury to marine mammals and sea turtles from pile driving operations	Record of mitigation measures being implemented, e.g., soft start.	Pile driving reports	During pile driving operations	Annual ESMP and SMP Compliance Report confirming the implementation of a pile driving mitigation monitoring program during pile driving operations to reduce acoustic-related injury to marine mammals and sea turtles from pile driving operations	Reading of the annual ESMP and SMP Compliance Report confirming the implementation of a pile driving mitigation monitoring program during pile driving operations to reduce acoustic-related injury to marine mammals and sea turtles from pile driving operations	Once at the end of pile driving operations	To be determined by the DCE	DEEC	None (desktop work)

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure		Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities					
			Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities
MON18	VSP mitigation monitoring program and observations during VSP operations	Co	Reduce acoustic-related injury to marine mammals and sea turtles from VSP operations	Record of marine mammal and sea turtle observations within an exclusion zone	VSP survey mitigation monitoring report	During VSP surveys	Annual ESMP and SMP Compliance Report presenting VSP mitigation to reduce acoustic-related injury to marine mammals and sea turtles from VSP operations	Reading of the annual ESMP and SMP Compliance Report presenting VSP mitigation to reduce acoustic-related injury to marine mammals and sea turtles from VSP operations	Once, after VSP surveys	To be determined by the DCE	DEEC	None (desktop work)
MON19	Ambient underwater sound recording program	Co	Understand the background sound characteristics of the area	Documentation of ambient underwater sound	Ambient sound measurement reports	Sound recording program, beginning prior to construction	Annual ESMP and SMP Compliance Report confirming the implementation of an ambient underwater sound recording program to understand the background sound characteristics of the area	Reading of the annual ESMP and SMP Compliance Report confirming the implementation of an ambient underwater sound recording program to understand the background sound characteristics of the area	Once according to the ESMP and SMP Report, after the completion of the recording program	To be determined by the DCE	DEEC	None (desktop work)
MON16	Monitor and record vessel collisions with marine mammals, sea turtles, and birds	Co, Op, De	Monitor project vessel collisions with marine mammals, sea turtles, and birds	Record project vessel collisions with marine mammals, sea turtles, and birds	Project vessel collision records; protected species reporting	Continuously during vessel operations	Annual ESMP and SMP Compliance Report indicating the monitoring and recording of project vessel collisions with marine mammals, sea turtles, and birds	Reading of the annual ESMP and SMP Compliance Report indicating the monitoring and recording of project vessel collisions with marine mammals, sea turtles, and birds	Annually	To be determined by the DCE	DEEC	None (desktop work)
Threatened Species and Protected Areas												
<i>See Monitoring Measures listed to monitor impacts on Plankton & Fish and Other Fishery Resources, Birds, Marine Mammals and Sea Turtles</i>												
Biodiversity												
<i>See Monitoring Measures listed to monitor impacts on Benthic Communities, Plankton & Fish and Other Fishery Resources, Birds, Marine Mammals and Sea Turtles, Threatened Species and Protected Areas</i>												

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure	Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities						
		Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Maritime Navigation												
<i>Corresponding to the impact:</i>												
<i>IMP28: Risk of collision between project vessels and pirogues due to project vessels movements. (Residual impact: 2 – Low in Co and Op Phases and 1 – Negligible in De Phase) / C, Op and De Phases</i>			<i>D and M Measures: D19, D20, D21, D22, D23, D43, M08, M09, M10, M11, M12, M13, M14, M15, M16, M17, M18, M19</i>									
MON20	Monitoring of safety incidents involving project vessels and other sea users, notably artisanal fishing boats	Co, Op, De	No collisions between project vessels and non-project vessels, notably artisanal fishing boats	Number of collisions and number of near misses between project vessels and non-project vessels	HSSE project records	Continuous during Construction, Operations and Decommissioning Phases	Annual ESMP and SMP Compliance Report confirming the monitoring of safety incidents involving project vessels and other sea users, notably artisanal fishing boats with the objective of having no collisions occurring between project vessels and non-project vessels, notably artisanal fishing boats	Reading of the annual ESMP and SMP Compliance Report confirming the monitoring of safety incidents involving project vessels and other sea users, notably artisanal fishing boats with the objective of having no collisions between project vessels and non-project vessels, notably artisanal fishing boats	Annually	To be determined by the DCE	HASSMAR	None (desktop work)
			No fatality due to a collision between project vessels and non-project vessels, notably artisanal fishing boats	Number of fatalities during collision between project vessels and non-project vessels	HSSE project records	Continuous during Construction, Operations and Decommissioning Phases	Annual ESMP and SMP Compliance Report confirming the monitoring of safety incidents involving project vessels and other sea users, notably artisanal fishing boats with the objective of having no fatality due to a collision occurring between project vessels and non-project vessels, notably artisanal fishing boats	Reading of the annual ESMP and SMP Compliance Report confirming the monitoring of safety incidents involving project vessels and other sea users, notably artisanal fishing boats with the objective of having no fatality due to a collision occurring between project vessels and non-project vessels, notably artisanal fishing boats	Annually	To be determined by the DCE	HASSMAR	None (desktop work)

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure	Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities						
		Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Artisanal Fisheries												
<i>Corresponding to the impact:</i>												
<i>IMP29: Potential loss of artisanal fishing gears (nets and buoys) due to project vessels movements in artisanal fishing areas. (Residual impact: 2 – Low) / Co, Op and De Phases</i>			<i>D and M Measures: D19, D23, D24, M09, M12, M13, M17, M18, M19, M20, M21, M22, M23, M24, M27</i>									
MON21	Monitoring of loss of artisanal fishing gears due to project vessel movements	Co, Op, De	Minimal losses of fishing gears	Number of gear losses reported	CLO records Grievance mechanism records	Every month during the Construction Phase + Every 6 months during Operations Phase and Decommissioning Phase	Annual ESMP and SMP Compliance Report confirming the monitoring of the loss of artisanal fishing gears due to project vessel movements with the objective of having minimal losses of fishing gears	Reading of the annual ESMP and SMP Compliance Report confirming the monitoring of the loss of artisanal fishing gears due to project vessel movements with the objective of having minimal losses of fishing gears	Annually	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
			Grievances associated with loss of fishing gears are addressed as per the grievance procedure	Number of claims closed vs. claims submitted	CLO records Grievance mechanism records	Every month during the Construction Phase + Every 6 months during Operations Phase and Decommissioning Phase	Annual ESMP and SMP Compliance Report confirming that the grievances associated with loss of fishing gears are addressed as per the grievance procedure	Reading of the annual ESMP and SMP Compliance Report confirming that the grievances associated with loss of fishing gears are addressed as per the grievance procedure	Annually	To be determined by the DCE	Saint-Louis Regional Department of Fisheries and Maritime Economy	None (desktop work)
Community Health, Safety and Security												
<i>Corresponding to the impact:</i>												
<i>IMP30: Risk of conflicts between artisanal fishermen and public security forces if some fishermen need to be escorted out of the exclusion safety zones. (Residual impact: 2 – Low during Co and Op Phases and 1 – Negligible during De Phase) / Co, Op and De Phases</i>			<i>D and M Measures: D23, D26, D43, M08, M17, M19, M25, M26</i>									
MON22	Monitoring entries attempts by fishermen into the exclusion safety zones where intervention by public security forces is required	Co, Op, De	Fishing interaction control measures are effective, and reduce the number of unauthorized entries or breaches of security by artisanal fishermen.	Number of unauthorized access incidents where intervention from public security forces is required	HSSE project records CLO records	Continuous during the Construction Phase, Operations Phase and Decommissioning Phase	Annual ESMP and SMP Compliance Report confirming the monitoring of entries attempts by fishermen into the exclusion safety zones where intervention by public security forces is required	Reading of the annual ESMP and SMP Compliance Report confirming the monitoring of entries attempts by fishermen into the exclusion safety zones where intervention by public security forces is required	Annually	To be determined by the DCE	HASSMAR	None (desktop work)

Table U-5. SMP Monitoring by the Mauritanian and Senegalese Authorities ...cont'd

Monitoring Measure	Project Phase	Operator Monitoring Elements (as a reminder)				Monitoring by the Mauritanian and Senegalese Authorities						
		Performance Objective	Performance Indicator	Source for Verification of Performance	Frequency of Monitoring	Monitoring Indicator of the Measure Implementation	Monitoring Activity to be Carried Out by the Authorities	Authorities Monitoring Schedule	Possible Monitoring Authorities in Mauritania	Potential Monitoring Authorities in Senegal	Cost of the Monitoring Activity by the Authorities	
Public Infrastructure and Services												
<i>Corresponding to the impact:</i>												
IMP32: <i>Placing additional demands on the public security forces limited resources since they will be required to be available 24/7 to handle a safety incident with artisanal fishermen or a search and rescue operation if needed. (Residual impact: 1 – Negligible in Co Phase and 2 – Low in Op Phase) / Co and Op Phases</i>			D and M Measures: D24, D26, D27, D28, M08, M09, M10, M11, M12, M13, M14, M16, M25, M26									
MON23	Monitoring the number of times public security forces are called in to handle project related safety incidents or search and rescue operations.	Co, Op,	Reduce number of incidents where support from public security forces is required to handle project related safety incidents or search and rescue operations	Number of incidents where public security forces are called in to handle project related safety incidents or search and rescue operations	HSSE project records	Continuous during the Construction Phase, Operations Phase and Decommissioning Phase	Annual ESMP and SMP Compliance Report confirming the monitoring of the number of times public security forces are called in to handle project related safety incidents or search and rescue operations with the objective of reducing the number of incidents where support from public security forces is required to handle project related safety incidents or search and rescue operations	Reading of the annual ESMP and SMP Compliance Report confirming the monitoring of the number of times public security forces are called in to handle project related safety incidents or search and rescue operations with the objective of reducing the number of incidents where support from public security forces is required to handle project related safety incidents or search and rescue operations	Annually	To be determined by the DCE	HASSMAR	None (desktop work)
Social Climate												
<i>Corresponding to the impact:</i>												
IMP34: <i>Social discontent in N'Diogo and Saint-Louis due to the potential perception of loss of fishing grounds and fishing catches combined with the limited employment opportunities, the perception of unsatisfied grievances and/or compensation claims (e.g. for lost gear), and elevated safety risk for fishermen at sea due to presence of project vessels. (Residual impact: 2 – Low in Co and Op Phases and 1 – Negligible in De Phase) / Co, Op, De Phases</i>			D and M Measures: D19, D24, D43, M09, M17, M18, M19, M20, M23, M24, M27, M28. M44, M46									
MON24	Monitor social discontent in N'Diogo and Saint-Louis	Co, Op, De	No project related social unrest and minimum social discontent in N'Diogo and Saint-Louis	Type of grievances received, or public expressions of discontent reported.	CLO records Grievance mechanism records BP External Affairs Managers in Mauritania and Senegal records	Continuous during the Construction Phase and Operations Phase	Annual ESMP and SMP Compliance Report confirming the monitoring of social discontent in N'Diogo and Saint-Louis	Reading of the annual ESMP and SMP Compliance Report confirming the monitoring of social discontent in N'Diogo and Saint-Louis	Annually	To be determined by the DCE	Technical Committee	None (desktop work)

**APPENDIX V: TECHNICAL COMMITTEE
MEETINGS FOR THE PRE-
VALIDATION OF THE ESIA
(SENEGAL)**

Appendix V
Technical Committee Meetings for the Pre-Validation of the ESIA (Senegal)

APPENDIX CONTENTS

- V-1 Official Proceedings of the July 26 and 27, 2018 Technical Committee Pre-Validation Meeting of the Environmental and Social Impact Assessment for the GTA Phase 1 Project (in French)
- V-2 Tracking Table of Responses to Observations Noted in the Official Proceedings of the Technical Committee Pre-Validation Meeting
- V-3 Official Proceedings of the Select Technical Committee Meeting held on October 22, 2018 (in French)
- V-4 Tracking Table of Responses to Observations Noted in the Official Proceedings of the Select Technical Committee Meeting

**APPENDIX V-1: OFFICIAL PROCEEDINGS OF
THE JULY 26 AND 27, 2018
TECHNICAL COMMITTEE PRE-
VALIDATION MEETING OF THE
ENVIRONMENTAL AND
SOCIAL IMPACT ASSESSMENT
FOR THE GTA PHASE 1
PROJECT (IN FRENCH)**



Dakar, le

20 AOUT 2018

La Directrice

A

Monsieur Géraud Moussarie
Directeur Général BP Sénégal

DAKAR

Objet : *Transmission du compte-rendu de la réunion du comité technique de pré-validation du rapport d'Etude d'impact environnemental du projet de développement gazier GTA Phase 1.*

Monsieur le Directeur Général,

Suite à la réunion du comité technique de pré-validation du rapport d'Etude d'Impact Environnemental et social (EIES) de votre projet cité en objet et tenue les 26 et 27 juillet 2018, je vous transmets, ci-joint, le compte- rendu.

Je vous saurais gré des dispositions qu'il vous plaira de prendre en rapport avec votre consultant, pour la prise en compte des observations formulées dans le présent compte-rendu en vue de la poursuite de la procédure.

Je vous prie d'agréer, **Monsieur le Directeur Général**, l'assurance de ma considération distinguée.

P.J: *Compte -rendu de la réunion du comité technique.*

**P/La Directrice de l'Environnement
et des Etablissements Classés, p.i**

Cheikh FOFANA

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Dakar, le 20 AOUT 2018

**COMPTE RENDU DE LA REUNION DU COMITE TECHNIQUE DANS LE CADRE DE
LA VALIDATION DU RAPPORT D'ETUDE D'IMPACT ENVIRONNEMENTAL ET SOCIAL
DU PROJET DE PRODUCTION DE GAZ GRAND TORTUE/AHMEYIM-PHASE 1 PAR BP**

INTRODUCTION

Les 26 et 27 juillet 2018, s'est tenue à l'hôtel *TERROU-BI* de Dakar, la réunion du comité technique d'examen et de validation du rapport d'Etude d'Impact Environnemental et Social (EIES) du projet de *Production de gaz Grand Tortue/Ahmeyim(GTA)-phase 1*.

Le promoteur du projet, représenté par Mme Gaelle BALDELLI, est *BP Sénégal* qui dans le cadre dudit projet travaille en partenariat avec *KOSMOS ENERGY, PETROSEN et SMHPM*. L'EIES réalisée par le pool de cabinets (*CSA, ACODEV, TROPICA et GOLDER*) est portée par *GOLDER*, Bureau d'Etude agréé par le Ministère de l'Environnement et du Développement Durable (MEDD) pour la réalisation de missions d'évaluation environnementale au Sénégal.

La réunion, présidée par Mme Aminata Ndoye TOURE, Directrice des Hydrocarbures, du Ministère du Pétrole et des Energies (MPE) a enregistré la présence des représentants des services techniques concernés par la mise en œuvre du projet (Cf. Liste de présence).

1. DEROULEMENT DE LA RENCONTRE

Après les présentations d'usage, Monsieur Abdoulaye SY, chef de la Division des Evaluations d'Impact sur l'Environnement (DEIE) de la Direction de l'Environnement et des Etablissements Classés (DEEC, a rappelé la procédure de validation des études d'EIES en mettant l'accent sur les points suivants :

- le caractère sous régional du projet GTA phase1 que la République du Sénégal partage avec la République Islamique de la Mauritanie ;
- les deux niveaux de validation de l'EIES, à savoir, la réunion du Comité technique qui regroupe les services techniques de l'Etat et les acteurs non étatiques impliqués dans la mise en œuvre du projet ; et l'Audience publique qui permet d'impliquer les populations et d'autres acteurs locaux, notamment les communautés de pêcheurs, dans le processus de prise de décision, en vue d'une acceptabilité sociale du projet ;
- l'innovation de taille apportée par la DEEC chargée d'assurer le secrétariat du Comité technique consistant à convier les Universitaires à prendre part à cette réunion du Comité technique (Université Gaston Berger de Saint-Louis et Université Cheikh Anta Diop de Dakar) ;
- le Comité technique institué par arrêté ministériel est chargé de la validation interne des rapports d'étude d'impact environnemental et social ;
- les termes de référence de l'EIES ont été validés par la DEEC à travers la tenue d'une réunion de cadrage (procédure formelle) avec les services techniques de l'Etat et d'autres parties prenantes clés (société civile, collectivité territoriale, populations, etc.) ;
- l'importance du renforcement des capacités des agents de l'Administration afin de relever les défis associés à la mise en œuvre des projets pétroliers et gaziers et la nécessité de réaliser une évaluation environnementale stratégique du secteur pétro-gazier ;

A sa suite, la consultante Madame Hélène MARCHAND a procédé à la présentation de la première partie du rapport, en articulant son exposé autour des points suivants :

- ✚ Introduction ;
- ✚ Description et justification du projet ;
- ✚ Localisation du projet et les conditions environnementales et sociales de base ;
- ✚ Principales composantes du projet ;
- ✚ Phases développement et production;
- ✚ Identification et analyse des impacts ;
- ✚ Consultation publique ;

- ✚ Etude de dangers ;
- ✚ Plan de Gestion environnementale et sociale ;

La deuxième partie du rapport a été présentée par l'expert en étude de danger qui a mis en exergue les points suivants :

- ✚ Description des installations et des procédés ;
- ✚ Identification des dangers potentiels ;
- ✚ Analyse préliminaire des risques ;
- ✚ Etude détaillée des risques (quantification et modélisation) ;
- ✚ Mesures de gestion des risques ;
- ✚ Analyse des risques professionnels ;
- ✚ Conclusion de l'étude de danger.

Après ces présentations, les membres du Comité technique ont formulé des observations à travers des constats, questions et recommandations.

2. **OBSERVATIONS**

2.1 **Constats**

- Des incertitudes sont relevées dans le rapport en termes d'études complémentaires à réaliser. Celles -ci portent notamment sur le caractère adéquat des matériaux de construction du complexe de l'île artificielle, l'équilibre dynamique côtier, l'évaluation des risques d'accident dans le cadre du processus de conception du projet, les impacts potentiels liés à l'implantation des pipelines, la gestion des déchets, la pertinence des mesures de protection côtière (brises lames) et sur l'absence d'étude diachronique de l'évolution de l'embouchure, etc. ;
- le taux d'érosion considéré à la suite de la modélisation (1,05m/an) semble sous-évalué, même si le brise-lames participe à reconstruire une bonne portion de plage, son impact en aval transit sera plus important que ce qui est annoncé ;
- le plan de gestion environnemental et social (PGES) est incomplet et non opérationnel. En plus des mesures de mitigation des impacts, ce plan devrait regrouper un plan de suivi et de surveillance, un plan de renforcement des capacités, un plan de gestion des déchets, un plan

d'intervention d'urgence et un plan de démantèlement et de remise en état des zones perturbées par le projet ;

- l'absence d'informations claires (sources de vérification, indicateurs, etc.) sur le mécanisme de mise en œuvre du PGES;
- les limites du modèle d'évolution de la ligne côtière. Le modèle utilisé n'est pas en mesure de prédire les changements que subira la ligne côtière et semble n'avoir pris en compte que des conditions environnementales « normales ». La brèche au sud de Saint-Louis et l'impact de la construction du port de Ndiago sont occultées ; Ce port, à l'image du « port de l'amitié » de Nouakchott pourrait impacter sur le transit sédimentaire et fausser les prévisions d'accrétion (dépôt) prévues dans l'EIES sur environ 08 km dans la zone en face du brise-lames ;
- dans l'identification et l'analyse des impacts potentiels, le consultant semble minimiser beaucoup d'impacts. C'est le cas par exemple de l'impact de l'eau de production sur les écosystèmes. Le contenu d'Hydrocarbure Aromatique Polycycliques (HAP) dans l'eau de production de champs gaziers est en moyenne plus élevé (jusqu'à 11 fois) que le contenu de HAP dans l'eau de production des champs pétroliers, hors ces HAP sont carcinogènes et persistants dans le temps et peuvent s'accumuler dans la chaîne alimentaire ;
C'est le cas également des éruptions de puits, lesquelles sont considérées comme rarissimes dans l'analyse des impacts, alors que l'accidentologie fournie des informations contraires (Page 8.27 paragraphe 1 et 2, rapport étude de danger) ;
- dans l'analyse et l'identification des impacts, le problème lié aux modifications chimique et physique de la colonne d'eau provoquées par des pertes lors de la remontée de matériaux et le rejet des déchets en phases d'installation, d'exploitation et de fermeture n'a pas été suffisamment traité dans le document ;
- la zone de pipeline connue autrement sous le nom de la zone de prétraitement n'est pas bien abordée par le consultant. Il faut retenir que cette zone se situe sur les 40 km des côtes et avoisine environ sur les 120

mètres de profondeur. Elle suppose être une zone de convergence de la remontée d'eau froide profonde, appelée upwelling. Sans le contrôle sur la gestion de ces déchets, la faune marine notamment les ressources halieutiques peut être terriblement affectée ;

- les menaces qui pèsent sur les acteurs de la pêche à Saint-Louis ne sont pas minutieusement analysées. L'étude a beaucoup minimisé l'impact négatif que le projet peut entraîner au niveau de ce secteur précité.
- l'impact du projet sur le tourisme n'a pas été suffisamment analysé, hors ce secteur constitue un cadre pourvoyeur de ressources et d'emplois à Saint-Louis ;
- l'importance de la pêche, l'exiguïté des zones de pêche de Saint-Louis, la densité du parc piroguier et la forte dépendance vis-à-vis des eaux mauritaniennes est une réalité qu'il faut bien appréhender pour plusieurs raisons telles que l'absence d'accord entre les deux pays pendant deux ans, la difficulté de partager le gaz sans collaborer sur le plan halieutique et l'interdiction de l'accès aux eaux mauritaniennes à la communauté de Saint-Louis peut être une source de mécontentement);
- la question des engins de pêche n'est pas abordée alors qu'ils peuvent être déployés sur près de deux kilomètres de long, ce qui pose problème par rapport aux navires et installations ;
- le plan de communication ne prend pas en compte la dimension culturelle et sociologique de la communauté de Guet-Ndar ;
- l'absence de plan de formation et de renforcement des capacités des acteurs locaux ; détaillé et budgétisé ;
- le projet n'est pas pourvoyeur d'emplois, 25 personnes en phase de construction entre 20 et 40 pour la phase des opérations, ce qui est très insuffisant par rapport aux attentes des populations alors que le secteur de la pêche génère plus de 65 000 emplois ;
- la politique de RSE/BP n'est pas clairement définie, elle se résume juste en déclarations d'intentions ;
- le plan de riposte en cas d'éruption de puits (Blow out) pour le gaz naturel n'est pas bien abordé ;



- les aquifères (nappes) qui sont dans le bassin du delta du fleuve Sénégal semblent ne pas être pris en compte dans cette étude quand on sait qu'il y a une relation hydraulique entre la mer et ces aquifères alors que la granulométrie des sédiments marins identifiés par l'étude s'apparente un peu à celle des aquifères qui se trouvent dans la zone terrestre du bassin du delta du fleuve Sénégal. Cela prouve l'existence de cette relation hydraulique entre la mer et les aquifères ;
- les analyses chimiques de base ont porté sur un nombre de polluants assez réduit, surtout pour les éléments traces métalliques ;
- une analyse de la radioactivité de base aurait dû être faite à cause du rejet de saumures qui a un potentiel de radioactivité ;
- les analyses manquent de précisions portant par exemple sur le statut d'accréditation du laboratoire d'analyse, le nombre et la saison hydro-climatique à laquelle ces analyses ont été réalisées. En effet, ces informations auraient permis de donner plus de fiabilité aux résultats et légitimer leur utilisation en tant que données de référence pour les analyses qui seront réalisées pendant le suivi et la surveillance ;
- il aurait fallu procéder à l'analyse des 16 molécules de HAP qui sont réglementées au niveau international du fait de leur toxicité au lieu des HAP totaux qui ne précisent ni les noms des molécules ni leurs concentrations relatives;
- les analyses de qualité chimique de base auraient dû être faites également dans la colonne d'eau et dans les tissus d'organismes pour avoir une idée du comportement environnemental des éléments analysés, surtout de leur biodisponibilité ;
- il fallait également procéder en plus des analyses de qualité chimique, à celles de biomarqueurs d'effets généraux identiques à ceux de d'OSPAR sur des organismes benthiques. En effet, ces biomarqueurs considérés comme indicateurs d'effets précoces, sont des indicateurs de l'état de santé des écosystèmes car ils renseignent sur les effets combinés du mélange de tous les polluants, connus ou pas, dans les écosystèmes ainsi que de toute autre source de stress non identifiée et auquel les organismes sont soumis ;

- des indicateurs de populations benthiques de la zone d'influence du projet auraient pu être étudiés pour les références pendant le suivi et la surveillance ;
- le recours aux données écotoxicologiques (PNEC et CL₅₀, notamment) normalement établies pour des espèces vivant dans la Méditerranée et dans l'Atlantique nord, pour évaluer les impacts environnementaux de tous les produits chimiques qui seront utilisés dans ce projet remet fortement en cause les résultats. En effet, l'extrapolation de ces données sans en connaître les facteurs de variabilité, s'accompagne d'une grande incertitude sur les évaluations ainsi réalisées.
- les mesures de mitigations ne sont pas suffisantes sur le plan économique, car concernant les emplois générés, la communauté de pêche de Saint-Louis n'a pas de spécialité pour accéder à ces emplois ;

2.2 Questions

- Comme pour le forage, la fermeture ou le démantèlement de certains appareillages est-il fait progressivement ?
- Afin de ne pas négliger les puits de secours, quelles sont les dispositions prévues en cas de blow out (éruption de puits), pour minimiser les dégâts sur la biodiversité marine dont dépend la pêche ?
- Est-il prévu la mise en place d'un fond de garantie avant de démarrer la production afin de réparer les dégâts collatéraux en cas d'accident ou de déversement accidentel ?
- Quelles sont les mesures d'accompagnement sociales prévues envers les pêcheurs impactés au niveau de Saint-Louis dans l'adaptation et la continuité des activités de pêche ?
- Quelles sont les installations qui feront l'objet de démantèlement à la fermeture de l'exploitation ;
- Est-il prévu une évaluation à mi-parcours de l'exploitation pour s'assurer de l'efficacité de certaines mesures du PGES, particulièrement la gestion des déchets, le phénomène de l'érosion, l'impact sur le milieu, la pollution de l'eau ?

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- Saint-Louis est caractérisé par deux saisons de pêche bien distinctes, est-ce qu'il ne serait pas plus pertinent de caler certaines activités à risque (construction-installation) pendant la basse saison ou la mer est moins fréquentée ?
- Certains déchets qui ne peuvent pas être traités sont acheminés à terre et confiés à des sociétés agréées, lesquelles ?
- Le Gouvernement du Sénégal a un programme de réhabilitation de certains aéroports secondaires, notamment celui de Saint-Louis, par conséquent est-ce qu'il ne serait pas bien de l'intégrer dans l'étude ?
- Comment avez-vous procédé pour fixer la brise lames à 10km du trait de côte ?
- Comment les produits chimiques peuvent-ils affecter la qualité de l'eau sans pour autant affecter les composants biologiques ?
- Est-ce que les impacts sont négligeables sur les autres composantes (biologiques et sociales) (tableau 7.4-7.5 et 7.6 volume 2) ?
- Est-ce que le projet dispose de protocoles ou de conventions avec d'autres structures de traitement spécialisés pour éviter le stockage à long termes ?
- Quelle a été la durée des analyses de sédiments ? combien de fois par an ?
- Est-ce que le carénage des FPSO et navires sont prévus ? si oui où se fera-t-il ?

2.3 Recommandations

- ✓ Intégrer dans la correction du rapport les observations citées en constats ;
- ✓ Intégrer dans le rapport corrigé un tableau de prise en charge des observations avec des pages de renvoi ;
- ✓ fournir des informations précises en termes de délais et d'intégration dans le PGES des études complémentaires à réaliser ;
- ✓ Prévoir dans le PGES un mécanisme de gestion des griefs et conflits liés à l'activité ;
- ✓ Organiser des ateliers de partage et de validation des différents plans du PGES avec les administrations en charge du suivi (plans de suivi et de surveillance, un de renforcement des capacités, de gestion des déchets, d'intervention et d'urgence, de démantèlement et de remise en état des zones perturbées par le projet etc.) ;

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- ✓ Mettre en place un cadre institutionnel de suivi des paramètres clés du projet dans ces différentes phase et élaborer un plan de suivi externe pour les institutions nationales ;
- ✓ préciser clairement dans le rapport comment l'opérateur compte gérer les déchets liquides (eaux de production) associés avec le gaz naturel brut lors de la distillation atmosphérique.
- ✓ budgétiser les coûts des impacts et des mesures de suivi et d'accompagnement ;
- ✓ Harmoniser l'écriture de l'aire d'importance écologique ou biologique (page 347) ;
- ✓ Donner des informations précises sur les bases logistiques se trouvant au Port et à l'aéroport ;
- ✓ viser le décret no 89-1539 du 19 décembre 1989 réglementant la fabrication, l'importation, la conservation, le transport et l'emploi des substances explosives relatif au transport et stockage d'explosifs et inclure les explosifs dans l'EDD ;
- ✓ mettre à jour les informations relatives à l'Aéroport Internationale Blaise DIAGNE (AIBD) qui est aujourd'hui fonctionnel ;
- ✓ revoir le texte évoqué pour consacrer le CLPA ;
- ✓ faire la situation de référence des aquifères afin de suivre leur évolution durant toutes les phases du projet ;
- ✓ capitaliser dans le document le rapport d'enquête publique réalisé suite à la demande de la société KOSMOS ENERGY pour l'autorisation d'exploiter au titre des ICPE ;
- ✓ volume 1, chapitre 4, page 192, enlever locale dans « l'organisation administrative, territoriale et locale... » ;
- ✓ remplacer la loi N°96-06 du 22 mars 1996, portant Code des collectivités locales par la loi N°2013-10 du 28 décembre 2013 portant Code général des collectivités locales (CGCL Page 16) ;
- ✓ Enlever du rapport « conseil rural » qui n'existe plus ;
- ✓ mettre décret N°2008-1025 du 10 septembre fixant le ressort territorial et le chef-lieu des régions, départements et arrondissements ;
- ✓ faire une analyse du milieu en fonction de la brèche ;
- ✓ reconsidérer l'impact de l'érosion côtière ;

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- ✓ revoir la réglementation, inclure les articles pertinents du Code l'environnement sur la pollution des eaux, sur les installations, sur la gestion des déchets (dangereux, toxiques, radioactifs, biomédicaux, banals) ;
- ✓ faire le plan de surveillance, de suivi d'évolution de poissons du Benthos, des crustacés des mammifères marins, des tortues, des espèces menacées en danger listé dans la liste rouge de l'UICN ;
- ✓ dans le plan de gestion des polluants, substances chimiques, dangereux, toxiques, porter une attention particulière sur le sulfure d'hydrogène (H₂S) et éléments radioactifs
- ✓ revoir le rejet des eaux, le risque de présence d'éléments radioactifs dans les eaux saumures ;
- ✓ inclure des analyses de bio marqueurs d'effets généraux dans le plan de suivi ;
- ✓ inclure des analyses de la qualité d'eau des analyses des tissus des organismes benthiques ;
- ✓ inclure des indicateurs écologiques (abondance, richesse spécifique, DELTA, etc.) ;
- ✓ baser le choix des molécules chimiques sur CHARM/OSPAR ;
- ✓ intégrer dans le PGES la conservation des différentes espèces en situation critique de disparition ;
- ✓ préciser l'origine des matériaux des brise-lames et du sable (qualité) ;
- ✓ développer un programme de formation-recherche pour renforcer les connaissances sur la biodiversité marine (le MEDD en charge de la convention) ;
- ✓ construire l'expertise locale (universités et instituts de formation et de recherche) dans le court et le long terme ;
- ✓ la mise en place des essais de toxicité des produits chimiques pertinents utilisés par le projet sur ces bio-indicateurs afin de disposer de valeurs de PNEC et éventuellement de normes environnementales de rejet et de qualité environnementale de ces produits correspondants à nos écosystèmes.
- ✓ inclure des essais de toxicité des eaux de rejets et des déchets solides (boue de forage notamment) après traitements, analyses et avant rejet en mer comme le

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recommande la convention OSPAR et qui, par ailleurs, constitue une bonne pratique ;

- ✓ élaborer un plan de formation par BP à l'endroit du comité technique ;
- ✓ contribuer à la réalisation de l'Evaluation environnementale stratégique du secteur pétro-gazier et accompagner l'Etat dans la mise en œuvre du plan cadre de gestion environnementale et sociale du secteur ;
- ✓ mettre en place un cadre institutionnel de suivi des paramètres clés du projet dans ces différentes phases du projet et élaborer un plan de suivi externe pour les institutions nationales ;
- ✓ mettre en place un système d'alerte précoce pour la micro contamination en faisant suivre des indicateurs pertinents susceptible de toucher par la pollution des hydrocarbures. Cela permettrait de corriger les anomalies liées aux mauvaises pratiques au niveau de la gestion des déchets autour du champ d'exploitation des hydrocarbures ;
- ✓ impliquer les universitaires ayant un apport scientifique sur le sujet en vue d'accompagner la bonne gestion et des impacts des projets pétroliers.
- ✓ mettre en place avec l'Université Gaston Berger (UGB) de Saint Louis, une équipe de suivi de l'érosion côtière dans la zone d'impact de l'exploitation gazière ;
- ✓ proposer des mécanismes de suivi des processus de sélection des sous-traitants notamment dans l'élimination des déchets dangereux ;
- ✓ veiller à la transmission périodique des rapports de surveillance environnementale à la DEEC durant toutes les phases du projet ;
- ✓ rajouter dans la description la saisonnalité de l'activité et voir comment planifier certaines activités et les réaliser pendant la basse saison où il n'y a pas beaucoup de fréquentation ;
- ✓ Promouvoir une approche pouvant permettre une meilleure appropriation du projet par les acteurs à travers :
 - L'accompagnement social des acteurs susceptibles d'être impactés ;
 - La restauration des écosystèmes aquatiques qui fournissent les moyens d'existence aux communautés ;

- ✓ prendre en compte les inquiétudes et recommandations des acteurs de la pêche, la réussite de cette activité passe inéluctablement par une bonne prise en compte de leurs avis dans cette EIES ;
- ✓ proposer un plan de développement de l'aquaculture afin de compenser la réduction des prises de pêche maritime ;
- ✓ dans le cadre institutionnel, mettre la HASSMAR au niveau de la primature ;
- ✓ continuer la collaboration avec la HASSMAR dans le cadre de la mise en œuvre de plan national d'interventions en mer (PNIUM) ;
- ✓ renforcer les équipements de suivi pour les impacts au niveau « érosion côtière » ;
- ✓ innover par une gestion moderne des déchets et accompagner le secteur privé national et l'Etat à mettre en place des infrastructures adéquates ;
- ✓ pour le soutien logistique, privilégier les entreprises nationales pour impacter sur les retombés du projet (emploi, revenu, économie nationale) ;
- ✓ ajouter les textes sur la législation du travail et ses décrets d'application en plus du code de la marine marchande même si tout le personnel de BP ne sera pas des gens de mer ;
- ✓ investir dans la recherche pour mieux approfondir la connaissance scientifique du milieu récepteur du projet ;
- ✓ budgétiser tous les plans du rapport (Plan de renforcement de capacités, de suivi, etc.);
- ✓ revoir le PGES pour les besoins de suivi et de surveillance et prendre en compte la phase de fermeture et démantèlement ;
- ✓ décliner le plan de gestion des déchets dangereux, toxiques, solides et liquides, prenant en compte aussi les différents emballages ;
- ✓ revoir la matrice des impacts, tout ne peut pas être négligeable ou tolérable, l'information ne reflète pas la réalité, revoyez la littérature des recherches scientifiques qui sont en contradiction sur les affirmations notées plusieurs fois dans le rapport à ce niveau ;
- ✓ mettre l'accent sur les impacts : collision avec les pirogues avec le FLNG car les embarcations sont en bois et ne peuvent pas être repérées par le radar donc revoir les mesures de mitigation proposées ;

- ✓ faire ressortir en termes d'effets cumulatifs l'impact du projet sur ceux en cours dans la zone ;
- ✓ les dispositions applicables aux navires seront étendues au FLNG et au FPSO donc une formation des inspecteurs de la sécurité est nécessaire ;
- ✓ protéger et outiller les communautés de pêcheurs pour un développement durable de leur métier qui s'est tissé depuis plusieurs générations ;
- ✓ favoriser une meilleure approche dans la communication envers les communautés locales afin d'inverser la perception de ces dernières par rapport au projet ;
- ✓ informer sur le monitoring dans le PGES relativement à la surveillance de la dynamique sédimentaire liée à l'installation du brise-lames ;
- ✓ le PGES doit prendre en compte en compte la conservation des différentes espèces en situation critique de disparition ;
- ✓ prévoir des ateliers de partage et de validation des différents plans avec les

3. REPOSES

✦ Consultants

- Le projet n'a pas mis en place un PAR parce qu'il n'y aura aucun déplacement ;
- L'enquête publique pour ce projet a bien eu lieu et elle a été faite en amont ;
- Lors de la consultation, les experts sont allés sur le terrain pour recueillir des informations sur les lieux de pêches artisanales (communautés de pêcheurs, division régionale des pêches de Saint-Louis, etc.) ;
- Les activités de routine prévues dans le cours normal des opérations sont décrites au chapitre 2 du volume 1 ;
- La base logistique exacte n'était pas clairement définie au début de l'étude, aujourd'hui cette base est identifiée, il s'agit de celle que détient KOSMOS au Mole 1 du port autonome de Dakar ;
- Le nombre de puits pour la première phase est fixé à 12 et sera réparti dans les deux pays ;

- Il n'est pas prévu un éclairage permanent des puits, si ce n'est de façon ponctuelle ;
- Il y aura un dispositif de sécurisation des installations sur plusieurs niveaux (système de détection, radar, éclairage adapté) ;
- Il y aura également un plan de sécurité et de sûreté qui sera discuté avec les autorités compétentes ;
- La zone d'exclusion est établie sur un rayon de 500 à 600 m, ce qui fera au total 3,2 km² de part et d'autre de la frontière. Il sera de 1,6 km² ;
- Le vide juridique concerne plus le côté mauritanien ;
- Le point 4.7.7 décrit l'état de la navigation, l'évaluation des impacts ;
- Il a été analysé l'impact du projet sur le trafic maritime ;
- Le PGES une fois validé devient contractuel et le promoteur s'engage à respecter tout ce qui est contenu dans ce document ;
- Concernant les détails du PGES, il y a des sous-traitants, chaque sous-traitant aura un plan de gestion détaillé qui va faire l'inventaire et les modalités de gestion ;
- Le renforcement de capacité et les coûts associés au point 9.5 du volume 3 seront revus avec la DEEC ;
- Il n'y aura pas de déplacement de populations ni de reconversion de pêcheurs ;
- Les statistiques sur la pêche fournies dans le document datent de 2015 et ont été mises à la disposition du consultant par le chef service de pêche de Saint-Louis ;
- Les impacts du projet sur la pêche sont temporaires (cf. mesures 110-111) ;
- Dans la consultation publique, le brise-lames a fait l'objet de discussions et c'est ce qui a poussé à sa localisation à 10 km des côtes ;
- Le Cabinet a pris bonne note des observations relatives à la préservation de la biodiversité marine ;
- L'eau rejetée aura une température de 7°, elle n'aura pas de conséquences sur les juvéniles et les adultes qui vont migrer. Toutefois, les larves pourront être affectées. Cependant du fait de la superficie de la zone très large, l'impact va demeurer négligeable ;
- En phase installation, les marteaux batteurs utilisés pour enfoncer les pieux vont engendrer du bruit qui fera fuir les poissons. Il faut cependant noter que

cette activité ne durera que 3 mois. Par conséquent, l'impact sera relativement faible ;

- Les caractéristiques du brise-lames sont détaillées à l'annexe I.1 du volume 4 ;
 - L'objectif du brise-lames est de protéger le FLNG ;
 - L'emplacement du brise-lames est motivé par trois conditions : l'orientation en fonction des vagues, les caractéristiques des sols et la profondeur ;
 - Le plan des installations des bases logistiques est décrit en annexe O.1 du volume 5 ;
 - Il n'y a pas encore de plan de masse défini, seul des plans types ont été fournis ;
 - L'acétylène n'est présente que dans les navires de forage ;
 - Il y aura 12 bouteilles de gaz de 1,4 m³ et ils ont été prises en charge dans l'analyse préliminaire des risques ;
 - La cinétique a bien été prise en compte (annexe O.2) ;
 - Le risque initial, résiduel et final sont pris en compte dans l'annexe O.2 du volume 5 ;
 - Le plan d'identification des risques a été identifié (annexe O.2 nœud de papillon) ;
 - La fréquence d'une éruption de puits est d'une fois tous les 455ans ;
 - L'analyse de dangers des personnes sur les installations dépasse l'étude de danger ;
 - Les problèmes sanitaires sont identifiés dans l'annexe O.1.04 ;
 - En ce qui concerne la modélisation sur le déversement d'hydrocarbures, les modèles utilisés sont ceux développés dans les cinq dernières années ;
 - Il y a deux catégories de rejet d'effluents : les rejets généraux avec ½ douzaine de sources (sanitaire, eau domestique, lavage, ...) et les rejets spéciaux liées à des événements particuliers (eau produite par le FPSO, eau de refroidissement, ...) ;
 - Transport adéquat de déchets : tous les déchets sont classifiés et caractérisés.
- ✚ **BP**
- La référence relative au budget du programme de renforcement de capacités de la Banque Mondiale va être supprimée ;
 - BP a un programme d'assurance approprié pour la prise en charge ;
 - La stratégie de communication va intégrer les recommandations ;

- Lors de la consultation du public les pêcheurs étaient représentés ;
- L'impact du projet du port de N'DIAGO est pris en considération même si par ailleurs il n'y a pas beaucoup d'informations sur ce projet ;
- Le protocole d'Abidjan va être pris en charge ;
- Le rapport d'enquête publique sera intégré ;
- Le suivi sera distingué de la surveillance ;
- Pour chaque puit foré, il y aura un plan de puits de secours ;
- Absence d'étude de perception : l'enquête de perception n'est pas dans l'architecture de l'EIES, cependant l'enquête publique servira à cela ;
- BP s'engage à accompagner le secteur privé et l'Etat dans la mise en place d'infrastructures de traitement des déchets de forage ;
- Toutes les recommandations sont prises en compte et seront intégrées dans le rapport corrigé.

Conclusion

Au terme de ces deux journées d'examen et d'échange, **le Comité technique a décidé de pré-valider le rapport d'Etude d'impact environnemental et social du projet de production de Gaz GTA, sous réserve de l'intégration des observations et recommandations formulées au cours de la réunion.**

Ainsi, le président du comité technique a demandé aux consultants de corriger le rapport d'EIES sur la base de ce présent compte rendu. Un comité restreint sera mis en place à cet effet pour veiller à l'intégration des recommandations dans le rapport corrigé en vue de la poursuite de la procédure.

Le rapport corrigé devra être déposé en cinq (5) exemplaires, en plus de la version numérique.

En outre, il est demandé à BP, en relation avec ses consultants de se rapprocher du Gouverneur de la région de Saint-Louis ainsi que des collectivités locales concernées pour les besoins de l'organisation de l'audience publique.

Sur la base de ce présent compte rendu et de celui de l'audience publique, le rapport d'EIES devra être corrigé et déposé en dix (10) exemplaires en plus de la version

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numérique à la Direction de l'Environnement et des Etablissements Classés, pour la délivrance du certificat de conformité environnementale.

Suite à cette décision, le président a remercié l'ensemble des participants avant de lever la séance.

Les Rapporteurs

**Cheikhou DANSOKHO
Sanou DAKONO
Babacar SY**



**APPENDIX V-2: TRACKING TABLE OF
RESPONSES TO
OBSERVATIONS NOTED IN
THE OFFICIAL PROCEEDINGS
OF THE TECHNICAL
COMMITTEE PRE-VALIDATION
MEETING**

Table V-2-1. Tracking Table of Responses to Observations Noted in the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018.

Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
Findings		
1	<p>Uncertainties are identified in the report in terms of complementary studies to be carried out. Those pertain notably to the adequate nature of the construction materials for the artificial island complex, the coastal dynamic equilibrium, the accident risk assessment as part of the project design process, potential impacts related to pipeline installations, waste management, the relevance of coastal protection measures (breakwater) and the absence of a diachronic study on the evolution of the river mouth, etc.;</p>	<p>A set of additions were made to the revised ESIA to clarify the uncertainties identified in terms of additional studies to be carried out, including: 1) the suitability of breakwater construction materials; 2) coastal dynamic equilibrium; 3) accident risk assessment as part of the project design process; 4) potential impacts related to the installation of pipelines; 5) waste management; 6) the relevance of coastal protection measures; and 7) the lack of a diachronic study of the river mouth evolution.</p> <p>1. Suitability of breakwater construction materials</p> <p>Details on the breakwater construction materials have been added to Sections 2.2.3 and 2.7 to reflect the engineering information of the construction contractor now available.</p> <p>In Section 2.2.3, the following footnote was added (p. 2-15):</p> <p>"With the advancement of project engineering, the sources of supply of breakwater construction materials have become more defined. As of September 2018, it is expected that the caissons will be manufactured within the Dakar port and that this will be the subject of a separate ESIA. Sand, with appropriate geotechnical characteristics, will be used as ballast material of the caissons. This sand will be extracted in Mauritania, probably from an offshore source, which guarantees, de facto, its suitability to the marine aquatic environment. Potential sources of sand extraction are currently being analyzed by the contractor responsible for the construction of the breakwater. Rocks will be required for the foundation of the breakwater. These rocks will come from a quarry in Mauritania and this will be the subject of an environmental and social impact assessment."</p> <p>In Section 2.7, the following clarification has been added regarding the rocks that will be used for the construction of the breakwater (p. 2-26):</p> <p>"Geological and geotechnical literature studies were conducted to identify an appropriate quarry taking into account environmental requirements. The nature of the rocks will be confirmed by an analysis</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>of their mineralogy. According to the results of this mineralogy, an analysis of the rock reactivity in the water will be conducted. This will confirm the suitability of the rocks for their intended use. "</p> <p>2. Coastal dynamic equilibrium</p> <p>The M40 mitigation measure, specifically related to the coastal equilibrium, was reformulated as follows in the revised ESIA:</p> <p>M40: "a) To improve understanding of the long-term coastal dynamic equilibrium, the project will develop and implement a coastline monitoring plan during the project life cycle. Coastline monitoring will commence prior to breakwater construction, i.e. before 2020. This will include the collection of further bathymetric data along the Saint-Louis shore, including the Senegal River mouth. The project will aim to involve local academics in the implementation of the coastline monitoring plan. The relevant authorities and local communities will be informed of the monitoring results.</p> <p>b) The data collected as part of the implementation of the coastline monitoring plan will be used to update the coastline modeling (in Appendix I-3) to be completed before the construction of the breakwater in 2020. Additional modeling updates will be conducted at key stages of the project life cycle when new information with the potential to have a significant impact on the modeling results will become available.</p> <p>c) BP will seek the necessary authorizations to share relevant data for government led morphological studies initiatives and local academics.</p> <p>d) a contingency plan for the coastline will be developed by the project in consultation with the relevant authorities if the results of the coastline monitoring and modeling clearly and systematically demonstrate, over the duration of the project, negative impacts related to the GTA Phase 1 project which exceeds those currently identified in the GTA Phase 1 project ESIA report (in particular Section 7.3.3)".</p> <p>The reformulation of the M40 measure has been done wherever this measure is mentioned in the ESIA report, for example in Table 7-72 in Section 7.3.3.4, p. 7-196.</p>

Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>3. Accident risk assessment as part of the project design process</p> <p>We understand that the observation made about uncertainty in the accident risk assessment studies as part of the project design process refers to BP's ongoing process during project engineering. These are BP's internal studies that are conducted outside of the scope of the ESIA.</p> <p>4. Potential impacts related to the installation of pipelines</p> <p>Pipeline impacts were assessed for each phase of the project. The installation of the pipelines will be done during the Construction Phase. Therefore, the potential impacts of this installation are addressed in Section 7.2 of Chapter 7. The physical presence of equipment in the Pipeline Zone, including the pipelines themselves, has been systematically analyzed as a potential source of impact on a set of resources of the biophysical and social environments. See, for example:</p> <ul style="list-style-type: none"> ▪ Potential Impacts of pipeline laying on sediment quality in Section 7.2.4.2.3 (p. 7-39); ▪ Potential Impacts of pipeline installation on benthic communities in Section 7.2.5.2.3 (p. 7-52 and 7-53); and ▪ Potential impacts of pipeline footprint on seabed occupation and use in Section 7.2.13.2.3 (p.7-123). <p>5. Waste management</p> <p>A preliminary waste management plan has been developed and added to the revised ESIA. It constitutes the new Appendix S of the revised ESIA.</p> <p>6. Relevance of coastal protection measures</p> <p>The coastline monitoring is a critical precursor for the validation of the modeling of project impact on the coastline. Work done to date has predicted that the project's impacts on the coastline will be low. It is only when the results of the monitoring after breakwater construction will become available, will the need to identify additional mitigation measures be considered if the impacts on the coastline are significantly different or greater than those predicted by the project</p>

Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>development. Coastline monitoring will provide crucial evidence for decision making with regards to the planning for possible additional measures.</p> <p>It is also essential that the potential impacts on the coastline from other projects than the GTA Phase 1 project be identified and understood, before defining additional potential mitigation measures, which, to be effective, should be integrated with third party development plans.</p> <p>Commitments made through mitigation measures M40 and M41 were defined with this approach in mind, first targeting knowledge sharing and understanding of the existing natural process of coastal erosion and supporting the Municipal Development Agency's project concerning the two-year modeling of the Senegal River and coastal dynamics.</p> <p>7. Lack of a diachronic study of the river mouth evolution</p> <p>As reported in Section 4 of the CH2M report presented in Appendix I-2 (p. 24-29), an historical analysis of the coastline change was carried out using digitized satellite imagery from 2002 to 2016 and the Digital Shoreline Analysis System (DSASv4.4). This considered shoreline change along the Langue de Barbarie, including the area of the breach where estimates of transport rate were made based on the breach accretion and erosion rates.</p> <p>The CH2M report in Appendix I-2 (p. 51) includes consideration of other studies of the breach evolution including:</p> <ul style="list-style-type: none"> ▪ AIDioma B., I. A. Bilbao, A. Abou, I. S. Perez and S. R. Valido (2013). Résultats du suivi 2010-2012 de l'évolution de la brèche ouverte sur la Langue de Barbarie au Sénégal et de ses conséquences. <i>Physio-Géo Géographie physique et environnement</i>, Volume 7. ▪ Sadio M., E. J. Anthony, A. T. Diaw, P. Dussouillez, J. T. Fleury, A. Kane, R. Almar and E. Kestenare (2017). Shoreline Changes on the Wave-Influenced Senegal River Delta, West Africa: The Roles of Natural Processes and Human Interventions. <i>Water</i>, 9, 357.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>In addition, the ESIA makes a commitment through measures M40 and MON9 to continue in the future the monitoring of the coastline, including the area of the breach and to using this to verify the predicted morphological changes to the coastline (see point 6 above on that matter).</p>
2	<p>Pursuant to the modelling, the rate of erosion considered (1.05 m/year) seems to be under-evaluated, even if the breakwater is helping to rebuild a considerable stretch of beach, its impact downstream will be more significant than what is indicated;</p>	<p>Unless we are mistaken, the results of the modeling do not mention an erosion of 1.05 m/year.</p> <p>It should be noted that predictions of shoreline change (e.g. Figure 6.5 in Appendix I-3, p. 36) are presented relative to the shoreline change without the project (breakwater) rather than as absolute predictions of shoreline change.</p> <p>As noted in text below Figure 6.5, the natural rate of erosion on some sections of the coastline can reach 5 m per year (which could be 50 m if it continued for 10 years), whereas the impact of the breakwater is to increase natural erosion rates in some areas by about 0.6 m per year (or 6 m over a 10 year period).</p> <p>The data analysis and coastline modelling work were carried out by expert modellers from CH2M/Jacobs including:</p> <ul style="list-style-type: none"> ▪ Dr Hakeem Johnson (Ph.D.) who has over 25 years of experience in the civil engineering industry, gained in mathematical modelling to support a wide range of coastal and port engineering projects. He has extensive experience in various aspects of coastal modelling to deliver better understanding of coastal conditions that feeds directly into engineering design – from option appraisal to detailed design. He has more than 15 years of experience in senior specialist positions as modelling expert, specialist advisor and team leader for coastal engineering studies within the UK and worldwide. ▪ Dr Karim Rakha (Ph.D.) has over 22 years of experience in the fields of coastal and hydraulic engineering with emphasis on numerical modelling of coastal hydrodynamics and beach morphology. After completing his Ph.D. in Canada, Dr. Rakha worked at the International Research Centre for Computational Hydrodynamics ICCH, at the Danish Hydraulic Institute DHI for three years. At the ICCH he worked on improving the sediment

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		<p>transport models developed by DHI. Dr. Rakha has worked for the Engineering Company for Marine Affairs ECMA in Egypt as a senior coastal engineer during which he participated in many consultancy projects including design of coastal structures, bathymetric surveys, design of artificial lagoons, modelling of waves and currents in the nearshore area and environmental impact assessments.</p> <p>The data analysis and modelling were subject to a detailed technical review by experts from the Scientific Research Association, HR Wallingford. The review staff included:</p> <ul style="list-style-type: none"> ▪ Dr James Sutherland (Ph.D., M.Inst.P., C.Phys.) is a Technical Director in the Coasts and Oceans Group, who is also business development lead for the coastal management and development sector. He has 25 years' experience of working and publishing on nearshore hydrodynamics, sediment transport, scour around coastal structures, coastal erosion and beach management. He has worked on projects in over 20 countries in Europe, the Middle East, Asia-Pacific, Africa and the Americas. ▪ Iain Gunn, (Meng, Hons, MICE) is also a Technical Director. M. Gunn has a strong technical background in marine works, including 22 years' experience in the planning and execution of multidisciplinary engineering studies for marine facilities. Project involvement ranges from site selection and feasibility to FEED, detailed design, construction and expert witness. Specialist project experience includes marine import/export facilities, site selection, definition of environmental design criteria, navigation risk assessment, environmental risks and management measures, intakes and outfalls and asset protection.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
3	<p>The Environmental and Social Management Plan (ESMP) is incomplete and non-operational. In addition to the impact mitigation measures, this plan should comprise a surveillance and monitoring plan, a capacity-building plan, a waste management plan, an emergency response plan and a decommissioning and remediation plan for areas disturbed by the project;</p>	<p>The ESMP has been enhanced in the revised ESIA. In addition to mitigation measures to reduce negative impacts, the ESMP is completed by:</p> <ul style="list-style-type: none"> ▪ a revised preliminary plan for capacity building (Section 9.5 of Chapter 9); ▪ a revised surveillance and monitoring plan (Chapter 10); ▪ a preliminary waste management plan (the new Appendix S); ▪ a preliminary decommissioning plan covering the decommissioning and rehabilitation of the project areas (the new Appendix T); and ▪ a monitoring plan for the authorities (the new Appendix U). <p>The various contingency plans to be implemented in the event of an emergency (for example, the Shipboard Oil Pollution Emergency Plan [SOPEP], the Source Control Emergency Response Plan [SCERP], etc.) cannot be finalized at this stage since infrastructure engineering is not yet complete. They will be finalized by BP prior to the beginning of activities concerned by these plans, for example before the mobilization of concerned vessels for the SOPEP and before commencing the development wells drilling activities for the SCERP, and provided to the relevant authorities.</p>
4	<p>The absence of clear information (sources of verification, indicators, etc.) on the implementation mechanism for the ESMP;</p>	<p>Information on the ESMP implementation mechanism is provided in the ESIA. Measures, objectively verifiable indicators, sources for verification, frequency of verification and others are shown in Tables 9-1 (p. 9-9 to 9-34), 9-2 (p. 9-35 to 9-66) 9-3 (p. 9-67 to 9-79) and 9-4 (p. 9-80 to 9-105) of Chapter 9.</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
5	<p>The limitations of the coastline evolution model. The model used is not able to predict changes that will be experienced by the coastline and seems to have considered only “normal” environmental conditions. The breach south of Saint-Louis and the impact of the construction of the Port of Ndiago are passed over; This port, similar to Nouakchott’s “Port de l’Amitié”, could have an impact on sediment transit and skew the accretion (deposit) forecasts presented in the ESIA over approximately 8 km in the area opposite the breakwater;</p>	<p>At this stage there is little/no publicly available information on the design of the future port at N’Diago, beyond the artists impression of the naval and fishing ports which have been erected at the site. The port is partly intended for military use and therefore design is confidential and construction is led by the Ministry of Defense in Mauritania.</p> <p>The ESIA consultant is therefore not in a position, at this stage, to model the impacts of this N’Diago port project. If design and construction methodologies were to become available, BP could work with the relevant parties including both countries’ government to consider the potential cumulative impact of the port project and GTA’s own project.</p> <p>However, an addition was made to Chapter 10 of the revised ESIA (p. 10-6) to make the following clarification:</p> <p>“It is to be noted that the currently proposed beach profile monitoring (included in the coastline monitoring plan) covers the Mauritania and Senegal coastline from North of N’Diago (latitude 1,800,000 - WGS84/UTM 28N) to South of the breach (latitude 1,756,200 - WGS84/UTM 28N).”</p> <p>These monitoring activities will help to assess the potential impacts of GTA Phase 1 project development and other third-party projects in the area covered by the beach profile monitoring.</p>
6	<p>In its identification and analysis of potential impacts, the consultant seems to minimize many impacts. For example, such is the case for the impact of production water on ecosystems. Polycyclic aromatic hydrocarbon (PAH) content in production water from gas fields is on average higher (up to 11 times) than the PAH content in production water from oil fields; these PAHs are carcinogenic and persistent over time and can accumulate in the food chain; This is also the case for well blowouts, which are considered to be remote occurrences in the impact analysis, whereas the accidentology suggests the contrary (Page 8.27, Paragraphs 1 and 2, Risk Study report);</p>	<p>This observation focuses on three topics: 1) the impact assessment methodology; 2) PAHs in produced water; 3) the probability of well blowouts.</p> <p>1. Impact Assessment Methodology</p> <p>The impact analysis is based on a standard and rigorous method. It takes into account the impact consequence and impact likelihood to determine its overall significance. The determination of the impact consequence is based on the integration of three criteria: the intensity, the extent and the duration of the impact. The determination of intensity corresponds to the degree of disturbance associated with each of the impacts: low, moderate or high. The extent of an impact refers to the area in which the impact could occur: immediate vicinity, local, or regional extent. The duration of an impact describes the</p>

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		<p>period during which its effects could continue: short term or long term. The probability of an impact is the possibility that it will occur. The various probability categories have been classified as follows: frequent (> 50% to 100%, or may occur a few times a year), occasional (> 10% to 50%, or may occur a few times during the life of the project) , rare (> 1% to 10%, or may occur once during the life of the project), or extremely rare (<1% or unlikely to occur during the life of the project). This method is explained in detail in Section 7.1 (p. 7-1 to 7-20).</p> <p>2. PAH in Produced Water</p> <p>An addition has been made to Section 7.3.2.2.3 of Chapter 7 of the revised ESIA to clarify the following with respect to PAHs in produced water:</p> <p>"Regarding the presence of PAHs in produced water, gas production fields are widely known to have a higher content of low molecular weight aromatic hydrocarbons, such as BTEX in produced water, than water from oil production platforms. BTEX compounds were included in the produced water modeling performed as part of the GTA-Phase 1 ESIA.</p> <p>PAH values, like any naturally occurring substances, can vary significantly from field to field. Studies have been published comparing PAH concentrations from a number of North Sea Oil and Gas platforms (Cofino et al., 1993¹ and Røe, 1999²). The results show comparable median concentrations for the majority of PAHs compared. International Association of Oil and Gas Producers (IOGP) Report No 1.20/324 <i>Aromatics in produced water; occurrence fate and effects and treatments</i>, 2002 also compared PAH concentrations for oil and gas installations and did not observe significant differences in PAH concentrations within the same regions.</p> <p>The GTA Phase 1 produced water modelling was completed based on current understanding of the condensed water quality. This understanding is achieved through assessing various tests of</p>

¹ Cofino, W.P., Slager, L.K. and van Hattum, B., 1993. Environmental Aspects of Produced Water Discharges From Oil and Gas Production on The Dutch Continental Shelf. Part 1: Overview of Surveys on the Composition of Produced Waters Conducted on The Dutch Continental Shelf. NOGEP, The Hague. ISBN 90-5383-218-1, 46pp.

² Røe, T.I., 1999. Chemical Characterisation of Produced Water from Four Offshore Oil Production Platforms in the North Sea. Chemosphere, 39:15. pp. 2593-2606.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>reservoir fluids completed during the appraisal drilling campaign and subsequent process modelling. This is the normal approach for oil and gas projects during this engineering design phase where operations have not started and therefore produced water is not available yet. The current understanding is that PAHs would be present at insignificant concentrations compared to other contaminants, such as BTEX."(p. 7-184).</p> <p>The GTA Phase 1 project has however committed through MON8 measure, notably in Table 10-1 of Chapter 10 (p. 10-5), to update the produced water modelling once analytical results from treated produced water samples are indeed available within 18 months of operations. PAHs compounds will form part of the produced water analysis to be completed by an accredited laboratory. This produced water environmental risk assessment will also be updated throughout the project life cycle if there is a material change in effluent composition including from PAHs or volume.</p> <p>3. Likelihood of well blowouts.</p> <p>Concerning the likelihood of well blowouts: the same likelihood of accident was used for both the impact analysis (Chapter 7) and the Risk Study (Chapter 8). The eruption of wells is an extremely rare event. The frequency of occurrence of a well blowout is 1 time per 455 years (p. 7-418).</p>
7	<p>In the analysis and identification of impacts, the problem related to chemical and physical modifications to the water column caused by losses when raising materials and discharging waste during the installation, operation and abandonment phases was not sufficiently covered in the document;</p>	<p>The impacts of accidental loss of solid waste on water quality as well as changes in water quality due to discharges of treatment chemicals as well as general vessel discharges and sediment disturbance are assessed for all areas of the project and all phases of the project. These topics are addressed in sections of the report dedicated to the impacts of project activities on water quality. See Section 7.2.2 (p. 7-26 to 7-33) for impacts on water quality during the Construction Phase, Section 7.3.2 (p. 7-181 to 7-189) for those during the Operations Phase and Section 7.4.2 (p. 7-308 to 7-313) for those during the Decommissioning Phase.</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
8	<p>The pipeline area, otherwise known as the pre-processing area, is not properly addressed by the consultant. It should be noted that this zone is located 40 km from the coast and is approximately 120 m deep. It is assumed to be a convergence zone for the upward movement of deep, cold waters known as upwelling. In the absence of controlled management of this waste, marine wildlife, particularly fishery resources, may be severely affected;</p>	<p>The pre-treatment unit, the FPSO, is actually located in the Pipeline Area. The Pipeline Area is a narrow corridor connecting offshore infrastructures to nearshore infrastructures. The FPSO will be located in this corridor, approximately 40 km from the coast.</p> <p>The potential impacts of the project in the Pipeline Area are systematically addressed in Chapter 7 (Identification and Impact Analysis) for each phase of the project (construction, operations and decommissioning), in each of the project areas (Offshore Area, Pipeline Area, Nearshore Hub/Terminal Area and the Onshore Support Operations Area) and for each resource of the environment (water quality, benthic communities, plankton, fish and other fishery resources, marine flora, marine mammals , etc.).</p> <p>For example, for the Construction Phase, Section 7.2.6 deals with impacts on plankton, fish and other fishery resources. The first subsection, Subsection 7.2.6.1 (p. 7-58), identifies the factors causing the impacts in each of the four project areas, including the Pipeline Area. In this case, solid waste was selected as one of the sources of impact in the Pipeline Area. The following subsection, Subsection 7.2.6.2, systematically describes the impacts in each of the Areas, including the Pipeline Area in 7.2.6.2.3 (p. 7-61 and 7-62).</p> <p>See also the following other examples:</p> <ul style="list-style-type: none"> ▪ Sections 7.2.2.1 (p. 7-26) and 7.2.2.2.3 (p. 7-29 and 7-30) for impacts on water quality during the Construction Phase ▪ Sections 7.2.5.1 (p. 7-43) and 7.2.5.2.3 (p. 7-52 and 7-53) for impacts on benthic communities during the Construction Phase ▪ Sections 7.3.6.1 (p. 7-207) and 7.3.6.2.3 (p. 7-210 and 7-211) for impacts on plankton, fish and other fishery resources during the Operations Phase <p>The structure of Chapter 7 follows the same pattern for all sections. Thus, the identification and description of impacts in the Pipeline Area are systematically covered.</p>

<p>9</p>	<p>The threats faced by the fishing stakeholders in Saint-Louis have not been thoroughly analyzed. The study significantly minimized the negative impact that the project may have on the aforementioned sector.</p>	<p>Threats to fishing stakeholders in Saint-Louis have been carefully described in the project's baseline description in Chapter 4:</p> <ul style="list-style-type: none"> ▪ Section 4.7.6.3 provides a description of artisanal fishing activities in Senegal, particularly in Saint-Louis (p. 4-191 to 4-198). ▪ Section 4.7.6.4 provides a description of other actors in the artisanal fisheries sector, particularly in Saint-Louis (p. 4-199 and 4-200). ▪ Section 4.7.15 provides a description of the political and social climate in communities. It describes in particular the specific difficulties faced by fishermen in Saint-Louis: 1) the termination of fishing agreement between Mauritania and Senegal and the loss of access to fishery resources and associated revenues from fishing in Mauritanian waters in 2017; 2) the breach of the Langue de Barbarie and associated marine safety issues that this poses for fishermen; and 3) the unresolved problem of coastal erosion on the Langue de Barbarie and the associated hazards and risks that homes might be lost (p. 4-219 and 4-220). <p>In addition, the potential impacts of the project on artisanal fisheries and fishing communities, particularly those of Saint-Louis, were systematically analyzed for each phase of the project as well as in the event of an accident. See the sections below.</p> <p>For activities of the Construction Phase:</p> <ul style="list-style-type: none"> ▪ Section 7.2.16: Impacts on artisanal fisheries and related activities, particularly in Saint-Louis (p. 7-136 to 7-143). ▪ Section 7.2.20: Impacts on community livelihoods including Saint-Louis (p. 7-154 to 7-157). ▪ Section 7.2.26: Impacts on the social climate, taking into account the difficulties already encountered by fishermen in Saint-Louis (p. 7-172 to 7-176). <p>For activities of the Operations Phase:</p> <ul style="list-style-type: none"> ▪ Section 7.3.16: Impacts on artisanal fisheries and related activities, particularly in Saint-Louis (p. 7-268 to 7-273). ▪ Section 7.3.20: Impacts on community livelihoods including Saint-Louis (p. 7-283 to 7-285). ▪ Section 7.3.26: Impacts on the social climate, taking into account the difficulties already encountered by fishermen in Saint-Louis (p. 7-300 to 7-304).
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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>For activities of the Decommissioning Phase:</p> <ul style="list-style-type: none"> ▪ Section 7.4.16: Impacts on artisanal fisheries and related activities, particularly in Saint-Louis (p. 7-383 to 7-387). ▪ Section 7.4.20: Impacts on community livelihoods including Saint-Louis (p. 7-396 to 7-398). ▪ Section 7.4.26: Impacts on the social climate, particularly in Saint-Louis fishing communities (p. 7-411 to 7-415). <p>In case of accidental events:</p> <ul style="list-style-type: none"> ▪ Section 7.5.16: Impacts on artisanal fisheries and related activities, particularly in Saint-Louis (p. 7-572 to 7-579). ▪ Section 7.5.20: Impacts on community livelihoods, including Saint-Louis (p. 7-585 to 7-589). ▪ Section 7.5.26: Impacts on the social climate, particularly in the Saint-Louis fishing communities (p. 7-601 to 7-604). <p>The impacts assessment on fishing stakeholders in Saint-Louis was done according to a standard and rigorous methodology, as explained in response to Observation No 6 in this table. A total of 23 different Design & Operation Controls measures and 26 different mitigation measures are recommended in the ESIA to mitigate the impacts on fisheries stakeholders including those in Saint-Louis (see sections referred to above).</p>
10	The project's impact on tourism has not been sufficiently analyzed, yet this sector is an important provider of resources and jobs in Saint-Louis;	<p>Tourism is indeed an important economic sector for Saint-Louis. Section 4.7.7.2 of Chapter 4 makes reference to tourism in Saint-Louis and the surrounding area, using data from the Regional Tourism Service (p. 4-202).</p> <p>Impacts on tourism were systematically addressed in Chapter 7 for all phases of the project as well as in the event of an accident. Tourism was included in the "Other Coastal and Sea-Based Activities" component. See the sections below.</p> <ul style="list-style-type: none"> ▪ Section 7.2.17: Impacts of Construction Phase Activities on Other Coastal and Sea-Based Activities including tourism (p. 7-143 to 7-147).

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ Section 7.3.17: Impacts of Operations Phase Activities on Other Coastal and Sea-Based Activities including tourism (p. 7-273 to 7-277). ▪ Section 7.4.17: Impacts of Decommissioning Phase Activities on Other Coastal and Sea-Based Activities including tourism (p. 7-387 to 7-390). ▪ Section 7.5.17: Impacts of Accidental Events on Other Coastal and Sea-Based Activities including tourism (p. 7-580 to 7-584).
11	<p>The importance of fishing, the cramped fishing zones off Saint-Louis, the density of the pirogue fleet and the strong dependence on Mauritanian waters is a reality that must be properly addressed for a number of reasons such as the absence of an agreement between the two countries for two years, the difficulty of sharing gas without collaborating on fishery-related issues and the closing of Mauritanian waters to the community of Saint-Louis, which can be a source of discontent);</p>	<p>The importance of fishing for Senegal in general and for Saint-Louis in particular, the density of the pirogue park in Saint-Louis, the small fishing areas of Saint-Louis for fishermen who are used to fishing in Mauritanian waters, the absence of a fishing agreement between Mauritania and Senegal until recently, and the resulting dissatisfaction of the Saint-Louis fishermen are findings shared by the ESIA experts. These topics are discussed in detail in Chapter 4 in the sections below.</p> <ul style="list-style-type: none"> ▪ Section 4.7.5.2: Primary Economic Activities and Means of Subsistence of Communities (p. 4-186 to 4-189). ▪ Section 4.7.6.3: Artisanal Fishing (p. 4-191 to 4-198). ▪ Section 4.7.15: Political and Social Climate (p. 4-219 and 4-220). <p>Additional information on these topics is also provided in the following appendices:</p> <ul style="list-style-type: none"> ▪ Appendix E-2: Report on Fisheries Resources and Fisheries in the Senegalese Portion of the Core Study Area of the Project (p. 35 to 58 in the Appendix). ▪ Appendix E-4: Report on Fishing Communities in the Senegalese Portion of the Core Study Area of the Project (p. 2 to 29 in the Appendix).
12	<p>The issue of fishing gear is not addressed, despite the fact that the latter can be deployed over a distance of approximately 2 km, which creates issues with respect to ships and installations;</p>	<p>The different types of fishing gear used in Senegal and Mauritania, particularly those of the artisanal fishery, are presented in Section 4.5.4.2 of Chapter 4. The length of the nets deployed is given (p. 4-81). These data, reviewed by fishing and fishery resources experts in Mauritania and Senegal, indicate that fishing gear generally has the following lengths: purse seine nets are 300 to 400 m long, gill nets</p>

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		<p>have a length between 300 and 500 m, and handlines have a length of 100 to 200 m.</p> <p>In Chapter 7, adjustments were made to the text to recall the length of nets and thus better characterize the potential impact of movements of project vessels on artisanal fishing gear. See the following sections.</p> <ul style="list-style-type: none"> ▪ Section 7.2.16.2.2: Additionally, project vessels movements could interact with artisanal fishermen nets. Due to the large number of fishing nets deployed in coastal waters offshore Saint-Louis and the length of the nets (up to 500 m), the fishing nets could be difficult to avoid for project vessels coming in/out of the Nearshore Hub/Terminal Area. There is a risk for project vessels to cross over fishing nets and buoys and, in some cases, damaging them. This would entail fishing gear losses for artisanal fishermen. (p. 7-138) ▪ Section 7.3.16.2.2: Additionally, project vessel movements could interact with artisanal fishing gear. This is the case for project vessels entering or leaving the safety exclusion zone around the breakwater. Due to the large number of fishing nets deployed in coastal waters off Saint-Louis and the length of the nets (up to 500 m), fishing nets could be difficult to avoid for project vessels. There is a risk for project vessels to cross over fishing nets and buoys and, in some cases, damage them. This would entail fishing losses for artisanal fishermen. (p. 7-269) ▪ Section 7.4.16.2.2: Up to 13 project vessels will be coming in/out of the exclusion safety zone around the breakwater; they could cross over fishing nets (which can be up to 500 m in length) and buoys and in some cases, damage them. (p. 7-384) <p>That said, the potential loss of artisanal fishing gear (nets and buoys) due to movements of project vessels in artisanal fishing areas had already been identified as a potential project impact, particularly in the Construction and Operations Phases (IMP29). Several mitigation measures are planned to avoid or reduce this impact.</p>

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13	The communication plan does not take into account the cultural and sociological dimension of the Guet-Ndar community;	<p>It is understood that this comment refers to the communication plan implemented during the ESIA consultation process. In this respect, the cultural and sociological dimension of the Guet-Ndar community has been taken into account. Indeed, the consultation meetings were organized by Tropica in close collaboration with representatives of Guet-Ndar to ensure that the format, time and location of these meetings were suitable for as many community members as possible, given their cultural and sociological realities.</p> <p>The methodology adopted and the information activities organized before the public assemblies in Guet-Ndar and other fishing communities are specified in Section 6.2 of Chapter 6 (p. 6-3 and 6-4).</p>
14	The absence of a training and capacity-building plan for local stakeholders; detailed and budgeted;	<p>The revised ESIA includes additions to better cover capacity building.</p> <p>The capacity building plan for the institutions involved in the implementation of the ESMP has been reviewed. It is located in Section 9.5 of Chapter 9 and contains a budget (p. 9-110).</p> <p>Beyond the ESMP, capacity building is also covered in a section added to Chapter 2. The new Section 2.14, entitled "Social Investment", specifies the five areas of priority for social investment. One of these is capacity building in partnership with local authorities (p. 2-72 to 2-75).</p> <p>Finally, the revised ESIA also highlights support for capacity building of Mauritania and Senegal with respect to oil and gas. It specifies in particular that for Senegal:</p> <p>"[...] BP and partner Kosmos recently announced a multi-million-dollar commitment to support Senegal's national oil and gas institute (INPG). The aim is to utilize the INPG for industry related capacity building, including with the Technical Committee"(Section 2.14, p. 2-75).</p>

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15	<p>The project is not a major source of employment: 25 people during the construction phase and between 20 and 40 for the operation phase, which is very insufficient compared to the expectations of the populations; conversely, the fishing sector generates over 65 0000 [SIC] jobs;</p>	<p>Offshore oil and gas activities are not major job providers, and this is typical to this sector. A sentence was added to Section 2.13.2 of Chapter 2 to recall this fact.</p> <p>“Generally speaking and across the world, offshore oil and gas projects do not generate a lot of employment and the employment generated are high skilled. This is due to the high level of automatization required due to the remoteness of operations and limited space available offshore. BP, as operator of the project, has set practices around people and procurement management, which is applicable to Mauritania and Senegal. Recruitment will follow BP diversity and inclusion principles to target diverse candidates for example female, and personnel from different background.” (p. 2-70). The personnel and local content approach for the GTA Phase 1 project is described in Chapter 2, Section 2.13 (p. 2-68 to 2-71).</p> <p>That said, the number of direct jobs in Mauritania and Senegal planned for the GTA Phase 1 project is over 25 during the Construction Phase and between 20 and 40 during the Operations Phase since these numbers only concern jobs at the onshore supply bases.</p> <p>Estimates of the number of direct jobs in Mauritania and Senegal are specified in Chapter 7.</p> <ul style="list-style-type: none"> ▪ For the Construction Phase (Section 7.2.18.3): 1) up to 25 people in onshore supply bases; 2) up to 30 people on support vessels; and 3) up to 20 people in N'Diago and Saint-Louis as local Fishery Liaison Officers or Community Liaison Officers (p. 7-151 and 7-152). ▪ For the Operations Phase (Section 7.3.18.3): 1) between 20 and 40 people in onshore supply bases; 2) up to 400 people gradually replacing expatriate workers on offshore installations (p. 7-279 and 7-281). ▪ For the Decommissioning Phase (Section 7.4.18.3): 1) between 20-40 people in onshore supply bases; 2) an additional number of people from Mauritania and/or Senegal on the vessels (p. 7-392 to 7-394).

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		<p>A clarification was added to Section 7.3.18.3 to indicate that "In addition, local Fisheries Liaison Officers or Community Liaison Officers will also be required in N'Diogo and Saint-Louis during the Operations Phase. These employment opportunities, split between the two countries, will result in a positive impact. (p. 7-280).</p> <p>This clarification has also been added to Table 7-106. The impact has been rephrased as follows: "Employment opportunities for 20-40 people in Dakar and/or Nouakchott during 20 years, as well as progressively for 400 nationals people on offshore facilities for 20 years, and local Fisheries Liaison Officers or Community Liaison Officers will also be required in N'Diogo and Saint-Louis. " (p. 7-281)</p>
16	The BP CSR policy is not clearly defined; it simply consists of declarations of intent;	<p>The principles governing BP's social responsibility policy are defined in Section 3.8.2 of Chapter 3 of the ESIA (p. 3-27). These general principles are supplemented in Section 2.14 of Chapter 2 (p. 2-72 to 2-75). In fact, this section provides information on BP's five areas of priority for social investment. This section also provides a detailed list of the social investment projects approved by the partners of the GTA Phase 1 project for the year 2018 in Mauritania and Senegal (p. 2-73 to 2-75). In Senegal, the projects approved for 2018 are as follows:</p> <p>Community Health:</p> <ul style="list-style-type: none"> ▪ Provision of ambulance for Guet Ndar health centre; ▪ Rehabilitation and provision of equipment to the health posts in Langue de Barbarie; ▪ Support the access to universal governmental health coverage program for the poorest population in Langue de Barbarie; ▪ Training of health care providers (nurses and midwives) in Saint-Louis District and community actors (relays and community leaders); ▪ Conduct door to door health campaign activities for prevention activities, monitoring of child and maternal health; and ▪ Provision of comprehensive package of preventive activities at community level focused on maternal and child health and hygiene and sanitation.

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		<p>Economic Development:</p> <ul style="list-style-type: none"> ▪ Provide access to finance for the women cooperatives and the artisanal fishermen; ▪ Provide capacity building to strengthen the institutional capacity of the organizations relevant to artisanal fishing and provide key equipment for marine safety and monitoring of fishing activities; ▪ Organize a study visit for the CLPA members to learn the experience from other CLPAs in Senegal in terms of fishery resources management and revenue-generating activities; ▪ Provide capacity-building for fish-processing cooperatives on fish processing techniques on the development of new products; ▪ Training for the women engaged in food processing on the labelling of fish-based products at the ECOWAS level; ▪ Provide capacity-building on entrepreneurship, marketing, accounting, sales and financial skills; ▪ Provide equipment to the women cooperatives on fish processing; and ▪ Setting-up semi-industrial units for processing fruit, vegetables, and cereals for the women in Langue de Barbarie who are engaged in food processing. <p>Environment:</p> <ul style="list-style-type: none"> ▪ Conduct environmental education at local schools in Saint-Louis; ▪ Conduct information-sharing activities and develop a common guide and tools between Djoudj, and Diawling National Parks on biodiversity conservation; ▪ Provide capacity building to strengthen the institutional and technical capacity of elected representatives and territorial actors on the management of environment; ▪ Provide capacity building to increase the capacity of territorial actors (e.g. elected representatives, technicians, fishermen, economic actors) on the management of the ecological challenges; and

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		<ul style="list-style-type: none"> ▪ Community awareness-raising about the environmental RESILIENCE project.
17	The response plan in the event of a well blowout for natural gas is not well addressed;	<p>Section 7.5.1 has been reorganized to better highlight information on spill prevention and response measures, particularly in case of blowouts. Hence, the new Subsection 7.5.1.5 addresses spill prevention and response and is now presented as follow:</p> <ul style="list-style-type: none"> ▪ Section 7.5.1.5.1: Oil Spill Prevention Measures (p. 7-437 and 7-438). ▪ Section 7.5.1.5.2: BOP Intervention (p. 7-438). ▪ Section 7.5.1.5.3: Well Capping and Containment (p. 7-438 and 7-439). ▪ Section 7.5.1.5.4: Relief Well Drilling (p. 7-439). ▪ Section 7.5.1.5.5: Development of Oil Spill Response Strategies (p. 7-439 and 7-441). ▪ Section 7.5.1.5.6: Spill Response Contingency Plans (p. 7-442 and 7-443). ▪ Section 7.5.1.5.7: Response Capability (p. 7-444 and 7-445). ▪ Section 7.5.1.5.8: Demonstrating Readiness - Oil Spill Preparedness and Response Verification and Assurance (p. 7-445 and 7-446). <p>In order to reflect these changes, the beginning of the introductions of Sections 7.5 and 7.5.1 has been modified as follows.</p> <ul style="list-style-type: none"> ▪ Section 7.5: "The following section addresses accident-related impacts to the biophysical and social environments. A description of the accidental event scenarios and the spill prevention and response measures is first provided, followed by the impact assessment on a resource by resource basis. (p. 7-416) <p>Section 7.5.1: "The purpose of this section is to:</p> <ul style="list-style-type: none"> ▪ Explain the framework used to identify potential hydrocarbon spill scenarios and outline the approach taken for hydrocarbon spill modeling (Sections 7.5.1.1 to 7.5.1.3);

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		<ul style="list-style-type: none"> ▪ Present an overview of the fate of an oil spill using the <i>Deepwater Horizon</i> incident as an example (Section 7.5.1.4); and ▪ Explain the methods of oil spill prevention and response which can be employed to avoid or reduce impacts as well as methods of verifying and assuring activities associated with spill planning and response (Section 7.5.1.5)." (p. 7-416)
18	<p>The aquifers (groundwater) in the Senegal River Delta Basin do not seem to have been accounted for in this study while it is known that there is a hydraulic relationship between the sea and these aquifers, and the grain size of the marine sediments identified by the study is somewhat similar to that of the aquifers found in the land portion of the Senegal River Delta Basin. This is proof of the existence of the said hydraulic relationship between the sea and the aquifers;</p>	<p>The following text has been added to the Water Quality resource in Table 7-3 to explain why aquifers in the Senegal River delta basin were not included in the impact analysis:</p> <p>"Groundwater within the Senegal River delta basin were not retained in the impact analysis because three factors eliminate the potential for groundwater contamination: 1) limited activities near onshore aquifers, 2) distance, and 3) isolation of project-related fluids. First, any potential penetration of local aquifers could only occur during one activity associated with the GTA Phase 1 project - the drilling of 12 wells within the Offshore Area. No other construction, operation, or decommissioning phase activities will penetrate local aquifers. Second, all development wells are located approximately 125 km from shore in 2,700-2,800 m water depths, well removed from the onshore aquifers associated with the Senegal River delta. This distance alone will preclude any drilling-related effects to local onshore aquifers. Third, during the drilling process each wellbore will be lined with steel casing and cemented in place; the presence of the casing and surrounding cement effectively isolates well fluids from the surrounding rock layers. Consequently, seepage or flow of well fluids into local onshore aquifers cannot occur." (p. 7-6)</p>

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19	Basic chemical analyses concerned a rather limited number of pollutants, especially with regard to trace metals;	<p>The scope of sampling and analysis during the Environmental Baseline Survey conducted for the GTA Phase 1 project (summarized in Chapter 4, p. 4-12 to 4-19 and 4-46 to 4-50, and included in Appendix D of the ESIA, pp. 2 to 5) is consistent with benthic characterization surveys conducted internationally.</p> <p>The new Table G-23, added to Subsection G-10 of Appendix G (p.52), lists the parameters analyzed during the Environmental Baseline Survey of the project and the rationale for their selection.</p> <p>For sediment trace metals, the choice of parameters is based on metals potentially associated with offshore oil and gas activities. This clarification has been added to Section 4.4.1.4 (p.4-12).</p>
20	A basic radioactivity analysis should have been conducted due to the discharge of brines, which are potentially radioactive;	<p>The process of potable water generation from seawater will generate a concentrated brine at the project locations. The potable water generation via the Reverse Osmosis process does add chemicals to remove residual free chlorine, assist filtration and prevent scaling (to be confirmed with Vendor based on seawater properties); however, these chemicals would not cause an increase in the Naturally Occurring Radioactive Material in the brine beyond potentially existing background levels. Therefore, it was deemed not necessary to include radioactive elements analysis in the seawater baseline analysis.</p> <p>This information was added to Section 2.10.3 of Chapter 2 (p. 2-51 and 2-52).</p>
21	The analyses lack details, e.g. on the accreditation status of the analysis laboratory, the number of analyses and the hydro-climatic season in which these analyses were conducted. In fact, this information would have enhanced the reliability of the results and legitimized their use as reference data for analyses that will be conducted during monitoring and surveillance;	<p>The accreditations of the various analytical laboratories have been provided in the Environmental Baseline Survey report (see Annex D, Section 2.4.1, p. 15-18). Table 3 in Appendix D (p. 15-16) outlines the analytical methods and respective quantification limits for each analyte or suite of analytes, along with the laboratory that conducted the analyses. Chemical analyses were conducted by laboratories that have attained either the National Environmental Laboratory Accreditation Program certification or have met the applicable ISO requirements.</p> <p>As indicated in the revised ESIA, regarding the number and hydroclimatic season during which these analyzes were conducted: the Environmental Baseline Survey was conducted from November 25 to December 4, 2016, during the dry season, with sampling directed at</p>

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		<p>characterizing the baseline conditions for marine water and sediment quality, ichthyoplankton (fish eggs and larvae) and benthic macrofaunal communities (Appendix D, p. 1 to 2). During a geological and geophysical survey, additional ichthyoplankton sampling was conducted in July-August 2017, during the wet season, to provide an indication of the seasonal variability of ichthyoplankton (Appendix M, p. 5 to 6).</p>
22	<p>An analysis should have been conducted on the 16 PAH molecules that are regulated at the international level due to their toxicity rather than total PAHs, where neither the names of the molecules nor their relative concentrations are specified;</p>	<p>Analysis for water and sediment was conducted to estimate concentration of individual polycyclic aromatic hydrocarbons (PAHs), inclusive of the 16 USEPA priority pollutants. Presentation of sediment and water organics (i.e., hydrocarbons) data within the Environmental baseline survey report (Appendix D), however, focused on four categories, presented in summary form for each sampling station and each area: total alkanes, total petroleum hydrocarbons (TPHs), extractable organic material (EOM), and (total) PAHs. See Tables 6 and 10 of Appendix D (p. 33 and 38). The list of the 16 individual PAHs are presented in Appendix C of the Environmental Baseline Survey (Appendix D, p. C-3).</p>
23	<p>Basic chemical quality analyses should also have been conducted in the water column and the tissues of organisms in order to have an idea of the environmental behavior of the elements analyzed, especially their bioavailability;</p>	<p>The Environmental Baseline Survey scope of work, while site- or area-specific, was intended for regional application to address collection of baseline data with the purpose of:</p> <ul style="list-style-type: none"> ▪ “Determining environmental baseline conditions (i.e., biological, chemical, and physical) prior to development activities; ▪ Providing baseline conditions of the environment against which effects from future operations can be compared; and ▪ Identifying parameters within the ecosystem that may be sensitive to change and provide a reference point to evaluate future claims of impact.” (Appendix D, p. 2) <p>Water column parameters were addressed in the Environmental Baseline Survey sampling program (see Section 2.2.2 of Appendix D, p. 10-11). Measured parameters included total suspended solids, total metals, dissolved metals, total mercury, dissolved mercury, and hydrocarbons (i.e., TPH, PAHs, including NPD and decalins). Hydrographic measurements conducted via water column profiling were also conducted, characterizing depth, temperature,</p>

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		<p>conductivity/salinity, dissolved oxygen, pH, chlorophyll (fluorescence), and turbidity.</p> <p>Tissue analysis was not conducted during the EBS since there is no strong evidence for bioaccumulation of oil and gas-related chemicals (e.g., see Offshore Operators Committee [1997³]; Neff [1987⁴, 2002⁵, 2005⁶] Neff et al. [2006⁷, 2011⁸]; Lourenco et al. [2018⁹]), and activities associated with the proposed project up to the 2016 Environmental Baseline Survey were limited to well drilling operations; as such, these tissue sampling parameters are not germane to meeting the stated Environmental Baseline Survey objectives.</p>
24	<p>In addition to chemical analysis, biomarkers indicating general effects identical to those of OSPAR on benthic organisms should also have been analyzed. In fact, these biomarkers are considered to be indicators of early effects and the health of ecosystems, as they provide information on the combined effects of all pollutants, known or unknown, in the ecosystems as well as any other unidentified source of stress to which organisms are exposed;</p>	<p>A scope of work was developed to meet the stated objectives of the Environmental Baseline Survey. Biomarkers had not been a general consideration for international baseline and monitoring programs. Therefore, they were not incorporated into this Environmental Baseline Survey, the latter of which was intended to provide a baseline description of existing environmental conditions within the GTA Phase 1 project development area.</p>

³ Offshore Operators Committee. 1997. Gulf of Mexico Produced Water Bioaccumulation Study. April 1997. Prepared by Continental Shelf Associates, Inc., Jupiter, FL for the Offshore Operators Committee, New Orleans, LA.

⁴ Neff, J.M. 1987. Biological effects of drilling fluids, drill cuttings, and produced waters. In: D.F. Boesch and N.N. Rabalais (eds.), Long-term Environmental Effects of Offshore Oil and Gas Development. Elsevier Applied Science Publishers, London, pp. 496-538.

⁵ Neff, J.M. 2002. Bioaccumulation in Marine Organisms. Effects of Contaminants from Oil Well Produced Water. Elsevier, Amsterdam, 452 pp.

⁶ Neff, J.M. 2005. Composition, Environmental Fates, and Biological Effects of Water Based Drilling Muds and Cuttings Discharged to the Marine Environment: A Synthesis and Annotated Bibliography. Prepared for Petroleum Environmental Research Forum (PERF) and American Petroleum Institute, Battelle, Duxbury, MA. http://www.perf.org/images/API_PERF_drilling_mud_report.pdf.

⁷ Neff, J.M., S. Johnsen, T.K. Frost, T.I.R. Utvik, and G.S. Durell. 2006. Oil well produced water discharges to the North Sea. Part II: comparison of deployed mussels (*Mytilus edulis*) and the DREAM model to predict ecological risk. *Mar. Environ. Res.* 62, 224e246.

⁸ Neff, J., K. Lee, and E.M. DeBlois. 2011. Produced water: overview of composition, fates, and effects. In: K. Lee and J. Neff (eds.), *Produced Water*. Springer, New York (Chapter 1).

⁹ Lourenço, R.A., E. Francioni, A.H.M.F.T. da Silva, C.A. Magalhães, F.D.C. Gallotta, F.F. de Oliveira, J.M. de Souza, L.F.M. de Araújo, L.P. de Araújo, M.A.G. de Araújo Júnior, M. de Fátima Guadalupe Meniconi, and M.A. de Souza Bindaes Gomes Lopes. 2018. Bioaccumulation Study of Produced Water Discharges from Southeastern Brazilian Offshore Petroleum Industry Using Feral Fishes. *Arch. Environ. Contam. Toxicol.* (2018 Apr) 74(3):461-470. doi: 10.1007/s00244-018-0510-5.

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25	Benthic population indicators of the project's zone of influence could have been studied as references for monitoring and surveillance;	<p>Infaunal (benthic communities) data were acquired during the Environmental Baseline Survey (see Section 2.2.1 of Appendix D, p. 7-10).</p> <p>To support the baseline characterization of benthic infaunal, these data were assessed via three univariate diversity indices: the Shannon-Wiener index [H']; Pielou's evenness index [J]; Simpson's index [N₂] using PRIMER-E. In addition, similarity of species composition among samples was calculated using the Bray-Curtis similarity index. The resulting similarity matrix was analyzed with group-average cluster analysis and non-metric multi-dimensional scaling (NMDS) ordination. The influence of environmental variables on the NMDS ordination was also examined. Finally, Indicator Species Analysis was used to identify individual taxa associated with the groups identified with the multivariate analyses. (see Appendix D, Section 2.4.3, p. 18-19).</p>
26	The use of ecotoxicological data (notably PNEC and LC50) normally established for species living in the Mediterranean and the North Atlantic to evaluate the environmental impacts of all chemicals that will be used in this project strongly undermines the results. In fact, extrapolating these data without an understanding of their variability factors leads to significant uncertainty in the corresponding assessments.	The produced water environmental risk based assessment presented in the ESIA aligns with OSPAR Guidelines in support of Recommendation 2012/5 for a Risk-based Approach to the Management of Produced Water Discharges from Offshore Installations, i.e. it is based on the comparison of the Predicted Effect Concentrations (PEC) and Predicted No Effect Concentrations (PNEC), referred to as the PEC/PNEC ratio, to give an indication of the likelihood of adverse effects occurring as a result of the exposure level to a toxic substance. The ratio PEC/PNEC is related to the probability of biological injury according to a method developed by Karman, 1994 ¹⁰ (and also published in Karman and Reerink, 1997 ¹¹). When PEC/PNEC = 1, this corresponds to a level at which there exists a possibility of injury to 5% of any species in the ecosystem (by inference they are likely to be the most sensitive).

¹⁰ Karman, C., 1994: "Eco toxicological Risk of Produced Water from Oil Production Platforms in the Statfjord and Gullfax Fields". TNO Environmental Sciences. Laboratory for Applied Marine Research, den Helder, The Netherlands. Report TNO-ES, February 1994.

¹¹ Karman, C. and Reerink, H.G., 1997: "Dynamic Assessment of the Ecological Risk of the Discharge of produced Water from Oil and Gas producing Platforms". Paper presented at the SPE conference in 1997, Dallas, USA. SPE paper No. SPE 37905.

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		<p>The PNEC values used are critical to the assessment of risk. As described in European Chemicals Bureau (ECB) Technical Guidance on Risk Assessment Part II-2003, the principle of a PNEC is based on:</p> <ul style="list-style-type: none"> ▪ The fact that ecosystem sensitivity depends on the most sensitive species; and that ▪ Protecting the ecosystem structure protects the community function. <p>PNEC values are derived from EC50, LC50 or NOEC values obtained from laboratory testing of toxicity for each component (or chemical product) in question. The EC50, LC50 or the NOEC value is divided by an assessment (safety) factor in order to arrive at the expected chronic PNEC. The assessment (safety) factor is used to mitigate for the limited ecotoxicity data available including:</p> <ul style="list-style-type: none"> ▪ intra- and inter-laboratory variation of toxicity data; ▪ intra- and inter-species variations (biological variance); ▪ short-term to long-term toxicity extrapolation; ▪ laboratory data to field impact extrapolation (additive, synergistic and antagonistic effects from the presence of other substances may also play a role here). <p>The size of the assessment (safety) factor depends on the confidence with which a PNEC can be derived from the available data. This confidence increases if data are available on the toxicity to organisms at a number of trophic levels, taxonomic groups and with lifestyles representing various feeding strategies. The lower the number of test species, the higher the assessment (safety) factor.</p> <p>Produced water effluent comprises two categories of substances: naturally occurring substances originating from the reservoir fluids and production chemicals added to the process to maintain safe operations.</p> <p>OSPAR developed a common set of PNEC values for naturally occurring substances that are used by OSPAR Contracting Parties based on good evidence and expert judgement. These PNECs values for naturally occurring substances and details on the assessment</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>(safety) factors used to develop these PNECs are available in OSPAR Recommendation 2014/5 - Establishment of a List of Predicted No Effect Concentrations (PNECs) for naturally occurring substances in produced water. The GTA Phase 1 produced water environmental risk assessment (see Appendix K-2) used the PNECs established by OSPAR which, through the application of an assessment (safety) factor have accounted for species variation.</p> <p>For added chemicals, the PNEC values are usually based on the information found in the HOCNF (Harmonized Offshore Chemical Notification Format) scheme (Johnsen et al., 2000¹²) or obtained from data on the chemical CEFAS certification templates. The OSPAR Guidelines in support of Recommendation 2012/5 for a Risk-based Approach to the Management of Produced Water recommend the continued use of the assessment factors set out in the 1996 ECB EC <i>Technical Guidance Document on Environmental Risk Assessment</i>. These assessment (safety) factors have been used to control chemical discharges from offshore installations for a number of years, and monitoring studies have indicated that they provide an appropriate level of protection to the ecosystem function. Therefore, to align with OSPAR guidance, a maximum assessment (safety) factor of 1,000 has been applied in the GTA Phase 1 produced water environmental risk assessment to derive PNECs for production chemicals.</p> <p>Section 3.2.1 of the produced water modeling report and the appendices to this report explain the PNEC values and the assessment factors (safety) used for the analysis of the GTA Phase 1 project (see Appendix K-2, p. 13 to 14 and p. 45 to 47).</p>
27	The mitigation measures will not be sufficient in terms of economics, because with regard to job creation, the fishing community of Saint-Louis lacks the specialization to access these jobs;	<p>The mitigation measures were determined according to the impacts identified in Chapter 7.</p> <p>As indicated in the summary table of impacts (Table 7-195, p. 7-605 to 7-613), the impact assessment showed that project activities could have the following significant non-negligible impacts on fishermen:</p>

¹² Johnsen, S., T.K. Frost, M. Hjelsvold and T.R. Utvik, 2000: "The Environmental Impact Factor – a proposed tool for produced water impact reduction, management and regulation". SPE paper 61178 presented at the SPE International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production held in Stavanger, Norway, 26 – 28 June 2000.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ IMP28: Risk of collision between project vessels and pirogues due to project vessel movements. ▪ IMP29: Potential loss of artisanal fishing gears (nets and buoys) due to project vessel movements in artisanal fishing areas. ▪ IMP30: Risk of conflict between artisanal fishermen and public security forces if some fishermen need to be escorted out of the exclusion safety zones. <p>Other potential impacts, including the loss of potential artisanal fishing areas, have been assessed as negligible. Indeed, the loss of fishing areas due to the project infrastructure and their exclusion safety zones is limited to about 1.6 km² in Senegal and an equivalent area in Mauritania. Section 7.2.16.3 provides a detailed analysis of this topic and the results show that the loss of access to these fishing areas will not have a negative consequence on the fishery catches (p. 7-140 to 7-142).</p> <p>Section 7.4.16.3 also identifies a potential positive impact of routine activities on artisanal fisheries and related activities, as the creation of a new artisanal fishing area at the end of the project, due to the artificial reef effect of the breakwater, assuming that it will not be removed during the Decommissioning Phase (p. 7-385 and 7-386).</p> <p>Mitigation measures have been proposed to reduce the significance of the three potential negative impacts identified above: IMP28, IMP29 and IMP30. Following the application of these measures, these three potential impacts are rated negligible to low (Table 7-195, p. 7-605 to 7-613).</p> <p>Therefore, and as discussed in Section 7.2.20 (p. 7-154 to 7-157) and Section 7.3.20 (p. 7-283 to 7-285), no potential impact is therefore anticipated by the ESIA on the livelihoods of fishermen and other members of their communities involved in artisanal fishing activities.</p> <p>Although no impacts are anticipated on community livelihoods, the experts provided for a mitigation measure to ensure a dialogue between the project and the fishing communities (Section 7.2.20.4, p. 7-156, Section 7.3.20.4, p. 7-285):</p>

Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ M20: Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers. <p>On the topic of potential jobs created by the project, the experts recognize that only few members of the fishing community have the required profile to access specialized jobs in the oil and gas sector in the short term. The project is expected however to operate for 20 years and over this time period individuals will be able to develop the skills to potentially be employed on the operations. To assist with skills development, BP committed to financially support the Senegalese Institute for Petroleum and Gas (INPG) by investing several millions of dollars in collaboration with Kosmos Energy and the following has been added to Section 3.8.2 of the ESIA: " BP also seeks to make meaningful community investments that meet local needs and align with its business activities. One of this investment publicly announced on 31 August 2018 relates to BP's multi-million-dollar financial commitment for the development of the Senegalese Institute for Petroleum and Gas (INPG) to help building national capacity in the sector." (p. 3 to 27).</p> <p>On this matter, the risk of social tension in Saint Louis especially due to limited jobs opportunities has however been identified as a potential impact from the project (IMP34) for the Construction and Operations Phases. To develop a positive dialogue and relationship with the fishing community the project has made several commitments in the ESIA regarding communication and implementing a social investment program with input from the local communities, including the following:</p> <ul style="list-style-type: none"> ▪ M09: Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities. ▪ M17: Establishing a grievance mechanism easily accessible to fishing communities members that includes monitoring of claims and the resolution thereof.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ M18: Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities in all matters related to the project. ▪ M19: Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project. ▪ M20: Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers. ▪ M23: Implement an environmental awareness building program in association with local schools and community groups. ▪ M24: Provide technical assistance to mutually agreed marine resource research programs notably the national oceanographic research centers of both countries (CRODT and IMROP). ▪ M27: Developing a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities. ▪ M28: Engaging in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities in order to help identify and support, if needed, ad hoc measures to prevent social discontent linked to project activities and its escalation into conflicts. ▪ M44: Review the social climate in N'Diago and in Saint-Louis prior to the Operations Phase to adjust as needed the mitigation measures identified to avoid or reduce social discontent. <p>These mitigation measures are notably listed in Table 7-197 in Chapter 7 (p. 7-617 to 7-619).</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
Questions		
28	As is the case for drilling, will the shut-down or dismantling of certain equipment be done gradually?	Decommissioning will not be done progressively: gas production will cease at a precise point of time. The Decommissioning Phase (dismantling of equipment) however will be spread over several months. Information on the dismantling of equipment is provided in the preliminary decommissioning plan added to the EIES, in Appendix T.
29	In order not to neglect relief wells, what measures are planned in the event of a well blowout in order to minimize harm to marine biodiversity, which is critical for the fishing industry?	<p>It is important to recall that the accidental blowout event that is presented in the ESIA is a worst case scenario and does not take into account the response measures that will be put in place, in order to present a very conservative impact assessment.</p> <p>In the event of such an accidental event, response measures will be promptly implemented to minimize the impacts on the environment, including those on marine biodiversity. These measures are described in the new Section 7.5.1.5 regarding Spill Prevention and Response. The planned interventions in case of a blowout are specified. They comprise a set of provisions including BOP intervention, well capping and containment, relief well drilling, and development of oil spill response strategies (p. 7-437 to 7-445).</p>
30	Is it planned to establish a guarantee fund prior to commencement of production in order to remedy collateral damage in the event of an accident or an accidental spill?	<p>The following text has been added in Section 3.5.1 to clarify the obligations under the hydrocarbon exploration and production sharing contract in the event of an accident or accidental spill:</p> <p>“[...] as per the Hydrocarbon Exploration and Production Sharing Contract for the Saint-Louis Offshore Profond Block, the Contractor [i.e. BP Senegal Investments Limited, Kosmos Energy Investments Senegal Limited and PETROSEN] has the following obligations:</p> <ul style="list-style-type: none"> ▪ To compensate and indemnify the State and any person in the event of damage caused by the oil and gas operations or due to the employees or officials of the Contractor during the Operations (Clause 4.5). ▪ To sign and have its subcontractors sign all insurance policies in use in the international oil industry concerning its obligations and liabilities and specifically the liability insurance policies with respect to third parties, property damage insurance policies to the property and the environment, and the insurance policies that

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		<p>might be required by the regulations in effect in the Republic of Senegal, and to provide the certificates proving the signing of said insurance policies to the Minister (Clause 4.6)." (p. 3-9 and 3-10).</p>
31	<p>What social support measures are planned for affected fishermen in Saint-Louis for the adaptation and continued pursuit of fishing activities?</p>	<p>The results of the ESIA do not predict that the project will lead to impacts that would require adaptation of the artisanal fishery for the continuity of this activity. Artisanal fishing may coexist with the project. The only potential non-negligible impacts of project activities on artisanal fisheries are identified in our response to Observation No 27. The mitigation measures planned to prevent or mitigate these potential impacts and, more generally, to support fishing communities, are indicated in the following sections:</p> <ul style="list-style-type: none"> ▪ Sections 7.2.16.4 (p. 7-142 and 7-143), 7.2.20.4 (p. 7-156 and 7-157) and 7.2.26.4 (p. 7-176) for the Construction Phase. ▪ Sections 7.3.16.4 (p. 7-272 and 7-273), 7.3.20.4 (p. 7-285) and 7.3.26.4 (p. 7-304) for the Operations Phase ▪ Sections 7.4.16.4 (p. 7-386 and 7-387), 7.4.20.4 (p. 7-398) and 7.4.26.4 (p. 7-414 and 7-415) for the Decommissioning Phase <p>These mitigation measures include, for example, the following measures:</p> <ul style="list-style-type: none"> ▪ M08: Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project. ▪ M09: Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities. ▪ M10: Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time. ▪ M11: Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of

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		<p>maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling.</p> <ul style="list-style-type: none"> ▪ M12: Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones. ▪ M13: Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing. ▪ M17: Establishing a grievance mechanism easily accessible to fishing communities members that includes monitoring of claims and the resolution thereof. ▪ M18: Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities in all matters related to the project. ▪ M19: Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project. ▪ M20: Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers. ▪ M21: Project vessels to record incidents with fishing gears and report them to the project. ▪ M27: Developing a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
32	Which installations will be dismantled following the end of operations?	<p>A preliminary decommissioning plan has been added to the ESIA. It is provided in the new Appendix T. As stated in this plan, the decommissioning goal is to restore the sites to their original conditions, as far as is practicable, unless environmental benefits warrant leaving certain redundant items in situ.</p> <p>The plan provides information on abandonment and decommissioning procedures of the wells, the subsea production system, the FPSO, the hub/terminal marine structures and topsides and the FLNG (see Sections 4.1 to 4.5 of the preliminary decommissioning plan in Appendix T, p. 2 to 6). As indicated in Section 4.4.3 of the preliminary decommissioning plan, it is currently planned that the rock berm of the breakwater will be left in place as this is likely to be environmentally preferable given it will offer an artificial reef effect (Appendix T, p.5 and 6).</p>
33	Is it planned to carry out an assessment midway through operations to ensure the effectiveness of certain measures of the ESMP, particularly waste management, erosion, impact on the host environment, water pollution?	<p>Rather than a mid-term assessment in operations, the ESMP plans for an ongoing assessment of the efficiency of a suite of ESMP measures.</p> <p>As indicated in Chapter 9, Section 9.1 (p.9-1), the evaluation of the mitigation measures provided for in the ESMP will be done throughout the project. In fact, the actions listed in the ESMP will be periodically reviewed according to the frequencies defined in the ESMP to validate that the provisions of the plan are implemented and to confirm that the planned measures effectively mitigate the predicted impacts. The actions listed in the ESMP may be amended as necessary or in pursuit of continual improvement.</p> <p>In addition, the surveillance and monitoring plan (SMP) presented in Chapter 10 complements the ESMP. Its specific objective is to verify that the mitigation measures identified in the ESMP generate the expected results in regard to avoiding or reducing potential impacts on biophysical or social environments. Table 10-1 in Chapter 10 (p. 10-5 to 10-9) presents the monitoring measures planned to assess the efficiency of some ESMP measures, in particular with regard to the potential impacts of the project on the erosion process, water quality and more generally the marine environment.</p>

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		Concerning waste management, monitoring the efficiency of the measures is part of the waste management plan itself. This is specified in Section 3.3. (p. 5 and 6) of the preliminary waste management plan that has been added as Appendix S to the revised ESIA report.
34	Saint-Louis is characterized by two distinct fishing seasons. Would it not be relevant to reschedule certain high-risk activities (construction-installation) in the low season when there is less traffic at sea?	The following text concerning the project schedule has been added to Section 2.3.1: “The partners in the project are working to have the first facilities operational on location at the end of 2021 to start generating revenues to the two countries. The overall project construction schedule has been developed with a view to achieving that. Some construction activities are also constrained by certain weather conditions for safety and technical reasons. In that schedule, the construction of the breakwater is currently planned between March to October 2020 with caisson installations at breakwater location in the nearshore area between June to October which corresponds to the low fishing season.” (p. 2-18 and 2-19).
35	Certain waste that cannot be processed are shipped back to land and passed on to certified companies. Which companies?	Waste that cannot be treated onboard of BP's facilities will be shipped onshore and transferred to authorized companies for either on-site processing or international transportation for treatment by approved and specialized companies. An identification / evaluation of approved companies in Mauritania and Senegal is planned. Those retained for the Construction Phase will be determined in the coming months. Section 3.7 of the preliminary waste management plan, added in the new Appendix S of the ESIA, defines the requirements and control measures that will be put in place by the project for monitoring these companies and ensure quality control of their services (p. 8 and 9).

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36	The Government of Senegal has a rehabilitation program for certain secondary airports, notably Saint-Louis; consequently, shouldn't this be integrated into the study?	<p>An addition has been made to the ESIA to incorporate the fact that the Government of Senegal has a rehabilitation program for the Saint-Louis airport.</p> <p>As this rehabilitation is not yet effective, the addition to the ESIA specifies that the possibility of using this airport once rehabilitation is completed will be examined later during project implementation.</p> <p>The following addition was made to the footnote in Section 2.2.4 of Chapter 2: "The Government of Senegal has a rehabilitation program for the Saint-Louis airport. As this rehabilitation is not yet effective, the possibility of using this airport for the GTA project once rehabilitation is completed will be examined later during project implementation." (p. 2-17)</p>
37	How did you determine that the breakwater would be located 10 km from the coastline?	<p>The selection of the breakwater location at 10 km from the coast was made by engineers on the basis of many technical criteria. One of these criteria was the potential impact of the breakwater on the coastline.</p> <p>As indicated in Section 5.2.4 of Chapter 5 (p. 5-5 and 5-6), modeling work was done to predict the impact of the breakwater on the coastline. Multiple breakwater locations were evaluated during this modeling to provide information regarding differing potential impacts based on the distance of the breakwater from shore and potential effects on coastal erosion. The breakwater was modeled at three locations: approximately 4 km, 7 km and 10 km from the coast. Appendix I-2 presents more details on these modelings.</p> <p>As noted in Section 5.3.4 of Chapter 5 (p. 5-8), modeling results demonstrated that the breakwater located approximately 10 km offshore was the preferred option from an environmental perspective, although the financial investment associated with this option is significantly higher.</p>

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38	How can chemicals affect water quality without affecting biological components?	<p>An addition was made in Section 7.2.6.3 regarding the link between water quality and biological resources, particularly plankton, fish and other fishery resources:</p> <p>“The interaction between marine water quality and marine flora and fauna is complex. In general, significant alterations in water quality may have an effect on marine flora and/or fauna, depending upon the nature of the host environment, the physical and/or chemical alteration being realized, the motility and sensitivity of the organisms present, and the degree and extent of exposure. It is important to note that impacts to water quality tend to be localized and transitory, particularly in open ocean systems; ambient oceanographic conditions will work to dilute and disperse discharges, with chemical contaminants moving away from the source.” (p. 7-62)</p> <p>The assessment of the impacts of the GTA Phase 1 project on water quality shows that these impacts are limited either spatially or in their duration, or both. Consequently, Negligible to Low level water quality impacts were identified for routine activities during various phases of the project (see Section 7.2.2, p. 7-26 to 7-33, Section 7.3.2, p. 7-181 to 7-189 and Section 7.4.2, p. 7-308 to 7-313). Under these circumstances, impacts to flora and fauna will also be limited. Among fauna, individuals may be affected by diminished water quality depending upon degree and extent of exposure, as well as sensitivity. For motile species, reduced water quality may prompt movement out of the affected area. Population level effects are not expected as a result of localized water quality changes.</p>
39	Are the impacts negligible on the other components (biological and social) (Tables 7-4, 7-5 and 7-6 Volume 2)?	<p>Tables 7-4, 7-5 and 7-6 that the question refers to are included in Section 7.1 of Chapter 7. Section 7.1 is devoted to the methodology of impact analysis. The three tables have been prepared for a preliminary screening of the potential impacts of the project. They are matrices of possible interactions between sources of impacts, called "Impact Producing Factor" (IPFs), and the major resources of the physical, biological and social environments.</p> <p>In these tables, an "●" indicates that an IPF listed in the left column could affect the physical, biological, and social resources of the top row.</p>

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		<p>In these three tables, the significance of impacts is not assessed. As a result, whether or not impacts on biological, social and physical resources are rated as negligible is not determined at this stage.</p> <p>It is at a later step of the analysis that the significance of the impacts is assessed. Indeed, the potential impacts identified in Tables 7-4, 7-5 and 7-6 of Section 7.1 are subject to a very fine assessment, resource by resource, in Sections 7.2 to 7.5 of Chapter 7 (p. 7-20 to 7-604).</p>
40	Does the project have any protocols or agreements with other specialized treatment facilities in order to avoid long-term storage?	<p>The preliminary waste management plan has been added as Appendix S of the ESIA. It is planned that specialized waste treatment companies will be contracted to avoid long-term storage of waste.</p> <p>As indicated in response to Observation No 35, Section 3.7 of the preliminary waste management plan defines the requirements and control measures that will be put in place by the project for monitoring these companies and ensure quality control of their services (see Appendix S, Section 3.7, p. 8-9).</p>
41	What was the duration of the sediment analyses? How many times a year?	<p>As specified on page 2 of the Environmental Baseline Survey report (Appendix D), the sediment analyses in this survey were conducted following sampling conducted between November 25 and December 4, 2016.</p> <p>In addition, sediment analyses are also planned for the future. Sediment sampling proposed as part of the surveillance and monitoring program (MON10 measure) includes a study within six years of FPSO commissioning. The subsequent monitoring strategy will be determined based on the results of this study (Chapter 10, Table 10-1, p. 10-6).</p>

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42	Is it planned to refit the FPSOs and ships? If so, where will this take place?	<p>The project is not planning to do hull cleaning of the FLNG and FPSO. Management of biofouling will be through the application of anti-fouling paints that are used to coat the bottoms of ships to prevent sea-life such as algae and molluscs attaching themselves to the hull.</p> <p>The following text was added to Section 2.5 of Chapter 2 to explain this:</p> <p>“[...] the applicable project vessels will have an anti-fouling system (biofouling) compliant with the 2001 International Convention on the Control of Harmful Anti-fouling Systems in Ships (AFS 2001). The project does not plan for the cleaning of FLNG and FPSO hulls. The management of biofouling will be done through the application of anti-fouling paints used to coat the hulls of ships to prevent sea-life such as algae and molluscs, to attach to the hull.” (p.2-21).</p>
Recommendations		
43	Integrate in the correction of the report the observations listed as Findings;	The revised version of the report was prepared taking into account the responses to the observations of the Technical Committee appearing in the current table.
44	Integrate in the corrected report a table presenting the observations along with reference page numbers;	The current tracking table of responses to observations, which includes page references for the responses to the observations (findings, questions and recommendations), has been incorporated into the revised version of the ESIA. It is presented in the new Appendix V, added to the ESIA report.

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45	Provide specific information on timeframes for the complementary studies to be carried out and for their integration into the ESMP;	<p>Specific information on the schedule of further studies and plans announced in the Design & Operation Controls measures as well as mitigation measures has been added to the revised version of the ESIA.</p> <p>This information is presented in the new Table 9-5 (p. 9-107 to 9-109). An introductory paragraph was added before this table (p. 9-2). It reads as follows:</p> <p>"In Tables 9-1 to 9-4, some project Design & Operation Controls measures as well as some proposed mitigation measures recommend the preparation of further studies and plans. Table 9-5 gathers the list of these additional studies and plans announced in the measures as well as the approximate schedule expected for the preparation of these documents. [...] Additional studies and plans relating to routine activities will be provided to the DCE and the Technical Committee upon request. Plans associated to accidental events prepared by BP will be discussed and forwarded to national authorities including the Ministry of Fisheries and Maritime Economy / Mauritanian Coast Guard and HASSMAR in Senegal. The relevant national authorities will be invited to the relevant exercises conducted by the project to test the applicable contingency plans."</p>
46	Provide for a mechanism in the ESMP to manage grievances and conflicts related to the activity;	<p>The ESMP provides a mechanism for managing grievances related to the project. It is integrated into the ESMP as a mitigation measure for routine activities as well as in case of accidental events. The two measures are identified as follows:</p> <ul style="list-style-type: none"> ▪ M17: Establishing a grievance mechanism easily accessible to fishing communities members that includes monitoring of claims and the resolution thereof. ▪ M106: In the unlikely event of a spill, establish a grievance mechanism easily accessible to affected stakeholders that includes monitoring of claims and the resolution thereof. <p>These measures are stated in Chapter 7 (see Table 7-197 at p. 7-617 to 7-619 and Table 7-200 at p. 7-633).</p> <p>These measures are also included in the ESMP in Chapter 9, particularly in Table 9-1 (p. 9-9 to 9-34), Table 9-2 (p. 9-35 to 9-66), Table 9-3 (p. 9-67 to 9-79), and Table 9-4 (p. 9-80 to 9-106).</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
47	Organize workshops for discussion and validation of the various plans of the ESMP with the administrations responsible for surveillance (monitoring and surveillance plan, capacity-building plan, waste management plan, emergency response plan, decommissioning and remediation plan of areas disturbed by the project, etc.);	<p>An addition has been made to Section 9.2 of the revised ESIA indicating the following:</p> <p>“Additional studies and plans relating to routine activities will be provided to the DCE and the Technical Committee upon request. Plans associated to accidental events prepared by BP will be discussed and forwarded to national authorities including the Ministry of Fisheries and Maritime Economy/Mauritanian Coast Guard and HASSMAR in Senegal. [...] The sharing and presentation format such as thematic sessions will be determined with the relevant authorities depending on the nature of the plan.” (p. 9-2)</p>
48	Implement an institutional framework for the monitoring of key project parameters in these different phases and develop an external monitoring plan for national institutions;	<p>An external monitoring plan by the national authorities has been added to the revised ESIA. It is presented in Appendix U.</p> <p>In addition, a section has been added to Chapter 9 of the revised ESIA to introduce and explain the content of Appendix U. The new Section 9.4, entitled "Monitoring of the ESMP by the National Authorities", reads as follows:</p> <p>"The implementation of the ESMP will be monitored by the Mauritanian and Senegalese authorities. A monitoring plan has been developed for this purpose. It is provided in Appendix U of this report. The purpose of this plan is to provide a monitoring tool to the authorities, detachable from the rest of the ESIA if needed. The plan covers both the monitoring of the implementation of the ESMP, presented in Chapter 9 of this report, and the monitoring of the implementation of the surveillance and monitoring plan (SMP), presented in Chapter 10.</p> <p>The monitoring plan includes five tables that constitute operational tools for the authorities:</p> <ul style="list-style-type: none"> ▪ Table U-1: ESMP Monitoring by the Mauritanian and Senegalese authorities - Construction Phase; ▪ Table U-2: ESMP Monitoring by the Mauritanian and Senegalese authorities – Operations Phase; ▪ Table U-3: ESMP Monitoring by the Mauritanian and Senegalese authorities - Decommissioning Phase;

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		<ul style="list-style-type: none"> ▪ Table U-4: ESMP Monitoring by the Mauritanian and Senegalese authorities - Accidental events; and ▪ Table U-5: SMP Monitoring by the Mauritanian and Senegalese authorities. <p>The following information are specified in the first four tables used for the monitoring of the ESMP:</p> <ul style="list-style-type: none"> ▪ Potential impacts, by biophysical and social resource; ▪ Country where the impact could occur; ▪ Project Design & Operation Controls measures to mitigate impacts; ▪ Mitigation measures to avoid or reduce non-negligible negative impacts; ▪ Residual impact assessment; ▪ Operator monitoring elements (as a reminder); ▪ Authorities monitoring indicator; ▪ Monitoring activity to be carried out by the authorities; ▪ Authorities monitoring schedule; ▪ Potential institution responsible for monitoring in Mauritania; ▪ Potential institution responsible for monitoring in Senegal; and ▪ Cost of the monitoring activity by the authorities. <p>In Table U-5 for monitoring the SMP, the following information is provided:</p> <ul style="list-style-type: none"> ▪ Potential impacts, by biophysical and social resource; ▪ Operator monitoring measures; ▪ Operator monitoring elements (as a reminder); ▪ Authorities monitoring indicator; ▪ Monitoring activity to be carried out by the authorities; ▪ Authorities monitoring schedule; ▪ Potential institution responsible for monitoring in Mauritania; ▪ Potential institution responsible for monitoring in Senegal; and

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		<ul style="list-style-type: none"> ▪ Cost of the monitoring activity by the authorities. <p>In Mauritania, potential monitoring authorities may be identified by the DCE. In Senegal, potential monitoring authorities include the Technical Committee, including ANAM, DEEC, HASSMAR and the Ministry of Fisheries and Maritime Economy.</p> <p>The monitoring activities to be carried out by the authorities include reading of monitoring reports and management plans provided by the GTA Phase 1 project as well as other project documents, and project facilities inspections and visits. There are no monitoring costs associated with document reading. For inspections and visits, the GTA Phase 1 project plans for the transportation by boat or helicopter as used by the project personnel to reach the project facility and accommodation at the facility depending on the duration of the inspection/visit. The cost of this transportation and accommodation will be covered by the GTA Phase 1 project."(p. 9-5 to 9-7)</p> <p>A similar addition was made to Chapter 10 of the revised ESIA. The new Section 10.4, "SMP Monitoring by the Authorities", recaps the monitoring elements announced in Section 9.4 (p. 10-2 to 10-4).</p>
49	Clearly specify in the report how the operator intends to manage liquid waste (production water) associated with crude natural gas during atmospheric distillation.	<p>Produced water will only be generated at the FPSO.</p> <p>The project will not be undertaking atmospheric distillation of the condensate stream on board the FPSO.</p> <p>The addition below was made in Section 2.10.3 of Chapter 2 to clarify the production and treatment process of the produced water.</p> <p>"The natural gas received on to the FPSO will be conditioned to prevent the formation of gas hydrates in the Subsea flowlines and FPSO Gas Dewpointing, via the injection of monoethylene glycol (MEG). This MEG will have affinity to the produced water and this aqueous phase (sometimes referred to as rich MEG) will be recovered from the gas reception, condensate processing and gas dewpoint plant. The MEG will be recovered for reuse via a regeneration process on board the FPSO. This involves atmospheric distillation of the rich MEG to boil off the produced water vapour. The produced water vapour will be condensed and treated through the produced water treatment system prior to discharge in the sea at the FPSO location." (p. 2-50)</p>

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50	Budget the costs of impacts as well as monitoring and support measures;	<p>It is not common to budget the costs of potential project impacts in an ESIA. The potential impacts of a project are those likely to occur if no mitigation measure is implemented. However, the mitigation measures are specifically aimed at avoiding or mitigating the potential impacts of the project.</p> <p>Regarding the costs of monitoring and support measures by the project proponent, the following clarification was made to Section 9.2 of Chapter 9 of the revised ESIA:</p> <p>“It is important to note that most of the monitoring activities to be conducted by GTA Phase 1 project are through equipments/instruments/meters installed on the FPSO and FLNG. The cost associated with those are included in CAPEX and the use/maintenance of the equipment will be captured in project OPEX. The details of the OPEX costs for use and maintenance of meters are not available.</p> <p>Another type of monitoring activities to be conducted by the project are those that are generally combined with other GTA Phase 1 maintenance/integrity inspection activities, e.g. seabed surveys. This approach is often adopted by the O&G industry to optimize vessels utilization time. Therefore, the cost of those campaigns will not be only associated to environmental activities. They will be captured in the OPEX cost.</p> <p>The production sharing contracts/Joint Operating Agreements define the mechanism by which these OPEX cost are approved annually by all GTA’s partners.” (p. 9-2)</p> <p>Regarding the costs of the monitoring measures by the authorities, additions have been made to Chapters 9 and 10 of the revised ESIA to address this element.</p> <p>As now described in Chapters 9 and 10, monitoring activities to be completed by authorities comprise the reading of monitoring reports and management plans provided by GTA Phase 1 project, inspections and visit of project facilities. There are no monitoring costs associated with reading of documents. For inspections and visits, the GTA Phase 1 project will provide boat or helicopter transportation as used by the project personnel to reach the project facility and accommodation at the project facility for the duration of the inspection/visit. The cost for</p>

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		this transport and accommodation will be covered by the GTA Phase 1 project (p. 9-7 and p. 10-3 and 10-4).
51	Align the text with reference to the area of ecological or biological importance (page 347);	The error that had crept into the French title of Figure 4-23 has been corrected to « Emplacement des aires d'importance écologique ou biologique à proximité des zones d'étude restreinte et élargie ». [No change is required in the English version of the ESIA.]
52	Provide specific information on the shorebases found at both the port and the airport;	<p>As mentioned in the ESIA, GTA Phase 1 project supply bases are planned to be located within the Dakar and/or Nouakchott ports. It was originally anticipated that a supply base could be located in Mole 1 of the Dakar Port where the Kosmos supply base is. However, this is currently subject to on-going commercial discussions with the relevant parties of the Dakar port. Until these discussions are concluded GTA Phase 1 project is unable to provide more details on the subject. Details will be provided to DEEC when they become available.</p> <p>The GTA Phase 1 project intends to use scheduled commercial flights for the international crew transfer. In Senegal, these commercial flights are currently landing at Blaise Diagne International Airport (AIBD). No supply base is currently planned at the Dakar or Nouakchott airports. However, it is planned to use these airports for crew transfer. For helicopter transfer, the project will use the services of approved companies, and the airports used will be the ones from which these companies choose to operate.</p>

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53	Integrate Decree no. 89-1539 of December 19, 1989 regulating the fabrication, importation, preservation, transport and use of explosive substances with regard to the transport and storage of explosives and include explosives in the Risk Study;	<p>Decree N° 89-1539 dated December 19, 1989 regulating the manufacturing, import, storage, transportation and use of explosive substances has been added to Table 3-2 entitled Senegalese Environmental Laws and Regulations Relevant to the Proposed Project. The description of the decree included in the table is as follows: "Defines the terms of application of Law N° 88-06 dated August 26, 1989 on the Mining Code with regards to administrative procedures, safety rules and conditions to comply with concerning explosive substances. It revokes all contrary provisions, including the Decrees N° 61-356 M.T.P.H.U.IG dated September 21, 1961 fixing the exploitation mode of quarries and dated January 11, 1929 regulating explosive substances in French West Africa, and their orders of application." (p. 3-15)</p> <p>Explosives were considered in the Risk Study (EDD). As shown in Table 8-5 in Section 8.3.2.2 (p. 8-34 and 8-35), the use of explosives in drillship drilling operations is a potential hazard that has been investigated as part of the Risk Study. Section 8.3.2.2.3.1 "Use of Explosives" specifically discusses this aspect (p. 8-43). The preliminary risk analysis for explosives is presented under No. H-04.03.01 in Appendix O-2. (p. 23).</p>
54	Update the information on the Blaise DIAGNE International Airport (AIBD), which is now operational;	<p>Information on Blaise Diagne airport in Dakar has been updated in Section 4.7.10.3. The text now reads as follows:</p> <p>"A new international airport has been serving Dakar since December 2017. It is the Blaise Diagne International Airport (AIBD) which is located approximately 40 km from Dakar and is connected to the city by a highway. Its capacity will be around 3 million passengers per year (Blaise Diagne Dakar Airport, 2018)." (p. 4-215)</p>
55	Review the text with regard to the CLPA;	<p>The text describing the local artisanal fishing councils (CLPAs) in Section 4.7.8 has been revised to clarify the ministerial order that applies to them and to provide information on their composition and functioning. It now reads as follows:</p> <p>"In addition to the professional fishing organizations mentioned above, certain fishermen are members of local artisanal fishing councils (CLPA), introduced by a ministerial order, whose purpose is to create and state the composition, the attributions and the mode of operation of these structures. that were created by Ministerial Decree Order no</p>

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		<p>9077 of October 8, 2010 created five CLPAs including those of Lompoul and of Saint-Louis; the latter covers Guet Ndar, Goxu Mbathie, Santhiaba et Hydrobase sites. CLPAs were set up to serve as bridges between local artisanal fishing stakeholders and public agencies. They are frameworks of cooperation that help manage conflicts, ensure the surveillance and monitoring of fisheries, and promote the co-management of resources. Their mission is notably to reinforce good governance in the fishing sector. Each community in the core study area is associated with a CLPA. At least three-quarters of the members of a CLPA chapter must be fishing stakeholders, the president is ex officio the community Prefect, and the function of secretary belongs to a fisheries service officer.</p> <p>Each CLPA is made up of representatives of colleges (wise or notable, local elected representatives, local administration, actors of the artisanal maritime fisheries such as fishermen, fish mongers, processors and related professions). Appointed by order of the head of the relevant administrative division (Prefect), the members of the council are 40 persons at most and at least three quarters are chosen from the fishing communities.</p> <p>The CLPA is chaired by the head of the relevant administrative division; the secretariat is provided by the representative of the administration college who is an officer of the fisheries department of the locality where the council is established. The operational resources of the CLPA come from the contributions of the Ministry in charge of Fisheries, contributions from development partners, part of the annual fees for licenses for professions related to artisanal maritime fisheries or any other contributions. The council sets up and forwards to the competent departments of the Ministry in charge of Fisheries an annual budget showing the needs and the sources of financing.” (p. 4-207).</p>

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56	Conduct a baseline study of aquifers in order to track their evolution during all project phases;	As indicated in the response to Observation No 18, three factors eliminate the potential for contamination by project activities of aquifers in the Senegal River Delta basin: 1) limited project activities near onshore aquifers, 2) distance and 3) isolation of project-related fluids. First, any potential penetration of local aquifers could only occur during one activity associated with the GTA Phase 1 project - the drilling of 12 wells within the Offshore Area. No other construction, operation, or decommissioning activities will penetrate local aquifers. Second, all development wells are located approximately 125 km from shore in 2,700-2,800 m water depths, well removed from the onshore aquifers associated with the Senegal River delta. This distance alone will preclude any drilling-related effects to local onshore aquifers. Third, during the drilling process each wellbore will be lined with steel casing and cemented in place; the presence of the casing and surrounding cement effectively isolates well fluids from the surrounding rock layers. Given these factors, a baseline study of aquifers is not warranted.
57	Place greater emphasis in the document on the public enquiry report prepared following KOSMOS ENERGY's request for authorization to operate in regard to ICPE;	An addition was made to Section 6.1.2 of Chapter 6 to make the following clarification: "Senegal's regulatory process also includes conducting a public enquiry as part of the Classified Establishments request for authorization. This was carried out in Saint-Louis in accordance with the Order N° 336/GRSL/AD/MS dated October 07, 2016 on the public enquiry opening for a period of 15 days, from October 13 to October 27, 2016." (p. 6-2).
58	Volume I, Chapter 4, Page 192, remove the word "local" in "the administrative, territorial and local organization...";	The correction was made in Section 4.7.1.1 to remove the word "local". Taking into account also Observation No 61, the text now reads as follows: "Administrative and territorial organization in Senegal is defined by the Decree N° 2008-1025 of September 10, 2008, which establishes the territorial jurisdiction and the capitals of the regions, departments and districts, and Law N° 2013-10 of December 28, 2013 implementing the General Code of Local Government Structures. " (p. 4-176).

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59	Replace Law N° 96-06 of March 22, 1996, implementing the Code of Local Government Structures with Law No. 2013-10 of December 28, 2013 implementing the General Code of Local Government Structures (Page 16);	The correction was made in Appendix F-2. The text on page 15 now reads as follows: "According to Law 2013-10 of December 28, 2013 bearing the General Code of Local Collectivities, the peripheral zone of the Parks and reserves belongs to the terroir zone, placed under the specific competence of the Commune (article 305)."
60	Remove from the report "rural council", which no longer exists;	The correction has been made in Appendix F-2 in the same paragraph that was presented for Observation No 59. In addition, on page 9 of Appendix F-2, the reference to "the rural community of Gandon" has been replaced by "the Commune of Gandon". The text now reads as follows: "The Saint-Louis Marine Protected Area (MPA) was created by Presidential Decree No 2004-1408 on November 4, 2004. The MPA covers 496 km ² (49,600 ha) and is located in the department of Saint-Louis, on the seaboard of the Commune of Gandon (eastern boundary of MPA) and the Commune of Saint-Louis in Rao arrondissement, on the Langue de Barbarie spit located between the former mouth of the Senegal River and the Guet Ndar fishing district (Ndong et al., 2010, COMPACT, n.d.)."
61	Reference Decree N° 2008-1025 of September 10, which establishes the territorial jurisdiction and administrative seats of regions, departments and districts;	The decree number and title have been added to the text of Section 4.7.1.1 as follows: "Administrative and territorial organization in Senegal is defined by the Decree N° 2008-1025 of September 10, 2008, which establishes the territorial jurisdiction and the capitals of the regions, departments and districts, and Law N° 2013-10 of December 28, 2013 implementing the General Code of Local Government Structures." (p. 4-176).

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62	Conduct an analysis of the environment in relation to the breach;	<p>The host environment analysis was done taking the breach into consideration. This has been taken into account in Chapter 4 and Appendix I-1. See:</p> <ul style="list-style-type: none"> ▪ Chapter 4, Section 4.4.2 (Coastal Geology and Geomorphology), p. 4-19 to 4-21. ▪ Chapter 4, Section 4.4.3 (Coastal Erosion), p. 4-21 and 4-22. ▪ Chapter 4, Section 4.7.15 (Political and Social Climate), p. 4-219 and 4-220. ▪ Appendix I-1, Section 05.02, p. 16 and 17. ▪ Appendix I-1, Section 05.03, Figures 13 and 14, p. 20 and 21.
63	Reconsider the impact of coastal erosion;	<p>The impact assessment has been reviewed and the results are confirmed. However, the demonstration has been reworded in Section 7.3.3.</p> <p>In Section 7.3.3.2.1 of the revised ESIA, a clarification was made in the text. In addition, Figure 7-8 has been improved to better localize accretion and erosion phenomena predicted by the modeling. The text reads as follows:</p> <p>"[...] results of the coastal evolution model indicate that the presence of the breakwater will cause a reduction of the wave heights along part of the study area. It will also cause a modification to the wave directions (Figure 7-6). Model results showed that the presence of the breakwater will produce two effects: 1) accretion or reduction in natural erosion along approximately 8 km of coast southeast of the breakwater which is for the most part currently experiencing erosion, providing a positive impact to the coast along this coastal section; and 2) a maximum increase in coastal erosion rate along approximately 2 km of coast further south, starting at the south end of the Hydrobase neighborhood in an area that is less densely populated and where the beach width currently ranges between approximately 100 and 250 m. The maximum positive shoreline change (accretion) is estimated to be 13 m over 10 years relative to the case without the breakwater. The maximum negative shoreline change (erosion) is estimated to be an additional 6 m over 10 years relative to the case without the breakwater." (p. 7-192)</p>

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		<p>The improved Figure 7-8 (Section 7.3.3.3 of Chapter 7, p. 7-194) shows that the modeling locates the maximum accretion zone relative to the case without the breakwater over an area of 8 km. This 8 km zone includes the neighborhoods of Goxxu Mbacc, Ndar Toute, Guet Ndar and Hydrobase (with the exception for its extreme south). The modeling locates the maximum erosion zone of 6 m over 10 years relative to the case without the breakwater over a 2 km area, starting at the extreme south of the Hydrobase. This figure also shows that the mouth of the river is much further south, more than 4 km further the illustrated erosion zone.</p> <p>Finally, the impact has been rephrased as follows to better locate the phenomena of accretion and erosion:</p> <p>“Accretion or reduction in natural erosion of the Langue de Barbarie (relative to the case without the breakwater) of up to 13 m over 10 years near the Mauritania-Senegal border and extending southward approximately 8 km, accompanied by a maximum increase in coastal erosion rate (relative to the case without the breakwater) of approximately 6 m over 10 years further south, along approximately 2 km of coast, starting from the south end of the Hydrobase neighborhood.”</p> <p>This rephrasing of impact has been done in Section 7.3.3.3 (p. 7-195) as well as in other sections of the ESIA where this impact is mentioned. Similarly, the clarifications of the demonstration made in Section 7.3.3. have been done in the other sections addressing coastal erosion.</p>
64	Review regulations, include relevant articles of the Environmental Code on water pollution, installations, waste management (hazardous, toxic, radioactive, biomedical, common);	<p>The description of relevant provisions of the Environmental Act (<i>Loi portant Code de l'Environnement</i>) has been added to Section 3.5.2 of Chapter 3. The following addition was made after the paragraph describing the Enforcement Decree of the Environmental Act.</p> <p>"Classified establishments for environmental protection (ICPE): Chapter I of Title II ("Prevention and fight against pollution and nuisances") of the Environmental Act gives a framework for the ICPEs; Articles L9 to L27 define the typology of ICPEs, the modalities to be respected for their opening and exploitation; the fees and taxes to which the operator of an ICPE is subject.</p>

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		<p>Water pollution is regulated by the provisions of Chapter I of Title III ("Receiving environment protection and development") of the Environmental Act. These provisions cover "direct or indirect spills, flows, discharges and deposits of any kind and more generally any situation likely to cause or increase the degradation of waters by modifying their physical, chemical, biological or bacteriological characteristics..." (Article 59).</p> <p>According to Article L61, the Minister in charge of the environment, in relation to the relevant Ministers, has the prerogative to state: 1) the list of the substances that the direct or indirect release, spill, deposit, dumping or introduction in inland and marine waters must be either proscribed or subject to authorization from the environment and sanitation authorities and 2) the compliance criteria for discharged effluents.</p> <p>Article L64 states: "Without prejudice to the special provisions of international conventions for the prevention and fight against marine pollution ratified by Senegal, are prohibited spills, dumping and burning in marine waters under Senegalese jurisdiction, of substances of all kinds likely to (1) adversely affect public health and marine living resources; (2) adversely affect maritime activities, including navigation and fishing; (3) alter the quality of marine waters from the point of view of their use and (4) degrade the amenity values and tourism potential of the sea and coastline."</p> <p>Waste management is regulated by the provisions of Chapter III of Title II ("Waste management") of the Environmental Act.</p> <p>Article L31 states: "Anyone who produces or holds waste must self-dispose or recycle or have it disposed of or recycled at companies approved by the Minister in charge of the environment. Failing this, he must hand over the waste to the local community or to any state-approved company for waste management."</p> <p>According to Article L37, the disposal of waste by industrial structures must be made on authorization and supervision of the Ministry in charge of the environment which sets requirements; while Article L41 prohibits the dumping, incineration or disposal, by any process whatsoever, of waste in inland, maritime or fluvio-maritime waters under Senegalese jurisdiction." (p. 3-10 and 3-11)</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
65	Develop the surveillance, monitoring plan for the evolution of fish, benthos, crustaceans, marine mammals, turtles, and threatened and endangered species as per the IUCN Red List;	The surveillance and monitoring plan includes monitoring measures related to benthic communities, plankton, fish and other fishery resources, birds, marine mammals and sea turtles, and threatened species and protected areas (Chapter 10, Table 10-1, p. 10-5 to 10-9). The monitoring measures that have been selected do not specifically concern the monitoring of the evolution of populations of these groups because multiple factors influence the state of the populations. The monitoring measures selected are more specific to the GTA Phase 1 project and aim at verifying that the mitigation measures identified for the project produce the expected results in terms of eliminating or reducing potential impacts on the biophysical or social environments.
66	In the management plan for pollutants and chemical, hazardous, and toxic substances, pay particular attention to hydrogen sulphide (H ₂ S) and radioactive elements;	Chapter 2 identifies chemicals and hazardous materials, including toxic substances, that are contemplated for the various phases of the project (see Section 2.8, p. 2-26 to 2-32). The preliminary waste management plan, added to the ESIA in the new Appendix S, specifies how hazardous waste will be managed. Specifically, for hydrogen sulphide (H ₂ S), and as described in Section 8.3.2.2.11, it may be present in the oil-bearing formation and may be returned to the surface with the drilling mud, or may be contained in production well fluids. It is to be noted however that the Drilling Stem Test (DST) performed on the lower Cenomanian reservoir fluids of GTA Phase 1 did not show significant amounts of H ₂ S. Radioactive materials are limited to small amounts found within specialized tools used during the drilling and well evaluation process (see Section 2.8.2 and in particular Table 2-11, p. 2-29).
67	Review water discharges, including the risk of the presence of radioactive elements in brine waters;	As explained in the response to Observation No 20, it is expected that the process of potable water generation from seawater, via the reverse osmosis process, would not cause an increase in the Naturally Occurring Radioactive Material in the brine beyond potentially existing background levels.
68	Include analyses of general effect biomarkers in the monitoring plan;	The relevance of including bio-marker analyzes in the monitoring plan was considered for this project. The Norwegian Water Column Monitoring Program uses a range of biomarkers in caged cod (<i>Gadus morhua</i>) and blue mussels (<i>Mytilus edulis</i>) to evaluate the effect of Alkyl-Phenols and PAHs in produced

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		<p>water discharges from oil platforms operating in the North Sea. The use of biomarkers in caged fish and mussels poses some challenges. A comprehensive review summarizing the findings of a large Norwegian research program (Bakke et al., 2013¹³) concluded that extrapolation from short-term biomarker effects in individual organisms to long term effects on populations and communities is inherently difficult. Alkyl-Phenols and PAHs are rapidly metabolized in cod. Sub-lethal effects observed in different biomarkers are triggered only at exposure for weeks to months and at less than 100-1000 times dilution of the produced water concentrations. Even large produced water plumes will rapidly become more diluted than this, hence damaging exposure is unlikely. The GTA Phase 1 project produced water plume is considered small compared to the Norwegian oil platforms assessed as part of that study.</p> <p>Field data also strongly suggest that biomarker effects are local. Impacts of drill cuttings are mostly physical, i.e. depletion of oxygen/burial; demonstrating the limited impact on benthos does not require biomarkers. No biomarkers have been developed for cooling water effluent monitoring.</p> <p>The following footnote has been added to the MON8 monitoring measure in Table 10-1 of Chapter 10 (p. 10-5) to explain the rationale for this decision:</p> <p>“Given the limited added value of biomarkers in these types of monitoring, and noting that effective use of biomarkers in monitoring programs in Senegalese waters would require significant development and application of region-specific methods in key species and associated assessment criteria, it can be argued that an environmental risk based modelling approach as proposed in the ESIA offers the best method for assessing potentially significant effects of produced water discharges at the population and ecosystem levels.”</p> <p>The methodology used in the environmental risk assessment presented in the GTA Phase 1 project ESIA is aligned with OSPAR</p>

¹³ Bakke, T., J. Klungsøyr, and S. Sanni. 2013. Environmental impacts of produced water and drilling waste discharges from the Norwegian offshore petroleum industry. *Marine Environmental Research* 92 (2013): 154-169.

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		<p>Recommendation 2012/5 for a risk-based approach to the management of produced water discharges from offshore installations and the OSPAR Guidelines in support of Recommendation 2012/5. The modelling of produced water discharges, presented in Appendix K-2 of the ESIA, has been completed using the Dose-related Risk and Effect Assessments Model (DREAM) developed by the Norwegian Foundation for Scientific and Industrial Research (SINTEF) as part of the implementation of the OSPAR risk-based approach.</p>
69	<p>Include water quality analyses and tissue analyses of benthic organisms;</p>	<p>For the purpose of impact monitoring, discrete water quality measurements directly in the marine environment generally lead to inconclusive results as currents are highly variable and the water column highly dispersive in the offshore environment. Such measurements only provide a snapshot of water quality that is of limited value if one wants to understand pollution gradients.</p> <p>Sediment analyses provide a more definitive record of potential contamination associated with drill cuttings or produced water as the contaminants (e.g., heavy metals, PAHs) ultimately are deposited on the seafloor; adsorption of these contaminants to particulates in the water column occurs, with subsequent transport to the seafloor via natural deposition processes. Pollutants also are detectable in higher concentrations in the fine sediment fraction (e.g., silts and clays). The monitoring plan proposed in ESIA Chapter 10 includes sediment sampling (MON10) and visual inspection of the seafloor at the drill sites (MON11). The latter will give an indication of the extent of the drill cuttings and degree of recovery.</p> <p>Tissue sampling in benthic fauna (e.g. mussels or demersal fish) is seen as an appropriate method to assess potential environmental exposure, however, it requires collection of sufficient tissue mass for analysis and analytical results do not necessarily equate to environmental impact due primarily to an inability to correlate tissue analyte levels to a source. In deeper waters, collection of an adequate number of specimens will be problematic.</p> <p>Further, and most importantly, the collection and analysis of tissues from motile fauna will be extremely difficult, with linkage of tissue body burdens to GTA Phase 1 project discharges tenuous. Other sources of pollution (bilge water and engine oil from fishing vessels and river</p>

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		<p>outflow) are also sources of PAH. Motile fauna may move great distances, including into areas well outside the potential zone of influence from project-related discharges. Most aquatic animals, particularly fish, can metabolize and actively excrete most of the organic compounds of concern in produced water (Neff, 2002¹⁴). As a final note, discharges of produced water and discharged drill cuttings have shown very limited potential for bioaccumulation of metals or organics in monitoring studies conducted in the U.S. Gulf of Mexico and the North Sea (CSA, 2006¹⁵; Ekins et al., 2005¹⁶), where oil and gas activities have been more extensive and the volumes of discharged produced water and used drilling muds have been significantly higher.</p> <p>In summary, sampling of tissues from benthic fauna collected in deeper waters has not been retained because of the difficulty of obtaining the desired number of animals at these depths, the fact that little research has been done on suitable sentinel species and associated biomarkers in this part of the world, and the tenuous nature of linking the exposure of project-related discharges to increases in tissue analyte body burdens.</p> <p>In the ESIA, the GTA Phase 1 project committed to provide technical assistance to mutually agreed marine resource research programs notably those with the respective national oceanographic research centers of both countries (CRODT and IMROP), specifically through the M24 measure (see Section 7.2.16.4, p. 7-142). GTA Phase 1 project believes that some of the concerns expressed by the Technical Committee can be addressed in such a research program set up to study the health of the marine ecosystem vis-à-vis multiple stressors (e.g. river inputs, fishing, changes in upwelling patterns, oil and gas developments or natural disturbance events such as waves and tidal currents).</p>

¹⁴ Neff, J.M. 2002. Bioaccumulation in Marine Organisms: Effects of Contaminants from Oil Well Produced Water, 468 pp. Elsevier

¹⁵ CSA (Continental Shelf Associated, Inc.), 2006. Effects of oil and gas exploration and development at selected continental slope sites in the Gulf of Mexico. Volume II: Technical report. OCS Study MMS 2006-045. US Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region. New Orleans. LA. 636 pp.

¹⁶ Ekins, P., R. Vanner, and J. Firebrace. 2005. Management of Produced Water on Offshore Oil Installations: A Comparative Assessment Using Flow Analysis. March 2005. 89 pp.

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70	Include ecological indicators (abundance, species richness, DELTA, etc.);	<p>In the baseline study, ecological indices were primarily used to characterize the benthic community across different depths (e.g., see Table 14 in the Environmental Baseline Survey Report, presented as Appendix D of the ESIA, p. 52).</p> <p>The scientific literature suggests that ecological indices measuring species diversity, evenness, or dominance can be of value in generally describing community-level data (Magurran, 2013¹⁷; Hayek et al., 2007¹⁸) but have limited utility as indicators of environmental impact as demonstrated by Hurlbert (1971¹⁹), Feinsinger (2001²⁰) and Green (1979²¹).</p> <p>Assessment of benthic community health will be addressed via two monitoring efforts: MON10 and MON11 measures.</p> <p>Under MON10, sediment sampling will be conducted near the FPSO prior to FPSO installation, and within 6 years of FPSO startup, to assess sediment chemical characteristics. Of particular interest will be chemical compounds associated with produced water discharges. (see Chapter 10, p. 10-6).</p> <p>Because sampling equipment can damage a well head and other subsea infrastructure, no benthic sampling will be conducted in close proximity of wells. Instead, under MON11, it is proposed that visual inspection of surficial sediments at and near one or two wells by ROV will provide a measure of the recovery of the seabed over time from drilling discharges. (see Chapter 10, p. 10-6).</p> <p>Near the breakwater, it is proposed to use ecological indicators in the analysis of the fish community (MON15 measure, see Chapter 10, p. 10-7). The information will be used to understand what fish fauna develops near the breakwater and how it compares to the fish community away from the breakwater.</p>

¹⁷ Magurran, A.E. 2013. Measuring biological diversity. John Wiley & Sons. 264 pp

¹⁸ Hayek, L., M.A. Buzas, and L.E. Osterman. 2007. Community structure of foraminiferal communities within temporal biozones from the western Arctic Ocean. *Journal of Foraminiferal Research* 37(1):33-40.

¹⁹ Hurlbert, S.H. 1971. The nonconcept of species diversity: a critique and alternative parameters. *Ecology* 52:577-586.

²⁰ Feinsinger, P. 2001. Designing field studies for biodiversity conservation. Island Press, Washington, D.C. 212 pp.

²¹ Green, R.H. 1979. Sampling design and statistical methods for environmental biologists. Wiley Interscience, New York, NY. 257 pp.

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71	Base the choice of chemical molecules on CHARM/OSPAR;	<p>The following footnote has been added to Section 2.8.1 of Chapter 2 of the revised ESIA:</p> <p>“The GTA Phase 1 project will follow OSPAR Harmonised Mandatory Control System (HMCS; OSPAR Recommendation 2000/2 as amended by OSPAR decision 2005/1) and OSPAR Guidelines for Completing the Harmonised Offshore Chemical Notification Format (HOCNF) (OSPAR Agreement: 2010/3, as amended by OSPAR recommendation 2014/7) for the selection and use of production chemicals.</p> <p>The project will also use a number of chemicals that are listed on the OSPAR List of Substances/Preparations Used and Discharged Offshore which are Considered to Pose Little or No Risk to the Environment (PLONOR).” (p. 2-26)</p>
72	Integrate into the ESMP the conservation of the various critically endangered species;	<p>This is planned in the ESMP. See, in Chapter 9, the section titled "Threatened Species and Protected Areas" in Table 9-1 (p. 9-22), Table 9-2 (p. 9-53 and 9-54), Table 9-3 (p. 9-72) and Table 9-4 (p. 9-90 to 9-92).</p>
73	Specify the origin of breakwater material and sand (quality);	<p>As explained in the response to Observation No 1, details on the breakwater construction materials have been added to Sections 2.2.3 and 2.7 to reflect the engineering information of the construction contractor now available.</p> <p>In Section 2.2.3, the following footnote was added (p. 2-15):</p> <p>"With the advancement of project engineering, the sources of supply of breakwater construction materials have become more defined. As of September 2018, it is expected that the caissons will be manufactured within the Dakar port and that this will be the subject of a separate ESIA. Sand, with appropriate geotechnical characteristics, will be used as ballast material of the caissons. This sand will be extracted in Mauritania, probably from an offshore source, which guarantees, de facto, its suitability to the marine aquatic environment. Potential sources of sand extraction are currently being analyzed by the contractor responsible for the construction of the breakwater. Rocks will be required for the foundation of the breakwater. These rocks will come from a quarry in Mauritania and this will be the subject of an environmental and social impact assessment."</p>

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		<p>In Section 2.7, the following clarification has been added regarding the rocks that will be used for the construction of the breakwater (p. 2-26):</p> <p>"Geological and geotechnical literature studies were conducted to identify an appropriate quarry taking into account environmental requirements. The nature of the rocks will be confirmed by an analysis of their mineralogy. According to the results of this mineralogy, an analysis of the rock reactivity in the water will be conducted. This will confirm the suitability of the rocks for their intended use."</p>
74	Develop a training-research program to enhance knowledge of marine biodiversity (MEDD in charge of convention);	<p>The GTA Phase 1 project has committed to support research through measure M24 of the ESMP, appearing for instance in Table 7-197 of Chapter 7 (p. 7-618).</p> <p>"M24: Provide technical assistance to mutually agreed marine resource research programs notably the national oceanographic research centers of both countries (CRODT and IMROP)."</p> <p>In addition, BP's social investment program, which is detailed in Chapter 2 of the revised ESIA, identifies priority actions. These include support for environmental initiatives including academic research on the offshore marine environment (p. 2-72).</p>
75	Develop local expertise (universities and training and research institutes) in the short and long term;	<p>As indicated in response to Observation No 74, the GTA Phase 1 project will provide technical assistance to mutually agreed marine resource research programs notably the national oceanographic research centers of both countries (CRODT and IMROP).</p> <p>In addition, the following addition was made in Chapter 10 of the revised ESIA:</p> <p>"The GTA Phase 1 project will aim at implementing the monitoring activities described in the current chapter through contracts with relevant national academics (universities, research institutes) where practicable and for relevant monitoring activities. This is considered an effective way to sustainably build the local academic capability on oil and gas industry and offshore environment both in terms of equipment and expertise." (p.10-1)</p>

<p>76</p>	<p>Implement toxicity testing for relevant chemicals used by the project on these bio-indicators in order to obtain PNEC values and potentially environmental discharge standards and environmental quality standards for these products that correspond to our ecosystems.</p>	<p>As indicated in response to Observation No 71, the GTA Phase 1 project will follow OSPAR Harmonised Mandatory Control System (HMCS; OSPAR Recommendation 2000/2 as amended by OSPAR decision 2005/1) and OSPAR Guidelines for Completing the Harmonised Offshore Chemical Notification Format (HOCNF) (OSPAR Agreement: 2010/3, as amended by OSPAR recommendation 2014/7) for the selection and use of production chemicals. (see footnote added on this matter in Chapter 2, p. 2-26).</p> <p>The OSPAR HMCS was set up for use and reduction of discharges of offshore chemicals by Contracting Parties. Under OSPAR, chemical suppliers are required to submit data including results of toxicology testing about chemicals to be used and discharged offshore. The database that OSPAR maintains has been built over many years using standardized toxicology testing notably defined by OECD and a suite of species defined by OSPAR and found in temperate waters. OSPAR then recommends the use of assessment (safety) factor to derive the associated PNEC and therefore account for species variability.</p> <p>In the absence of an equally comprehensive toxicology data set on locally present species, present in West Africa and defined by the regulator, BP will resort to following OSPAR HMCS and HOCNF and the use of appropriate assessment (safety) factors. The use of assessment factors essentially provides an extra layer of protection. See response to Observation No 26 for more details on assessment factors.</p> <p>It should be noted that the current draft "Additional protocol to the Abidjan Convention on environmental norms and standards for offshore oil and gas exploration and exploitation activities" recommends in Annex II B that ecotoxicological documentation in the form of OSPAR Harmonised Offshore Chemical Notification Format (HOCNF) shall exist for all chemicals used in the Protocol Area and mandates the completion of toxicity tests using <i>Skeletonema costatum</i>, <i>Acartia tonsa</i> and <i>Scophtalamus maximus</i> which are the standards OSPAR defined species.</p> <p>The project will also use a number of chemicals that are listed on the OSPAR List of Substances/Preparations Used and Discharged Offshore which are Considered to Pose Little or No Risk to the Environment (PLONOR) (see the footnote added to Chapter 2, p. 2-26). This list contains substances whose use and discharge offshore</p>
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		are subject to expert judgement by the competent national authorities or do not need to be strongly regulated.
77	Include toxicity testing of discharge water and solid waste (notably drilling muds) after processing, analysis and prior to discharge at sea as recommended by the OSPAR Convention, and which is also good practice;	<p>OSPAR Guidelines in support of Recommendation 2012/5 for a Risk-based Approach to the Management of Produced Water Discharges from Offshore Installations (OSPAR Agreement: 2012-7) recommends to adopt a risk based approach to the management of produced water discharge during operations. The risk-based approach includes a number of steps data collection, hazard assessment, exposure assessment, risk characterization, risk management and monitoring.</p> <p>The data collection step described in the OSPAR Guidelines includes the analysis of a produced water samples while the facility is in operation to identify the hazardous properties of the discharge. The OSPAR Guidelines mentioned above recommends two approaches for assessing produced water properties for the purpose of the environmental risk assessment:</p> <p>either chemical analysis of the produced water sample for a list of naturally occurring substances and collection of production chemicals toxicological information obtained from the chemical registration process; or</p> <p>completion of a whole effluent toxicity testing (WET testing)</p> <p>Both approaches have pros and cons which are explained in the OSPAR Guidelines and it is left to the appreciation of the OSPAR Contracting Parties to choose the approach to take. The WET testing approach gives an indication of the produced water toxicity to ecosystem however it does not allow the identification of potential compounds of concern for potential risk management actions. It also requires the use of recognized international standard protocols for the test including of the species to be tested and access to a laboratory that is accredited to conduct those tests and work in compliance with the current OECD principles of Good Laboratory Practice (GLP) at the time of testing.</p> <p>Through MON8, the GTA Phase 1 project committed to conduct one analysis of naturally occurring compounds during the first 18 months of production, or following a material change in effluent composition or volume. This was to inform the update of the FPSO produced water</p>

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		<p>environmental risk assessment i.e. modelling (Chapter 10, Table 10-1, p. 10-5).</p> <p>In the revised ESIA, the MON8 measure now includes the completion of a WET testing on a produced water sample during the first 18 months of production or following a material change in produced water composition. The WET testing will be done following OSPAR methodology 2012/5 and relevant OSPAR species as described in OSPAR Guidelines for Completing the Harmonised Offshore Chemical Notification Format (HOCNF) (OSPAR Agreement: 2012/05. Update 2015). This addition was made in Table 10-1 (p. 10-5).</p> <p>Regarding discharge of cuttings, OSPAR Decision 2000/3 on the Use of Organic-Phase Drilling Fluids (OPF) and the Discharge of OPF-Contaminated Cuttings does not require toxicity testing prior to discharge of cuttings. BP's practice is aligned with OSPAR requirements: prohibiting the discharge of whole organic phase fluid to the marine environment and prohibiting discharge of cuttings contaminated with oil-based drilling fluids at a concentration greater than 1% by weight (see measure D09 in Chapter 7, for example in Table 7-196 on p. 7-614).</p> <p>For BP operations in Mauritania and Senegal, synthetic (olefin) based drilling fluids will be used, which have been shown to have significantly lower toxicity and environmental impact than even so-called 'low toxicity' oil-based fluids. BP can provide supporting documentation if requested. BP's practices prohibit discharge of cuttings contaminated with synthetic-based drilling fluids at a concentration greater than 6.9% by weight which conforms with IFC standard (see measure D09 in Chapter 7, for example in Table 7-196 on p. 7-614). Testing will be performed to confirm these requirements are being met as per D09.</p>

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78	Develop a BP-led training plan for the Technical Committee;	<p>As indicated in response to Observation No 14, the revised ESIA includes additions to better cover capacity building, including for the Technical Committee.</p> <p>The capacity building plan of the institutions involved in the implementation of the ESMP, including the Technical Committee, was reviewed. It appears in Section 9.5 of Chapter 9 (p. 9-7 and 9-8).</p> <p>The revised ESIA also outlines support for capacity building of Mauritania and Senegal with regards to oil and gas. It is specified that for Senegal in particular:</p> <p>"[...] BP and partner Kosmos recently announced a multimillion-dollar commitment to support Senegal's National Institute of Oil and Gas (INPG). The aim is to utilize the INGP for industry related capacity building, including with the Technical Committee"(Section 2.14, p. 2-75).</p>
79	Contribute to the preparation of the Strategic environmental assessment of the oil & gas sector and support the State in implementing the framework plan for environmental and social management of the sector;	BP will contribute to the technical discussions associated to the <i>Evaluation Environnementale Stratégique du secteur pétro-gazier</i> when requested and will comply with the requirements that will be put in place for the oil and gas operators as part of the environment and social management of the industry. As this request does not fall within the ESIA framework, this response will not be added to the ESIA text.
80	Implement an institutional framework for the monitoring of key project parameters in these different project phases and develop an external monitoring plan for national institutions;	See response to Observation No 48.

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81	Implement an early alert system for micro-contamination by monitoring relevant indicators likely to be affected by hydrocarbon pollution. This would help correct anomalies related to poor waste management practices around the oil and gas development field;	<p>The GTA Phase 1 project has put in place a series of measures intended to act as an early warning system. It is to be noted however that there is no early warning device efficient in an open offshore environment for the type and associated quality of treated effluents that the GTA Phase 1 project will produce i.e., with low levels of either naturally occurring substances from the reservoir and/or production chemicals. The early warning devices have to be located prior to the effluent discharge point in the form of effluent quality monitoring. The FPSO is designed with produced water treatment and continuous oil in water measurements prior to discharge (see MON7 in Chapter 10, p. 10-5) to confirm that the produced water discharges meet the required discharge standard. If the oil in water measurements show exceedance to the required standard the produced water stream is routed to an off-specification tank for storage.</p> <p>Production chemical injection and use on the FPSO will be monitored typically through flowmeters downstream of the pump spillback, or other means of metering what is being injected in the production fluid, and level transmitters on chemical tanks. Residual chlorine concentration in the FLNG cooling water effluent is also being monitored (see measure M36, for example in Table 7-197 of Chapter 7, p. 7-618). Regular maintenance and inspection (measure D36) will verify that the equipment is functioning as required. The measurements taken act as an early warning system for contamination. This is in accordance with good international industry practice.</p>
82	Involve members of the academic community that can make a scientific contribution on the subject in an effort to support the sound management of oil projects and their impacts.	See the response to Observation No 75.
83	Together with Gaston Berger University (UGB) in Saint-Louis, establish a coastal erosion monitoring team in the area affected by gas operations;	See the response to Observation No 75.
84	Propose monitoring mechanisms for the subcontractor selection process, notably for the disposal of hazardous waste;	As indicated in the response to Observation No 35, Section 3.7 of the preliminary waste management plan, added as Appendix S of the revised ESIA, defines the requirements and control measures that will be put in place by the project for monitoring the companies subcontracted for waste management and ensure quality control of their services (p. 8 and 9).

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85	Ensure that environmental surveillance reports are periodically submitted to DEEC in all project phases;	<p>Periodic transmission of environmental monitoring reports to the DEEC during all phases of the project is provided for in the ESMP and the SMP. See the following sections:</p> <ul style="list-style-type: none"> ▪ Section 9.3.4 of Chapter 9: "On a periodical basis, BP will prepare ESMP Compliance Reports. The reports will provide a statement of compliance with the mitigation measures identified in Tables 9-1 to 9-4, with supporting notes. The ESMP Compliance Reports will be provided to Mauritanian and Senegalese authorities by BP." (p. 9-5). ▪ Section 10.3 of Chapter 10: "The outcome of specific monitoring programs stipulated in the SMP will also be reported to Mauritanian and Senegalese authorities at a frequency to be agreed with the regulator or in conformance with regulatory requirements." (p. 10-2).
86	Add to the description the seasonality of the activity and explore how certain activities can be planned and carried out in the low season when the sea is not as heavily frequented;	See the response to Observation No 34.
87	<p>Promote an approach that helps reinforce the stakeholders' sense of ownership of the project through:</p> <ul style="list-style-type: none"> ▪ Social accompaniment of those stakeholders likely to be affected; ▪ Restoration of aquatic ecosystems that provide means of existence to communities; 	<p>The social support for the communities of Saint-Louis and N'Diogo is presented through mitigation measure M27 on social investments:</p> <ul style="list-style-type: none"> ▪ M27: Developing a social investment program to enhance project benefits for the directly affected N'Diogo and Saint-Louis communities, including livelihood enhancement activities. (see, among others, Table 7-197, p. 7-618) <p>The impact assessment demonstrated that the potential impacts of project activities on plankton, fish and other fishery resources, water quality, sediment quality, benthic communities, and marine flora, which are the main resources of aquatic ecosystems, will be negligible or low. Consequently, no mitigation measures are required to restore aquatic ecosystems.</p> <p>That being said, to emphasize the importance of conserving the aquatic ecosystems that contribute to communities' livelihoods, measure M43 had been included in the ESMP:</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ M43: Implement a program of support to local protected area management initiatives through mutually agreed capacity building. (see, among others, Table 7-197, p. 7-619)
88	Take into consideration the concerns and recommendations of the fishing stakeholders; the success of this activity inevitably depends on taking proper account of their opinions in this ESIA;	<p>Concerns and recommendations from fisheries stakeholders were identified during the extensive public consultation process conducted during the ESIA.</p> <p>These concerns and recommendations are presented in Chapter 6 dedicated to public consultations. They are also detailed in Appendix Q (detailed reports of the public consultation meetings in Mauritania and Senegal).</p> <p>In Chapter 6, Tables 6-3 to 6-10 (p. 6-10 to 6-18) clearly indicate how the issues, concerns, recommendations and opinions of fishery stakeholders were taken into account in the ESIA.</p>
89	Propose an aquaculture development plan in order to compensate for lower catches from the maritime fishing sector;	<p>The impact assessment demonstrates that project activities will not lead to reduction in fishing catches. Consequently, no compensation measures are envisaged for reduction of fish catches.</p> <p>That being said, in order for the fishing communities to receive social benefits, mitigation measure M27 of the ESMP (see, among others, Table 7-197, p. 7-618) provides for a social investment program, whose specific activities targeted to fishing communities, including economic development, will be discussed and agreed later with the relevant stakeholders.</p>
90	In the institutional framework, place HASSMAR under the prime minister's office;	<p>In order to better describe HASSMAR, the section that described both the Ministry of Armed Forces and HASSMAR has been divided in two sections as follows:</p> <p>"3.4.4 Ministry of the Armed Forces</p> <p>The Ministry of Armed Forces (<i>Ministère des Forces Armées</i>) protects the territory and national interests of Senegal. The Ministry of Armed Forces participates in the monitoring and intervenes in the maritime area in collaboration with the High Authority for Maritime Security, Maritime Safety and Marine Environment Protection (<i>Haute Autorité chargée de la Coordination de la Sécurité maritime, de la Sûreté maritime et de la Protection de l'Environnement marin</i> - HASSMAR).</p>

Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>3.4.5 High Authority for Maritime Security, Maritime Safety and Marine Environment Protection (HASSMAR)</p> <p>Created in 2006 (n° 2006-322 of April 7, 2006), HASSMAR is linked to the Primature (Prime Minister's office) and placed under the technical supervision of the Ministry of Armed Forces; it has an operational assignment to fulfill its mandate.</p> <p>In case of a disaster or an emergency at sea, HASSMAR coordinates all services including those of other ministries and public agencies. HASSMAR has a significant assignment for security (prevention of illicit activities), safety (rescuing people), and environment protection at sea and on river waters under Senegal's jurisdiction.</p> <p>HASSMAR has developed and is responsible for the National Plan for Emergency Operations at Sea (Plan National d'Interventions d'Urgence en Mer - PNIUM). This Plan includes three specific plans: the Search and Rescue Plan (SAR Plan), the National Security Plan (SURMAR Plan), and the Pollution Response Plan (POLMAR Plan). HASSMAR is responsible for coordinating responses to hydrocarbon spills at the national level.</p> <p>HASSMAR's operational organization for operation at sea is divided into regional delegations according to three sea areas: 1) North; 2) Central; and 3) South. HASSMAR's national coordination of search and rescue operations is placed under the responsibility of a specific department, the Maritime Rescue Coordination Center (Centre de Coordination des Secours Maritimes - MRCC)." (Chapter 3, p. 3-8)</p>
91	Continue collaboration with HASSMAR for the implementation of the national maritime response plan (PNIUM);	<p>The response is divided into three items, such as the National Plan for Emergency Operations at Sea (PNIUM) developed by HASSMAR, namely: search and rescue at sea, maritime security and marine pollution (Section 3.4.5, p. 3-8).</p> <p>Concerning search and rescue at sea, several Design & Operational Controls measures and mitigation measures are planned for the project, including measures D24, M09, M10, M11 and M14 (see in particular Section 7.2.22.4, p. 7-165 and 7-166), to reduce the risk of collision with pirogues. This should minimize the use of public security forces.</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>For maritime security, the collaboration with and support for national authorities is indicated in measures D26 and M25:</p> <ul style="list-style-type: none"> ▪ “D26: A site security plan will be developed that considers the security arrangements for each of the facilities including the modalities of support provided by government.” (see specifically Section 7.2.21.4, p. 7-161) ▪ “M25: The project will seek to work with the public security forces to establish an appropriate response and security framework which may include resource, equipment, training and response protocols.” (see specifically Section 7.2.21.4, p. 7-162) <p>Finally, for marine pollution, an addition made to Section 9.2 in the chapter of the ESMP specifies that “plans associated to accidental events prepared by BP will be discussed and forwarded to national authorities, including the Ministry of Fisheries and Maritime Economy/Mauritanian Coast Guard and HASSMAR in Senegal. The relevant national authorities will be invited to the relevant exercises conducted by the project to test the applicable contingency plans.” (p. 9-2).</p>
92	Upgrade monitoring equipment for impacts related to “coastal erosion”;	As indicated in the response to Observation No 75, The GTA Phase 1 project will aim at implementing the monitoring activities described in this chapter through contracts with relevant national academics (universities, research institutes) where practicable and for relevant monitoring activities. This is considered an efficient way to sustainably build the local academic capability on oil and gas industry and offshore environment both in terms of equipment and expertise.
93	Innovate through modern waste management and support the national private sector and the State in implementing adequate infrastructures;	A preliminary waste management plan is presented in Appendix S. It is based on international best practice for waste management. As described in that plan, GTA Phase 1 project will conduct duty of care audits of waste management contractors. Deficiencies will be identified where necessary during these audits. The GTA Phase 1 project will help the contractors understand the actions to be taken to close the gaps and track those actions to closure with the contractor thus raising the standards of the waste management private sector to internationally recognized level.

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		<p>In addition, as described in Section 2.14, one of the main themes for the GTA Phase 1 project social investment plan is environment. Opportunities for waste management related projects will be considered as part of delivery of that theme (p. 2-72).</p>
94	<p>For logistical support, give precedence to national companies to increase the economic spinoffs of the project (employment, revenues, national economy);</p>	<p>For logistics support, the ESIA plans that national companies will be favored to positively impact jobs, incomes and the national economy. Section 2.13.1 of Chapter 2 presents the proponent's contract strategy and approach for local content in Mauritania and Senegal (p. 2-68 to 2-70). It states that the project is committed to maximizing local qualified suppliers with recognized quality and safety skills. A detailed list of services that can potentially be provided by national companies, including logistical support, is included in this section: caisson fabrication, rock supply, soil replacement material supply, personnel mobilization and demobilization, in-country transportation, onshore accommodation and security services, provision of food and other consumables, bunkering and fuels for construction vessels, etc.</p> <p>In addition to the potential use of national companies for logistical support, the project will aim at implementing monitoring activities through contracts with relevant national academics (universities, research institutes) where practicable, and for relevant monitoring activities. This is considered an effective way to sustainably build the local academic capability on oil and gas industry and offshore environment both in terms of equipment and expertise. (Section 10.1 of Chapter 10, p. 10-1).</p>
95	<p>Add texts on labor legislation and its decrees of application in addition to the Merchant Marine Code, even if not all BP staff will be sea workers;</p>	<p>Texts on labor legislation and its enforcement decrees, in addition to articles of the Merchant Navy Act pertinent to worker health and safety has been added at the end of Section 3.5.2 of Chapter 3 as follows:</p> <p>"In terms of labor legislation, Law N° 2002-22, dated August 16, 2002, of the Merchant Navy Act, applies to "all vessels registered in Senegal, crews and passengers on board...", as opposed to foreign-flagged vessels unless otherwise expressly stated in the Act. Law N° 97-17, dated December 1, 1997, on the Labor Code, regulates, amongst other things, the working conditions in Title X: work duration, night work, work of women and children, weekly rest, etc. Hygiene and safety in workplaces are covered in Title XI.</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>Article L. 171 states: "The employer must ensure that workplaces, machinery, materials, substances and work processes under the employer's control do not pose a risk to the health and safety of workers". To this end, the employer must take: 1) technical measures 2) arrangement of occupational medicine measures and 3) work organization measures. If these measures are insufficient, the employer must implement individual protection measures against occupational risks and monitoring of worker's health.</p> <p>Several decrees are issued for the applications of Labor Code provisions:</p> <ul style="list-style-type: none"> ▪ Decree N° 2006-1251 dated November 15, 2006, on work equipment: establishes minimum health and safety requirements for the use of work equipment by workers, such as machinery, devices, gear and other equipments used to perform work. ▪ Decree N° 2006-1252 dated November 15, 2006, establishes minimal requirements for the prevention of some physical environmental conditions: establishes minimum requirements for the prevention of physical environmental factors such as lighting, temperature and noise. ▪ Decree N° 2006-1253 dated November 15, 2006, establishes occupational health inspections and determining their functions: ensures the application of legislation and regulation provisions relating to the health and safety at work and to the protection of workers in the workplace by controlling the functioning of occupational health services. ▪ Decree N° 2006-1256 dated November 15, 2006, establishes the obligations of employers in terms of work safety: sets the obligations of employers for improving the health and safety of workers. ▪ Decree N° 2006-1257 dated November 15, 2006, establishes the minimum requirements for protection against chemical risks: applies to employers and workers and set rules for protecting workers from health and safety risks.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ Decree N° 2006-1258 dated November 15, 2006, establishes the missions and organization and operation rules for occupational health services: regulates the procedures for the recruitment of occupational physicians and the organization, operation and financing of occupational health services. ▪ Decree N° 2006-1259 dated November 15, 2006, on safety signaling measures at work to warn workers: of the presence of a risk or a hazard, of the prohibition of behavior likely to present a risk, of the obligation to adopt specific behavior, of the location of firefighting equipments, escape routes and exits, as well as first-aid treatments. ▪ Decree N° 2006-1260 dated November 15, 2006, on ventilation and sanitation conditions of workplaces: establishes the standards and the measures to be taken to respect those standards. ▪ Decree N° 2006-1261 dated November 15, 2006, establishes the general hygiene and safety measures in establishments of any kind: regulates the quality of places and workstations, the quality and order in the workplace, the services and premises provided for workers (work clothes, locker rooms and lockers), ways of insuring personal hygiene, the provision of toilets, protection and prevention services, first-aid measures, fire-fighting equipment and the evacuation of workers." (p. 3-11 and 3-12)
96	Invest in research to further scientific understanding of the receiving environment of the project;	<p>The ESMP includes a measure for research support to further develop scientific knowledge of the marine environment. However, this measure has been rephrased in the revised version of the ESIA to potentially include research institutes other than CRODT and IMROP:</p> <ul style="list-style-type: none"> ▪ M24: Provide technical assistance to mutually agreed marine resource research programs notably the national oceanographic research centers of both countries (CRODT and IMROP). <p>This measure is stated, among others, in Table 7-197 (p. 7-618). The revision of measure M24 was carried out throughout the report.</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
97	Provide budgets for all plans described in the report (capacity-building plan, monitoring plan, etc.);	<p>The budget of the capacity building plan has been increased in the revised ESIA.</p> <p>The budget associated with the capacity building plan in the ESIA is presented in Table 9-6. It amounts to US \$ 900 000:</p> <ul style="list-style-type: none"> ▪ US \$ 450 000 for Mauritania; and ▪ US \$ 450 000 for Senegal. <p>The budget includes two components: a training component totaling US \$ 250 000 per country and a technical assistance program totaling US \$ 200 000 per country.</p> <p>This budget is presented in Section 9.5 (p. 9-8), as well as in Table 9-6 (p. 9-110) and it is also mentioned in Section 10.4 (p. 10-4).</p> <p>The costs of the monitoring plan by authorities have been identified. They are discussed in Section 9.4 (p. 9-7) and Section 10.4 (p. 10-4), as well as in tables of the new Appendix U.</p> <p>The monitoring activities to be completed by authorities include the reading of monitoring reports and management plans provided by the GTA Phase 1 project as well as other project documents, inspections and the visit to project facilities. There are no monitoring costs associated with document reading. For inspections and visits, the GTA Phase 1 project plans for the transportation by boat or helicopter as used by the project personnel to reach the project facility and accommodation at the facility depending on the duration of the inspection/visit. The cost of this transportation and accommodation will be covered by the GTA Phase 1 project.</p>
98	Review the ESMP for monitoring and surveillance needs and take the closure and decommissioning phase into account;	<p>Chapter 9 (Environmental and Social Management Plan) and Chapter 10 (Surveillance and Monitoring Plan) have been revised. Specific sections in these two chapters are devoted to the monitoring of the ESMP and the SMP by national authorities (Section 9.4 p. 9-5 to 9-7 and Section 10.4 p. 10-2 to 10-4). An external monitoring plan by the national authorities is included in the new Appendix U. The Decommissioning Phase is included in the ESMP, specifically in Table 9-3 (Chapter 9, p. 9-67 to 9-79).</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
99	Describe the waste management plan for hazardous, toxic, solid and liquid waste, while also taking into account various types of packaging;	A preliminary waste management plan has been developed and added to the ESIA in Appendix S. This plan takes into account various types of waste and their packaging.
100	Review the impact matrix; not everything can be negligible or tolerable; the information does not reflect reality; review scientific research literature, which contradicts several of the affirmations presented in the report in this regard;	<p>The ESIA is based on a large body of scientific literature, the list of which is provided after Chapter 11 (p. 12-1 to 12-50).</p> <p>The impact assessment matrix is based on a standard, rigorous method, as commonly used in ESIA's on an international scale. It is based on the consequence and likelihood of impacts. The determination of impact consequence itself is based on precise criteria: intensity, extent and duration. Section 7.1.4 in Chapter 7 provides details on the method of identifying and classifying impacts.</p> <p>The analysis of potential impacts shows that many impacts are negligible, but not all of them are negligible. Indeed, the impact analysis of routine activities, summarized in Chapter 11 (p. 11-3), mentions the significance of potential impacts as the following:</p> <ul style="list-style-type: none"> ▪ Negligible: >50 ▪ Low: 26 ▪ Medium or high: 8 <p>However, the implementation of several mitigation measures allows, as it should, to reduce the significance of the impacts. With these mitigation measures, the significance of residuals impacts resulting from routine activities is low or negligible.</p> <p>As indicated in Section 7.1.4.3 (p. 7-19), it should be noted that the use of likelihood in the assessment methodology gives rise to two things in the context of highly unlikely accident scenarios (as opposed to impacts from routine activities): i) the reduction of most impact significances to low or negligible; and (ii) no apparent reduction in the impact with mitigation measures because although the likelihood may be reduced (in reality in the event of an incident) by the mitigation measures, it is already in the lowest possible likelihood bracket before the application of mitigation measures. The significance of the impact should therefore not be interpreted as an attempt to downplay the</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>consequence of the impact if a highly unlikely accident were to happen.</p> <p>Therefore, in order to highlight the consequence of the impact if an accidental event were to occur, in Section 7.5, the impact consequences are also highlighted through colour coding similar to that which is used for impact significance (see, for example, Table 7-165, p. 7-517).</p> <p>Since spill scenarios are highly unlikely to occur (remote likelihood), the overall significance of the impacts of accidental events was assessed as negligible in several cases. However, 34 potential impacts were assessed as non-negligible, as summarized in Chapter 11 (p. 11-5):</p> <ul style="list-style-type: none"> ▪ 15 were assessed as low ▪ 19 were assessed as medium. <p>As it should be, many mitigation measures have been identified to reduce the significance of the impacts from accidental events. With the application of these mitigation measures, 11 residual impacts remain as medium. These include impacts on birds, marine mammals, sea turtles, threatened species, protected areas, and biodiversity (Chapter 11, p. 11-7).</p>
101	Emphasize impacts: collisions between FLNG and pirogues, as the latter are constructed of wood and cannot be spotted by radar; thus review proposed mitigation measures;	<p>Several mitigation measures are planned to avoid collisions between project vessels and pirogues, including measure M10 on equipping project vessels with radar or infrared systems that can detect small fishing vessels during poor visibility/night time.</p> <p>A note has been added to Table 7-45 in Chapter 7 to provide the following clarification on measure M10 when it is discussed for the first time in Chapter 7:</p> <p>“The detection of wooden pirogues by radar would be at a closer distance than the detection of a metal boat, but the pirogues and the metallic structures (e.g. engines) on them would be detectable by radar.” (p. 7-132)</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
102	In terms of cumulative effects, identify the impact of the project on other projects being carried out in the area;	<p>The cumulative impacts of the project are discussed in Section 7.7 of Chapter 7 (p. 7-633 to 7-643).</p> <p>The analysis systematically takes into account current activities and projects as well as those planned in a foreseeable future. These projects and the information available on them are identified in Tables 7-201 and 7-202 (p. 7-633 to 7-643). The projects for which little information is available are identified. For these specific projects, the uncertainties about their potential impacts are clearly stated.</p> <p>The analysis of potential cumulative impacts is done for each of the three phases of the GTA Phase 1 project:</p> <ul style="list-style-type: none"> ▪ Construction Phase (see Section 7.7.2, p. 7-638 to 7-640). ▪ Operations Phase (see Section 7.7.3 p. 7-640 to 7-643) ▪ Decommissioning Phase (see Section 7.7.4, p. 7-643) <p>This analysis highlights the cumulative impacts of the project on the different resources of the biophysical and social environments.</p>
103	Provisions that pertain to ships will also apply to the FLNG and FPSO; a training program for safety inspectors is therefore required;	<p>In the revised version of the ESIA, an addition was made to Section 9.5 of Chapter 9 to indicate that capacity building, including through training, could include a range of authorities, for instance ANAM (p. 9-6).</p>
104	Protect and empower fishing communities for the sustainable development of their trade, which has been practiced for generations;	<p>As indicated in the response to Observation No 27, the impact analysis showed that the project activities will not have a negative impact on the fishery catches and the livelihoods of fishermen and other members of their communities involved in artisanal fishing.</p> <p>In addition, the potential impacts of the project on maritime safety for fishermen due to project vessel movements are avoided or mitigated by a combination of measures. The risk of collision between project vessels and pirogues (IMP28) is avoided or mitigated by 18 measures (see Table 7-195, p. 7-611). This includes, for example, the following measures:</p> <ul style="list-style-type: none"> ▪ M08: Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ M09: Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities. ▪ M10: Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time. ▪ M11: Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling. ▪ M12: Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones. ▪ M13: Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing. <p>Furthermore, more general support to fishing communities is provided through a specific measure concerning social investments (see, among others, Table 7-197, p. 7-618):</p> <ul style="list-style-type: none"> ▪ M27: Developing a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities.

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
105	Seek a better approach for communicating with local communities in order to reverse the perception of the latter with regard to the project;	<p>The ESMP includes measures that foster better communication with local communities throughout the three phases of the project. See especially in Table 7-197 (p. 7-617 to 7-618) the following measures:</p> <ul style="list-style-type: none"> ▪ M18: Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities in all matters related to the project. ▪ M19: Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project. ▪ M20: Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers.
106	Provide further details in the ESMP on monitoring of the sediment dynamic as related to installation of the breakwater;	<p>Mitigation measure M40, indicated in Tables 9-2 and 9-3 in Chapter 9 (p. 9-35 to 966 and 967 to 9-79) of the ESIA, commits to the further collection of additional bathymetric and oceanographic data along the Saint-Louis shore, including the Senegal River mouth, to inform future coastline modelling efforts and to develop a coastline monitoring plan.</p> <p>In Chapter 10, measure MON9 has been reformulated to ensure coherence with the reformulation of measure M40. It reads as follows: "MON9: Develop and implement a coastline monitoring plan." (p.10-6)</p> <p>A note has been added to Table 10-1 in Chapter 10 (p. 10-6) of the revised ESIA to provide more information about the monitoring of sediment dynamics related to the breakwater installation:</p> <p>"The monitoring plan will include nearshore bathymetric survey, beach profile and coastline position surveys. The survey measurements will be sufficient to identify key coastline features and support additional coastline modelling if necessary. Surveys will be set up to allow repeatability so that changes over time can be assessed."</p>

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Numbers	Observations Taken from the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		The GTA Phase 1 project will aim at contracting with national Mauritanian and Senegalese academics, including those from the Université Gaston Berger in Saint-Louis, to implement the beach profile monitoring. In addition, BP will seek appropriate approval to share the relevant collected data to support government led morphological study initiatives and local academic studies.
107	The ESMP shall take into consideration the conservation of various critically endangered species;	See the response to Observation No 72.
108	Plan workshops for discussing and validating the various plans with the (MISSING WORDS)	It is our understanding that this recommendation is in line with Observation No 47. See the response to this observation.

Other Changes Made to the ESIA

- The cover page has been modified to identify the revised version and the date was updated to October 2018.
- A foreword has been added to explain the background for this revised version.
- A new Volume has been created to allow the inclusion of the four new Appendices that have been added. In addition, these new Appendices were mentioned in the Table of Contents (p. LXXVIII to LXXI), in the Non-Technical Summary (p. II) and in Chapter 1 (p. 1-5). The revised ESIA has now seven volumes instead of six.
- In Section 9.5 of Chapter 9, references to the budget associated with the World Bank capacity building program have been removed.
- Various typographical errors were corrected during the preparation of the revised ESIA and layout adjustments were made.

Errors or Omissions in the Official Proceedings

Errors or omissions in the responses provided by BP and the consultant appear in the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018. The following table lists the entries to be corrected.

Table V-2-2. Errors or Omissions in the BP and Consultant Responses Documented in the Official Proceedings of the Technical Committee Pre-Validation Meeting of August 20, 2018.

Page No. of the Official Proceedings	Original Entry in the Official Record	Proposed Correction to better Reflect BP's and Consultant's Response
p. 14	The established exclusion zone has a radius of 500 to 600 m, which is equivalent to a total of 3.2 km ² on either side of the border. It will be 1.6 km ² .	The established exclusion zone around the breakwater has a radius of 500 to 600 m, which is equivalent to a total of 3.2 km ² on either side of the border. The established exclusion zone around the breakwater will be approximately 1.6 km ² in each of the two countries.
p. 14	The legal gap concerns mainly the Mauritanian side.	There is no legal gap. Mauritania and Senegal both have an Environmental Act (<i>Loi portant Code de l'Environnement</i>). In Mauritania, no decree has yet been issued to establish air quality standards.
p. 14	Discharged water will have a temperature of 7°	Before discharging, the cooling water discharged from the FLNG will have a temperature 7°C higher than that of the seawater pumped for the cooling process. In other words, there will be a 7°C difference between the seawater pumped upstream of the cooling process and the same water before discharge at the outlet of the cooling process.
p. 15	The plan for the supply bases facilities is described in Appendix O.1 of Volume 5	Table 8-46 in Section 8.4.2.1.5 of Chapter 8 mentions the risks associated with the supply bases. None of the risks identified present a major risk. In conclusion, supply bases are not considered to pose a major risk for staff or third parties. For this reason, it was not considered useful to establish a third-party facilities plan.

Page No. of the Official Proceedings	Original Entry in the Official Record	Proposed Correction to better Reflect BP's and Consultant's Response
p. 15	A project-specific infrastructure layout has not yet been defined, only generic plans were provided	All other project-specific infrastructures are located at sea and pose no threat to third-party facilities. Consequently, the Risk Study does not present any third-party infrastructure layouts. For the infrastructure layouts, the current design is not advanced enough to provide an infrastructure layout. For this reason, the Risk Study presents figures with a typical layout for the FPSO and the FLNG.
p. 15	There will be 12 cylinders of gas, each with a volume of 1.4 m ³ , which were taken into consideration in the preliminary risk analysis	Acetylene is present in small volumes in the form of 12 pressurized gas cylinders, each with a volume of 1.4 m ³ , used for welding operations. With this volume, the risk is not considered major, but rather as an occupational risk. The rupture of a pressurized gas cylinder used for welding was evaluated for the qualitative analysis of occupational risks (see the table in Appendix O-4).
p. 15	Kinetics were properly accounted for (Appendix O.2)	Kinetics were evaluated in a qualitative way (slow, moderate or rapid) for all major accidental events during the preliminary risk analysis (see Appendix O-2).
p. 15	The initial, residual and final risks are accounted for in Appendix O.2 of Volume 5	The initial risk (without barriers) and the residual risk (with barriers) were assessed for all major accidental events during the preliminary risk analysis (see Appendix O-2).
p. 15	The risk identification plan has been identified (bowtie in Appendix O.2)	In order to be able to anticipate risks, the Risk Study systematically identified all prevention, control and mitigation barriers for all major accidental accidents. These barriers are either mentioned in the preliminary risk analysis table (see Appendix O-2) or in the bowtie diagrams for catastrophic events (see Section 8.3.4.2.2 – Standard Bowtie Diagrams) and critical events (see Appendix O-3).
p. 15	The risk assessment for persons working on the installations exceeds the scope of the Risk Study	The risk assessment covers the analysis of hazards from infrastructure on all persons, namely those related to the project and the public (passing vessels, fishermen, pirogues, etc.). The risk assessment also covers the analysis of hazards related to normal activities of the public on all of the project infrastructures. However, the risk assessment does not extensively address the hazards related to malicious activities (sabotage, piracy, etc.) from people outside of the project. The risk is, however, analyzed qualitatively in the preliminary risk analysis and the bowtie analysis.
p. 15	Health problems are identified in Appendix O.1.04	The hazards associated with products related to health risks are identified in Appendix O-1. Health risks are analyzed in the occupational risk analysis in Appendix O-4.
p. 16	For each well drilled, there will be a relief well plan	There are plans for a relief well for each well site, but the relief wells will not be drilled now.

Page No. of the Official Proceedings	Original Entry in the Official Record	Proposed Correction to better Reflect BP's and Consultant's Response
p. 16	Absence of perception survey: the perception survey is not included in the structure of the ESIA; however, the public enquiry will serve this purpose	The ESIA framework does not require a perception survey. However, public consultations have provided this information to some extent.
p. 16	BP undertakes to accompany the private sector and the State for the installation of treatment facilities for drilling waste	<p>Waste management plan: BP has four main sub-contractors, and each must have their own waste management plans that adhere to BP's principles. The sub-contractors will prepare these plans after establishing their construction methodology and a precise inventory of the waste they will produce. BP has also reviewed the facilities with waste management capacities in Senegal and Mauritania.</p> <p>The GTA Phase 1 Project will conduct due diligence audits of its waste management sub-contractors. During these audits, gaps will be identified when applicable. The GTA Phase 1 Project will assist the sub-contractors in understanding and identifying measures to address these gaps and in following these measures until these gaps are resolved.</p> <p>In addition, one of the main themes for the GTA Phase 1 Project social investment is environment. Opportunities for waste management related projects might be considered as part of delivery of that theme.</p>

**APPENDIX V-3: OFFICIAL PROCEEDINGS OF
THE SELECT TECHNICAL
COMMITTEE MEETING HELD
ON OCTOBER 22, 2018
(IN FRENCH)**



Dakar, le 17 DEC. 2018

La Directrice

A
Monsieur Géraud Moussarie
Directeur Général
British Petroleum
BP-Sénégal.

DAKAR

Objet : *Transmission des comptes rendus de la réunion du Comité technique restreint et de l'audience publique de validation de l'étude d'impact environnemental et social (EIES) du projet de Production de Gaz Grand Tortue/Ahmeyim, Phase 1, et des observations complémentaires issues d'une tierce expertise de la DEEC sur l'EIES du projet GTA*

Monsieur le Directeur Général,

Suite à la réunion du Comité technique restreint (CTR) et à la séance d'audience publique de validation du rapport d'Etude d'Impact Environnemental et Social (EIES) de votre projet cité en objet, tenues respectivement les lundi 22 octobre 2018 et mardi 13 novembre 2018, je vous transmets, ci-joint, les comptes rendus y afférents.

La Direction de l'Environnement et des Etablissements Classés (DEEC) vous demande de prendre les dispositions appropriées, pour l'intégration des observations et des recommandations formulées par le Comité technique et les populations de Saint-Louis et qui sont consignées dans lesdits comptes rendus dans le rapport final, en vue de la poursuite de la procédure d'instruction de ce dossier.

Par ailleurs, dans le cadre de son processus de renforcement des capacités sur les projets pétroliers et gaziers, la DEEC s'est attachée les services d'une tierce expertise pour l'accompagner dans l'instruction technique de ces projets, compte tenu de leur contexte nouveau au Sénégal.

A cet effet, la DEEC vous transmet par la même occasion, ci-joint, les observations et les recommandations recueillies auprès de cette tierce expertise. En conséquence, la DEEC vous demande de bien vouloir apporter des réponses circonstanciées à ces observations et recommandations et d'étudier la possibilité d'en prendre compte dans la finalisation du rapport d'EIES ou ultérieurement, sous un format à discuter avec la DEEC.

Je vous prie d'agréer, **Monsieur le Directeur Général**, l'assurance de ma considération distinguée.

P.J. :

- *Compte rendu de la réunion du Comité technique restreint (CTR) de pré-validation de l'EIES du projet de Production de Gaz GTA, Phase 1 ;*
- *Compte rendu de la séance d'audience publique de validation de l'EIES du projet de Production de Gaz GTA, Phase 1 ;*
- *Observations et recommandations supplémentaires issues de l'exploitation des avis d'experts indépendants sur l'EIES du projet GTA, Phase par BP-Sénégal*

**P/ La Directrice de l'Environnement
et des Etablissements Classés, pi**



Cheikh FOFANA

Ampliation :

- *MEDD (ATCR) ;*
- *Monsieur le Directeur Général de la Société des Pétroles du Sénégal (pour information) ;*
- *Madame le Directeur des Hydrocarbures (pour information) ;*
- *DGL (pour information) ;*
- *DIC (pour information) ;*
- *DCPN (pour information) ;*
- *DREEC/SL (pour information).*



Dakar, le

17 DEC. 2018

**COMPTE RENDU DE LA REUNION DU COMITE TECHNIQUE RESTREINT
DE PRE-VALIDATION DE L'ETUDE D'IMPACT ENVIRONNEMENTAL
ET SOCIAL DU PROJET DE PRODUCTION DE GAZ
GRAND TORTUE/AHMEYIM (GTA), PHASE 1 PAR BP**

Introduction

Le lundi 22 octobre 2018 s'est tenue, à l'hôtel TERROU BI de Dakar, une réunion restreinte portant vérification de l'intégration des recommandations issues de la première réunion du Comité technique sur le rapport d'Etude d'Impact Environnemental et Social (EIES) du Projet de Production de Gaz Grand Tortue/AHMEYIM-Phase 1 par BP.

Pour rappel, la première réunion d'examen du présent rapport d'EIES s'était tenue les jeudi 26 et vendredi 27 juillet 2018 à Dakar et a été sanctionnée par une pré-validation de l'EIES. Néanmoins, compte tenu des nombreuses observations soulevées au cours de cette rencontre, le Comité avait jugé nécessaire de mettre en place un groupe restreint pour vérifier l'effectivité de l'intégration de ces différentes observations dans le rapport corrigé.

La réunion a été présidée par le Colonel, Dodj SENE de la HASSMAR et le rapport d'EIES, commandité par BP, est élaboré par le Cabinet GOLDER en joint-venture avec le Cabinet TROPICA, Bureaux d'études agréés par le Ministre en charge de l'Environnement pour la réalisation des évaluations environnementales au Sénégal.

Ont pris part à la rencontre, les représentants des services techniques impliqués dans la mise en œuvre du projet (cf. liste de présence).

1. Déroulement de la rencontre

Après les présentations d'usage, monsieur Abdoulaye SY, Chef de la Division des évaluations d'impact sur l'environnement a rappelé le contexte de la réunion avant d'insister sur le mandat du Comité technique restreint qui consiste à vérifier la bonne prise en compte des différentes recommandations et à l'amélioration de la qualité du rapport d'EIES avant la tenue de l'audience publique.

A sa suite, Madame Hélène MARCHAND, représentant du pool de consultants ayant réalisé l'étude a procédé à la présentation du tableau récapitulatif des observations et des recommandations du Comité technique ainsi que leur niveau de prise en charge dans le rapport corrigé. (Cf. compte rendu CT des 26 et 27 juillet 2018).

Au terme de la présentation de Madame MARCHAND, les membres ont félicité l'équipe de consultants pour la qualité du travail abattu. Cependant, quelques observations et recommandations complémentaires ont été soulevées, à nouveau, par certains membres du (CTR). Ces observations se résument principalement en constats et recommandations.

2. Observations

2.1 Constats

- La nécessité d'avoir des informations complémentaires sur le volume des déchets prévu et les sites de gestion, etc. ;
- La convention de Vienne et /ou son protocole, celui de Montréal ainsi de la convention de Minamata ne sont pas analysées ;
- L'EIES fourni en Annexe S un plan préliminaire de gestion des déchets, sans un inventaire détaillé des déchets qui devrait être rédigé compte tenu des retours d'expérience sur des projets similaires. Bien qu'il n'existe pas de filière structurée d'élimination des déchets dangereux industriels, l'EIES fait référence à leur élimination par des filières nationales. Il apparaît essentiel au stade de l'EIES de définir les principes et filières d'élimination des déchets dangereux (y compris des procédures d'export en conformité avec la Convention de Bâle). (Élément à prendre en compte dans l'élaboration ultérieure du plan de gestion des déchets).

2.3 Recommandations

- Disposer d'un plan détaillé de réponse aux déversements d'hydrocarbures et de catastrophes ;
- Appuyer les centres, laboratoires agréés et universités relativement à l'analyse des rejets d'eaux pour promouvoir la recherche développement ;
- Se rapprocher de l'ANAM pour la validation des plans de démantèlement dans la section 7 ;
- Aux pages 26,76 prendre en compte la résilience des écosystèmes ;
- Faire l'étude des espèces conformément à la convention d'Abidjan ;
- Faire la situation de référence des espaces menacées ;
- Corriger le nombre d'emploi pour le secteur de la pêche ;
- Disposer un registre consolidé des engagements (RCE) avec une définition des rôles et responsabilités notamment de l'administration ;
- Développer dans l'EIES le contenu des plans de gestion, et tout particulièrement la gestion des déchets solides et liquides (élimination au Sénégal, export, etc.).

Conclusion

A l'issue de l'examen du rapport corrigé, tenant compte tenu du niveau d'intégration satisfaisant des observations formulées lors de la première réunion du Comité technique, les membres du Comité technique ont entériné la pré-validation du rapport d'EIES, avec les observations et recommandations complémentaires, citées ci-haut, à prendre en compte dans le rapport final d'EIES.

Sur la base du rapport corrigé, BP devra prendre toutes les dispositions appropriées en se rapprochant des autorités administratives et locales de Saint-Louis avec l'appui de la DREEC, pour la tenue de l'audience publique de validation avec les populations.

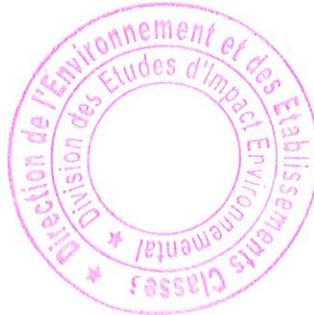
Le rapport final, intégrant les observations du Comité technique, du Comité technique restreint et de l'audience publique, devra être soumis en cinq (05) exemplaires en version papier et dix (10) en électronique sur clés USB.

Sur ce, le président a remercié les membres du comité technique restreint avant de lever la séance.

Rapportage :

Division des Evaluations d'Impact sur l'Environnement de la Direction de l'Environnement et des Etablissements Classés (DEIE/DEEC)

Abobaye S



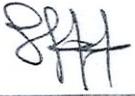
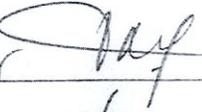
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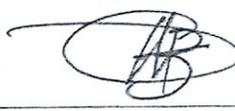
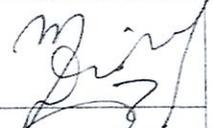
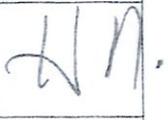
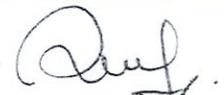
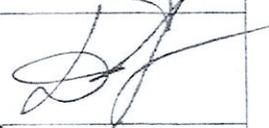
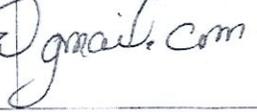


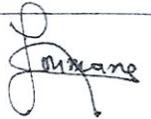
Liste de présence/ Réunion du Comité technique restreint de pré-validation du rapport d'étude d'impact environnemental et social (EIES) du projet de développement gazier Grand Tortue/Ahmevim Phase I

Lundi 22 octobre 2018

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**APPENDIX V-4: TRACKING TABLE OF
RESPONSES TO
OBSERVATIONS NOTED IN
THE OFFICIAL PROCEEDINGS
OF THE SELECT TECHNICAL
COMMITTEE MEETING**

Table V-4-1 Tracking Table of Responses to Observations Noted in the Official Proceedings of the Select Technical Committee Meeting

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
Findings		
1	The need for complementary information on the anticipated volume of waste, management sites, etc.;	<p>A preliminary waste management plan is included in Appendix S of the ESIA. The objective of this plan is to define the guiding principles to be adopted regarding waste management for Phase 1 of the GTA project.</p> <p>Section 2.11 of Chapter 2 of the ESIA provides estimates for the types and volumes of waste that will be generated by the project; see specifically Tables 2-30 and 2-31 for the Construction Phase (p. 2-56 and p. 2-58 to 2-62) and Table 2-32 for the Operations Phase (p. 2-64). These estimates will be refined for the Construction Phase by BP's subcontractors. As explained in Table V-2-2 of Appendix V-2 (p. 81), BP's primary subcontractors will have their own waste management plans that comply with BP principles. They will prepare these plans after having established their construction methodology and an accurate inventory of the waste that they will produce.</p> <p>For the Operations Phase, waste details will be included in the waste management plan for the Operations Phase and this plan will be available before the beginning of the said phase.</p>
2	The Vienna Convention and/or its protocol, the Montréal Convention as well as the Minamata Convention are not analyzed;	<p>The Vienna Convention for the Protection of the Ozone Layer as well as the Montréal Protocol on Substances that Deplete the Ozone Layer are described in Table 3-3 of Chapter 3 of the ESIA (p. 3-20).</p> <p>The Minamata Convention on Mercury was added to the end of Table 3-3 and its objective was summarized as follows:</p> <p>"The obligations of this Convention aim to control anthropogenic emissions and discharges of mercury into the air, water and soil. The Convention also covers the storage and disposal of mercury, mercury compounds as well as waste containing mercury." (p. 3-23).</p>

ESIA FOR THE GRAND TORTUE/AHMEYIM PHASE 1 GAS PRODUCTION PROJECT

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
3	<p>The ESIA provides in Appendix S a preliminary waste management plan that does not include a detailed waste inventory, which should be prepared based on experience acquired in similar projects. Although there are no structured channels for disposing of hazardous industrial waste, the ESIA makes reference to their disposal through national channels. At the ESIA stage, it appears essential to define the principles and channels for hazardous waste disposal (including export procedures in compliance with the Basel Convention) (element to be taken into consideration when developing the waste management plan).</p>	<p>As explained in response to Observation No. 1, Section 2.11 of Chapter 2 of the ESIA provides estimates for the types and volumes of waste that will be generated by the project; see specifically Tables 2-30 and 2-31 for the Construction Phase (p. 2-56 and p. 2-58 to 2-62) and Table 2-32 for the Operations Phase (p. 2-64). These estimates were developed on the basis of available information regarding project design, anticipated operational procedures and experience acquired at similar facilities. The waste inventory will be reviewed under the waste management plan in each project phase: construction, operations and decommissioning.</p> <p>Regarding waste disposal, the preliminary waste management plan provided in Appendix S of the ESIA identified the Basel Convention as one of the key international conventions and treaties with which to comply (p. 2-2). On several occasions, this same plan mentions the potential shipping of waste to an approved processing facility (local or international supplier). In the event of an international supplier, this will require compliance with the Basel Convention for cross-border movement of waste. Evidently, the best practice is to follow the Proximity Principle as much as possible. If this is not possible, cross-border movement of waste will be considered (see Section 3.6 of Appendix S, p. 8).</p> <p>These principles are described in Section 3.3 of the preliminary waste management plan (Appendix S, p. 5 and 6):</p> <p>"The plan shall describe waste sorting, its transfer and disposal in appropriate places and include a procedure to monitor the performance of all sub-contractors involved. It shall consider the capacity constraints of local storage and treatment centres in order to select the most suitable destination for disposal.</p> <p>Lastly, BP's duty of care is described in Section 3.7.1 of the preliminary waste management plan:</p> <p>"Under the 'Duty of Care' principle, BP shall control that it handles all of its waste safely and in compliance with the appropriate regulations, and shall verify that its contractors do the same. This includes verifying that organisation collecting, transporting or receiving BP waste has the required authorisation and competence.</p> <p>Monitoring of third-party environmental performance will include periodic audits, including site visits to treatment, storage and disposal locations. Any actions recorded as a result of these inspections will be tracked by BP." (Appendix S, p. 9).</p>

ESIA FOR THE GRAND TORTUE/AHMEYIM PHASE 1 GAS PRODUCTION PROJECT

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
Recommendations		
4	Develop a detailed oil spill and disaster response plan;	<p>A number of design and operational control measures to avoid or mitigate impacts stemming from accidental events are described in Chapter 7 of the ESIA, including Measures D111 and D112 pertaining to such emergency plans:</p> <ul style="list-style-type: none"> ▪ D111: Develop a Source Control Emergency Response Plan (SCERP), with provisions for well containment and capping and relief well planning. ▪ D112: Develop an Oil Spill Contingency Plan (OSCP), which will cover a range of response strategies for different spill scenarios. <p>As indicated in Table 9-5 of Chapter 9, these plans are due to be prepared in 2019 (p. 9-109).</p>
5	Support centres, accredited laboratories and universities to promote research and development in water discharge analysis;	<p>Water discharge analysis is one of the monitoring activities planned for the project. Among the objectives of the project's surveillance and monitoring plan described in Section 10.1 of the ESIA, it is explained that "GTA Phase 1 project will aim at implementing monitoring activities described in the current chapter through contracts with relevant national academics (universities, research institutes) where practicable, and for relevant monitoring activities whenever appropriate. This is considered an effective way to sustainably build the local academic capacity on oil and gas industry and offshore environment both in terms of equipment and expertise" (p. 10-1).</p>
6	Work more closely with ANAM for the validation of the decommissioning plans presented in Section 7;	<p>In Section 1.0 of the preliminary decommissioning plan presented in Appendix T of the ESIA, it is mentioned that under the Hydrocarbon Exploration and Production Contract for Block C8 and the Hydrocarbon Exploration and Production Sharing Contract for the Saint-Louis Deep Offshore Block, a remediation/decommissioning plan will be prepared and submitted for approval as per the schedule defined in these contracts (p. 1).</p> <p>An amendment was made to Section 2.1.4 to indicate that "when preparing the final version of this plan, the relevant authorities of Mauritania and Senegal, notably including Senegal's National Agency on Maritime Affairs (<i>Agence Nationale des Affaires Maritimes</i> - ANAM), will be consulted." (p. 2-10).</p>
7	On Pages 26 and 76, take the resilience of ecosystems into account;	<p>Resilience was considered indirectly in the analysis of impacts of construction or decommissioning activities on certain resources. For example, in Section 7.2.6.2.1 of Chapter 7 (p. 7-58), it is explained that due to noise, disturbance to the seabed and high turbidity, bathypelagic and demersal fish are expected to avoid construction areas for the duration of the installation of each well or other infrastructure. However, subsequent to these limited disturbances, the displaced fish are expected to return and others will be attracted by this infrastructure. Similarly, for marine mammals, it is indicated that the physical presence of ships participating in decommissioning activities is expected to trigger avoidance or short-term displacement of marine mammals or groups of marine mammals (see Section 7.4.9.2.1, p. 7-345).</p> <p>Furthermore, in the impact analysis, recovery time was considered for certain resources, e.g. the benthic communities affected by sediment resuspension and deposition (see Section 7.2.5.3, p. 7-54).</p>

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
8	Carry out species studies in accordance with the Abidjan Convention;	<p>We understand that the recommendation refers to the analysis of impacts to environmental resources (species) as a function of the articles in the Abidjan Convention, i.e.:</p> <ul style="list-style-type: none"> ▪ Article 5: Pollution from ships ▪ Article 6: Pollution caused by dumping from ships and aircraft ▪ Article 7: Pollution from land-based sources ▪ Article 8: Pollution from activities relating to exploration and exploitation of the seabed ▪ Article 9: Pollution from or through the atmosphere ▪ Article 10: Coastal erosion ▪ Article 11: Specially protected areas <p>A number of the topics addressed in the articles of the Abidjan Convention were assessed in the impact analysis presented in Chapter 7 of the ESIA. Some of them were considered among the impact producing factors (IPFs) evaluated in the impact analysis. Potential interactions between IPFs and biological resources of the receiving environment were analyzed in the matrices of interrelations (Tables 7-4 to 7-7 of Chapter 7, p. 7-11 to 7-14). The potential impacts identified in these tables were then addressed in detail in Sections 7.2 to 7.5 (p. 7-20 to 7-604). Moreover, other subjects were considered as environmental resources in the impact analysis.</p> <p>Pollution from ships was considered among the IPFs assessed: this included discharges and solid waste as defined in Table 7-1 of Chapter 7 (p. 7-3).</p> <p>Pollution caused by dumping from ships and aircraft as well as pollution from land-based sources are not applicable to this project.</p> <p>Pollution from activities relating to exploration and exploitation of the seabed and under the seabed is considered in the IPFs of routine activities, notably in the physical presence, the safety exclusion zones, vessel movements, chemicals and hazardous materials and helicopter traffic, as well as in the IPFs of accidental events such as well blowouts or the failure of the FPSO due to a ship collision or a pipelaying vessel collision (see Tables 7-1 and 7-2, p. 7-3 and 7-5).</p> <p>Pollution from or through the atmosphere is considered an IPF; it is referred to as "emissions" in Chapter 7 (see for example Table 7-1 on p. 7-3).</p> <p>Lastly, coastal erosion and specially protected areas were considered as environmental resources. They are addressed in Sections 7.2.3, 7.3.3 and 7.4.3 for coastal erosion and in Sections 7.2.11, 7.3.11, 7.4.11 and 7.5.11 for protected areas.</p>

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
9	Establish a baseline case for threatened species;	<p>The baseline case for threatened species was described for the following resources in Chapter 4 of the ESIA:</p> <ul style="list-style-type: none"> ▪ Fish (Section 4.5.4.1, p. 4-70 to 4-75) ▪ Marine and coastal birds (Section 4.5.5.2, p. 4-84 to 4-92 and Section 4.5.5.3, p. 4-93 to 4-97) ▪ Marine mammals (Section 4.5.6.2, p. 4-98 to 4-101 and Section 4.5.6.3, p. 4-101 to 4-103) ▪ Sea turtles (Section 4.5.7.1, p. 4-103 to 4-105) <p>Additionally, Section 4.5.8 presents a synopsis of information on critically endangered (CR) and endangered (EN) species – as per the Red List classification of the International Union for the Conservation of Nature (IUCN) – that are likely to be present in the project study areas (p. 4-107 to 4-109).</p>
10	Correct the number of jobs for the fishing sector;	<p>We understand that the recommendation refers to the July report (see Appendix V-1 of ESIA), where it is indicated that the number of jobs in Senegal's fishing sector is 65,000. However, this figure should be corrected to be over 650,000. As indicated in Section 4.7.6.1 of the ESIA, there are approximately 63,000 Senegalese fishermen, while auxiliary or secondary fishing activities employ over 600,000 people (p. 4-190). Consequently, no correction is required in the revised ESIA.</p>
11	Maintain a consolidated register of commitments with a definition of roles and responsibilities, notably those of the administration;	<p>The social investment program is a commitment for the three project phases, i.e. a duration of over 20 years. At this stage, it is not possible to list all the projects that will be implemented during this period. The needs of the community could also change in the course of such a prolonged period.</p> <p>As indicated in Section 2.14 of the ESIA, social investments will be scheduled annually, and the projects retained will be discussed with the relevant stakeholders. Consequently, these commitments will be periodically shared with the relevant authorities throughout the project. Social investment priority will be placed on activities relating to the following areas: education, economic development, environmental initiatives, community health and safety activities, capacity building and strengthening of institutions.</p> <p>In Senegal, social investment projects identified and approved for 2018 by project partners of GTA-Phase 1 include:</p> <ul style="list-style-type: none"> ▪ Community health: <ul style="list-style-type: none"> ○ Provision of ambulance for Guet Ndar health centre; ○ Rehabilitation and provision of equipment to the health posts in Langue de Barbarie; ○ Support the access to universal governmental health coverage programme for the poorest population in Langue de Barbarie; ○ Training of health care providers (nurses and midwives) in Saint-Louis District and community actors (relays and community leaders); ○ Conduct door to door health campaign activities for prevention activities, monitoring of child and maternal health; and

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
		<ul style="list-style-type: none"> ○ Provision of comprehensive package of preventive activities at community level focused on maternal and child health and hygiene and sanitation. ▪ Economic development: <ul style="list-style-type: none"> ○ Provide access to finance for the women cooperatives and the artisanal fishermen; ○ Provide capacity building to strengthen the institutional capacity of the organizations relevant to artisanal fishing and provide key equipment for marine safety and monitoring of fishing activities; ○ Organize a study visit for the CLPA members to learn the experience from other CLPAs in Senegal in terms of fishery resources management and revenue-generating activities; ○ Provide capacity-building for fish-processing cooperatives on fish processing techniques on the development of new products; ○ Training for the women engaged in food processing on the labelling of fish-based products at the ECOWAS level; ○ Provide capacity-building on entrepreneurship, marketing, accounting, sales and financial skills; ○ Provide equipment to the women cooperatives on fish processing; and ○ Setting-up semi-industrial units for processing fruit, vegetables, and cereals for the women in Langue de Barbarie who are engaged in food processing. ▪ Environment: <ul style="list-style-type: none"> ○ Conduct environmental education at local schools in Saint-Louis; ○ Conduct information-sharing activities and develop a common guide and tools between Djoudj, and Diawling National Parks on biodiversity conservation; ○ Provide capacity building to strengthen the institutional and technical capacity of elected representatives and territorial actors on the management of environment; ○ Provide capacity building to increase the capacity of territorial actors (e.g. elected representatives, technicians, fishermen, economic actors) on the management of the ecological challenges; and ○ Community awareness-raising about the environmental RESILIENCE project.
12	Develop within the ESIA the content of management plans, particularly for the management of solid and liquid waste (disposal within Senegal, export, etc.).	<p>Waste Management Plan</p> <p>Section 3.3 of the preliminary waste management plan provided in Appendix S of the ESIA identifies the elements to be included in the final waste management plan, namely:</p> <ul style="list-style-type: none"> ▪ "Consideration of country or region-specific waste management strategies; ▪ Review and understanding of the receiving environment and possible risks associated with operation of the existing or proposed waste management facilities;

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
		<ul style="list-style-type: none"> ▪ Implementation of the Proximity Principle in order to reduce risk and provide a cost-effective approach; ▪ Application of avoidance and minimisation (e.g. return to vendor, reuse and recycling measures, toxicity reduction); ▪ Identification and characterisation of all potential waste streams; ▪ Details of how each waste stream will be managed in accordance with the waste hierarchy, including personnel responsible; ▪ Recording and manifesting system requirements; ▪ Segregation, labelling and storage requirements; ▪ Process for assessment, selection, management and monitoring of waste management contractors and facilities; ▪ Reporting systems, including waste management, key performance indicators for reduction or recycling; ▪ Training and awareness program; ▪ Details of proposed continual improvement measures; and ▪ Review period." (p. 6 <p>Dredging Management Plan</p> <p>Measure D13 presented in Chapter 7 (see notably Table 7-196 in Chapter 7, p. 7-614) identifies the main elements that will be included in the dredging management plan, i.e.:</p> <ul style="list-style-type: none"> ▪ Dredging methodology; ▪ Disposal site options for dredged material; ▪ Characterisation of composition and behaviour of sediment to be dredged; ▪ Definition of the zone of influence; and ▪ Identification of potential mitigation and monitoring measures. <p>Source Control Emergency Response Plan</p> <p>BP requires that all deepwater wells have a detailed well capping and relief well drilling plan in the event of a breakdown in primary and secondary well controls. This requirement is found in Measure D111 "Develop a Source Control Emergency Response Plan (SCERP), with provisions for well containment and capping and relief well planning" (see notably Table 7-199 of Chapter 7, p. 7-632).</p> <p>As explained in Section 7.5.1.5.3 of Chapter 7 (p. 7-438 and 7-439), the well containment and capping plans describe the measures to be taken to reduce the amount of oil discharged into the environment. This plan</p>

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
		<p>comprises specific technical response capacities as well as associated personnel, processes, resources and logistical support. The well containment and capping plan includes but is not limited to:</p> <ul style="list-style-type: none"> ▪ Ability to monitor the seabed and interface well control equipment on the seabed with a Remote Operated Vehicle (ROV); ▪ Subsea Dispersant Injection from support vessel; ▪ Seabed Debris Clearance; ▪ Lower Marine Riser Package removal; ▪ Well capping equipment; ▪ Containment Cap Installation; ▪ Detailed logistics plans to be ready for mobilization; ▪ GTA project specific interface verifications for different capping scenarios (wellhead, top of lower BOP, top of flex joint adapter); ▪ Deployment of an ROV from a support vessel; ▪ Subsea Dispersant Injection Capability; and ▪ Backup plans for using alternative capping support tools. <p>All BP wells are required to demonstrate the capability to drill a relief well to stem the flow of hydrocarbon (and kill the well if necessary) as a contingency to the well capping strategy. Areas addressed within the Relief Well Plan include:</p> <ul style="list-style-type: none"> ▪ Organizational capability; ▪ Field and well data; ▪ Metocean conditions; ▪ Dynamic well kill modelling; ▪ Relief well design; ▪ Detailed Ranging and Interception strategy; and ▪ Equipment and relief well rig availability. <p>(see Section 7.5.1.5.4 of Chapter 7, p. 7-439)</p>

Numbers	Observations Taken from the Official Proceedings of the Select Technical Committee Meeting	Responses to Observations (including reference page numbers in the ESIA)
		<p>Oil Spill Contingency Plan</p> <p>Regarding Measure D112 "Develop an Oil Spill Contingency Plan (OSCP), which will cover a range of response strategies for different spill scenarios" (see notably Table 7-199 of Chapter 7, p. 7-632), this plan will reflect good industry practices and will comprise the following:</p> <ul style="list-style-type: none"> ▪ Planning scenarios, i.e. risk assessment; ▪ Response strategies based on a three-tier approach and on the assessment of mitigation of spill-related impacts; ▪ Corresponding relevant tactical response plans; ▪ Resources and equipment required for each tier; ▪ Roles and responsibilities: ▪ Stakeholder engagement activities; and ▪ Requirements in terms of exercises and training.

**APPENDIX W: PUBLIC HEARING
(SENEGAL)**

Appendix W Public Hearing (Senegal)

APPENDIX CONTENTS

- W-1 Official Proceedings of the Public Hearing Held on November 13, 2018 for the Environmental and Social Impact Assessment for the GTA Phase 1 Project (in French)
- W-2 Tracking Table of Responses to Observations Noted in the Official Proceedings of the Public Hearing

**APPENDIX W-1: OFFICIAL PROCEEDINGS OF
THE PUBLIC HEARING HELD
ON NOVEMBER 13, 2018 FOR
THE ENVIRONMENTAL AND
SOCIAL IMPACT ASSESSMENT
FOR THE GTA PHASE 1
PROJECT (IN FRENCH)**

X

Saint-Louis, le 16 novembre 2018

**MINISTERE DE L'ENVIRONNEMENT
ET DU DEVELOPPEMENT DURABLE**

**DIRECTION DE L'ENVIRONNEMENT
ET DES ETABLISSEMENTS CLASSES**



**DIVISION REGIONALE DE L'ENVIRONNEMENT
ET DES ETABLISSEMENTS CLASSES DE SAINT-LOUIS**

**COMPTE RENDU DE L'AUDIENCE PUBLIQUE DE VALIDATION DE L'ETUDE
D'IMPACT ENVIRONNEMENTAL ET SOCIAL DU PROJET DE PRODUCTION DE
GAZ GRAND TORTUE/AHMEYIM (GTA), PHASE 1**

Introduction

Le Mardi 13 Novembre 2018, s'est tenue, à la Chambre de commerce de Saint-Louis, l'audience publique de validation de l'étude d'impact environnemental et social du projet de production de gaz grand tortue/ahmeyim (GTA), phase 1.

BP Sénégal est le porteur du projet et dont la délégation a été conduite par son Directeur Général, Monsieur Géraud MOUSSARIE. Le rapport d'EIES est réalisé par le groupement GOLDER et TROPICA Environnement, Bureaux d'études agréés par le Ministère en charge de l'Environnement pour conduire des missions d'évaluation environnementale au Sénégal.

Monsieur Alioune Badara DIOP, 1^{er} Adjoint au Maire de la commune de Saint-Louis, a assuré la présidence de la rencontre.

Etaient présents à la réunion les représentants des communautés de pêcheurs, des collectivités locales et des services techniques au niveau régional et national, impliqués dans la mise en œuvre du projet (Cf. feuille de présence).

1. Déroulement de la rencontre

Après les prières et les mots de bienvenue formulés à l'endroit des invités et des populations venues assister à l'audience publique, Monsieur le Maire a souligné toute l'importance accordée à cette rencontre.

A sa suite, Monsieur le Directeur Général de BP Sénégal a magnifié la tenue de cette rencontre de validation avec les populations de Saint-Louis. Il a souhaité la bienvenue aux invités et est revenu sur l'importance du projet avant d'expliquer aux populations les enjeux et les bénéfices du gaz.

A sa suite, Monsieur Moussa GUEYE, Chef de la DREEC de Saint Louis, en prenant la parole, a rappelé le contexte dans lequel se tient cette audience publique. Faisant suite aux réunions de validation du Comité technique de Dakar et auxquelles ont participé les services techniques

compétents, le Conseil départemental de Saint-Louis, la commune de Saint-Louis et l'Université Gaston BERGER de Saint-Louis.

Aussi, Il est revenu sur les objectifs de cette audience publique qui donne la possibilité aux populations de se prononcer par rapport au projet GTA.

A la suite de Monsieur GUEYE de la DREEC de Saint-Louis, Monsieur Samba YADE, du Groupement Golder – Tropica, a rappelé les principes de l'étude et a fait l'économie du contenu du rapport. Sa présentation s'articule autour de ces points ci-après :

- *Introduction*
- *Description et justification du projet*
- *Cadre réglementaire et institutionnel*
- *Description du milieu récepteur*
- *Analyse des variantes et description du projet retenu*
- *Consultation du publique*
- *Identification et analyse des impacts*
- *Etude de dangers et analyse des risques professionnels*
- *Plan de Gestion Environnementale et Sociale*
- *Plan de Surveillance et de Suivi*
- *Conclusion*

Suite à cette présentation de Monsieur YADE, les populations ont tour à tour fait part de leurs observations et celles-ci se résument en constats, en questions et en recommandations.

2. Observations

2.1. Questions

- Quelles sont les retombées du projet GTA pour la commune de Saint-Louis ?
- Qu'est-ce qui est prévu en termes d'indemnisation en cas de dommages sur les ressources en mer ?
- Que gagne la communauté des pêcheurs de la Langue de Barbarie dans le cadre de ce projet ?
- Peut-on envisager dans le cadre de la RSE, l'accompagnement de l'Hôpital régional de Saint-Louis, en termes d'équipements et de dotation en médicaments, afin de lui permettre de faire face aux situations de crise sanitaire ?
- Les observations et recommandations du Comité technique sont-elles intégrées dans le rapport corrigé ?
- Comment les modélisations sont-elles faites ?
- Qu'est ce qui est prévu, en termes d'accompagnement, pour femmes qui ne pratiquent pas de transformation de produits halieutiques ?
- Est-ce le document est disponible ?

2.2. Recommandations

- Prendre en compte la pêche qui est l'activité économique principale des populations de la langue ;
- Faire de sorte que le suivi soit régulier et étroit ;

- Avoir un plan de communication durant tout le projet ;
- Prendre en compte les pertes / fuites de produits chimiques, en mer ;
- Impliquer les personnes compétentes dans le suivi du projet ;
- Former les jeunes surtout ceux de la Langue de Barbarie ;
- Favoriser la formation d'une relève nationale dans le secteur pétrolier et gazier ;
- Assurer le suivi rigoureux du projet ;
- Faire des formations de renforcement de capacités des agents de l'Administration relativement au suivi des opérations et activités de production ;
- Prendre en compte l'effet de la lumière et de la pollution sonore qui peuvent perturber les organismes vivants en mer ;
- Faire des rencontres périodiques voire mensuelles avec les populations ;
- Appuyer à la reconversion des pêcheurs en aquaculture et autres ;
- Informer et sensibiliser les pêcheurs à la zone d'exclusion ;
- Gérer les déchets qui seront générés dans le cadre de l'exploitation des différentes installations ;
- Il faut mettre à la disposition des populations le rapport d'étude d'impact environnemental et social ;
- Spécifier les type d'emplois qui seront créés dans le cadre de ce projet ;
- Minimiser au maximum les impacts potentiels du projet ;
- Tenir compte et informer les populations de la mise en œuvre du projet ;
- Prendre en considération la population surtout la jeunesse, dans la prise en charge des besoins.

3. Réponse

- Après la pré-validation du rapport d'EIES les 27 et 28 juillet 2018 à Dakar, un Comité technique restreint (CTR) a été tenu le 22 octobre pour voir si les commentaires assortis à la pré-validation ont été pris en compte et intégrés. C'est suite à cette rencontre, que le rapport d'EIES a été pré-validé et que l'audience publique est organisée ;
- Les ressources halieutiques font parties des priorités de l'étude, elles ont bien été prises en compte ;
- Les zones d'exclusion ou de sécurité ont été mises en place pour protéger les opérations, les travailleurs et les installations. Elles constituent des zones d'interdiction pour les pêcheurs, ces deux zones, l'une fait 1,6 km² et l'autre c'est 0,5 km² ;
- On parle de collusion, mais beaucoup de mesures de mitigation ont été prises l'une des mesures, consiste pour BP, à informer et à alerter les pêcheurs de la venue des bateaux pour prévenir toute sorte d'accident ou d'incident ;
- Une formation va se faire pour des interventions en cas de déversement accidentel dans la mer, et pour la protection de l'AMP ;
- Les navires du projet seront suffisamment éclairés et les navires de soutien pour éviter les accidents la nuit ;
- Personne ne doit pêcher dans la zone d'exclusion, donc les pêcheurs ne doivent pas poser leurs filets à proximité des plateformes pour éviter l'intrusion dans les zones d'exclusion ;
- Les retombés du pétrole et du gaz doivent être au bénéfice et au profit des populations et entrent dans le financement des activités de pêche, du tourisme entre autres ;
- Les déchets solides vont être récupérés et gérés rigoureusement par le projet ;
- Toutes les préoccupations sont et seront prises en compte ;

- Pour la santé et la sécurité, il y' aura des dispositifs qui sont mis dans les plateformes et des personnes sont formées pour que en cas de catastrophe, celles-ci interviennent, il y'a aussi des plans d'intervention dans les plateformes ;
- BP va mettre en place des plans pour les suivis, BP va aussi aider les institutions (DEEC/ DREEC et Comité technique), pour qu'elles puissent mener bien leurs activités dans le cadre du suivi du PGES du projet.

Conclusion

A l'issue de l'audience publique, le rapport d'étude d'impact environnemental et social du projet GTA, Phase, 1 de BP a été validé par les populations qui fondent beaucoup d'espoir sur ce projet de production de gaz.

Toutefois, il a été demandé au consultant d'intégrer toutes les observations et recommandations issues de l'audience publique, afin de produire un rapport final qui devra être soumis à la Direction de l'Environnement et des Etablissements Classés en dix (10) exemplaires, en plus de la version électronique.

Sur cette décision, le président a remercié l'ensemble des participants avant de lever la séance.

Rapportage :

Division régionale de l'Environnement et des Etablissements Classés de la Direction de l'Environnement et des Etablissements Classés (DREEC/SL-DEEC)



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 MINISTERE DE L'ENVIRONNEMENT ET DU DEVELOPPEMENT DURABLE

 DIRECTION DE L'ENVIRONNEMENT ET DES ETABLISSEMENTS CLASSES

 DIVISION REGIONALE DE L'ENVIRONNEMENT ET DES ETABLISSEMENTS CLASSES DE SAINT LOUIS

Saint-Louis, le 13 novembre 2018

Objet : audience publique du rapport d'Etude d'impact environnemental et social(EIES) du projet de Développement gazier Grand Tortue /Ahmeyim phase 1(service techniques).

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REPUBLIQUE DU SENEGAL
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 MINISTÈRE DE L'ENVIRONNEMENT ET DU DÉVELOPPEMENT DURABLE
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Saint-Louis, le 13 novembre 2018

Objet : audience publique du rapport d'Etude d'impact environnemental et social(EIES) du projet de Développement gazier Grand Tortue /Ahmeyim phase 1

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31	Dumais BA	V. P. C. Caribjya	773072034	
32	Papa Abi Kane Diallo	Sec. CC Caribjya	773072034	
33	Abdoulhamid	Caribjya	773072034	
34	IMAN Bactin Diop	AIUS/SL	775189939	
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36	Khadija Fall	Caribjya	773072034	
37	Abdoulhamid	Caribjya	773072034	
38	Moussata Gye	Caribjya	773072034	
39	Moussata Gye	Caribjya	773072034	
40	MOUSSA NDIAYE	Agent Municipal	77.584.82.12	
41	Papa Thiabou Ndiaye	Agent Municipal	775524853	
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43	LATTE Fall	Caribjya	773072034	
44	Abdoulhamid	Caribjya	773072034	

45	Ndiaye Khadija Ndiaye	Agent Municipal	77540613	
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47	Abdoulhamid	Caribjya	773072034	
48	Sony Parkour Diop	Caribjya	773072034	
49	Abdoulhamid	Caribjya	778052075	
50	Abdoulhamid Gueye	Caribjya	770724027	
51	Alicoune Gueye	Caribjya	774062699	
52	Abdoulhamid	Caribjya	772313071	
53	Abdoulhamid	Caribjya	775072034	
54	Abdoulhamid	Caribjya	775072034	
55	Abdoulhamid	Caribjya	773072034	
56	Abdoulhamid	Caribjya	774226884	
57	Abdoulhamid	Caribjya	774326014	
58	Abdoulhamid	Caribjya	773072034	
59	Abdoulhamid	Caribjya	703652682	
60	Abdoulhamid	Caribjya	773358175	
61	Abdoulhamid	Caribjya	773378337	
62	FALY SECK	Caribjya	706598943	

63	Y. S. J. J.		77 234 20 34	
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67	Klondra Sek	Consales		of
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69	Abraham Ndoye	Cellulose	77 234 20 34	diog
70	Adams Sall	Cellulose	77 234 33 13	diog
71	Cherki BA	Cellulose	77 417 33 10	diog
72	Nancy Othone	Cellulose	77 234 20 34	diog
73	Brigitte Mbaye	Cellulose	77 588 58 63	diog
74	Rassat Sall	Cellulose	77 85 51 53	diog
75	Mamadou Siga Mbaye	Cellulose	77 563 67 29	diog
77	Mamadou Mbaye	Cellulose	77 234 20 34	diog
78	Baba Guaye	Cellulose	77 234 20 34	diog
79	Mariam Kamate	Cellulose	77 533 15 23	diog
80	Tatou Dionf	Cellulose	77 566 40 38	diog
81	Yacine Diagne	Cellulose	77 557 85 83	diog

82	Seynabou Diop	Cellulose	77 585 31 02	diog
83	K. S. J. J.	Cellulose	77 342 04 61	diog
84	Rolande Ndiaye	Cellulose	77 506 82 81	diog
85	M. S. J. J.	Cellulose	77 585 31 02	diog
86	Yacine Diagne	Cellulose	77 585 31 02	diog
87	Mamadou Siga	Cellulose	77 585 31 02	diog
88	Yacine Diagne	Cellulose	77 585 31 02	diog
89	Yacine Diagne	Cellulose	77 585 31 02	diog
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94	Yacine Diagne	Cellulose	77 463 10 21	diog
95	Yacine Diagne	Cellulose	77 538 80 26	diog
96	Yacine Diagne	Cellulose	76 569 39 65	diog
97	Yacine Diagne	Cellulose	76 569 39 65	diog
98	Yacine Diagne	Cellulose	77 585 31 02	diog
99	Yacine Diagne	Cellulose	77 585 31 02	diog

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105	Amber Lynn Faye	Wessex	77-289-2844	
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109	Alphonse M. Gueye	Wessex	77-289-2844	
110	Alphonse M. Gueye	Wessex	77-289-2844	
111	Alphonse M. Gueye	Wessex	77-289-2844	
112	Alphonse M. Gueye	Wessex	77-289-2844	
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**APPENDIX W-2: TRACKING TABLE OF
RESPONSES TO
OBSERVATIONS NOTED IN
THE OFFICIAL PROCEEDINGS
OF THE PUBLIC HEARING**

Table W-2-1. Tracking Table of Responses to Observations Noted in the Official Proceedings (dated November 16, 2018) of the Public Hearing.

Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
Questions		
1	What economic benefits will the GTA project have for the commune of Saint-Louis?	<p>The main economic benefits for the two countries are at the national level with revenue generated through earnings from PETROSEN's and SMHPM's shares as well as the States' shares in LNG sales and taxes. It is our understanding that it is the responsibility of the national authorities to decide how these revenues will be allocated.</p> <p>Furthermore, the GTA Phase 1 project will have direct spinoffs for the inhabitants of the commune of Saint-Louis and surrounding areas through social investments. The latter are described in Section 2.14 of the ESIA report (p. 2-72 to 2-75).</p> <p>Furthermore, as described in Sections 7.2.18.3 and 7.3.18.3 of the report, up to 20 people from Saint-Louis and N'Diogo could be hired as community liaison officers or local fisheries liaison officers (see p. 7-168 and p. 7-308).</p>
2	What is planned in terms of compensation in the event of adverse effects to marine resources?	<p>As indicated in Section 3.5.1 of the ESIA report, the hydrocarbon exploration and production sharing contract for the Saint-Louis Offshore Profond block lays out the following obligations for the contractor [i.e., BP Senegal Investments Limited, Kosmos Energy Investments Senegal Limited and PETROSEN]:</p> <ul style="list-style-type: none"> ▪ To compensate and indemnify the State and any person in the event of damage caused by the oil and gas operations or due to the employees or officials of the Contractor during the Operations (Clause 4.5). ▪ To sign and have its subcontractors sign all insurance policies in use in the international oil industry concerning its obligations and liabilities and specifically the liability insurance policies with respect to third parties, property damage insurance policies to the property and the environment, and the insurance policies that might be required by the regulations in effect in the Republic of Senegal, and to provide the certificates proving the signing of said insurance policies to the Minister (Clause 4.6) (p. 3-10). <p>Additionally, the following mitigation measures are included in Chapter 7 of the ESIA in order to avoid or reduce the impacts stemming from accidental events:</p> <ul style="list-style-type: none"> ▪ M108: In the unlikely event of a spill, in coordination with national authorities if requested, monitor and support ways to address the concerns of stakeholders regarding potential impacts of the spill.

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Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
		<ul style="list-style-type: none"> ▪ M109: In the unlikely event of a spill, implement, in coordination with national authorities if requested, an emergency fund to assist affected vulnerable households in artisanal fishing communities if needed. ▪ M110: In the unlikely event of a spill, prepare and implement, in coordination with national authorities if requested, a Livelihood Restoration Plan for affected communities. ▪ M111: In the unlikely event of a spill, implement, in coordination with national authorities if requested, an emergency plan to ensure food security of affected vulnerable households and groups if needed.
3	What does the Langue de Barbarie fishing community stand to gain in this project?	<p>The GTA Phase 1 project social investment program includes activities specifically intended for the fishing community; these activities will be discussed and agreed upon with the relevant stakeholders at a later time. Mitigation measure M27, which is included in Chapter 7 of the ESIA, confirms this commitment:</p> <ul style="list-style-type: none"> ▪ M27: Developing a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities. <p>The social investment program will last the entire duration of the project. For the year 2018 and as indicated in Section 2.14 of the ESIA report (p. 2-73 and 2-74), the social investment projects identified and approved by the partners of the GTA Phase 1 project include a number of projects dedicated partially or specifically to the fishing communities of the Langue de Barbarie, such as:</p> <ul style="list-style-type: none"> ▪ Community health: <ul style="list-style-type: none"> ○ Provision of ambulance for Guet Ndar health centre; ○ Rehabilitation and provision of equipment to the health posts in Langue de Barbarie; ○ Support the access to universal governmental health coverage programme for the poorest population in Langue de Barbarie; ○ Training of health care providers (nurses and midwives) in Saint-Louis District and community actors (relays and community leaders); ○ Conduct door to door health campaign activities for prevention activities, monitoring of child and maternal health; and ○ Provision of comprehensive package of preventive activities at community level focused on maternal and child health and hygiene and sanitation.

Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
		<ul style="list-style-type: none"> ▪ Economic development: <ul style="list-style-type: none"> ○ Provide access to finance for the women cooperatives and the artisanal fishermen; ○ Provide capacity building to strengthen the institutional capacity of the organizations relevant to artisanal fishing and provide key equipment for marine safety and monitoring of fishing activities; ○ Organize a study visit for the CLPA members to learn the experience from other CLPAs in Senegal in terms of fishery resources management and revenue-generating activities; ○ Provide capacity-building for fish-processing cooperatives on fish processing techniques on the development of new products; ○ Training for the women engaged in food processing on the labelling of fish-based products at the ECOWAS level; ○ Provide capacity-building on entrepreneurship, marketing, accounting, sales and financial skills; ○ Provide equipment to the women cooperatives on fish processing; and ○ Setting-up semi-industrial units for processing fruit, vegetables, and cereals for the women in Langue de Barbarie who are engaged in food processing.
4	<p>Are there any support measures that might be envisaged for the Saint-Louis regional hospital in terms of medical equipment and supplies, in order to enable the facility to better address health crisis situations?</p>	<p>We understand that this question refers to the limited capacities of the Saint-Louis hospital to accommodate potential victims in the event of project-related accidents. Prior to the commencement of the GTA Phase 1 project, a detailed emergency response plan will be established by BP in collaboration with the relevant authorities.</p> <p>That said, the project has already set out provisions to prepare for emergency situations and manage major hazards and risks. The said provisions are described in Section 8.3.6 of the ESIA report (p. 8-186 to 8-197).</p> <p>Further, the project has also set out provisions for managing professional risks. As indicated in Section 8.4.4.5 of the ESIA report (p. 8-223), facility specific emergency response plans cover all types of accidents, whether they are occupational accidents (illnesses and injuries) or accidents related to major hazards. These plans are supported by detailed medical protocols and requirements, as documented in medical procedures.</p>

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Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
		<p>All facilities (drillship, FPSO and Nearshore Hub/Terminal) have a full-time Medic on site to manage injuries, illnesses and general health of personnel. The drillship, FPSO and QU platform are equipped with dedicated sick bays with patient beds, medical equipment and medications. Main offshore construction and installation vessels are also equipped with appropriate medical facilities and trained medical support.</p> <p>Medical equipment and medications are selected based on BP requirements, site-specific occupational health and safety hazards and risks, vessel Flag State medicine chest guidance, and World Health Organization (WHO) (2007) guidelines.</p> <p>In addition to the trained Medic, certain crew members are also trained in First Aid and can provide first responder assistance to the Medic if necessary. The Medic is responsible for dispensing, securing, and monitoring the use of controlled and therapeutic drugs. Additional shore based medical support is provided by a Company Medical Advisor, to advise and direct healthcare and emergency situations offshore.</p> <p>Depending upon the type and severity of the incident onboard the facility, the sick or injured person may require medical evacuation (medivac). Medivac will primarily be undertaken by helicopter. Depending upon the type and severity of the incident, shore-based treatment may be provided locally, or out of country. A third party medical services provider (such as International SOS) is available for additional shore side support as required.</p> <p>Lastly, as indicated in Section 2.14 of the ESIA report (p. 2-72 to 2-75), social investment priority will be placed on activities relating to five broad fields, one of which refers specifically to health, i.e., community health and safety activities. The nature of the social investment projects to be completed or continued will be defined and approved by project partners of GTA at the beginning of each year after consulting with stakeholders, especially local communities and authorities.</p>
5	Are the observations and recommendations of the Technical Committee integrated into the corrected report?	<p>The Technical Committee's observations and recommendations that were made at the Technical Committee's meeting on July 26 and 27, 2018 were all integrated into the revised ESIA report dated October 2018. Appendix V-1 of this report provides the official proceedings of the Technical Committee's meeting and Appendix V-2 presents a tracking table of the responses to the observations made. However, we understand that the Technical Committee is responsible for providing a further response to this question if needed.</p>

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Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
6	How is the modelling performed?	<p>Generally speaking, the modelling presented in the ESIA was performed by modelling specialists who are experts in their fields and using specialized software. More specifically, we understand that this question concerns modelling to identify potential impacts that the breakwater might have on the coastline. The methodology used for this modelling is presented in detail in the two coastline modelling reports appended to the ESIA report:</p> <ul style="list-style-type: none"> ▪ Appendix I-2: p. 13 to 23. ▪ Appendix I-3: p. 12 to 26.
7	What is planned for women who do not work in the fish processing sector?	<p>As detailed in Section 2.14 of the ESIA report, the project includes a social investment program. This program might include not only projects for women processors, but also projects that can benefit women who are not engaged in the processing of fishery products.</p> <p>As indicated in the answer to Observation No. 2 above, the social investment projects identified and approved for 2018 by partners of the GTA Phase 1 project include a number of projects that might benefit women who are not involved in the processing of fishery products. These include, for example, the following community health projects:</p> <ul style="list-style-type: none"> ▪ Provision of ambulance for Guet Ndar health centre; ▪ Rehabilitation and provision of equipment to the health posts in Langue de Barbarie; ▪ Support the access to universal governmental health coverage programme for the poorest population in Langue de Barbarie; ▪ Training of health care providers (nurses and midwives) in Saint-Louis District and community actors (relays and community leaders); ▪ Conduct door to door health campaign activities for prevention activities, monitoring of child and maternal health; and ▪ Provision of comprehensive package of preventive activities at community level focused on maternal and child health and hygiene and sanitation.
8	Is the document available?	<p>It is our understanding that this question refers to the ESIA report. The report was submitted to the DEEC in October 2018. We understand that the public may consult this report at DEEC offices in Dakar as well as at the Regional Department of the Environment and Classified Establishments (DREEC) in Saint-Louis.</p>

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Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
Recommendations		
9	Take into consideration that fishing is the primary economic activity for the communities of the Langué.	<p>The ESIA report has taken into account that fishing is the primary economic activity for communities on the Langué de Barbarie.</p> <p>This topic is addressed in detail in Chapter 4 of the report in the sections listed below:</p> <ul style="list-style-type: none"> ▪ Section 4.7.5.2: Primary Economic Activities and Means of Subsistence of Communities (p. 4-186 to 4-189). ▪ Section 4.7.6.3: Artisanal Fishing (p. 4-191 to 4-198). <p>Supplementary information on this subject is also provided in the following appendices:</p> <ul style="list-style-type: none"> ▪ Appendix E-2: Report on Fishery Resources and Fisheries in the Senegalese Portion of the Core Study Area of the Ahmeyim/Guembeul Gas Production Project (p. 35 to 57 of the appendix). ▪ Appendix E-4: Study of Fishing Communities in Senegalese Portion of Core Study Area of the Ahmeyim/Guembeul Gas Production Project (p. 2 to 30 of the appendix).
10	Ensure that close and regular monitoring is conducted.	<p>The ESIA report calls for regular and rigorous monitoring. In fact, two chapters of the ESIA are dedicated to monitoring: Chapter 9 and Chapter 10.</p> <p>Chapter 9 presents the project's environmental and social management plan (ESMP). The ESMP defines a system for the implementation, the compliance monitoring, and performance evaluation of the mitigation measures. Chapter 9 includes four tables that are operational tools for implementing the ESMP and for tracking this implementation. They notably provide the following information for each component of the biophysical or social environment that could be affected:</p> <ul style="list-style-type: none"> ▪ Listing of potential impacts; ▪ Country in which the impact could occur; ▪ Design and operational controls inherent to the project to mitigate impacts; ▪ Specific mitigation measures to further avoid or reduce negative impacts with a significance rating over "Negligible"; ▪ Rating of residual impact; ▪ Objectively verifiable indicators of the implementation of the measures; ▪ Suggested source for verification of implementation; ▪ Recommended frequency of verification of implementation.

Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
		<p>Furthermore, Section 9.4 of Chapter 9 provides details on the monitoring of the ESMP by national authorities. Indeed, the implementation of the ESMP will be monitored by the Mauritanian and Senegalese authorities. A monitoring plan has been developed for this purpose, and is provided in Appendix U of the ESIA report. This plan includes a calendar of monitoring activities to be carried out.</p> <p>Moreover, Chapter 10 of the ESIA report presents the project's surveillance and monitoring plan (SMP). The overall purpose of the SMP is to evaluate that the mitigation measures identified in the ESMP generate the expected results in regard to avoiding or reducing potential impacts on the biophysical or social environments. The SMP complements the ESMP and aims to identify:</p> <ul style="list-style-type: none"> ▪ Actual impact on physical, biological and socioeconomic receptors associated with the project; ▪ Effects not anticipated in the present impact assessment; ▪ Effects exceeding or below the levels anticipated in the present impact assessment; ▪ Appropriate mitigation measures for effects not anticipated or exceeding levels anticipated in the impact assessment; and ▪ Need for corrective action to be agreed with regulatory authorities. <p>Chapter 10 includes a table that represents an operational tool of the SMP. Notably, this table provides performance objectives for the actions associated with each potential impact, as well as performance indicators with their source and frequency of verification.</p> <p>Lastly, as indicated in Section 10.1 of Chapter 10, the GTA Phase 1 project will aim at implementing monitoring activities described in this chapter through contracts with relevant national academics (universities, research institutes) where practicable, and for relevant monitoring activities whenever appropriate. This is considered an effective way to sustainably build the local academic capability on oil and gas industry and offshore environment both in terms of equipment and expertise.</p>

Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
11	Have a communication plan throughout the project.	<p>The ESMP includes measures to promote good communication with local communities throughout the three project phases. See notably the following measures in Table 7-197 (p. 7-617 and 7-618):</p> <ul style="list-style-type: none"> ▪ M18: Maintaining a community liaison officer (CLO) for N'Diago and Saint-Louis to provide a direct link with the fishing communities in all matters related to the project. ▪ M19: Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project. ▪ M20: Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers.
12	Take into account chemical losses.	<p>The impacts of the accidental loss of solid waste on water quality as well as changes in water quality due to discharges of treatment chemicals, routine discharges from vessels, and sediment disturbance are analyzed for all project areas and phases.</p> <p>These questions are addressed in the sections of the report dedicated to the impacts of project activities on water quality. See Section 7.2.2 (p. 7-26 to 7-33) for impacts on water quality during the Construction Phase, Section 7.3.2 (p. 7-181 to 7-189) for such impacts during the Operations Phase and Section 7.4.2 (p. 7-308 to 7-313) for such impacts during the Decommissioning Phase.</p>

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Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
13	Involve competent individuals.	<p>It is our understanding that this recommendation refers to the involvement of national experts. As indicated on p. XXIV, the ESIA was prepared with the involvement of national experts from Mauritania and Senegal. In Senegal, six experts contributed to the ESIA.</p> <p>Moreover, the commitment made in the ESIA through mitigation measure M24 indicates that the GTA Phase 1 project will provide technical assistance to mutually agreed marine resource research programs notably the national oceanographic research centers of both countries (CRODT and IMROP).</p> <p>Additionally, the ESIA report specifies that "the GTA Phase 1 project will aim at implementing monitoring activities described in Chapter 10 through contracts with relevant national academics (universities, research institutes) where practicable, and for relevant monitoring activities whenever appropriate. This is considered an effective way to sustainably build the local academic capability on oil and gas industry and offshore environment both in terms of equipment and expertise." (p. 10-1).</p>
14	Provide training for young people, especially on the Langu de Barbarie.	<p>The request for youth training (notably young residents of the Langu de Barbarie) expressed at the public hearing had also been brought up during the public consultations presented in Chapter 6 of the ESIA.</p> <p>As indicated in Section 6.4.5 of Chapter 6 (p. 6-13), the consultant overseeing the ESIA took note of the requests for training and investments voiced by individuals present at the consultations, and transmitted them to BP for potential social investments that could be integrated into the company's corporate social responsibility (CSR) program. However, some of the stakeholders' requests refer to State responsibilities. Therefore, those requests are out of the scope of the ESIA.</p> <p>However, the ESIA underscores BP's support for training young people through capacity-building support for Mauritania and Senegal in the oil & gas sector. The report notably specifies that for Senegal, BP and partner Kosmos recently announced a multi-million dollar commitment to support the country's National Institute of Oil and Gas (INPG) (Section 2.14, p. 2-75).</p> <p>Lastly, as indicated in Section 2.14, the thrusts of the social investment activities of the GTA Phase 1 project encompass five areas including economic development opportunities for income and employment through the provision of a mix of instruments (e.g., micro-finance in combination with vocational education, business services for community based-enterprises, fishing cooperatives and wider support for entrepreneurship) that could possibly benefit youth.</p>

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Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
15	Promote the training of future generations at the national level.	<p>In order to support the development of national expertise that can ensure a labor force into the future, BP has undertaken to financially support INPG in Senegal by investing several million dollars with its partner, Kosmos Energy.</p> <p>In this regard, see Section 3.8.2 of Chapter 3, where it is specified that BP is seeking to make meaningful community investments that meet local needs and align with its business activities. One of these investments publicly announced on 31 August 2018 relates to BP's multi-million dollar financial commitment for the development of the Senegalese National Institute of Oil and Gas (INPG) to help building national capacity in the sector (p. 3-28).</p>
16	Ensure rigorous monitoring of the project.	See answer to Observation No 10.
17	Conduct capacity-building training of government officials for the monitoring of operations and production activities.	<p>The ESIA report includes a preliminary capacity-building plan for government officials for the monitoring of offshore oil and gas activities. This plan is defined in Section 9.5 of the report (p. 9-7 and 9-8).</p> <p>As indicated in Section 9.5, a detailed capacity-building plan will be prepared by BP in 2019 in collaboration with the relevant authorities. This capacity-building plan as well as the associated budget are conditional upon a positive final investment decision by the GTA Phase 1 project.</p>
18	Take into account the effects of light and sound pollution, which can disturb living organisms.	<p>Potential impacts of the light and sounds produced by project activities are addressed in Chapter 7 of the ESIA report. Light and sounds to be generated are taken into consideration in the impact analysis of the physical presence of infrastructures on the receiving environment. See the definition of impact producing factors (IPFs) in Table 7-1 of Chapter 7 (p. 7-3).</p> <p>The impacts of light were notably analyzed for plankton, fish and other fishery resources. See for example Section 7.2.6 of Chapter 7 (p. 7-57 to 7-65).</p> <p>The impacts of light on birds were also analyzed. See for example Section 7.2.8 of Chapter 7 (p. 7-70 to 7-80).</p>
19	Hold periodic or even monthly meetings with local communities.	See answer to Observation No. 11.
20	Support the retraining of fishermen for work in aquaculture and other sectors.	<p>The impact assessment demonstrates that project activities will not result in lower catches for the maritime fishing sector. Consequently, no measures are planned for the retraining of fishermen.</p> <p>That said, for the sake of social benefits for fishing communities, measure M27 of the ESMP (see notably Table 7-197, p. 7-618) provides for a social investment program. This program comprises specific activities for fishing communities, including economic development, which will be discussed and agreed upon with the relevant stakeholders at a later time.</p>

Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
21	Inform and educate fishermen with regard to the exclusion zone.	<p>The ESMP provides for the informing and education of fishermen regarding the exclusion zone established for their safety and that of the operations. Additionally, the ESMP lays out a series of measures for the safety of fishermen at sea. Such measures notably include the following:</p> <ul style="list-style-type: none"> ▪ M08: Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project. ▪ M09: Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities. ▪ M10: Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time. ▪ M11: Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling. ▪ M12: Have a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones. ▪ M13: Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.
22	Manage the waste that will be generated during operations of the various installations.	<p>The management of waste generated in the context of project activities is covered in the ESIA report. In this regard, see notably the preliminary waste management plan in Appendix S of the ESIA report as well as measure D06, which is presented in Chapter 7 of the ESIA and that reads as follows:</p> <p>A waste management plan will be developed and implemented to avoid unauthorized waste discharges and transfers, with written procedures for collection, segregation, storage, processing and disposal of waste, including use of equipment and record keeping.</p>

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Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
23	The environmental and social impact assessment report should be made available to the public.	It is our understanding that this recommendation is addressed to the authorities.
24	Specify the types of jobs that will be created in the context of this project.	<p>The approach for the labor force and local content of the GTA Phase 1 project is set out in Section 2.13 of Chapter 2 of the ESIA report.</p> <p>As the project will be carried out at sea, most of the jobs will also be offshore. An estimate of the number of employees required and the types of jobs that will be created are presented in Section 2.13.2 (p. 2-70 to 2-71).</p>
25	Minimize the potential impacts of the project.	<p>As indicated in Chapter 1 of the ESIA report, the primary objective of the ESIA is to predict the potential environmental effects of the project activities before the project is carried out and to incorporate environmental considerations into decision making.</p> <p>Presented in Chapter 9 of the ESIA, the ESMP includes a series of measures to avoid or reduce the potential adverse impacts of the project.</p> <p>As indicated in Section 9.1, the actions listed in the ESMP will be periodically reviewed throughout the project in order to determine that the plan's provisions are implemented and to confirm that the planned mitigation measures are effective in mitigating the predicted impacts. Findings will be reported to the relevant project or operation management teams, and the actions listed in the ESMP may be amended as necessary in pursuit of continual improvement (p. 9-1).</p> <p>As indicated in Section 9.3 of Chapter 9, BP will periodically prepare ESMP compliance reports. These reports will provide a statement of compliance with the mitigation measures accompanied by supporting notes. The ESMP compliance reports will be provided to the Mauritanian and Senegalese authorities by BP (p. 9-3 and 9-4).</p> <p>Additionally, the objective of implementing the SMP presented in Chapter 10 of the ESIA is to evaluate that the mitigation measures identified in the ESMP generate the expected results in regard to avoiding or reducing potential impacts on the biophysical or social environments.</p> <p>The SMP identifies a series of measures with performance objectives to monitor the following elements:</p> <ul style="list-style-type: none"> ▪ Air emissions ▪ Water quality ▪ Coastline

Numbers	Observations Taken from the Official Proceedings (dated November 16, 2018) of the Public Hearing	Responses to Observations (including reference page numbers in the ESIA, if applicable)
		<ul style="list-style-type: none"> ▪ Sediment quality, notably with reconnaissance of the ocean floor at the drillsites using a remotely-operated vehicle ▪ Benthic communities ▪ Ichthyoplankton in proximity to the FLNG ▪ Ichthyofauna associated with the Nearshore Hub/Terminal ▪ Safety incidents involving project vessels and other users of the sea, notably artisanal fishing craft ▪ Loss of artisanal fishing equipment due to project vessel traffic. <p>As indicated in Section 10.3 of Chapter 10, the result of the various monitoring programs defined in the SMP will be presented in reports submitted to the Mauritanian and Senegalese authorities (p. 10-2).</p>
26	Take local communities into consideration and keep them informed of project implementation.	See answer to Observation No. 11.
27	Take into consideration local communities and especially their youth when addressing needs.	See answer to Observations No. 1, 3, 7 and 14.

Other Modifications to ESIA

- The cover page was modified to identify the revised version and to change the date to December 2018.
- A foreword was added to explain the context of this revision.
- Amendments were made to Appendix V. Appendix V-3 provides the official proceedings of the meeting held by the Select Technical Committee on October 22, 2018. Appendix V-4 provides a table of observations noted in the official proceedings of the Select Technical Committee meeting. Additionally, these amendments were mentioned in the Table of Contents (p. LXXVII).
- A new appendix – Appendix W – was added to Volume 7 to account for the public hearing held in Senegal. Further, this new appendix was mentioned in the Table of Contents (p. LXXVII), the Non-Technical Summary (p. III), Chapter 1 (p. 1-6) and Chapter 6 (p. 6-2).
- Various typographical errors were corrected and formatting adjustments were made in the revised version of the ESIA.

**APPENDIX X: PUBLIC ENQUIRY
(MAURITANIA)**

Appendix X Public Enquiry (Mauritania)

APPENDIX CONTENTS

- X-1 Summary of the Public Enquiry Report for the ESIA of the Grand Tortue/Ahmeyim Phase 1 Gas Production Project dated November 2018 (in French)
- X-2 Tracking Table of Responses to Comments Noted in the Summary of the Mauritanian Public Enquiry Report

**APPENDIX X-1: SUMMARY OF THE PUBLIC
ENQUIRY REPORT FOR THE
ESIA OF THE GRAND
TORTUE/AHMEYIM PHASE 1
GAS PRODUCTION PROJECT
DATED NOVEMBER 2018
(IN FRENCH)**

République Islamique de Mauritanie

Honneur – Fraternité – Justice

Ministère de l'Environnement et du Développement Durable

Direction du Contrôle Environnemental

**Résumé du Rapport de l'enquête publique de l'EIE
du projet de production de gaz Grand
Tortue/Ahmeyim – Phase 1**

Novembre 2018

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- 3.1. Contexte du projet
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IV. Evaluation du dossier de l'EIE

- 4.1. Caractéristiques du dossier de l'EIE
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- 4.1. Conclusions suite à l'examen de conformité du dossier de l'EIE
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VI. Recommandations

I. Introduction

1.1. Contexte de l'enquête publique

En 2015 et 2016, un gisement de gaz naturel a été découvert en offshore de la Mauritanie et du Sénégal. Il s'agit de l'une des plus importantes découvertes historiques de gaz au large de l'Afrique de l'Ouest.

Le projet de production de gaz proposé, appelé le projet Grand Tortue/Ahmeyim (GTA) - Phase 1, est la première phase de l'exploitation de cette découverte.

Le projet sera exécuté par un groupe de partenaires :

- BP Mauritanie Investments Limited (BPMIL) et BP Senegal Investments Limited (BPSIL), appelés ensemble « BP » dans le présent document, sont les opérateurs conjoints actuels du projet conformément aux accords d'opération conjointe ;
- Kosmos Energy Mauritanie (KEM) et Kosmos Energy Investments Senegal Limited (KEISL) appelés ensemble « Kosmos » dans ce document ;
- La Société des Pétroles du Sénégal (PETROSEN) ; et
- La Société Mauritanienne des Hydrocarbures et de Patrimoine Minier (SMHPM).

Une étude d'impact environnemental et social (EIES) a été préparée pour ce projet. Elle a été réalisée par deux sociétés internationales d'experts-conseils en environnement, soit Golder Associés Ltée (Golder) et CSA Ocean Sciences Inc. (CSA), en collaboration avec un cabinet mauritanien, Ecodéveloppement (Ecodev) et un cabinet sénégalais, Tropica Environmental Consultants (Tropica).

1.2. Objectifs de l'enquête publique

L'EIE s'est surtout basée sur la documentation fournie et les textes réglementaires suivants :

- EIE du projet de production de gaz Grand Tortue/Ahmeyim – phase 1 ;
- Code de l'Environnement, Loi n° 2000-045 du 26 juillet 2000 et ses décrets d'application (Décret No 2004-094, 4 novembre 2004 et décret No 2007-105, 14 mars 2007) ;
- Code de la Marine Marchande (Loi n°2013-029 du 30 juillet 2013) ;
- Code des Pêches (Loi n°2015-017 du 19 juillet 2015) ;
- Conventions internationales de l'ONU, en particulier l'OMI ;
- Directives et bonnes pratiques GIPIP.

L'enquête publique est un examen du dossier de l'EIE pour :

- Evaluer sa conformité vis-à-vis des textes réglementaires ;
- Evaluer la pertinence de l'analyse (exhaustivité et évaluation) des impacts ;
- Evaluer le degré d'efficacité des mesures d'atténuation et du suivi environnemental proposées dans le PGE ;
- Formuler des conclusions et des recommandations.

L'enquête publique s'est déroulée en 3 phases principales : 1. Analyse de la documentation fournie, 2. réalisation d'une enquête publique et 3. Rédaction d'un rapport d'enquête publique.

II. Déroulement de l'enquête

L'enquête publique de l'EIE du projet a porté principalement sur la zone maritime et côtière du pays. Le Ministre de l'Environnement et du Développement Durable a désigné des enquêteurs de plusieurs institutions qui ont entrepris les activités suivantes :

- L'ouverture de l'enquête auprès du wali de Nouakchott Ouest et le Hakem de Teveragh Zeina ;
- Une première phase de bureau où les enquêteurs désignés ont entrepris la préparation de l'enquête ;
- Deux visites de terrain de 5 jours chacune, à l'ouverture et à la fermeture de l'enquête. Les enquêteurs se sont répartis en trois groupes : un groupe a couvert la Zone de Nouakchott et les deux autres se sont rendus au littoral Sud et littoral Nord ;
- Une deuxième phase de bureau pour la synthèse et la rédaction du rapport de l'enquête.

Il a été recommandé une lecture de tous les documents pour avoir une vision globale du projet. Chaque groupe désigne un rapporteur pour l'échange avec le compilateur. Les membres du groupe sont invités à prendre contact avec toute personne ressource jugée utile pour apporter une contribution pertinente relative à l'EIE.

Plusieurs réunions des enquêteurs ont permis de partager le travail en fonction des spécialités :

Groupes thématiques :

Groupe 1 : DCE

- La conformité ; méthodologie ; compilation des inputs, Analyse des impacts et leur évaluation et le PGES
 - Point focal : Khadijetou

Groupe 2 : IMROP/PNBA/PND

- Environnement marin et côtier ; état de référence ; érosion côtière ; impact sur le PND et l'impact cumulatif ; Analyse des impacts et leur évaluation le PGES
 - Points focaux : PND (Zein Alabidin), IMROP (Khairi Dine) ; PNBA (Lemhaba)

Groupe 3 : DMM/SMHPM/DGH

- Architecture et conception du projet (design du projet) ; Déversement accidentel ; réglementation OMI et standards ; pollution marine, Analyse des impacts et leur évaluation le PGES
 - Point focal : Omar

III. Le projet

Le projet a pour objectif d'extraire, traiter et exporter du gaz naturel liquéfié (GNL). Jusqu'à 2,5 millions de tonnes de GNL seront produites chaque année. Le projet rendra également le gaz naturel disponible pour une utilisation dans les deux pays. Le gaz naturel sera extrait de formations rocheuses situées sous le plancher océanique, à environ 125 km de la côte, de chaque côté de la frontière maritime entre la Mauritanie et le Sénégal.

Le projet extraira le gaz du champ gazier et l'acheminera par un système de pipelines, en passant par le navire FPSO (une unité flottante de production, de stockage et de déchargement) vers des installations dans les eaux côtières, près de N'Diogo et de Saint-Louis, où il sera traité, liquéfié et exporté par de grands navires. Les infrastructures et les opérations requises en Mauritanie ou au Sénégal feront partie d'un même projet pour cette première phase.

La justification de ce projet réside dans l'intérêt des deux pays à développer leurs ressources gazières et pétrolières offshore. Les bénéfices pour les deux pays comprendront des revenus : des recettes provenant des parts de PETROSEN et de la SMHPM dans le projet, la part des États dans la vente de GNL et des taxes.

En raison de l'ampleur du champ gazier, le projet actuel correspond à la phase 1 d'un développement potentiel plus important. Seule la phase 1 est couverte par la présente EIES. Si une expansion du projet s'avère viable, des EIES distinctes seront préparées ultérieurement pour couvrir les autres phases du développement.

Le projet comprend trois grandes composantes : la Zone Offshore, la Zone de Pipeline et la Zone du Terminal du Hub GNL près des Côtes.

IV. Evaluation du dossier de l'EIE

C'est la partie principale de l'analyse. Elle précise dans un premier temps la composition du dossier de l'EIE et la méthodologie mise en œuvre pour l'évaluation avant de procéder à l'examen de conformité du dossier vis-à-vis des exigences auxquelles doit répondre le dossier d'EIE, conformément à la réglementation en

vigueur en Mauritanie. Enfin, elle donne une revue détaillée des deux principales parties du dossier de l'EIE : le résumé non technique et le PGE.

4.1. Composition du dossier de l'EIE

Le dossier transmis par la société comprend les documents suivants : Un rapport de l'EIES et un résumé non technique (en arabe et en français).

Le rapport de l'EIES comprend 11 chapitres, une bibliographie et 18 annexes, organisés comme suit :

Chapitre 1 : Introduction

Chapitre 2 : Description et justification du projet

Chapitre 3 : Cadre réglementaire et institutionnel

Chapitre 4 : Description du milieu récepteur

Chapitre 5 : Analyse des variantes et description du projet retenu

Chapitre 6 : Consultations publiques

Chapitre 7 : Identification et analyse des impacts (y compris les mesures de mitigation)

Chapitre 8 : Étude de dangers et analyse des risques professionnels

Chapitre 9 : Plan de gestion environnementale et sociale

Chapitre 10 : Plan de surveillance et de suivi

Chapitre 11 : Conclusion

Bibliographie et références

Les annexes sont identifiées de A à R, et plusieurs d'entre elles comprennent plus d'un document.

Elles sont organisées comme suit :

A. Termes de Référence de l'EIES approuvés par la Direction du Contrôle Environnemental (DCE) de la Mauritanie et la Direction de l'Environnement et des Établissements Classés (DEEC) du Sénégal

B. Caractéristiques techniques des infrastructures, des navires, des hélicoptères et des autres équipements du projet

C. Politique de santé, sécurité, sûreté et environnement et politique opérationnelle de BP pour la région de la Mauritanie et du Sénégal

D. Rapport de l'étude de référence environnementale océanographique

E. Rapports sur les ressources halieutiques, la pêche et les communautés de pêcheurs

F. Notes sur les aires protégées

G. Données complémentaires à l'état de référence du milieu biophysique

- H. Données complémentaires à l'état de référence du milieu social
- I. Rapports sur la situation de référence et la modélisation des processus hydrodynamiques (érosion côtière)
- J. Rapport de modélisation des émissions atmosphériques
- K. Estimations des rejets d'effluents et rapport de modélisation de l'eau produite
- L. Rapport de modélisation de la dispersion des boues et des déblais de forage
- M. Rapport de modélisation de l'entraînement du plancton
- N. Rapports de modélisation des scénarios d'événements accidentels
- O. Données complémentaires à l'Étude de dangers
- P. Liste indicative des installations classées pour la protection de l'environnement (ICPE) du projet
- Q. Rapports de consultation publique
- R. Fiches de données de sécurité des produits (FDS).

4.2. Méthodologie de l'évaluation

La présente analyse technique du dossier de l'EIE du projet comprend un examen de conformité du dossier de l'EIE, une revue du résumé non technique et du PGE. L'examen de conformité du dossier de l'EIE permet d'évaluer la conformité du dossier de l'EIE par rapport aux TdR validés et aux textes réglementaires en vigueur en Mauritanie. L'objectif étant de permettre au MEDD de se prononcer sur la recevabilité en l'état du dossier de l'EIE vis-à-vis de ces différentes exigences formelles.

La revue du dossier de l'EIE porte sur le rapport de l'EIE, du résumé non technique et du PGE. Cette revue est un examen plus technique du dossier. Elle s'appuie sur l'expertise et l'expérience des enquêteurs désignés et a pour principal objectif d'évaluer la pertinence des documents transmis.

4.3. Examen de conformité du dossier de l'EIE

4.3.1. Conformité aux TdR

Le rapport de TdR a été soumis au Ministère de l'Environnement et du Développement Durable (MEDD) et a été validé à l'issue d'une réunion de cadrage qui a regroupé les principaux départements ministériels concernés et le promoteur.

4.3.2. Conformité avec la réglementation mauritanienne sur les EIE

L'objectif de cet examen est de vérifier que le dossier de l'EIE répond à la réglementation mauritanienne sur les EIE.

Les exigences de la réglementation mauritanienne en matière d'EIE sont rappelées dans l'article 7 et l'annexe II du décret 2007-105.

Le rapport de l'EIE doit être traduit en français et présenté selon le plan dont le modèle figure en annexe II du Décret 2007-105. Ce plan est comme suit :

- ✚ Résumé exécutif
 - ✚ Législation, cadre juridique et institutionnel
 - ✚ Description du projet
 - ✚ Situation existante sans projet [...]
 - ✚ Evaluation des risques
 - ✚ Impact du projet sur les différents domaines de l'environnement
 - ✚ Analyse des alternatives
 - ✚ Plan de Gestion Environnementale
 - ✚ Modalités de consultation et de participation du public
 - ✚ Chronogramme
- **Contenu d'un rapport de l'EIE :** L'article 7 du décret 2007-105 précise que « l'étude d'impact sur l'environnement doit être en relation avec l'importance des travaux, ouvrages et aménagements projetés et avec leurs impacts prévisibles sur l'environnement et la population. Toutefois, l'étude d'impact doit comporter nécessairement :
 - Une présentation du projet et des aménagements, ouvrages et travaux à réaliser, la justification du choix des techniques et des moyens de production ainsi que sa localisation ;
 - Une analyse de l'état initial du site et de son environnement [...]
 - Une analyse des impacts directs et indirects [...]
 - Une description des risques éventuels pour l'environnement hors du territoire national de l'activité projetée ;
 - Une description des lacunes relatives aux connaissances techniques ainsi que des incertitudes rencontrées dans la mise au point de l'information nécessaire ;
 - Un plan de gestion environnementale faisant ressortir les mesures nécessaires pour supprimer, réduire et compenser les conséquences dommageables du projet ainsi que l'estimation des dépenses correspondantes [...]
 - Un résumé non technique se rapportant aux rubriques précédentes destinées à l'information du public et des décideurs.
 - Un plan de réhabilitation du site pour certains projets.
 - **Exigences relatives au PGE :** Le contenu du PGE est précisé dans l'article 7 alinéa 6, du décret 2007-105 : « Ce plan doit comprendre nécessairement [...] une définition précise des mesures [...], des données chiffrées des dommages et taux d'émission des polluants [...], le planning d'exécution, une estimation des dépenses et une indication chiffrée des résultats attendus en terme de

taux de polluants ou de seuils de nuisance et parallèlement les normes légales ou pratiques admises dans les cas sensibles. »

4.4. Revue du contenu du Rapport de l'EIE

Le plan suivi par le rapport de l'EIE respecte- il le modèle préconisé par décret 2007-105 en annexe II.

Tableau relatif à la conformité du contenu du rapport de l'EIE :

	Eléments réglementaires exigés dans les décrets n°2004-094 et n°2007-105	Commentaires	Conformité
Exigences du contenu (Art. 7)	« [...] l'étude d'impact doit comporter nécessairement :		
	<ul style="list-style-type: none"> • Une présentation du projet et de ses aménagements [...] 	Le chapitre 2 : Description et justification du projet	OUI
	<ul style="list-style-type: none"> • Une analyse de l'état initial et de son environnement [...] 	Le chapitre 4 : Description du milieu récepteur (+ Annexe G)	OUI
	<ul style="list-style-type: none"> • Une analyse des impacts directs et indirects [...] 	Le chapitre 7 : Identification et analyse des impacts (y compris les mesures de mitigation)	OUI
	<ul style="list-style-type: none"> • Une description des risques éventuels pour l'environnement hors territoire national et activité projetée 	Les impacts dans la sous- région sont évoqués en cas de catastrophe suite à des accidents (chapitre 7) mais non étudiés (aucune activité projetée)	OUI
	<ul style="list-style-type: none"> • Description des lacunes [...] et incertitudes [...] 	L'EIES tient des incertitudes importantes lorsqu'elles existent et explique leur répercussion.	OUI
	<ul style="list-style-type: none"> • Le Plan de Gestion de l'Environnement [...] 	Le chapitre 9 : Plan de Gestion Environnementale et sociale	OUI
	<ul style="list-style-type: none"> • Un résumé non technique 	Le volume 1	OUI
	<ul style="list-style-type: none"> • Pour l'autorisation de certaines activités, un plan de réhabilitation du site [...] 	Sans objet (cette partie fera l'objet d'une EIES en temps opportun)	NON
Eléments complémentaires (annexe II)	« Le modèle de plan donné en annexe II fait apparaître des éléments supplémentaires :		
	<ul style="list-style-type: none"> • Législation, cadre juridique et institutionnel 	Le chapitre 3 : Cadre juridique et institutionnel	OUI
	<ul style="list-style-type: none"> • Analyse des alternatives 	Le Chapitre 5 : Analyse des variantes et développement du projet retenu	OUI
	<ul style="list-style-type: none"> • Modalités de consultation et de participation du public 	Le chapitre 6 : Consultations publiques	
	<ul style="list-style-type: none"> • Chronogramme 	Un échéancier a été décrit pour les 3 phases : installation, exploitation et fermeture (échéancier et phases du projet au chapitre 2)	OUI

Sur le plan forme, le rapport de l'EIE répond à toutes les exigences de la réglementation en vigueur dans le pays à part le plan de fermeture qui fera l'objet d'une EIE ultérieurement.

En analysant en détail le document, les remarques de fond suivantes ont été relevées :

- **Une analyse de l'état initial et de son environnement [...] :**

ENVIRONNEMENT MARIN ET COTIER

La première tâche du groupe était de s'assurer que les volets évoqués si dessus sont bien traités dans le rapport de l'EIES.

Concernant le volet 1 (Environnement marin et côtier), le rapport de l'EIES, à travers une description détaillée du milieu récepteur a fait ressortir les points saillants caractéristiques de l'environnement des eaux mauritaniennes. Cette description a été soutenue par des données complémentaires et rapports de modélisation cités aux annexes E à J.

En l'absence de données propres aux sites PGTA, l'EIES a fait appel dans certains cas aux caractérisations régionales utilisées parallèlement à des interpolations entre l'information régionale et la zone du projet.

Parmi les imprécisions, il a été relevé une confusion dans la localisation de la permanence et saisonnalité de l'upwelling dans la région. (V1 CH4-43). Ce phénomène physique qui gouverne largement la production primaire est approximativement saisonnier au sud 20^{ème} parallèle et permanent au nord du même parallèle (upwelling permanent du Cap Blanc).

ETAT DE REFERENCE. (DONNEES COMPLEMENTAIRES ANNEXE G)

Ce volet devrait évaluer à travers des études biophysiques l'état de référence du milieu récepteur (état zéro) avant le démarrage effectif du projet. Ces études ont pour objectifs de fournir une description fondamentale des conditions environnementales initiales du milieu récepteur. Cet état de référence pourrait être utilisé pour évaluer et éventuellement surveiller l'effet des opérations futures du PGTA. Parmi les objectifs affichés, l'utilisation des données de l'état de référence du milieu biophysiques dans l'EIES, au besoin afin de pallier les lacunes en matières de données relatives à l'état de référence vu la pénurie des données historiques.

Les lacunes principales relevées par le groupe à ce niveau sont

- La localisation de l'étude à la zone restreinte du projet ;
- La volonté de donner aux résultats de ces études une portée régionale par son extrapolation à toute la région.

EROSION COTIERE.

La description de l'état de la ligne côtière a été réalisée par l'Etude grâce aux photographies aériennes historiques par satellites et une revue de publications (Annexe I-2 et I-3 et photo à l'annexe I-3). Elle a montré l'existence de trois types de régions littorales du sud de la Mauritanie jusqu'au sud du delta du fleuve présentant des comportements semblables.

- Région du sud de la Mauritanie où la ligne de végétation côtière dunaire est en régression vers la direction sud-est.
- Dans la région du delta du fleuve Sénégal, la ligne côtière se caractérise par une stabilité relative mais la ligne de végétation montre un recul semblable à celui de la région sud de la Mauritanie.

Cette description a exclu la ligne côtière allant vers Nouakchott, zone fortement menacée par les aléas de l'avancée probable de la mer.

- **Une analyse des impacts directs et indirects [...] :**

IMPACT SUR LE PND.

Cette question n'a été pas traitée dans l'EIES.

IMPACTS CUMULATIFS.

C'est la résultante des effets cumulés des différentes activités passées, présentes et prévisibles dans le futur proche (2 à 3 ans) au niveau du site du projet PGTA et zones environnantes.

Les impacts potentiels sur les composantes biophysiques et sociales associés aux activités de routine de la phase de construction seront de courte durée. L'impact se sentirait sur quelques centaines et plusieurs milliers de mètres des activités de chacune des quatre zones d'intervention du PGTA.

- Il y a peu de chance de générer des impacts cumulatifs avec les autres activités courantes dans la zone pour la composante biophysique notamment avec la pêche et le bunkering qui sont des activités de long terme alors que la phase de construction est de court terme.

- Les impacts cumulatifs avec d'autres activités pétrolières et gazières doivent être semblables et varier de négligeable à faible selon la composante biophysique et sociale. Il est à rappeler que des études sismiques devraient être menées par Exxon Mobil (Bloc C14, C17 et C22) et Tullow (Bloc 18 en 2019) suivies par des activités de forages exploratoires par Exxon Mobil en 2021. BP et Kosmos ont prévu d'effectuer des activités de forages exploratoires dans les eaux mauritaniennes en 2019 et 2020 sur les Bloc C6 et C8, C12 et C13.

1/Composante sociale : impacts cumulatifs des activités pétrolières prévus sont limitées. Les seuls impacts jugés importants est le risque de collision entre les embarcations de pêche artisanale et les navires de soutien aux opérations d'études sismique ou de forage exploratoire.

2/ Aucune composante biophysique n'est actuellement à risque en raison des impacts cumulatifs des autres usages maritimes et des projets connexes relatifs au milieu marin, à l'exception peut-être de celle qui suit :

- Probabilité de collision avec les mammifères marins est grande au large et diminue quand ils nagent vers le plateau continental. Cela varie selon les espèces (certaines s'approchent tels que les dauphins, d'autres plongent dans les fonds telles que les grandes baleines).
- La profondeur de l'eau n'affecte pas la vulnérabilité des tortues de mer aux collisions.
- Pour les espèces menacées, les impacts cumulatifs potentiels peuvent comprendre les blessures et les perturbations liées aux bruits, blessures auditives et collision avec les navires des opérations de constructions.
- L'introduction d'espèces non indigènes invasives.

Les impacts résiduels de ces FOI sur les espèces ont été cotés faibles et le restent quelle que soit leur interférence avec d'autres sources d'impacts.

Les effets cumulatifs sur la pêche artisanale et activités connexes du PGTA avec de N'Diogo et les deux ports fluviaux prévus à Saint Louis seraient la cause des impacts déjà signalés pour le secteur de la pêche. L'importance est cotée faible.

L'EIES, aurait dû simuler un ensemble d'impact cumulatifs qui seraient dus à l'extension et construction d'autres infrastructures portuaires nouvelles (Extension du port de Tanit, construction éventuelle d'un port en eau profonde à Nouadhibou, et installation de points de pontons de débarquement le long de la côte sud de Nouakchott et par conséquent l'augmentation du trafic maritime.

ANALYSE DES IMPACTS ET LEUR EVALUATION

Suite à l'analyse de cette partie du rapport de l'EIES, il a émis les remarques et recommandations suivantes :

- L'évaluation des conséquences du projet GTA, sur l'érosion côtière n'a pas pris en compte l'existence de brèches dans la zone littorale allant de N'Diogo à Nouakchott. Il est à rappeler que la ville de Nouakchott est soumise par endroits aux risques dus à **l'advection** des eaux de l'océan.

- L'effet négatif de la brise lame est évalué en 10 ans à un recul de la ligne de côte de 6m sur une distance de 2 km de littoral près de l'embouchure du fleuve, soit 18m sur 30 ans (durée du projet). Cet effet est jugé négligeable et ne nécessite pas de

mesure de mitigation. Nous considérons que cette situation pourrait constituer un danger pour les populations et les biens et devrait être reconsidérée.

- Pour les sédiments, il est impératif que les monticules carbonatés sensibles soient épargnés de toute activité susceptible de les modifier, même si le rapport donne l'assurance qu'ils seront préservés.

- Une recommandation réitérée s'impose quant à la préservation des aires marines protégées contre l'intrusion d'espèces invasives importées à travers les navires **engagés dans la phase de construction**, bien qu'aucune mesure de mitigation n'est nécessaire selon le rapport de l'EIES vu l'ampleur négligeable des impacts prévus.

- Il apparaît de l'analyse de cette composante que la liste espèces menacées établie dans cette EIES n'est pas exhaustive. Car, certaines espèces de différents groupes faunistiques en particulier, des tortues marines (tortue caouanne, tortue tuth, tortue olivâtre), des oiseaux (*Sterna hirundo*, *Balearica pavonina* (en danger) d'autres espèces sont soit vulnérables soit quasi menacées ...) des mammifères marins (baleine à bosse) y ont été omis. Il est à rappeler que les données issues du monitoring qu'elle effectue l'IMROP soulignent que la partie littorale s'étendant de Nouakchott à une zone de nidification des tortues caouannes et vertes fréquentant les eaux mauritaniennes.

- Une évaluation **plus poussée** des impacts des **émissions** de gaz notamment NOx et SO₂ sur la population **doit être établie. Ces dérivés gazeux sont particulièrement dangereux si l'on sait que leurs émissions dépasseront les seuils établis par le Bureau of Ocean Energy Management (BOEM) lors des travaux de routine en phase de construction.** Des mesures conséquentes devraient être prises **sachant** qu'aucune mesure de mitigation n'est envisagée dans le rapport de l'EIES.

- Les communautés benthiques sont très sensibles à tout ce qui touche au substrat, les habitats et les écosystèmes. A cet effet, une évaluation plus poussée est vivement recommandée pour pallier aux impacts des éventuels accidents.

- **Une description des risques éventuels pour l'environnement hors territoire national et activité projetée :**

Cette partie a été traitée dans

- **Description des lacunes [...] et incertitudes [...] :**

Cette partie a été traitée dans

- **Le Plan de Gestion de l'Environnement [...] :**

Cette section est traitée ci-dessous.

- **Un résumé non technique :**

Le résumé du rapport de l'EIE peut être considéré comme un résumé exécutif destiné à l'information du public et des décideurs. En effet, il reprend de manière simplifiée les différentes rubriques du rapport avec des illustrations claires et facilitant la compréhension du projet de la part de la population et des décideurs.

Le résumé non technique du présent projet répond à cette exigence.

- **Pour l'autorisation de certaines activités, un plan de réhabilitation du site [...] :**

La section n'a pas d'objet. Elle porte sur la phase 3 (Fermeture du projet).

- **Analyse des alternatives :**

La section n'a pas d'objet, puisqu'elle n'est pas pertinente.

- **Modalités de consultation et de participation du public :**

Une consultation du public a été organisée sous forme de rencontres avec les parties prenantes couronnées par des réunions.

4.5. Revue du Plan de Gestion Environnemental (PGE)

Le plan suivi par le PGE de l'EIE du projet respecte-t-il le modèle préconisé par décret 2007-105 en son annexe II ?

Tableau relatif à la conformité du contenu du PGES

	Éléments réglementaires du exigés dans les décrets n°2004-094 et n°2007-105	Commentaires	Conformité
Exigences du contenu (Art. 7)	Le PGE « doit comprendre nécessairement :		
	<ul style="list-style-type: none"> • Une définition précise des mesures prévues par le promoteur pour supprimer, réduire et compenser les conséquences dommageables du projet sur l'environnement 	Le tableau 9-1 Phase de construction – Mesures de mitigation et rôles principaux associés Le tableau 9-2 Phase des opérations – Mesures de mitigation et rôles principaux associés Le tableau 9-3 Evènements accidentels – Mesures de mitigation et rôles principaux	OUI

	<ul style="list-style-type: none"> Les données chiffrées des dommages et taux d'émission des polluants dans le milieu ambiant 	Ce point n'a pas d'objet	NON
	<ul style="list-style-type: none"> Le planning d'exécution 	Le PGES ne bénéficie pas d'un chronogramme d'exécution	NON
	<ul style="list-style-type: none"> Une estimation des dépenses 	Les coûts de mise en œuvre sont tous inclus dans le projet	NON
Exigences du plan (annexe II)	« Le modèle de plan donné en par le PGE par l'annexe II du décret fait apparaître quatre éléments exigés :		
	<ul style="list-style-type: none"> Mesures d'atténuation et de réduction des impacts 	Le tableau 9-1 Phase de construction – Mesures de mitigation et rôles principaux associés Le tableau 9-2 Phase des opérations – Mesures de mitigation et rôles principaux associés Le tableau 9-3 Evènements accidentels – Mesures de mitigation et rôles principaux	OUI
	<ul style="list-style-type: none"> Modalités de réalisation des mesures arrêtés et coûts 	Le tableau 9-1 Phase de construction – Mesures de mitigation et rôles principaux associés Le tableau 9-2 Phase des opérations – Mesures de mitigation et rôles principaux associés Le tableau 9-3 Evènements accidentels – Mesures de mitigation et rôles principaux	OUI
	<ul style="list-style-type: none"> Mesures de contrôle de la pollution 	Le tableau 10-1 Mesures de suivi et rôles principaux associés	OUI
	<ul style="list-style-type: none"> Développement et formation 	Le tableau 9-5 relatif aux renforcements des capacités	OUI

Le tableau ci-dessous montre que le PGES ne fournit ni les données chiffrées des dommages et taux d'émission des polluants dans le milieu ambiant, ni une estimation des dépenses. Il ne donne pas un planning d'exécution précis des mesures d'atténuation préconisées.

ANALYSES ET COMMENTAIRES

DU PLAN DE GESTION ENVIRONNEMENTALE ET SOCIALE

Le rapport de l'EIES a présenté le plan de gestion selon les normes reconnues. Il est conçu pour réaliser les objectifs suivants :

- Résumer les mesures de design et de contrôle des opérations du projet ainsi que les mesures de mitigation proposées pour éviter ou réduire les impacts négatifs significatifs.

- Définir un système de mise en œuvre, de la conformité et d'évaluation de la performance de ces mesures.
- Identifier les mécanismes de déclaration et de rapports.

Pour la mise et le suivi du PGES des outils opérationnels sont définis afin de fournir des informations pour chaque composante de l'environnement biophysique ou social qui pourrait être affecté. Ces outils reposent sur :

- La liste des impacts potentiels,
- Pays concernés par le projet
- Mesure de design et contrôle des opérations inhérentes au projet pour atténuer les impacts
- Mesures de mitigation spécifiques visant à éviter ou à réduire les impacts négatifs côtés d'une importance supérieure à 1- Négligeable
- Evaluation de l'impact résiduel
- Indicateurs objectivement vérifiables de la mise en œuvre de la mesure
- Source suggérée pour la vérification de la mise en œuvre
- Rôle principale dans la mise en œuvre de la mesure ; et
- Coûts de la mise en œuvre de la mesure.

L'analyse du PGES a permis de soulever quelques remarques et suggestions se rapportant à :

- Application de certaines mesures d'atténuation ;
- Source de vérification ;
- Acteur principal chargé de la mise en œuvre de la mesure ;
- Acteur chargé du suivi de la mesure.

Les mesures d'atténuation :

1. La formation destinée aux pêcheurs locaux, sur les règles de sécurité doit être étendue à tous les pêcheurs des deux pays par le biais d'une formation soutenue de formateurs.
2. Il est souhaitable que le programme d'intervention social visant à accroître les retombées du projet pour les communautés de N'Diogo et de Saint Louis soit élargi à plus d'opérateurs intervenant dans les activités artisanales côtières. Il est aussi nécessaire qu'il dépasse les simples besoins de subsistance pour s'impliquer davantage dans le développement local (écoles, unité de santé...).
3. En plus de l'aspect technique de l'assistance mutuellement consentie prévue pour les institutions de recherche (IMROP et CRODT) d'autres aspects (soutien financier entre autres) devraient être envisagés.

4. Dans le cadre des précautions et mesures d'interventions en cas d'accident, il est nécessaire de procéder périodiquement à des simulations d'accidents afin d'améliorer l'efficacité du plan d'intervention.

La source de vérification : Cette action se base dans son travail sur la disponibilité de rapports et documents fournis par les opérateurs chargé de la mise en œuvre des mesures. Pour plus de transparence et de traçabilité il est vivement recommandé la ventilation de ces rapports et document à la DCE en temps opportun.

Acteur principal chargé de la mise en œuvre de la mesure : Une partie tierce indépendante agréée et disposant de moyens serait la mieux placée pour co-assurer le suivi de la mise en œuvre.

Acteur chargé du suivi de la mesure : Pour plus de transparence, le suivi de la mise en œuvre ne doit pas être assuré par la partie chargé de la mise en œuvre. Là aussi, il est souhaité qu'une partie tierce compétente intervienne.

V. Conclusions

5.1. Conclusions suite à l'examen de conformité (recevabilité) du dossier de l'EIE

Le dossier de l'EIES peut être considéré comme recevable conformément aux exigences de la réglementation nationale en vigueur en Mauritanie. En effet, l'opérateur a traité tous les points sauf le plan de réhabilitation du site qui sera élaboré avant la fin de la première phase.

5.2. Conclusions suite à la revue du PGES

- Malgré l'absence de l'estimation des dépenses, le tableau relatif à la conformité du rapport du PGES demeure recevable car les impacts décrits et les mesures d'atténuation proposées sont dans l'ensemble suffisamment pris en charge.
- La modélisation est basée sur les valeurs du seuil sont basées sur le guide du Sénégal (2005).
- Le Dispositif de préparation aux situations d'urgence est basé sur le guide du Sénégal de 2005.

Le projet doit élaborer un guide spécifique à la Mauritanie qui pourra être actualisé avec le temps.

Malgré que le PNBA est loin de la zone du projet, que le PGE l'intègre en tant que zone particulièrement sensible du point de vue géomorphologique, hydrologique, éco biologique, etc....)

VI. Recommandations

Les recommandations de la présente enquête publique se sont dégagées de l'analyse de forme et de fond de la documentation qui a été mise à la disposition des enquêteurs désignés.

Les recommandations générales :

- Les effets cumulatifs sur l'écologie et la pêche n'ont pas été bien abordés dans l'EIES. **Nous préconisons de mettre en place un comité de suivi des impacts au démarrage du projet.**
- Les impacts sociétaux ont été bien identifiés dans l'EIES. Toutefois, les solutions suggérées pour les réduire n'ont pas reçues beaucoup d'attention. Dans le cadre de cette étude, des réunions par le biais d'un interlocuteur dans un but essentiellement informatif sont prévues. **Nous recommandons de mettre en place rapidement un programme d'investissement social ambitieux (indemnisation des pêcheurs, santé, éducation, etc.) pour les riverains du projet afin d'aider à l'acceptation du projet.**

Les recommandations spécifiques :

- Même si l'EIES et le PGES stipulent que les risques éventuels sont négligeables après les mesures adéquates suggérées dans le PGES permettant de réduire au minimum les risques biophysiques et socio-économique, **Nous suggérons que la DCE soit associée au plan de surveillance** car les impacts de la qualité de l'air notamment pour le NOx et le SOx semblent bien être établis.

**APPENDIX X-2: TRACKING TABLE OF
RESPONSES TO COMMENTS
NOTED IN THE SUMMARY OF
THE MAURITANIAN PUBLIC
ENQUIRY REPORT**

Table X-2-1. Tracking Table of Comments Notes in the Public Enquiry Report Summary of the DCE of November 2018.

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
Remarks		
1	<p>Marine and Coastal Environment: A confusion in the location of the permanence and seasonality of the upwelling in the region was noted among the gaps of the ESIA (V1 CH4-43). This physical phenomenon that mostly governs primary production is approximately seasonal south of the 20th parallel and permanent north of that same parallel (permanent upwelling in Cap Blanc).</p>	<p>The location of the permanence and the seasonality of the upwelling in the region is a phenomenon known to many researchers cited in the ESIA, notably in Sections 4.4.5.2 (p. 4-27 to 4-29) and 4.5.1.2 (p. 4-38) of Chapter 4. According to the authors, the limits of these phenomena vary around the 20th parallel; some refer to the 19th parallel, others to the 20th and yet others to the 21st.</p>
2	<p>Baseline (Support Material Appendix G): This item should assess, through biophysical studies, the baseline of the host environment (initial state) prior to the effective start of the project. These studies have the objective of providing a <u>fundamental description of the initial environmental conditions of the host environment</u>. This baseline could be used to assess and eventually monitor the future impacts of PGTA operations. Among the posted objectives, the use of the ESIA's biophysical environment data, as needed, to <u>address baseline data gaps</u> due to the lack of historical data. The main gaps identified by the group are:</p> <ul style="list-style-type: none"> - The location of the core study area of the study; - The desire to give a regional reach to the results these studies by extrapolating them to the entire region. 	<p>It is important to recall that Appendix G provides complementary data that support Chapter 4 of the ESIA, describing the host environment. The elements identified in the comment as inaccuracies are actually presented in Chapter 4. The location of the project's study areas is presented in Section 4.3 of Chapter 4, notably in Figure 4-1 for the limits of the core study area (p. 4-7). A description of the regional context of Mauritania, of Senegal, of the Canary Current Large Marine Ecosystem (CCLME) and of climate change is presented in Section 4.2 (p. 4-2 to 4-5). The sections that follow in Chapter 4 are, however, focused around the project's study areas because the objective is to describe and understand well the initial conditions specific to the location planned for the project and its potential impacts.</p>

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
3	<p>Coastal Erosion:</p> <p>The description of the coastline was conducted by the Study with historic aerial photographs taken by satellite and a literature review (Appendix I-2 and I-3 and picture in Appendix I-3). It showed the existence of three types of coastal regions from southern Mauritania to the south of River Delta showing similar behavior.</p> <ul style="list-style-type: none"> - Region of southern Mauritania where the coastal dune line of vegetation is regressing in southeast direction. - In the Senegal River Delta region, the coastline is characterized by relative stability, but the line of vegetation shows a regression similar to the one in southern Mauritania. <p>This description excluded the coastline extending toward Nouakchott, which is an area highly threatened by the consequences of the likely advance of the sea.</p>	<p>Appendices I-2 and I-3 comprise the reports of the modeling of the coastline (initial and updated modeling). These studies had the objective of assessing the impacts on the coastline potentially associated with the presence of the breakwater planned for the GTA Phase 1 project. Given the current coastal processes and based on the modeling performed, the project is not expected to have impacts on coastal processes north of N'Diogo. The potentially impacted coastline is in the vicinity of the breakwater, heading southeast. This explains why the description of the baseline has focused on the coastline in southern Mauritania and near the Senegal River Delta.</p> <p>It should be noted that the general description of littoral processes and of the state of the coastline, presented in Appendix I-1, covers a 402-km coastal strip between Nouakchott and Dakar.</p>
4	<p>Impacts on the DNP:</p> <p>This question was not covered in the ESIA.</p>	<p>The impacts on protected areas, including Diawling National Park (DNP), are described in Chapter 7 in the following sections:</p> <ul style="list-style-type: none"> ▪ Section 7.2.11: Impacts on threatened species and protected areas from activities during the Construction Phase (p. 7-106 to 7-120). ▪ Section 7.3.11: Impacts on threatened species and protected areas from activities during the Operations Phase (p. 7-238 to 7-250). ▪ Section 7.4.11: Impacts on threatened species and protected areas from activities during Decommissioning Phase (p. 7-357 to 7-367). ▪ Section 7.5.11: Impacts on threatened species and protected areas from accidental events (p. 7-536 to 7-549).

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
5	<p>Cumulative Impacts:</p> <p>The ESIA should have simulated a set of cumulative impacts that would be due to the extension and construction of other new port infrastructures (Extension of the Port of Tanit, possible construction of a deep-water port in Nouadhibou and installation of landing pontoon points along the southern coast of Nouakchott and consequently, the increase in maritime traffic).</p>	<p>Section 7.7.1 of Chapter 7 (p. 7-633 à 7-637) describes the scope and spatial and temporal limits of the analysis of cumulative impacts. In standard fashion, the analysis of cumulative impacts considered ongoing projects or projects planned for the foreseeable future for the areas within or in proximity of the GTA Phase 1 activity areas.</p> <p>Only projects that have or will have activities and impacts in a relative proximity to the GTA Phase 1 project are selected for the assessment of cumulative impacts.</p> <p>The extension of Port of Tanit and the possible construction of a deep-water port in Nouadhibou are located outside the GTA Phase 1 project study area, which is why they were not selected for the analysis of cumulative impacts.</p> <p>The installation of landing pontoon points along the southern coast of Nouakchott was not selected because there was no publicly available information on this project. However, cumulative impacts of this project as well as of the installation of landing pontoon points may be examined as needed when monitoring the GTA Phase 1 project.</p> <p>Finally, the possible increase in maritime navigation related to the multipurpose maritime port that is to be located approximately 30 km north of N'Diogo was considered in the assessment of cumulative impacts (p. 7-633 to 7-643).</p>
6	<p>Impact Analysis and Assessment:</p> <p>Following the analysis of this part of the ESIA report, the following remarks and recommendations were made:</p> <ul style="list-style-type: none"> - The assessment of the GTA project's consequences on erosion did not consider <u>the existence of breaches in the littoral zone</u> from N'Diogo to Nouakchott. It should be recalled that the city of Nouakchott is subject in some places to risks due to the advection of ocean waters. 	<p>As explained in the response to Comment No. 3, given the current coastal processes and the modeling performed, the project is not expected to have impacts on coastal processes north of N'Diogo. The potentially impacted coastline by the presence of the GTA Phase 1 breakwater will be located on the coast in front of it and in a southeastern direction on the Senegalese side.</p>
7	<ul style="list-style-type: none"> - The negative effect of the breakwater is evaluated to a 6 m decline of the coastline over <u>a 2 km distance near the mouth of the river over 10 years, or 18m over 30 years (duration of the project)</u>. <u>This effect is considered negligible</u> and does not require a mitigation measure. We consider that this situation may constitute a danger for populations and property and should be reconsidered. 	<p>As explained in Section 7.3.3.3 of Chapter 7 (p. 7-190 to 7-193), the overall significance of the impact on coastal erosion during the Operations Phase is rated 2 – Low. The duration of the Operations Phase is based on the anticipated duration of the FLNG vessel's contract, i.e. 20 years and not 30 years. As indicated in Section 7.2.3.3 (p. 7-35) of Chapter 7, in view of the predominant current and wave directions, the modeling showed that the potential impacts of the presence of the breakwater on coastal erosion will be realized in Senegal. On the Senegalese side, the modeling shows an accretion or reduction of the natural erosion of the Langue de Barbarie (relative to the case without the breakwater) of up to 13 m over 10 years near the Mauritania-Senegal border and extending southward</p>

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>approximately 8 km, accompanied by a maximum increase in coastal erosion rate (relative to the case without the breakwater) of approximately 6 m over 10 years further south, along approximately 2 km of coast, starting from the south end of the Hydrobase neighborhood.</p> <p>Moreover, the ESIA includes a commitment, with measures M40 and MON9, to continue the monitoring of the coastline in the future and using these results to verify the predictions of the coastline's morphological changes.</p> <p>Mitigation measure M40, specifically related to the coastal equilibrium, was reformulated as follows in the consolidated version of the ESIA report:</p> <ul style="list-style-type: none"> ▪ "M40: a) To improve understanding of the long-term coastal dynamic equilibrium, the project will develop and implement a monitoring plan of the coastline for the entire project life cycle. Coastline monitoring commence prior to breakwater construction, i.e. before 2020. This will include the collection of further bathymetric data along the Saint-Louis shore, including the Senegal River mouth. The project will aim to involve local academics in the implementation of the coastline monitoring plan. The relevant authorities and local communities will be informed of the monitoring results. b) The data collected as part of the implementation of the coastline monitoring plan will be used to update the coastline modeling (in Appendix I-3) to be completed before the construction of the breakwater in 2020. Additional modeling updates will be conducted at key stages of the project life cycle when new information with the potential to have significant impacts on the modeling results will become available. c) BP will seek the necessary authorizations to share relevant data for government led morphological studies initiatives and local academics. d) a contingency plan for the coastline will be developed by the project in consultation with the relevant authorities if the results of the coastline monitoring and modeling clearly and systematically demonstrate, over the duration of the project, negative impacts related to the GTA Phase 1 project which exceeds those currently identified in the GTA Phase 1 project ESIA report (in particular Section 7.3.3)". <p>The reformulation of measure M40 has been done wherever this measure is mentioned in the consolidated version of the ESIA report, for example, in Table 7-72 of Section 7.3.3.4, p. 7-194.</p>

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>Monitoring measure MON9 is planned concerning coastal erosion in the project surveillance and monitoring plan (Chapter 10, p. 10-6). It consists in collecting bathymetric and oceanographic data along the Saint-Louis shore, including the Senegal River mouth, to support future modeling efforts. For greater clarity, in Chapter 10 of the consolidated version of the ESIA report, measure MON9 has been reformulated as follows:</p> <ul style="list-style-type: none"> ▪ "MON9: Develop and implement a coastline monitoring plan." (p. 10-6). <p>A note has been added to Table 10-1 in Chapter 10 (p. 10-6) of the consolidated version of the ESIA report to provide more information about the monitoring of sediment dynamics related to the breakwater installation:</p> <ul style="list-style-type: none"> ▪ "The monitoring plan will include nearshore bathymetric survey, beach profile and coastline position surveys. The survey measurements will be sufficient to identify key coastline features and support additional coastline modeling if necessary. Surveys will be set up to allow repeatability so that changes over time can be assessed."
8	<ul style="list-style-type: none"> - For sediments, it is imperative that <u>sensitive carbonate mounds be spared</u> from any activity that could alter them, even if the report gives the assurance that they will be preserved. 	<p>As explained in Section 5.3.1 of Chapter 5 (p. 5-7), an alternative route of the pipeline has been retained to "avoid all relict carbonate mounds, avoid slide debris by at least 1,000 m, avoid subsea gully run-outs to the maximum extent possible, cross seafloor gullies in the lowest slope area possible, cross an identified headwall scarp at a perpendicular angle, avoid coral exclusion zones by at least 600 m, avoid the confluence of gullies and avoid crossing gullies and rocky outcrops where possible".</p> <p>Furthermore, mitigation measure M03 has been planned to avoid impacts on carbonate mounds:</p> <ul style="list-style-type: none"> ▪ M03: Dredged material and drill cuttings will not be disposed on or near carbonate mounds and away from coastal areas. The proposed pipeline route will avoid sensitive carbonate mounds. (See Sections 7.2.4 (p. 7-36 to 7-42) and 7.2.5 (p. 7-43 to 7-57) of Chapter 7)

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
9	<p>- There is a need for a renewed recommendation on the preservation of <u>Marine Protected Areas</u> against the intrusion of invasive species imported through vessels engaged in the Construction Phase, although no mitigation measures are required according to the ESIA report given the negligible magnitude of the projected impacts.</p>	<p>Preservation of Marine Protected Areas from the intrusion of invasive species imported by vessels engaged in the Construction Phase and even those of the Operations Phase is a concern addressed by the ESIA.</p> <p>The application of the IMO Ballast Water Management Convention is planned and reinforced by the implementation of the design and control measure for operations included in the project (D08) which will reduce the probability of introduction of non-indigenous or invasive species:</p> <ul style="list-style-type: none"> ▪ D08: Ballast water will be discharged according to IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM), where applicable. <p>This operations control and design measure is listed in Table 7-196 of Chapter 7 (p. 7-614).</p>
10	<p>- It appears from the analysis of this resource that the list of threatened species established in the ESIA is not exhaustive. In fact, certain species of different faunistic groups, in particular, sea turtles (loggerhead turtle, leatherback turtle, olive ridley turtle), birds (<i>Sterna hirundo</i>, <i>Balearica pavonina</i> (threatened) other species are either vulnerable or quasi-threatened ...) marine mammals (humpback whales) have been omitted. It should be recalled that IMROP monitoring data highlight the existence of a coastal area extending from Nouakchott to a nesting area for loggerhead and green turtles frequenting Mauritanian waters.</p>	<p>We assume this remark refers to Section 4.5.8 on Threatened Species in Chapter 4 (p. 4-106 to 4-108). Indeed, this section does not compile all the species of the different faunistic groups. Only species that are Critically Endangered (CR) or Endangered (EN) according to the IUCN Red List are included. Complete lists of species including their status are presented in the individual sections dedicated to their group.</p> <p>For example, in Section 4.5.7 (p. 4-102 to 4-106), habitats, diets, seasons and nesting locations (when known), IUCN red list status, and potential presence in the core and extended study areas are described for the following species of sea turtles:</p> <ul style="list-style-type: none"> ▪ Loggerhead sea turtle ▪ Leatherback sea turtle ▪ Green sea turtle ▪ Hawksbill sea turtle ▪ Olive ridley sea turtle ▪ Kemp's ridley sea turtle. <p>Similarly, data on birds and marine mammals are found in Sections 4.5.5 (p. 4-83 to 4-96) and 4.5.6 (p. 4-97 to 4-102) respectively.</p>
11	<p>- Further assessment of the impacts of gas emissions including NO_x and SO₂ on the population must be established. These gaseous derivatives are particularly dangerous if it is known that their emissions will exceed the thresholds established by</p>	<p>As explained in Section 7.2.1.2 of Chapter 7 (p. 7-20 to 7-24), most air emissions from construction activities will be below the BOEM thresholds and low enough that no impact on air quality onshore is expected. However, using a conservative approach that assumes that all engines and equipment operate at the same time</p>

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
	<p>the Bureau of Ocean Energy Management (BOEM) during the routine works in the Construction Phase. Substantial action should be taken as no mitigation measure is envisaged in the ESIA report.</p>	<p>and at full capacity (which is unlikely to happen), our calculations indicate that higher levels of NO_x and SO₂ could potentially result in brief periods of onshore exposure during the Construction Phase.</p> <p>In addition, in a prudent approach, the ESIA did include four design and control measures and two mitigation measures to avoid or reduce the impacts of routine activities on air quality during Construction Phase. These measures are presented in Section 7.2.1.4 of Chapter 7 (p. 7-25) relating to the impacts on air quality during the Construction Phase.</p> <p>With the application of these measures, the analysis has shown that the significance of the impact of NO_x and SO_x emissions on air quality during the Construction Phase decreases and becomes low (see Table 7-14 of Chapter 7, p. 7-25).</p> <p>The design and control measures are the following:</p> <ul style="list-style-type: none"> ▪ D01: Contractors will be expected to comply with the contract terms that have been established, including HSSE standards and performance requirements. ▪ D02: Compliance with applicable national and international regulations (MARPOL 73/78 Annex VI) and guidelines regarding emissions of nitrogen oxides (NO_x) and sulphur oxides (SO_x) from main project vessels ▪ D03: An efficient flare burner head equipped with an appropriate combustion enhancement system will be selected with the intent of minimizing incomplete combustion, black smoke, and hydrocarbon fallout to the sea. ▪ D04: Volumes of hydrocarbons flared will be recorded. <p>The mitigation measures are the following:</p> <ul style="list-style-type: none"> ▪ M01: Maintaining routine maintenance procedures to help ensure that engines are operating at defined operational performance and specified emissions levels. ▪ M02: Monitoring fuel consumption as a proxy for measuring performance and emissions. When practical, or as required by applicable regulations, vessel operators will be expected to utilize low-sulfur fuels to limit SO_x production.

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
12	<p>- <u>Benthic communities</u> are very sensitive to anything related to substrate, habitats and ecosystems. Therefore, further evaluation is strongly recommended to mitigate the impacts of possible accidents.</p>	<p>Section 7.5.5 of Chapter 7 (p. 7-480 to 7-486) provides an assessment of impacts on benthic communities from accidental events. Three accidental events were considered in this section:</p> <ul style="list-style-type: none"> ▪ Well blowout ▪ Failure of FPSO due to a ship collision ▪ Pipelaying vessel collision. <p>As explained in this section, the accidental event that could potentially have the greatest negative impact on benthic communities is the failure of the FPSO due to a ship collision. It is not anticipated that this accidental event accompanied by a subsequent discharge of condensate and marine diesel to the sea surface will have a detectable effect on soft bottom benthic communities. The potentially more significant effects would be on hard substrate fouling communities due to a significant loss of fauna and flora.</p> <p>A series of design and operation control measures included in the project and mitigation measures are planned to avoid or reduce the impacts of accidental events (see Chapter 7, Tables 7-199 and 7-200, p. 7-632 to 7-633).</p>
13	<p>The table below [Table on the conformity of the ESMP content] shows that the ESMP does not provide the quantified data on environmental damage and emission rates of pollutants, nor an estimate of expenditures. It does not give an implementation planning of the recommended mitigation measures.</p>	<p>Concerning the quantifiable data of the damage, there could potentially be environmental damage in the case of an accident, but it is not possible to quantify it at the moment because the amount will depend on a series of factors, including the following:</p> <ul style="list-style-type: none"> ▪ The type and nature of the accident ▪ The location of the accident ▪ The volume of contaminants spilled and the physical and chemical characteristics of the contaminants ▪ The environmental context at the time of the accident (season, weather conditions, ocean conditions, etc.) ▪ The effectiveness of initial intervention measures. <p>A series of design and control measures and of mitigation measures to prevent or reduce impacts from accidental events are planned for the project (see Tables 7-199 and 7-200 in Chapter 7, p. 7-632 to 7-633) including notably mitigation measure M110:</p> <ul style="list-style-type: none"> ▪ M110: In the unlikely event of a spill, prepare and implement, in coordination with national authorities if requested, a Livelihood Restoration Plan for affected communities.

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>The following text has been added to Section 3.3.1 of Chapter 3 of the consolidated version of the ESIA report (p. 3-3 to 3-4) to specify the obligations planned in the Exploration-Production Contract (EPC) in the case of an accident or an accidental spill:</p> <p>"Furthermore, pursuant to the Exploration-Production Contract for Block C8, the Contractor [i.e. BP Mauritania Investments Limited, Kosmos Energy Mauritania and SMHPM] has the following obligations:</p> <ul style="list-style-type: none"> ▪ To compensate and hold harmless any person, including the State, for any damage or loss that the Contractor, his employees or his subcontractors and their employees may cause to the person, property or rights of other persons, by reason of or during Petroleum Operations (clause 24.1). ▪ To obtain and maintain in force, and cause his subcontractors to obtain and maintain in force, all insurance coverages relative to Petroleum Operations of the type and amounts in use in international petroleum industry, in particular (a) general third party liability coverage, (b) coverage for environmental risks pertaining to Petroleum Operations, (c) coverage for employee work-related accidents, and (d) any other insurance coverage required by the regulations in force. The insurance coverages in question shall be obtained from top tier insurance companies pursuant to the applicable regulations. The Contractor shall provide the Minister with certificates proving the obtaining of insurance coverage and the maintenance in force of the above-cited insurance coverages (clause 24.2)." <p>Concerning the emission rates, these are presented in Chapter 2 relating to the description of the project, see in particular:</p> <p>Construction Phase:</p> <ul style="list-style-type: none"> ▪ Table 2-16: Summary of Maximum Daily Air Emissions Forecast, by Source, for Drilling Activity at a Single Well (p. 2-34) ▪ Table 2-17: Annual Emissions Forecast from FPSO HUC Vessels (p. 2-35) ▪ Table 2-18: Annual Emissions Forecast from Preparation, Construction and Installation of the Nearshore Hub/Terminal (p. 2-35) ▪ Table 2-19: Annual Emissions Forecast from Subsea and Pipeline Installation (p. 2-35)

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ Table 2-22: Cuttings Volumes and Weights, by Section, for a Representative Cenomanian Well (p. 2-39) ▪ Table 2-25: Effluents Discharges Forecast during the Preparation, Construction and Installation Phase (p. 2-43 to 2-48) ▪ Table 2-26: Provisional Fluid Discharge Volumes for Pipeline Installation and Commissioning (p. 2-50) ▪ Table 2-30: Summary of Projected Maximum Waste Volumes for a Single Well (p. 2-57) ▪ Table 2-31: Estimate of Solid Waste from the FPSO, Subsea Installation, General Support Vessels, Nearshore Hub/Terminal and FLNG during the Preparation, Construction and Installation Phase (p. 2-59 to 2-63) <p>Operations Phase:</p> <ul style="list-style-type: none"> ▪ Table 2-20: Summary of Annual Emissions Forecast for Operations, by Major Source (p. 2-36) ▪ Table 2-27: Typical Effluents from the FPSO during the Operations Phase (p. 2-52) ▪ Table 2-32: Estimate of Wastes Generated from the FPSO, FLNG and QU Platform and General Support Vessels during the Operations Phase (p. 2-65) <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> ▪ Table 2-21: Total Air Emissions Forecast for FPSO and Support Vessels, Decommissioning Phase (p. 2-37) ▪ Table 2-28: Typical Effluents from the FPSO, Subsea Infrastructure, and General Support Vessels during the Decommissioning Phase (p. 2-54) ▪ Table 2-29: Typical Effluents from the FLNG, QU Platform, Hub and General Support Vessels during the Decommissioning Phase (p. 2-55) <p>Furthermore, the modeling reports provide additional data on pollutant emission rates. These reports are presented in Appendix J for air emissions, Appendix K for effluent discharges from wastewater and produced water, and Appendix L for muds and cuttings during drilling.</p>

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>Regarding the estimate of expenditures, the following clarification was made to Section 9.2 of Chapter 9 in the consolidated version of the ESIA report:</p> <p>“It is important to note that most of the monitoring activities to be conducted by GTA Phase 1 project are through equipments/instruments/meters installed on the FPSO and FLNG. The cost associated with those are included in CAPEX and the use/maintenance of the equipment will be captured in project OPEX. The details of the OPEX costs for use and maintenance of meters are not available.</p> <p>Another type of monitoring activities to be conducted by the project are those that are generally combined with other GTA Phase 1 maintenance/integrity inspection activities, e.g. seabed surveys. This approach is often adopted by the O&G industry to optimize vessels utilization time. Therefore, the cost of those campaigns will not be only associated to environmental activities. They will be captured in the OPEX cost.</p> <p>The production sharing contracts/Joint Operating Agreements define the mechanism by which these OPEX cost are approved annually by all GTA's partners.” (p. 9-2)</p> <p>A review of the ESMP implementation costs column (Chapter 9 of the ESIA) will be conducted towards the end of 2020.</p> <p>Additions have also been made to Chapters 9 and 10 of the consolidated version of the ESIA report to address the costs of monitoring measures by the authorities.</p> <p>As now described in Chapters 9 and 10, the monitoring activities to be carried out by the authorities include reading of monitoring reports and management plans provided by the GTA Phase 1 project, project facilities inspections and visits. There are no monitoring costs associated with document reading. For inspections and visits, the GTA Phase 1 project plans for the transportation by boat or helicopter as used by project personnel to reach the project facility and accommodation at the facility depending on the duration of the inspection/visit. The cost of this transportation and accommodation will be covered by the GTA Phase 1 project (p. 9-6 and 10-3).</p> <p>Regarding the precise implementation planning of the mitigation measures, Table X-2-2 added to this appendix presents the implementation timeline for the mitigation measures for routine activities.</p> <p>If necessary, the implementation of mitigation measures in case of accidental events will be triggered following the notification of a spill and it will depend on the nature and evolution of the accidental event. It should be noted that no table has</p>

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		been developed for the implementation of the operations' design and control measures, as these are inherent to the project and are part of the design and operations of the project.
Analysis and Comments on the Environmental and Social Management Plan		
14	Mitigation Measures: 1. Training for local fishermen on safety rules should be extended to all fishermen in both countries through sustained training of trainers.	In consultation with the Mauritanian authorities concerned, a possible extension of the training program for local fishermen can be evaluated in due course by BP.
15	2. It is desirable that the social intervention program aimed at increasing the benefits of the project for the communities of N'Diogo and Saint-Louis be expanded to include more operators involved in coastal artisanal activities. It is also necessary that it goes beyond simple subsistence needs to become more involved in local development (schools, health units, etc.).	The GTA Phase 1 social investment program is described in a section added to Chapter 2 of the consolidated version of the ESIA report. The new Section 2.14, "Social Investment" (p. 2-73 to 2-76), outlines BP's general approach to social investment, which consists of: <ul style="list-style-type: none"> ▪ Consult with relevant stakeholders to identify needs and potential focus and themes of social investment. Use a range of implementing partners – including NGOs, civil society and other development groups to assist in the implementation and management of its social investment strategy. ▪ Select implementing partners using a transparent Request For Proposals process and criteria for selection based on international community's social investment best practices. ▪ Use participatory practices to involve local stakeholders as much as possible in the implementation and/or monitoring of social investment projects. The new Section 2.14 also specifies the five priority axes of the GTA Phase 1 project's social investment in Mauritania and in Senegal: <ul style="list-style-type: none"> ▪ Education through supporting learning and education initiatives focusing on business skills, language skills, literacy, computing skills, science & technology, including oil and gas related education; ▪ Economic development opportunities for income and employment through the provision of a mix of instruments (e.g., micro-finance in combination with vocational education, business services for community based-enterprises, fishing cooperatives and wider support for entrepreneurship);

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ Environmental initiatives focusing on sustainable management of natural resources, efficient use, environmental awareness, waste management, protection and development of biodiversity and ecosystems and academic research on the offshore marine environment; ▪ Community health and safety activities through health programs and activities focusing on access and quality of health services for communities in close proximity; and ▪ Capacity building and institutional strengthening in partnership with local government and authorities. <p>Finally, the new Section 2.14 provides a detailed list of the social investment projects identified and approved by the partners of the GTA Phase 1 project for year 2018 in Mauritania. These include:</p> <ul style="list-style-type: none"> ▪ Health: <ul style="list-style-type: none"> ▪ Provision of health-care equipment following the identification of priority needs of the regional health directorate and health facilities of N'Diago; ▪ Six advanced medical campaigns (each campaign 4 days) estimated to have an average of 300 consultations per day; ▪ Home visits and follow-up system for monitoring people with chronic diseases; ▪ Training of 30 community relays on behaviour change communication (BCC) on priority health topics; and ▪ 120 educational talks on priority health topics and public sessions - the format is to set up a tent in one of the villages from morning to evening to sensitize the population on health issues. A total of 25 public sessions will be carried out during the 12 months of the project. ▪ Economic development: <ul style="list-style-type: none"> ▪ Conduct fishing sector diagnostic study; ▪ Conduct trainings to fishing community on HSE standards and marine safety; ▪ Provide equipment to fishermen with safety related equipment and communication tools; ▪ Organize study visits for artisanal fishermen to enhance fishing related productivity;

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<ul style="list-style-type: none"> ▪ Capacity-building of artisanal fishermen on fish processing techniques; ▪ Provide equipment in the identified high need areas of the artisanal fishermen in N'Diago; ▪ Provide access to finance for the women cooperatives and artisanal fishermen; ▪ Conduct a water feasibility study in N'Diago area; and ▪ Conduct diagnostic study of the agricultural and pastoral sector in N'Diago area.
16	3. In addition to the technical aspect of the mutually agreed support for research institutes (IMROP and CRODT) other aspects (financial support and others) should be considered.	In the consolidated version of the ESIA report, the involvement of research institutes (notably IMROP and CRODT) is also envisaged in some monitoring activities. In fact, the project will aim at implementing monitoring activities through contracts with relevant national academics (universities, research institutes) where practicable, and for relevant monitoring activities whenever appropriate. This is considered an effective way to sustainably build the local academic capability on oil and gas industry and offshore environment both in terms of equipment and expertise (see Chapter 10, Section 10.1) of the consolidated version of the ESIA report, p. 10-1).
17	4. In the context of precautions and intervention measures in the event of an accident, it is necessary to periodically perform accident simulations to improve the effectiveness of the intervention plan.	<p>Section 7.5.1 of Chapter 7 of the consolidated version of the ESIA report (p. 7-414 to 7-444) has been reorganized to better highlight information on spill prevention and response measures.</p> <p>In order to reflect these changes, the introduction of Section 7.5.1 has been modified as follows:</p> <p>"The purpose of this section is to:</p> <ul style="list-style-type: none"> ▪ Explain the framework used to identify potential hydrocarbon spill scenarios and outline the approach taken for hydrocarbon spill modeling (Sections 7.5.1.1 to 7.5.1.3); ▪ Present an overview of the fate of an oil spill using the <i>Deepwater Horizon</i> incident as an example (Section 7.5.1.4); and ▪ Explain the methods of oil spill prevention and response which can be employed to avoid or reduce impacts as well as methods of verifying and assuring activities associated with spill planning and response (Section 7.5.1.5)." (p. 7-414)

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		<p>Hence, the new Subsection 7.5.1.5 addresses spill prevention and response and is now presented as follows:</p> <ul style="list-style-type: none"> ▪ Section 7.5.1.5.1: Oil Spill Prevention Measures (p. 7-435 and 7-436). ▪ Section 7.5.1.5.2: Blowout Preventer (BOP) Intervention (p. 7-436). ▪ Section 7.5.1.5.3: Well Capping and Containment (p. 7-436 and 7-437). ▪ Section 7.5.1.5.4: Relief Well Drilling (p. 7-437). ▪ Section 7.5.1.5.5: Development of Oil Spill Response Strategies (p. 7-437 and 7-438). ▪ Section 7.5.1.5.6: Spill Response Contingency Plans (p. 7-440 and 7-441). ▪ Section 7.5.1.5.7: Response Capability (p. 7-442 and 7-443). ▪ Section 7.5.1.5.8: Demonstrating Readiness - Oil Spill Preparedness and Response Verification and Assurance (p. 7-443 and 7-444). <p>Section 7.5.1.5.8 describes training and exercises planned by BP in the event of accidents as follows:</p> <p>“Maintaining a team of trained personnel is a cornerstone of operation. Tests and drills are conducted to verify their competency. Regular training is set up to prepare responders for a well control event.</p> <p>Oil spill exercises are also regularly organized in accordance with the Oil Spill Contingency Plan. This includes simulation exercises to test different aspects of preparedness, build familiarity and ensure competence.</p> <p>As part of capacity building and engagement efforts, BP will work with regulators and other stakeholders to establish clear understanding of the relationship between BP and national response agencies and partners for incident response through training and exercises.</p> <p>Lessons learned and corrective actions are generated and tracked to closure from both verification and assurance and tests and drills to enable continuous improvement and rectification of identified issues.”</p>

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
18	<p>Verification source: This action is based on the availability of reports and documents provided by the operators responsible for the implementation of the measures. For greater transparency and traceability it is strongly recommended that these reports and documents be distributed to the DCE in a timely manner.</p>	<p>In the consolidated version of the ESIA report, Section 9.3.4 (p. 9-4 and 9-5) states that BP will periodically prepare ESMP compliance reports. These reports will provide a statement of compliance with the mitigation measures presented in Tables 9-1 to 9-4 with supporting remarks. As specified, the ESMP compliance reports will be provided by BP to the Mauritanian and Senegalese authorities.</p> <p>Similarly, as indicated in Section 10.3 of Chapter 10 (p. 10-1 and 10-2) of the consolidated version of the ESIA report, the results of the various monitoring programs defined in the SMP will also be recorded in reports submitted to the Mauritanian and Senegalese authorities, at intervals to be agreed with the regulatory authorities or in accordance with regulatory requirements.</p>
19	<p>Main Party in Charge of Implementing the Measure: An independent, accredited, competent third party would be best placed to co-monitor the implementation.</p>	<p>As indicated in the response to Comment No. 18, it is the responsibility of the competent Mauritanian and Senegalese authorities to carry out external monitoring of the implementation of the ESMP according to their own national procedures and requirements.</p> <p>The concerned authorities of Mauritania and Senegal have expressed a need to strengthen their capacity to monitor offshore oil and gas activities, which are new in Senegal and recent in Mauritania. The capacity building plan for the institutions concerned with the implementation of the ESMP, including the DCE, has therefore been reviewed. It is included in Section 9.5 of Chapter 9 of the consolidated version of the ESIA report (p. 9-6 and 9-7).</p> <p>The outline of this plan for strengthening the capacities of the Mauritanian and Senegalese authorities for the monitoring of the ESMP and the SMP are provided in Section 9.5. A detailed capacity building plan will be prepared by BP in 2019 in collaboration with the relevant authorities. The budget associated with the capacity building plan of the national authorities involved in the implementation of the ESMP is also included in the same section.</p> <p>Section 9.5 states that in addition to the training program, capacity building includes a technical assistance program to the DCE [Mauritania] and the Technical Committee [in Senegal] to support the execution of the monitoring of the ESMP and the SMP. This technical assistance, which should be mutually agreed upon, could take the form of, for example, coaching by an expert or a consulting firm. The terms of reference and the selection process of the expert or consulting firm will be based on arrangements agreed between the relevant authorities and the GTA Phase 1 project. The budget associated with this technical assistance is shown in Table 9-6 of the consolidated version of the ESIA report (p. 9-110).</p>

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
		In addition, the consolidated version of the ESIA report includes a monitoring plan for the ESMP and the SMP by the national authorities. This monitoring plan is presented in Section 9.4 of Chapter 9 (p. 9-5 to 9-6) and Section 10.4 of Chapter 10 (p. 10-2 to 10-4) and provided in Appendix U. The purpose of this plan is to provide a monitoring tool to the authorities, detachable from the rest of the ESIA if needed.
20	Party in Charge of Monitoring the Measure: For more transparency, monitoring of implementation must not be ensured by the implementing party. Again, it is desired that a competent third party intervene.	See responses to Comments Nos. 18 and 19.
21	<ul style="list-style-type: none"> ▪ The modeling is based on the threshold values that are based on the guide of Senegal (2005). ▪ The Emergency Preparedness Device is based on the 2005 Senegal Guide. <p>The project should develop a specific guide to Mauritania that can be updated over time.</p>	Participation in the development of a guide for risk studies specific to Mauritania could be part of capacity building if it is a priority of the Mauritanian authorities and it fits within the framework of planned budget for the capacity building program. This budget, revised upwards in the consolidated version of the ESIA report, is specified in Section 9.5 of Chapter 9 (p. 9-6 and 9-7).
Recommendations		
22	<p>General Recommendations:</p> <p>Cumulative impacts on ecology and fishing were not covered well in the ESIA. We recommend setting up an impact monitoring committee at the start of the project.</p>	<p>The cumulative impacts on ecology and fishing are described and analyzed in Section 7.7 of Chapter 7 (p. 7-633 to 7-643) and more specifically:</p> <ul style="list-style-type: none"> ▪ In Section 7.7.2 (7-638 to 7-640) for potential cumulative impacts during Construction Phase ▪ In Section 7.7.3 (p. 7-640 to 7-643) for potential cumulative impacts during Operations Phase ▪ In Section 7.7.4 (p. 7-643) for potential cumulative impacts during Decommissioning Phase. <p>Moreover, mitigation measure M19 (see in particular Table 7-197, p. 7-617 to 7-619) plans for BP's collaboration with a monitoring committee to be set up at the initiative of concerned local stakeholders:</p> <ul style="list-style-type: none"> ▪ M19: Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diogo and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.

Numbers	Comments Taken from the Public Enquiry Report Summary of the DCE of November 2018	Responses to Observations (Including the ESIA Cross-Reference Page)
23	Societal impacts have been well identified in the ESIA. However, suggested solutions to reduce them did not receive much attention. In the context of this study, meetings through an interlocutor for essentially informative purposes are planned. We recommend early implementation of an ambitious social investment program (fishermen’s compensation, health, education, etc.) for project residents in order to help with project acceptance.	The implementation of a social investment program by BP has already started. See the response to Comment No. 15 for more details on the program and on social investments made in Mauritania in 2018.
24	Specific Recommendations: Although the ESIA and the ESMP state that the potential risks are negligible after the appropriate measures suggested in the ESMP to minimize biophysical and socio-economic risks, we suggest that the DCE be associated with the monitoring plan as the impacts of air quality, particularly for NO _x and SO _x , seem to be well established.	See responses to Comments Nos. 18 and 19. Furthermore, as indicated in Section 9.4 of Chapter 9, the consolidated version of the ESIA report plans that in Mauritania, potential monitoring authorities may be identified by the DCE (p. 9-6).

Table X-2-2. Implementation Timeline for Routine Activities' Mitigation Measures.

No.	Mitigation Measure	Phase ¹	Timeline
Mitigation Measures for Routine Activities			
M01	Maintaining routine maintenance procedures to help ensure that engines are operating at defined operational performance and specified emissions levels.	Co, Op	From mobilization of vessels.
M02	Monitoring fuel consumption as a proxy for measuring performance and emissions. When practical, or as required by applicable regulations, vessel operators will be expected to utilize low-sulfur fuels to limit SO _x production.	Co, Op	Quarterly from mobilization of vessels for construction and annually during the Operations Phase.
M03	Dredged material and drill cuttings will not be disposed on or near carbonate mounds and away from coastal areas. The proposed pipeline route will avoid sensitive carbonate mounds.	Co	During periods of dredging and drilling.
M04	Seismic survey mitigation measures to be implemented during VSP survey(s) with the aim of minimizing the acoustic exposures to marine mammals (e.g. gradually increasing seismic source elements over a period of approximately 30 minutes until the operating level is achieved before any VSP activity begins).	Co	During the seismic campaigns of VSP.
M05	Sound mitigation measures will be implemented during pile driving (e.g. soft-starting [gradually increasing hammer power]).	Co	During pile driving activities.
M06	Vessel operators will implement vessel strike avoidance protocols to reduce the potential for vessel strike with marine mammals and sea turtles (including injured/dead protected species reporting).	Co, Op, De	During the activities of the vessels in the project area from their mobilization.
M07	Collection and analysis of acoustic data from the area to determine background sound levels and marine mammal presence/absence, and underwater sound modeling to determine distances to various thresholds.	Co	Once, prior to the start of construction in the project area.

¹ Project phases:
 Co: Construction Phase
 Op: Operations Phase
 De: Decommissioning Phase

No.	Mitigation Measure	Phase ¹	Timeline
M08	Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project.	Co, Op, De	<p>Once, prior to the start of the Construction Phase and every semester thereafter during the Construction Phase.</p> <p>Once, prior to the start of the Operations Phase and annually thereafter or as needed depending on the monitoring of maritime safety incidents and near misses.</p> <p>Once, prior to the start of the Decommissioning Phase.</p>
M09	Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities.	Co, Op, De	<p>Once, prior to the start of the Construction Phase and quarterly thereafter or as needed depending on the schedule of project activities.</p> <p>Once, prior to the start of the Operations Phase and annually thereafter or as needed depending on the schedule of project activities.</p> <p>Once, prior to the start of the Decommissioning Phase and, if necessary, thereafter.</p>
M10	Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time.	Co, Op, De	Prior to the mobilization of vessels (or new vessels) in the project area or as needed depending on the progress of the technology at the time of decommissioning.
M11	Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling.	Co, Op, De	From the mobilization of vessels in the project area.
M12	Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones.	Co, Op, De	From the mobilization of vessels in the relevant areas of the project.
M13	Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.	Co, Op, De	From the mobilization of vessels in project areas at risk of interaction with artisanal fishermen.

No.	Mitigation Measure	Phase ¹	Timeline
M14	Equipping the support vessels and the project patrol boat with lifesaving appliances approved by the Convention for Safety of Life at Sea (SOLAS) and IMO, which can be used to assist in rescuing fishermen in the water in line with international maritime protocols or in the event of an accident involving a pirogue with a project vessel. Assist with the rescue of any fishermen involved in a collision with a project vessel or following the capsizing of their vessel due to ship wake associated with project vessels	Co, Op, De	Prior to the mobilization of vessels (or new vessels) in the project area or as needed depending on the progress of the technology at the time of decommissioning.
M15	In case of a collision, BP will inform as soon as possible the relevant national authorities: the Mauritanian Coast Guard (Garde Côte Mauritanienne) in Mauritania and HASSMAR in Senegal.	Co, Op, De	After a reported collision.
M16	Ensuring that each project vessel keeps records of maritime safety incidents with pirogues and other vessels, including near misses, and that these are subsequently shared with the project. BP will monitor maritime safety incidents and adjust, if required, project specific maritime safety rules, security and search & rescue arrangements in place.	Co, Op, De	From the mobilization of vessels in the project area.
M17	Establishing a grievance mechanism easily accessible to fishing communities members that includes monitoring of claims and the resolution thereof.	Co, Op, De	Prior to the start of the Construction Phase and continuous monitoring during the Construction and Operations Phases.
M18	Maintaining a community liaison officer (CLO) for N'Diogo and Saint-Louis to provide a direct link with the fishing communities in all matters related to the project.	Co, Op, De	During the Construction, Operations and Decommissioning Phases.
M19	Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diogo and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project.	Co, Op, De	During the Construction, Operations and Decommissioning Phases.
M20	Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers.	Co, Op	During the Construction and Operations Phases.
M21	Project vessels to record incidents with fishing gears and report them to the project.	Co, Op	From the mobilization of vessels in the project area.
M22	To the extent feasible, establish a maritime corridor or speed restrictions for project vessels within artisanal fishing areas.	Co, Op	From the mobilization of vessels in the project area.
M23	Implement an environmental awareness building program in association with local schools and community groups.	Co, Op	Once, during the Construction Phase and once, during the Operations Phase.
M24	Provide technical assistance to mutually agreed marine resource research programs with the respective national oceanographic research centers (CRODT and IMROP).	Co, Op, De	According to the nature of the admissible technical support requests received by the operator during each phase.
M25	The project will seek to work with the public security forces to establish an appropriate response and security framework which may include resource, equipment, training and response protocols.	Co, Op, De	Confidential.

No.	Mitigation Measure	Phase ¹	Timeline
M26	Include in the security stakeholder engagement plan, provisions around response, management and interface with Public security forces for security incidents scenario such as act of terrorism and unlawful entry in the exclusion safety zones.	Co, Op, De	Confidential.
M27	Developing a social investment program to enhance project benefits for the directly affected N'Diago and Saint-Louis communities, including livelihood enhancement activities.	Co, Op, De	Once, prior to the start of each phase, with adjustments as needed during the completion of these phases.
M28	Engaging in an on-going dialogue with national, regional and local authorities to monitor the social climate in the local communities in order to help identify and support, if needed, ad hoc measures to prevent social discontent linked to project activities and its escalation into conflicts	Co, Op, De	Continuously.
M29	Use of dry low emissions (DLE) gas turbine drivers for the main refrigeration compressors on the FLNG.	Op	When purchasing project equipment prior to installation during the Construction Phase.
M30	Conduct monitoring of baseline air quality prior to the Construction Phase at receptor level to establish ground-level ambient air concentrations. Update air dispersion modelling if necessary when equipment specifications from vendors are available in detailed design phase.	Op	Once, before construction.
M31	Tug boats and other project support vessels not in operational use and moored at the Hub facility will be connected to electrical power provided by the Hub to the extent practical.	Op	As far as possible during the Operations Phase.
M32	The seawater intake depth at the FLNG will be optimized to reduce the heated water plume. Cooling water effluent will not result in a temperature change of more than 3°C at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors, and assimilative capacity.	Op	During the detailed design stage.
M33	Monitoring use of added chemicals to produced water stream (corrosion inhibitors, scale inhibitors, coagulants/flocculants).	Op	During the Operations Phase.
M34	Verifying compliance with MARPOL Convention and implementation of a waste management plan, with the intent of reducing the likelihood of accidental loss.	Op	Annually, during the Operations Phase.
M35	The seawater intake depth at the FPSO will be designed with the intent to reduce the need for use of antifoulant chemicals.	Op	During the detailed design stage.
M36	Free chlorine in FLNG cooling water discharges to be sampled at point of discharge will be maintained below 0.2 parts per million (ppm)	Op	During the Operations Phase.
M37	Produced water will be treated prior to discharge with sufficient treatment. Oil and grease content of the produced water effluent discharge at sea will be compliant with applicable regulation and not exceed 42 mg/L daily maximum; 29 mg/L monthly average.	Op	During the Operations Phase.
M38	Produced water effluent quality will be monitored. The first 18 months of monitoring data will be used to assess the potential impacts of the effluent upon the receiving water body using an Environmental Risk Assessment approach, which is to be repeated following a material change in effluent composition or volume.	Op	After the first 18 months of the Operations Phase or following an important change in effluent composition or volume.
M39	The discharge of cooling water will be designed to reduce recirculation.	Op	During the detailed design stage.

No.	Mitigation Measure	Phase ¹	Timeline
M40	<p>a) To improve understanding of the long-term coastal dynamic equilibrium, the project will develop and implement a monitoring plan of the coastline for the entire project life cycle. Coastline monitoring commence prior to breakwater construction, i.e. before 2020. This will include the collection of further bathymetric data along the Saint-Louis shore, including the Senegal River mouth. The project will aim to involve local academics in the implementation of the coastline monitoring plan. The relevant authorities and local communities will be informed of the monitoring results.</p> <p>b) The data collected as part of the implementation of the coastline monitoring plan will be used to update the coastline modeling (in Appendix I-3) to be completed before the construction of the breakwater in 2020. Additional modeling updates will be conducted at key stages of the project life cycle when new information with the potential to have significant impacts on the modeling results will become available.</p> <p>c) BP will seek the necessary authorizations to share relevant data for government led morphological studies initiatives and local academics.</p> <p>d) a contingency plan for the coastline will be developed by the project in consultation with the relevant authorities if the results of the coastline monitoring and modeling clearly and systematically demonstrate, over the duration of the project, negative impacts related to the GTA Phase 1 project which exceeds those currently identified in the GTA Phase 1 project ESIA report (in particular Section 7.3.3).</p>	Op, De	Once, during the detailed design stage, to support modelling, then, as mentioned in the monitoring plan, during the Operations and Decommissioning Phases.
M41	Provide specialist assistance and relevant project data to studies led by local or national authorities on Saint-Louis coastal management.	Op, De	According to the nature of the admissible technical support requests received by the operator during the Operations and the Decommissioning Phases.
M42	The seawater intake of the cooling water systems will be positioned taking into account technical constraints and appropriate screens or velocity caps will be fitted, if safe and practical, with the intent of avoiding entrainment and impingement of marine flora and fauna. The intake velocity will be below 1.0 m/s	Op	During the detailed design stage.
M43	Implement a program of support to local protected area management initiatives through mutually agreed capacity building.	Op	According to the nature of the admissible support requests received by the operator during the Operations Phase.
M44	Review the social climate in N'Diogo and in Saint-Louis prior to the Operations Phase to adjust as needed the mitigation measures identified to avoid or reduce social discontent.	Op	Once, prior to the start of the Operations Phase.
M45	A final decommissioning plan will be developed for approval by the authorities near the end of the operational lifetime, which takes into consideration further morphological studies and data collection as applicable.	De	Once, prior to the start of the Decommissioning Phase.
M46	Review the social climate in N'Diogo and in Saint-Louis prior to the Decommissioning Phase to adjust as needed the mitigation measures identified to avoid or reduce social discontent.	De	Once, prior to the start of the Decommissioning Phase.

**APPENDIX Y: ENVIRONMENTAL
AUTHORIZATIONS**

Appendix Y Environmental Authorizations

APPENDIX CONTENTS

- Y-1 Mauritania's Environmental Feasibility Notice
- Y-2 Responses to Comments Included in Mauritania's Environmental Feasibility Notice
- Y-3 Attestation and Order of Environmental Conformity from Senegal

**APPENDIX Y-1: MAURITANIA'S
ENVIRONMENTAL
FEASIBILITY NOTICE**



0000877

N°/MPEM

AB

19 DEC 2018

Nouakchott, le انواكشوط في

Le Ministre الوزير

A Monsieur, Le Responsable Pays
BP Mauritania Investments Limited

Objet : Transmission de l'avis de faisabilité environnementale du projet de production de gaz GTA phase 1

Monsieur, Le Responsable Pays,

J'ai l'honneur de vous transmettre la lettre du Ministre de l'Environnement et du Développement Durable N° 561/MEDD/M, portant "**Avis de faisabilité environnementale du projet de production de gaz du champ Grand Tortue Ahméyim GTA**"

Mohamed ABDEL VETAH

Ampliations :

- PM ;
- MSG/PR.

Pièce jointe :

- L'Avis de faisabilité





N° 56 /Medd/M

Nouakchott, le

18 DEC 2018

انواكشوط في:

N°/Réf:

LM
19/12/18

V/Réf:

A Monsieur

Le Ministre du Pétrole, de l'Energie et des
Mines



Objet : Avis de faisabilité environnementale du Projet de production du Gaz
Grand Tortue Ahmeyim- phase1

Réf.1 : lettre N°526/MPEM/M du 16 juin 2016

Réf.2 : lettre N°162/DCE/MEDD du 13 juillet 2016

Réf.3 : lettre N°234/DCE/MEDD du 4 novembre 2016

Réf.4 : lettre N°099/MEDD/SG du 21 avril 2017

Réf.5 : lettre N°457/MEDD/M du 19 octobre 2018

Réf.6 : lettre N°173/MEDD/SG du 26 octobre 2018

Suite à la transmission, par votre Département (Réf.1), des termes de référence de l'Etude d'Impact Environnemental et Social (EIES) du Projet cité en objet au profit de la société BP Mauritania Investments limited, une procédure d'EIES a été engagée par mon Département et menée à terme. Aussi, j'ai l'honneur de vous rapporter ci-après les conclusions de cette procédure.

Une équipe d'enquêteurs a été désignée et comprend les quatre départements ministériels clés concernés par l'exploitation pétrolière et gazière en offshore : Ministère du Pétrole, de l'Energie et des Mines, le Ministère des Pêches et de l'Economie Maritime, Ministère Secrétariat Général du Gouvernement et le Ministère de l'Environnement et du Développement Durable.

Les conclusions de l'enquête publique ont concerné la conformité du dossier de l'EIES transmis et la revue des documents fournis par la société BP Mauritania.

Sur le plan forme, la société BP Mauritania a achevé les différentes étapes de la procédure de l'EIES chronologiquement comme suit : la tenue d'une réunion de cadrage des termes de référence et leur validation (Réf.2 et Réf.3), la réalisation

d'une phase d'information et de participation du public clôturée par l'organisation de trois journées de consultation du public à Nouakchott, à Bouhajra et à Ndiago dans la wilaya de Trarza (Réf.4), la transmission du rapport de l'EIES suivi d'une enquête publique (Réf.5 et Réf.6) menée par mon Département.

Le rapport de l'EIES est composé de 11 chapitres et 18 annexes portant sur plus de 4000 pages en plus d'un résumé non technique (en arabe et en français). Il a respecté la forme de présentation exigée par la réglementation environnementale nationale et les standards internationaux en matière d'EIES.

Toutefois, l'examen du rapport de l'EIES du projet en question fait ressortir les remarques suivantes :

- La proximité de l'écosystème du bas-delta (le PND et RBTDS notamment), sensible et vulnérable, du projet nécessite une attention particulière et un accompagnement dans le plan de suivi des impacts du projet.
- Même si l'impact du projet sur la ressource halieutique et la pêche est jugé mineur, il serait judicieux de prévoir des compensations pour les pêcheurs qui auront perdu leurs filets et une partie de leur zone de pêche.
- La conception du projet (design du brise-lames) prévoit de minimiser les impacts sur les mouvements sédimentaires et l'érosion côtière. Toutefois, les effets cumulatifs des impacts des autres infrastructures socioéconomiques à proximité doivent être pris en considérations.
- Etant donné que le milieu récepteur du projet est une zone d'éclosion et de concentration larvaire, la biodiversité marine et côtière (poissons, tortues, mammifères et oiseaux marins) devrait faire l'objet de mesures spécifiques dans le plan de suivi, particulièrement l'aspiration de l'eau de refroidissement et son impact sur les juvéniles et le plancton.
- Les émissions atmosphériques (gaz à effet de serre) doivent faire l'objet d'une évaluation quantitative et des mesures d'atténuation appropriées.

- L'EIES envisage l'utilisation des boues de forage à base d'huile pour les sections basses alors que les bonnes pratiques recommandent l'usage exclusif des boues à base d'eau et les boues synthétiques.
- Les déchets et rejets doivent faire l'objet d'un plan de gestion en conformité avec les dispositions et exigences de la Convention MARPOL et ses annexes et autres référentiels en la matière.
- Etant donné que les infrastructures du projet se situent sur les voies maritimes, il y a lieu de tenir compte des exigences de sécurité maritime, notamment en matière de balisage, de marquage ainsi que celles applicables aux moyens nautiques (FPSO, servitudes, FLNG, ...).
- Même si les évènements accidentels sont considérés par l'EIES comme rarissimes, cela n'exclut par leur dangerosité. De ce fait, un plan d'urgence et d'alerte précoce en cas de déversement d'hydrocarbures doit être élaboré avant le commencement des travaux.
- Les produits chimiques et matières dangereuses doivent faire l'objet d'un plan de gestion conformément au Code IMDG et aux dispositions de la Convention FAL de manière à éviter qu'ils n'impactent le milieu récepteur.
- Etant donné l'existence de plusieurs infrastructures socioéconomiques dans la zone du projet, il est important de prendre en compte les effets cumulatifs de leurs impacts.
- Les opérations de dragage de sable marin pour les besoins de la construction du brise-lames et l'extraction de matériaux rocheux feront l'objet de procédures d'EIES spécifiques.
- Le PGES et le plan de surveillance et de suivi ne sont pas chiffrés. Il est judicieux de déterminer leurs coûts conformément à la réglementation environnementale nationale en vigueur.
- Les simulations des impacts potentiels du projet se sont basées sur des données limitées. Il est recommandé dans le plan de suivi d'approfondir et mettre à jour les données pour plus précision de ces modèles.

- Malgré que le PNBA soit loin de la zone du projet, il est important que le PGES l'intègre en tant que zone particulièrement sensible du point de vue géomorphologique, hydrologique, éco-biologique, etc.

Par ailleurs, le plan de renforcement des capacités prévu dans l'EIES au profit de la Direction du Contrôle Environnemental doit être exécuté dans les meilleurs délais dans l'objectif d'accompagner la mise en œuvre du projet. Ce plan de renforcement des capacités doit inclure d'autres institutions nationales concernées par le projet.

L'examen de l'EIES a fait ressortir des lacunes en termes de connaissance du milieu marin. Il est donc fortement recommandé que le projet contribue à l'approfondissement des connaissances des écosystèmes marins pour concilier son exploitation et sa conservation.

Des analyses complémentaires de l'EIES sont prévues et dont les résultats vous seront communiquées en temps opportun en vue d'enrichir et d'améliorer le PGES et le plan de surveillance et de suivi ainsi que l'état de référence.

A la lumière de ce qui précède, j'ai l'honneur d'accorder un avis favorable de faisabilité environnementale du projet gazier Grand Tortue Ahmeyim phase 1 au profit de la société BP Mauritania Investments Limited.

Ampliations :

- PM
- MSG/PR.
- DCE/MEDD
- DG/ BP

Amédi CAMARA



**APPENDIX Y-2: RESPONSES TO
COMMENTS INCLUDED IN
MAURITANIA'S
ENVIRONMENTAL
FEASIBILITY NOTICE**

Table Y-2-1. Tracking Table of the Responses to the Comments Included in the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018.

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
1	<p>The proximity of the project to the ecosystem of the low delta (particularly DNP and SRDTBR), which is sensitive and vulnerable, means that special attention has to be paid and there must be support in the plan for monitoring the impacts of the project.</p>	<p>The Environmental and Social Impact Assessment (ESIA) team very early in the ESIA report development process recognized the presence and relative proximity of important protected areas and other areas of conservation interest to the project location, in particular, the location of the Nearshore Hub/Terminal. The ESIA, in its approach to impact analysis and mitigation, employed a resource-based approach supplemented with consideration of several additional topics including biodiversity, protected areas, and areas of conservation interest. The inherent value of these resources and other biophysical attributes of the project area is certainly acknowledged, as is the conservation value of these resources to local communities and respective national governments.</p> <p>Protected areas such as the Diawling National Park (DNP) and the Senegal River Delta Transboundary Biosphere Reserve (SRDTBR) are described in Sections 4.5.9.1 (p. 4-109 to 4-113) and 4.5.9.3 (p. 4-117 to 4-119) respectively of Chapter 4, and potential impacts to the protected areas are assessed in Sections 7.2.11 (p. 7-106 to 7-120), 7.3.11 (p. 7-238 to 7-250), 7.4.11 (p. 7-357 to 7-367), and 7.5.11 (p. 7-536 to 7-549) of Chapter 7. Protection of these resources, including DNP and SRDTBR, is the fundamental reason for some of the mitigation measures and monitoring requirements proposed in the ESIA report.</p> <p>In addition to mitigation measures proposed for potential impacts identified on protected areas, in recognition of the importance of the conservation of protected areas, the ESIA further proposes measure M43 (see Section 7.3.11.4, p. 7-249 and 7-250):</p> <ul style="list-style-type: none"> ▪ M43: Implement a program of support to local protected area management initiatives through mutually agreed capacity building. <p>Finally, as presented in Section 2.14 (p. 2-73 to 2-76) of Chapter 2, the GTA Phase 1 project includes a social investment program. This program comprises five areas of priority, one of which is environmental initiatives focusing on sustainable management of natural resources, efficient use, environmental awareness, waste management, protection and development of biodiversity and ecosystems and academic research on the offshore marine environment.</p>

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
2	<p>Even if the impact of the project on fisheries resources and fishing is deemed to be minor, it would be wise to provide compensation for fishermen who have lost their nets and part of their fishing area.</p>	<p>Potential impacts of the project on fisheries have been assessed in Chapter 7 of the ESIA. As indicated in Sections 7.2.16 (p. 7-135 to 7-142) and 7.3.16 (p. 7-266 to 7-271) of the ESIA, the following impacts to artisanal fisheries and related activities from routine activities of the GTA Phase 1 project were assessed:</p> <ul style="list-style-type: none"> ▪ Loss of potential artisanal fishing grounds of about 1.6 km² in each country (Mauritania and Senegal), due to project infrastructures and their exclusion safety zones. ▪ Potential loss of artisanal fishing gears (nets and buoys) due to project vessels movements in artisanal fishing areas. <p>No mitigation measure was recommended for the loss of potential artisanal fishing grounds as this impact was assessed as negligible. Indeed, the loss of fishing areas due to the project infrastructures and their exclusion safety zones is limited to about 1.6 km² in Mauritania and an equivalent area in Senegal. Section 7.2.16.3 provides a detailed analysis of this topic and the results show that the loss of access to these fishing areas will not have a negative consequence on the fishery catches (p. 7-139 to 7-141). The impact assessment demonstrates that project activities will not lead to reduction in fishing catches. Consequently, no compensation measures are envisaged for reduction of fish catches.</p> <p>For the potential loss of artisanal fishing gears, the following mitigation measures were identified (see Sections 7.2.16.4 and 7.3.16.4, p. 7-141 and 7-142 and p. 7-270 and 7-271):</p> <ul style="list-style-type: none"> ▪ M09: Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities. ▪ M12: Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones. ▪ M13: Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing. ▪ M17: Establishing a grievance mechanism easily accessible to fishing communities members that includes monitoring of claims and the resolution thereof. ▪ M18: Maintaining a community liaison officer (CLO) for N'Diogo and Saint-Louis to provide a direct link with the fishing communities in all matters related to the project.

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
		<ul style="list-style-type: none"> ▪ M19: Collaboration with a community council of formally nominated representatives of local key stakeholders from N'Diago and Saint-Louis set up to review local fishing communities' concerns and grievances related to the project. ▪ M20: Develop and implement a framework for interaction with artisanal fisheries, with provisions covering engagement with local communities on access to fishing grounds, grievance and recourse mechanism for damage to fishing gear, environmental awareness building, livelihood enhancement and the role of community liaison officers. ▪ M21: Project vessels to record incidents with fishing gears and report them to the project. ▪ M22: To the extent feasible, establish a maritime corridor or speed restrictions for project vessels within artisanal fishing areas. <p>The efficiency of the above measures to mitigate the potential loss of artisanal fishing gears (due to project vessels movements in artisanal fishing areas) will be monitored during the course of the project. The Surveillance and Monitoring Plan (SMP), presented in Chapter 10 of the ESIA report, has the objective to evaluate that the mitigation measures identified in the Environmental and Social Management Plan (ESMP) generate the expected results to avoid or reduce potential impacts on the biophysical or social environments.</p> <p>The SMP includes one specific measure to monitor the efficiency of mitigation measures for potential loss of fishing gears, as indicated in Table 10-1 of Chapter 10 (p. 10-5 to 10-9):</p> <ul style="list-style-type: none"> ▪ MON21: Monitoring of loss of artisanal fishing gears due to project vessel movements. <p>This monitoring will be conducted during all project phases. As indicated in Section 10.3 (p. 10-1 and 10-2), if a mitigation measure is not having the desired effect, or if effects not previously anticipated occur, BP will identify and discuss as appropriate with regulators (including the DCE), the feasibility of corrective actions and/or additional mitigation measures that need to be implemented to meet the performance objectives.</p>
3	<p>The project design (design of the breakwater) aims to minimize the impact on sedimentary movements and coastal erosion. However, the cumulative effects of the impacts of other socioeconomic infrastructures nearby must be taken into consideration.</p>	<p>The selection of the breakwater location at 10 km from the coast was made by engineers on the basis of many technical criteria. One of these criteria was, indeed, the potential impact of the breakwater on the coastline.</p> <p>As indicated in Section 5.2.4 of Chapter 5 (p. 5-5 and 5-6), modeling work was done to predict the impact of the breakwater on the coastline. Multiple breakwater locations were evaluated during this modeling to provide information regarding differing potential impacts based on the distance of the breakwater from shore and potential effects on coastal erosion.</p>

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
		<p>As noted in Section 5.3.4 of Chapter 5 (p. 5-8), modeling results demonstrated that the breakwater located approximately 10 km offshore was the preferred option from an environmental perspective, although the financial investment associated with this option is significantly higher.</p> <p>The breakwater was modeled at three locations: approximately 4 km, 7 km and 10 km from the coast. Appendix I-2 presents more details on these modelings. The modelings were conducted taking into consideration other infrastructures present in the area at the time of the modeling. As indicated in Section 7.2.3.3 (p. 7-35) of Chapter 7, given the predominant direction of the current and the waves, the modeling has shown that the potential impacts of the breakwater presence on coastal erosion will be felt in Senegal.</p> <p>Cumulative impacts with other projects in a foreseeable future are addressed in Section 7.7 of Chapter 7 (p. 7-633 to 7-643). Table 7-202 (p. 7-637) provides a summary of other marine uses and known marine-related developments in the GTA Phase 1 project area. Potential cumulative impacts of the project with these developments are assessed, for each project phase, in Sections 7.7.2 (p. 7-638 to 7-640), 7.7.3 (p. 7-640 to 7-643) and 7.7.4 (p. 7-643).</p> <p>As detailed in Section 4.4.3 of Chapter 4 (p. 4-21 and 4-22), coastal dynamic equilibrium is an important issue in the area.</p> <p>Mitigation measure M40, specifically related to the coastal equilibrium, was reformulated as follows in the consolidated version of the ESIA report:</p> <p style="padding-left: 40px;">M40: "a) To improve understanding of the long-term coastal dynamic equilibrium, the project will develop and implement a coastline monitoring plan during the project life cycle. Coastline monitoring will commence prior to breakwater construction, i.e. before 2020. This will include the collection of further bathymetric data along the Saint-Louis shore, including the Senegal River mouth. The project will aim to involve local academics in the implementation of the coastline monitoring plan. The relevant authorities and local communities will be informed of the monitoring results.</p> <p style="padding-left: 40px;">b) The data collected as part of the implementation of the coastline monitoring plan will be used to update the coastline modeling (in Appendix I-3) to be completed before the construction of the breakwater in 2020. Additional modeling updates will be conducted at key stages of the project life cycle when new information with the potential to have a significant impact on the modeling results will become available.</p>

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
		<p>c) BP will seek the necessary authorizations to share relevant data for government led morphological studies initiatives and local academics.</p> <p>d) a contingency plan for the coastline will be developed by the project in consultation with the relevant authorities if the results of the coastline monitoring and modeling clearly and systematically demonstrate, over the duration of the project, negative impacts related to the GTA Phase 1 project which exceeds those currently identified in the GTA Phase 1 project ESIA report (in particular Section 7.3.3)".</p> <p>The reformulation of mitigation measure M40 has been done wherever this measure is mentioned in the consolidated version of the ESIA report, for example in Table 7-72 in Section 7.3.3.4, p. 7-194.</p> <p>Coastline monitoring is a critical precursor for the validation of the modeling of project impacts on the coastline. Work done to date has predicted that the project's impacts on the coastline will be low. It is only when the results of the monitoring after breakwater construction will become available that the need to identify additional mitigation measures will be considered if the impacts on the coastline are significantly different or greater than those predicted by the project development. Coastline monitoring will provide crucial evidence for decision making with regards to the planning for possible additional measures.</p> <p>It is also essential that the potential impacts on the coastline from other projects than the GTA Phase 1 project be identified and understood, before defining additional potential mitigation measures, which, to be effective, should be integrated with third party development plans.</p>
4	<p>Given that the project's host environment is a larval hatching and concentration area, marine and coastal biodiversity (marine fish, turtles, mammals and birds) should be the subject of specific measures in the monitoring plan, particularly the suction of cooling water and its impact on juveniles and plankton.</p>	<p>Biodiversity is an important attribute of the region that certainly deserves attention and protection during all phases of the project. Planktonic fish eggs and larvae are central to replenishing and maintaining regional fish biodiversity. Recognizing this, the authors of the ESIA covered plankton including fish eggs and larvae in the description of the host environment (Chapter 4), identification and analysis of impacts (Chapter 7), and environmental and social management and monitoring (Chapters 9 and 10). The baseline description of the plankton and larval fish assemblages in the project area was supported by literature sources and, more importantly, site-specific field data collected at sea during the Winter 2016 for the Environmental Baseline Survey (EBS) and in the Summer 2017 during a geological and geophysical study. Results of these field samples are described in detail in Sections 4.4.1.3 (p. 4-11 and 4-12) and 4.5.1.4 (p. 4-40 to 4-42) of Chapter 4. Additional</p>

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
		<p>details regarding these field samples from different areas and seasons (Winter and Summer) are given in Appendix D.</p> <p>The potential impact of drawing in large volumes of cooling water at the FLNG facility on fish eggs and larvae was also assessed in the ESIA. These impacts, known as entrainment, are expected during the Operations Phase at the FLNG Nearshore Hub/Terminal and were described in Section 7.3.6.2.2 (p. 7-206 to 7-208) and Table 7-76 (p. 7-211) of Chapter 7. An in-depth modeling exercise was undertaken to project the possible population-scale effects of removing planktonic larval stages. In brief, the volumes of plankton (including fish larvae) removed by cooling water intakes during a single day were assessed relative to a local parcel of water potentially at risk for entrainment during that same day. Data collected during the EBS were essential for these analyses. Details of the empirical transport model used to evaluate potential effects on local fish populations may be found in Appendix M. Similar models have been effective in monitoring entrainment losses for coastal power plants and other facilities using large volumes of cooling water in the U.S. (e.g., Raimondi, 2011¹ and Steinbeck et al., 2007²).</p> <p>To mitigate the potential impact caused by the losses of fish eggs and larvae and adult fish associated with entrainment and impingement during the Operations Phase, the following mitigation measure is included in the ESMP (see Table 9-2 in Chapter 9, p. 9-49):</p> <ul style="list-style-type: none"> ▪ M42: The seawater intake of the cooling water systems will be positioned taking into account technical constraints and appropriate screens or velocity caps will be fitted, if safe and practical, with the intent of avoiding entrainment and impingement of marine flora and fauna. The intake velocity will be below 1.0 m/s. <p>Although the pre-construction modeling did not indicate that population-level effects would occur, plankton and larval fish will be monitored as outlined in Chapter 10 (see measure MON14 in Table 10-1, p. 10-7).</p>

¹ Raimondi, P. 2011. Variation in Entrainment Impact Based on Different Measures of Acceptable Uncertainty. Prepared for California Energy Commission, Public Interest Energy Research Program. <http://www.energy.ca.gov/2011publications/CEC-500-2011-020/CEC-500-2011-020.pdf>.

² Steinbeck, J.R., J. Hedgepeth, P. Raimondi, G. Cailliet and D.L. Mayer. 2007. Assessing Power Plant Cooling Water Intake System Entrainment Impacts. Appendix E- Guidance Documents for Assessing Entrainment Including Additional Information on the Following Loss Rate Models: Fecundity Hindcasting (FH), Adult Equivalent Loss (AEL) and Area Production Forgone using an Empirical Transport Model (ETM/APF).

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
5	<p>Atmospheric emissions (greenhouse gases) must be the subject of a quantitative evaluation and appropriate mitigation measures.</p>	<p>Atmospheric emissions (greenhouse gases) contribute to climate change and are one of the most important causes of diffuse pollution resulting in impacts to a suite of environmental resources and human health.</p> <p>The reduction of greenhouse gas emissions from the FPSO is one of the elements that was considered in the analysis of the variants of the GTA Phase 1 project. As explained in Section 5.2.5 (p. 5-6) of Chapter 5 of the ESIA report, several measures have been considered to reduce greenhouse gas emissions produced by the FPSO during the lifetime of the project. These measures included reductions in energy consumption and increased energy efficiency and heat efficiency. They also included the increase in inlet pressure and design measures designed to eliminate compression, the inclusion of a turboexpander rather than a Joule-Thomson (JT) type valve to improve energy efficiency, removal of molecular sieves and related use of regeneration gas. In addition, heat recovery, flash gas recovery and steam recovery have been implemented to reduce emissions and improve efficiency. The decrease in energy demand allows for the use of smaller, more flexible power generation units, as well as the implementation of a high degree of electrification of the FPSO processing equipment.</p> <p>As such, quantitatively evaluating the proposed project's contribution and mitigating said contributions during all phases of the project is an important aspect of the ESIA report. Recognizing this, the authors of the ESIA described current conditions of the host environment (Section 4.4.7, p. 4-32 and 4-33 of Chapter 4), forecasted air emissions by source during all phases of the proposed project (Section 2.9, p. 2-33 to 2-37 of Chapter 2), and described potential impacts during each project phase and accidental events (Sections 7.2.1 (p. 7-20 to 7-25), 7.3.1 (p. 7-175 to 7-180), 7.4.1 (p. 7-303 to 7-306), and 7.5.1 (p. 7-414 to 7-444) of Chapter 7). The baseline description of the project study area was supported by literature sources and regional air quality monitoring stations and the impacts assessment was supported by an atmospheric emissions modeling report provided in Appendix J.</p> <p>A summary of potential air quality and greenhouse gases impacts may be found under IMP01 and IMP02 in Table 10-1 (p. 10-5) of Chapter 10. While the air quality monitoring indicated that the project would not have any significant air quality impacts along the shoreline, as well as to inland areas of Mauritania and Senegal, various mitigation and monitoring measures will be implemented as outlined in Chapter 9 in Table 9-1 (see M01 and M022, p. 9-17 and 9-27), Table 9-2 (see D01, D02, D04, D15, D29 thru D33, M01, M02, M29 thru M31, p. 9-35 to 9-45) and Chapter 10 (see MON1 thru MON4 in Table 10-1, p. 10-5).</p>

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6	The ESIA plans to use oil-based drilling muds for the lower sections even though best practice recommends that only water-based muds and synthetic muds should be used.	The use of oil-based drilling muds is not anticipated for the GTA Phase 1 project. As indicated in Section 2.10.2 of Chapter 2 (p. 2-37 to 2-50), it is planned that each well will be drilled using water based drilling muds (WBM) in the upper two sections of the well and a synthetic based drilling fluid (SBDF) will be used in the lower (deeper) sections of the well.
7	The waste and effluents must be the subject of a management plan which complies with the provisions and requirements of the MARPOL Convention and its appendices and other relevant standards.	<p>The Environmental and Social Management Plan (ESMP) includes the preparation of a waste management plan, which will provide a detailed waste inventory with the description of the solid and liquid waste management procedure.</p> <p>As indicated in the ESMP (Table 9-5 of Chapter 9 of the consolidated version of the ESIA report, p. 9-107 to 9-109), the waste management plan will be developed and implemented to avoid unauthorized waste discharges and transfers, with written procedures for collection, triage, storage, processing and disposal of waste, including use of equipment and record keeping. The waste management plan will be revised based on the nature of the waste to be managed during each phase of the project: construction, operations and decommissioning.</p> <p>A preliminary waste management plan has been developed and added to the ESIA. It constitutes the new Appendix S of the consolidated version of the ESIA report.</p> <p>Section 2.0 of the preliminary waste management plan (Appendix S, p.1 to 4) identifies the national and international regulations, standards and guidelines applicable to storage, handling and disposal of the GTA Phase 1 project waste. The applicable international conventions include the MARPOL Convention, in particular, Annex I - Regulations for the Prevention of Pollution by Oil and Annex V - Regulation for the Prevention of Pollution by Garbage from Ships.</p> <p>Section 2.6.2. of the preliminary waste management plan (Appendix S, p. 4) specifically states the following regarding compliance with the MARPOL Convention:</p> <p>“Ships shall be certified for compliance with offshore requirements for waste, including in particular the latest International Maritime Organization (IMO) requirements as given in Annex V of MARPOL and resolutions issued by the IMO Marine Environment Protection Committee (MEPC).</p> <p>Relevant requirements will be observed, including the need for a Garbage Record Book (whether as part of the ship’s official log book or otherwise) which shall record details of all discharge operations.</p>

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		<p>In line with requirements for the GTA Phase 1 project:</p> <ul style="list-style-type: none"> ▪ All solid wastes shall be separated by category and stored in appropriate, labelled containers before being shipped to shore for reuse, recycling or disposal; and ▪ Food waste will be ground prior to discharge (i.e., comminuted) to <25 mm diameter to meet discharge requirements, in accordance with MARPOL (i.e., for vessels 400 gross tonnage and above). When ground to these specifications, food waste discharges are allowed if the vessel is 3 nmi (5.6 km) or more from land, or 12 nmi (22.2 km) or more from land when within special areas”. <p>Section 2.0 of the preliminary waste management plan also states that the GTA Phase 1 project ESIA takes into account the International Finance Corporation (IFC) standards and the World Bank Group (WBG) Environmental, Health and Safety guidelines (general and specific to facilities) providing guidance on waste management and identifying Good International Industry Practice (GIIP). Relevant guidelines include the following:</p> <ul style="list-style-type: none"> ▪ General EHS Guidelines; ▪ Specific guidelines for Construction Materials Extraction; ▪ Specific guidelines for Offshore Oil and Gas development; ▪ Specific guidelines for Onshore Oil and Gas development (with regard to onshore disposal of offshore-generated drill cuttings); and ▪ Specific guidelines for LNG Facilities. <p>Section 2.0 of the preliminary waste management plan also states that in addition to meeting all regulatory requirements, the GTA Phase 1 project will adopt Best Available Techniques (BAT) / Best Available Control Technology (BACT) to determine the Best Practicable Environmental Option (BPEO) so that potential impacts are reduced to As Low As Reasonably Practicable (ALARP) for storage, handling and disposal of the GTA Phase 1 project wastes.</p>

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8	<p>Given that the infrastructures of the project are located in seaways, account should be taken of maritime safety requirements, particularly regarding the placing of beacons and markings, and also those applicable to vessels (such as FPSO, support vessels, FLNG, ...).</p>	<p>The national maritime navigation regulation and requirements applicable to the GTA Phase 1 project are addressed in Chapter 3 of the ESIA report. As indicated in Table 3-1 in Section 3.3.2 (p. 3-7 and 3-8), applicable regulation includes the Merchant Marine Code (<i>Loi portant Code de la Marine Marchande</i>) which governs the legal aspects related to maritime navigation as well as maritime commerce.</p> <p>Section 2.4 (p. 2-10 and 2-21) of Chapter 2 describes how the permanent exclusion safety zone boundaries will be demarcated. For example, during the Construction Phase, the permanent exclusion safety zones will be demarcated through the use of:</p> <ul style="list-style-type: none"> ▪ Marker buoys equipped with audio and visual warnings effective by both day and night in the prevailing sea conditions; ▪ Long life (LED or similar) bulbs; ▪ Anchorage at pre-set intervals; ▪ Buoys positioned to demarcate shipping lanes used for entry/exit and safety areas around fixed installations; and ▪ Tamper-proof, anti-climb design not suitable for small vessels to use as a mooring. <p>The impact of the project on maritime navigation has been assessed for all project phases in Chapter 7 of the ESIA report. See Section 7.2.14 for the Construction Phase (p. 7-124 to 7-131), Section 7.3.14 for the Operations Phase (p. 7-256 to 7-262) and Section 7.4.14 for the Decommissioning Phase (p. 7-372 to 7-378). During these three phases, the potential impacts of the project on maritime navigation include the risk of collision between project vessels and pirogues due to project vessels movements.</p> <p>To mitigate potential impacts on maritime navigation safety, several measures are included in the ESMP, for instance the following:</p> <ul style="list-style-type: none"> ▪ D19: The relevant maritime, port or shipping authorities will be notified of all permanent offshore facilities, as well as safety zones and routine shipping routes to be used by project-related vessels. Permanent facility locations will be demarcated on nautical charts. ▪ D20: Project vessels will follow the Convention on International Regulations for Preventing Collisions at Sea (COLREGs) adopted by the IMO.

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		<ul style="list-style-type: none"> ▪ D21: Main project vessels will be equipped with Universal Shipborne Automatic Identification System (AIS), a system of transponders installed on vessels which transmit over two dedicated digital marine VHF channels. ▪ D22: Where there is a risk of vessel interaction, standard communication procedures will be used in international maritime traffic and shipping, aided by project patrol boats or standby vessels near the drilling, pipelay and Nearshore Hub/Terminal Area to prevent collision with larger vessels. ▪ D23: Information will be provided to the national industrial fishing fleet of both Mauritania and Senegal to communicate and record the exclusion safety zones and applicable navigational charts. ▪ M08: Develop and implement a training and awareness program targeting local fishing communities on the specific maritime safety rules associated with the project. ▪ M09: Provide regular notices to mariners in the appropriate form and language to artisanal fishermen on project infrastructure, associated exclusion safety zones, travel and approach plans and the approximate timing of project activities. ▪ M10: Equip the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with radar or infrared systems that can detect small fishing vessels during poor visibility/night time. ▪ M11: Provide adequate lighting aboard the support vessels and other project vessels that regularly move outside the construction or operational exclusion safety zones with the intent of maintaining high visibility during poor visibility/night time. These vessels will also feature searchlights that can be used to shine on or signal approaching pirogues and foghorns for audible signaling. ▪ M12: Having a project patrol boat to monitor the exclusion safety zones, including patrolling ahead of the approach or exiting of larger project vessels into or out of the exclusion safety zones. ▪ M13: Where there is a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing. a risk of vessel interaction, using the services of local fishermen liaison officers (FLOs) aboard the project patrol boats in the areas of artisanal fishing.

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		<ul style="list-style-type: none"> ▪ M16: Ensuring that each project vessel keeps records of maritime safety incidents with pirogues and other vessels, including near misses, and that these are subsequently shared with the project. BP will monitor maritime safety incidents and adjust, if required, project specific maritime safety rules, security and search & rescue arrangements in place.
9	<p>Even if accidental events are considered remote by the ESIA, it does not rule them out from being dangerous. An emergency and early warning plan in the event of a hydrocarbon spill must therefore be developed before the work begins.</p>	<p>In fact, although the accidental events are considered remote, an emergency and early warning plan in the event of a hydrocarbon spill must be developed before the work begins. It is planned in the ESIA. The ESMP includes the preparation of a Source Control Emergency Response Plan (SCERP) and of an Oil Spill Contingency Plan (OSCP). As indicated in Table 9-5 of Chapter 9 (p. 9-109), the design and operational control measures include the following:</p> <ul style="list-style-type: none"> ▪ D111: Develop a Source Control Emergency Response Plan (SCERP), with provisions for well containment and capping and relief well planning. ▪ D112: Develop an Oil Spill Contingency Plan (OSCP), which will cover a range of response strategies for different spill scenarios. <p>As indicated in Table 9-5, these plans will be developed in 2019 once all required information is available.</p> <p>As indicated in Section 9.2 (p. 9-1 and 9-2), plans associated to accidental events prepared by BP will be discussed and forwarded to national authorities including the Ministry of Fisheries and Maritime Economy/Mauritanian Coast Guard in Mauritania, and HASSMAR in Senegal. The relevant national authorities will be invited to the relevant exercises conducted by the project to test the applicable contingency plans. The sharing and presentation format such as thematic sessions will be determined with the relevant authorities depending on the nature of the plan.</p>
10	<p>Chemical products and hazardous materials must be the subject of a management plan in accordance with the IMDG Code and the provisions of the FAL Convention to prevent them from impacting the host environment.</p>	<p>Regarding the selection and use of chemical products, the following footnote has been added to Section 2.8.1 (p. 2-27) of Chapter 2 of the consolidated version of the ESIA report:</p> <p>“The GTA Phase 1 project will follow OSPAR Harmonised Mandatory Control System (HMCS; OSPAR Recommendation 2000/2 as amended by OSPAR decision 2005/1) and OSPAR Guidelines for Completing the Harmonised Offshore Chemical Notification Format (HOCNF) (OSPAR Agreement: 2010/3, as amended by OSPAR recommendation 2014/7) for the selection and use of production chemicals.</p>

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		<p>The project will also use a number of chemicals that are listed on the OSPAR List of Substances/Preparations Used and Discharged Offshore which are Considered to Pose Little or No Risk to the Environment (PLONOR).”</p> <p>Selection and management of chemical products and hazardous materials is included in several measures of the Environmental and Social Management Plan (ESMP), presented in Chapter 9 of the ESIA, to prevent or minimize impacts to the environment, for instance the following measures are listed in Tables 9-1 (p. 9-11) and 9-2 (p. 9-42 and 9-43):</p> <ul style="list-style-type: none"> ▪ D10: Selection of drilling chemicals will be in accordance with the BP chemical selection and waste management standards to reduce potential for environmental effect. Where feasible, lower toxicity drilling muds and biodegradable and environmentally friendly additives within muds, cements and completion fluids will be preferentially used. If barite is used as weighting agent, it will not contain more than: <ul style="list-style-type: none"> - Hg: max 1 mg/kg dry weight in stock barite and - Cd: max 3 mg/kg dry weight in stock barite. ▪ D36: An inspection and maintenance program will be developed and implemented with the intent of maintaining mechanical integrity of equipment, piping, relief and vent systems and devices, emergency shutdown systems, controls, pumps and instrumentation, and prevent uncontrolled releases of hazardous or polluting materials from the project. ▪ D37: Chemicals used in the production process, flow assurance, maintenance, well intervention and management, desalination and fire management systems will be selected and managed with the intent to reduce the potential for environmental effects. <p>Used chemical products and hazardous waste will be managed in compliance with the waste management plan. A preliminary waste management plan is included in Appendix S of the consolidated version of the ESIA report. This plan defines the principles and channels for hazardous waste disposal. Section 2.0 of the preliminary waste management plan (Appendix S, p.1-4) identifies the national and international regulations, standards and guidelines applicable to storage, handling and disposal of the GTA Phase 1 project wastes. The applicable international conventions include the MARPOL Convention and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.</p>

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		<p>Section 2.0 of the preliminary waste management plan also states that in addition to meeting all regulatory requirements, the GTA Phase 1 project will adopt Best Available Techniques (BAT) / Best Available Control Technology (BACT) to determine the Best Practicable Environmental Option (BPEO) so that potential impacts are reduced to As Low As Reasonably Practicable (ALARP) for storage, handling and disposal of the GTA Phase 1 project wastes.</p>
11	<p>Given the existence of several socioeconomic infrastructures in the project area, it is important to consider the cumulative effects of their impacts.</p>	<p>The cumulative impacts of the GTA Phase 1 project with other socioeconomic infrastructures are assessed in Section 7.7 (p. 7-633 to 7-643) of Chapter 7 of the ESIA report.</p> <p>As indicated in Section 7.7.1, in addition to the GTA Phase 1 project, other sources of impact that may contribute to cumulative impacts include on-going and future oil and gas exploratory (i.e., seismic surveys; exploratory drilling) and development activities in Mauritanian and Senegalese waters and other activities in the offshore and nearshore region, including maritime navigation and shipping, artisanal and industrial fishing, hydrocarbon bunkering, port development or modification and shoreline stabilization projects. Potential cumulative impacts with possible future phases of the GTA project will be addressed, in due time, in the ESIA reports for these phases.</p> <p>Tables 7-201 and 7-202 list the ongoing activities and anticipated projects in the foreseeable future in the GTA project areas. Table 7-201 (p. 7-635 and 7-636) summarizes recently completed and anticipated oil and gas-related operations offshore Mauritania and Senegal. Table 7-202 (p. 7-637) provides a summary of other current maritime uses and known marine-related projects.</p> <p>The assessment of cumulative impacts is based on the ongoing activities and anticipated projects identified in Tables 7-201 and 7-202. Cumulative impacts are assessed for each of the three project phases, respectively in Section 7.7.2 for the Construction Phase (p. 7-638 to 7-640), in Section 7.7.3 for the Operations Phase (p. 7-640 to 7-643) and in Section 7.7.4 for the Decommissioning Phase (p. 7-643).</p>

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12	Marine sand dredging operations for the purposes of building the breakwater and extracting rock materials will be the subject of specific ESIA procedures.	<p>Indeed, specific environmental assessments will be conducted for the breakwater construction materials. This is indicated in Section 2.2.3 of Chapter 2 (p. 2-15):</p> <p>"With the advancement of project engineering, the sources of supply of breakwater construction materials have become more defined. As of September 2018, it is expected that the caissons will be manufactured within the Dakar port and that this will be the subject of a separate ESIA. Sand, with appropriate geotechnical characteristics, will be used as ballast material of the caissons. This sand will be extracted in Mauritania, probably from an offshore source, which guarantees, de facto, its suitability to the marine aquatic environment. Potential sources of sand extraction are currently being analyzed by the contractor responsible for the construction of the breakwater. Rocks will be required for the foundation of the breakwater. These rocks will come from a quarry in Mauritania and this will be the subject of an environmental and social impact assessment."</p>
13	The ESMP and the surveillance and monitoring plan are not quantified. It is wise to determine their costs in accordance with the national environmental regulations in force.	<p>Regarding the costs of the implementation of the ESMP and the surveillance and monitoring plan by the project proponent, the following clarification was made to Section 9.2 of Chapter 9 of the consolidated version of the ESIA report:</p> <p>"It is important to note that most of the monitoring activities to be conducted by GTA Phase 1 project are through equipment/instruments/meters installed on the FPSO and FLNG. The cost associated with those are included in CAPEX and the use/maintenance of the equipment will be captured in project OPEX. The details of the OPEX costs for use and maintenance of meters are not available.</p> <p>Another type of monitoring activities to be conducted by the project are those that are generally combined with other GTA Phase 1 maintenance/integrity inspection activities, e.g. seabed surveys. This approach is often adopted by the O&G industry to optimize vessels utilization time. Therefore, the cost of those campaigns will not be only associated to environmental activities. They will be captured in the OPEX cost.</p> <p>The production sharing contracts/Joint Operating Agreements define the mechanism by which these OPEX cost are approved annually by all GTA's partners." (p. 9-2)</p> <p>A review of the cost column for the ESMP implementation (Chapter 9 of the ESIA) will be done around the end of 2020.</p>

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		<p>Regarding the cost of the monitoring by authorities, these costs have been identified in the consolidated version of the ESIA report. They are discussed in Section 9.4 (p. 9-6) and Section 10.4 (p. 10-3), as well as in the tables of the new Appendix U. This appendix provides an external monitoring plan of the ESMP and the SMP by the national authorities of Mauritania and Senegal.</p> <p>The monitoring activities to be completed by authorities include the reading of monitoring reports and management plans provided by the GTA Phase 1 project as well as other project documents, inspections and the visit of project facilities. There are no monitoring costs associated with document revision. For inspections and visits, the GTA Phase 1 project plans for the transportation by boat or helicopter used by the project personnel to reach the project facility and accommodation at the facility for the duration of the inspection/visit. The cost of this transportation and accommodation will be covered by the GTA Phase 1 project.</p>
14	<p>The simulations of the potential impacts of the project are based on limited data. It is recommended in the monitoring plan that the data be further developed and updated so that these models are more accurate.</p>	<p>As recommended in the remark, the SMP already includes activities to monitor and update, as needed, ESIA report data. Chapter 10 of the ESIA provides details on the planned modeling updates. This being said, the ESIA contains, either in the main text or in supporting appendices, extensive biophysical and socioeconomic data upon which impacts and appropriate mitigation measures were determined.</p> <p>The assessment of the project's potential impacts was based on: 1) the project description provided in Chapter 2 of the ESIA; 2) the description of the host environment provided in Chapter 4 and; 3) an impact assessment provided in Chapter 7.</p> <p>The project description is very detailed. Chapter 2, long of around 80 pages, describes the project components, the processes and their location, the schedule and phases of the project as well as the applicable exclusion safety zones for the proposed development of natural gas resources. It explains the anticipated needs and procurement in energy and water, and identifies the typical chemicals and hazardous materials. The expected air emissions, effluent discharges, light and noise emissions as well as generated solid wastes are detailed. The estimated personnel needs, and the health, safety, security and environment procedures that will need to be developed are also described.</p> <p>The host environment description contains, either in the main text or in supporting appendices, the relevant biophysical and socioeconomic data upon which to determine impacts and appropriate mitigation measures. The ESIA team reviewed available sources in both peer-reviewed and grey literature, acquired site-specific data via several survey efforts</p>

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		<p>and drew upon local knowledge through the use of in-country experts. The host environment baseline was subject to a quality control procedure by national and international technical experts of the ESIA team.</p> <p>A very detailed description of the host environment is provided in Chapter 4 of the ESIA report. This chapter, which counts over 200 pages, provides detailed data on the marine and costal environments and the socioeconomic aspects of Mauritania and Senegal.</p> <p>Additionally, ten appendices provide complementary environmental data:</p> <ol style="list-style-type: none"> 1. Appendix D – Environmental Baseline Survey Report; 2. Appendix E-1 – Report on Fisheries and Fisheries Resources in the Mauritanian Portion of the Core Study Area of the Ahmeyim/Guembeul Gas Production Project; 3. Appendix E-2 – Report on Fishery Resources and Fisheries in the Senegalese Portion of the Core Study Area of the Ahmeyim/Guembeul Gas Production Project; 4. Appendix E-3 – Report on Fishing Communities in Mauritanian Portion of Core Study Area of the Ahmeyim/Guembeul Gas Production Project; 5. Appendix E-4 – Study of Fishing Communities in Senegalese Portion of Core Study Area of the Ahmeyim/Guembeul Gas Production Project; 6. Appendix F-1 – Note on Protected Areas in the Mauritanian Portion of the Extended Study Area of the Project; 7. Appendix F-2 – Note on Protected Areas in the Senegalese Portion of the Extended Study Area of the Project; 8. Appendix G – Biophysical Baseline Support Material; 9. Appendix H – Social Baseline Support Material; and 10. Appendix I-1 – Regional Characterization of Coastal Processes Report. <p>This comprehensive set of environmental data is deemed sufficient for the impact characterization provided in the ESIA report.</p> <p>The impact characterization, presented in Chapter 7, is based on a standard and rigorous method. It takes into account the impact consequence and impact likelihood to determine its overall significance. The determination of the impact consequence is based on the integration of three criteria: the intensity, the extent and the duration of the impact. The determination of intensity corresponds to the degree of disturbance associated with each of the impacts: low,</p>

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		<p>moderate or high. The extent of an impact refers to the area in which the impact could occur: immediate vicinity, local, or regional extent. The duration of an impact describes the length of time over which its effects could occur: short term or long term. The likelihood of an impact is the probability that it will occur. The various categories of likelihood have been classified as follows: likely (> 50% to 100%, or may happen a few times per year), occasional (> 10% to 50%, or may happen a few times during the lifetime of the project), rare (1% to 10%, or may possibly happen once during the lifetime of the project), or remote (<1% or unlikely to happen at all during the lifetime of the project). This method is explained in detail in Section 7.1 (p. 7-1 to 7-20).</p> <p>Several modellings were conducted to support the impact characterization. The following modeling reports are appended to the ESIA report:</p> <ul style="list-style-type: none"> ▪ Coastline (coastal erosion) modelling; ▪ Air emissions modelling; ▪ Water discharges calculations and produced water modelling; ▪ Muds and cuttings dispersion modelling; ▪ Plankton entrainment modelling; and ▪ Accidental event scenarios modelling. <p>Consequently, the overall impact assessment has been conducted with extensive data and the ESIA consultant is confident that the results are well grounded. Nevertheless, the ESIA report includes an SMP presented in Chapter 10. As indicated in Section 10.1 of this chapter (p. 10-1), the overall purpose of the SMP is to evaluate that the mitigation measures identified in the Environmental and Social Management Plan (ESMP) generate the expected results in regard to avoiding or reducing potential impacts on the biophysical or social environments.</p> <p>The SMP complements the ESMP and aims to identify:</p> <ul style="list-style-type: none"> ▪ Actual impacts on physical, biological and socioeconomic receptors associated with the project; ▪ Effects not anticipated in the present impact assessment; ▪ Effects exceeding or below the levels anticipated in the present impact assessment; ▪ Appropriate mitigation measures for effects not anticipated or exceeding levels anticipated in the impact assessment; and

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		<ul style="list-style-type: none"> ▪ Need for corrective action to be agreed with regulatory authorities. <p>As indicated in Table 10-1 (p. 10-5 to 10-9), the SMP includes a series of measures with performance objectives to monitor the project's potential impacts, including those on the following resources:</p> <ul style="list-style-type: none"> ▪ Air quality; ▪ Water quality; ▪ Coastal erosion; ▪ Sediment quality; ▪ Benthic communities; ▪ Ichthyoplankton at and near the FLNG; ▪ Fish fauna associating with the Nearshore Terminal/Hub; ▪ Maritime navigation; and ▪ Artisanal fisheries. <p>The SMP includes modeling updates during the course of the project in addition to the modeling conducted for the ESIA. Monitoring measures MON8 and MON9, identified in Table 10-1, provide for modeling updates to monitor potential impacts of the project on coastal erosion and water quality. Moreover, mitigation measure M30 plans for modeling updates of atmospheric dispersion, as needed, when technical specifications for equipment are provided by the suppliers at the stage of detailed design (see Section 7.3.1.3, p. 7-178 and 7-179) of Chapter 7.</p> <p>The GTA Phase 1 project will aim at implementing monitoring activities described in Chapter 10 through contracts with relevant national academics (universities, research institutes) where practicable, and for relevant monitoring activities where relevant.</p>
15	<p>Despite the fact that PNBA is far from the project area, it is important for the ESMP to include it as an area which is particularly sensitive from the point of view of geomorphology, hydrology, eco-biology etc.</p>	<p>Despite the fact that Banc d'Arguin National Park (PNBA) is located far from the project infrastructure, its conservation importance is well recognized in the ESIA report (see Section 4.5.9.1 of Chapter 4, p. 4-109 to 4-113). Its contribution to various resource topics (e.g., fauna such as birds, marine mammals, turtles, fish, threatened species; fixed locations such as protected areas, IBAs), is noted extensively in Chapter 4.</p>

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		<p>PNBA is located outside of the core and extended study areas of the project and none of the potential impacts associated with the project's routine activities come anywhere near it. This assessment is supported by the analysis of the spatial extent of impacts: all routine impacts are expected to occur in relatively close proximity to their source, normally within a few kilometers or less. As there were no potential impacts from routine activities on the PNBA, no measures have been specifically included in the ESMP with regards to the PNBA.</p> <p>In addition to routine activities, the ESIA has considered potential accidental events. Three potential accidental event scenarios corresponding to worst credible cases are discussed in the ESIA. Potential spill scenario for each of the three accidental events were examined using oil spill modeling to assess the fate of each hydrocarbon spill. Modeling reports of accidental events is presented in Appendices N1a to N1d of the ESIA report.</p> <p>These accidental events have a remote likelihood of occurrence (0.001 to 0.2%; see Section 7.5.1 of Chapter 7, p. 7-416). Nonetheless, several design and operation controls measures and mitigation measures are included in the ESMP of the project to avoid or reduce impacts from accidental events (see Table 9-4 of Chapter 9, p. 9-80 to 9-106) and they would also apply to PNBA if relevant. Some of these measures are listed below:</p> <ul style="list-style-type: none"> ▪ D104: Management and mitigation measures will be in place to prevent and/or minimize the likelihood of a spill from the installation and operation of the subsea facilities. This may include flowline design specification, use of appropriate design codes (e.g. for corrosion allowance), use of corrosion inhibitor. BP will also implement a risk-based proactive pipeline inspection and maintenance program. ▪ D111: Develop a Source Control Emergency Response Plan (SCERP), with provisions for well containment and capping and relief well planning. ▪ D112: Develop an Oil Spill Contingency Plan (OSCP), which will cover a range of response strategies for different spill scenarios. ▪ D113: Tier 1 spill response equipment will be available and maintained in conformance with internal procedures and good international industry practice throughout construction, operations and decommissioning. ▪ D115: Conduct routine spill response drills and training. ▪ D116: Development of an oil spill sensitivity map highlighting resources at risk.

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
		<ul style="list-style-type: none"> ▪ M101: In the unlikely event of a spill, tactical response methods that may be considered under the OSCP include: surveillance and monitoring, offshore containment and recovery; subsea and at surface dispersant application; in-situ burning; shoreline protection; shoreline clean up; and oiled wildlife response. ▪ M102: All response measures will be continuously monitored to ensure that they remain effective. The response team will maintain situational awareness of the event and response effort. ▪ M103: In the unlikely event of a spill reaching the shoreline, a Shoreline Clean-up and Assessment Technique (SCAT) program will be implemented to inform shoreline clean-up and remediation as applicable. ▪ M104: In the unlikely event of a spill reaching the shoreline, a shoreline clean-up and remediation team will be mobilized to the affected areas. BP will also engage specialized expertise to mitigate impacts to sensitive areas and wildlife species as needed. ▪ M105: In the unlikely event of a spill, follow national regulatory requirements for reporting and notification, using established protocols, which extends to all relevant external stakeholders. ▪ M112: In the unlikely event of a spill of high intensity, specific monitoring (e.g., environmental effects monitoring) may be required and developed in consultation with applicable national authorities. ▪ M113: Provide training in oil spill response planning and techniques to management staff of the designated National Parks and Marine Protected Areas that based on the ESIA spill modelling results could potentially be affected.

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
16	<p>In addition, the capacity building plan provided in the ESIA for the Department of Environmental Control must be implemented as soon as possible with the aim of supporting implementation of the project. This capacity building plan must include other national institutions which are affected by the project.</p>	<p>Section 9.5 of Chapter 9 (p. 9-6 to 9-110), dedicated to capacity building, has been revisited in the consolidated version of the ESIA report. This section provides an outline of the capacity building plan for the Mauritanian and Senegalese authorities. A detailed capacity building plan will be prepared by BP in 2019 in collaboration with the relevant authorities.</p> <p>The capacity building training program will aim at strengthening the capacity of the DCE and other authorities in Mauritania to monitor environmental aspects of offshore oil and gas projects in general, and to monitor the implementation of the GTA Phase 1 project ESMP and SMP in particular.</p> <p>The budget associated with the capacity building plan in the consolidated version of the ESIA is presented in Table 9-6 (p. 9-110). It amounts to US\$ 900,000:</p> <ul style="list-style-type: none"> ▪ US\$ 450,000 for Mauritania; and ▪ US\$ 450,000 for Senegal. <p>The budget includes two components: a training component totaling US\$ 250,000 per country and a technical assistance program totaling US\$ 200,000 per country.</p>
17	<p>An examination of the ESIA shows gaps in terms of knowledge of the marine environment. It is therefore strongly recommended that the project contribute to a more in-depth knowledge of the marine ecosystems in order to reconcile their exploitation and conservation.</p>	<p>As indicated in our response to Remark no 14, the host environment description, notably for the marine environment, contains, either in the main text or in supporting appendices, extensive biophysical and socioeconomic data upon which to determine impacts and appropriate mitigation measures. The ESIA team exhausted available sources in both peer-reviewed and grey literature, acquired site-specific data via several survey efforts, drew upon local knowledge through the use of in-country experts, and conducted a thorough quality control with the help of national and international technical experts.</p> <p>A very detailed description of the host environment is provided in Chapter 4 of the ESIA report. This chapter, which counts over 200 pages, provides detailed data on the marine and coastal environments and the socioeconomic aspects of Mauritania and Senegal.</p> <p>Additionally, ten appendices provide complementary environmental data:</p> <ol style="list-style-type: none"> 1. Appendix D – Environmental Baseline Survey Report; 2. Appendix E-1 – Report on Fisheries and Fisheries Resources in the Mauritanian Portion of the Core Study Area of the Ahmeyim/Guembeul Gas Production Project; 3. Appendix E-2 – Report on Fishery Resources and Fisheries in the Senegalese Portion of the Core Study Area of the Ahmeyim/Guembeul Gas Production Project;

No.	Remarks Taken from the Environmental Feasibility Notice Issued by the MEDD (Mauritania) on December 18, 2018	Responses to the Remarks (Including the Page Numbers Referring to the Consolidated Version of the ESIA Report where Relevant)
		<ol style="list-style-type: none"> 4. Appendix E-3 – Report on Fishing Communities in Mauritanian Portion of Core Study Area of the Ahmeyim/Guembeul Gas Production Project; 5. Appendix E-4 – Study of Fishing Communities in Senegalese Portion of Core Study Area of the Ahmeyim/Guembeul Gas Production Project; 6. Appendix F-1 – Note on Protected Areas in the Mauritanian Portion of the Extended Study Area of the Project; 7. Appendix F-2 – Note on Protected Areas in the Senegalese Portion of the Extended Study Area of the Project; 8. Appendix G – Biophysical Baseline Support Material; 9. Appendix H – Social Baseline Support Material; and 10. Appendix I-1 – Regional Characterization of Coastal Processes Report. <p>This comprehensive set of environmental data is deemed sufficient for the impact characterization provided in the ESIA report.</p> <p>However, the GTA Phase 1 project has committed to contribute to a more in-depth knowledge of the marine ecosystems. BP's social investment program, which is detailed in Chapter 2 of the ESIA, identifies priority actions. These include support for environmental initiatives including academic research on the offshore marine environment (p. 2-73).</p> <p>Additionally, support for in-depth knowledge of the marine environment is planned for in the ESMP through measure M24 (mentioned in Table 7-197 of Chapter 7, p. 7-618):</p> <ul style="list-style-type: none"> ▪ M24: Provide technical assistance to mutually agreed marine resource research programs notably the national oceanographic research centers of both countries (CRODT and IMROP).
18	Additional analyses of the ESIA are planned and the results of those will be communicated to you in due course with the aim of enhancing and improving the ESMP and the surveillance and monitoring plan as well as the baseline.	

**APPENDIX Y-3: ATTESTATION AND ORDER
OF ENVIRONMENTAL
CONFORMITY FROM
SENEGAL**



N° 3597 MEDD/DEEC/DEIE

Dakar, le 17 DEC. 2018

La Directrice

A T T E S T A T I O N

Le Comité technique interministériel s'est réuni les jeudi 26 et vendredi 27 juillet 2018 et en Comité technique restreint le lundi 22 octobre 2018, à Dakar pour l'examen du rapport d'Etude d'Impact Environnemental et Social (EIES) du projet de Production de Gaz Grand Tortue/Ahmeyim (GTA), Phase 1, par British Petroleum (BP) Sénégal.

Suite à ces rencontres, une séance d'audience publique s'est tenue le mardi 13 novembre 2018, à la Chambre de Commerce de Saint-Louis.

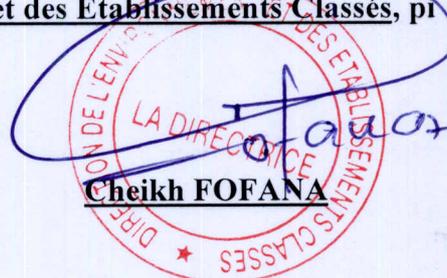
Au terme de cette procédure, j'atteste que le projet de **Production de Gaz Grand Tortue/Ahmeyim (GTA), Phase 1** est conforme aux dispositions du Code de l'environnement relatives aux Etudes d'Impact sur l'environnement.

La présente attestation est délivrée à **BP-Sénégal** pour servir et valoir ce que de droit, en attendant la signature de l'arrêté ministériel portant certificat de conformité environnementale.

Toutefois, le démarrage du projet reste subordonné à l'obtention des autres autorisations administratives requises. Ce démarrage des travaux doit être notifié à la Direction de l'Environnement et des Etablissements Classés qui se chargera de veiller à ce que les mesures prévues dans le plan de gestion environnementale et sociale (PGES) soient appliquées.

Le non-respect du plan de gestion environnementale et sociale contenu dans le rapport d'étude d'impact environnemental et social validé peut entraîner le retrait du certificat de conformité environnementale.

P/La Directrice de l'Environnement
et des Etablissements Classés, pi



Cheikh FOFANA



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N°.....MEDD/DEEC/DEIE.nfn

Dakar, le 21 FEV. 2019

La Directrice

A
Monsieur le Directeur Général
BP Sénégal

DAKAR

Objet : *Transmission de l'arrêté de conformité environnementale*

Monsieur le Directeur Général,

Au terme de la procédure de validation du rapport d'Etude d'Impact Environnemental et Social du projet de Développement Gazier GTA Phase 1, je vous transmets, ci-joint, l'arrêté de conformité aux dispositions du Code de l'environnement.

Je vous demande de veiller à l'application des mesures issues du plan de gestion environnementale et sociale validé, qui sera régulièrement suivi par le Comité technique.

Je vous prie d'agréer, **Monsieur le Directeur Général**, l'assurance de ma considération distinguée.

PJ : *Arrêté de conformité environnementale*



Ampliation :

- MEDD (ATCR) ;
- DREEC/SL (pour information).

ARRÊTE :

Article premier. - Le projet de Développement Gazier GTA Phase 1 est déclaré conforme aux dispositions prévues par la loi n° 2001-01 du 15 janvier 2001 portant Code de l'environnement en ses articles L48, L49, L50, L51, L52, L53 et le décret n° 2001-282 du 12 avril 2001 portant application dudit code en ses articles R38, R39, R40, R41, R42 et R43.

Article 2.- BP Sénégal est tenu de mettre en œuvre le plan de gestion environnementale et sociale annexé au présent arrêté. Des rapports de surveillance environnementale devront être fournis semestriellement à la Direction de l'Environnement et des Etablissements Classés, pour rendre compte de l'état de mise en œuvre de la gestion environnementale et sociale du projet.

Article 3.- Les services de la Direction de l'Environnement et des Etablissements Classés effectueront, en rapport avec les services concernés, des visites régulières sur le site du projet, afin de s'assurer de l'effectivité de la mise en œuvre des mesures énoncées dans le plan de gestion environnementale et sociale.

Article 4.- La non-application des mesures prévues dans ce plan de gestion environnementale et sociale, par le promoteur, BP Sénégal, entraîne des sanctions prévues par les textes en vigueur.

Article 5. - Les frais et moyens relatifs à la surveillance et au suivi environnemental sont à la charge de BP Sénégal, promoteur du projet, conformément au volet renforcement des capacités du plan de gestion environnementale et sociale validé. Les mécanismes d'opérationnalisation de ce volet renforcement des capacités seront définis d'un commun accord entre le Ministère chargé de l'Environnement et BP Sénégal.

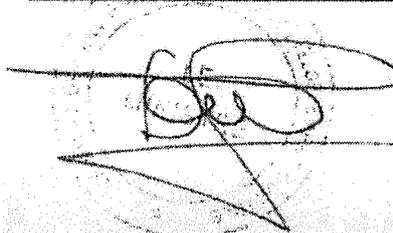
Article 6.- Le présent certificat de conformité environnementale est délivré pour une durée de quatre (04) ans. Son renouvellement s'effectuera par voie d'audit environnemental et social validé, conformément à la procédure Sénégalaise en matière d'Evaluation Environnementale.

Article 6.- Le Directeur de l'Environnement et des Etablissements classés est chargé, de l'exécution du présent arrêté qui sera publié partout où besoin sera.

AMPLIATION :

- PM/SGG ;
- MEFP ;
- Ministère du Pétrole et des Energies ;
- Gouverneur de la région de Saint-Louis ;
- Maire de la Commune de Saint-Louis ;
- L'Intéressé : BP Sénégal ;
- Archives Nationales.

Pr Mame Thierno DIENG





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