ADNOC GAS

ADNOC RUWAIS LNG PROJECT

CONSTRUCTION ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (CESMP) FOR THE LNG PLANT IN RUWAIS, ABU DHABI

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ABBREVIATIONS

AAQ	Ambient Air Quality
ADACH	Abu Dhabi Authority for Culture and Heritage
ADNOC	Abu Dhabi National Oil Company
ADTCA	Abu Dhabi Tourism and Culture Authority
AQMS	Air Quality Monitoring System
ASME	American Society of Mechanical Engineers
BAP	Biodiversity Action Plan
BAT	Best Available Technologies
BSL	Below Sea Level
CAP	Corrective Action Plan
CBD	Convention on Biological Diversity
CCRA	Climate Change Risk Assessment
CEMS	Continuous Emission Monitoring Systems
CEO	Chief Executive Officer
CESMP	Construction Environmental Social Management Plan
CFM	Community Feedback Mechanism
CICPA	Critical Infrastructure and Coastal Protection Authority
CITES	Convention on International Trade in Endangered Species
CMS	Convention on Migratory Species
CR	Clean Water System or Storm Water Run-off
CSR	Corporate Social Responsibility
CWM	Center for Waste Management
DCT	Department of Culture and Tourism
DDV	Drop-down Video
EAD	Environmental Agency of Abu Dhabi
EBS	Environmental Baseline Survey
EDG	Emergency Diesel Generator
EHS&S	Environmental, Social, Health, and Safety
EIA	Environmental Impact Assessment
ELARD	Earth Link and Advanced Resources Development
ENVID	Environmental Impact Identification
EOH	Environmental and Occupational Health
EP	Equator Principle
EPA	Environmental Protection Agency
EPC	Engineering, Procurement and Construction

ERP	Emergency Response Plan
ERT	Emergency Response Team
ESEP	External Stakeholder Engagement Plan
ESIA	Environmental and Social Impact Assessment
ESMS	Environmental and Social Management System
FEED	Front End Engineering Development
FW	Fire Water
GC	Group Company
GC CHSE	GC Corporate Health, Safety, and Environment
GC GSA	GC General Services and Administration
GCC	Gulf Cooperation Council
GHG	Greenhouse Gas
GHSEF	Group Health Safety and Environment Function
HAB	Harmful Algal Blooms
HSE	Health, Safety, and Environment
HSEIA	Health, Safety, Environmental Impact Assessment
HSEMS	Health, Safety, and Environment Management System
HSS	Health, Safety, and Security
HVAC	Heating, Ventilation, and Air Conditioning
IAPP	International Air Pollution Prevention
IFC	International Finance Corporation
ILO	International Labor Organization
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
LDAR	Leak Detection And Repair
LMXD	Littoral Mixed Deposit
LNG	Liquefied Natural Gas
LSED	Littoral Sediment
MARPOL	Marine Pollution
MEPC	Marine Environmental Protection Committee
MES	Monaco Engineering Solutions
MLEAD	Marine Life of the Emirate of Abu Dhabi
MMO	Marine Mammal Observer
MOCCAE	Ministry of Climate Change and Environment
MPA	Marine Protected Area

NA	Not Applicable
NCM	National Centre of Meteorology
NFPA	National Fire Protection Association
NOC	No Objection Certificate
NRU	Nitrogen Rejection Unit
O&G	Oil and Gas
OH SME	Occupational Health Subject Matter Expert
OHID	Occupational Health Identification
OHRA	Occupational Health Risk Assessment
OHS	Occupational Health and Safety
OSHAD SF	Abu Dhabi Occupational Safety and Health System Framework
PPC	Pollution Prevention and Control
PPE	Personal Protective Equipment
QCC	Quality and Conformity Council
RCP	Representative Concentration Pathway
RIC	Ruwais Industrial Complex
RLNG	Ruwais Liquefied Natural Gas
ROPME	Regional Organization for the Protection of the Marine Environment
RRW	Ruwais Refinery West
SEP	Stakeholder Engagement Plan
SHA	Seismic Hazard Assessment
SIA	Social Impact Assessment
SL.MACA	Macroalgae Beds
SLMXD	Sublittoral Mixed Sediment
SLSED	Sublittoral Sediment
SOLAS	Safety of Life at Sea
SOPs	Standard Operating Procedures
SRM	Social Risk Management
STCW	Standards of Training, Certification, and Watchkeeping for Seafarers
STP	Sewage Treatment Plant
TBC	To be Confirmed
UAE	United Arab Emirates
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
VP	Vice President
WHO	World Health Organization
YMPA	Yasat Marine Protected Area

1. INTRODUCTION

1.1. Project Background

The Abu Dhabi National Oil Company (ADNOC) Ruwais Liquefied Natural Gas (RLNG) Front End Engineering Development (FEED) Project will develop a two train, near net-zero electrically driven LNG facility, targeting international markets. The project is located adjacent to the Ruwais Refinery West, United Arab Emirates (UAE), comprising approximately 2 million square meters within the Ruwais Industrial Area. The feed gas for the project will be supplied from the Habshan gas processing plant, via a new sales gas pipeline. The pipeline is not part of the scope of this Environmental Impact Assessment (EIA) study.

Monaco Engineering Solutions (MES) (hereinafter referred to as the "CONSULTANT") has been invited by ADNOC Gas (hereinafter referred to as "COMPANY") to perform FEED Phase Health, Safety, Environmental Impact Assessment (HSEIA) Study for the ADNOC Ruwais LNG FEED Project (hereinafter referred to as the "PROJECT"), which is a revalidation of the HSEIA conducted during the FEED phase for the Fujairah LNG project. The Environmental and Social scope has been contracted to Earth Link and Advanced Resources Development (ELARD). MES and ELARD are jointly referred to as CONSULTANT. ELARD is a registered environmental consultant with the Environmental Agency of Abu Dhabi (EAD) and with ADNOC.

This project is located in an ADNOC concession area and does not cross any protected area; accordingly, ADNOC is the delegated competent environmental authority for environmental permitting.

1.2. Purpose of the CESMP

1.2.1. Purpose

The Construction Environmental and Social Management Plan (CESMP) is a project specific plan developed for the Contractor and appointed subcontractors to ensure appropriate environmental and social management practices are followed during the construction phase of the Project as well as define the environmental and social performance expectations. The CESMP process aims at covering all aspects of planned construction works by the Contractor as well as by its Subcontractors. The main objectives of the CESMP are to:

- Mitigate potential adverse impacts during construction of the project.
- Achieve compliance with environmental and social permit and legal requirements, EIA mitigation, management, and monitoring requirements, Equator Principles IV, and Best Available Techniques.
- Ensure compliance of subcontractors with the same requirements including labor accommodation management companies, catering, and cleaning companies, etc.
- Ensure compliance of manpower suppliers with the same requirements.
- Ensure adherence of the supply chain to the same governing principles of sustainability (environmental management) (suppliers and labor recruitment agencies shall be vetted and audited for compliance).

- Ensure that the necessary human and financial resources with upper management support are secured for the project.

It should be noted that this is a FEED-stage CESMP that still requires finalization by the EPC Contractor following detailed design and prior to construction. It also requires integration of additional studies and surveys that are not yet completed such as a marine ecological survey and associated Biodiversity Management Plan (restoration plan) for the construction of the jetty.

1.2.2. Scope

The overall RLNG project will be split into two phases with the initial (Phase-1) being the installation of two (2) Liquefied Natural Gas (LNG) Trains (together with inlet gas treating facilities), two (2) LNG Tanks and an LNG Loading jetty with two (2) berths together with support utilities and infrastructure buildings. In Phase-1 it may also be required that the final construction of the second LNG train is carried out during commissioning/ operation of the first unit.

The scope of this CESMP study includes Phase-1 facilities and has considered both the LNG trains, irrespective of the two different construction schedules for each train. This CESMP does not cover the impacts from dredging activities, which were assessed in a distinct EIA, and which should be covered in a distinct CESMP by the contractor responsible for construction of the canal. However, the Dredging EIA outcome will be included in RLNG HSEIA Phase 2 report.

Other upstream and downstream facilities, as listed below, are being assessed by other contractors and are also outside the scope of this CESMP:

Upstream (Habshan) gas processing facility and associated gas pipeline.

Feed Gas supply from the Habshan pipeline tie-in point (manual pipeline end valve) to the RLNG Plant.

Electric power interfaces upstream to the tie-in to the local TRANSCO 400 kV grid network.

LNG Carriers.

LNG Bunkering Vessels.

Miscellaneous other marine support vessels for LNG loading activities

Referring to ADNOC Standard for EIA development [Ref 4], a CESMP must be prepared prior to start of construction activities and must provide the necessary information for the contractor to effectively control any adverse environmental and social impacts identified during the EIA and Social Impact Assessment (SIA) for the construction phase. Hence, this CESMP is prepared while referring to the FEED Phase ENVID Report [Ref 28] and according to the template provided in Appendix 4 of ADNOC Standard for EIA development [Ref 4]. The scope of this CESMP is to provide control and mitigation measures for the RLNG Project construction phase that includes early works as well as construction works.

1.3. Structure of the CESMP

The CESMP aligns with and integrates key documents to ensure effective management of environmental and social risks during construction. It translates the mitigation measures from the EIA and SIA into actionable steps. Additionally, it references Standard Operating Procedures (SOPs), HSE manuals, and project-specific plans to guide day-to-day

operations. The CESMP also ensures compliance with regulatory requirements and permits, while maintaining alignment with the Environmental and Social Management System (ESMS) and Stakeholder Engagement Plan (SEP) to promote consistent stakeholder engagement and risk management throughout the construction phase.

The structure of the CESMP Report is as follows:

Section 1	Introduction
Section 2	Project Description
Section 3	Environmental and Social Policy
Section 4	Environmental and Social Management
Section 5	Environmental Management Plans
Section 6	Social Management Plans
Section 7	Occupational Health & Safety Management Plans
Section 8	Emergency Response Plans
Section 9	Conclusion

Appendices

2. PROJECT DESCRIPTION

2.1. Project Location

The RLNG plant is located on the coast within the Ruwais Industrial Complex (RIC), adjacent to the Ruwais Refinery West (RRW), covering approximately 2 million square meters. It is bordered by industrial plots to the west and south, with the Persian Gulf to the north and east. The feed gas for the project will come from the Habshan gas processing plant via a new 364 km sales gas pipeline. The overall project location is shown in Figure 2-1, while the proposed development area is depicted in Figure 2-2.

Figure 2-1. Project Locations

Figure 2-2. Project Site

2.1.1. Sensitive Areas

The Ruwais LNG Project is located in an ADNOC concession area. Surrounding the RLNG plant are several sensitive areas, including:

- Dhafra Beach Hotel 2.0 km northwest
- ADNOC Beach Club – Ruwais 2.4 km northwest
- Al Dhanna city (nearest residential area) 5.0 km south
- Barqa Al Suqoor Protected Area (nearest protected terrestrial area) 9.8 km south
- Marawah Marine Protected Area (MPA) (nearest protected marine area) 10.0-15.0 km northeast
- Sir Bani Yas Island 13.0-15.0 km northwest
- Al Houbara Protected Area (protected terrestrial area) 16.0 km southeast

2.2. Project Layout

The project layout is shown in and summarized below

Gas liquefaction via 2 x 4.8 MTPA electrically driven LNG trains.

Common facilities including LNG storage, BOG handling, flare, refrigerant storage, and buildings.

Utilities to support the facilities including import power from the national grid.

Marine facilities for LNG export and bunkering.

It is to be noted that only Trains 1 and 2 are planned to be implemented in the short-term and are part of the current study. However, allocation for possible future expansion is provided. The final plot plan will be decided by ADNOC Gas and included in the final CESMP.

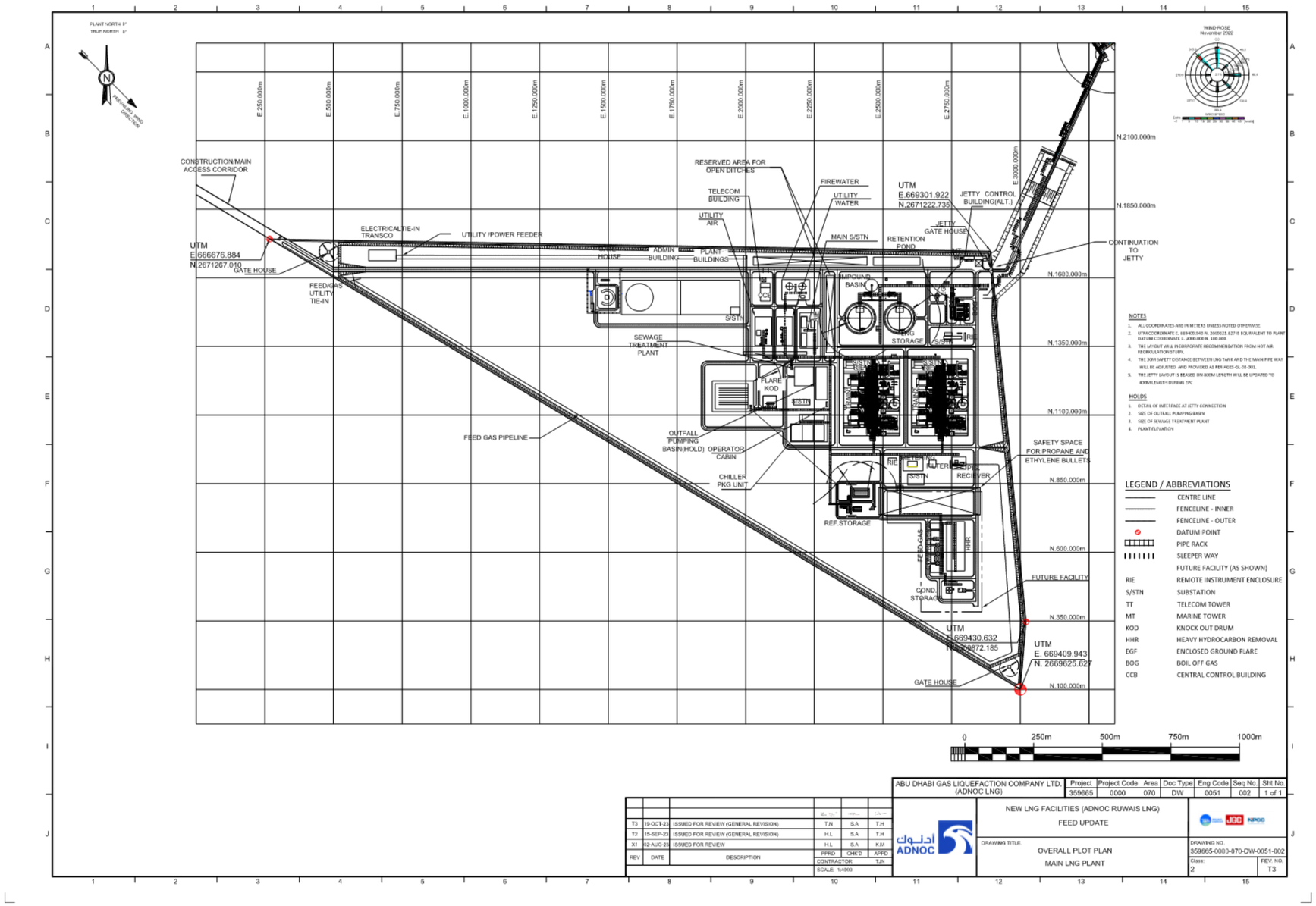


Figure 2-3. Plot Plan

2.3. Exclusion Zones

The RLNG Project is situated in an ADNOC concession area where only industrial activities occur. The nearest protected sensitive environmental feature is the Marawah Marine Protected Area (MPA), a 4,255 km2 UNESCO designated 'Marine Biosphere Reserve'. The MPA comprises a range of unique marine and coastal habitats including sand flats, salt marshes, mangroves, seagrass beds, oyster reefs/beds, and coral reefs. The MPA is located approximately 10 - 15 km north-east of RIC and no impact is anticipated due to Project activities. In addition, a seagrass habitat is located approximately 18 km northeast of the RLNG site development [Ref. 29]. Impacts related to Marine Ecology are further explored in Section 5.9. The jetty will be constructed within a marine buffer allocated for the project including a canal for marine vessels transporting LNG.

There are no archaeological and cultural sites in the near vicinity of the Project Area and no associated impacts are expected. The nearest archaeological and cultural sites identified are listed below:

Fossil sites within Ruwais Industrial Complex (RIC) (potentially containing fossils from the Late Miocene Period).

An archaeological site in the RIC, located 1 km south from the current shoreline.

2.4. Main Construction Activities

The Project's construction phase will comprise onshore and offshore construction activities including the following:

- **Site Preparation and Earthworks (Onshore):**
  Initial onshore activities will involve comprehensive site clearing, grading, and leveling to prepare the foundation for construction. Earthworks will also include excavation, trenching for utility installation, and soil stabilization to support infrastructure development.
- **Foundations and Superstructure Construction (Onshore):**
  Following earthworks, construction will commence on foundational structures for key project elements such as the LNG trains, storage tanks, and utility buildings. This phase will involve extensive concrete pouring, reinforcement installation, and curing processes. Superstructure construction will follow, with steel and concrete frameworks erected to support LNG processing and storage, common facilities, and essential buildings for plant operations.
- **Marine Works for Jetty and Marine Structures (Offshore):** The marine component of construction will involve establishing a jetty and marine structures necessary for LNG export and bunkering activities. Marine works will include site preparation, mobilization of specialized marine construction equipment, and assembly of berthing and mooring structures to accommodate LNG carriers and other vessels.
- **Dredging Activities (covered separately in a dedicated CESMP):** Dredging will be conducted to create and maintain adequate water depths, allowing safe navigation for LNG carriers and other operational vessels accessing the jetty. Dredging activities will be managed under a separate CESMP.
- **Onshore and Marine Piling Activities:** Piling operations will form the structural foundation of both the jetty and the berthing areas, with scope depending on the final berth configuration. Expected piling requirements include:
    - Single Berth Construction: 200 piles driven, over an estimated duration of 8 months.

- Two-Berth Configuration: 400 piles driven, expected over 16 months.
- Four-Berth Expansion: Up to 800 piles over 24 months if ADNOC opts to double the plant's capacity. Final berth numbers will be confirmed during the Engineering, Procurement, and Construction (EPC) stage.

- **Jetty Substructure and Superstructure (Offshore):** Jetty construction will involve driving steel piles into the seabed to support the substructure, with a concrete deck installed above. Precast concrete segments will be fabricated onshore, then transported by tug and barge for installation at the offshore site. Topsides construction will involve crane operations, welding, and pipeline installation. Safety buffer zones will be in place during air testing of pipelines. Typical jetty configurations and components are shown in Figure 2-4 and Figure 2-5.
- **Material Off-Loading Facility (MOLF):** A dedicated Material Off-Loading Facility (MOLF) will be constructed in the northeastern area of the site, streamlining delivery of large equipment and materials necessary for onshore construction. This facility requires no additional land reclamation.

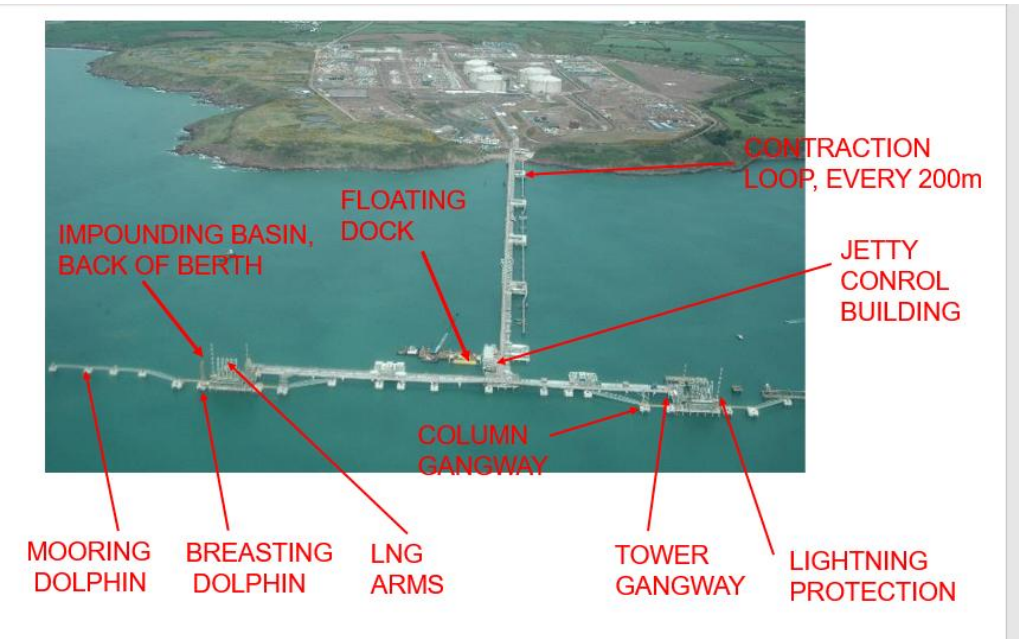
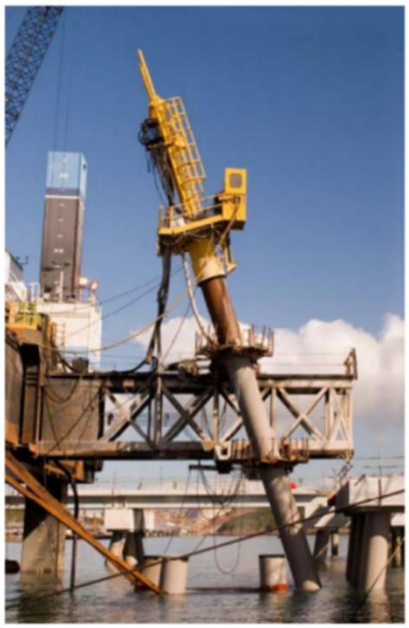


Figure 2-4. Typical Jetty Components



(a) Steel Pile Installation

(b) Pre-cast concrete

(c) In situ concreting

(d) Topside

Figure 2-5. Typical Jetty Components and Construction Activities

2.5. Temporary Facilities / Construction Support Infrastructure

This section, which describes the additional infrastructure and facilities required to support construction activities, will be developed during the EPC stage prior to construction start.

2.5.1. Access Roads

Details any new or existing roads that will be used or constructed for access to the project site.

2.5.2. Laydown Areas

Describes areas designated for the storage of equipment and materials.

2.5.3. Construction Yards

Details the locations and functions of construction yards.

2.5.4. Site Offices

Describes the office facilities to be used during construction.

2.5.5. Other Temporary Facilities

Details any other temporary facilities required during construction.

2.6. Labor Accommodation Camps

2.6.1. Onsite Accommodation

Based on currently available information, no onsite accommodation camps are planned.

2.6.2. Satellite Accommodation

Based on currently available information, a new labor camp will be established near the RLNG site. Additional details will be provided during the EPC stage prior to construction start.

2.7. Raw Material

Raw material types, quantities and sources shall be defined in the EPC phase prior to construction.

2.8. Power

Power during construction will be sourced from the grid and diesel generators. The number and consumption estimates will be provided during the EPC Stage prior to construction.

2.9. Water

Water for construction and domestic purposes (drinking and sanitary) will be provided from onshore potable water sources. Consumption estimates will be provided during the EPC Stage prior to construction.

2.10. Resourcing and Construction Schedule

The project construction is very labor intensive and involves a labor influx of up to 12,000 workers. The overall duration of the construction phase is 4 years. More details shall be provided during the EPC Stage prior to construction.

3. ENVIRONMENTAL AND SOCIAL POLICY

3.1. Purpose and Scope

This Environmental and Social Policy is designed to guide all construction activities under the Ruwais LNG Project, ensuring that those are conducted responsibly and transparently. This policy applies to all project activities, contractors, and stakeholders, aiming to prevent adverse impacts, manage risks, and enhance the positive contributions of the project to the local environment and community.

3.2. Regulatory and Standards Compliance

The Ruwais LNG Project will strictly comply with all relevant UAE federal and emirate-specific environmental, health, and safety (EHS) regulations, including guidelines issued by the UAE Ministry of Climate Change and Environment (MOCCAE). In addition, the project will endeavor to implement international best practices, including:

- International Finance Corporation (IFC) Performance Standards for managing social and environmental risks and impacts.
- Equator Principles for responsible project financing.
- ISO 14001 for environmental management and ISO 45001 for occupational health and safety.

These standards set the framework for a comprehensive and systematic approach to risk management in line with global expectations.

3.3. Environmental and Social Commitments

3.3.1. Environmental Management

To minimize environmental impacts during the construction phase, the project will implement specific protocols aligned with industry best practices:

- Waste Management: Implement waste segregation, reduction, and disposal protocols to minimize landfill use and promote recycling.
- Spill Prevention and Control: Develop a spill prevention and response plan to avoid contaminating local soil and water resources.
- Air Quality and Noise Control: Regularly monitor emissions and noise levels, implementing mitigation measures to ensure compliance with UAE standards and minimize impact on local communities.
- Marine and Biodiversity Protection: Conduct pre-construction surveys (i.e., Marine Environmental Baseline Study, Marine Habitat Map, Marine Habitat and Ecological Survey Study Report, , Biodiversity Management Plan), establish exclusion zones, and monitor marine environments to protect local biodiversity and habitats.

3.3.2. Social Management

The project is committed to respecting and benefiting the local communities impacted by construction activities. Social management strategies include:

- Community Engagement: Communicate with local communities, government bodies, and industry partners.
- Grievance Mechanism: Implement an accessible grievance redress mechanism to address community concerns promptly, fairly, and transparently.
- Cultural Sensitivity and Respect: Conduct all operations with respect for local customs and values, working collaboratively with stakeholders to enhance positive social outcomes.

3.3.3. Worker Welfare

Recognizing the importance of worker health, safety, and welfare, the project will:

- Occupational Health and Safety (OHS): Adhere to ISO 45001 standards and UAE EHS regulations, with regular training, safety protocols, and audits to prevent accidents and occupational hazards.
- Worker Accommodations: Ensure that all worker accommodations comply with international standards and ADNOC standards (i.e., HSE-OH-ST07 - Contractor Welfare Management, HSE-OH-ST06 Food and Water Safety, HSE-GA-ST05-Contractor HSE Management, and ADNOC HSEWM Minimum Requests in Contracts), providing safe, clean, and comfortable living conditions and endeavor to implement IFC worker guidelines
- Health and Well-being: Provide access to mental and physical health support, fair treatment, and protection from discrimination.

3.4. Adaptive Management and Monitoring

To maintain a dynamic and responsive approach, the project will conduct continuous environmental and social monitoring throughout construction. Adaptive management strategies will be used to respond to changing conditions and unforeseen challenges:

- Regular Assessments: Conduct scheduled environmental and social assessments to track impacts, identify areas for improvement, and adjust management measures as needed. maintain transparency and demonstrate accountability to ADNOC Group.

3.5. Roles and Accountability

The project assigns clear roles and responsibilities to ensure that environmental and social commitments are met including:

- Environmental Manager: Responsible for overseeing environmental compliance, monitoring, and reporting.
- Social Manager: Oversees social impact management, community engagement, and grievance redress.
- HSE (Health, Safety, and Environment) Manager and Team: Develop and implement safety protocols, conduct training, and ensure continuous improvement in worker welfare and compliance with ADNOC and UAE safety standards.

3.6. Stakeholder Collaboration

The Ruwais LNG Project is dedicated to promoting collaborative partnerships with all stakeholders. By prioritizing transparent communication, ongoing dialogue, and community involvement, the project aims to build mutual trust and ensure that all project activities align with community values and contribute positively to the region.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT

4.1. Regulatory Framework and Applicable Standards

4.1.1. Relevant UAE Environmental and Social Legislation.

Environmental

Environmental Framework Policies relating to the Project consist of laws, international conventions, and Management Action Plans. The Ministry of Climate Change and Environment (MOCCAE), formerly the Ministry of Environment and Water, is the principal environmental institution within the UAE. The MOCCAE develops environmental laws that are implemented and enforced as a minimum level of environmental due diligence by the various member Emirates.

The main law governing environmental protection in the UAE is the Federal Law No. 24 of 1999 for the "Protection and Development of the Environment", with which all companies/ establishment operating in the UAE have to comply with.

The main objective of this Law is to promote the protection and conservation of the environment across the UAE through:

- Protection and conservation of the quality and natural balance of the environment.
- Control of all forms of pollution and avoidance of any immediate or long-term harmful effects resulting from industrial, economic or agricultural development.
- Development of natural resources and conservation of biological diversity.
- Protection of society, human health and health of other living creatures.
- Protection of human health and the health of other living creatures from environmentally harmful activities.
- Compliance with international and regional conventions ratified or approved by the UAE regarding environmental protection and control of pollution.
- ADNOC and its operating companies, by virtue of Article 94 of Federal Law No. 24 of 1999, have been given the self-regulatory status for O&G Sector, with regard to the following:
    - Issuance of environmental permit or approvals for projects.
    - Implementation and submission of environmental monitoring reports.
    - Inspection (sampling) to verify compliance of liquid waste discharges.
    - Handling and treatment of hazardous wastes.

Therefore, the Project will obtain approval or secure environmental permits from the ADNOC for its activities and not from the EAD, the competent authority for Abu Dhabi Emirate for non-O&G Sector. Activities and operations located outside the ADNOC concession areas or within or near protected areas requires EAD approval, which is not the case of this project.

Irrespective of ADNOC or EAD requirements, the Company is not exempted from the following provisions of Federal Law No. 24:

- Ensuring that emission of air pollutants from its operation and other activities do not exceed the acceptable permissible limits.
- Prohibition on discharging untreated substances, wastes or liquids which may directly or indirectly cause pollution to the water environment.
- Prohibition on damaging or disturbing the natural properties or polluting the soil in any way that may affect its productivity.
- Prohibition on damaging flora, which can cause desertification or deformation of natural environment.

In addition to the Federal Law No. 24 of 1999 for the Protection and Development of the Environment, the Local Law No. 8 of 1978 Conservation of Petroleum Resources set out the high-level expectations of environmental protection from operating entities. Local Law No. 8 (Article 3) requires entities to "take all necessary measures to prevent damage or hazard, as a result of its operations, to the life or health of individuals, properties, natural resources, cemeteries, or archaeological, religious or tourist places. Article 56 of this law compels entities to take necessary precautions to prevent pollution of the air, underground and surface waters, territorial waters, and waters of continental shelf, shores and all islands within the territorial waters and the continental shelf.

Social

In terms of Health and Safety, the Federal Law No. 8 of 1980 concerning Regulation of Working Relations is a comprehensive law that regulates all aspects of labor relations between employers and employees. Federal Law No. 8 of 1980 has been amended by the following laws: Federal Law No. 8 of 2007, Federal Law No. 14 of 1999, Federal Law No. 12 of 1986, Federal Law No. 15 of 1985 and Federal Law No. 24 of 1981. Other Health & Safety related legislations are listed below:

- Ministerial Order No. 32 of 1982 Specifying Preventive Methods and Measures for Protecting Workers against Work Hazards.
- Federal Law No. 27 of 1981 Concerning Prevention from Communicable Diseases and its UAE Cabinet Decision No. 28 of 2010 on the Medical Examination System of the Persons coming to the UAE for Work or Residence.
- Federal Law No. 27 of 1981 Concerning Prevention from Communicable Diseases and its UAE Cabinet Resolution No. 7 of 2008 on the Medical Examination System of the Persons coming to the UAE for Work or Residence.
- Ministerial Resolution No. 443 of 2010 concerning the Working Hours during Summer.
- Ministerial Decision No. 37/2 of 1982 on the Medical Care which the Employer is Obliged to Provide to his Workers.

- Cabinet Resolution No. 13 of 2009 Approving the General Standards Manual of the Labor Collective Accommodation and Attached Services.
- Federal Law No. 3 Concerning Civil Defense and its amendments.
- Federal Law No. 1 of 1992.
- Federal Law No. 1 of 1995.
- Ministerial Resolution No. 154 of 1991 Concerning the Provisions of Fire Prevention in Public and Private Premises.
- Federal Law No. 21 of 2005 Concerning Traffic Law.
- Abu Dhabi Emirate Law No. 23 of 2005 and the Executive Regulations Regarding the Health Insurance Scheme for the Emirate of Abu Dhabi.
- Law No. 1 of 2006 concerning Civil Service and its Executive Order (issued in October 2007) relating to the civil service Law.
- Industrial Safety and Health Regulations - Part 3: Occupational Health and Environmental Control (Emirates Standardization and Metrology Authority).

Table 4-1 and Table 4-2 present lists of key legislation within the UAE legislative framework that are relevant to the project, covering areas such as environmental protection, solid waste and wastewater management, and social risk management, respectively.

Table 4-1. Main Laws Related to Environmental Protection in UAE

Year	Law/ Decree	Relevant Provisions	Relevance to the Project
2018	Federal Law No. 12	Integrated Waste Management.	--
2009	Federal Law No. 6	Peaceful Uses of Nuclear Energy.	Addresses the control of the use of Radioactive sources and protection against its hazards.
2009	Federal Law No. 7	Environmental affairs of UAE in general.	--
2008	Local Law No. 28	Establishment of Center for Waste Management (CWM).	• Established CWM to control and coordinate waste management activities throughout the Abu Dhabi Emirate with following objectives: • Establish systems to deal with all aspects of waste management to avoid or minimise pollution and health risks. • To be the focal point for coordinating all waste management practices within the Emirate. • To establish an electronic market for all types of recoverable wastes to facilitate trade and re-use. • To work with construction and industry sectors to establish specifications for re-use of secondary materials arising from waste treatment processes.
2005	Local Law No. 17	Establishment of the Abu Dhabi Authority for Culture and Heritage (ADACH), now Abu Dhabi Tourism and Culture Authority (ADTCA)	--

Year	Law/ Decree	Relevant Provisions	Relevance to the Project
2006	Council of Ministers' Decision No. 12	Regulation on Protection of Air from Pollution	Sets the requirements and limits for emissions from industries and all associated equipment and processes. Also sets the acceptable ambient limits for air and noise quality.
2005	Local Law No. 21	Waste Management in Abu Dhabi Emirate	Sets the requirements for handling all types of waste by parties generating waste and / or operating in the field of collection, transport, and storage, recycling processing and disposal of wastes.
2003	Ministerial Decree No. 50	Basic Regulating Rules for Ionizing Radiation Protection.	Sets the framework for protection against ionizing radiation.
2002	Federal Law No. 11	Regulation and Control of International Trade in Endangered Species of Wild Flora and Fauna.	--
2002	Regulation for Handling Hazardous Material, Hazardous work and Medical waste		Handling and management of hazardous materials, activities and medical wastes.
2001	Council of Ministers' Decision No. 37	Regulation concerning Environmental Impact Assessment of Projects	--
2001	Council of Ministers' Decision No. 37	Regulation on Handling Hazardous Materials, Hazardous Wastes and Medical Wastes.	Sets the requirements for import, transport, handling, and storage of hazardous substances as well as for generation of hazardous wastes and their management and disposal (Articles 5-14).

Year	Law/ Decree	Relevant Provisions	Relevance to the Project
2001	Council of Ministers' Decision No. 37	Regulation on Protection of Marine Environment.	Sets laws and regulations for marine transportation, as well as oil/gas platforms activities to protect the marine environment in terms of discharge-prohibited materials, and limits of allowed discharges.
2001	Council of Ministers Decree No. 23	Protection of ports, shore, and maritime territory from oil pollution incidents.	--
2000	The Water Quality Regulations		Provide water quality standards.
1999	Federal Law No. 24 and its Executive Orders	Protection and Development of the Environment.	This law aims at the protection and conservation of the quality and natural balance of the environment. Requirements applicable to the Project operations include: • Pollution from land sources (Articles 35-38) • Protection of drinking water and underground water (Article 39-41) • Soil protection (Article 42-47) • Air pollution (Article 48-57) • Handling of hazardous substances and wastes and medical wastes (Article 58-62) • Liability and compensation for Environmental damages (Article 71-90).

Year	Law/ Decree	Relevant Provisions	Relevance to the Project
1999	Federal Law No. 23	Exploitation, Protection and Development of Living Aquatic Resources in UAE	Key regulations pursuant to Article 62: • The Trade Effluent Control Regulations June 2010 • The Recycled Water and Bio-solids Regulations June 2010 • The Water Supply Regulations • Fuel Storage Tank Regulations 2009.
1998	Local Law No. 2, as amended	Regulation of the Water and Electricity Sector in the Emirate of Abu Dhabi	Key regulations pursuant to Article 62: • The Trade Effluent Control Regulations June 2010 • The Recycled Water and Bio-solids Regulations June 2010 • The Water Supply Regulations • Fuel Storage Tank Regulations 2009.
1993	Federal Law No. 19	Concerning the Delimitation of Maritime Zones in UAE.	--
1978	Abu Dhabi Emirate Law No.8	Conservation of Petroleum Resources	--

Table 4-2. Main Laws Related to Social Protection in UAE

Year	Law/ Decree	Relevant Provisions	Relevance to the Project
2021	Federal Decree-Law No. 33	Employment Relationship	This law regulates the relationship between the employer and the employees and aims at positive engagements to avoid/minimise work disruptions caused by protests or worker dissatisfaction.
2021	Federal Decree-Law No. 47	Unified General Rules of Labor in the United Arab Emirates	This law has come into force as of February 2, 2022. The law repeals the Federal Law No.8 of 1980 (UAE Labor Code). The law sets and unifies the general rules of labor in the UAE. The law adopts the principles of equality and non-discrimination at the workplace and draws up general employment conditions in the UAE.
2006	Federal Law No. 29	Rights of People of Determination as amended	This law states the right of people with disabilities for social welfare, education, work, and other services.
2012	Federal Decree No. 73	State's accession to the Convention against torture and other cruel, inhuman, or degrading treatment or punishment of 1984	This decree ratifies the Convention against torture and other cruel, inhuman, or degrading treatment or punishment, especially by those in higher positions and high societal status.
2006	Federal Law No. 51	Combating Human Trafficking Crime as amended	This law provides the legal framework for handling human trafficking cases.
2006	Council of Ministers' Decision No. 12	Regulation on Protection of Air from Pollution	Sets the requirements and limits for emissions from industries and all associated equipment and processes. Also sets the acceptable ambient limits for air and noise quality which generate a nuisance to social receptors.
2005	Federal Law No. 21	Traffic Law	Reflects the relevant provisions involving the use of road vehicles on the public road network.

Year	Law/ Decree	Relevant Provisions	Relevance to the Project
2004	Decree No. 38	State's accession to the Convention on the Elimination of all Forms of Discrimination Against Women	This decree ratifies the Convention on the Elimination of all Forms of Discrimination Against Women including the workplace.
1999	Federal Law No. 24	Protection and Development of the Environment	This law aims at the protection and conservation of the quality and natural balance of the environment. Requirements applicable to the Project operations include: • Pollution from land sources (Articles 35-38) • Protection of drinking water and underground water (Article 39-41) • Soil protection (Article 42-47) • Air pollution (Article 48-57) • Handling of hazardous substances and wastes and medical wastes (Article 58-62) • Liability and compensation for Environmental damages (Article 71-90).
1985	Federal Law No. 5	UAE Civil Code as amended	This law draws up the civil rights of nationals and foreigners in the UAE. Key clauses relevant to the Project are: • Ownership of assets and other in-kind rights are governed by the local legislation (Article 18) • State-specific regulations govern contacts and agreements between different parties (Articles 19 and 20)) • The law of the UAE applies to all people, including those who are stateless and those who hold multiple nationalities (Article 24)

Year	Law/ Decree	Relevant Provisions	Relevance to the Project
			• Different kind of rights and means to prove the person's right (Articles 107-112) • Framework for the sale of vacant space and lands (Articles 580 and 581).

4.1.2. ADNOC Standards and Guidelines.

ADNOC serves as the regulatory authority for Health, Safety, and Environment (HSE) and Social Protection in the Oil and Gas (O&G) sector in Abu Dhabi, managing compliance within its concession areas. ADNOC has established a series of standards covering various HSE and social aspects relevant to the industry. These standards fulfill the requirements of Article 94 of Federal Law No. 24, forming the framework for ADNOC's self-regulatory system, in which ADNOC acts as both a regulator and operator.

For environmental compliance, ADNOC standards outline mandatory requirements that all ADNOC group companies must follow, detailing procedures for HSE management across operations.

In terms of social protection, ADNOC's Social Risk Management (SRM) Standard provides guidelines for identifying, assessing, and mitigating social impacts. This includes procedures for impact assessments, social engagement plans, and mitigation measures that all ADNOC group companies and contractors must implement.

Relevant ADNOC environmental and social standards for this CESMP are listed in Table 4-3.

Together, these standards ensure that ADNOC's activities align with both environmental protection and social responsibility within its operational areas.

Table 4-3. ADNOC Standards Relevant to the CESMP Study

ADNOC Standards	Title
HSE-RM-ST01	HSE Risk Management System
HSE-RM-ST02	HSE Impact Assessment (HSEIA)
HSE-RM-ST03	HAZID ENVID OHID
HSE-EN-ST01	Environment Impact Assessment
HSE-EN-ST02	Pollution Prevention and Control
HSE-EN-ST03	Energy Management System
HSE-EN-ST04	Waste Management
HSE-EN-ST05	Environmental Performance Monitoring
HSE-EN-ST06	Biodiversity Assessment
HSE-EN-ST07	Air Dispersion Modelling Techniques
HSE-GA-ST02	HSEMS Standard
HSE-GA-ST04	ADNOC incident Notification, Investigation & Reporting Standard

ADNOC Standards	Title
HSE-GA-ST06	Project HSE Plan and Standard
HSE-GA-ST07	HSE Design Philosophy
HSE-GA-ST08	HSE Performance Monitoring and Reporting
HSE-GA-ST09	HSE Audit and Assurance
HSE-GA-ST10	Social Risk Management
EOH-GID-010	BAT in GHG Management of Projects
HSE-CE-ST02	Oil Spill Response
HSE-OA-ST08	Hazardous Substances
HSE-OH-ST08	Physical Health Hazard Standard
HSE-OH-ST09	Chemical Hazards Standard
HSE-OH-ST10	Biological Hazards Standard
HSE-OH-ST12	Indoor Air Quality Standard
HSE-OS-ST24	Marine Operations Safety
HSE-OS-ST27	Hazards Communication Standard

4.1.3. Equator Principles IV requirements.

The Equator Principles IV (EP IV) provide essential guidance for managing environmental and social risks in project financing, reinforcing the project's commitment to sustainable development and responsible investment.

Under EP IV, a thorough Environmental and Social Impact Assessment (ESIA) is essential to identify and address potential project impacts. For the RLNG Project, this entails a detailed evaluation of potential effects on local ecosystems, air and water quality, and community health and safety. Given the unique environmental features of Abu Dhabi, special attention will be paid to preserving biodiversity, protecting marine habitats, and safeguarding desert ecosystems.

EP IV also emphasizes the importance of continuous stakeholder engagement, ensuring that community voices and concerns are genuinely considered throughout the project lifecycle. To support this, the project has developed a comprehensive stakeholder engagement plan, promoting open communication and collaboration with local communities, key stakeholders, and government agencies.

In line with EP IV, the project will implement targeted management plans to monitor and mitigate environmental impacts, including waste management, emissions control, and resource conservation. These efforts demonstrate the project's commitment to responsible resource use, minimizing greenhouse gas emissions, and protecting biodiversity.

By integrating the Equator Principles IV into the project framework, the RLNG Project aims to uphold high standards of environmental and social responsibility, delivering an LNG project that respects both local and global best practices. This approach reflects the project's dedication to supporting a resilient, sustainable future for the communities and ecosystems involved in the RLNG Project.

4.1.4. International Conventions and Best Practices.

Refer to the 'Regulatory Framework and Standards' subsection under Section 5 Environmental Management Plans, for a list of specific international conventions applicable to each environmental category.

The following list includes some key international conventions and best practices for environmental and social management.

- IFC Performance Standards (2006):
- ISO 14001 (Environmental Management) (first published in 1996, revised in 2015):
- ISO 45001 (Occupational Health and Safety) (published in 2018):
- United Nations Framework Convention on Climate Change (UNFCCC) (1992):
- Convention on Biological Diversity (CBD) (1992):
- International Labor Organization (ILO) Conventions (various dates, notably the Declaration on Fundamental Principles and Rights at Work in 1998):
- Stockholm Convention on Persistent Organic Pollutants (POPs) (2001):
- Minamata Convention on Mercury (2013):
- United Nations Sustainable Development Goals (SDGs) (adopted in 2015):
- World Bank Environmental and Social Framework (2017):

4.1.5. Environmental Permits

A list of all relevant environmental permits and licenses required for construction shall be provided during the EPC stage.

4.2. Environmental and Social Aspects and Impacts

4.2.1. Environmental Impact Assessment Summary of Impacts

Several impacts during construction were identified as possibly significant and assessed in the EIA, These include:

- Disturbance of sensitive marine ecology for the construction of the jetty and dredging (assessed in a separate EIA for dredging activities) of the navigation channel; EPC Contractor should develop a detailed marine habitat map for the area affected by dredging and jetty construction activities and develop a habitat restoration plan

as part of a Biodiversity Action Plan in line with HSE-EN-ST06 [Ref 9], as needed to compensate for impacts to these habitats., as needed to compensate for impacts to these habitats.

- Underwater noise is likely to result following piling activities. This may disturb marine fauna and eventually have social consequences due to reduced sightings of dugongs and other marine mammals targeted by tourists visiting Sir Banyas island as well as possible impacts to fisheries sector.
- The generation of noise during onshore and offshore piling works (expected to last 6 to 9 months) leading to possible impacts to sensitive receptors health and a deterioration in their wellbeing.
- Note: There are no impacts to land-based livelihoods or fishing livelihoods expected though there is a slight likelihood that underwater noise could disturb fisheries activities in the region. The area within the Project site is not accessible to the public and is not being used for any purpose (such as the cultivation of crops for example), and fishing activities are prohibited along the coastline which is patrolled regularly by the Coastguard. There is also no impact on structures (private property) due to vibration-induced damage, as the nearest structures subject to vibration are outside the impact zone for structural damage thresholds.

Social Impact Assessment Summary of Impacts

Several impacts during construction were identified as possibly significant and assessed in the Social Impact Assessment (SIA). These include:

- The possible generation of road traffic congestion along the main road used to access the Project site from the use of busses to transport the workforce to/from their labor accommodation camp, leading to congestion and delays to other road users (including those from Dhafra beach club, ADNOC Beach Club, VIP residences, other labor workers, and entrance to the Sir Bani Yas ferry station). The peak construction workforce is expected to be up to 12,000 personnel, none of whom will be living at the Project site itself. EPC Contractor should prepare a Construction Traffic Impact Assessment including a traffic management plan to address this impact.
- Increased community health and safety risks arising from additional vehicles on the public road, transporting construction materials and personnel, leading to a possible increase in the number of accidents involving pedestrians and other road users.
- The potential for the Contractor and Sub-contractors not complying with ADNOC's workers welfare standards, leading to the deterioration of the Labor wellbeing and health due to exposure to poor working conditions and accommodation standards.
- An increase in navigational risk to other users of the sea arising from the use of a maritime exclusion zone and construction vessels, leading to an increased risk of vessel collisions and the associated economic loss and human health impacts.
- The potential for the migrant workforce to behave in an inappropriate and disrespectful manner amongst local communities in the vicinity of their labor accommodation camps in Ghayathi.

- During the SIA, stakeholder engagement activities will also be undertaken to inform the SIA, where this is relevant to do so. During all engagements, efforts shall be made to raise awareness of the RLNG Community Feedback Mechanism so that stakeholders can raise a concern, or request additional information about the Project, should they wish to do so.

4.2.2. ENVID Study

In line with ADNOC standards, an ENVID workshop was also conducted to determine the environmental impact after considering the design and administrative control measures and monitoring measures.

The findings in terms of High, High-Medium, Medium, and Low impacts are presented in Table 4-4. A list of ENVID recommendations and current status is provided in Table 4-4. Some actions originally assigned to HSEIA consultant or COMPANY have been transferred to EPC contractor since required information is not available during FEED re-validation or because the COMPANY has decided to transfer actions to EPC (such as construction transportation study and ground flare illumination study).

Table 4-4. Summary of Planned and Unplanned Environmental Impacts

Subsystem	Number of Identified Consequences	Planned Environmental Impacts				Unplanned Environmental Impacts			
		H	H-M	M	L	H	H-M	M	L
System: 1. FEED stage - ADNOC Ruwais LNG Plant - Operation & Maintenance activities	38	0	1	18	1	0	2	6	10
Source: FEED PHA (HAZID/ ENVID/ OHID) Workshop Report.									

As part of the EPC Scope the EIA and all associated studies will be updated to reflect construction activities to reflect CESMP and Waste Management.

4.2.3. EIA Action Plan

Table 4-5 presents the Action Plan for the RLNG Project. This action plan enlists the actions that are necessary in order to properly implement the environmental measures identified in this EIA Report. This plan should be transferred into an Action Tracking Register in order to ensure implementation by relevant parties.

This FEED phase EIA study shall be updated during EPC phase to incorporate latest design details available at that time and while considering the below listed recommendations.

Table 4-5. EIA and SIA Recommendations and Action Plan

Rec No.	Action	Responsibility
New Recommendations for RLNG Revalidation Scope		
1	Close all pending ENVID recommendations	COMPANY/EPC CONTRACTOR
2	Consider the possibility of utilizing flare gas in adjacent facilities rather than burning.	COMPANY
3	Include the Sewage Treatment Plant in the EPC Phase EIA including air dispersion study and effluent discharge study	EPC CONTRACTOR
4	Conduct a Transportation Traffic Impact Assessment Study as part of EPC	EPC CONTRACTOR
5	Air dispersion and noise studies to be updated to consider the use of diesel generations during the commissioning phase	EPC CONTRACTOR
6	Update Noise Study during EPC with vendor data	EPC CONTRACTOR
7	Update impacts from construction stage during EPC based on more detailed construction methods and information	EPC CONTRACTOR
8	Develop hydrotesting procedure in EPC and update mitigation measures accordingly	EPC CONTRACTOR
9	Assess impacts anticipated with the Jetty construction works and dredging during EPC considering critical and sensitive habitats present in the area. Habitat Restoration plan to be prepared based on impacts as part of a Biodiversity Action Plan in line with HSE-EN-ST06.	EPC CONTRACTOR
10	Quantities for the identified waste streams for the Project construction and operations should be included in the EPC phase EIA Report.	EPC CONTRACTOR
11	Conduct an illumination study for the groundflare during EPC	EPC CONTRACTOR
12	Update SBS and SIA study during EPC and implement the External Stakeholder Engagement Plan (ESEP)	EPC CONTRACTOR

Rec No.	Action	Responsibility
13	Develop a Construction Social Management Plan during EPC	EPC CONTRACTOR
14	Develop an Operations Social Management Plan before start of operations	COMPANY
15	Construction Waste Management Plan to be prepared during EPC	EPC CONTRACTOR
16	EPC Contractor to conduct EIA study for the dredging activities and obtain NOC from EAD	EPC CONTRACTOR

As part of the EPC Scope the EIA and all associated studies will be updated to reflect construction activities to reflect CESMP and Waste Management.

4.2.4. CESMP

The EPC Contractor shall complete all pre-construction actions and studies in accordance with the EIA, ENVID, and Action Plan findings described above. Subsequently, the EPC contractor shall consolidate an up-to-date list of aspects and impacts that will be ranked in terms of risk significance in accordance with ADNOC Standards (e.g., HSE-RM-ST01 – HSE Risk Management). Competent staff such as an EHS Officer, Engineer, Specialist Subcontractor or trained and experienced personnel as well as a social expert shall be responsible for carrying out risk assessment.

Risk assessment allows the EPC Contractor to prioritize the relative risks of its activities and determine the significance of each EHS and Social impact for each of the EHS and Social aspects identified.

In addition, before any construction phase or unplanned construction activity is carried out and also on a quarterly basis during construction, reassessment is required to identify new environmental and social aspects and associated impacts, from a life cycle perspective. When determining environmental and social aspects, the EPC Contractor shall consider:

1. Change, including planned or new developments, and new or modified activities.
2. Abnormal conditions and reasonably foreseeable emergency.

The EPC Contractor shall maintain documented information of its:

- Environmental and social aspects and their associated impacts;
- Criteria used to determine its significant environmental and social aspects; and
- Significant environmental and social aspects.

The methodology for risk assessment and control should be aligned with ADNOC Standards (e.g., HSE-RM-ST01 – HSE Risk Management).

The EPC Contractor shall communicate its significant environmental and social aspects internally and externally, as appropriate in accordance with the Communication and Consultation Procedure (see Section 4.4.3).

At present (November 2024), and based on the ENVID Study, the identified Aspects and Impacts are provided in Table 4-6.

Table 4-6
RNLG Environmental and Social Aspects and Impacts

Aspect	Potential Impact	Mitigation / Management Measures	Responsibility	Timeline
Air Quality				
Air Emissions from Construction Equipment and Vehicles	Increased emissions impacting air quality and potentially affecting community health	Implement routine maintenance for equipment and vehicles; monitor air quality to meet UAE and ADNOC standards; consider low-emission machinery	Environmental Specialist	During Construction
Greenhouse Gas (GHG) Emissions	Contribution to climate change from GHG emissions during construction	Incorporate emissions control technology; develop GHG management plan aligned with international standards; explore options to utilize flare gas	Environmental Manager	Detailed Design Stage
Noise and Vibrations				
Noise from Piling, Onshore, and Offshore Activities	Health impacts on nearby communities and sensitive receptors	Schedule high-noise activities for daytime hours; conduct regular noise monitoring; use noise barriers where feasible	Environmental Specialist	During Construction
Occupational Noise Exposure	Health risks to workers from prolonged exposure to construction noise	Provide hearing protection (PPE) and implement noise control measures; schedule periodic health assessments for workers	HSE Team	During Construction
Traffic and Transportation				
Road Traffic Congestion	Increased congestion, affecting local road users' well-being and safety	Conduct a Construction Traffic Impact Assessment; implement a traffic management plan with routing, scheduling, and alternative transport methods	Traffic Manager / HSE Manager	Detailed Design Stage
Community Health and Safety from Increased Traffic	Higher risk of accidents involving pedestrians and road users	Train drivers on safe practices; limit vehicle speeds near populated areas; designate safe pedestrian crossings near construction zones	Traffic Manager / HSE Manager	Detailed Design Stage and During construction
Health and Safety				
Exposure to Occupational Health and Safety (OHS) Risks	Potential health impacts on migrant workforce due to working conditions	Enforce ADNOC Worker Welfare Standards; provide safe accommodations and monitor adherence to standards for OHS practices	HSE Manager	During Construction
Worker Stress and Fatigue from Long Commutes	Increased stress and health risks due to extended travel times	Schedule staggered transport shifts to reduce commute times; provide on-site resting areas and monitor worker health	Social Manager	During Construction
Public Safety from Construction Activities	Risks to public safety from project-related construction near public access areas	Establish secure fencing around high-risk areas; post clear signage; implement incident response protocols for public areas	HSE Team	During Construction
Waste Management				

General Waste from Construction Activities	Risk of environmental contamination from improper waste disposal	Develop a Waste Management Plan aligned with ADNOC and international guidelines; conduct regular waste audits to ensure compliance	Environmental Manager and Specialists	Detailed Design Stage and During construction
Hazardous Waste	Potential environmental and health risks from hazardous waste materials	Establish dedicated hazardous waste storage areas; ensure safe transport and disposal methods; provide training on hazardous waste handling	Environmental Manager and HSE Manager	During Construction
Water and Wastewater Management				
Effluent and Wastewater Discharge	Potential contamination of nearby water bodies	Conduct regular effluent quality monitoring; ensure wastewater treatment systems comply with ADNOC standards; implement spill prevention measures	Environmental Specialist	During Construction
Stormwater Runoff	Contamination risk to surrounding areas from untreated runoff	Develop and implement a stormwater management plan, including sediment control and spill containment	Environmental Manager	Detailed Design Stage
Lighting and Visual Impact				
Artificial Lighting from Jetty and Construction Sites	Disturbance to local wildlife and nearby communities due to increased lighting	Conduct an illumination study to minimize impact; use directional lighting and shielding to reduce light spillover in sensitive areas	Environmental Manager	Detailed Design Stage
Biodiversity and Habitat Conservation				
Marine Habitat Disturbance from Construction Activities (excluding canal dredging)	Disturbance to sensitive marine habitats, affecting biodiversity and local species populations	Develop a comprehensive marine habitat map; establish exclusion zones to protect marine life; implement a Biodiversity Action Plan aligned with ADNOC standards	Environmental Manager	Detailed Design Stage and During construction
Social and Cultural Impacts				
Inappropriate Worker Behavior in Local Communities	Potential strain on community relations and local customs	Conduct cultural sensitivity training for the workforce; establish a code of conduct and enforce disciplinary measures for non-compliance	Social Manager	Detailed Design Stage and During construction
Community Engagement and Feedback Mechanism	Need for transparent communication with communities about project impacts	Implement an External Stakeholder Engagement Plan; raise awareness of ADNOC's Community Feedback Mechanism; provide accessible channels for inquiries	Social Manager	Detailed Design Stage and During construction
Cultural Heritage Protection				
Potential Impact on Archaeological Sites	Low risk of disturbance to cultural heritage during construction	Obtain an NOC from the Department of Culture and Tourism (DCT); ensure construction teams follow procedures for the preservation of cultural heritage sites	Environmental Manager	Detailed Design Stage

4.3. Environmental and Social Objectives and Targets

The EHS and Social Objectives and Targets relate to the identified Environmental and Social aspects, which were determined to have significant EHS and Social impacts (See Section 4.2). The following objectives and targets are specified at present and shall be updated following the update of Environmental and Social Aspects and Impacts:

4.3.1. General Compliance

- Objective: Ensure Contractor's full compliance with ADNOC's EHSMS, UAE federal laws, Abu Dhabi regulatory standards, and endeavor to meet EP IV guidelines during construction.
- Target:
    - Conduct regular audits and inspections and implement ADNOC's prequalification requirement for the subcontractors.

4.3.2. Environmental Aspects

a. Consumption of Energy

- Objective: Minimize energy consumption and emissions during construction in line with GHG Assessment.
- Target:
    - Conduct energy audits every quarter, with an attempt to minimize fuel consumption for machinery through efficiency measures.

b. Generation of Traffic and Fuel Consumption

- Objective: Reduce the impact of construction-related traffic on the local environment and communities.
- Target:
    - Implement a traffic management plan that aims at least 90% compliance with designated routes and no traffic violations.

c. Waste Management

- Objective: Promote the reduction, reuse, and recycling of construction waste.
- Target:
    - Follow-up waste hierarchy rate with priority to waste avoidance, reduction and recycling.
    - Ensure that hazardous waste is tracked and disposed of according to local and international regulations.

d. Air Quality

- Objective: Control and reduce air pollution from construction activities.
- Target:
  - Conduct weekly monitoring of dust levels and ensure that dust control measures (e.g., water spraying) are applied in all relevant work areas.
  - Monitor compliance with vehicle emissions standards for construction equipment.

e. Marine Ecology

- Objective: Protect marine biodiversity during coastal construction.
- Target:
  - Install silt curtains and sediment control measures in all of marine construction zones.
  - Monitor and report water quality impacts monthly with a goal of zero significant adverse effects on marine habitats.

f. Noise and Vibrations

- Objective: Minimize noise and vibration impacts on local communities and wildlife.
- Target:
  - Noise levels should remain within permissible limits (as per EAD guidelines) at 95% of the time.

4.3.3. Health and Safety Aspects

a. Fire Hazards

- Objective: Prevent fire hazards and ensure rapid response capabilities.
- Target:
  - Equip 100% of construction areas with fire safety equipment and conduct monthly fire drills.
  - Target zero fire incidents throughout the construction phase.

b. Traffic Management (Construction & Marine)

- Objective: Prevent traffic-related accidents involving construction vehicles and marine vessels.
- Target:
  - No major traffic incidents involving construction vehicles.
  - Implement a traffic management plan to separate routes for construction traffic and worker movement.

c. Working at Height, Scaffolds, and Lifting Operations

- Objective: Ensure safety during high-risk construction activities.
- Target:
  - Zero incidents related to working at height through strict adherence to safety protocols and regular equipment inspections.
  - Provide working-at-height safety training for 100% of relevant workers.

4.3.4. Social Aspects

a. Community Engagement and Grievance Mechanism

- Objective: Maintain open communication with local communities and address their concerns.
- Target:
  - Implement grievance mechanism.
  - Hold community engagement meetings, as necessary.

b. Employment and Labor Conditions

- Objective: Aim that all workers in general and migrant workers in particular are employed under fair labor practices, in full compliance with UAE labor laws and endeavor to meet Equator Principles IV's standards for worker rights, safety, and well-being.
- Target:
  - Aim that all migrant workers are hired in compliance with UAE labor laws, including fair contracts, proper wages, and access to benefits such as health insurance and paid leave.
  - Conduct audits to ensure that all contractors and subcontractors meet ADNOC's standards for labor conditions, including working hours, overtime compensation, and access to adequate rest periods.
  - Provide decent accommodation that meets international standards (IFC and EBRD Guidelines on Workers Accommodation), ensuring that workers have access to safe, sanitary, and comfortable living conditions.
  - Establish worker grievance mechanisms and secure resolution of grievances giving migrant workers a transparent platform to address concerns.
  - Offer capacity-building programs aimed at upskilling migrant workers, enhancing their safety awareness and potential employability in the future.

c. Public Health and Safety

- Objective: Protect local communities from construction-related health risks.
- **Target:**
  - Conduct regular air and noise monitoring
  - Maintain 100% compliance with EAD's health and safety standards for community protection.

4.4. Implementation

4.4.1. Management Organizational Structure

This section outlines the key responsibilities of the principal organizational stakeholders involved in managing and implementing the environmental, social, and compliance standards during the construction phase of the LNG project in Ruwais, Abu Dhabi. The stakeholders include ADNOC (the project owner), the EPC Contractor, Subcontractors, and International Lenders under the framework of the Equator Principles IV (EP IV).

The EPC Contractor is responsible for implementing the CESMP and managing subcontractors, while Subcontractors must adhere to the CESMP under the EPC contractor's supervision. ADNOC as the competent environmental authority also oversees regulatory compliance within the project area..

1. Environment Agency - Abu Dhabi (EAD)

The Environment Agency - Abu Dhabi (EAD) has no direct role in this project given that the project is within an ADNOC concession area and does not cross protected areas.

2. Project Owner

The Project Owner, holds ultimate responsibility for ensuring that the LNG project complies with both local and international environmental and social standards. Key responsibilities include:

- **Overall Project Accountability:** ensuring that the project complies with all environmental, social, and health & safety standards outlined in the CESMP and endeavors to meet the Equator Principles IV.
- **Approval of CESMP:** Review and approve the Construction Environmental and Social Management Plan (CESMP), ensuring it aligns with ADNOC's internal standards, UAE environmental regulations, and endeavor implementation of international lender requirements.
- **Regulatory Compliance:** The project owner holds environmental approval responsibilities and will ensure that all necessary permits and authorizations are obtained in compliance with UAE environmental regulations. The project owner will also coordinate with the Environmental Authority in Abu Dhabi.
- **Resource Provision:** Ensure that the EPC contractor and subcontractors have adequate resources (financial, technical, and human) to implement environmental and social measures in compliance with CESMP and endeavor to meet EP IV requirements.

- **Stakeholder Engagement:** Ensure ongoing engagement with all stakeholders, including local communities, regulatory authorities, to maintain transparency and address any concerns related to the project's environmental and social impacts.
- **Monitoring and Reporting:** Regularly review the environmental and social performance of the EPC contractor and subcontractors. Project Owner will oversee audits, performance assessments, and the reporting of key compliance indicators.

3. EPC Contractor

The EPC (Engineering, Procurement, and Construction) Contractor is responsible for the direct implementation of the CESMP during the construction phase. The EPC contractor's responsibilities include:

CESMP Implementation: Implement all environmental and social management measures as specified in the CESMP and ensure compliance with ADNOC's standards, UAE and Abu Dhabi regulations, and endeavor to meet international lenders' requirements (EP IV).

Subcontractor Management: Ensure that all subcontractors comply with the CESMP and relevant environmental and social standards. This includes conducting audits, monitoring performance, and ensuring corrective actions are implemented when necessary.

Risk and Impact Management: Identify environmental and social risks associated with construction activities and take appropriate mitigation measures in collaboration with environmental and social specialists. The EPC contractor will also conduct regular risk assessments.

Compliance Reporting: Regularly report to Project Owner on environmental and social compliance, including key performance indicators (KPIs), incidents, and non-compliance events.

Coordination with Regulatory Authorities: Liaise with Project Owner regarding Abu Dhabi Environmental Authority (or ADNOC's internal environmental approval team) for permits and approvals, ensuring that all construction activities meet legal requirements.

Training and Capacity Building: Ensure that personnel involved in the project, including those from subcontractors, are adequately trained in environmental and social compliance, health and safety procedures, and grievance mechanisms.

4. Subcontractors

Subcontractors play a critical role in executing specific construction activities and are accountable for ensuring compliance with the CESMP under the supervision of the EPC Contractor. Their key responsibilities include:

- **Adherence to CESMP:** Ensure full compliance with the CESMP, ADNOC's standards, UAE and Abu Dhabi regulationsduring the execution of construction activities. This includes environmental protection, waste management, labor rights, and health and safety standards.

- **EHS&S Focal Points:** Appoint Environmental, Social, Health, and Safety (EHS&S) focal points to coordinate with the main EPC contractor's HSE and social management teams, ensuring all subcontracted activities are aligned with project standards.
- **Training and Capacity Building:** Participate in training programs provided by the EPC contractor on environmental and social compliance, ensuring that all workers understand their roles in protecting the environment and maintaining labor rights.
- **Incident Reporting:** Immediately report any environmental or social incidents (e.g., spills, labor disputes) to the EPC contractor and ensure that corrective actions are implemented as required.
- **Grievance Mechanism:** Ensure that all workers, including migrant laborers, have access to an effective grievance mechanism to raise concerns related to labor rights, working conditions, and social welfare.

4.4.2. Roles and Responsibilities

To implement the environmental management measures, an appropriate organizational framework shall be developed, where key EHS&S designations and roles and responsibilities shall be as follows:

1. Project Director (PD)

The Project Director holds overall accountability for CESMP compliance and the successful execution of the Environmental, Health, Safety & Social (EHS&S) aspects during the construction phase. The key responsibilities include:

- **Approval** of CESMP and relevant management plans.
- **Oversight** of CESMP implementation, ensuring alignment with ADNOC standards, UAE legislation, and endeavors to meet Equator Principles IV.
- **Provision of Resources** to ensure effective CESMP management, including human resources, equipment, and financial support.
- **Compliance Enforcement** through regular reviews of project performance against CESMP requirements and ADNOC's standards.
- **Interface with ADNOC** and key stakeholders for issues related to CESMP implementation and regulatory compliance.
- **Emergency Response**: Approve emergency response procedures and oversee the adequacy of emergency preparedness.
- **Incident Review**: Ensure participation in incident investigations when required, ensuring corrective actions are effectively implemented.

2. Project HSE Manager

The HSE Manager reports to the Project Director and is responsible for managing the implementation and ongoing monitoring of CESMP compliance, covering environmental, social, health, and safety matters. Responsibilities include:

- **Development of HSE Management Systems:** Maintain systems and procedures related to health, safety, environment, and emergency response.
- **Risk Management:** Ensure that environmental and social risk assessments are developed and integrated into the CESMP.
- **KPIs Monitoring:** Oversee the monitoring of safety, environmental, and social performance indicators (KPIs), taking corrective action as necessary to meet the targets.
- **Incident Reporting and Analysis:** Ensure that all incidents, near misses, and unsafe acts/conditions are reported, investigated, and analyzed to prevent recurrence.
- **Liaison with Engineering:** Collaborate with the engineering team to integrate HSE and environmental studies into project design and implementation.
- **Training Oversight:** Oversee training programs to ensure personnel are competent in managing environmental and safety risks.

3. Project Health, Safety, and Environment (HSE) Team

The HSE Team supports the HSE Manager in ensuring compliance with ADNOC's safety standards, UAE labor safety laws, and best practices during construction. The team plays a key role in implementing HSE protocols on the ground. Key responsibilities include:

- **On-Site HSE Compliance Monitoring:** Conduct daily inspections and monitoring to ensure all construction activities comply with CESMP safety protocols and ADNOC standards, immediately addressing any deviations.
- **Safety Audits and High-Risk Activity Oversight:** Perform regular audits focused on high-risk activities such as working at height, scaffolding, lifting operations, and confined space entry, reporting findings to the HSE Manager.
- **Incident Reporting and Preliminary Investigation:** Record and report health and safety incidents, near misses, and unsafe conditions, conducting preliminary investigations and collaborating with the HSE Manager on root cause analysis.
- **Emergency Preparedness and Response Support:** Assist in implementing emergency response plans, conducting drills, and providing immediate support during emergency situations to ensure swift, effective action.
- **Worker Health and Safety Training:** Deliver toolbox talks, safety briefings, and refresher training sessions, particularly on job-specific hazards, PPE use, and safe operating procedures.
- **Record-Keeping and Documentation:** Maintain accurate records of all inspections, audits, incidents, and training sessions, ensuring documentation aligns with ADNOC and CESMP requirements.

4. Environmental Manager

The Environmental Manager, reporting to project HSE Manageris responsible for overseeing all environmental aspects of the project, ensuring compliance with UAE environmental regulations, ADNOC standards, and international best practices. This role involves strategic planning, monitoring, and continuous improvement to minimize environmental impacts. Key responsibilities include:

- **Environmental Compliance Management:** Ensure that all project activities comply with UAE environmental regulations, ADNOC guidelines, and international standards such as ISO 14001, including preparing and submitting necessary permits and reports.
- **Environmental Risk Assessment and Mitigation:** Conduct environmental risk assessments and develop mitigation strategies for key environmental risks, such as air emissions, noise, waste, water quality, and biodiversity protection. Update these strategies as needed based on monitoring results and new risks identified.
- **Environmental Monitoring and Reporting:** Oversee the regular monitoring of key environmental parameters, including air and water quality, waste management, and marine ecosystems. Ensure data accuracy, analyze trends, and prepare regular environmental performance reports for the Project HSE Manager and relevant regulatory authorities.
- **Waste and Resource Management:** Develop and implement waste management protocols aligned with ADNOC and local regulations, including waste minimization, recycling, and disposal. Oversee efficient use of natural resources, reducing consumption wherever possible.
- **Incident Investigation and Corrective Action:** Lead investigations into environmental incidents, determine root causes, and implement corrective actions to prevent recurrence. Work closely with the HSE Manager to address environmental and safety overlaps.
- **Sustainability Initiatives:** Promote sustainable construction practices, including the use of environmentally friendly materials, energy conservation measures, and carbon footprint reduction strategies.
- **Stakeholder Engagement and Communication:** Act as the main point of contact for environmental matters, liaising with government agencies, local communities, and other stakeholders to ensure transparent communication about environmental impacts and mitigation efforts.
- **Training and Awareness Programs:** Develop and deliver environmental training sessions for project staff and contractors to increase awareness of environmental responsibilities and promote a culture of environmental stewardship.

5. Social Manager (Performed by HSE Manager)

The Social Manager focuses on managing the social aspects of the project, ensuring compliance with international standards, particularly related to labor rights, worker welfare, and community engagement. Responsibilities include:

- **Community Engagement:** Manage stakeholder engagement processes, ensuring that grievances from the community are addressed in line with the CESMP and endeavors to meet EP IV requirements.
- **Worker Welfare:** Monitor working conditions, accommodation standards, and health and safety protocols to ensure compliance with international labor standards and UAE labor laws.
- **Labor Management:** Liaise with the Manpower Supplier and Subcontractor Focal Points to ensure that migrant workers' rights are upheld, and proper living conditions are provided.
- **Training and Capacity Building:** Oversee training programs aimed at enhancing workers' skills and improving long-term employability.
- **Grievance Mechanism:** Ensure the effectiveness of grievance mechanisms for workers and local communities, ensuring timely resolution of issues.
- **Supply Chain Social Compliance:** Conduct regular audits of the supply chain to assess adherence to social performance standards, including worker welfare.
- **Labor and Welfare Monitoring:** Oversee subcontractors' and suppliers' labor conditions, including recruitment, wages, and worker accommodations, ensuring compliance with ADNOC standards, UAE labor laws, and endeavors to meet Equator Principles IV. Ensure proper labor management systems are in place across all supply chain entities.
- **Reporting and Auditing:** Ensure that social compliance audits and performance assessments are conducted. Report any non-compliance or social-related incidents to the Project Director and HSE Manager and ensure corrective actions are implemented.

6. Procurement Manager

This role ensures that suppliers and subcontractors meet ADNOC standards, UAE legislation. This includes ensuring adherence to international best practices and ADNOC code of ethics.

7. Subcontractor Environmental, Health, Safety and Social (EHS&S) Focal Points

Each subcontractor is required to appoint EHS&S Focal Points for coordination with the main project CESMP team. These focal points ensure subcontractors' compliance with ADNOC standards, UAE laws, and endeavors to meet EP IV. Responsibilities include:

- **Implementation of CESMP Requirements:** Ensure all subcontractor activities are aligned with the CESMP, particularly in environmental, social, and health & safety areas.
- **Regular Reporting:** Submit regular compliance reports to the HSE Manager and participate in audits.
- **Training and Capacity Building:** Ensure subcontractor staff receive adequate training on EHS&S issues.

8. All Employees and Workers

All project personnel, including those from subcontractors, are responsible for adhering to the CESMP and contributing to a safe and compliant work environment:

- **Participating in EHS&S Initiatives:** Actively engage in toolbox talks, safety meetings, and risk assessments.
- **Incident Reporting:** Report any incidents, unsafe acts, or near misses to their supervisors.
- **Following Procedures:** Ensure strict adherence to safety protocols, environmental procedures, and personal protective equipment (PPE) use.

4.4.3. Communication

Effective communication during the construction phase of the LNG Project is essential to ensure compliance with environmental, social, and health & safety standards. The following outlines the communication protocols to be followed, aligning with project communication procedures. These protocols also reference communication within the Stakeholder Engagement Plan (SEP) and the Emergency Response Plan (ERP), both of which are detailed later in the CESMP.

1. Internal Communication

Communication within the Project Team and Contractors consists of the following:

- **Clear Communication Channels:**

All project personnel, including the EPC Contractor and subcontractors, must be aware of and follow the established communication channels for reporting environmental and social issues. The EPC Contractor, including its Social Manager, is responsible for ensuring efficient communication, particularly for critical issues like environmental incidents, grievances, and safety concerns.

- **Environmental and Social Briefings:**

Regular environmental and social briefings must be conducted by the EPC Contractor to ensure that all key personnel, subcontractors, and workers are informed about environmental risks, social responsibilities, and mitigation measures outlined in the CESMP.

- **Weekly and Monthly Meetings:**

Weekly or monthly meetings between project management, the EPC Contractor, subcontractors, and relevant environmental and social personnel must be held. These meetings will serve as a forum for discussing:

    - HSE performance updates.
    - Incidents, near misses, and non-compliance events.
    - Grievance management and worker welfare issues.
    - Corrective actions implemented and lessons learned.

- **Incident and Non-Compliance Reporting:**

All environmental and social incidents, near misses, and non-compliance events must be reported immediately to ADNOC's management and documented using established procedures. The EPC Contractor's HSE and Social Manager teams will investigate and address incidents.

- **Stakeholder Engagement Plan (SEP):**

Communication with internal and external stakeholders regarding environmental and social matters will align with the Stakeholder Engagement Plan (SEP), detailed later in the CESMP. The SEP outlines procedures for engaging with affected communities, local authorities, and other stakeholders, ensuring that concerns and inputs are incorporated into project decisions.

2. External Communication

- **Stakeholder Engagement and Grievance Mechanism**
    - Coordination with External Stakeholders:

The project holds the primary responsibility for high-level engagement with external stakeholders, including regulatory authorities, local communities, and international lenders (if applicable). However, the EPC Contractor's Social Manager will oversee day-to-day grievance management and will be responsible for receiving and addressing grievances from external stakeholders and workers.

- Public and Worker Grievance Mechanism:

A formal Grievance Mechanism will be established to allow external stakeholders (including local communities) and workers to submit concerns or complaints. The grievance mechanism will:

- Be accessible and transparent for all stakeholders.
- Ensure timely responses and resolution of grievances.
- Be documented, ensuring that all complaints are logged, investigated, and addressed by the EPC Contractor's Social Manager.

- Grievance Management Responsibilities:
    - The EPC Contractor's Social Manager will manage the grievance process for both external stakeholders and workers.
    - The EPC Contractor's team will be responsible for logging and reporting all grievances to ADNOC, including actions taken to resolve them.
    - All grievances must be included in the project's monthly performance reports submitted to ADNOC.

- **Environmental Complaints and Incident Communication**
    - Public Environmental Complaints: RLNG's management will oversee the resolution of public environmental complaints, such as those related to air quality, noise, waste management, or transportation impacts. The EPC Contractor's HSE and Social teams must support ADNOC by providing data and reports necessary to resolve complaints effectively.
    - Environmental Incident Reporting to Authorities: In the event of significant environmental incidents, the project will coordinate with the Environment Agency - Abu Dhabi (EAD) and other relevant authorities to ensure that proper notification and response protocols are followed. The EPC Contractor is responsible for informing the project of such incidents in a timely manner.

3. Regular Reporting and Communication Protocols

- **Environmental and Social Performance Reporting**
    - Monthly and Quarterly Environmental Reports: The EPC Contractor will prepare and submit regular environmental and social performance reports to RLNG. These reports will include:
        - Environmental performance data (air quality, waste management, energy consumption, etc.).
        - Social performance data (worker welfare, grievances received and resolved, stakeholder engagement activities).
        - Corrective actions taken to address non-compliance or grievances.
    - KPI Monitoring and Reporting: The EPC Contractor must monitor and report key performance indicators (KPIs) related to environmental and social performance. These KPIs must align with ADNOC's standards and endeavor to meet EP IV requirements to ensure consistent monitoring and management of project impacts.
    - Lenders Reporting Requirements (EP IV): If international lenders are involved, RLNG will endeavor to comply with all reporting obligations under Equator Principles IV. The EPC Contractor will support RLNG in providing necessary updates, including risk management, mitigation measures, and stakeholder engagement activities.
- **Meetings and Stakeholder Updates**
    - Monthly Internal Progress Meetings: Monthly internal meetings between ADNOC, the EPC Contractor, and subcontractors will focus on identifying and resolving any environmental and social issues that arise during construction.
    - Quarterly External Reporting and Meetings: ADNOC will coordinate the reporting on environmental and social performance and meetings to ensure external stakeholders are informed of project progress and challenges.

- **Ad Hoc Meetings and Reporting**

  In addition to scheduled meetings, ad hoc meetings or reports should be conducted as needed to address specific incidents or compliance issues.

4. Emergency Communication

Emergency Communication is detailed in the Emergency Response Plan in Section 8 and briefly described below:

- Emergency Communication within the ERP: The communication protocols for emergencies will be managed as part of the Emergency Response Plan (ERP), which is detailed later in the CESMP. This plan includes all emergency communication protocols required to notify ADNOC, local authorities, emergency services, and stakeholders in the event of environmental or social emergencies.
- Immediate Incident Reporting: All emergency incidents, including environmental, safety, or social emergencies (e.g., spills, worker accidents, fires), must be reported immediately to ADNOC by the EPC Contractor. The response will follow the procedures laid out in the ERP, ensuring a coordinated effort to mitigate and manage the emergency.
- Coordination with Local Authorities: In the event of a major emergency, ADNOC will coordinate with local authorities (including the Environment Agency - Abu Dhabi and emergency services) to manage the response. The EPC Contractor will provide full support, including personnel, resources, and incident documentation, as part of the ERP.

5. Stakeholder Engagement Plan (SEP)

Communication with external stakeholders, including local communities and regulators, will adhere to the guidelines provided in the Stakeholder Engagement Plan (SEP), which is detailed in Section 6.4 of the CESMP. The SEP outlines:

- Procedures for engaging with stakeholders during the construction phase.
- Mechanisms for receiving and addressing concerns or complaints from communities.
- Ongoing consultation processes to ensure transparency and responsiveness to community and regulatory needs.

4.4.4. Training and Awareness

Success of the Construction Environmental and Social Management Plan (CESMP) for the LNG project in Ruwais relies on ensuring that all personnel, including the EPC contractor's team, subcontractors, and official visitors, are fully trained and aware of their environmental, social, health, safety, and security responsibilities. This section outlines the training programs required during the construction phase, designed in compliance with ADNOC's policies and best international practices.

The training programs will cover a broad range of topics, including environmental and social policies, stakeholder engagement commitments, emergency response procedures, and cultural sensitivity. The goal is to ensure that all

blue- and white-collar workers, including subcontractor staff, are competent and able to meet the project's environmental and social standards.

1. Training Programs Overview

Training programs will be developed and implemented prior to the commencement of construction activities and will be periodically updated throughout the construction phase. The training will be designed to:

- Ensure personnel understand their environmental, social, health, safety, and security responsibilities.
- Instill awareness of ADNOC's code of conduct, social and environmental policies, and cultural sensitivity in dealing with local communities.
- Promote understanding of the Stakeholder Engagement Plan (SEP) and emergency response plans.

- **Key Training Areas:**
  - Environmental Responsibilities: Personnel will be trained on the potential environmental impacts of their activities, as outlined in the Environmental Impact Assessment (EIA) report and the CESMP.
  - Health, Safety, and Security (HSS) Awareness: Training will cover key health, safety, and security protocols to ensure a safe construction site, including proper use of personal protective equipment (PPE), safe work practices, and site security measures.
  - Social and Cultural Sensitivity: Training will include awareness of local cultural norms and expectations, as well as cultural sensitivity training for workers, particularly those from diverse backgrounds. This ensures that workers understand how to interact respectfully with local communities.
  - Code of Conduct: All workers, including subcontractors, will be trained on ADNOC's code of conduct, which includes guidelines on ethical behavior, respect for compliance with UAE labor laws and international practices.
  - Stakeholder Engagement and Communication: Personnel involved in community engagement will receive specific training on the Stakeholder Engagement Plan (SEP), which includes procedures for addressing stakeholder concerns and complaints through the established grievance mechanism. This ensures that all interactions with external stakeholders are handled professionally and in line with project commitments.
  - Emergency Response and Preparedness: All workers will be trained on the Emergency Response Plan (ERP), with a focus on emergency communication procedures, spill responses, and first-aid protocols. This ensures workers are prepared to respond quickly and effectively to any incidents.

2. Training Delivery and Frequency

- **Induction Procedures:**
    - Environmental and Social Induction: Before any personnel (including subcontractors) commence work on site, they will undergo a comprehensive induction program. This induction will cover the project's key environmental and social requirements, the contents of the CESMP, and the specific responsibilities of the personnel concerning the project's environmental and social policies.
    - Emergency Preparedness Induction: The induction will also cover emergency response procedures, ensuring that all personnel understand the communication and response actions required in case of an environmental, social, or safety incident.
- **Regular Toolbox Talks:**
    - Weekly Toolbox Talks: To reinforce environmental and social awareness, weekly toolbox talks will be held on-site. Toolbox talks provide ongoing opportunities to refresh workers' knowledge and ensure they remain aware of their responsibilities throughout the construction phase. These short, focused discussions will cover specific environmental topics such as:
        - Spill response procedures.
        - Waste management and pollution control.
        - Marine ecology protection (if applicable).
        - Cultural sensitivity and stakeholder interaction.
- **Specialized Training for Key Roles:**
    - Social and Environmental Focal Points: Specific personnel, such as social managers, environmental engineers, and HSE managers, will receive in-depth training tailored to their roles. This training will cover detailed aspects of environmental risk management, stakeholder engagement, and grievance handling procedures as outlined in the Stakeholder Engagement Plan (SEP).
    - Emergency Response Team Training: Personnel designated as part of the emergency response team will receive specialized training on the Emergency Response Plan (ERP), including fire safety, first-aid, and incident communication protocols.

3. Training Responsibilities and Documentation

- **Training Program Development and Coordination:**

The EPC Contractor's HSE Manager and Social Manager will be responsible for developing, implementing, and updating the training programs throughout the construction phase. The training programs will be aligned with

ADNOC's internal policies, UAE and Abu Dhabi regulations, and will endeavor to meet Equator Principles IV (EP IV) requirements.

- **Competence Assurance:**

  The EPC Contractor's HSE and Social Management teams must ensure that all personnel are competent in carrying out their duties, particularly concerning environmental and social compliance. Training effectiveness will be monitored, and additional sessions will be provided if necessary.

- **Induction and Training Records:**

  - Documentation: All training sessions, inductions, and toolbox talks will be fully documented, including attendance records, training materials, and certificates of competence where applicable. These records will be reviewed regularly to ensure compliance with the CESMP and to meet reporting requirements for ADNOC and international lenders.
  - Tracking Compliance: A training log will be maintained by the EPC Contractor's HSE and Social teams, detailing all personnel who have completed the required training and induction programs. Regular reviews will be conducted to ensure that all subcontractors and new hires have completed their inductions.

5. Transparency and Public Disclosure

Transparency is necessary for maintaining trust with stakeholders, particularly local communities and other affected parties. This section outlines how the project will regularly disclose relevant environmental and social performance information to stakeholders in a transparent and accessible manner, ensuring compliance with ADNOC's policies and Equator Principles IV (EP IV).

1. Objectives of Public Disclosure

- **Build Trust and Accountability:** Ensure that stakeholders, especially local communities, are kept informed about the project's environmental and social impacts, thus promoting trust through regular updates and transparency.
- **Promote Engagement:** Facilitate ongoing dialogue with affected stakeholders by providing them with accurate, up-to-date information, encouraging participation in decision-making processes when relevant.

2. Types of Information to be Disclosed

The project will regularly disclose the following types of information:

- **Environmental and Social Performance:** Summaries of key performance indicators (KPIs) related to environmental impacts (e.g., air and water quality, waste management) and social outcomes (e.g., worker welfare, community engagement, grievance management).
- **Incident Reports and Corrective Actions:** Disclosure of significant environmental or social incidents (e.g., spills, accidents) and the corrective actions taken to address them, ensuring transparency in how risks are managed.

- **Project Updates:** Information on the construction schedule, milestones, and any changes that may affect stakeholders, particularly local communities.
- **Grievance Mechanism Summary:** Regular updates on the grievance mechanism, including the number and type of grievances received and how they were resolved, as outlined in the Stakeholder Engagement Plan (SEP).

3. Disclosure Formats

Information will be accessible to all stakeholders, including vulnerable and directly affected groups as per ADNOC External communication policy on information accessibility and declarations as well as the following formats:

- **Public Meetings:** Scheduled public meetings, especially in affected communities, to provide updates on project progress and environmental and social performance as required.
- **Printed Materials:** Distribution of printed materials, such as newsletters or fact sheets, to local communities and stakeholders, ensuring the information is available in local languages and easy to understand.
- **Community Notice Boards:** Updates posted on community notice boards in areas directly affected by the project, allowing stakeholders easy access to timely information.

4. Frequency of Disclosure

- **Regular Updates:** Key environmental and social performance reports will be disclosed on a regular basis, in line with external reporting requirements for regulatory authorities and international lenders (EP IV).
- **Ad Hoc Disclosure:** Significant incidents or project changes affecting stakeholders will be disclosed as they occur, ensuring timely communication of critical information.

4.4.5. Documentation, Control, Review, and Updates

This section establishes the procedures for managing, reviewing, and updating all documents related to the CESMP during the construction phase of the LNG Project in Ruwais. It ensures that all documents are properly created, reviewed, approved, distributed, and maintained, while the CESMP remains a dynamic, up-to-date document capable of adaptation to changing project conditions. These processes comply with ADNOC's internal standards, UAE and Abu Dhabi regulations, and endeavor the implementation of Equator Principles IV (EP IV).

1. Objectives

- **Consistency and Control:** Ensure that all documents related to the CESMP, including environmental, social, health, and safety documentation, are accurate, consistently managed, and easily accessible to relevant personnel.
- **Live Document Management:** Keep the CESMP and associated documents as "live" tools that can be updated regularly to reflect changes in project scope, environmental conditions, stakeholder feedback, or new regulatory requirements.

- **Compliance and Continuous Improvement:** Maintain compliance with ADNOC's policies and EP IV standards, promoting continuous improvement in environmental and social performance through systematic document control and updates.

2. Document Creation, Approval, and Control

- **Creation and Version Control:** All environmental and social documents, including the CESMP and supporting documentation, will be created with clear version control. Each document must include the author's details, date of creation, and revision history.
- **Approval Process:** Documents must be reviewed and approved by the EPC Contractor's HSE Manager and Social Manager, in collaboration with ADNOC's environmental and social teams, before being distributed. Approval ensures that all documents comply with ADNOC's corporate standards and UAE and Abu Dhabi regulations.
- **Controlled Distribution:** Approved documents will be distributed to all relevant personnel, including the EPC Contractor, subcontractors, ADNOC, and regulatory authorities. Document distribution will be controlled and tracked to ensure that only the most current versions are in use.
- **Access to Documentation:** All personnel involved in the project will have access to the CESMP and other relevant documents through a controlled digital document management system or secure project-specific platform. Hard copies will also be made available on-site.
- **Document Maintenance and Storage:** Documents, including records of environmental and social performance, will be securely stored in both digital and physical formats. Outdated documents will be clearly marked as "superseded" to prevent accidental use. All records will be archived in line with ADNOC's retention policies and regulatory requirements.

3. Document Review and Updates

- **Regular Review Cycle:** The CESMP and associated documents will be reviewed on a quarterly basis to ensure their continued relevance and accuracy. The review process will be led by the EPC Contractor's HSE Manager and Social Manager, with oversight from ADNOC's environmental and social management teams.
- **Ad Hoc Updates:** The CESMP will also be updated as necessary in response to significant changes in project conditions, environmental or social incidents, regulatory updates, or feedback from stakeholders. Examples of conditions that may trigger an update include:
    - Changes in project scope or design.
    - New environmental or social risks.
    - Regulatory changes from the Environment Agency - Abu Dhabi (EAD).
    - Feedback or grievances raised by local communities or other stakeholders.

- **Stakeholder Involvement:** Updates to the CESMP will consider stakeholder input, particularly from affected communities, regulatory authorities, and international lenders. Major updates that impact stakeholders will be communicated in line with the Stakeholder Engagement Plan (SEP) and Transparency and Public Disclosure procedures.

4. Roles and Responsibilities

- **EPC Contractor's HSE and Social Managers:** The HSE Manager and Social Manager of the EPC Contractor are responsible for coordinating both document control and CESMP reviews. They will ensure that updates are made in response to project needs and that the document control system functions effectively.
- **ADNOC Oversight:** ADNOC's environmental and social teams will oversee the review and update process, ensuring all revisions align with corporate standards and that the CESMP continues to comply with UAE and Abu Dhabi regulations and endeavor to meet EP IV.

5. Updating and Distributing the CESMP

- **Procedure for Updates:** When updates are necessary, the CESMP will be revised in accordance with the established document control procedures. All changes will be documented in the revision history, and the updated version will be distributed to all relevant parties, including ADNOC, the EPC Contractor, subcontractors, and external stakeholders.
- **Version Control:** Each updated version of the CESMP will be assigned a unique version number to ensure clear identification and traceability. Outdated versions will be archived and marked as "superseded."
- **Communicating Updates to Stakeholders:** Significant updates to the CESMP, particularly those affecting external stakeholders, will be communicated through the channels outlined in the Transparency and Public Disclosure section and the Stakeholder Engagement Plan (SEP). This ensures that affected communities, regulatory authorities, and international lenders are kept informed of key changes.

6. Monitoring, Reporting, and Adaptive Management

- **Monitoring and Feedback Integration:** Results from environmental and social monitoring activities, including incident reports and performance audits, will be used to inform CESMP updates. This feedback loop ensures that the plan is continuously improved and remains effective in managing the project's environmental and social risks.
- **Adaptive Management:** The CESMP will be treated as a live document, capable of adapting to changing project conditions. This approach allows for the proactive management of risks and ensures that all updates reflect real-time project developments and stakeholder needs.

7. Document Control and Audit Trail

- **Audit Trail:** A full audit trail will be maintained for all revisions to the CESMP and related documents. Each revision will be documented, indicating who made the change, the date of the update, and the reason for the revision.

- **Record Keeping:** All document control activities, including approvals, updates, and distribution logs, will be documented to ensure transparency and traceability. These records will be maintained for the duration of the project and archived according to ADNOC's document retention policies.

4.4.6. Management of Subcontractors

Effective management of subcontractors is essential to ensure that all environmental, social, health, safety, and security (EHS&S) requirements of the Construction Environmental and Social Management Plan (CESMP) are met during the construction phase of the LNG project. This section outlines the procedures and responsibilities for managing subcontractor performance in line with ADNOC's standards, UAE and Abu Dhabi regulations, and endeavor to meet Equator Principles IV (EP IV).

1. Objectives

- **Compliance:** Aim that all subcontractors adhere to the environmental, social, health, and safety requirements outlined in the CESMP, as well as ADNOC's corporate standards and regulatory requirements.
- **Risk Management:** Minimize environmental and social risks by ensuring that subcontractors fully understand and implement the project's environmental and social mitigation measures.
- **Promote Accountability:** Establish clear roles, responsibilities, and accountability mechanisms to ensure subcontractors maintain high standards of ESHS performance throughout the construction phase.

2. Subcontractor Selection and Pre-Qualification

Before engaging subcontractors, a thorough pre-qualification process will be implemented to ensure they have the capability and commitment to comply with the project's CESMP and other EHS&S requirements.

- **Pre-Qualification Criteria:** Subcontractors will be pre-qualified based on their past environmental and social performance, adherence to health and safety standards, and ability to meet project-specific requirements, including:
    - Compliance with ADNOC's environmental and social policies.
    - Adherence to UAE labor laws and ADNOC PD requirements.
    - Proven track record of implementing environmental and social mitigation measures of local EPC contractor suitable for the pre-qualifications.
- **Environmental and Social Risk Screening:** The EPC Contractor's HSE and Social Managers will assess potential subcontractors for environmental and social risks during the selection process. Subcontractors with a history of non-compliance or poor performance in managing these risks will be excluded from the bidding process.
- **Contractual Requirements:** All subcontract agreements will include specific clauses requiring compliance with the CESMP, ADNOC standards, UAE and Abu Dhabi regulations. These contracts will outline the consequences of non-compliance, including penalties, contract termination, or corrective action requirements.

3. Onboarding and Induction

Before beginning work on-site, all subcontractors must undergo a comprehensive onboarding process to ensure they fully understand the project's CESMP and their environmental and social responsibilities.

- **Subcontractor Induction:** A detailed induction program will be provided for subcontractors, covering the following topics:
    - Environmental responsibilities and mitigation measures outlined in the CESMP.
    - Social responsibilities, including adherence to the Stakeholder Engagement Plan (SEP) and grievance mechanisms.
    - Health and safety protocols, including the use of personal protective equipment (PPE) and emergency response procedures.
    - Cultural sensitivity and community interaction protocols to ensure respectful engagement with local stakeholders.
- **Training Programs:** Subcontractors will participate in the same training programs outlined in the Training and Awareness section. This includes regular toolbox talks and refresher training on key environmental and social issues, such as spill response, waste management, and worker welfare.

4. Subcontractor Monitoring and Reporting

Regular monitoring and reporting are critical to ensuring subcontractor compliance with the CESMP and project standards. This section outlines the processes for ongoing subcontractor performance evaluation.

- **Site Audits and Inspections:**

The EPC Contractor's HSE and Social Managers will conduct regular audits and inspections of subcontractor activities to ensure compliance with the CESMP. These audits will focus on:

- Environmental performance, including waste management, pollution prevention, and biodiversity protection.
- Social performance, including worker welfare, accommodation conditions, and adherence to labor rights.
- Health and safety compliance, particularly in high-risk areas such as scaffolding, lifting operations, and working at height.

- **Key Performance Indicators (KPIs):**

Subcontractors will be required to report on specific KPIs related to their environmental, social, health, and safety performance. These KPIs will include:

- Number of environmental incidents and near-misses.
- Number of safety incidents and lost-time injuries.

- Compliance with labor rights and worker grievance resolution.

- **Monthly Reporting:** Subcontractors must submit monthly reports to the EPC Contractor's HSE and Social teams, detailing their environmental and social performance. These reports will be reviewed by ADNOC to ensure ongoing compliance with project requirements.

5. Non-Compliance and Corrective Actions

In cases where subcontractors fail to meet the CESMP requirements or contractual obligations, corrective action will be taken to address non-compliance.

- **Non-Compliance Identification:** Non-compliance may be identified through site inspections, audits, incident reports, or stakeholder complaints. The EPC Contractor's HSE Manager will document all non-compliance events and assess their severity.

- **Corrective Action Plans (CAPs):** Subcontractors found to be non-compliant will be required to develop and implement a Corrective Action Plan (CAP). The CAP must outline the steps that will be taken to address the non-compliance, including timelines and responsibilities.

- **Monitoring Corrective Actions:** The EPC Contractor's HSE and Social Managers will monitor the implementation of the CAP to ensure that non-compliance issues are resolved. If subcontractors fail to implement corrective actions, further penalties or contract termination may be enforced.

- **Contract Termination:** Persistent non-compliance or serious breaches of environmental and social obligations may result in contract termination, as stipulated in the subcontractor agreements. In such cases, the EPC Contractor will ensure a smooth transition to a replacement subcontractor without impacting project performance.

6. Grievance Mechanism for Subcontractor Workers

As part of the project's commitment to worker welfare, subcontractors must ensure that their workers have access to the project's Grievance Mechanism. This mechanism allows workers to raise concerns related to labor conditions, health and safety, or social issues.

- **Worker Access to the Grievance Mechanism:** Subcontractor workers must be informed of their rights to raise grievances and the process for doing so. The EPC Contractor's Social Manager will oversee the grievance mechanism, ensuring that all complaints are addressed in a timely and fair manner.

- **Grievance Tracking and Resolution:** The EPC Contractor will track all grievances raised by subcontractor workers and ensure that they are resolved according to the procedures outlined in the Stakeholder Engagement Plan (SEP). Subcontractors will be held accountable for addressing grievances related to their workforce.

7. Continuous Improvement and Subcontractor Capacity Building

The project will support the continuous improvement of subcontractor performance through capacity-building initiatives and ongoing engagement.

- **Capacity Building Programs:** The EPC Contractor's HSE and Social teams will provide subcontractors with access to capacity-building programs designed to improve their environmental and social management practices. This includes training on best practices for waste management, pollution control, and worker welfare.
- **Subcontractor Performance Reviews:** Regular performance reviews will be conducted to evaluate subcontractor compliance with the CESMP. Subcontractors that demonstrate strong performance will be recognized, while those needing improvement will be provided with additional support and training.

4.4.7. Emergency Preparedness and Response

This section outlines the plans and procedures for emergency preparedness and response, detailing how potential environmental and social emergencies will be managed to minimize impacts. These procedures are in accordance with ADNOC's standards, UAE regulations, and endeavor to meet Equator Principles IV (EP IV).

This section accounts for the specific risks and potential emergencies identified in the Environmental and Social Aspects and Targets section. Such emergencies include both environmental incidents (such as spills, and underwater noise) and social incidents (such as road traffic impacts, community safety, and worker welfare issues).

1. Objectives

- **Minimize Environmental and Social Impacts:** Aim that all potential emergencies—both environmental and social—are managed to minimize their impact on marine ecology, community health and safety, worker wellbeing, and local infrastructure.
- **Risk-Specific Preparedness:** Develop tailored emergency procedures based on the specific environmental and social risks identified in the EIA, SIA, and ENVID studies, ensuring the project is equipped to handle emergencies effectively.
- **Rapid Response and Recovery:** Establish clear procedures for rapid response and recovery from incidents to mitigate any potential long-term environmental, social, or health impacts.

2. Risk Assessment and Emergency Scenarios

The risk assessment conducted during the EIA and SIA has identified several potential emergencies. The Emergency Response Plan (ERP) will be designed to address the following key risks and will be prepared in line with ADNOC Standards:

- **Community Health and Safety (Road Traffic Incidents):** With the transportation of a large workforce (up to 10,500 personnel), the potential for traffic congestion and accidents may pose a significant risk to local communities.
    - Traffic Incident Response: Emergency traffic management plans will include coordination with local authorities, real-time traffic monitoring, and procedures to respond to accidents involving project vehicles. This includes emergency medical response for accidents involving road users, including pedestrians.

- **Worker Wellbeing (Occupational Health and Safety):** The large migrant workforce may face potential occupational health and safety risks due to long travel times.
    - Emergency Medical Response: Aim that the Emergency Response Team (ERT) is trained to handle medical emergencies, including long-distance transportation of workers for medical treatment. Emergency protocols will also include coordination with local hospitals and first aid response teams on-site.
- **Social and Community Risks (Migrant Workforce):** Potential conflicts between the migrant workforce and local communities due to cultural differences or inappropriate behavior could lead to social emergencies.
    - Community Interaction Protocols: In case of a social incident involving the workforce and local communities, the Social Manager will coordinate responses with local authorities and community leaders to de-escalate tensions. Emergency communication channels will be activated to inform stakeholders and manage grievances swiftly.

3. Emergency Response Plan (ERP) Structure

The Emergency Response Plan (ERP) for the LNG project (see Section 8) will address both environmental and social emergencies through clear, structured response procedures:

- **Roles and Responsibilities:**
    - EPC Contractor's HSE Manager: Oversees responses to environmental emergencies, including spills, air and water pollution, and ecological impacts.
    - Social Manager: Manages social incidents, particularly those affecting local communities or involving workforce-community interactions.
    - Emergency Response Team (ERT): Trained personnel responsible for executing emergency procedures on-site, supported by ADNOC's high-level oversight.
    - Marine Ecologist and Biodiversity Experts: Available for consultation in case of marine impacts, ensuring alignment with the Biodiversity Action Plan (BAP).
- **Emergency Communication Protocols:** The ERP will include communication procedures for notifying internal and external stakeholders, including ADNOC, local authorities, emergency services, and impacted communities. Real-time updates will be provided in case of emergencies affecting the public or local environment.

4. Response Procedures for Key Emergency Scenarios

Based on the identified risks, the ERP will include detailed response procedures for the following scenarios:

- **Spill Response (Marine and Terrestrial):** Procedures for containing, cleaning, and reporting spills of hazardous materials, particularly in marine environments. This includes the rapid deployment of spill response equipment and notifying the Incident Commander.

- **Fire and Explosion Response:** Evacuation procedures, fire containment measures, and coordination with local firefighting services. Special focus will be placed on high-risk areas such as fuel storage and equipment handling zones.
- **Noise Exceedance and Marine Disturbance:** Shutdown procedures for piling activities if noise thresholds are exceeded or marine fauna are disturbed. Monitoring will ensure compliance with noise limits and minimize disturbances to the local ecosystem and tourism activities.
- **Traffic Accident and Road Safety Response:** Procedures for managing accidents involving project vehicles, including medical evacuation, traffic management, and coordination with local emergency services. Traffic management plans will be integrated into the response strategy to prevent further congestion.
- **Worker Health and Safety Incidents:** On-site medical treatment and emergency evacuation procedures for workers involved in accidents or suffering from health issues. Emergency medical response teams will be stationed on-site to ensure rapid care.

5. Training and Drills

- **Induction and Onboarding Training:** All workers, including subcontractors, will receive emergency preparedness training during their induction. This includes specific training on the ERP, marine incident response, and emergency evacuation procedures.
- **Quarterly Mini Drills:** Focused, brief drills held quarterly to test specific elements of the Emergency Response Plan (ERP), such as minor spills or small-scale road incidents. These drills ensure personnel and subcontractors are familiar with key procedures and can identify any immediate gaps in response readiness.
- **Semi-Annual Regular Drills:** Comprehensive drills conducted twice a year to simulate larger, high-risk scenarios, like significant spills and major traffic accidents. These exercises evaluate the full ERP, coordination among teams, and overall readiness, identifying areas for improvement in emergency response.
- **Specialized Marine Emergency Drills:** For jetty construction, marine-specific drills will be conducted to ensure the rapid deployment of spill containment measures and noise reduction protocols.

6. Post-Incident Review and Continuous Improvement

After each emergency, a post-incident review will be conducted to assess the response effectiveness and identify areas for improvement.

- **Incident Investigation:** Detailed investigations will follow each emergency, focusing on identifying root causes, evaluating the response, and determining corrective actions.
- **Corrective Action Plans (CAPs):** CAPs will be developed and implemented to address the root causes of each emergency and prevent recurrence. Lessons learned will be incorporated into future updates of the ERP.
- **Feedback Integration:** Feedback from post-incident reviews and emergency drills will be used to continuously improve the ERP. Monitoring results and stakeholder feedback will also inform updates to ensure the plan remains effective.

7. **Emergency Resources and Equipment**

- **Spill Response Kits and Marine Containment:** Spill response kits and containment booms will be readily available on-site, especially near marine construction areas. Regular inspections will ensure they are in working order.
- **Medical Equipment and First Aid:** First aid kits, medical supplies, and evacuation vehicles will be stationed on-site, and all personnel will have access to trained first-aid responders.
- **Traffic Control and Safety Equipment:** Traffic management resources, including signage, barriers, and emergency vehicles, will be on standby to manage accidents and prevent further congestion.

ERP will be prepared during EPC HSEIA study in line with ADNOC standards.

4.5. Checking and Corrective Action

The success of the Construction Environmental and Social Management Plan (CESMP) relies on effective mechanisms for monitoring performance, addressing incidents, and ensuring continuous compliance with environmental, social, health, and safety standards. This section outlines the processes for measuring performance, managing nonconformances, conducting audits, and maintaining comprehensive records.

4.5.1. Performance Measurement and Monitoring

The project's environmental and social performance will be measured and monitored regularly to ensure compliance with the CESMP's objectives, targets, and regulatory requirements. This section outlines the methods, indicators, and responsibilities for monitoring and measuring the project's performance.

- **Key Performance Indicators (KPIs):** The EPC Contractor, in coordination with ADNOC, will establish environmental and social KPIs based on the identified impacts from the EIA, SIA, and ENVID studies. These indicators will track progress on key areas such as:
    - Environmental Monitoring:
        - Marine water quality, air emissions, noise levels, and waste management practices.
        - Biodiversity impacts, especially during jetty construction.
        - Monitoring of dredging-related turbidity levels and adherence to marine ecological thresholds.
    - Social Monitoring:
        - Worker welfare, labor conditions, travel-related health impacts, and road traffic incidents.
        - Community health and safety indicators, including traffic congestion and accident rates.
- **Monitoring Methods:**

Various methods will be used to collect performance data, including:

- On-Site Monitoring: Regular environmental monitoring (e.g., air and water quality) using specialized equipment.
- Worker and Community Surveys: To monitor social performance, including worker satisfaction and community grievances.
- Inspections and Spot Checks: Routine inspections of project activities to ensure compliance with environmental and social policies, particularly around high-risk operations such as piling, dredging, and transport.

- **Frequency:** Monitoring will be conducted according to the project's risk profile and regulatory requirements. High-risk activities (e.g., marine dredging, piling) may require daily monitoring, while other activities may only need weekly or monthly checks.

4.5.2. Incidents, Accidents, Nonconformance, and Corrective and Preventive Action

This section outlines the procedures for managing incidents, accidents, and nonconformances, ensuring that they are promptly reported, investigated, and addressed. Corrective and preventive actions will be implemented to prevent recurrence and ensure continuous improvement. Procedures and documentation will be updated during EPC and will be aligned with ADNOC standards.

- **Incident Reporting:** All environmental, health, safety, and social incidents, accidents, or nonconformances must be reported immediately. This includes:
  - Environmental Incidents: Spills, air or water contamination, and other unplanned environmental impacts.
  - Health and Safety Incidents: Worker injuries, vehicle accidents, and other safety-related incidents.
  - Social Incidents: Community grievances, labor disputes, or conflicts involving the workforce.
- **Investigation Procedures:** Every incident or nonconformance will be thoroughly investigated by the EPC Contractor's HSE Manager and Social Manager, with oversight from ADNOC. The investigation will:
  - Identify the root causes of the incident.
  - Assess the potential impact on environmental, social, or health and safety performance.
  - Recommend corrective and preventive actions to prevent recurrence.
- **Corrective and Preventive Actions:** Following each investigation, a Corrective Action Plan (CAP) will be developed, detailing:
  - The steps to correct the issue and mitigate any immediate impacts.
  - Preventive actions to ensure the issue does not recur.
  - Responsibilities and timelines for implementing the CAP.

- Monitoring to verify the effectiveness of corrective and preventive actions.

4.5.3. Audit and Inspection

Regular audits and inspections will be conducted to verify compliance with the CESMP, evaluate performance, and identify areas for improvement. Audits will cover all aspects of environmental and social management, ensuring continuous adherence to project standards and regulatory requirements.

- **Audit Scope and Frequency:**
    - Internal Audits: Conducted quarterly by the EPC Contractor's HSE and Social teams to ensure ongoing compliance with the CESMP, particularly during high-risk activities (e.g., marine construction, labor management). Audits will focus on key areas such as marine ecology impacts, waste management, and worker welfare.
    - External Audits: Independent audits may be conducted by ADNOC or external auditors to verify compliance with ADNOC's environmental and social policies, and UAE regulations.
- **Site Inspections:** Routine inspections of construction activities will be carried out by the EPC Contractor's site supervisors, HSE personnel, and ADNOC representatives. These inspections will focus on high-risk activities and compliance with specific CESMP requirements.
- **Corrective Measures from Audits:** If any non-compliance issues are identified during audits or inspections, the EPC Contractor will develop a Corrective Action Plan (CAP) and implement it as part of the ongoing improvement process.

4.5.4. Performance Reporting

Performance reporting ensures transparency and accountability regarding the project's environmental, social, health, and safety performance. This section describes the reporting mechanisms, both internal and external, that will be used throughout the construction phase.

- **Internal Reporting:**
    - Monthly Performance Reports: The EPC Contractor will submit monthly reports to ADNOC, covering environmental, social, health, and safety performance. These reports will include monitoring data, incident summaries, nonconformances, and corrective actions taken.
    - Quarterly Reports: High-level quarterly reports will summarize overall performance, KPIs, and any significant incidents or audits conducted during the reporting period.
- **External Reporting:**
    - Regulatory Reporting: As required by EAD and ADNOC, the EPC Contractor will submit periodic reports on environmental and social performance. This includes emissions reports, waste management data, and updates on biodiversity monitoring.

- **Incident Reporting:** Serious incidents or regulatory breaches will be reported immediately to ADNOC and external authorities, ensuring that all relevant stakeholders are informed in real-time.

4.5.5. Record Control

The project will establish a comprehensive record-keeping system to ensure all CESMP-related records are properly maintained and traceable (refer to Section 4.4.5). This ensures that the project's environmental, social, and safety performance can be tracked over time and that compliance is verifiable.

- **Document Types:** Records will include:
    - Monitoring data (air and water quality, noise levels, biodiversity impacts, etc.).
    - Incident and accident reports.
    - Audit and inspection reports.
    - Corrective Action Plans (CAPs).
    - Training records for personnel and subcontractors.
    - Grievance records (worker and community grievances).
- **Record Maintenance:**
    - All records will be legible, identifiable, and traceable to the relevant activity, product, or service.
    - Records will be stored securely in both digital and physical formats, ensuring they are protected against damage, deterioration, or loss.
    - Only authorized personnel will have access to sensitive records, ensuring confidentiality when required (e.g., worker grievances).
- **Retention Period:** Records will be retained for a period determined by ADNOC's retention policies and in compliance with UAE regulatory requirements. After the project concludes, records will be archived for future reference or in case of regulatory audits.

4.6. Management Review

Management Review is an essential component of the CESMP. It ensures that the environmental, social, health, and safety management processes remain effective, relevant, and aligned with the project's evolving needs, regulatory requirements, and stakeholder concerns. The management review process involves regular assessments of performance, results from audits, incidents, and feedback from interested parties. This review also determines the suitability of the CESMP in response to changing project conditions and external factors.

4.6.1. Objectives of the Management Review

The primary objectives of the Management Review are to:

- **Evaluate Performance:** Assess the project's environmental and social performance against the established objectives, targets, and key performance indicators (KPIs).

- **Ensure Continuous Improvement:** Identify opportunities for improvement, including updates to policies, procedures, and practices based on audit findings, incident reports, and changing conditions.
- **Maintain Compliance:** Ensure continued compliance with ADNOC standards, UAE and Abu Dhabi regulations, and Equator Principles IV (EP IV), addressing any new regulatory changes or industry best practices.
- **Respond to Stakeholder Concerns:** Evaluate concerns raised by internal and external stakeholders (including communities, workers, and regulators) and incorporate necessary adjustments into the CESMP.

4.6.2. Inputs for the Management Review

The Management Review process will be informed by a range of inputs, including but not limited to:

- **Audit Results:**
    - Findings from both internal and external audits conducted during the construction phase, including non-conformance reports and areas for improvement identified during these audits.
    - Audit results that specifically address compliance with CESMP procedures, including environmental monitoring, social impact management, and health, safety, and security (HSS) performance.
- **Performance Against Objectives and Targets:**
    - Review of the project's performance against the CESMP's environmental and social objectives and KPIs, including those related to air and water quality, marine biodiversity, noise, worker welfare, and community health and safety.
    - Analysis of trends in performance metrics, identifying areas of strong performance as well as any that require corrective action or adjustment.
- **Review of Procedures and Policy:**
    - Evaluation of the suitability and effectiveness of key procedures outlined in the CESMP (e.g., incident reporting, grievance handling, emergency response).
    - Review of the project's environmental and social policy, ensuring it remains aligned with ADNOC's strategic goals, UAE and Abu Dhabi regulations, and endeavor to meet EP IV requirements. Adjustments to the policy may be recommended based on audit findings or changes in project scope.
- **Incident and Non-Conformance Reports:**
    - Assessment of all reported incidents, accidents, and non-conformances, including those related to environmental damage, worker safety, or community interactions.
    - Analysis of the effectiveness of corrective and preventive actions implemented to address these incidents.

- **Stakeholder Concerns:**
    - Review of concerns raised by interested parties, including internal stakeholders (workers and contractors) and external stakeholders (local communities, regulatory authorities, and international lenders).
    - Specific attention will be given to grievances raised through the project's Grievance Mechanism and community feedback channels as outlined in the Stakeholder Engagement Plan (SEP).
- **Regulatory and Compliance Updates:**
    - Review of any changes in UAE environmental, social, and labor regulations that may affect the CESMP. This may include updates from the Environment Agency - Abu Dhabi (EAD) or changes in ADNOC's internal policies.
- **Changes in Project Scope or Conditions:** Assessment of how changes in the project's scope, design, or operational activities may affect the CESMP. This includes reviewing new activities, risks, or impacts that were not previously identified or foreseen.

4.6.3. Review Process and Frequency

- **Frequency of Management Reviews:**

The Management Review will be conducted semi-annually during the construction phase. However, it may be conducted more frequently (e.g., quarterly) if there are significant changes in the project scope, incidents, or new regulatory requirements that necessitate a review. The recommended review period for individual management plans is typically on quarterly basis and as clarified under each plan in sections 5 to 8.

- **Participants:** The review process will involve senior management from both the EPC Contractor and ADNOC, including:
    - Project Director
    - HSE Manager
    - Environmental Manager
    - Social Manager
    - Environmental and Social Experts
    - Representatives from ADNOC's Environmental, Health, Safety and Social (EHS&S) teams
- **Review Meetings:**
    - A formal Management Review Meeting will be held to discuss the findings and inputs outlined above. The meeting will focus on evaluating the effectiveness of the CESMP and making necessary adjustments to policies, procedures, and targets.

- Meeting minutes will be recorded, summarizing key decisions, agreed actions, and timelines for implementation of any required changes.

4.6.4. Outcomes of the Management Review

The Management Review process will result in actionable outcomes that help enhance the project's environmental and social performance. These outcomes include:

- **Recommendations for CESMP Updates:** Based on the review, specific recommendations may be made to update or revise the CESMP to ensure it remains effective and relevant. These updates will reflect any changes in project activities, environmental conditions, stakeholder concerns, or regulatory requirements.
- **Improvement in Procedures and Practices:** Recommendations for improving operational procedures (e.g., incident reporting, grievance handling, worker welfare management) will be documented, with clear responsibilities assigned to implement these improvements.
- **Adjustments to Objectives and KPIs:** If performance metrics indicate that certain objectives or targets are not being met, the management review may result in revised KPIs or new performance targets that better reflect current project conditions and regulatory expectations.
- **Corrective and Preventive Actions:** Any incidents, accidents, or nonconformances identified during the review will be followed by Corrective Action Plans (CAPs) to ensure that the root causes are addressed, and preventive measures are implemented to avoid recurrence.
- **Stakeholder Feedback Integration:** Stakeholder concerns and feedback, particularly those from local communities or workers, will be incorporated into future updates of the CESMP. The project will ensure that all feedback is considered in line with the Stakeholder Engagement Plan (SEP).

4.6.5. Communication of Review Outcomes

- **Internal Communication:** The outcomes of the Management Review will be communicated internally to all relevant project personnel, including those responsible for implementing any corrective actions or CESMP updates.
- **External Communication:** Where applicable, key outcomes from the Management Review, particularly those related to regulatory compliance or significant incidents, will be communicated to external stakeholders, including regulatory authorities and international lenders. This will be done in accordance with the Transparency and Public Disclosure and Stakeholder Engagement Plan (SEP) procedures.
- **Documentation of Review Outcomes:** All review findings, decisions, and recommendations will be formally documented, and records will be maintained as part of the project's Record Control system (Section 4.4.5). This ensures traceability and accountability for the decisions made during the review process.

5. ENVIRONMENTAL MANAGEMENT PLANS

5.1. Air Quality Management Plan

5.1.1. Objectives

The main objectives of the Air Quality Management Plan during the construction phase of the LNG Project in Ruwais, Abu Dhabi are to:

- Prevent or Mitigate Adverse Effects on Air Quality: Implement measures to minimize air emissions and dust generation to protect human health and the environment.
- Ensure Compliance: Adhere to all relevant UAE laws, Abu Dhabi regulations, ADNOC standards, and international best practices related to air quality management.
- Promote Environmental Responsibility: Foster a culture of environmental stewardship among all project personnel through training and awareness.

5.1.2. Regulatory Framework and Standards

The Air Quality Management Plan aligns with the following regulatory frameworks, standards, conventions, and guidelines relevant to air quality management:

ADNOC Standards

- EOH-GID-010: Best Available Techniques (BAT) in Greenhouse Gas (GHG) Management of Projects
- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST04: Incident Notification, Investigation, and Reporting
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-GA-ST07: HSE Design Philosophy
- HSE-GA-ST08: HSE Performance Monitoring and Reporting
- HSE-GA-ST09: HSE Audit and Assurance
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-EN-ST07: Air Dispersion Modelling Techniques
- HSE-OH-ST08: Physical Health Hazard Standard
- HSE-OH-ST09: Chemical Hazards Standard
- HSE-OH-ST10: Biological Hazards Standard
- HSE-OH-ST12: Indoor Air Quality Standard

UAE Laws and Regulations

- Federal Law No. 24 of 1999: Protection and Development of the Environment
- Federal Cabinet Resolution No. 12 of 2006: Concerning Protection of Air from Pollution
- Council of Ministers' Decision No. 37 of 2001: Regulation concerning Environmental Impact Assessment of Projects
- Emirates Authority for Standardization and Metrology (ESMA) Standards: EMS 477 (Air Quality Standards)
- Ministerial Resolutions Issued by the Ministry of Climate Change and Environment (MOCCAE)
- Environment Agency Abu Dhabi (EAD) Noise and Vibration Guidelines

International Conventions and Protocols

- United Nations Framework Convention on Climate Change (UNFCCC), 1992
- Kyoto Protocol of the UNFCCC, 1997
- Paris Agreement under UNFCCC, 2015

WHO Air Quality Guidelines: For key pollutants including $PM_{2.5}$, PM_{10}, NO_2, SO_2, O_3, and CO.

International Best Practices

- ISO 14001: Environmental Management Systems
- Implementation of Best Available Techniques (BAT)
- Continuous Emission Monitoring Systems (CEMS)
- Community Communication Programs:
    - Engagement with Nearby Communities: Maintaining open communication channels to address air quality concerns.
    - Complaint Mechanisms: Establishing platforms for community feedback to ensure swift resolution of issues.

5.1.3. Baseline Conditions

5.1.3.1 General Climatic Conditions

- Climate Classification: The Ruwais area exhibits a desert climate characterized by hot summers and mild winters.
- Seasonal Variations:
    - Summer Season: Extends from June to September, with temperatures reaching up to 51.2°C.
    - Winter Season: From December to March, with temperatures dropping to as low as 6.0°C.

- Transitional Months: April to May and October to November.

- Humidity: Relative humidity is relatively high throughout the year, ranging from 42% to 72%.
- Rainfall: Minimal annual rainfall, typically ranging from 0 mm to 10.1 mm.

5.1.3.2 Meteorological Data

- Temperature and Humidity: Data from the Al Ruwais weather station (2011-2022) indicate significant temperature variations and consistently high humidity levels.
- Wind Patterns:
  - Dominant Wind Direction: Predominantly from the northwest, influencing pollutant dispersion patterns.
  - Wind Speed: Average wind speeds vary, with higher speeds potentially increasing dust dispersion.

5.1.3.3 Ambient Air Quality Conditions

- Monitoring Stations (Figure 5-1):
  - ADNOC Ruwais Air Quality Monitoring System (AQMS): Located approximately 5 km southeast of the project site.
  - Environment Agency Abu Dhabi (EAD) AQMS: Situated about 9 km west of the project boundary.
- Key Pollutants Monitored:
  - Sulfur Dioxide (SO_2)
  - Nitrogen Dioxide (NO_2)
  - Particulate Matter (PM_{10} and $PM_{2.5}$)
  - Ozone (O_3)
  - Carbon Monoxide (CO)
- Ambient Air Quality Data Summary (Table 5-1):
  - SO_2 and NO_2: Generally, within UAE ambient air quality standards, with average concentrations well below the limits.
  - PM_{10}: Occasional exceedances of the daily average standards, likely due to natural dust events and construction activities in the region.
  - O_3 and CO: Concentrations typically within acceptable ranges.

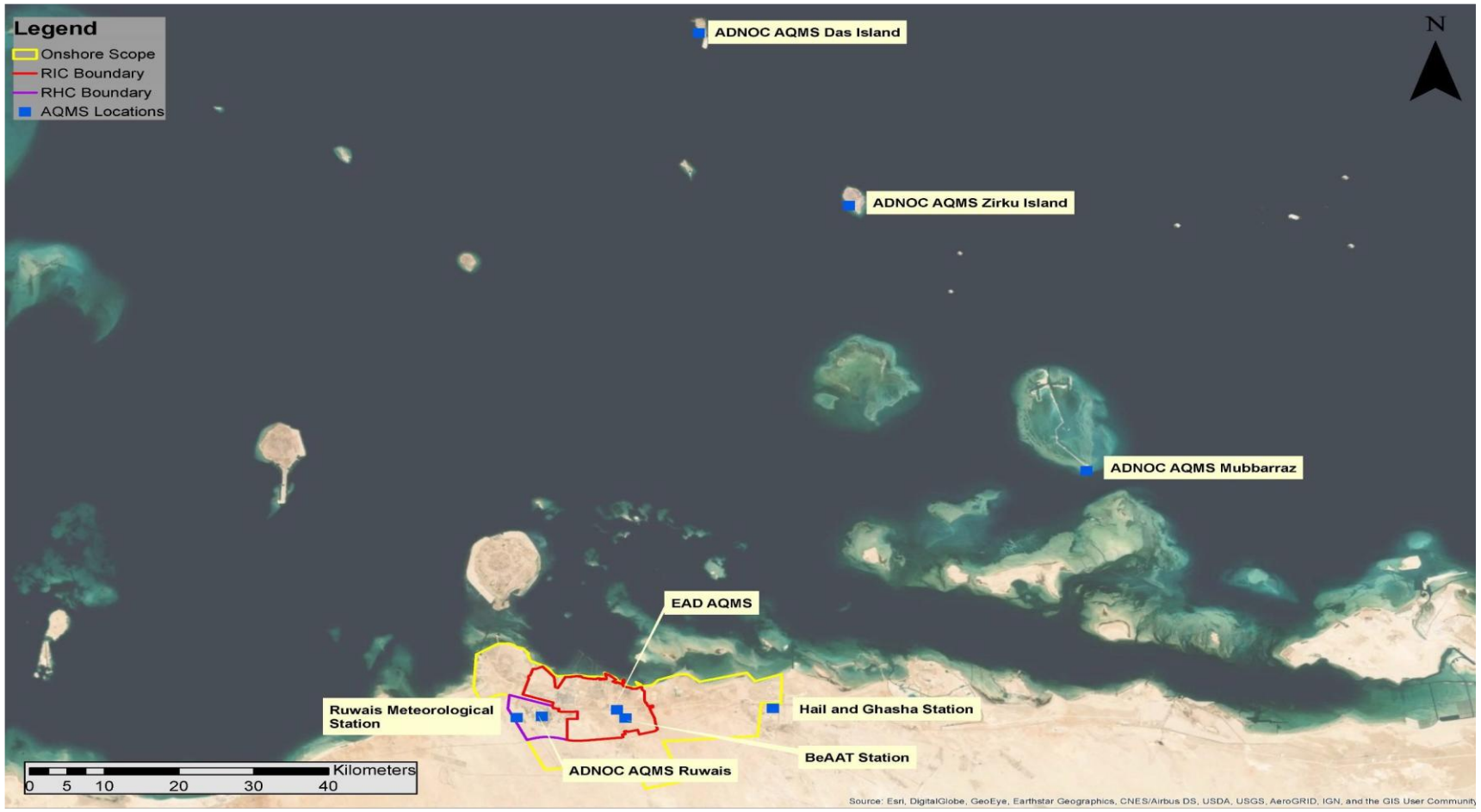


Figure 5-1. AAQ Monitoring Stations

Table 5-1. EAD Ruwais AQMS Results (2015 – 2019)

Year	Parameter	CO (mg/Nm^3)		NO^2 (µg/m^3)		SO$_2$ (µg/m^3)		PM (µg/m^3)
	Averaging Period	*1 Hour*	*8 Hour*	*1 Hour*	*24 Hour*	*1 Hour*	*24 Hour*	*24 Hour*
	Ambient Standards	*30*	*10*	*400*	*150*	*350*	*150*	*150*
2015	Maximum	8.90	8.34	194.04	84.71	**476.38**	91.14	**2,215.26**
	Minimum	0.01	0.05	1.50	3.27	0.20	1.16	26.97
	Average	0.79	0.79	25.77	25.77	15.63	15.67	143.90
2016	Maximum	2.86	2.27	164.86	74.84	278.75	91.67	**895.16**
	Minimum	0.00	0.12	0.11	6.42	0.43	2.66	24.09
	Average	0.85	0.85	24.84	24.85	20.16	20.19	124.98
2017	Maximum	5.87	5.87	137.04	76.74	339.93	82.64	**1,124.59**
	Minimum	0.01	0.07	1.22	5.68	1.32	2.42	22.10
	Average	1.00	1.00	21.74	21.85	19.07	19.17	110.45
2018	Maximum	1.56	1.38	124.45	52.87	**737.71**	99.77	**992.69**
	Minimum	0.02	0.03	2.74	7.76	1.00	3.47	9.50
	Average	0.36	0.36	22.36	22.37	20.91	20.96	116.63
2019	Maximum	5.43	1.87	152.93	61.11	163.29	47.13	**503.72**

Year	Parameter	CO (mg/Nm^3)		NO^2 (µg/m^3)		SO$_2$ (µg/m^3)		PM (µg/m^3)
	Averaging Period	*1 Hour*	*8 Hour*	*1 Hour*	*24 Hour*	*1 Hour*	*24 Hour*	*24 Hour*
	Ambient Standards	*30*	*10*	*400*	*150*	*350*	*150*	*150*
	Minimum	0.01	0.01	1.45	7.05	0.75	2.27	17.10
	Average	0.83	0.81	21.84	21.80	16.37	16.35	102.33
Key: Exceedance in bold								
Source: Regulations for the Protection of Air from Pollution (Ministerial Decree No. 12 of 2006). ADNOC Standard for Pollution Prevention and Control (HSE-EN-ST-02.)								

5.1.4. Potential Impacts

5.1.4.1 Impact Sources

During the construction phase of the LNG facility in Ruwais, Abu Dhabi, potential sources of air emissions that may impact ambient air quality include:

- **Engine Exhaust Emissions:** Emissions from diesel-powered construction equipment, heavy machinery, vehicles, and generators (CO, NO_x, SO_2, PM, CO_2).
- **Dust Emissions:** Particulate matter generated from excavation, earthworks, material handling, and movement of vehicles on unpaved surfaces.
- **Fugitive Emissions:** Volatile organic compounds (VOCs) released during fuel storage and handling, refueling activities, and solvent use.
- **Odor:** Odors arising from waste handling, temporary sewage facilities, and storage of certain materials.

5.1.4.2 Sensitive Receptors

During the construction phase, the primary sensitive receptors for air quality impacts are the on-site workers and the adjacent marine environment. Given the expected construction activities, dust, exhaust emissions, and potential odors are the main air quality concerns that may affect these receptors.

Key sensitive receptors and their characteristics are as follows:

- On-Site Workers: Workers present within the project boundary are at the highest risk of exposure to dust, exhaust emissions, and any localized odors generated during construction activities. Ensuring air quality controls, proper PPE, and routine health checks for these personnel is essential.
- Adjacent Marine Environment: The nearby sea could be affected by airborne particulates settling on the water surface and emissions from construction activities close to the shoreline. Monitoring emissions and implementing dust control measures near the shoreline will help minimize potential impacts on marine water quality and marine life.
- Nearby Communities identified in the Air Dispersion Modelling study [Ref 31] are the same for both air-sensitive and noise-sensitive receptors. However, these are considered low-risk receptors due to their distance from the site. The identified receptors are listed below with their names/IDs, descriptions, and distances from the project area (in km), respectively:
    - NML01 – NMC Ruwais Hospital – 4.9 km
    - NML04 – Dhafra Beach Hotel – 2.0 km
    - NML06 – Ruwais School – 5.1 km
    - NML07- Ruwais Palace – 5.0 km
    - NML10 – ADNOC Beach Club – Ruwais -2.4 km

- NML14 – RIC Boundary - 3.0 km

Figure 5-2 displays the air sensitive receptor to RLNG project.

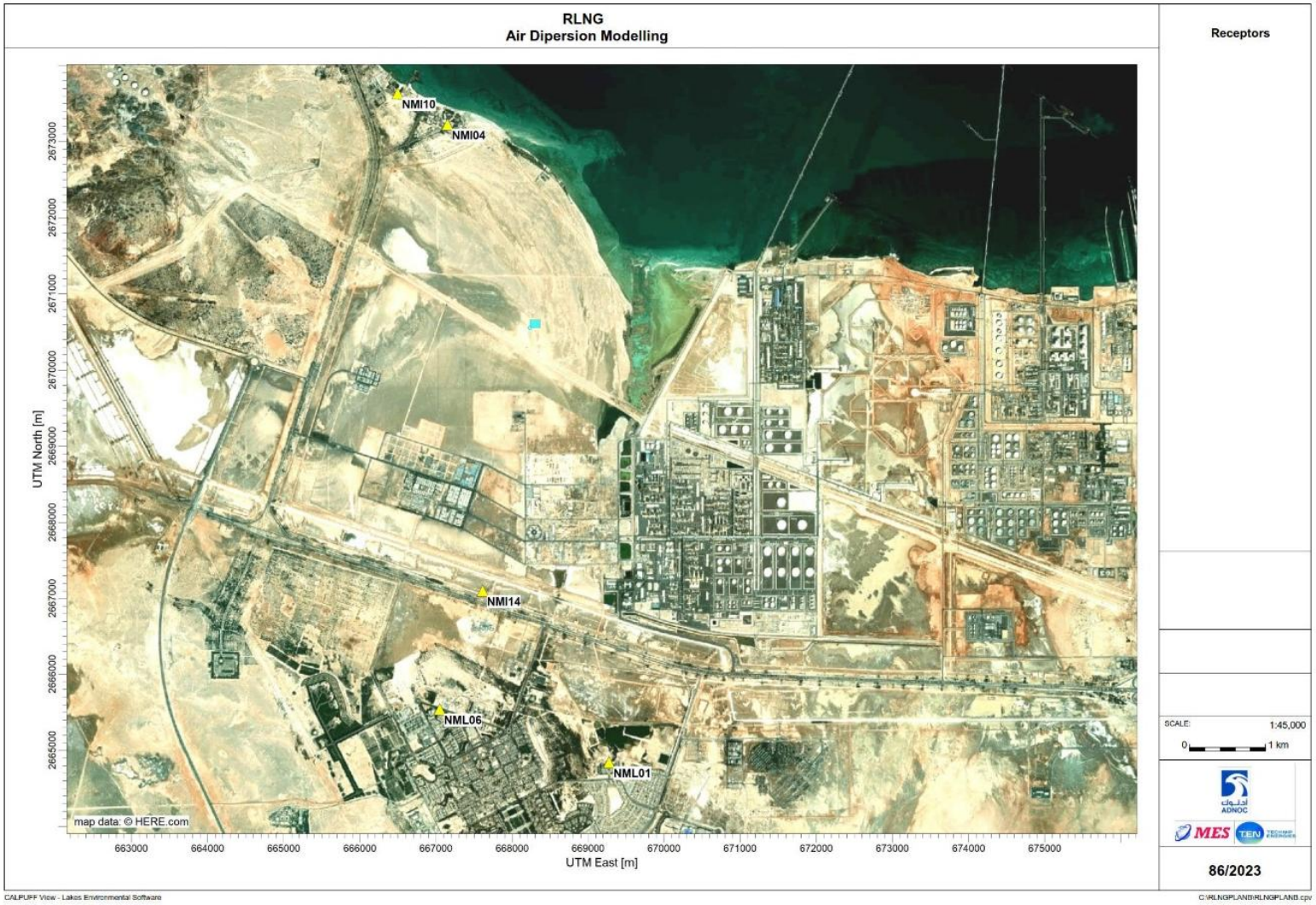


Figure 5-2. Air Sensitive Receptors

5.1.4.3 Impact Assessment

Given that the primary receptors during the construction phase are the onsite workers and the adjacent marine environment, pertinent impacts are described below:

- **Engine Exhaust Emissions**
    - **Description:** Emissions from construction equipment, generators, and vehicles may contribute to local air pollution.
    - **Impact:** Potential health effects on workers due to inhalation of pollutants; minor contribution to local air quality degradation.
    - **Significance:** Assessed as Low to Medium, considering the open environment and emission dispersion.
- **Dust Emissions**
    - **Description:** Activities such as excavation and vehicle movement can generate dust affecting air quality.
    - **Impact:** Respiratory issues for workers; potential dust deposition on the adjacent sea surface affecting water quality.
    - **Significance:** Assessed as Medium, due to the proximity to workers and the sea.
- **Fugitive Emissions**
    - **Description:** Release of VOCs during fuel storage and handling.
    - **Impact:** Exposure of workers to harmful vapors; minor impact on air quality.
    - **Significance:** Assessed as Low with proper handling procedures.
- **Odor**
    - **Description:** Odors from waste management and sewage facilities.
    - **Impact:** Nuisance to workers; negligible impact on distant receptors.
    - **Significance:** Assessed as Low, being localized and temporary.

5.1.5. Mitigation

To minimize air quality impacts during construction, the following mitigation measures will be implemented:

- **Engine Exhaust Emissions**
    - Use well-maintained equipment and vehicles to ensure efficient combustion.
    - Implement a preventative maintenance schedule for all machinery.
    - Utilize low-sulfur diesel fuel in compliance with UAE regulations.

- Turn off engines when not in use to reduce idling emissions.
- Preferentially use newer equipment meeting higher emission standards.
- Require all vessels (as applicable) to have a MARPOL/ IMO/ IAPP certificate, energy efficiency plan (specifically MARPOL Annex VI, which addresses maritime air pollution preventions).

- **Dust Emissions**
  - Regularly water unpaved areas, especially during dry and windy conditions.
  - Limit vehicle speeds on unpaved roads.
  - Cover or enclose stockpiles of dusty materials.
  - Use wheel-wash facilities at site exits.
  - Install windbreaks or barriers where appropriate.
- **Fugitive Emissions**
  - Store and handle fuels and chemicals in designated areas with proper containment.
  - Use sealed containers and proper transfer techniques.
  - Train personnel on safe handling of volatile substances.
  - Regularly inspect storage tanks and equipment for leaks.
- **Odor**
  - Manage waste and sewage properly to prevent odor generation.
  - Use closed systems for sewage collection and storage.
  - Regularly remove waste to authorized disposal facilities.
  - Implement good housekeeping practices.

5.1.6. Monitoring

To ensure the effectiveness of mitigation measures and compliance with relevant standards, the monitoring activities in Table 5-2 will be conducted.

Table 5-2. Air Quality Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Frequency	KPI(s)
Engine Exhaust Emissions	- Emission levels of CO, NO_x, SO_2, PM, CO_2 from equipment and vehicles - Visual inspections of emissions	- Quarterly monitoring - Daily visual inspections	- Percentage of equipment undergoing regular maintenance

Aspect	Parameter(s)	Frequency	KPI(s)
			- Number of instances of unnecessary idling per week
Dust Emissions	- PM_{10} and $PM_{2.5}$ concentrations - Visual observations of dust generation	- Continuous monitoring during peak activities - Daily inspections	- Number of dust complaints received per month - Compliance with PM_{10} and $PM_{2.5}$ standards
Fugitive Emissions	- VOC concentrations near storage and handling areas - Inspections for leaks and spills	- Monthly monitoring - Daily inspections	- Number of spill incidents reported per month - Percentage of personnel trained in handling procedures
Odor	- Odor observations (qualitative assessments)	- Daily inspections	- Number of odor complaints from workers per month

Monitoring Details:

- **Engine Exhaust Emissions**
    - Methodology: Use portable emission analyzers to measure exhaust emissions from equipment. Visual inspections for excessive smoke.
    - Standards: Compliance with UAE Federal Law No. 24 of 1999 and its amendments.
- **Dust Emissions**
    - Methodology: Install air quality monitors at site boundaries and near the adjacent sea to measure PM_{10} and $PM_{2.5}$.
    - Standards: Ensure compliance with UAE ambient air quality standards.
- **Fugitive Emissions**
    - Methodology: Monitor VOC levels using appropriate detection equipment near fuel storage areas.
    - Standards: Follow ADNOC standards and international best practices for VOC emissions.
- **Odor**
    - Methodology: Conduct routine site walkthroughs to identify odor sources and assess their intensity.

- Standards: Implement measures promptly upon detection of any significant odors.

5.1.7. Reporting

All monitoring results will be documented and reported to the project management team monthly. Any exceedances of standards will be reported immediately with corrective action plans.

5.1.8. Responsibilities

The HSE Manager will oversee the implementation of the Air Quality Management Plan, ensure compliance with mitigation measures, and coordinate monitoring activities.

5.1.9. Training and Awareness

Conduct regular training sessions for workers on:

- The importance of air quality management.
- Proper operation and maintenance of equipment to reduce emissions.
- Dust control practices.
- Safe handling and storage of fuels and chemicals.
- Waste management procedures to prevent odor generation.

5.1.10. Review and Update

The Air Quality Management Plan will be reviewed quarterly or when significant changes in construction activities occur to ensure its effectiveness and relevance.

5.2. GHG Management Plan

5.2.1. Objectives

The main objectives of the Greenhouse Gas (GHG) Management Plan during the construction phase of the LNG Project in Ruwais, Abu Dhabi are to:

- Reduce GHG Emissions: Implement strategies to minimize GHG emissions associated with construction activities.
- Ensure Compliance: Adhere to relevant regulatory requirements and standards for GHG emissions.

5.2.2. Regulatory Framework and Standards

The GHG Management Plan aligns with the following regulatory frameworks, standards, and guidelines relevant to GHG emissions during construction:

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-EN-ST03: Energy Management System
- HSE-EN-ST05: Environmental Performance Monitoring
- EOH-GID-010: Best Available Techniques (BAT) in GHG Management of Projects

UAE Laws and Regulations

- Federal Law No. 24 of 1999: Protection and Development of the Environment
- National Climate Change Plan 2017-2050
- UAE Net Zero by 2050 Strategic Initiative
- Council of Ministers' Decision No. 12 of 2006: Regulation on Protection of Air from Pollution

International Conventions and Protocols

- United Nations Framework Convention on Climate Change (UNFCCC), 1992
- Kyoto Protocol, 1997
- Paris Agreement under UNFCCC, 2015
- Intergovernmental Panel on Climate Change (IPCC) Guidelines for National GHG Inventories

5.2.3. Potential Impacts

5.2.3.1 Impact Sources

During the construction phase, GHG emissions are primarily associated with:

- Fuel Combustion: Use of diesel-powered equipment, machinery, and vehicles.
- Electricity Consumption: Use of electricity generated onsite by diesel generators.
- Transportation: Emissions from the transportation of materials, equipment, and personnel to and from the site.
- Material Use: Production and use of construction materials like cement and steel, which have embodied GHG emissions.

A GHG estimation methodology based on the GHG assessment conducted with guidance on monitoring and corrective actions is provided in **Appendix A** of this GHG Management Plan.

5.2.3.2 Impact Assessment

Potential Impacts:

- Contribution to Climate Change: GHG emissions contribute to global warming and climate change.
- Regulatory Non-Compliance: Exceeding emission limits can lead to regulatory penalties and reputational damage.
- Environmental Impact: GHG emissions can indirectly affect local ecosystems, including the adjacent sea.

Significance:

Given the scale of construction activities, the GHG emissions are significant and need to be managed effectively. The impact is assessed as Medium.

5.2.4. Mitigation

To reduce GHG emissions during construction, the following mitigation measures will be implemented:

- Fuel Efficiency and Equipment Management
    - Use Efficient Equipment: Utilize modern, fuel-efficient machinery and vehicles that meet high emission standards.
    - Regular Maintenance: Implement a preventive maintenance program to ensure equipment operates at optimal efficiency.
    - Equipment Selection: Select equipment appropriately sized for the task to avoid excessive fuel consumption.
    - Idle Reduction: Instruct operators to turn off engines when not in use to minimize idling.
- Alternative Energy Sources
    -
    - Grid Electricity: Connect to the electrical grid to reduce reliance on diesel generators, where possible.

- Transportation Management
    - Logistics Planning: Optimize transportation routes and schedules to reduce the number of trips.
    - Load Optimization: Maximize vehicle loads to reduce the total number of trips required.
    - Local Sourcing: Procure materials from local suppliers to minimize transportation distances.
- Material Efficiency
    - Efficient Use of Materials: Optimize design and construction methods to reduce material waste.
    - Use of Low-Carbon Materials: Where feasible, use materials with lower embodied carbon (e.g., blended cements, recycled steel).
- Awareness and Training
    - Staff Training: Educate workers on fuel-efficient practices and the importance of reducing GHG emissions.
    - Awareness Campaigns: Promote energy conservation and environmental awareness on-site.

5.2.5. Monitoring

A comprehensive monitoring plan will be implemented to track GHG emissions and the effectiveness of mitigation measures as show in Table 5-3.

Table 5-3. GHG Emissions Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Frequency	KPI(s)
Fuel Consumption	- Volume of diesel fuel consumed by equipment and vehicles	Monthly recording	- Total fuel consumption per month Fuel consumption per unit of work (e.g., liters per hour)
Electricity Generation	- Hours of operation of diesel generators - Amount of electricity generated	Monthly recording	- Total generator runtime per month - Efficiency of generators (kWh per liter of diesel)
Equipment Efficiency	- Maintenance records - Equipment performance data	Quarterly reviews	- Percentage of equipment maintained on schedule - Average fuel efficiency improvements
Transportation Emissions	- Number of trips - Distance traveled - Fuel consumption of vehicles	Monthly recording	- Average fuel consumption per trip - Reduction in total trips due to optimization

Material Use	- Quantity of high GHG materials used (e.g., cement, steel)	Monthly recording	- GHG emissions associated with material use (embodied emissions)
GHG Emissions Inventory	- Total GHG emissions calculated from fuel and electricity use	Quarterly reporting	- Total GHG emissions per quarter - GHG emissions per unit of construction activity

Monitoring Details:

- Methodology: Use standard emission factors from recognized sources (e.g., IPCC Guidelines, ADNOC Standards) to calculate GHG emissions based on fuel consumption data.
- Data Collection: Collect accurate data on fuel usage, electricity generation, and material consumption.
- Verification: Regular audits to verify data accuracy and compliance with monitoring protocols.

5.2.6. Reporting

GHG emission reports will be prepared quarterly and submitted to project management and relevant authorities as required.

5.2.7. Responsibilities

The Project Environmental Manager will oversee the GHG Management Plan, ensuring implementation of mitigation measures and monitoring activities.

5.2.8. Training and Awareness

- Training Programs: Conduct training sessions for staff on:
    - Efficient operation of equipment.
    - Fuel-saving practices.
    - Importance of GHG emission reduction.
- Awareness Materials: Distribute informational materials (posters, bulletins) highlighting GHG reduction strategies.

5.2.9. Review and Update

- Periodic Review: The GHG Management Plan will be reviewed biannually or when significant changes occur in construction activities.
- Continuous Improvement: Adjust mitigation measures and targets based on monitoring results and advancements in technology or best practices.

5.2.10. Appendices

Appendix A: GHG Emissions Estimation and Management

I. GHG EMISSIONS INVENTORY

An estimation of GHG emissions during the construction phase is provided to establish a baseline and identify key emission sources.

Major Sources of GHG Emissions:

1. **Fuel Combustion from Equipment and Vehicles**
    - **Diesel Consumption**: Heavy machinery and vehicles consume diesel fuel, leading to CO_2, CH_4, and N_2O emissions.
    - **Estimation Method**: Calculate total diesel consumption and apply emission factors.
2. **Electricity Generation Onsite**
    - **Diesel Generators**: Used when grid electricity is unavailable.
    - **Estimation Method**: Calculate fuel consumption based on generator runtime and load.
3. **Transportation of Materials**
    - **Delivery Trucks**: Emissions from transporting construction materials.
    - **Estimation Method**: Calculate emissions based on distance traveled and fuel efficiency.
    -

Example GHG Emission Calculation:

- **Diesel Fuel Combustion**
    - **Total Diesel Consumption**: Assume 1,000,000 liters over the construction period.
    - **Emission Factor**: 2.68 kg CO_2 per liter of diesel (IPCC default value).
    - **Total CO_2 Emissions**: 1,000,000 liters × 2.68 kg CO_2/liter = 2,680,000 kg CO_2 or 2,680 tonnes CO_2.
- **Embodied Emissions in Cement**
    - **Cement Usage**: Assume 10,000 tonnes.
    - **Emission Factor**: 0.83 tonnes CO_2 per tonne of cement (World Business Council for Sustainable Development).
    - **Total CO_2 Emissions**: 10,000 tonnes × 0.83 tonnes CO_2/tonne = 8,300 tonnes CO_2.

Total Estimated GHG Emissions: Sum emissions from all sources to obtain the total.

II. MONITORING PROGRESS

- **Emissions Tracking**: Regularly update the GHG emissions inventory to track performance against reduction targets.
- **Performance Indicators**:
    - **Fuel Consumption Reduction**: Measure decrease in fuel usage per unit of work.
    - **Emission Intensity**: Monitor GHG emissions per unit of construction activity (e.g., tonnes CO_2 per square meter built).

III. CORRECTIVE ACTIONS

- If monitoring indicates that targets are not being met:
    - **Review Practices**: Analyze current practices to identify inefficiencies.
    - **Implement Additional Measures**: Introduce further mitigation strategies, such as increased use of more efficient equipment.
    - **Engage Stakeholders**: Involve contractors and suppliers in efforts to reduce emissions.

IV. STAKEHOLDER ENGAGEMENT

- **Communication**: Inform stakeholders (employees, contractors, authorities) about GHG management efforts and achievements.
- **Collaboration**: Work with suppliers and contractors to source low-carbon materials and adopt best practices.

V. COMPLIANCE AND AUDIT

- **Regulatory Compliance**: Ensure all GHG emissions are within regulatory limits and reporting requirements are met.
- **Audits**: Conduct internal audits to verify compliance and identify opportunities for improvement.

5.3. Climate Risk Management Plan

5.3.1. Objectives

The main objectives of the Climate Risk Management Plan during the construction phase of the LNG Project in Ruwais, Abu Dhabi are to:

- Identify and Manage Climate Risks: Recognize potential climate-related risks during construction and operation phases and implement measures to mitigate them.
- Ensure Resilience and Sustainability: Incorporate adaptation strategies into project design and construction to enhance resilience against climate change impacts.
- Comply with Regulations: Adhere to all relevant UAE laws, Abu Dhabi regulations, ADNOC standards, and international best practices related to climate risk management.

5.3.2. Regulatory Framework and Standards

The Climate Risk Management Plan aligns with the following regulatory frameworks, standards, conventions, and guidelines:

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST07: HSE Design Philosophy
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-GA-ST09: HSE Audit and Assurance

UAE Laws and Regulations

- Federal Law No. 24 of 1999: Protection and Development of the Environment
- Abu Dhabi Climate Change Strategy 2021-2025: A strategic plan for mitigating and adapting to climate change impacts

International Standards and Guidelines

- Intergovernmental Panel on Climate Change (IPCC) Reports: Providing scientific assessments on climate change
- International Finance Corporation (IFC) Performance Standards:
    - Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
    - ISO 14090: Adaptation to Climate Change—Principles, Requirements, and Guidelines

- ISO 14001: Environmental Management Systems

International Best Practices

- Equator Principles: A risk management framework for determining, assessing, and managing environmental and social risk
- World Bank Group's Climate Change Action Plan

5.3.3. Climate Risks to the Project

5.3.3.1 Overview

As per the Climate Change Risk Assessment (CCRA) report [Ref 33], a climate change risk assessment was performed for the Ruwais RLNG facility using the Equator Principles/World Bank screening tool and methodology. The assessment considered two scenarios, the SSP2- 4.5 and the SSP5-8.5 from 2025 till 2100 based on representative Concentration Pathway (RCP) 4.5 and RCP 8.5 scenarios up to 2030, 2050, and 2100, focusing on:

- Temperature
- Humidity
- Precipitation
- Sea Level Rise
- Dust Storms
- Sand Encroachment
- Wind and Storms
- Cyclones

RCP Scenarios

- RCP 4.5: Moderate emissions scenario with stabilization of emissions by mid-century.
- RCP 8.5: High emissions scenario with limited mitigation efforts.

5.3.3.2 Identified Risks

The risks identified are categorized under the following three main areas while the key risks are detailed further below:

1. Risks to Asset Integrity/Infrastructure Damage
2. Risks Related to Resource Availability, Resilience, Productivity Loss
3. Risks Related to People's Health and Related Consequences to the Facility

Key Risks:

a. Vulnerability to Sand Movement (Physical Risk)

- Assessment Findings
    - Roads in the project area are at moderate risk of sand encroachment due to sandy topsoil textures (Figure 5-3).
    - Roads near existing facilities in the southern and southeastern areas have low to medium probability of sand blockage.
- Implications
    - Potential for road blockages affecting transportation and access.
    - Increased maintenance requirements for roads and infrastructure.

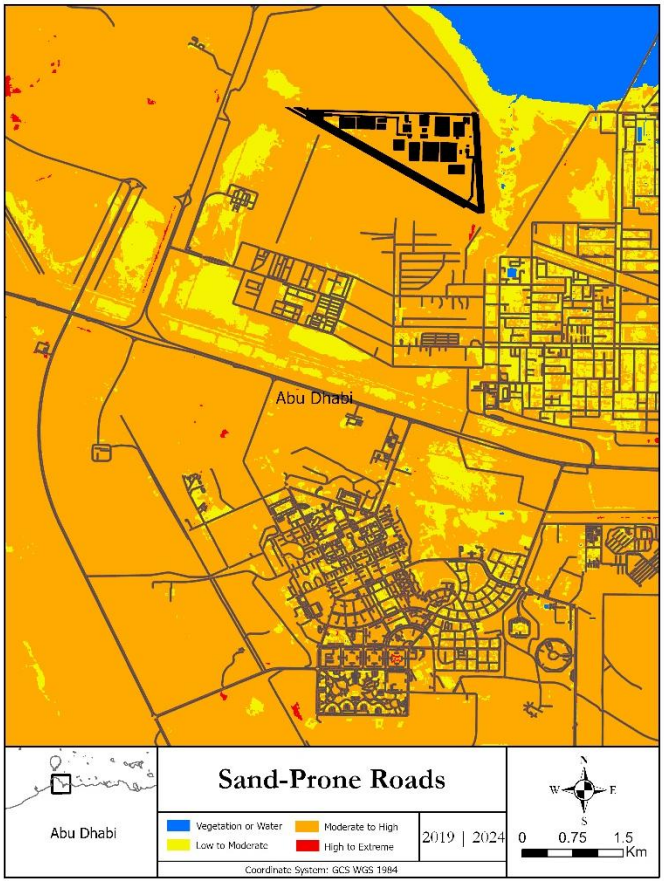


Figure 5-3. Vulnerability of roads toward sand encroachment (Aug 2019 till Aug 2024 – Mean)

b. Temperature-Related Risks

- Average Performance Loss Projection (Figure 5-4)
    - Methodology

– For each 1°C rise in maximum air temperature from 29°C to 46°C, a decrease in performance by 0.6% is expected.

– Projections made under RCP SSP2-4.5 and RCP SSP5-8.5 scenarios.

- RCP SSP2- 4.5 Findings

– Average annual performance loss from 2025 to 2060 is approximately 5.69%.

– Highest losses (>6%) expected in certain years due to higher temperatures.

– Trend shows increasing performance loss over time.

- RCP SSP5- 8.5 Findings

– Average annual performance loss is about 5.77%, slightly higher than RCP SSP2-4.5.

– More pronounced increase in performance loss due to higher temperature rise.

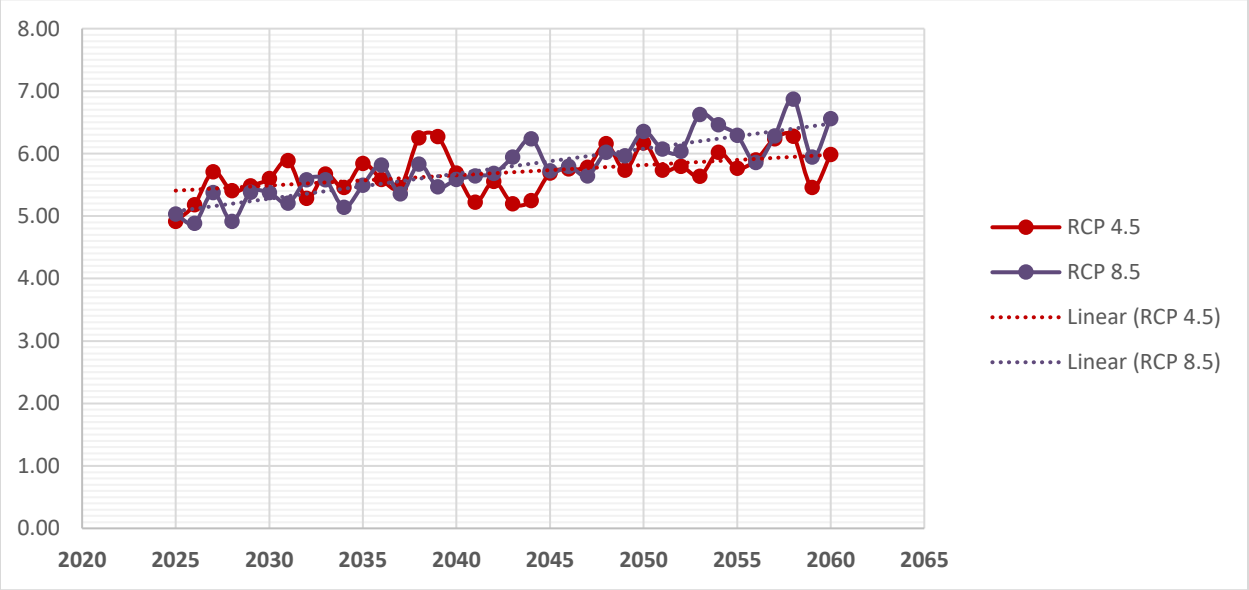


Figure 5-4. Average Performance Loss during Summer Season under RCP SSP2-4.5 and SSP5-8.5

- Human Risk Level

Risk Assessment Based on Maximum Air Temperature is shown in Table 5-4.

Table 5-4. Risk Assessment Based on Maximum Air Temperature (Source: Technical Guidelines for Management of Heat Stress at Work, Government of Dubai (2010)

Maximum Air Temperature Range	Human Risk Level	Control Approach
Up to 34°C	Low Risk (Caution)	Basic heat safety and planning
35°C to 39°C	Moderate Risk	Implement planned controls and create awareness
40°C to 45°C	High Risk	Additional controls with increased awareness
46°C and above	Very High Risk	Enhanced controls with enhanced awareness

- RCP SSP2- 4.5 Scenario (Figure 5-5)

- Occurrences of temperatures reaching 46°C are rare.
- High-risk levels (40°C to 45°C) are significant across most years.
- Moderate risk levels (35°C to 39°C) are prevalent, indicating increased exposure for workers.

- RCP SSP5-8.5 Scenario (Figure 5-6)

- Instances of temperatures reaching 46°C occur more frequently.
- High-risk levels are notably prevalent, with a peak of 89 days in 2058.
- Greater overall risk to worker health due to higher temperatures.

- Implications

- Increased risk of heat-related illnesses among workers.
- Potential for reduced productivity and operational disruptions.
- Need for enhanced heat stress management measures.

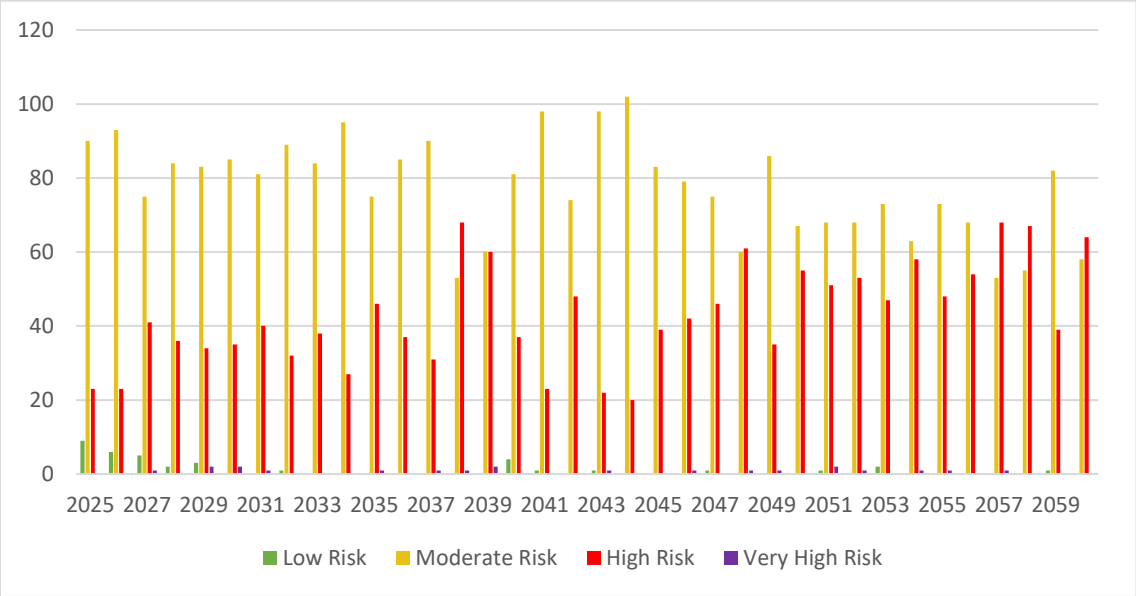


Figure 5-5. Human Risk Level Projection under SSP2- 4.5 from 2025 to 2060

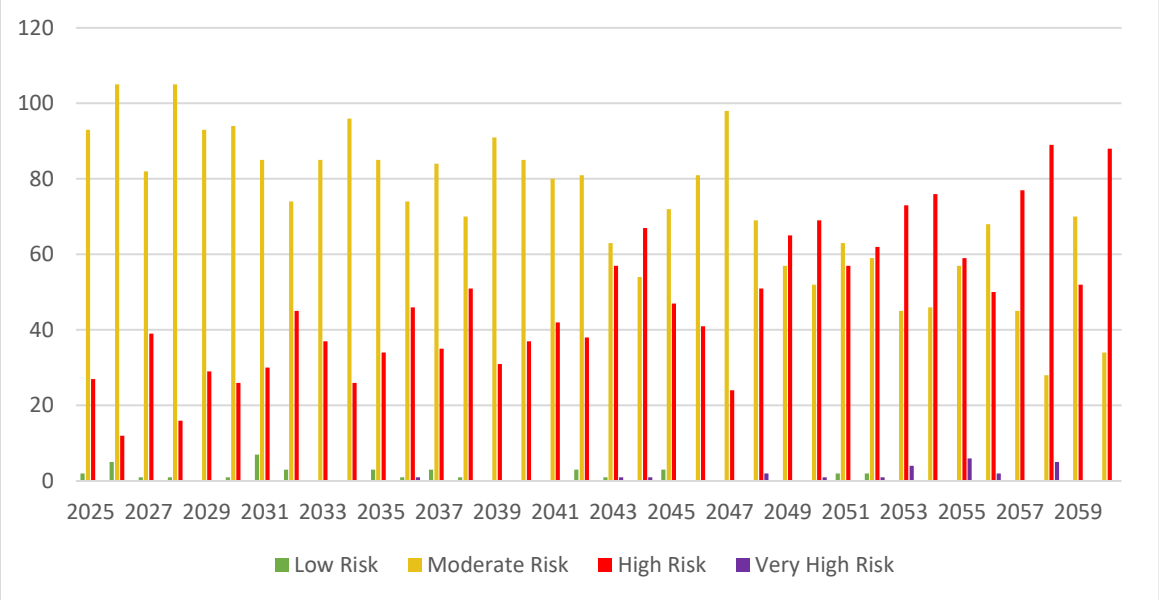


Figure 5-6. Human Risk Level Projection under SSP5- 8.5 from 2025 to 2060

5.3.4. Risk Assessment

5.3.4.1 Methodology

- Sensitivity of project components to identified hazards was assessed using a structured risk assessment methodology.

- A stakeholder workshop was conducted with the ADNOC design team to validate mitigation and adaptation measures and assess adaptive capacity.
- The risk assessment considered existing controls and adaptation measures already integrated into the design and operational procedures.

5.3.4.2 Results

The overall risk is Low for all relevant climate-related hazards when considering existing and planned mitigation and adaptation measures a shown in Table 5-5.

Table 5-5. Summary Table of the Overall Risk per Hazard

Hazard	Risk
Temperature	Low
Sea Level Rise	Low
Heavy Winds	Low
Soil Erosion	Low
Cyclones	Low

5.3.5. Adaptation Measures

To enhance resilience against identified climate risks, specific adaptation measures have been developed for both the design (EPC Contractor to incorporate in Design prior to construction) and construction phases. These measures (Table 5-6 and Table 5-7) are aimed at mitigating potential impacts on infrastructure, operations, and personnel.

Table 5-6. Design Phase Adaptation Actions

Action No.	Adaption Aspect	Action Name	Action Description	Responsible Entity	KPIs
1	Temperature Control	Install Advanced Temperature Control Systems and Insulation	- Incorporate advanced HVAC units, automated temperature sensors, thermal insulation materials, and heat-resistant materials into facility design for plant facilities and power supply systems. - Ensure designs comply with temperature limits (not above 46°C).	ADNOC / EPC Contractor	- Reduction in temperature fluctuations inside plant facilities. - Decrease in energy consumption of HVAC systems. - Temperature stability within operational limits.
2	Heat Stress Management	Implement Heat Stress Management Measures for Workers	- Design facilities to include shade areas or shelters. - Plan the placement of drinking water stations. - Specify PPE designed to minimize heat stress. - Develop a heat stress management plan.	ADNOC / EPC Contractor	- Availability of shade areas and water stations in design. - Specification of PPE in procurement plans.
3	Sea-Level Rise and Flooding Protection	Elevate Critical Infrastructure and Install Flood Barriers	- Design and elevate storage tanks, processing equipment, power supply equipment, and marine facilities to at least 5 meters Abu Dhabi Datum (as planned). - Design barriers, berms, or sea walls around these facilities to prevent flooding.	ADNOC / EPC Contractor	- Compliance with elevation specifications in design. - Inclusion of flood protection measures in design documents.
4	Corrosion Protection and Material Durability	Apply Protective Measures to Pipelines	- Specify high-quality anti-corrosion coatings and cathodic protection systems for pipelines in design. - Select heat-resistant materials and insulation for pipelines exposed to temperature extremes.	ADNOC / EPC Contractor	- Percentage of pipelines designed with anti-corrosion measures. - Percentage of pipelines specified with heat-resistant materials.
5	Pipeline Design and Maintenance	Incorporate Flexible Joints and Supports in Pipelines	- Incorporate flexible joints and supports in pipeline design to accommodate ground movement. - Plan for ground movement assessments.	ADNOC / EPC Contractor	- Percentage of pipelines designed with flexible joints. - Inclusion of ground movement assessments in project plans.
6	Pipeline Design and Maintenance	Establish Routine Inspection and Maintenance Program	- Develop an inspection and maintenance schedule for pipelines during the operation phase. - Set up maintenance documentation requirements.	ADNOC / EPC Contractor	- Availability of maintenance schedules and documentation templates.
7	Facility Design for Extreme Weather	Design Facilities to Withstand Extreme Weather Events	- Incorporate reinforced structures and use impact-resistant, durable materials in facility design. - Use storm-resistant designs for power supply systems and backup power sources.	ADNOC / EPC Contractor	- Percentage of facilities designed for extreme weather resilience. - Compliance with design standards.

			- Plan for regular reviews and updates of design practices.		
8	Emergency Response Planning and Monitoring	Develop Emergency Response Plans and Monitoring Systems	- Develop emergency response plans, including contingency plans for access and supply chain flexibility. - Design and integrate advanced weather monitoring systems into the facility.	ADNOC / EPC Contractor	- Availability of emergency response plans. - Integration of monitoring systems in design.
9	Power Supply System Resilience	Enhance Resilience of Power Supply Systems	- Design cooling systems and select heat-resistant materials for power supply systems. - Elevate power supply equipment and design flood defenses. - Incorporate storm-resistant designs for power systems and backups.	ADNOC / EPC Contractor	- Compliance with temperature and elevation specifications in power system design. - Inclusion of backup power sources in design.
10	Roads and Access Routes	Enhance Resilience of Roads and Access Routes	- Design roads and access routes with erosion control measures and durable construction materials. - Develop contingency plans for maintaining access during adverse weather conditions.	ADNOC / EPC Contractor	- Percentage of roads designed with durable materials. - Availability of access contingency plans.
11	Supply Chain Management	Develop Flexible Supply Chain Strategies	- Identify alternative supply routes and suppliers during planning. - Establish agreements with backup suppliers and transportation services.	ADNOC / EPC Contractor	- Number of alternative routes and suppliers identified. - Number of backup agreements in place.
12	Support Infrastructure Resilience	Enhance Resilience of Support Infrastructure	- Plan to reinforce critical access points with weather-resistant materials. - Include structural reinforcements for bridges, culverts, and vulnerable structures in the design.	ADNOC / EPC Contractor	- Percentage of infrastructure designed with reinforcements. - Compliance with resilience standards in design.

Table 5-7. Construction Phase (CESMP) Adaptation Actions

Action	Aspect Area	Action Name	Action Description	Responsible Entity	KPIs
1	Temperature Control	Install Advanced Temperature Control Systems and Insulation	- Procure and install advanced HVAC units, automated temperature sensors, thermal insulation materials, and heat-resistant materials as per design specifications. - Ensure installation complies with quality standards.	ADNOC / EPC Contractor	- Installation completion as per schedule. - Quality checks passed. - Compliance with design specifications.
2	Heat Stress Management	Implement Heat Stress Management Measures for Workers	- Construct shade areas or shelters. - Install drinking water stations. - Provide PPE to workers. - Conduct initial training sessions on heat stress prevention. - Implement the heat stress management plan during construction activities.	ADNOC / EPC Contractor	- Number of shelters and water stations installed. - Percentage of workers provided with PPE. - Number of training sessions conducted.
3	Sea-Level Rise and Flooding Protection	Elevate Critical Infrastructure and Install Flood Barriers	- Elevate facilities to specified heights during construction. - Construct barriers, berms, or sea walls as designed. - Ensure construction quality meets design and safety standards.	ADNOC / EPC Contractor	- Compliance with construction specifications. - Inspection approvals obtained. - Number of facilities elevated and protected as per design.
4	Corrosion Protection and Material Durability	Apply Protective Measures to Pipelines	- Apply anti-corrosion coatings and install cathodic protection systems on pipelines during construction. - Install heat-resistant materials and insulation as specified. - Conduct quality assurance tests.	ADNOC / EPC Contractor	- Percentage of pipelines treated as per specifications. - Quality assurance tests passed. - Compliance with material specifications.
5	Pipeline Design and Maintenance	Incorporate Flexible Joints and Supports in Pipelines	- Install flexible joints and supports in pipelines as per design. - Prepare for ground movement assessments post-construction. - Document installation details for future maintenance.	ADNOC / EPC Contractor	- Completion of installations as per design. - Documentation of installation details. - Compliance with design parameters.
6	Pipeline Design and Maintenance	Establish Routine Inspection and Maintenance Program	- Set up maintenance documentation and schedules for pipelines. - Train relevant personnel on maintenance procedures. - Ensure readiness for operational phase inspections.	ADNOC / EPC Contractor	- Availability of maintenance schedules. - Number of personnel trained. - Quality of maintenance documentation.
7	Facility Design for Extreme Weather	Design Facilities to Withstand Extreme Weather Events	- Build facilities using reinforced structures and durable materials as per design. - Implement storm-resistant features in power systems and backups. - Conduct inspections to ensure compliance with design standards.	ADNOC / EPC Contractor	- Construction compliance with design standards. - Inspection and testing reports passed. - Percentage of facilities built as per extreme weather design.

8	Emergency Response Planning and Monitoring	Develop Emergency Response Plans and Monitoring Systems	- Install advanced weather monitoring systems. - Finalize and distribute emergency response plans to construction teams. - Conduct training sessions for construction personnel on emergency procedures.	ADNOC / EPC Contractor	- Operational monitoring systems installed. - Number of personnel trained. - Effectiveness of training sessions (assessed via feedback).
9	Power Supply System Resilience	Enhance Resilience of Power Supply Systems	- Install cooling systems and heat-resistant materials for power supply systems as per design. - Elevate power equipment and install flood defenses during construction. - Implement storm-resistant designs. - Test backup power sources.	ADNOC / EPC Contractor	- Completion of installations as per design. - Compliance with elevation and resilience standards. - Backup systems tested and operational.
10	Roads and Access Routes	Enhance Resilience of Roads and Access Routes	- Construct roads and access routes using specified durable materials and erosion control measures. - Prepare and communicate contingency plans for access during construction activities. - Ensure construction quality meets design standards.	ADNOC / EPC Contractor	- Road construction quality and durability. - Availability and communication of access plans. - Compliance with erosion control measures.
11	Supply Chain Management	Develop Flexible Supply Chain Strategies	- Establish agreements with backup suppliers and transportation services. - Set up communication protocols for supply chain management during construction. - Ensure materials and equipment are sourced as per contingency plans if needed.	ADNOC / EPC Contractor	- Number of agreements signed. - Supply chain readiness. - Effectiveness of communication protocols.
12	Support Infrastructure Resilience	Enhance Resilience of Support Infrastructure	- Reinforce critical access points and structures with weather-resistant materials during construction. - Complete structural reinforcements as per design. - Conduct inspections to ensure compliance.	ADNOC / EPC Contractor	- Percentage of infrastructure reinforced. - Inspection approvals obtained. - Compliance with resilience standards.

Monitoring

To ensure the effectiveness of adaptation measures and compliance with relevant standards, the following monitoring activities will be conducted:

Climate Event Monitoring

Temperature and Heat Stress

Monitor ambient temperature and humidity levels.

Record instances of heat stress incidents among workers.

Sea-Level Rise and Flooding

Monitor sea levels and weather forecasts for extreme events.

Inspect flood protection measures regularly.

Infrastructure Monitoring

Structural Integrity

Regular inspections of facilities, pipelines, and protective structures.

Assess for signs of corrosion, wear, or damage.

Roads and Access Routes

Monitor for sand encroachment and erosion.

Maintain access routes in safe condition.

Health and Safety Monitoring

Worker Health Surveillance

Record and analyze health data related to heat stress and other climate-related risks.

Implement corrective actions as necessary.

Supply Chain Monitoring

Logistics Assessments: Monitor supply chain performance and adjust contingency plans as needed.

Performance Indicators Tracking

KPIs as per Adaptation Actions: Regularly assess progress against KPIs outlined in the adaptation tables (Table 5-6 and Table 5-7).

Reporting

Monthly Reports: Summarize monitoring data, incidents, and actions taken.

Incident Reports: Immediate reporting of any significant climate-related incidents.

Annual Reviews: Assess overall performance of adaptation measures and update plans as necessary.

Responsibilities

Project Director/Manager:

Responsible for integrating adaptation measures into design and construction.

Ensure compliance with specifications and standards.

Overall responsibility for implementing the Climate Risk Management Plan.

Ensure adequate resources are allocated for adaptation measures.

HSE Manager:

Oversee monitoring activities and compliance with environmental and safety standards.

Coordinate with EPC Contractor on adaptation measures.

Environmental Manager:

Monitor environmental conditions and effectiveness of adaptation measures.

Report on climate-related performance indicators.

Construction Teams:

Implement adaptation actions during construction.

Report any issues or deviations promptly.

Stakeholder Engagement Officer:

Manage communication with stakeholders regarding adaptation measures.

Collect and address feedback from the community and other stakeholders.

Training and Awareness

Provide training and awareness programs for staff on climate risks and adaptation strategies.

Encourage innovation and proactive approaches to climate resilience.

Communication

Effective communication is essential for conveying mitigation and adaptation efforts to stakeholders based on the following:

Stakeholder Engagement Activities

Regular meetings with community members, local authorities, and other stakeholders.

Workshops and informational sessions on specific adaptation topics.

Information Dissemination

Public information campaigns, including articles, infographics, and videos.

Updates on project websites and social media platforms.

Feedback Mechanisms

Online surveys and feedback forms.

Suggestion boxes and community hotlines.

Review and Update

Regularly review the Climate Risk Management Plan to incorporate new data, technologies, and best practices.

Update adaptation measures based on monitoring results and stakeholder feedback.

5.4. Noise and Vibration Management Plan

5.4.1. Objectives

The main objectives of the Noise and Vibration Management Plan during the construction phase of the LNG Project in Ruwais, Abu Dhabi are to:

- Minimize Noise and Vibration Impacts: Reduce noise and vibration levels to protect the health and well-being of workers and minimize impacts on the adjacent marine environment.
- Ensure Compliance: Adhere to relevant regulatory requirements and standards for noise and vibration levels during construction activities.

5.4.2. Regulatory Framework and Standards

The Noise and Vibration Management Plan aligns with the following regulatory frameworks, standards, and guidelines relevant to noise and vibration during construction:

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-OH-ST08: Physical Health Hazard Standard

UAE Laws and Regulations

- Council of Ministers' Decision No. 32 of 1982This law is concerned with the protection of Health and Safety of workers
- Federal Law No. 24 and its Executive Orders of 1999 Protection and Development of the Environment
- Council of Ministers' Decision No. 12 of 2006Regulation on Protection of Air from Pollution - Allowable limits for Noise levels (EAD Noise and Vibration Standards)

International Conventions and Protocols

- International Maritime Organization (IMO), MARPOL Convention, 1973/1978
- Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, 1976
- Convention on Migratory Species (CMS), 1979
- Convention on Biological Diversity (CBD), 1992

WHO Guidelines

- WHO Environmental Noise Guidelines, 2018

International Best Practices

- ISO 14001 – Environmental Management Systems
- Implement BAT
- Community Communication Programs:
    - Engaging with nearby communities and providing real-time updates on noise and vibration helps maintain good relations and ensure transparency.
    - Complaint Mechanisms: Establishing platforms for community feedback regarding noise and vibration issues encourages swift resolution of concerns.

5.4.3. Baseline Conditions

The project site is located in an industrial area, and there are existing high noise sources in this area associated with industrial activities such as construction, operation of large-scale industries, vehicle movement from adjacent highway as well as vessels movement etc. The operation of the proposed Project will also contribute to noise levels in the industrial area.

A noise survey was undertaken by Arcadis at Ruwais and the surrounding area from 20th to 22nd September 2020 at 15 representative SR locations within the iRAMP area during the daytime (7.00 am - 8.00 pm) and night-time (8.00 pm - 7.00 am) periods using a type 1 sound level meter. Recordings were taken for 15-minute intervals at each monitoring location. Each location was monitored for equivalent continuous sound pressure level (LAeq).

In summary, the daytime noise levels were in compliance with the Federal noise standards at 12 locations, whereas the night-time noise levels were in compliance with the Federal limits at nine locations. The observed exceedances were recorded due to the following noise sources:

- Road traffic:
    - Occasional road traffic on the internal roads.
    - Road traffic on the E11 highway.
- The Ruwais Market, which included movement of residents and vehicles as well as humming and buzzing noise from the generator and lighting at the area.

5.4.4. Potential Impacts

5.4.4.1 Impact Sources

During the construction phase, potential sources of noise and vibration include:

- Onshore Activities:

- Operation of heavy machinery and equipment (e.g., excavators, bulldozers, cranes)
- Transportation of materials and equipment by trucks and other vehicles
- Piling and foundation works
- Operation of diesel generators

- Offshore Activities:
  - Piling operations for jetty construction
  - Movement of vessels and barges
  - Underwater blasting (if applicable)

5.4.4.2 Sensitive Receptors

Although the project site is in an industrial area with existing high noise levels, the primary sensitive receptors during construction are:

- Onsite Workers: Exposure to high noise levels can affect workers' health and safety.
- Marine Fauna: Underwater noise can impact marine species in the adjacent sea, including fish, marine mammals, and turtles.

The nearest community sensitive receptor is the Dhafra Beach Hotel, located approximately 2 km away from the project site. Given this distance and the industrial setting, noise and vibration impacts on this receptor are expected to be negligible.

5.4.4.3 Impact Assessment

- Onshore Noise and Vibration
  - Potential Impacts:

  – Health risks to workers due to prolonged exposure to high noise levels, potentially causing hearing loss or stress.

  – Nuisance and disturbance to workers, affecting productivity and well-being.

  – Structural vibrations affecting sensitive equipment or temporary structures on site.

  - Significance:

  – The impact on workers is assessed as Medium, requiring mitigation measures to protect health and safety.

  – Impact on offsite receptors is assessed as Low due to the distance and existing industrial noise levels.

- Offshore Noise and Vibration
  - Potential Impacts:

- Underwater noise from piling may disturb marine fauna, leading to behavioral changes, displacement, or physical harm.
- Potential impact on fish stocks, affecting local fisheries.
- Cumulative impacts when combined with existing maritime activities.
    - Significance:
- The impact on marine fauna is assessed as Medium to High, necessitating specific mitigation measures.
- Impact on the adjacent sea environment requires careful management.

5.4.5. Mitigation

To minimize noise and vibration impacts during construction, the following mitigation measures will be implemented:

- Onshore Mitigation Measures
    - Engineering Controls:
- Use equipment fitted with noise suppressors or silencers.
- Maintain equipment regularly to ensure optimal performance and minimal noise emissions.
- Employ temporary noise barriers or enclosures around high-noise activities when near sensitive areas.
    - Administrative Controls:
- Schedule high-noise activities during daytime hours when possible.
- Implement a job rotation schedule to limit workers' exposure to high noise levels.
- Enforce mandatory use of personal protective equipment (PPE), such as earplugs or earmuffs.
    - Transportation Management:
- Limit vehicle speeds within the construction site.
- Designate specific routes for heavy vehicles to minimize noise in certain areas.
- Restrict unnecessary horn usage.

- Offshore Mitigation Measures
    - Piling Techniques:
- Use low-noise piling methods, such as hydraulic or vibratory piling where feasible.
- Implement soft-start procedures (gradual increase in intensity) to allow marine fauna to move away.
    - Marine Fauna Monitoring:
- Employ Marine Mammal Observers (MMOs) to monitor for the presence of sensitive species.
- Establish exclusion zones; halt piling if marine mammals are observed within the zone.

- Scheduling: Avoid piling during critical periods for marine life (e.g., breeding or migration seasons).
- Equipment Selection: Use modern, well-maintained vessels and equipment designed to minimize underwater noise emissions.

- Vibration Mitigation Measures
  - Monitoring: Regularly monitor vibration levels during high-vibration activities to ensure they remain within acceptable limits.
  - Communication: Inform all workers about potential vibration sources and safety precautions.

5.4.6. Monitoring

To ensure effective noise and vibration management and compliance with relevant standards, the monitoring activities in Table 5-8 will be conducted.

Table 5-8. Noise and Vibration Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Onshore Noise Levels	- Sound pressure levels (dB(A)) - Octave band analysis	- At site boundaries - Near high-noise equipment - Worker areas	- Weekly measurements - Continuous monitoring during peak activities	- Compliance with UAE noise standards - Number of exceedances per month
Worker Exposure	- Personal noise dosimetry readings	- Selected workers in high-noise areas	- Quarterly assessments - Spot checks	- Percentage of workers exceeding exposure limits - PPE compliance rates
Offshore Noise Levels	- Underwater sound levels (dB re 1 µPa)	- Near piling sites - At specified distances from source	- Continuous during piling activities	- Compliance with marine noise guidelines - Observations of marine fauna behavior
Vibration Levels	- Vibration velocity (mm/s) - Acceleration (m/s²)	- At locations near vibration sources	- As required during high-	- Vibration levels within acceptable limits

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
	- Frequency spectra (velocity/acceleration at each frequency)	- Sensitive equipment areas	vibration activities	- Number of complaints or incidents
Marine Fauna Observations	- Sightings of marine mammals and turtles - Behavioral changes	- Within specified monitoring zones offshore	- Continuous during offshore activities	- Number of marine fauna sightings - Actions taken upon sightings

Monitoring Details

- Noise Monitoring Equipment:
    - Use calibrated Type 1 sound level meters for onshore noise measurements.
    - Utilize underwater hydrophones for offshore noise monitoring.
- Standards and Guidelines:
    - Ensure compliance with UAE Federal Law No. 24 of 1999 and Council of Ministers' Decision No. 12 of 2006 for noise limits.
    - Follow WHO Environmental Noise Guidelines, 2018.
- Worker Exposure Monitoring:
    - Conduct personal noise exposure assessments using dosimeters.
    - Ensure that exposure does not exceed occupational exposure limits.

5.4.7. Reporting

- Prepare monthly environmental monitoring reports summarizing noise and vibration data.
- Report any exceedances of noise or vibration limits immediately to project management.
- Document any incidents involving marine fauna and actions taken.

5.4.8. Responsibilities

- Environmental Manager: Oversee the implementation of the Noise and Vibration Management Plan, ensure compliance, and coordinate monitoring activities.
- HSE Officer: Ensure that workers are provided with appropriate PPE and that safe work practices are followed.

- Marine Mammal Observers (MMOs): Monitor marine fauna during offshore activities and advise on necessary action.

5.4.9. Training and Awareness

- Worker Training:
    - Provide training on the hazards of noise exposure and proper use of PPE.
    - Educate workers on vibration risks and safety measures.
- Marine Fauna Awareness: Train offshore personnel on the importance of marine fauna protection and procedures to follow when fauna are observed.

5.4.10. Communication

- Internal Communication: Regularly inform workers about ongoing noise and vibration management efforts.
- External Communication: While nearby communities are distant, establish a communication channel for any stakeholders to raise concerns.

5.4.11. Review and Update

- Periodic Review: Review the Noise and Vibration Management Plan quarterly or when significant changes in construction activities occur.
- Continuous Improvement: Adjust mitigation measures based on monitoring results and feedback to enhance effectiveness.

5.5. Soil and Groundwater Management Plan

5.5.1. Objectives

The main objectives of the Soil and Groundwater Management Plan during the construction phase of the LNG Project in Ruwais, Abu Dhabi are to:

- Prevent Contamination: Avoid soil and groundwater contamination resulting from construction activities.
- Ensure Safe Handling: Implement safe handling, storage, and disposal practices for hazardous materials and waste.
- Protect Receptors: Safeguard the health of workers and prevent adverse impacts on the adjacent marine environment.

5.5.2. Regulatory Framework and Standards

In the aim of environmental protection and development, the following regulatory framework, standards, conventions, and protocols, which are relevant to soil and groundwater protection are listed below.

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST04: Waste Management
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-CE-ST02: Oil Spill Response

UAE Laws and Regulations

- Federal Law No. 5 of 1981: Regulating groundwater resources
- Federal Law No. 24 and its Executive Orders of 1999: Protection and Development of the Environment
- Council of Ministers' Decision No. 37 of 2001: Regulation on Handling Hazardous Materials, Hazardous Wastes and Medical Wastes
- Local Law No. 21 of 2005: Waste Management in Abu Dhabi Emirate
- Ministerial Decree No. 20 of 2008: Establishes specific controls over the use of treated wastewater to prevent soil and groundwater contamination
- Abu Dhabi Environment, Health, and Safety Management System Framework, 2009
- Federal Law No. 12 of 2018: Integrated Waste Management:
- Federal Decree-Law No. 15 of 2020: Water Resources Management and Protection

- EAD Soil Contamination Standards, 2016

International Conventions and Protocols

- MARPOL (Marine Pollution) Convention, 1973/ 1978
- Convention on Wetlands of International Importance (Ramsar Convention) especially Waterfowl Habitat, as amended, 1982/1987
- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1989
- Protocol on the Control of Marine Trans boundary Movements and Disposal of Hazardous Wastes and Other Wastes, 1998

WHO Guidelines

WHO does not have specific guidelines solely for soil and groundwater protection. However, it does address related areas indirectly through standards on water quality, environmental health, and safe management of hazardous substances. WHO's guidelines on safe drinking water quality, for example, emphasize protecting groundwater sources, as they are often primary sources of potable water, particularly in rural areas. These guidelines set limits for contaminants and recommend strategies for pollution prevention to avoid contaminating groundwater sources.

Additionally, WHO's work on sanitation and health (e.g., guidelines for safe wastewater reuse) also provides principles that align with soil and groundwater protection, especially in terms of preventing contamination from wastewater. Although these recommendations are not explicitly targeted at soil and groundwater alone, they support the overall goal of environmental health, which includes protecting these resources indirectly through contamination prevention strategies and safe land management practices.

International Best Practices

- ISO 14001 – Environmental Management Systems
- Best Available Techniques (BAT): Source control and pollution prevention
- Community Communication Programs:
    - Engaging with nearby communities helps maintain good relations and ensure transparency.
    - Complaint Mechanisms: Establishing platforms for community feedback regarding soil and groundwater issues encourages swift resolution of concerns.

5.5.3. Baseline Conditions

Soil and Geology

The Ruwais coastal region is typified by carbonate sediments and saline sandy soils, known as "Sabkha," which have formed through the interplay of wind, evaporation, and occasional sheet flows. These processes have led to the formation of salt crusts near the surface due to capillary action from the shallow groundwater. The area's geological

profile includes weak calcarenite formations such as “Miliolite Sandstone” and bioclastic limestones, which reflect the sedimentary evolution of the UAE coastline.

To establish baseline soil quality, a soil survey was conducted on September 6, 2023, during which nine samples were collected from five locations within the project development area. Analysis results (detailed in Table 5.20 of the EIA report [Ref 30]) were benchmarked against the ADNOC Pollution Prevention and Control standards [Ref 5] and the Abu Dhabi QCC’s “Environmental Specification for Soil Contamination (ADS19/2017)” [Ref 38]. All results complied with these standards.

Groundwater

Groundwater in the Emirate of Abu Dhabi is limited due to low recharge rates, with high salinity and shallow levels along the coast. The project area is characterized by elevated groundwater tables near the coastline. Groundwater sampling was conducted between September 6 and 7, 2023, from three boreholes. As specific local standards for groundwater quality were unavailable, the results were assessed against Dutch Standards (see Table 5.21 in the EIA report [Ref 30]). All samples met the referenced standards, establishing a baseline for groundwater quality.

5.5.4. Potential Impacts

5.5.4.1 Impact Sources

During the construction phase, potential sources that may impact soil and groundwater include:

- Hazardous Material Storage and Handling: Leaks or spills from storage containers of chemicals, fuels, and hazardous substances.
- Fuel and Oil Spills: Leakage from construction equipment, vehicles, and fuel storage tanks.
- Chemical Spills: Accidental releases during handling and use of construction chemicals.
- Waste Generation and Disposal: Improper disposal of construction waste, including hazardous and non-hazardous waste.
- Excavation and Earthworks: Disturbance of contaminated soil or exposure of groundwater.

5.5.4.2 Sensitive Receptors

The primary sensitive receptors during construction are:

- Onsite Workers: Potential exposure to contaminated soil or groundwater.
- Adjacent Marine Environment: The sea adjacent to the construction site, which could be affected by runoff or spills reaching the marine ecosystem.

5.5.4.3 Impact Assessment

- Potential Impacts:
    - Soil Contamination: Spills or leaks of hazardous materials can lead to soil contamination, affecting soil quality and potentially impacting flora and fauna.

- Groundwater Contamination: Contaminants can infiltrate through soil to the groundwater table, leading to pollution of groundwater resources.
- Marine Pollution: Runoff carrying contaminants can reach the adjacent sea, harming marine life and ecosystems.
- Worker Health Risks: Exposure to contaminated soil or groundwater can pose health risks to workers through dermal contact or inhalation of vapors.

- Significance:
  - Soil and Groundwater: The impact is assessed as Medium, requiring effective mitigation measures to prevent contamination.
  - Marine Environment: The impact is assessed as Medium, necessitating controls to prevent pollutants from reaching the sea.
  - Worker Health: The impact is assessed as Medium, highlighting the need for safe work practices and protective measures.

5.5.5. Mitigation

To prevent soil and groundwater contamination during construction, the following mitigation measures will be implemented:

- Hazardous Material Storage and Handling
  - Secure Storage Areas:
    - Store hazardous materials in designated, secure areas with restricted access.
    - Use impermeable surfaces and secondary containment (e.g., bunds or drip trays) capable of holding 110% of the largest container's volume.
  - Proper Labeling and Segregation:
    - Clearly label all containers with contents and hazard symbols.
    - Segregate incompatible materials to prevent reactions.
  - Leak Detection and Maintenance:
    - Regularly inspect storage containers and equipment for leaks or damage.
    - Maintain a maintenance log for all equipment handling hazardous materials.
- Fuel and Oil Spill Prevention
  - Equipment Maintenance:
    - Implement a preventative maintenance program for all machinery and vehicles to prevent leaks.
    - Use absorbent pads or drip trays under stationary equipment.

- Refueling Procedures:
  - Conduct refueling activities in designated areas with spill containment measures.
  - Train personnel on safe refueling practices.
- Chemical Spill Prevention
  - Safe Handling Procedures:
  - Provide training to personnel on the proper handling and use of chemicals.
  - Use appropriate transfer equipment to minimize spills during dispensing.
  - Spill Response Kits:
  - Position spill response kits at strategic locations, including storage areas and work sites.
  - Ensure kits contain absorbents, neutralizing agents, and protective equipment.
- Waste Management Practices
  - Waste Segregation and Storage:
  - Segregate waste at the source into hazardous and non-hazardous categories.
  - Store waste in designated areas with appropriate containment.
  - Authorized Disposal:
  - Use licensed waste contractors for the collection and disposal of waste.
  - Maintain waste transfer notes and disposal certificates.
  - Reduce, Reuse, Recycle (3Rs):
  - Implement waste minimization practices.
  - Encourage recycling of materials where feasible.
- Excavation and Earthworks Control
  - Soil Management:
  - Characterize excavated soil for contamination before reuse or disposal.
  - Store excavated soil away from drainage pathways.
  - Erosion and Sediment Control:
  - Implement silt fences, sediment traps, or barriers to prevent runoff.
  - Schedule earthworks during dry weather when possible.
- General Measures

- Emergency Response Plan:

- Develop and implement a Spill Prevention and Response Plan.
- Train personnel in emergency procedures and conduct regular drills.

- Drainage Control:

- Design site drainage to prevent contaminated runoff from reaching the sea.
- Use oil-water separators where appropriate.

- Training and Awareness:

- Conduct regular training sessions on environmental protection practices.
- Display signage to reinforce proper procedures.

5.5.6. Monitoring

To ensure the effectiveness of mitigation measures and compliance with relevant standards, the monitoring activities in Table 5-9 will be conducted.

Table 5-9. Soil and Groundwater Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Soil Quality	- Total Petroleum Hydrocarbons (TPH) - Heavy Metals (e.g., lead, mercury) - pH and Conductivity	- Areas near hazardous material storage - Spill sites (if any)	- Quarterly sampling - After any spill incident	- Compliance with EAD Soil Contamination Standards - Number of exceedances reported
Groundwater Quality	- pH, - Conductivity - TPH - Heavy Metals - Chemical Oxygen Demand (COD)	- Existing groundwater monitoring wells - Down-gradient of the site	- Quarterly sampling - After any significant spill	- Compliance with referenced groundwater standards - Number of exceedances reported
Inspection of Storage Areas	- Integrity of storage containers - Condition of secondary containment - Spill kit availability	- Hazardous material storage areas - Fuel storage tanks	- Weekly inspections	- Number of inspection findings addressed Percentage of storage areas compliant

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Waste Management	- Waste segregation practices - Waste storage conditions - Documentation of waste disposal	- Waste storage areas - Throughout the construction site	- Weekly inspections	- Percentage of waste properly segregated - Number of waste disposal records maintained
Spill Response Readiness	- Availability of spill kits - Training records - Response time to spills	- Throughout the construction site	- Monthly checks - After training sessions	- Percentage of staff trained - Number of spill incidents responded to effectively
Runoff and Drainage Control	- Visual inspection of drainage systems - Erosion control measures	- Site perimeter - Near drainage outfalls	- Weekly inspections - After heavy rain events	- Number of incidents of uncontrolled runoff - Effectiveness of erosion controls
Recycling	- Types of recyclable materials - Compliance with waste segregation and recycling procedures	- Waste storage areas - Throughout the construction site	- Weekly inspections	- Percentage of construction waste recycled versus total waste generated - Volume of recyclable materials diverted from landfills
Dewater (hydrotest water)	- Volume of hydrotest water generated and treated (m^3) - Water quality parameters before discharge/reuse	- Dewatering discharge points - Water storage/treatment areas	- Monthly checks	- Compliance rate with water quality discharge standards - Volume of hydrotest water discharged versus total volume generated

Monitoring Details

- Sampling and Analysis:
    - Soil and groundwater samples will be collected by qualified personnel using standard methods.
    - Analysis will be conducted at accredited laboratories.

- Standards and Guidelines:
    - Soil quality results will be compared to the latest EAD Soil Contamination Standards (2016).
    - Groundwater quality will be assessed against applicable international guidelines if local standards are unavailable.
- Incident Reporting:
    - Any exceedance of standards or spill incidents will be reported immediately to project management.
    - An incident investigation will be conducted to identify root causes and preventive measures.

5.5.7. Reporting

- Prepare monthly environmental monitoring reports summarizing soil and groundwater monitoring data.
- Report any incidents, non-compliances, and corrective actions taken.
- Maintain records of training, inspections, and waste disposal.

5.5.8. Responsibilities

- Environmental Manager: Oversee the implementation of the Soil and Groundwater Management Plan, ensure compliance, and coordinate monitoring activities.
- Site Supervisor: Ensure that mitigation measures are implemented on-site and that workers follow procedures.
- HSE Officer: Conduct inspections, provide training, and respond to incidents.

5.5.9. Training and Awareness

- Training Programs - Provide training to all personnel on:
    - Safe handling and storage of hazardous materials.
    - Spill prevention and response procedures.
    - Waste segregation and disposal practices.
    - Emergency response and reporting protocols.
- Awareness Materials:
    - Display signage and posters highlighting key procedures and environmental protection measures.
    - Distribute informational leaflets or conduct toolbox talks.

5.5.10. Review and Update

- Periodic Review: Review the Soil and Groundwater Management Plan quarterly or when significant changes in construction activities occur.
- Continuous Improvement:
    - Adjust mitigation measures based on monitoring results and feedback to enhance effectiveness.
    - Incorporate lessons learned from incidents or near-misses.

5.6. Waste Management Plan

5.6.1. Objectives

The main objectives of the waste management plan during the construction phase of the RLNG Project are to:

- Minimize Waste Generation: Implement waste prevention, reduction, reuse, and recycling practices to reduce the volume and toxicity of waste generated.
- Ensure Proper Handling and Disposal: Safely manage waste through proper segregation, storage, transportation, and disposal to prevent environmental impacts.
- Protect Sensitive Receptors: Safeguard the health of workers and prevent contamination of the adjacent sea.

5.6.2. Regulatory Framework and Standards

In the aim of environmental protection and development, the following regulatory framework, standards, conventions, and protocols, which are relevant to waste management are listed below.

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST04: Waste Management
- HSE-EN-ST05: Environmental Performance Monitoring

UAE Laws and Regulations

- Ministerial Order No. 32 of 1982: Prevention Methods and Measures for Protecting Workers against Work Hazards
- Federal Law No. 24 and its Executive Orders of 1999: Protection and Development of the Environment
- Council of Ministers' Decision No. 37 of 2001: Regulation concerning Environmental Impact Assessment of Projects
- Law of 2002: Regulation on Handling Hazardous Materials, Hazardous Wastes, and Medical Wastes
- Local Law No.21 of 2005: Waste Management in Abu Dhabi Emirate
- Council of Ministers' Decision No. 12 of 2006: Regulation on Protection of Air from Pollution
- Local Law No. 17 of 2008: Establishment of the Center for Waste Management
- Federal Law No.12 of 2018: Integrated Waste Management
- Occupational Safety and Health Center Abu Dhabi Occupational Safety and Health System Framework (OSHAD-SF) Code of Practice (CoP) 3.0.

International Conventions and Protocols

- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1989
- Protocol for the Protection of the Marine Environment against Pollution from Land-Based Sources, 1990
- United Nations Framework Convention on Climate Change (UNFCCC), 1992
- Kyoto Protocol of the UNFCCC, 1997
- Stockholm Convention on Persistent Organic Pollutants (POPs), 2001
- Paris Agreement under UNFCCC, 2015

International Best Practices

- ISO 14001 – Environmental Management Systems
- Implement Best Available Technologies (BAT)
- Continuous Emission Monitoring Systems (CEMS)
- Community Communication Programs:
    - Engaging with nearby communities and providing real-time updates on waste management helps maintain good relations and ensure transparency.
    - Complaint Mechanisms: Establishing platforms for community feedback regarding waste management issues encourages swift resolution of concerns.

5.6.3. Potential Impacts

5.6.3.1 Impact Sources

During the construction phase, waste generation can lead to several potential impacts on the environment and human health if not properly managed:

- Hazardous Waste Generation: Use of chemicals, oils, paints, solvents, and other hazardous materials can produce hazardous waste.
- Non-Hazardous Waste Generation: Construction activities generate non-hazardous waste such as concrete, wood, metals, plastics, and packaging materials.
- Domestic Waste: Waste generated from worker accommodations and site offices, including food waste, paper, and general refuse.
- Wastewater: Effluent from site facilities, including sanitary wastewater and wash water.
- Potential Litter and Debris: Improper disposal can lead to waste dispersal by wind or water runoff.

5.6.3.2 Sensitive Receptors

- Onsite Workers: Exposure to hazardous waste can pose health risks.
- Adjacent Marine Environment: The nearby sea can be contaminated by waste runoff, spills, or improper disposal, affecting marine life and ecosystems.

5.6.3.3 Impact Assessment

- Potential Impacts
    - Soil and Water Contamination: Improper disposal or accidental spills can lead to contamination of soil and groundwater, potentially reaching the adjacent sea.
    - Health Risks to Workers: Exposure to hazardous waste can cause health issues.
    - Marine Pollution: Waste entering the sea can harm marine organisms and disrupt ecosystems.
    - Waste Accumulation: Unmanaged waste can lead to unsightly conditions, attract pests, and create odors.
- Significance: The impact is assessed as Medium, requiring effective waste management practices to mitigate potential adverse effects.

5.6.4. Mitigation Measures

To minimize waste generation and manage waste properly during construction, the following mitigation measures will be implemented:

5.6.4.1 Waste Minimization

- Waste Prevention and Reduction
    - Material Optimization: Order materials accurately to reduce surplus.
    - Efficient Construction Methods: Use prefabrication where possible to minimize onsite waste.
    - Material Substitution: Use materials that generate less waste or are recyclable.
- Reuse and Recycling
    - Segregation at Source: Separate waste streams at the point of generation.
    - Reuse of Materials: Reuse materials such as timber, pallets, and formwork where feasible.
    - Recycling Programs: Implement recycling for materials like metals, plastics, paper, and glass.

5.6.4.2 Waste Segregation and Storage

- Segregation Practices
    - Provide clearly labeled and color-coded waste containers for different waste types (hazardous, non-hazardous, recyclable, etc.).
    - Educate workers on proper segregation through training and signage.

- Waste Storage
    - Store waste in designated areas away from watercourses and drainage systems.
    - Use covered containers to prevent waste dispersion by wind or rain.
    - Ensure hazardous waste is stored in secure, bunded areas with secondary containment.

5.6.4.3 Waste Handling and Transportation

- Licensed Contractors
    - Use approved and licensed waste service providers for transportation and disposal.
    - Verify that contractors comply with regulatory requirements.
- Safe Handling Procedures
    - Train personnel on safe handling of waste, particularly hazardous waste.
    - Use appropriate equipment for handling waste to prevent spills and exposure.

5.6.4.4 Waste Disposal

- Compliance with Regulations
    - Dispose of waste in accordance with ADNOC standards and UAE regulations.
    - Hazardous waste will be managed through approved facilities like the BeAAT (Central Environment Protection Facilities).
- Documentation
    - Maintain records of waste types, quantities, and disposal methods.
    - Keep waste transfer notes and disposal certificates.

5.6.4.5 Emergency Response

- Spill Response Plan
    - Develop and implement a plan for responding to waste spills.
    - Equip the site with spill response kits appropriate for the types of waste handled.

5.6.4.6 Training and Awareness

- Worker Education
    - Conduct regular training sessions on waste management practices.
    - Use toolbox talks, posters, and bulletins to reinforce key messages.

5.6.5. Monitoring

To ensure effective waste management and compliance with relevant standards, the monitoring activities in Table 5-10 will be conducted.

Table 5-10. Waste Management Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Waste Generation	- Types and quantities of waste generated - Segregation effectiveness	- Throughout the construction site	- Monthly recording - Weekly inspections	- Total waste generated per month - Percentage of waste segregated correctly
Waste Storage	- Condition of storage areas - Labeling and signage - Container integrity	- Waste storage areas	- Weekly inspections	- Number of non-compliances identified and corrected - Percentage of containers in good condition
Waste Disposal	- Documentation of waste transfers - Disposal methods - Contractor compliance	- Administrative offices Disposal sites	- Monthly audits	- All waste disposed through licensed contractors - Availability of disposal certificates
Hazardous Waste Management	- Storage conditions - Spill incidents - Training records	- Hazardous waste storage areas	- Weekly inspections - After any incident	- Number of spill incidents Percentage of staff trained in hazardous waste handling
Recycling Efforts	- Quantities of materials recycled - Recycling facilities used	- Waste storage areas	- Monthly recording	- Percentage of waste recycled - Reduction in waste sent to landfill
Worker Training and Awareness	- Training sessions conducted - Attendance records	- Training facilities	- Quarterly	- Number of workers trained

Monitoring Details

- Data Collection:

- Use waste tracking forms to record types and quantities of waste.
- Collect weighbridge tickets, manifests, and receipts from waste contractors.

- Inspections:
  - Conduct regular site inspections to check waste storage, segregation, and housekeeping practices.
  - Inspect waste containers for integrity and proper labeling.
- Audits: Perform periodic audits of waste management procedures and contractor compliance.
- Reporting: Prepare monthly waste management reports summarizing data and any issues identified.

5.6.6. Reporting

To ensure transparency and accountability in waste management, regular reporting will be carried out as follows:

- Monthly Reports: Summarize waste data, KPIs (e.g., waste generated, recycled percentage), and corrective actions.
- Incident Reports: Document any waste-related incidents within 24 hours, detailing responses and follow-up actions.
- Quarterly Compliance Summary: Provide an overview of regulatory and ADNOC compliance, including trends and recommendations.
- Annual Review: Conduct a year-end evaluation of waste management effectiveness, updating the plan as needed.

All reports will be made available to ADNOC and other relevant stakeholders to ensure ongoing compliance and continuous improvement in waste management practices.

5.6.7. Responsibilities

- Environmental Manager:
  - Oversee the implementation of the Waste Management Plan.
  - Ensure compliance with regulations and standards.
  - Coordinate monitoring activities and reporting.
- Site Supervisor:
  - Ensure that waste management practices are implemented on-site.
  - Address any issues identified during inspections.
- HSE Officers / Environmental Specialists
  - Conduct training and awareness programs.

- Monitor worker compliance with waste management procedures.

- All Personnel:
    - Follow waste segregation and handling procedures.
    - Report any spills or incidents immediately.

5.6.8. Training and Awareness

- Training Programs – Provide training to all workers on:
    - Waste segregation and recycling practices.
    - Safe handling and storage of waste.
    - Emergency response procedures for spills.
- Awareness Campaigns:
    - Display posters and signage to reinforce waste management messages.
    - Conduct regular toolbox talks focusing on waste-related topics.

5.6.9. Review and Update

- Periodic Review: Review the Waste Management Plan quarterly or when significant changes in construction activities occur.
- Continuous Improvement:
    - Update the plan based on monitoring results, audits, and feedback.
    - Implement corrective actions to address any non-compliances or inefficiencies.

5.7. Hazardous Materials Management Plan

5.7.1. Objectives

The main objectives of the hazardous material management plan during the construction phase of the RLNG Project are to:

- Ensure Safe Handling and Storage: Implement procedures for the safe handling, storage, and use of hazardous materials to prevent accidents and incidents.
- Prevent Contamination and Accidents: Minimize the risk of environmental contamination and occupational exposure by effectively managing hazardous materials.
- Comply with Regulations: Adhere to all relevant UAE laws, Abu Dhabi regulations, ADNOC standards, and international best practices related to hazardous materials management.
- Promote a Safety Culture: Foster awareness and responsibility among all personnel regarding the risks associated with hazardous materials.

5.7.2. Regulatory Framework and Standards

In the aim of environmental protection and development, the following regulatory framework, standards, conventions, and protocols, which are relevant to hazardous material management are listed below

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST04: Incident Notification, Investigation, and Reporting
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-GA-ST07: HSE Design Philosophy
- HSE-GA-ST08: HSE Performance Monitoring and Reporting
- HSE-GA-ST09: HSE Audit and Assurance
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST04: Waste Management
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-OA-ST08: Hazardous Substances
- HSE-OH-ST08: Physical Health Hazard Standard
- HSE-OH-ST09: Chemical Hazards Standard
- HSE-OH-ST10: Biological Hazards Standard
- HSE-OS-ST27: Hazard Communication Standard

UAE Laws and Regulations

- Federal Law No. 24 of 1999: Protection and Development of the Environment
- Federal Law No. 27 of 1981: Regulation of Industrial Waste (including hazardous substances)
- Federal Law No. 37 of 1992: Regulation of Hazardous Materials
- Council of Ministers' Decision No. 37 of 2001: Regulation concerning Environmental Impact Assessment of Projects
- UAE Cabinet Regulation for Handling Hazardous Materials, Hazardous Wastes and Medical Wastes, 2001
- Abu Dhabi Environmental Law (Law No. 21 of 2005): Governs environmental protection in Abu Dhabi, with provisions for hazardous materials
- Abu Dhabi Waste Management Center (Tadweer) Regulations, 2010
- Ministry of Climate Change and Environment (MOCCAE) Guidelines
- UAE Civil Defense Laws and Regulations
- Ministry of Human Resources and Emiratization, Occupational Safety and Health Regulations, 1980

International Conventions and Protocols

- International Maritime Dangerous Goods (IMDG) Code, 1965
- MARPOL (Marine Pollution) Convention, 1973/ 1978
- Vienna Convention for the Protection of the Ozone Layer, 1985
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987
- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1989
- ILO Convention No. 170 on Safety in the Use of Chemicals at Work, 1990
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998
- Stockholm Convention on Persistent Organic Pollutants (POPs), 2001
- Minamata Convention on Mercury, 2013
- Strategic Approach to International Chemicals Management, 2020

WHO Guidelines

- Air Quality Guidelines
- Emergency Response Framework

- Guidelines for Drinking-water Quality (for Chemical Contaminants in Water)
- International Chemical Safety Cards
- Occupational Health and Safety Guidelines

International Best Practices

- ISO 14001 – Environmental Management Systems
- Implement BAT
- Community Communication Programs:
    - Engaging with nearby communities helps maintain good relations and ensure transparency.
    - Complaint Mechanisms: Establishing platforms for community feedback regarding hazardous material issues encourages swift resolution of concerns.

5.7.3. Potential Impacts

5.7.3.1 Impact Sources

During the construction phase, the use and management of hazardous materials can lead to several potential impacts on the environment and human health if not properly managed:

- Chemical Spills and Leaks: Accidental spills or leaks of hazardous chemicals such as solvents, fuels, lubricants, and paints.
- Exposure to Hazardous Substances: Workers may be exposed to hazardous substances through inhalation, skin contact, or ingestion.
- Hazardous Waste Generation: Improper disposal of hazardous waste can lead to contamination.
- Fire and Explosions: Improper storage and handling of flammable or reactive materials can result in fires or explosions.

5.7.3.2 Sensitive Receptors

- Onsite Workers: Directly exposed to hazardous materials during handling, storage, and use.
- Adjacent Communities: Potential exposure through air, water, or soil contamination.
- Marine Environment: Proximity to the sea means spills could impact marine ecosystems.
- Soil and Groundwater: Potential contamination from spills and leaks affecting soil quality and groundwater resources.

5.7.3.3 Impact Assessment

- Potential Impacts

- Environmental Contamination: Spills and leaks can contaminate soil, groundwater, and surface water, affecting ecosystems.
- Health Risks to Workers: Exposure can lead to acute or chronic health effects, including chemical burns, respiratory issues, or poisoning.
- Fire and Explosion Hazards: Risk of injury, property damage, and environmental harm.
- Regulatory Non-Compliance: Failure to manage hazardous materials properly can result in legal penalties and project delays.

- Significance: The impact is assessed as High, requiring stringent management and mitigation measures to prevent adverse effects.

5.7.4. Mitigation Measures

To manage hazardous materials safely during construction, the following mitigation measures will be implemented:

- Hazardous Materials Management
    - Hazard Identification and Inventory

  – Inventory Management: Maintain an up-to-date inventory of all hazardous materials, including quantities, storage locations, and MSDS/SDS.

  – Hazard Classification: Classify materials according to their hazard potential (flammable, corrosive, toxic, reactive).

    - Substitution and Minimization

  – Material Substitution: Use less hazardous alternatives where feasible.

  – Quantity Control: Order and store only the necessary amounts to reduce the volume of hazardous materials on-site.

- Storage and Handling Procedures
    - Storage Practices

  – Designated Storage Areas: Use appropriate, secure, and labeled storage facilities with secondary containment in accordance with ADNOC HSE-OA-ST08 Hazardous Substances [Ref 11] (i.e., secondary containment)

  – Segregation: Store incompatible materials separately to prevent reactions.

  – Ventilation: Ensure adequate ventilation to prevent accumulation of fumes.

    - Handling Procedures

  – Standard Operating Procedures (SOPs): Develop and implement SOPs for handling hazardous materials.

  – Personal Protective Equipment (PPE): Provide appropriate PPE and ensure its correct use.

- Transportation of Hazardous Materials
    - Licensed Contractors
    - Regulatory Compliance: Use approved and licensed carriers for transportation.
    - Documentation: Maintain proper documentation, including permits and manifests.
    - Safe Transportation
    - Packaging and Labeling: Use appropriate containers and label them according to regulations.
    - Route Planning: Plan transportation routes to minimize risks to the public and environment.
- Emergency Response and Spill Management
    - Spill Response Plan
    - Emergency Procedures: Develop and implement procedures for responding to spills and leaks.
    - Spill Kits: Equip the site with appropriate spill response equipment.
    - Training
    - Emergency Training: Train personnel in spill response and emergency procedures.
- Training and Awareness
    - Worker Education
    - Training Programs: Conduct regular training on hazardous materials management.
    - Awareness Campaigns: Use signage and toolbox talks to reinforce safe practices.
- Waste Management
    - Hazardous Waste Disposal
    - Compliance with Regulations: Dispose of hazardous waste through approved facilities.
    - Segregation and Storage: Properly segregate hazardous waste and store it securely until disposal.

5.7.5. Monitoring

To ensure effective hazardous materials management and compliance with relevant standards, the monitoring activities in Table 5-11 will be conducted.

Table 5-11. Hazardous Materials Management Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Hazardous Materials Inventory	- Types and quantities of hazardous materials - Inventory accuracy	- Storage areas - Administrative offices	- Monthly recording - Quarterly audits	- Up-to-date inventory - Percentage accuracy of inventory records
Storage Conditions	- Condition of storage areas - Labeling and signage - Containment integrity	- Hazardous materials storage areas	- Weekly inspections	- Number of non-compliances identified and corrected - Percentage of storage areas meeting standards
Handling Practices	- Compliance with handling procedures - PPE usage	- Throughout the construction site	- Weekly inspections - Random checks	- Number of safety violations - Percentage of workers using PPE correctly
Transportation Records	- Documentation of hazardous materials transport - Contractor compliance	- Administrative offices - Transport vehicles	- Monthly audits	- All hazardous materials transported by licensed contractors - Availability of transport permits and manifests
Spill and Incident Reporting	- Number of spills/incidents - Response time	- Entire construction site	- After any incident - Monthly summaries	- Number of incidents - Average response time - Percentage of incidents properly reported
Training and Awareness	- Training sessions conducted - Attendance records	- Training facilities	- Quarterly	- Number of workers trained - Increase in compliance rates
Environmental Monitoring	- Signs of contamination in soil and water	- Site perimeter - Nearby water bodies	- Quarterly	- Number of contamination events - Results within acceptable limits

Monitoring Details

- Data Collection:
    - Use monitoring forms to record observations and data.
    - Collect documentation such as inventory records, transport manifests, and training attendance sheets.
- Inspections:
    - Conduct regular site inspections to check storage conditions, labeling, and handling practices.
    - Inspect spill response equipment and PPE availability.
- Audits: Perform periodic audits of hazardous materials management procedures and contractor compliance.

5.7.6. Reporting

To ensure transparency and accountability in hazardous materials management, regular reporting will be carried out as follows:

- Monthly Reports: Summarize hazardous materials data, KPIs (e.g., inventory accuracy, incidents), and corrective actions.
- Incident Reports: Document any spills or hazardous materials incidents within 24 hours, detailing responses and follow-up actions.
- Quarterly Compliance Summary: Provide an overview of regulatory and ADNOC compliance, including trends and recommendations.
- Annual Review: Conduct a year-end evaluation of hazardous materials management effectiveness, updating the plan as needed.

All reports will be made available to ADNOC and other relevant stakeholders to ensure ongoing compliance and continuous improvement.

5.7.7. Responsibilities

- Environmental Manager:
    - Oversee the implementation of the Hazardous Materials Management Plan.
    - Ensure compliance with regulations and standards.
    - Coordinate monitoring activities and reporting.
- HSE Manager:
    - Ensure that hazardous materials management practices are implemented on-site.
    - Address any issues identified during inspections.

- Site Supervisors:
    - Enforce hazardous materials policies on-site.
    - Ensure proper handling, storage, and disposal practices are followed.
- HSE Officers / Environmental Specialists:
    - Conduct training and awareness programs.
    - Monitor worker compliance with hazardous materials procedures.
- All Personnel:
    - Follow hazardous materials handling and storage procedures.
    - Use PPE as required.
    - Report any spills or incidents immediately.

5.7.8. Training and Awareness

- Training Programs - Provide training to all workers on:
    - Hazardous materials handling and storage practices.
    - Use of PPE.
    - Emergency response procedures for spills.
- Awareness Campaigns:
    - Display posters and signage to reinforce hazardous materials management messages.
    - Conduct regular toolbox talks focusing on hazardous materials topics.

5.7.9. Review and Update

- Periodic Review: Review the Hazardous Materials Management Plan quarterly or when significant changes in construction activities occur.
- Continuous Improvement:
    - Update the plan based on monitoring results, audits, and feedback.
    - Implement corrective actions to address any non-compliances or inefficiencies.

5.8. Effluent, Drainage, and Wastewater Management Plan

5.8.1. Objectives

The main objectives of the effluent, drainage, and wastewater management plan during the construction phase of the RLNG Project are to:

- Prevent Environmental Contamination: Avoid pollution of soil, groundwater, and the adjacent sea through proper management of effluents and wastewater.
- Ensure Proper Treatment and Disposal: Implement effective treatment and disposal practices for all effluents and wastewater generated during construction.
- Comply with Regulatory Requirements: Adhere to all relevant laws, regulations, and standards governing effluent and wastewater management.

5.8.2. Regulatory Framework and Standards

The management plan aligns with the following regulatory frameworks, standards, and guidelines relevant to effluent, drainage, and wastewater management during construction:

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST04: Waste Management
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-CE-ST02: Oil Spill Response

UAE Laws and Regulations

- Ministerial Order No. 32 of 1982: Prevention Methods and Measures for Protecting Workers against Work Hazards
- Federal Law No. 24 and its Executive Orders of 1999: Protection and Development of the Environment
- Federal Law No. 23 od 1999: Exploitation, Protection and Development of Living Aquatic Resources in UAE
- Council of Ministers' Decision No. 37 of 2001: Regulation concerning Environmental Impact Assessment of Projects
- Council of Ministers' Decision No. 37 of 2001: Regulation on Protection of Marine Environment
- Law of 2002: Regulation on Handling Hazardous Materials, Hazardous Wastes, and Medical Wastes
- Local Law No.21 of 2005: Waste Management in Abu Dhabi Emirate

- Council of Ministers' Decision No. 12 of 2006: Regulation on Protection of Air from Pollution
- Local Law No. 17 of 2008: Establishment of the Center for Waste Management
- Federal Law No.12 of 2018: Integrated Waste Management
- Occupational Safety and Health Center Abu Dhabi Occupational Safety and Health System Framework (OSHAD-SF) Code of Practice (CoP) 3.0.

Conventions and Protocols

- International Convention for the Prevention of Pollution of the Sea by Oil, 1954
- Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter, 1972
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973
- Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution (ROPME), 1978
- Convention for the safety of Life at Sea -S.O.L.A.S. and protocol, 1978
- MARPOL (Marine Pollution) Convention, 1978
- Convention on conservation of migratory species of wild animal, 1979
- United Nations Convention on the Law of the Sea (UNCLOS), 1982
- Convention on Wetlands of International Importance especially Waterfowl Habitat, as amended, 1987
- Oil Pollution Preparedness, Response and Co-operation Convention, 1990
- Protocol for the Protection of the Marine Environment against Pollution from Land-Based Sources, 1990
- Convention on Biological Diversity, 1992
- Convention on Conservation of Wildlife and its Natural Habitats in the GCC Countries, 2003
- IMO (International Maritime Organization) Regulations

WHO Guidelines

- Guidelines for the safe use of wastewater, excreta and greywater

International Best Practices

- ISO 14001 – Environmental Management Systems
- Implement Best Available Technologies (BAT)
- Community Communication Programs:
    - Engaging with nearby communities and providing real-time updates on effluent, drainage, and wastewater management helps maintain good relations and ensure transparency.

- Complaint Mechanisms: Establishing platforms for community feedback regarding effluent, drainage, and wastewater management issues encourages swift resolution of concerns.

5.8.3. Potential Impacts

5.8.3.1 Impact Sources

During the construction phase, potential sources of effluent, drainage, and wastewater that may impact the environment include:

- Construction Runoff and Sedimentation: Surface runoff from disturbed soils and construction areas can carry sediments and pollutants into nearby water bodies.
- Machinery Washdowns and Oily Wastewater: Cleaning of equipment can generate wastewater contaminated with oils and greases.
- Sewage and Domestic Wastewater: Wastewater generated from sanitary facilities and worker accommodations.
- Stormwater Contamination: Stormwater may become contaminated due to spills, leaks, or improper storage of chemicals and fuels.
- Hydrotest Water Discharges: Water used for pressure testing pipelines and tanks may contain additives or contaminants.
- Chemical and Fuel Spills: Accidental releases during handling and storage of chemicals and fuels.
- Dewatering Activities: Groundwater extracted during excavation may be contaminated.

5.8.3.2 Sensitive Receptors

The primary sensitive receptors during construction are:

- Adjacent Marine Environment: The nearby sea, which could be affected by contaminated discharges, impacting marine life and ecosystems.
- Soil and Groundwater: Potential contamination could affect soil quality and groundwater resources.
- Onsite Workers: Exposure to contaminated water can pose health risks.

5.8.3.3 Impact Assessment

- Potential Impacts
    - Water Pollution: Discharge of untreated or improperly treated effluents can lead to contamination of the adjacent sea, affecting water quality and harming marine organisms.
    - Soil and Groundwater Contamination: Spills and leaks can infiltrate the soil, reaching the groundwater table.
    - Sedimentation: Increased sediment loads in runoff can cause turbidity in water bodies, affecting aquatic life.

- Health Risks: Exposure of workers to contaminated water can lead to health issues.

- Significance: The impact is assessed as Medium to High, depending on the nature and scale of the contamination, requiring effective mitigation measures to prevent adverse effects.

5.8.4. Mitigation

To prevent contamination and ensure proper treatment and disposal of effluents and wastewater during construction, the following mitigation measures will be implemented.

- Effluent and Wastewater Management
    - Treatment Facilities:
    - Install appropriate wastewater treatment systems for sewage and oily wastewater, such as package sewage treatment plants (STPs) and oil-water separators.
    - Ensure treated effluent meets UAE regulatory discharge standards before release.
    - Sanitary Wastewater:
    - Provide adequate sanitary facilities connected to approved sewage treatment systems.
    - Regularly maintain and monitor STPs to ensure efficient operation.
    - Machinery Washdowns:
    - Designate specific washdown areas equipped with oil-water separators.
    - Reuse wash water where feasible or treat prior to discharge.
    - Hydrotest Water:
    - Use environmentally friendly additives approved by ADNOC.
    - Collect and test hydrotest water before discharge to ensure compliance with discharge standards.
    - Obtain necessary permits for discharge or arrange for offsite disposal through licensed contractors.
- Stormwater and Drainage Management
    - Erosion and Sediment Control:
    - Implement measures such as silt fences, sediment traps, and temporary drainage ditches to prevent sediment-laden runoff.
    - Stabilize exposed soils promptly using mulching, geotextiles, or vegetation.
    - Stormwater Management:
    - Develop a Stormwater Pollution Prevention Plan (SWPPP).
    - Inspect and maintain drainage systems regularly to prevent blockages and overflows.
    - Spill Prevention:

- Store chemicals and fuels in designated areas with secondary containment.
- Implement procedures for safe handling and transfer of hazardous substances.

- Chemical and Fuel Spill Response
    - Spill Response Plan:
- Develop and implement a Spill Prevention and Response Plan specific to effluents and wastewater.
- Equip the site with spill kits appropriate for the types of chemicals and fuels used.
    - Training: Train personnel on spill prevention, response procedures, and proper use of spill equipment.

- Discharge Control
    - Monitoring and Compliance:
- Regularly test effluent quality to ensure compliance with discharge limits.
- Cease discharges that do not meet standards and take corrective actions.
    - Discharge Permits: Obtain necessary permits for any discharges to the environment, as required by regulatory authorities.

- Dewatering Management
    - Treatment of Dewatering Effluent:
- Treat dewatering water if contaminated before discharge.
- Discharge dewatering effluent in a manner that does not cause erosion or flooding.

- General Measures
    - Good Housekeeping:
- Maintain clean work areas to prevent pollutants from entering drainage systems.
- Regularly inspect storage and handling areas for leaks and spills.
    - Awareness and Communication:
- Conduct regular training sessions for workers on environmental protection measures.
- Display signage to remind personnel of proper practices.

5.8.5. Monitoring

To ensure the effectiveness of mitigation measures and compliance with relevant standards, the monitoring activities in Table 5-12 will be conducted:

Table 5-12. Effluent, Drainage, and Wastewater Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Treated Effluent Quality	- pH, BOD_5, COD - Total Suspended Solids (TSS) - Oil and Grease - Nutrients (Ammonia, Nitrogen, Phosphorus) E. coli / Fecal Coliforms	- Outlet of sewage treatment plants - Discharge points to the sea	- Monthly sampling - After significant maintenance or incidents	- Compliance with UAE discharge standards - Number of exceedances reported
Oily Wastewater	- Oil and Grease - TPH - pH	- Outlets of oil-water separators	- Monthly sampling - After equipment washdowns	- Oil and grease levels within permissible limits - Efficiency of oil-water separators
Stormwater Runoff	- Visual inspections for turbidity, oil sheen - Sediment levels in traps	- Site perimeter - Discharge points	- Weekly inspections - After heavy rainfall events	- Functionality of erosion control measures - No visible signs of contamination
Hydrotest Water	- pH, TSS, Oil and Grease - Additives used	- Collection points before discharge	- Prior to discharge	- Compliance with discharge criteria - Proper disposal records
Spill Incidents	- Number of spills - Volume and type of material spilled - Response time	- Throughout the construction site	- Immediately upon occurrence - Monthly summary	- Zero major spills - Prompt containment and cleanup - Staff trained in spill response
Dewatering Effluent	- Turbidity - Contaminant levels if suspected	- Dewatering discharge points	- As required based on activity	- Discharges meeting quality standards - No adverse impacts observed
Equipment Maintenance	- Inspection records - Maintenance logs	- Treatment facilities - Washdown areas	- Monthly inspections	- Percentage of equipment maintained on schedule - Reduced downtime due to equipment failure
Worker Training	- Training sessions conducted - Attendance records	- Training facilities	- Quarterly	- Number of workers trained - Increased compliance observed

Monitoring Details

- Sampling and Analysis:
    - Samples will be collected by qualified personnel using standard methods.
    - Analysis will be conducted at accredited laboratories.
    - Results will be compared against relevant UAE standards and ADNOC requirements.
- Inspections: Regular inspections of treatment facilities, storage areas, and drainage systems will be conducted to identify issues promptly.
- Incident Reporting:
    - All spills and non-compliances will be reported immediately to project management.
    - Incident investigations will be carried out to identify root causes and preventive measures.

5.8.6. Responsibilities

- Environmental Manager:
    - Oversee the implementation of the Effluent, Drainage, and Wastewater Management Plan.
    - Ensure compliance with regulations and standards.
    - Coordinate monitoring activities and reporting.
- Site Supervisor:
    - Ensure that mitigation measures are implemented on-site.
    - Address any issues identified during inspections.
- HSE Officers:
    - Conduct training and awareness programs.
    - Monitor worker compliance with procedures.
- All Personnel:
    - Follow procedures for handling effluents and wastewater.
    - Report any spills or incidents immediately.

5.8.7. Reporting

- Prepare monthly environmental monitoring reports summarizing data and any issues identified.
- Maintain records of permits, sampling results, inspections, training, and incidents.

5.8.8. Training and Awareness

- Training Programs - Provide training to all workers on:
    - Effluent and wastewater management procedures.
    - Spill prevention and response.
    - Proper operation of treatment systems.
- Awareness Campaigns:
    - Display posters and signage to reinforce key messages.
    - Conduct regular toolbox talks focusing on environmental protection.

5.8.9. Review and Update

- Periodic Review: Review the Effluent, Drainage, and Wastewater Management Plan quarterly or when significant changes in construction activities occur.
- Continuous Improvement:
    - Update the plan based on monitoring results, audits, and feedback.
    - Implement corrective actions to address any non-compliances or inefficiencies.

5.9. Marine Ecology Protection Plan

5.9.1. Objectives

The main objectives of the Marine Ecology Protection Plan during the construction phase of the LNG Project in Ruwais, Abu Dhabi are to:

- Protect Marine Habitats and Biodiversity: Safeguard sensitive marine ecosystems, habitats, and species from adverse impacts associated with construction activities.
- Minimize Environmental Disturbance: Implement measures to reduce physical, chemical, and acoustic disturbances to marine life.
- Ensure Regulatory Compliance: Adhere to all relevant laws, regulations, and international conventions pertaining to marine ecology protection.

5.9.2. Regulatory Framework and Standards

The management plan aligns with the following regulatory frameworks, standards, and guidelines relevant to marine ecology protection during construction:

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-EN-ST06: Biodiversity Assessment

UAE Laws and Regulations

- Federal Law No. 24 and its Executive Orders of 1999: Protection and Development of the Environment
- Federal Law No. 23 od 1999: Exploitation, Protection and Development of Living Aquatic Resources in UAE
- Council of Ministers' Decision No. 37 of 2001: Regulation on Protection of Marine Environment
- Council of Ministers' Decision No. 23 of 2001: Protection of Ports, Shore, and Maritime Territories from Oil Pollution Incidents.

Conventions and Protocols

- International Convention for the Prevention of Pollution of the Sea by Oil, 1954
- Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter, 1972
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973
- IMO MARPOL (Marine Pollution) Convention, 1973/1978

- Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution (ROPME), 1978
- Convention for the safety of Life at Sea -S.O.L.A.S. and protocol, 1978
- Convention on conservation of migratory species of wild animal, 1979
- United Nations Convention on the Law of the Sea (UNCLOS), 1982
- Convention on Wetlands of International Importance especially Waterfowl Habitat, as amended, 1987
- Oil Pollution Preparedness, Response and Co-operation Convention, 1990
- Protocol for the Protection of the Marine Environment against Pollution from Land-Based Sources, 1990
- Convention on Biological Diversity, 1992
- Convention on Conservation of Wildlife and its Natural Habitats in the GCC Countries, 2003
- IMO (International Maritime Organization) Regulations

International Best Practices

- ISO 14001 – Environmental Management Systems
- Implement Best Available Technologies (BAT)
- Community Communication Programs:
    - Engaging with nearby communities and providing real-time updates on marine ecology protection helps maintain good relations and ensure transparency.
    - Complaint Mechanisms: Establishing platforms for community feedback regarding marine ecology protection issues encourages swift resolution of concerns.

5.9.3. Baseline Conditions

M/s Fugro was contracted by ADNOC to conduct marine baseline surveys for the RLNG Project between 13th to the 19th of September 2023 using a combination of remote sampling and investigation techniques including Drop-down Video (DDV), sediment grab, water sampler and plankton nets [Ref 35]. The objectives of the marine baseline study were to:

- Determine Environmental and Ecological Conditions: Assess the existing marine environment, including habitats, species diversity, and water quality.
- Identify Sensitive Habitats and Species: Locate and map critical habitats such as seagrass beds, coral reefs, and areas frequented by protected species.
- Establish Baseline Data: Provide a reference point for future monitoring and impact assessment.

Key Findings:

- Habitats Identified:
    - Seagrass Beds: Patches of seagrass, including species such as *Halodule uninervis* and *Halophila stipulacea*, found approximately 18 km northeast of the project site.
    - Macroalgae: Presence of red algae and other macroalgae species.
    - Unconsolidated Bottom: Predominant habitat of sand and silt substrates.
- Marine Fauna:
    - Marine Mammals: Occurrence of species such as dugongs (*Dugong dugon*), which are classified as Vulnerable by the IUCN.
    - Sea Turtles: Presence of green sea turtles (*Chelonia mydas*) and hawksbill turtles (*Eretmochelys imbricata*), both of which are of conservation concern.
    - Fish Species: Diversity of reef-associated fish, including commercially important species.
- Protected Areas:
    - Marawah Marine Protected Area (MPA): Located approximately 10-15 km northeast of the project site, designated as a UNESCO Marine Biosphere Reserve.
    - Sir Bani Yas Island: An important area for migratory species and marine biodiversity.

5.9.4. Potential Impacts

5.9.4.1 Impact Sources

During the construction phase, potential sources of impact on marine ecology include:

- Piling Operations: Generation of underwater noise and vibrations affecting marine life.
- Vessel Traffic: Increased movement of vessels leading to potential collisions with marine fauna and introduction of pollutants.
- Chemical and Oil Spills: Accidental releases from vessels or construction activities contaminating marine waters.

5.9.4.2 Sensitive Receptors

- Marine Habitats (Figure 5-7):
    - Seagrass Beds: Vital for marine biodiversity, serving as feeding grounds and nursery areas.
    - Coral Reefs: Important ecosystems providing habitat for numerous marine species.
    - Mangroves and Mudflats: Essential for coastal protection and biodiversity.
- Marine Fauna:

- Endangered Species: Dugongs, sea turtles, and certain species of dolphins and whales (Table 5-12).
- Fish Stocks: Commercially important species vital for local fisheries.

- Protected Areas:
  - Marawah MPA: A UNESCO Marine Biosphere Reserve.
  - Sir Bani Yas Island: A designated area for conservation of migratory species

Table 5-13. Marine Mammals Present Within UAE Waters (IUCN, 2023)

Scientific name	Common name	IUCN status	Occurrence in UAE Arabian Gulf
Megaptera novaeangliae	Arabian Sea humpback whale	EN	Rare
Balaenoptera edeni	Bryde's whale	LC	Regular
Orcinus orca	Killer whale	DD	Rare
Pseudorca crassidens	False killer whale	NT	Rare
Sousa plumbea	Indian Ocean humpback dolphin	EN	Regular
Tursiops aduncus	Indo-Pacific bottlenose dolphin	NT	Regular
Stenella attenuata	Pantropical spotted dolphin	LC	Rare
Delphinus delphis tropicalis	Indo-Pacific common dolphin	LC	Regular
Stenella longirostris	Spinner dolphin	LC	Regular
Neophocaena phocaenoides	Indo-Pacific finless porpoise	VU	Rare
Dugong dugon	Dugong	VU	Regular
Reference: Nearshore Surveys Services for Ruwais LNG Project Environmental Baseline Survey (2023)			

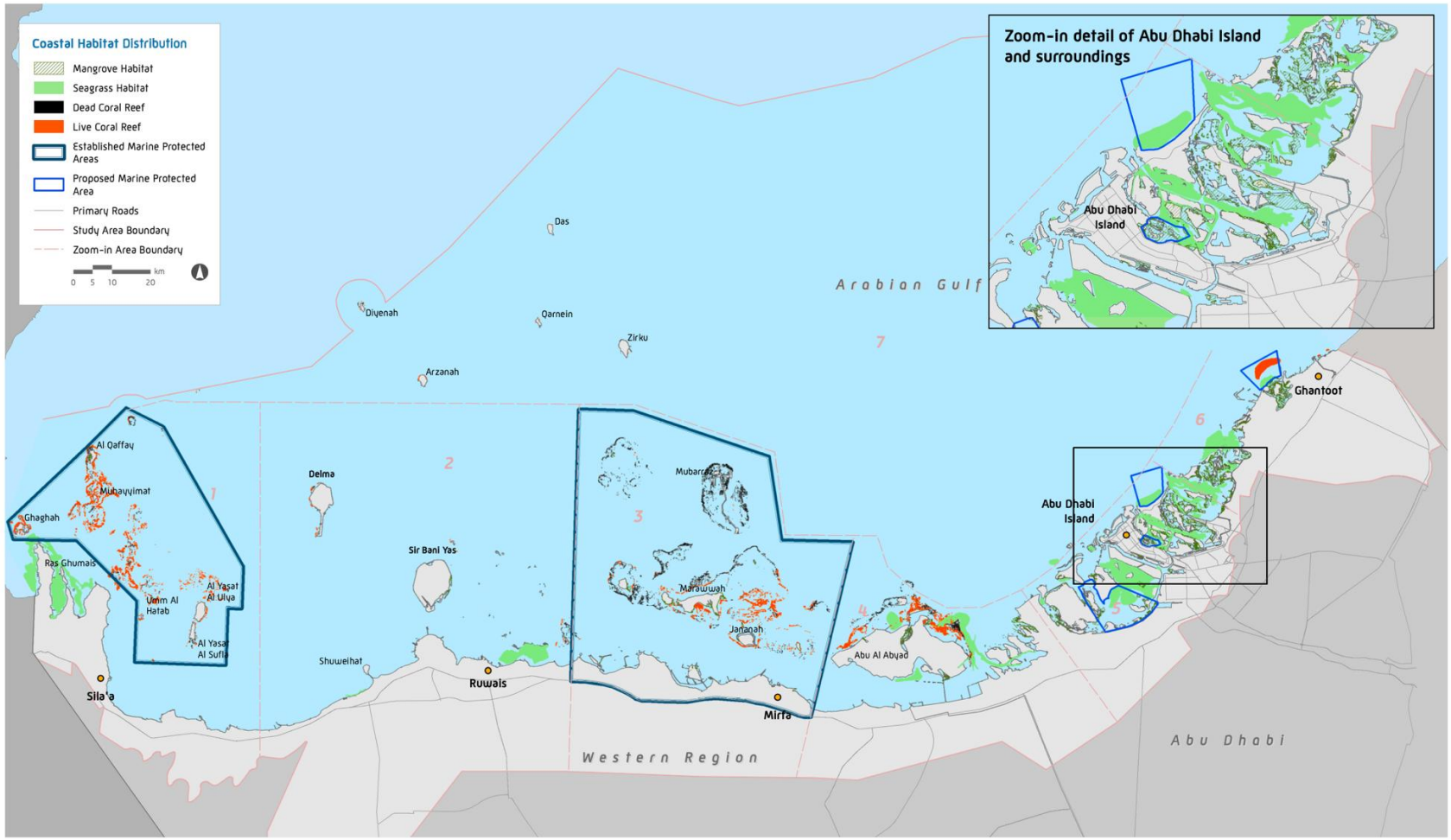


Figure 5-7. Marine Habitat Distribution

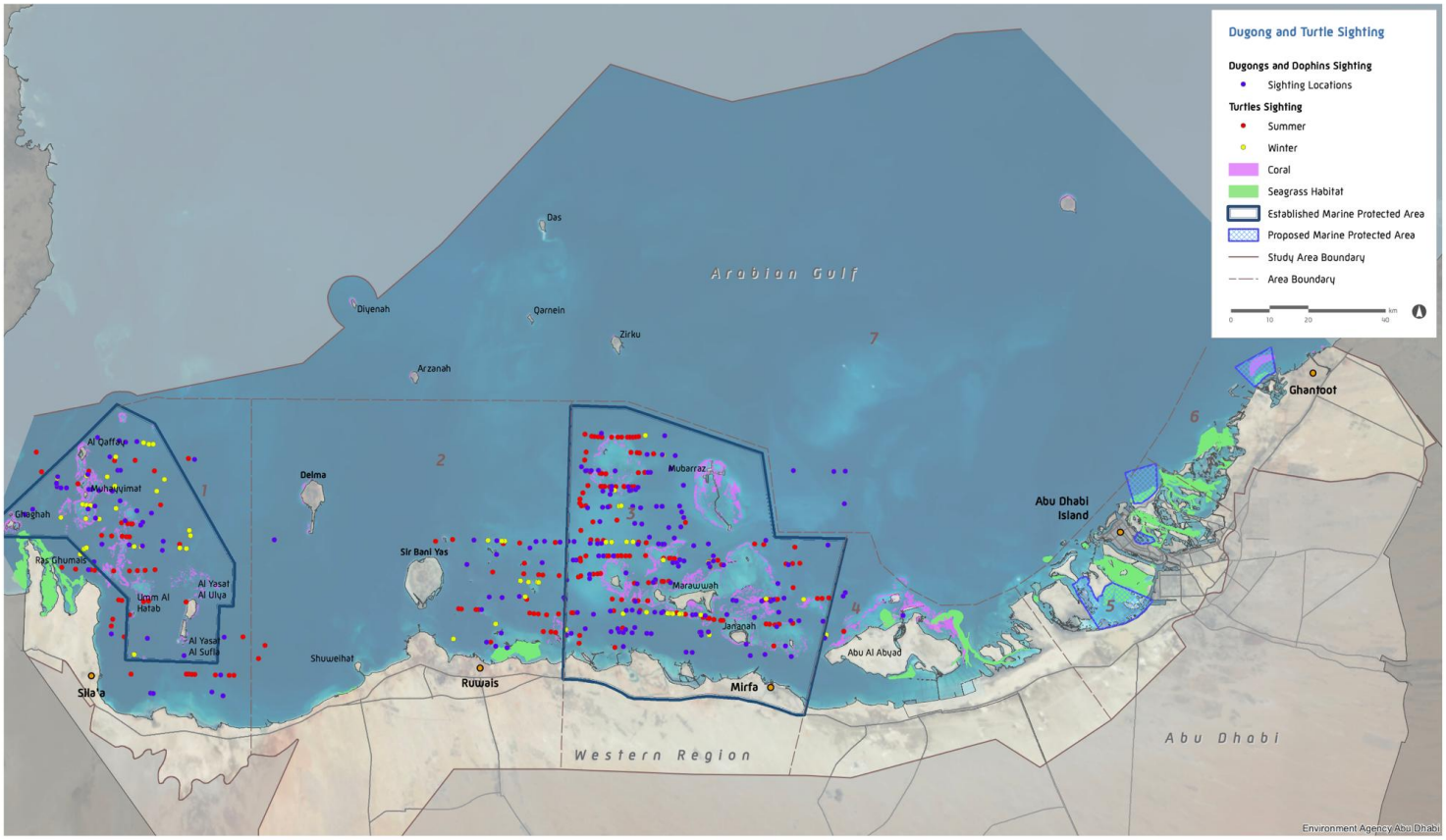


Figure 5-8. Dugongs and Turtle Sighting in Abu Dhabi

5.9.4.3 Impact Assessment

- Potential Impacts:
    - Habitat Destruction: Physical alteration or loss of habitats due to construction.
    - Underwater Noise Pollution: Disturbance to marine mammals and fish from piling and vessel operations.
    - Water Quality Degradation: Increased turbidity, sedimentation, and potential contamination from spills.
    - Collision Risks: Increased vessel traffic leading to potential collisions with marine fauna.
    - Disruption of Marine Life Behavior: Changes in feeding, breeding, and migration patterns.
- Significance: Due to the presence of sensitive habitats and endangered species, impact significance is considered High and requires stringent mitigation measures.

5.9.5. Mitigation Measures

To protect marine habitats and biodiversity, the following mitigation measures will be implemented:

- Planning and Design
    - Avoidance of Sensitive Areas:
    - Habitat Mapping: Conduct detailed marine habitat mapping prior to construction to identify sensitive areas.
    - Site Selection: Adjust construction plans to avoid critical habitats where possible.
    - Scheduling of Activities - Timing Restrictions: Schedule high-impact activities to avoid critical periods for marine species (e.g., breeding or migration seasons).
- Piling Operations
    - Sediment Control:
    - Silt Curtains: Deploy silt curtains around piling sites to contain suspended sediments.
    - Noise Reduction:
    - Soft-Start Procedures: Gradually increase piling intensity to allow marine life to vacate the area.
    - Use of Acoustic Dampening: Implement noise attenuation measures such as bubble curtains or cofferdams.
    - Monitoring of Marine Fauna:
    - Marine Mammal Observers (MMOs): Employ trained MMOs to monitor for the presence of marine mammals and turtles.
    - Exclusion Zones: Establish safety zones; halt operations if protected species are observed within these zones.
- Vessel Traffic Management

- Speed Restrictions - Transit Speed Limits: Implement maximum speed limits for vessels within designated areas to reduce collision risks.
- Designated Routes - Navigational Planning: Use predefined routes to avoid sensitive habitats.
- Crew Training - Environmental Awareness: Train vessel crews in marine species identification and collision avoidance protocols.

- Pollution Prevention
  - Spill Prevention and Response:
    - Spill Response Plan: Develop and implement an Oil Spill Contingency Plan.
    - Equipment Maintenance: Ensure all vessels and equipment are well-maintained to prevent leaks.
  - Waste Management - Proper Disposal: Ensure all waste, including bilge water and sewage, is managed in compliance with MARPOL regulations.
- Community and Stakeholder Engagement
  - Communication with Stakeholders:
    - Engage with Local Communities: Inform local stakeholders, including fishermen and conservation groups, about project activities.
    - Address Concerns: Consider feedback and adjust plans to mitigate impacts.
- Biodiversity Management
  - Restoration and Offset Programs:
    - Habitat Restoration: Develop plans to restore any habitats unavoidably impacted.
    - Biodiversity offsets: implement conservation projects to achieve a no net loss of natural habitat and net gain of critical habitat where required.39
- Regulatory Compliance
  - Permitting and Approvals:
    - Obtain Necessary Permits: Secure all environmental permits and approvals prior to commencement.
    - Adherence to Standards: Comply with all regulatory limits and guidelines for marine ecology protection.

5.9.6. Monitoring

To ensure the effectiveness of mitigation measures and compliance with relevant standards, the monitoring activities in Table 5-14 will be conducted.

Table 5-14. Marine Ecology Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Water Quality	- Turbidity Suspended Solids - Dissolved Oxygen - pH - Temperature	- Near piling sites - Control sites away from activities	- Weekly during active construction - After significant events (e.g., spills)	- Compliance with water quality standards - No significant deviation from baseline
Underwater Noise Levels	- Sound Pressure Levels (dB re 1 µPa) - Frequency spectra	- At varying distances from noise sources - Sensitive habitat areas	- Continuous during piling - Spot measurements during other activities	- Noise levels below threshold values for marine fauna - No observed behavioral disturbances
Marine Fauna Observations	- Sightings of marine mammals, turtles, and other protected species - Behavioral responses	- Within designated monitoring zones - From vessels and observation points	- Continuous during activities - Daily logs	- Number of sightings - Actions taken upon sightings - No incidents of harm
Habitat Condition	- Physical condition of habitats - Presence of sedimentation or contamination	- Sensitive habitats identified - Areas adjacent to construction	- Monthly surveys - Post-construction assessment	- No significant degradation of habitats - Successful restoration where applicable
Vessel Compliance	- Adherence to speed limits - Route deviations - Pollution incidents	- Vessel tracking systems - Port records	- Continuous monitoring - Monthly reviews	- Zero incidents of non-compliance - No collisions with marine fauna
Spill Incidents	- Number and volume of spills - Response effectiveness	- Throughout the marine operations area	- Immediately upon occurrence - Monthly summaries	- Zero major spills - Prompt and effective response

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Stakeholder Engagement	- Meetings held - Issues raised and addressed	- Local communities - Conservation groups	- Quarterly meetings - As needed	- Number of engagements - Positive feedback received

Monitoring Details

- Water Quality Sampling:
    - Conducted by qualified personnel using standard methods.
    - Laboratory analysis to be performed at accredited facilities.
- Underwater Noise Monitoring:
    - Use calibrated hydrophones and recording equipment.
    - Data analyzed by specialists in marine acoustics.
- Marine Fauna Monitoring:
    - MMOs to record sightings, behaviors, and any disturbances.
    - Data used to adjust activities as needed.
- Reporting:
    - Prepare regular monitoring reports summarizing findings.
    - Report any non-compliances or incidents promptly.

5.9.7. Responsibilities

- Environmental Manager:
    - Oversee the implementation of the Marine Ecology Protection Plan.
    - Ensure compliance with regulations and standards.
    - Coordinate monitoring activities and reporting.
- Marine Mammal Observers (MMOs):
    - Conduct observations and record data on marine fauna.
    - Advise on necessary actions to avoid impacts.
- Construction Manager:
    - Ensure that mitigation measures are integrated into construction activities.
    - Adjust schedules or methods based on monitoring feedback.

- Vessel Operators:
    - Adhere to speed limits and designated routes.
    - Report any sightings of marine fauna or incidents.
- All Personnel:
    - Comply with environmental policies and procedures.
    - Participate in training and awareness programs.

5.9.8. Reporting

- Prepare monthly environmental monitoring reports.
- Maintain records of permits, training, incidents, and stakeholder engagements.
- Report any incidents of non-compliance immediately.

5.9.9. Training and Awareness

- Training Programs:
    - Environmental Induction: Provide all personnel with an introduction to marine ecology and the importance of protection measures.
    - Specialized Training: For MMOs, vessel crews, and construction staff involved in high-risk activities.
- Awareness Campaigns:
    - Display informational materials about marine species and habitats.
    - Conduct toolbox talks focusing on specific aspects of marine ecology protection.

5.9.10. Review and Update

- Periodic Review: Review the Marine Ecology Protection Plan quarterly or when significant changes in activities occur.
- Continuous Improvement:
    - Update the plan based on monitoring results, new scientific information, and stakeholder feedback.
    - Implement corrective actions to address any issues.

5.10. Navigational Risk Management

5.10.1. Objectives

The main objectives of the navigational risk management plan during the construction phase of the RLNG Project are to:

- Ensure Safe Maritime Operations: Prevent navigation-related accidents and incidents during construction activities.
- Protect Marine Environment: Avoid marine pollution resulting from navigational mishaps.
- Comply with Regulations: Adhere to all relevant maritime laws, standards, and international conventions.

5.10.2. Regulatory Framework and Standards

The Navigational Risk Management Plan aligns with the following regulatory frameworks, standards, and guidelines relevant to maritime safety and environmental protection during construction:

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST04: Incident Notification, Investigation, and Reporting
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-GA-ST07: HSE Design Philosophy
- HSE-GA-ST08: HSE Performance Monitoring and Reporting
- HSE-GA-ST09: HSE Audit and Assurance
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-OH-ST08: Physical Health Hazard Standard
- HSE-OS-ST24: Marine Operations Safety

UAE Laws and Regulations

- Federal Law No. 26 of 1981: Commercial Maritime Law
- Federal Law No. 23 of 1999: Exploitation, Protection, and Development of Living Aquatic Resources
- Federal Law No. 24 of 1999: Protection and Development of the Environment
- Council of Ministers' Decision No. 23 of 2001: Protection of Ports, Shores, and Maritime Territories from Oil Pollution Incidents
- UAE Cabinet Resolution No. 71 of 2020: Governs marine and coastal activities.

International Conventions and Protocols

- International Regulations for Preventing Collisions at Sea (COLREGs), 1972

- IMO MARPOL Convention, 1973/1978
- IMO Marine Environmental Protection Committee (MEPC), 1973
- Safety of Life at Sea (SOLAS) Convention and Protocol, 1974/1988
- International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW), 1978/1995/2010
- United Nations Convention on the Law of the Sea (UNCLOS), 1982
- Oil Pollution Preparedness, Response, and Co-operation (OPRC), 1990

International Best Practices

- ISO 14001 – Environmental Management Systems
- Implement BAT
- Community Communication Programs:
    - Engaging with nearby communities helps maintain good relations and ensure transparency.
    - Complaint Mechanisms: Establishing platforms for community feedback regarding vessels and navigation issues encourages swift resolution of concerns.

5.10.3. Potential Impacts

5.10.3.1 Impact Sources

During the construction phase, potential sources of navigational risk include:

- Increased Vessel Traffic: Movement of construction vessels, barges, and support ships may increase the risk of collisions.
- Restricted Navigational Areas: Establishment of exclusion zones may impact regular maritime routes.
- Marine Construction Activities: Operations such as piling may pose hazards to navigation if not properly marked and communicated.
- Environmental Conditions: Adverse weather, sea states, and visibility can increase navigational risks.
- Human Error: Inadequate training or non-compliance with navigational protocols can lead to accidents.

5.10.3.2 Sensitive Receptors

The construction phase of the LNG Project in Ruwais involves several sensitive receptors that may be impacted by navigational risks. These include:

- Marine Ecosystems and Protected Species: Sensitive habitats near the project area include coral reefs, seagrass beds, and species like dugongs and sea turtles, which could be impacted by pollution or navigational incidents.
- Commercial Fisheries: Local fisheries operate nearby and may face disruptions from increased vessel traffic and restricted zones, potentially affecting livelihoods.

- Recreational and Tourist Areas: Occasional recreational boating and diving activities in the area may be impacted by restricted zones and need clear communication to ensure public safety.
- Existing Marine Infrastructure: Infrastructure such as jetties, buoys, and pipelines could be damaged by navigational accidents, leading to potential disruptions and repair costs.
- Commercial Shipping Routes: The project area intersects significant shipping routes; increased traffic and collision risks necessitate careful coordination to prevent operational delays and liabilities.

5.10.3.3 Impact Assessment

- Potential Impacts:
    - Collisions and Groundings: Increased vessel movements can lead to accidents, causing injuries, fatalities, or environmental pollution.
    - Interference with Other Sea Users: Disruption of commercial shipping lanes, fishing activities, or recreational boating.
    - Environmental Pollution: Accidents may result in oil spills or release of hazardous materials into the marine environment.
    - Damage to Infrastructure: Navigational accidents can damage existing marine infrastructure, including jetties, buoys, and pipelines.
    - Reputational Damage: Navigational incidents can harm the project's reputation and lead to legal liabilities.
- Significance: The impact is assessed as High, necessitating stringent navigational safety measures and compliance with maritime regulations.

5.10.4. Mitigation Measures

To ensure safe maritime operations and prevent navigation-related accidents during construction, the following mitigation measures will be implemented:

- Navigational Planning
    - Development of a Navigational Management Plan:
    - Route Planning: Define and communicate safe navigational routes for project vessels.
    - Exclusion Zones: Establish and enforce maritime exclusion zones around construction areas.
    - Navigational Risk Assessment: Conduct a comprehensive risk assessment to identify hazards and develop control measures. Navigational risks are already minimized due to established maritime exclusion zones and defined navigation routes for vessels as shown in Figure 5-9.
    - Coordination with Authorities:
    - Liaise with Port Authorities: Work closely with Abu Dhabi Ports and relevant maritime authorities.
    - Notification to Mariners: Issue Notices to Mariners (NTMs) regarding construction activities and exclusion zones.

- Vessel Management
    - Vessel Traffic Management System (VTMS):
    - Monitoring: Implement a VTMS to monitor vessel movements within the project area.
    - Communication: Ensure continuous communication between vessels and the project control center.
    - Vessel Standards:
    - Certification: All vessels to be certified and comply with international and UAE maritime regulations.
    - Equipment: Ensure vessels are equipped with necessary navigational aids (e.g., AIS, radar, GPS).
- Operational Procedures
    - Navigational Procedures:
    - Compliance with COLREGs: Adhere strictly to the International Regulations for Preventing Collisions at Sea.
    - Speed Restrictions: Implement speed limits within certain areas to reduce collision risks.
    - Environmental Considerations:
    - Weather Monitoring: Monitor weather and sea conditions; suspend operations during adverse conditions.
    - Pollution Prevention: Implement measures to prevent accidental discharges (e.g., double-hulled vessels, spill kits).
- Personnel Competency
    - Training and Certification:
    - Qualified Crew: Ensure all vessel crew are appropriately trained and hold valid certifications (STCW compliance).
    - Safety Drills: Conduct regular drills on emergency response and navigational safety.
    - Pilotage - Use of Pilots: Engage qualified marine pilots when necessary, especially for larger vessels or challenging navigation areas.
- Communication and Coordination
    - Marine Coordination Center:
    - Central Hub: Establish a center to coordinate all maritime activities related to the project.
    - Stakeholder Engagement: Maintain open communication with other sea users, including fishermen and commercial shipping operators.
    - Signage and Markings:
    - Navigational Aids: Install buoys, markers, and lights to delineate construction areas and hazards.
    - Visual and Auditory Warnings: Use signals to alert nearby vessels of ongoing operations.

- Emergency Preparedness
    - Emergency Response Plan:
    - Incident Management: Develop procedures for responding to navigational incidents.
    - Oil Spill Response: Equip vessels with spill response equipment and train crew in spill containment.
    - Search and Rescue Coordination - SAR Procedures: Establish protocols in coordination with national search and rescue services.

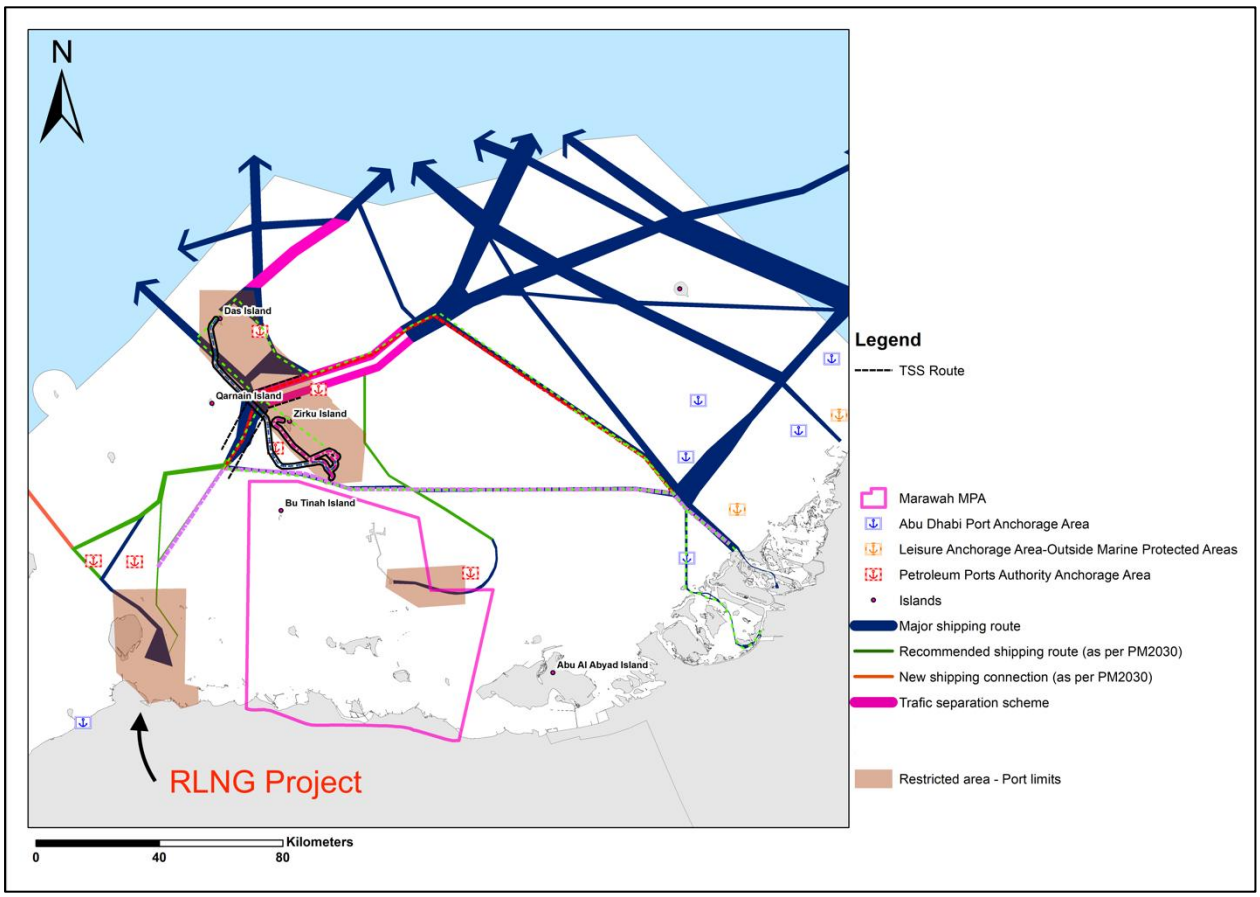


Figure 5-9. Existing Marine Transport Corridor

(Source: www.admaritime.ae [Ref 42])

5.10.5. Monitoring

To ensure the effectiveness of mitigation measures and compliance with relevant standards, the monitoring activities in Table 5-15 will be conducted.

Table 5-15. Navigational Risk Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Vessel Movements	- Number of vessel movements - Compliance with routes and speed limits	- Project area - Exclusion zones	- Continuous monitoring	- Zero unauthorized route deviations - Adherence to speed limits
Navigational Incidents	- Number and type of incidents - Near-misses reported	- Throughout the project area	- Immediate reporting - Monthly summaries	- Reduction in incidents over time - All incidents investigated
Communication Systems	- Functionality of communication equipment - Response times	- Vessels - Marine Coordination Center	- Daily checks	- 100% functionality of equipment - Prompt communication established
Compliance with Regulations	- Vessel certifications - Crew qualifications	- Vessel audits	- Prior to vessel deployment - Annual reviews	- All vessels and crew certified - No non-compliances found
Environmental Monitoring	- Oil discharge levels - Waste management practices	- Vessel operations	- Regular inspections	- Zero unauthorized discharges - Proper waste disposal records maintained
Training Records	- Training sessions conducted - Attendance records	- Training facilities	- Quarterly	- 100% of relevant personnel trained - Increased awareness observed
Stakeholder Engagement	- Meetings held - Feedback received and addressed	- Local maritime stakeholders	- Quarterly meetings	- Number of engagements - Positive feedback from stakeholders

Monitoring Details

- Vessel Tracking: Utilize Automatic Identification Systems (AIS) and GPS tracking to monitor vessel positions and movements in real-time.
- Incident Reporting: Implement a system for immediate reporting of any navigational incidents or near-misses.
- Audits and Inspections: Conduct regular audits of vessels for compliance with safety and environmental standards.
- Communication Tests: Perform routine tests of communication systems between vessels and the coordination center.

5.10.6. Responsibilities

- Marine Operations Manager:
    - Oversee all maritime activities and ensure compliance with the Navigational Risk Management Plan.
    - Coordinate with port authorities and maritime regulators.
- Vessel Masters (Captains):
    - Responsible for the safe operation of their vessels.
    - Ensure crew compliance with navigational protocols.
- Marine Coordination Center Staff:
    - Monitor vessel movements and maintain communication.
    - Manage emergency responses if necessary.
- Environmental Manager:
    - Oversee environmental compliance related to maritime operations.
    - Coordinate spill response efforts.

5.10.7. Reporting

- Daily Reports: Vessel masters to submit daily reports on operations and any incidents.
- Monthly Reports: Compile summaries of vessel movements, incidents, and compliance status.
- Incident Reports: Immediate reporting of any accidents or near-misses to relevant authorities and project management.

5.10.8. Training and Awareness

- Training Programs:
    - Navigational Safety Training: Provide training on COLREGs, local maritime regulations, and company procedures.

- Emergency Response Training: Conduct drills on collision avoidance, spill response, and search and rescue operations.
- Environmental Awareness: Educate crew on environmental protection measures and pollution prevention.

- Certification Verification: Ensure all crew members have up-to-date certifications as per STCW and other relevant standards.
- Awareness Campaigns:
  - Display signage on vessels highlighting key safety procedures.
  - Distribute information bulletins on navigational safety topics.

5.10.9. Review and Update

- Periodic Review: Review the Navigational Risk Management Plan quarterly or when significant changes occur in maritime operations.
- Continuous Improvement:
  - Update the plan based on monitoring results, incident investigations, and stakeholder feedback.
  - Implement corrective actions to address any identified issues.

6. SOCIAL MANAGEMENT PLANS

6.1. Worker Influx Management Plan

6.1.1. Objectives

The main objectives of the worker influx management plan during the construction phase of the RLNG Project are to:

- Manage Social Impacts: Mitigate potential negative effects of a large influx of workers on local communities and infrastructure.
- Promote Positive Engagement: Foster harmonious relationships between workers and local communities through cultural awareness and respectful interactions.
- Ensure Compliance: Adhere to relevant labor laws, international standards, and best practices for worker welfare and community relations.

6.1.2. Regulatory Framework and Standards

UAE Laws and Regulations

- Federal Law No. 8 of 1980: Regulation of Labor Relations
- Ministerial Resolution No. 44 of 2022: Concerning Occupational Health and Safety and Labor Accommodation
- Federal Law No. 6 of 1973: Concerning Entry and Residence of Foreigners
- Cabinet Decision No. 15 of 2017: Concerning Service Fees and Administrative Fines in the Ministry of Human Resources and Emiratization

International Standards and Guidelines

- International Labor Organization (ILO) Conventions:
    - ILO Convention No. 95: Protection of Wages Convention, 1949
    - ILO Convention No. 97: Migration for Employment Convention, 1949
    - ILO Convention No. 143: Migrant Workers (Supplementary Provisions) Convention, 1975
    - ILO Convention No. 155: Occupational Safety and Health Convention, 1981
- IFC/World Bank Group Guidelines:
    - IFC Performance Standard 2: Labor and Working Conditions
    - IFC Performance Standard 4: Community Health, Safety, and Security
    - IFC/EBRD Guidance Note on Worker Accommodation

International Best Practices

- ISO 26000: Guidance on Social Responsibility
- Community Communication Programs:

- Stakeholder Engagement: Engaging with local communities to build trust and ensure transparency.
- Grievance Mechanisms: Establishing platforms for community feedback regarding worker influx issues to encourage swift resolution of concerns.

6.1.3. Potential Impacts

During the construction phase, the influx of a large number of workers may lead to several potential social impacts:

- Strain on Local Infrastructure and Services:
  - Increased demand for housing, water, electricity, transportation, healthcare, and other public services.
  - Potential shortages or reduced quality of services for local residents.
- Social Tensions and Conflicts:
  - Cultural differences leading to misunderstandings or conflicts between workers and local communities.
  - Potential for inappropriate behavior by workers, causing community concerns.
- Economic Impacts:
  - Competition for local jobs and resources.
  - Inflation of prices for goods and services due to increased demand.
- Public Health Risks:
  - Increased risk of communicable diseases spreading between workers and the community.
  - Pressure on local healthcare facilities.
- Security Concerns:
  - Potential increase in crime rates or perception of insecurity.
  - Strain on local law enforcement resources.

Significance:

The overall impact is assessed as Medium to High, requiring effective mitigation strategies to manage worker influx and its effects on local communities.

6.1.4. Mitigation

To manage the social impacts of worker influx on local communities, the following mitigation measures will be implemented:

- Worker Accommodation and Facilities
  - Provision of Dedicated Worker Camps:

- Ensure camps meet or exceed standards outlined in the IFC/EBRD Guidance Note on Worker Accommodation, including adequate living space, sanitation, and recreational facilities.
    - Infrastructure and Services within Camps:
- Provide essential services within the camp, such as medical facilities, dining areas, shops, and recreational amenities, to reduce pressure on local infrastructure.
- Ensure reliable access to water, electricity, and waste management services.

- Cultural Awareness and Behavior
    - Cultural Orientation Programs:
- Conduct mandatory cultural sensitivity and awareness training for all incoming workers, covering local customs, traditions, laws, and expected behaviors.
- Include information on respecting local dress codes, religious practices, and social norms.
    - Code of Conduct:
- Develop and enforce a comprehensive Code of Conduct outlining acceptable behavior for workers both within the camp and in the community.
- Include provisions against harassment, discrimination, and any form of misconduct.
    - Disciplinary Procedures:
- Establish clear disciplinary procedures for violations of the Code of Conduct, including consequences up to termination of employment.

- Community Engagement
    - Stakeholder Engagement Plan:
- Develop a plan to engage with local communities, authorities, and other stakeholders regularly.
- Provide updates on project activities, worker numbers, and mitigation measures.
    - Grievance Mechanism:
- Establish a transparent and accessible grievance mechanism for community members to raise concerns related to the project or workers.
- Ensure timely investigation and resolution of grievances.

- Local Economic Opportunities
    - Local Employment:
- Prioritize hiring qualified local workers where feasible to promote local economic development and reduce unemployment.
- Provide training and capacity-building programs to enhance local workforce skills.
    - Procurement from Local Businesses:
- Source goods and services from local suppliers where possible, following fair procurement practices.

- Healthcare and Public Health
    - Medical Facilities:
    - Provide on-site medical clinics staffed with qualified healthcare professionals to address workers' health needs.
    - Ensure emergency medical response capabilities are in place.
    - Disease Prevention and Control:
    - Implement health screening procedures for workers upon arrival and periodically during employment.
    - Promote vaccination programs and health education campaigns.
    - Collaboration with Local Health Authorities:
    - Coordinate with local healthcare providers to share information on potential health risks and collaborate on public health initiatives.
- Security Measures
    - Security Personnel Training:
    - Employ trained security personnel to maintain order within worker camps and protect workers and assets.
    - Ensure security staff are trained in appropriate engagement with workers and community members.
    - Access Control:
    - Implement controlled access to worker accommodation and construction sites to prevent unauthorized entry.
- Transportation Management
    - Dedicated Transport Services:
    - Provide transportation for workers between the camp and work sites to reduce reliance on local transport systems.
    - Schedule transport to minimize peak traffic times and reduce congestion.
- Regulatory Compliance and Monitoring
    - Labor Law Compliance:
    - Ensure all employment practices comply with UAE labor laws and international labor standards.
    - Regularly audit labor practices, including working hours, wages, and working conditions.
    - Monitoring and Reporting:
    - Establish key performance indicators (KPIs) to monitor the effectiveness of mitigation measures.
    - Conduct regular inspections and audits of worker accommodation and welfare facilities.
- Emergency Preparedness - Emergency Response Plans:

- Develop and implement emergency response plans for scenarios such as disease outbreaks, natural disasters, or security incidents.
- Conduct drills and training for workers and staff.

6.1.5. Monitoring

To ensure the effectiveness of mitigation measures and compliance with relevant standards, the monitoring activities in Table 6-1 will be conducted.

Table 6-1. Worker Influx Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Worker Accommodation	- Living conditions - Sanitation and hygiene - Facility maintenance	- Worker camps	- Monthly inspections	- Compliance with accommodation standards - Number of issues corrected
Worker-Community Interactions	- Incidents or complaints - Observed behaviors	- Surrounding communities - Worker camps	- Continuous monitoring - Monthly summaries	- Reduction in complaints over time - Positive community relations
Grievance Mechanism	- Number of grievances received - Resolution time - Types of issues raised	- Community relations office	- Monthly reporting	- Grievances addressed within target time - Decrease in repeat issues
Local Infrastructure Impact	- Usage of local services by workers - Strain on utilities and services	- Local healthcare facilities - Public services	- Quarterly assessments	- No significant negative impact on local services - Collaboration with authorities
Employment Practices	- Number of local workers hired - Training provided	- Project employment records	- Quarterly reporting	- Percentage of local workforce - Training hours provided
Health and Safety	- Worker health statistics - Disease outbreaks - Access to medical care	- Worker camps - Worksites	- Monthly reporting - Immediate reporting for incidents	- Low incidence of health issues - Effective response to health emergencies
Security Incidents	- Number of security incidents - Response effectiveness	- Worker camps - Surrounding areas	- Immediate reporting - Monthly summaries	- Reduction in security incidents - Effective incident management

Training and Awareness	- Training sessions conducted - Attendance records	- Training facilities	- Quarterly	- 100% of workers trained - Improved compliance observed

Monitoring Details

- Inspections and Audits:
    - Conduct regular inspections of worker accommodation, welfare facilities, and workplaces to ensure compliance with standards.
    - Use checklists based on UAE regulations and international guidelines.
- Community Feedback:
    - Collect feedback from local communities through surveys, meetings, and the grievance mechanism.
    - Address concerns promptly and effectively.
- Health Monitoring:
    - Monitor worker health data to identify trends or outbreaks.
    - Coordinate with local health authorities if necessary.
- Reporting:
    - Prepare monthly monitoring reports summarizing findings, actions taken, and any areas for improvement.
    - Share relevant information with stakeholders as appropriate.

6.1.6. Responsibilities

- Project Manager:
    - Overall responsibility for implementing the Worker Influx Management Plan.
    - Ensure adequate resources are allocated for mitigation measures.
- Human Resources Manager:
    - Oversee recruitment practices, worker welfare, and compliance with labor laws.
    - Manage training programs and the Code of Conduct.
- Community Relations Officer:
    - Serve as the primary liaison between the project and local communities.
    - Manage the grievance mechanism and community engagement activities.
- Health and Safety Manager:

- Ensure health and safety standards are met within worker camps and worksites.
- Coordinate emergency preparedness and response efforts.

- Security Manager:
  - Oversee security personnel and measures to protect workers and assets.
  - Aim that security practices respect community relations.

6.1.7. Reporting

- Monthly Reports: Summarize monitoring data, incidents, and actions taken.
- Incident Reports: Immediate reporting of any significant incidents or breaches of the Code of Conduct.
- Stakeholder Updates: Provide regular updates to local authorities and stakeholders on worker influx management.

6.1.8. Training and Awareness

- Worker Induction Programs - Provide comprehensive induction training to all workers covering:
  - Project overview and objectives.
  - Health and safety procedures.
  - Cultural sensitivity and local customs.
  - Code of Conduct and expected behaviors.
  - Grievance mechanisms and reporting procedures.
- Ongoing Training:
  - Conduct refresher courses and toolbox talks to reinforce key messages.
  - Provide specialized training for staff in roles such as security, community relations, and health services.
- Community Awareness:
  - Inform local communities about the project, expected worker numbers, and mitigation measures.
  - Promote understanding and cooperation between workers and residents.

6.1.9. Review and Update

- Periodic Review: Review the Worker Influx Management Plan quarterly or when significant changes occur in workforce numbers or project activities.
- Continuous Improvement:
  - Update the plan based on monitoring results, feedback from workers and communities, and lessons learned.

- Implement corrective actions to address any issues or gaps identified.

6.2. Labor and Working Conditions Management Plan

6.2.1. Objectives

The main objectives of the Labor and Working Conditions Management Plan during the construction phase of the LNG Project in Ruwais, Abu Dhabi are to:

- Ensure Fair Employment Practices: Comply with UAE labor laws and international labor standards to provide equitable employment conditions.
- Protect Worker Rights: Uphold all workers are treated with dignity and respect.
- Promote Worker Welfare and Wellbeing: Provide safe and healthy working and living conditions, including adequate accommodation and amenities.
- Implement Effective Grievance Mechanisms: Establish accessible channels for workers to raise concerns without fear of retaliation.
- Supply Chain Compliance: Extend labor and working condition standards to contractors and suppliers in line with the project's Code of Ethics.

6.2.2. Regulatory Framework and Standards

The management plan aligns with the following regulatory frameworks, standards, and guidelines relevant to labor and working conditions:

UAE Laws and Regulations

- Federal Law No. 8 of 1980: Regulation of Labor Relations
- Federal Decree-Law No. 33 of 2021: Regulation of Labor Relations
- Ministerial Resolution No. 44 of 2022: Concerning Occupational Health and Safety and Labor Accommodation
- Federal Law No. 6 of 1973: Concerning Entry and Residence of Foreigners
- UAE Cabinet Decision No. 15 of 2017: Service Fees and Administrative Fines in the Ministry of Human Resources and Emiratisation
- Personal Data Protection Law, 2021

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST04: Incident Notification, Investigation, and Reporting
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-GA-ST08: HSE Performance Monitoring and Reporting

- HSE-GA-ST09: HSE Audit and Assurance
- HSE-OH-ST01: Occupational Health and Safety Management
- HSE-OH-07: Contractor Welfare Management Standard
- HSE-OH-ST08: Physical Health Hazards Standard
- HSE-OH-ST09: Chemical Hazards Standard
- HSE-OH-ST10: Biological Hazards Standard

International Standards and Guidelines

- International Labour Organization (ILO) Conventions:
    - ILO Convention No. 95: Protection of Wages, 1949
    - ILO Convention No. 97: Migration for Employment, 1949
    - ILO Convention No. 138: Minimum Age Convention, 1973
    - ILO Convention No. 182: Worst Forms of Child Labour Convention, 1999
    - ILO Convention No. 155: Occupational Safety and Health Convention, 1981
    - ILO Convention No. 143: Migrant Workers (Supplementary Provisions) Convention, 1975
- IFC Performance Standards:
    - Performance Standard 2: Labor and Working Conditions
    - Performance Standard 4: Community Health, Safety, and Security
- UN Global Compact (10 principles)

International Best Practices

- ISO 45001: Occupational Health and Safety Management Systems
- ISO 26000: Guidance on Social Responsibility
- **Community Communication Programs**:
    - Stakeholder Engagement: Engaging with workers and local communities to build trust and ensure transparency.
    - Grievance Mechanisms: Establishing platforms for worker feedback to encourage swift resolution of concerns.

6.2.3. Potential Impacts

6.2.3.1 Impact Sources

Potential impacts related to labor and working conditions during the construction phase include:

- Non-Compliance with Labor Laws: Risks of violating UAE labor laws and international standards, leading to legal consequences and reputational damage.

- Worker Rights Violations: Issues such as forced labor, child labor, discrimination, and inadequate grievance mechanisms.
- Poor Working Conditions: Unsafe work environments, lack of Personal Protective Equipment (PPE), and exposure to health hazards.
- Inadequate Accommodation: Substandard living conditions in worker camps, affecting health and morale.
- Supply Chain Risks: Contractors or suppliers not adhering to labor standards, leading to indirect violations.

6.2.3.2 Sensitive Receptors

- Workers: Directly affected by employment practices, working conditions, and accommodation standards.
- Local Communities: May be impacted by worker behavior, competition for resources, and social dynamics.
- Regulatory Bodies: Concerned with compliance to labor laws and standards.

6.2.3.3 Impact Assessment

- Potential Impacts:
    - Health and Safety Risks: Increased risk of accidents and occupational illnesses due to inadequate safety measures.
    - Legal and Financial Consequences: Non-compliance can lead to fines, legal action, and project delays.
    - Reputational Damage: Poor labor practices can harm the company's image and stakeholder relations.
    - Worker Morale and Productivity: Poor working conditions can lead to low morale, high turnover, and reduced productivity.
- Significance: The impact is assessed as High, necessitating comprehensive management and mitigation measures.

6.2.4. Mitigation Measures

To address the potential impacts, the following mitigation measures will be implemented:

- Compliance with Labor Laws
    - Legal Adherence:

– All employment practices comply with UAE labor laws and ILO conventions.

– Regularly update policies to reflect any changes in legislation.

- Audit and Verification:

– Conduct regular audits to verify compliance.

– Implement corrective actions for any non-compliance identified.

- Fair Recruitment and Hiring:
    - Transparent Processes
  - Use clear and fair recruitment procedures.
  - Prohibit the charging of recruitment fees to workers.
    - Age Verification:
  - Verify age documentation to prevent child labor.
  - Maintain records of employee ages.
- Terms of Employment
    - Employment Contracts:
  - Provide clear contracts in a language understood by the worker.
  - Outline terms including job role, wages, working hours, and benefits.
    - Fair Wages:
  - Ensure wages meet or exceed legal minimums.
  - Pay wages on time.
    - Working Hours:
  - Limit working hours according to legal requirements.
  - Compensate overtime appropriately.
- Occupational Health and Safety
    - Safety Measures:
  - Provide necessary PPE to all workers.
  - Implement safety management systems in line with ISO 45001.
    - Training:
  - Conduct regular safety training and drills.
  - Promote a safety-first culture.
- Worker Accommodation and Welfare
    - Accommodation Standards:
  - Ensure living facilities meet or exceed ADNOC and UAE standards.
  - Provide adequate space, sanitation, and amenities.
    - Welfare Facilities:
  - Offer access to recreational facilities and services.
  - Provide nutritious meals and clean drinking water.

- Transportation:
  - Provide safe transportation between accommodation and work sites.
  - Ensure vehicles are well-maintained and drivers are trained.
- Grievance Mechanisms
  - Accessible Channels:
  - Establish confidential and accessible grievance mechanisms.
  - Encourage workers to voice concerns without fear.
  - Timely Resolution:
  - Address grievances promptly and fairly.
  - Keep records of grievances and resolutions.
- Worker Code of Conduct
  - Behavioral Guidelines:
  - Develop a comprehensive Code of Conduct.
  - Include expectations on behavior, ethics, and compliance.
  - Enforcement:
  - Implement disciplinary procedures for violations.
  - Ensure consistent application across the workforce.
- Supply Chain Management
  - Contractual Obligations:
  - Require adherence to ADNOC's Supplier and Partner Code of Ethics.
  - Monitoring:
  - Conduct regular audits of suppliers' labor practices.
  - Enforce corrective actions for non-compliance.
- Training and Awareness
  - Education Programs:
  - Provide training on worker rights, safety, and company policies.
  - Ensure training materials are in languages understood by workers.
  - Awareness Campaigns:
  - Use posters, meetings, and other communication tools to reinforce messages.
  - Promote understanding of grievance mechanisms and worker welfare initiatives.

6.2.5. Monitoring

To ensure the effectiveness of mitigation measures and compliance with relevant standards, the monitoring activities in Table 6-2 will be conducted.

Table 6-2. Labor and Working Conditions Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Employment Practices	- Valid employment contracts - Wage payments - Recruitment compliance - Verification of age documents	- HR records - Worker interviews	- Quarterly audits - Monthly payroll checks	- 100% workers with valid contracts - - Timely wage payments - Zero incidents of child labor
Worker Rights Compliance	- Working hours and overtime - Non-discrimination - Grievance mechanism usage - Reports of forced labor or inhumane treatment	- Worksites - HR records - Grievance logs	- Monthly monitoring - Immediate reporting of issues	- Compliance with legal working hours - Reduction in discrimination complaints - Grievances resolved within target time - Zero forced labor incidents
Accommodation Standards	- Living conditions - Hygiene and sanitation - Facility maintenance - Accessibility for disabled workers	- Worker camps - Accommodation audits	- Monthly inspections - Spot checks	- Compliance with accommodation standards - Worker satisfaction levels - Accommodations provided for disabled workers
Occupational Health and Safety	- Incident and accident rates - PPE availability - Safety training completion - Health screenings	- Worksites - OHS records	- Monthly reporting - Immediate incident reporting	- Reduction in incident rates - 100% PPE provision - 100% workers trained - Low rates of health issues
Grievance Mechanism	- Grievances received and resolved - Awareness levels - Retaliation incidents - Freedom of expression metrics	- Grievance records - Worker surveys	- Monthly reporting - Ongoing monitoring	- Grievances resolved promptly - High awareness among workers - Zero retaliation cases - Positive feedback on grievance mechanism effectiveness
Supply Chain Compliance	- Supplier audits - Compliance with labor standards - Corrective actions - Zero tolerance for child labor and forced labor	- Supplier sites - Procurement records	- Annual audits - As needed	- High compliance rates - Timely implementation of corrective actions - Zero incidents of child labor or forced labor in supply chain
Training and Awareness	- Training sessions held - Worker attendance - Understanding of policies - Anti-bribery and corruption training	- Training facilities - HR records	- Quarterly - As required	- 100% workers trained - Positive evaluation of training effectiveness - Increased awareness of anti-corruption policies
Worker Well-being	- Health screenings - Access to medical services - Utilization of recreational facilities - Mental health support services	- Medical centers - Worker camps	- Monthly reporting - Periodic health checks	- Low rates of health issues - High utilization of facilities - Worker satisfaction with well-being programs
	-	-	-	-
Security Practices	- Training records for security staff - Incidents involving security personnel	- Security logs - Training records	- Monthly reporting - Immediate incident reporting	- Zero incidents of abuse by security staff - 100% security personnel trained

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
	- Compliance with protocols preventing inhumane treatment			- Positive reviews of security practices
Anti-Bribery and Corruption Compliance	- Training on anti-corruption policies - Whistleblower reports - Financial audits	- Financial records - HR records	- Annual audits - As needed	- Zero incidents of bribery or corruption - Effective whistleblower mechanism - Compliance with financial controls

Monitoring Details

- Data Collection:
    - Use standardized forms to record monitoring data.
    - Maintain records of audits, inspections, training, and incidents.
- Inspections and Audits:
    - Conduct regular inspections of worksites, accommodations, and supplier sites.
    - Use checklists aligned with UAE regulations and international standards.
- Worker Feedback:
    - Collect feedback through surveys, interviews, and grievance mechanisms.
    - Encourage open communication and anonymity where necessary.
- Reporting:
    - Prepare monthly reports summarizing monitoring data, KPIs, and actions taken.
    - Share relevant information with management and stakeholders.

6.2.6. Responsibilities

- Project Manager:
    - Overall responsibility for implementing the Labor and Working Conditions Management Plan.
    - Ensure adequate resources are allocated for mitigation measures.
- Human Resources Manager:
    - Oversee recruitment practices, worker welfare, and compliance with labor laws.
    - Manage training programs and the Code of Conduct.
- Health and Safety Manager:
    - Ensure health and safety standards are met within worker accommodations and worksites.
    - Coordinate emergency preparedness and response efforts.
- Accommodation Manager:
    - Ensure worker housing meets required standards.
    - Address accommodation-related issues promptly.
- Supply Chain Manager:
    - Ensure suppliers comply with labor standards.
    - Manage supplier audits and follow-up actions.
- Security Manager:
    - Oversee security personnel and ensure compliance with standards.
    - Implement protocols to prevent inhumane treatment.
- All Personnel:
    - Comply with company policies and procedures.
    - Participate in training programs.
    - Report any concerns or incidents promptly.

6.2.7. Reporting

- Monthly Reports:
    - Summarize monitoring activities, findings, and KPIs.
    - Highlight any incidents, grievances, or non-compliance issues.
- Incident Reports:

- Immediate reporting of any significant incidents or breaches of policies.
- Include details of the incident, actions taken, and preventive measures.

- Annual Reviews:
  - Assess overall performance against objectives.
  - Identify areas for improvement and set new targets.
- Stakeholder Updates:
  - Provide regular updates to management, regulatory bodies, and other stakeholders.
  - Ensure transparency and accountability.

6.2.8. Training and Awareness

- Worker Induction Programs:
  - Provide comprehensive induction training covering:
    - Employment terms and conditions.
    - Worker rights and responsibilities.
    - Health and safety procedures.
    - Code of Conduct and expected behaviors.
    - Grievance mechanisms and reporting procedures.
- Ongoing Training:
  - Conduct refresher courses and toolbox talks to reinforce key messages.
  - Provide specialized training for supervisors, managers, and security personnel.
- Communication Materials:
  - Display posters, notices, and visual aids in common areas.
  - Use multiple formats to accommodate different literacy levels.
  - Include information on grievance mechanisms and worker welfare.

6.2.9. Review and Update

- Periodic Review:
  - Review the Labor and Working Conditions Management Plan quarterly or when significant changes occur.
  - Incorporate feedback from audits, worker input, and incident investigations.
- Continuous Improvement:

- Update the plan based on monitoring results and lessons learned.
- Implement corrective actions to address any issues or gaps identified.
- Engage with stakeholders to refine approaches and enhance effectiveness.

6.3. Community Health and Safety Management Plan

6.3.1. Objectives

The main objectives of the community health and safety management plan during the construction phase of the RLNG Project are to:

- Protect Community Health and Safety: Safeguard local communities from construction-related risks and hazards.
- Minimize Negative Impacts: Reduce adverse effects on the well-being and quality of life of local residents.
- Enhance Positive Outcomes: Promote beneficial community engagement and support local health initiatives.
- Ensure Regulatory Compliance: Adhere to all relevant laws, regulations, and international standards related to community health and safety.

6.3.2. Regulatory Framework and Standards

The Community Health and Safety Management Plan aligns with the following regulatory frameworks, standards, and guidelines relevant to community health and safety during construction:

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST04: Incident Notification, Investigation, and Reporting
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-GA-ST08: HSE Performance Monitoring and Reporting
- HSE-GA-ST09: HSE Audit and Assurance
- HSE-OH-ST08: Physical Health Hazards Standard
- HSE-OH-ST10: Biological Hazards Standard
- HSE-OS-ST05: Traffic Safety

UAE Laws and Regulations

- Federal Law No. 24 of 1999: Protection and Development of the Environment
- Federal Law No. 6 of 1973: Concerning the Entry and Residence of Foreigners

- Ministerial Order No. 32 of 1982: Prevention Methods and Measures for Protecting Workers against Work Hazards
- Federal Law No. 8 of 1980: Regulation of Labor Relations
- Federal Law No. 12 of 2018: Integrated Waste Management
- Federal Decree-Law No. 33 of 2021: Regulation of Labor Relations
- Local Law No. 21 of 2005: Waste Management in Abu Dhabi Emirate

International Standards and Guidelines

- International Finance Corporation (IFC) Performance Standards:
- Performance Standard 4: Community Health, Safety, and Security
- World Health Organization (WHO) Guidelines:
- Occupational and Environmental Health Standards
- Guidelines for Community Noise
- ISO 45001: Occupational Health and Safety Management Systems
- ISO 39001: Road Traffic Safety Management Systems

International Best Practices

- Best Available Techniques (BAT)
- Community Communication Programs:
    - Stakeholder Engagement: Engaging with local communities to build trust and ensure transparency.
    - Grievance Mechanisms: Establishing platforms for community feedback regarding health and safety issues to encourage swift resolution of concerns.

6.3.3. Potential Impacts

6.3.3.1 Impact Sources

During the construction phase, potential sources of impacts to community health and safety include:

- Increased Traffic and Road Safety Risks:
    - Additional vehicles transporting construction materials, equipment, and personnel on public roads.
    - Increased risk of traffic accidents involving pedestrians and other road users.
- Air Emissions and Dust Generation:

- Exhaust emissions from vehicles, machinery, vessels, and diesel generators.
- Dust emissions from earthworks, material handling, and vehicle movements on unpaved roads.

- Noise and Vibration:
  - Noise from construction activities, machinery operation, vehicle movements, and piling operations.
  - Underwater noise affecting marine life and potentially impacting fishing activities.
- Public Health Risks:
  - Potential spread of communicable diseases due to the influx and movement of construction personnel.
  - Strain on local healthcare facilities.
- Community Disturbance:
  - Disruption to daily life due to construction activities, including visual impacts and accessibility issues.

6.3.3.2 Sensitive Receptors

- Local Communities:
  - Residents living near transportation routes and construction sites.
  - Vulnerable groups such as children, the elderly, and individuals with pre-existing health conditions.
- Public Infrastructure and Services: Local roads, utilities, and healthcare facilities.
- Marine Environment: Fishermen and communities relying on marine resources.

6.3.3.3 Impact Assessment

- Potential Impacts:
  - Traffic Accidents: Increased risk of road traffic incidents due to higher vehicle volumes and heavy machinery on roads.
  - Air Quality Degradation: Elevated levels of pollutants and dust affecting respiratory health.
  - Noise Pollution: Disturbance to residents leading to stress, sleep disturbances, and reduced quality of life.
  - Spread of Diseases: Potential for communicable diseases to spread between workers and the community.
  - Community Disruption: Impacts on local businesses, access to services, and social cohesion.

- Significance: The overall impact is assessed as Medium to High, requiring effective mitigation measures to protect community health and safety.

6.3.4. Mitigation

To protect community health and safety and minimize negative impacts during construction, the following mitigation measures will be implemented:

- Traffic Management
    - Traffic Impact Assessment:
  - Conduct a Detailed Assessment: Evaluate potential traffic congestion and risks associated with increased construction-related vehicles.
  - Identify High-Risk Areas: Focus on routes passing through residential areas or near schools and hospitals.
    - Traffic Management Plan:
  - Develop and Implement Strategies: Create a comprehensive Traffic Management Plan (TMP) outlining measures to control and reduce traffic risks.
  - Vehicle Scheduling: Plan deliveries and workforce transportation during off-peak hours to minimize congestion.
  - Designated Routes: Use predetermined routes for construction traffic to avoid sensitive areas.
    - Road Safety Measures:
  - Driver Training: Ensure all drivers receive training on defensive driving and road safety.
  - Vehicle Maintenance: Maintain vehicles in good condition to prevent accidents.
  - Speed Limits: Enforce speed restrictions for project vehicles, especially in residential areas.
  - Signage and Signals: Install warning signs, speed limit signs, and traffic signals where necessary.
    - Community Engagement:
  - Public Awareness Campaigns: Inform local communities about increased traffic, safety measures, and encourage safe road use.
  - Grievance Mechanism: Provide channels for community members to report traffic-related concerns.
- Air Quality and Dust Control
    - Emission Control:
  - Equipment Maintenance: Regularly service vehicles and machinery to minimize exhaust emissions.
  - Use of Cleaner Fuels: Utilize low-sulfur diesel or alternative fuels where feasible.

- Dust Suppression:

- Water Spraying: Regularly water unpaved roads and construction areas to suppress dust.
- Dust Screens and Barriers: Install barriers around dusty activities, particularly near sensitive receptors.
- Material Handling: Cover trucks transporting loose materials and limit drop heights during material transfer.

- Air Quality Monitoring: Conduct regular monitoring of particulate matter (PM10 and PM2.5) and other pollutants at key locations.

- Noise and Vibration Management

- Noise Control Measures:

- Equipment Selection: Use modern, low-noise equipment where possible.
- Maintenance: Ensure machinery and vehicles are well-maintained to reduce noise emissions.
- Scheduling: Restrict noisy activities to daytime hours (e.g., 7 AM to 7 PM) to minimize disturbance.
- Noise Barriers: Erect temporary noise barriers around high-noise activities near sensitive receptors.

- Piling Operations:

- Noise Mitigation Techniques: Employ less noisy piling methods (e.g., hydraulic piling) and use noise attenuation measures.
- Notification: Inform nearby communities in advance about the timing and duration of piling activities.

- Noise Level Monitoring: Regularly measure noise levels at the site boundary and sensitive locations.

- Public Health Initiatives

- Disease Prevention and Health Promotion:

- Health Screenings: Conduct pre-employment and periodic health screenings for workers.
- Vaccinations: Ensure workers are vaccinated against common communicable diseases.
- Health Education: Provide training on hygiene practices and disease prevention.

- Collaboration with Health Services:

- Local Healthcare Coordination: Work with local health authorities to monitor public health and share relevant information.
- Support to Health Facilities: Offer assistance to local healthcare facilities if increased demand is identified.

- Emergency Preparedness and Response:

- Develop Emergency Response Plans: Prepare for health emergencies, including disease outbreaks.

- First Aid and Medical Services: Provide on-site medical facilities and trained personnel.

- Community Engagement and Communication
    - Stakeholder Engagement Plan:
    - Regular Communication: Maintain open lines of communication with local communities.
    - Information Dissemination: Provide updates on construction activities, schedules, and potential impacts.
    - Grievance Mechanism:
    - Accessible Channels: Establish mechanisms for community members to raise concerns or complaints.
    - Timely Response: Ensure grievances are addressed promptly and effectively.
- General Measures
    - Site Security and Access Control:
    - Prevent Unauthorized Access: Implement measures to secure construction sites and prevent public entry.
    - Signage: Display warning signs around hazardous areas.
    - Visual Impact Reduction:
    - Site Hoarding: Use hoardings or fencing to screen construction activities from public view.
    - Good Housekeeping: Maintain a clean and orderly site to reduce visual disturbance.

6.3.5. Monitoring

To ensure the effectiveness of mitigation measures and compliance with relevant standards, the monitoring activities in Table 6-3 will be conducted.

Table 6-3. Community Health and Safety Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Traffic and Road Safety	- Number of project vehicles on public roads - Traffic incidents involving project vehicles - Compliance with traffic management plan	- Along designated transport routes - Near sensitive receptors	- Daily monitoring - Monthly reporting	- Zero major traffic accidents - Reduction in traffic complaints - Compliance with vehicle scheduling

Air Quality	- PM10 and PM2.5 levels - NOx, SOx, CO emissions	- Site boundaries - Nearby communities	- Monthly sampling - Continuous monitoring where necessary	- Compliance with UAE air quality standards - No exceedances reported
Noise Levels	- Ambient noise levels (dBA) - Vibration measurements	- Site perimeter - Sensitive receptors (e.g., residences)	- Weekly measurements - During high-noise activities	- Noise levels within permissible limits - Reduction in noise complaints
Public Health Indicators	- Incidence of communicable diseases - Health screening results - Vaccination records	- Worker accommodations - Local health facilities	- Monthly reporting - Immediate reporting for outbreaks	- Low incidence of diseases - 100% workers screened and vaccinated as required
Community Complaints	- Number of grievances received - Types of issues raised - Resolution time	- Community relations office - Grievance mechanism records	- Monthly summaries - Ongoing monitoring	- Grievances addressed within target time - Reduction in repeat issues
Emergency Preparedness	- Emergency drills conducted - Response times - Staff training records	- Construction site - Worker accommodations	- Quarterly drills - After any incident	- Effective emergency response - 100% relevant staff trained
Site Security	- Incidents of unauthorized access - Condition of fencing and signage	- Site perimeter - Access points	- Weekly inspections - Immediate reporting of incidents	- Zero security breaches - All signage and barriers in place

Monitoring Details

- Traffic Monitoring:

- Vehicle Logs: Record the number and types of vehicles entering and leaving the site.
- Incident Reporting: Document any traffic accidents or near-misses involving project vehicles.

- Air Quality Monitoring:
  - Use of Equipment: Deploy air quality monitoring stations at strategic locations.
  - Data Analysis: Compare results against national air quality standards.
- Noise Monitoring:
  - Sound Level Meters: Use calibrated equipment to measure noise levels.
  - Compliance Checks: Ensure levels do not exceed regulatory limits.
- Health Monitoring:
  - Health Records: Maintain confidential health records for workers.
  - Disease Surveillance: Monitor for signs of communicable diseases.
- Community Feedback:
  - Engagement Activities: Hold regular meetings with community representatives.
  - Grievance Analysis: Identify trends and address underlying causes.

6.3.6. Responsibilities

- Project Manager:
  - Overall responsibility for implementing the Community Health and Safety Management Plan.
  - Ensure adequate resources are allocated for mitigation measures.
- Health and Safety Manager:
  - Oversee implementation of health and safety measures.
  - Coordinate monitoring activities and incident investigations.
- Environmental Manager:
  - Ensure environmental mitigation measures are in place for air quality, noise, and waste management.
  - Liaise with regulatory authorities as required.
- Community Relations Officer:
  - Serve as the primary liaison between the project and local communities.
  - Manage the grievance mechanism and community engagement activities.

- Traffic Coordinator:
    - Implement the Traffic Management Plan.
    - Monitor vehicle movements and compliance with road safety measures.

6.3.7. Reporting

- Monthly Reports: Summarize monitoring data, incidents, grievances, and actions taken.
- Incident Reports: Immediate reporting of any significant incidents affecting community health and safety.
- Stakeholder Updates: Provide regular updates to local authorities and communities on project activities and mitigation efforts.

6.3.8. Training and Awareness

- Worker Training:
    - Health and Safety Induction: Provide all workers with induction training covering community health and safety responsibilities.
    - Ongoing Training: Conduct regular training sessions on specific topics such as road safety, environmental protection, and emergency response.
- Community Awareness:
    - Information Sessions: Organize sessions to inform communities about project activities and safety measures.
    - Educational Materials: Distribute leaflets, posters, or other materials to raise awareness about health and safety topics.
- Driver Training:
    - Defensive Driving Courses: Ensure all drivers complete approved training programs.
    - Awareness of Local Conditions: Train drivers on local traffic laws and cultural considerations.

6.3.9. Review and Update

- Periodic Review:
    - Quarterly Reviews: Assess the effectiveness of the Community Health and Safety Management Plan every quarter.
    - Adjustments: Make necessary adjustments based on monitoring results, community feedback, and changes in project activities.
- Continuous Improvement:
    - Lessons Learned: Incorporate lessons from incidents or near-misses into the plan.

- Stakeholder Input: Consider suggestions from community members and other stakeholders.

6.4. Stakeholder Engagement Plan

To ensure continuous engagement with communities, regulatory bodies, and other key stakeholders during Construction, a standalone stakeholder engagement plan was prepared. The main components of this plan are outlined below.

6.4.1. Objectives

The main objectives of the stakeholder management plan during the construction phase of the RLNG Project are to:

- Describe the regulatory, Client and requirements for consultation and disclosure.
- Identify stakeholders so that they are provided with timely and accurate information associated with the Project.
- Describe the future plan of activities and timetable for sharing information and consulting with stakeholders.
- Describe the internal resources and individual responsibilities assigned to implement engagement activities.
- Describe how the effectiveness of the SEP will be monitored and how lessons learned will be recorded, with the aim of improving stakeholder engagement activities during the lifecycle of the Project.
- Provide accurate and timely information to stakeholders in a culturally appropriate manner.

6.4.2. Regulatory Framework and Standards

ADNOC's requirements for stakeholder engagement are outlined in the Social Risk Management Standard [Ref 27], Section 5.2. A summary of the requirements from this standard are presented below:

- ADNOC shall conduct a broad, inclusive and continuous stakeholder engagement process with all potentially impacted stakeholders.
- Engagement with stakeholders shall be considered early in the Assess stage of a Project as timely engagement provides a valuable opportunity to inform people about a project, manage expectations, and establish positive relationships. Early interactions also provide an opportunity to identify potential environmental and social risks and impacts.
- ADNOC shall deploy community liaison personnel to maintain an open and continuous two-way communication channel within the community.
- Engagement materials and processes should be culturally appropriate, adopting local languages and customs.
- Grievances must be taken seriously, recorded, and investigated until resolved as soon as it is possible to do so.
- Aim that short term business interests are not allowed to jeopardise the broader social licence to operate.

During the construction stage, ADNOC should:

- Execute the social risk management plan including Corporate Social Responsibility (CSR) activities as applicable.
- Operate the Company Feedback Mechanism.
- Maintain active stakeholder engagement during construction.
- Close-out outstanding grievances and prepare hand-over of stakeholder relationships to production.
- Prepare stakeholder engagement strategy and plan incl. CSR activities for Operations stage.
- Deliverable: Update External Stakeholder Engagement Plan (ESEP).

6.4.3. Stakeholder Identification and Analysis

A list of priority stakeholders is presented in Table 6-4. Priority Stakeholders for Engagement.

Table 6-4. Priority Stakeholders for Engagement

Stakeholder Category	Justification for inclusion
Al Dafrah/ADNOC Beach Club/Sir Banyas island	Can be affected during construction by: - Traffic particularly at the entrance of the RLNG site for the 12,000 workers - Underwater noise that could affect marine wildlife presence and negatively affect tourism well-being at Sir Bani Yas
VIP Palace/representatives	Can be affected during construction by: - Traffic particularly at the entrance of the RLNG site for the 12,000 workers - Underwater noise that could affect marine wildlife presence and negatively affect tourism well-being at Sir Bani Yas
Al Dhannah/ Al-Ghayathi Hospital	Can be affected during construction by increased healthcare demand (12000 peak labor)
Al Dhannah/ Al-Ghayathi educational establishments	Can be affected during construction by increase demand in education services (12000 peak labor)
Al Dhannah/Ghayathi cities	Can be affected by increased demand for accommodation during construction

Stakeholder Category	Justification for inclusion
	Possible impacts related to labor influx
Road users between Ghayathi and RLNG site	Increased road safety risks during construction Possible impacts to visitors of coastal tourism facilities near the site during construction due to increased congestion
Fishers	Can possibly be impacted during construction with generation of underwater noise and less presence of fish in the vicinity noting that the area in front RLNG is a no fishing area, however underwater noise can affect wider areas (up to 15 km from source of noise and possibly beyond).

The following types of vulnerable people could be impacted from the Project:

- Residents in the neighboring community of Al Dhanna city, including those in VIP palaces, that could be potentially impacted by the generation of noise, visual change, and negative perceptions of health impacts from flaring. This includes elderly people, people with pre-existing medical conditions, and the disabled visiting the tourism establishments.
- Other road users who are using the highway adjacent to the Project which includes elderly persons, people with pre-existing medical conditions, and school children travelling on busses to/from school.
- Residents in communities in the vicinity of labor accommodation camps who may potentially be exposed to inappropriate behavior by the incoming workforce. This includes women and children.

6.4.4. Engagement Program, Information Disclosure, and Implementation Schedule

An integrated Engagement Action Plan for the construction and commissioning stages is presented in Table 6-5. Stakeholder Engagement Activities to be Undertaken During the Construction and Commissioning Stages of EPC.

Table 6-5. Stakeholder Engagement Activities to be Undertaken During the Construction and Commissioning Stages of EPC

Stakeholders	Engagement and Information Disclosure Approach
Potentially Affected Communities	
Al Dafrah/ADNOC Beach Club/Sir Banyas island	A regular (six monthly) joint meeting during construction to discuss: • The Project (schedule and key activities during construction stage); • Potential risks and impacts and the outcome of environmental and social monitoring activities during construction; • Any other concerns or questions raised. **Disclosure tools**: Project Information Leaflet, Project Information Poster, RLNG Community Feedback Mechanism Leaflet
VIP Palace/representatives	A regular information sharing about status of the project and construction activities **Disclosure tools**: Progress update leaflet, RLNG Community Feedback Mechanism Leaflet
Road users between Ghayathi and RLNG site	Public information about: • The Project (location, schedule, activities during each lifecycle stage); **Disclosure tools**: News, social media.
Fishers/Abu Dhabi Fisherman Association	A regular (six monthly) meeting during construction to discuss: • The Project (schedule and key activities during construction stage); • Potential risks and impacts and the outcome of environmental and social monitoring activities during construction; • Any other concerns or questions raised. **Disclosure tools**: Project Information Leaflet, Project Information Poster, RLNG Community Feedback Mechanism Leaflet.
Interested parties	
Al Dhannah/ Al-Ghayathi Hospitals	6-monthly coordination meeting

Stakeholders	Engagement and Information Disclosure Approach
Al Dhannah/ Al-Ghayathi educational establishments	6-monthly coordination meeting
Authorities	
EAD, DCT, Abu Dhabi Maritime, Abu Dhabi Ports, DMT, others	Regular NOC procedures and coordination

6.4.5. Roles, Responsibilities, and Resources

ADNOC Group accountabilities and responsibilities for Social Risk Management are held by three functions.

ADNOC GROUP HSE FUNCTION

Performs regulatory review and approval of Social Risk Management (SRM) Dossier, which include Social Impact Assessments and External Stakeholder Engagement Plans.

ADNOC GROUP COMMUNICATIONS & CSR FUNCTION

Supports and advises ADNOC Group HSE Function in the area of communications and stakeholder engagement.

Provides assistance to the Directorates and Group Companies where clarification is required on communication and stakeholder engagement aspects of the Social Risk Management Standard [Ref 27].

Provides training to Directorate and Group Company personnel on communication and stakeholder engagement topics that benefit from a corporate approach.

Provides expert advice on all aspects of social risk management to the Directorates and Group Companies.

Advises the Directorates and Group Companies on all formal external communications to ensure consistency of messaging and reputation management; and reviews and approves all external communication messages and materials.

Coordinates CSR activities.

Liaises with Group Services & Administration to align on corporate messaging and on application of stakeholder engagement methods and tools, and to ensure continuous learning from SRM implementation experiences [Ref 27].

ADNOC GROUP SERVICES & ADMINISTRATION FUNCTION

Supports and advises ADNOC Group HSE Function with delivery of its regulatory accountabilities in the area of stakeholder engagement.

Reviews stakeholder engagement plans before they are finalized, approved and distributed.

Coordinates all community engagement activities executed by Group Directorates, Group Companies, Joint Ventures and Partners and their contractors in the UAE.

Coordinates alignment of community engagement activities with engagement of local and national government and entities.

Liaises with Group Communications and CSR to align on corporate messaging and on application of stakeholder engagement methods and tools, and to ensure continuous learning from SRM implementation experiences.

GROUP COMPANY - CEO of ADNOC Group Company

The CEO of ADNOC Group Company is accountable for social risk management related to all business activities of Group Company.

HEAD OF GC CORPORATE HSE

Ensures that competent and independent subject matter experts are involved in the development of the SIA and associated studies. GC CHSE shall review and technically approve the independent third-party consultants including the Curriculum Vitaes of the lead technical personnel associated with the SIA process.

Review and technically approve SIA and associated studies during any stage of the project lifecycle (including the combined phase or modification projects).

Review all technical content, clarifications and deviations on the requirements of SIA and associated studies and provide necessary approval.

VP OF GC COMMUNICATIONS & CSR OR EQUIVALENT

The VP of ADNOC Group Company Communications & CSR (GC Comms) is the technical approver and custodian of the External Stakeholder Engagement Plan and related studies of the SRM Dossier.

This includes identification, assessment and engagement of communities and other stakeholders, communications, and management of reputation.

The VP of GC Comms shall:

Ensure that competent and independent subject matter experts are involved in the development of the External Stakeholder Engagement Plans and related studies. The VP of GC Comms shall review and technically approve the independent third-party consultants including the Curriculum Vitaes of the associated lead technical personnel;

Review and technically approve stakeholder engagement reports and related studies during any stage of the project lifecycle (including the combined phase or modification projects);

Review all technical content, clarifications and deviations on the requirements of External Stakeholder Engagement Plans and related studies and provide necessary approval;

Liaise with ADNOC Group Communications and CSR Function for Regulatory Approval of the

External Stakeholder Engagement Plan by timely submissions and follow up; and

Be the custodian (single point repository) of all the stakeholder engagement components of the SRM Dossier developed for various projects and operations in GC.

The VP of GC Comms is accountable for the Communication and CSR contribution to SRM and shall:

Represent Communications & CSR on the GC Social Risk Management Team

Ensure the consistency of the community engagement approach and external messaging related to SRM.

HEAD OF GC GENERAL SERVICES AND ADMINISTRATION OR EQUIVALENT

The Head of GC General Services and Administration (GC GSA) is accountable for community and other stakeholder engagement. The Head of GC GSA shall:

Represent GSA on the Social Risk Management Team

Ensure execution of community engagement in support of business activities.

Ensure close alignment of community engagement activities with engagement of government entities.

Implement and manage the Community Feedback Mechanism and analyse and report community (stakeholder) feedback received on a regular basis.

Ensure participation of and contribution from security subject matter experts as required

PROJECT MANAGER

The Project Manager is responsible for social risk management including stakeholder engagement during the project stages. The Project Manager is the owner of the SRM Dossier during the project stages and responsible for handover of the SRM Dossier to the operations phase. The Project Manager shall ensure that:

An SRM Operational Team is formed as early as possible in the project lifecycle and tasked with the management of social risks and delivery of SRM requirements. The Project Manager or his/her delegate will chair this team.

SRM activities and reports are prepared in line with the requirements of all applicable ADNOC Standards;

The independent third-party consultants, lead engineers and subject matter experts involved in the development of SRM studies and reports are pre-qualified within ADNOC, and that the proposed team is technically reviewed and approved by GC CHSE to ensure the competency of the personnel involved in the project work;

HEAD OF OPERATIONS

The Head of Operations is responsible for social risk management including stakeholder engagement during the operations stage. The Head of Operations is the owner of the respective Operations SRM Reports and SRM Dossier and is responsible for handover of the SRM Dossier to the decommissioning phase.

The Head of Operations shall ensure that:

An SRM Operational Team is formed or maintained and tasked with the management of social risks and delivery of SRM requirements. The Operations Manager or his/her delegate will chair this team.

The 'Statement of Fitness' is signed demonstrating that facilities shall be operated and maintained to ensure HSE and integrity.

SRM Operational Team

The SRM Operational Team shall:

Organise and attend stakeholder engagement activities;

Monitor the effectiveness of the ESEP using the indicators (refer to Section 6.4.7);

Approve the use of all information materials prior to their external release;

Implement the ADNOC Community Feedback mechanism.

EIA and SIA Consultant (ELARD)

ELARD is the specialist EIA and SIA contractor and shall be responsible for:

Preparing this initial version of the ESEP during the FEED stage.

Assisting ADNOC functions in the identification of stakeholders and planning stakeholder engagement activities.

Attending stakeholder engagement activities, recording the minutes, and discussing stakeholder feedback with relevant ADNOC functions.

EPC contractor

The EPC Contractor will be responsible to implement the ESEP activities along with ADNOC during the EPC stage.

As for the ESEP's budgeting and resources, ADNOC allocates a budget to implement the ESEP. This budget should be sufficient to:

Design and print communication materials.

Organize stakeholder engagement sessions, including refreshments to participants.

Mobilize sufficient human resources to implement the ESEP.

6.4.6. Community Feedback Mechanism

The purpose of RLNG's Community Feedback Mechanism (CFM) is to manage communities and other stakeholders' grievances and other feedback generated during the lifecycle of the Project. The mechanism is already established and will be implemented by the SRM Team. Details of the mechanism will be included in the information tools used.

Stakeholder feedback obtained from the mechanism shall be used to improve the environmental and social performance of the Project over time. Details of all grievances raised shall be summarised in future versions of the ESEP.

The CFM is described in detail in Appendix 12 of the SRM standard and is not repeated in this document.

The CFM will be publicized to the identified stakeholders and simplified CFM leaflets will be made available at the tourist facilities near the RLNG site and made available to the VIP representative.

RLNG project shall develop its own community Feedback Mechanism procedure.

6.4.7. Monitoring

The following performance monitoring indicators will be used during implementation of the ESEP to check progress and improve the overall effectiveness of the engagement programme over time:

An up-to-date checklist of Project stakeholders – The stakeholder checklist is up to date and reflects the current stage of the Project lifecycle.

Engagement activities completed – The register of stakeholder meetings reflects a target of 90% planned engaged as being completed.

Disclosure documents – the disclosure documents are accurate and reflect the current life cycle stage of the Project.

Capital spend on conducting engagements – the capital spent is aligned with the budget included in the latest version of the ESEP.

Periodically during the Project, Monitoring Compliance and Audit Reports shall be prepared by the SRM Operational Team to check that the content of the ESEP is being correctly implemented.

6.4.8. Reporting and Record Keeping

The following reports will be generated from implementation of the ESEP:

Stakeholder engagement meeting records.

Attendance records.

Social Incidents Reports (see below).

Reports that reflect the level of capital spend on implementation of the ESEP.

Any others as necessary.

Incident Reports:

A Social Incident is defined as an unplanned event induced by external stakeholders that interrupts business activities or impacts ADNOC's reputation. Every stakeholder engagement activity shall be used as an opportunity to raise awareness of the ADNOC Community Feedback Mechanism so that concerns raised by stakeholders can be recorded, investigated, and resolved in the shortest time possible. Details of all Social Incident Reports shall be appended to future versions of the ESEP, should any incidents arise during the lifecycle of the Project.

Periodic or Quarterly Performance Reports:

A Quarterly Performance Report shall be prepared by the SRM Operational Team from the start of construction, to gather and analyse stakeholder feedback obtained from the activities undertaken during construction.

Monitoring Compliance and Audit Reports:

Periodically during the Project, Monitoring Compliance and Audit Reports shall be prepared by the SRM Operational Team to check that the content of the ESEP is being correctly implemented.

Procedures to Review Inspections and Steps to Address Non-Compliance:

A Corrective Action Tracking Register shall be implemented by the SRM Operational Team to record and track until completion, all non-compliances identified from the compliance and audit reports.

6.4.9. Appendices

Complaint Action Form:

PART 1. CONTACT AND REGISTRATION DETAILS			**Detail**	**Copy to Log**
1	New or Existing Feedback or Complaint?	If new, allocated new feedback or complaint registration # (based on Complaint Log)		yes
		If update to existing feedback or complaint, enter existing registration #		
2	Date Received	DD/MM/YYYY		yes
3	Location	Community / Stakeholder name/general area		yes
4	Feedback Provider or Complainant	Feedback Provider or Complainant's name		yes
		Address		
		Phone #		
		Male/Female		
		Underage?		
		Vulnerable group?		
5	Received through	Suggestion box/phone/ letter / email etc.		
6	Received by	DD/MM/YYYY		
	Reported to (COMPANY function)	DD/MM/YYYY		
PART 2. COMPLAINT			**Detail**	**Copy to Log**
7	Anonymous or Confidential?	yes/no		
8	Stakeholder Category	Employee/community member/police/other state security forces/government official/NGO/supplier/media/journalist/other (specify)		yes
9	Geographic Scope	Local/provincial/regional/national/international		
10	Severity	Notable/minor/serious/major/catastrophic		yes
11	Type of Feedback/Complaint	Process/Layout/Interface/Specification/Compliance		yes
12	Feedback or Complaint Description	Detailed description		yes
PART 3. RESPONSE/CORRECTIVE ACTION			**Detail**	**Copy to Log**

13	Immediate Action Description			
	Action by	Name Company Representative		
14	In Need of Further Investigation?	yes/no		
15	Investigation Description			
16	Investigation Led by	Name Company Representative		
17	Representatives Involved	Name Company & External Representatives		
18	Deadline for Completing Investigation	DD/MM/YYYY		
19	Outcome of Investigation	Factually incorrect/reference to other mechanism/further action required		
20	Description of Further Action Required	Detailed description		
21	Action Completed	DD/MM/YYYY		
22	Approved by	Name (Company Representative)		
23	Complaint Notified Through	Phone/letter/in person/notice board/in a meeting/other (specify)		
24	Complaint Notified On	DD/MM/YYYY		
25	Response to Feedback/Complaint	Anonymous/no feedback/accepts action/rejects action/other (specify)		
26	Feedback or Complaints appeal	yes/no		
PART 3.1. ONLY COMPLETE IN CASE OF APPEAL			**Detail**	**Copy to Log**
27	Description of Appeal			
28	Appeal Panel Participants	Name of participants		
29	Deadline for Appeal	DD/MM/YYYY		
30	Outcome of Appeal			
31	Complaint Notified Through	Phone/letter/in person/notice board/in a meeting/other (specify)		
32	Complaint Notified On	DD/MM/YYYY		
33	Response from Complainant	Anonymous/no feedback/accepts action/rejects action/other (specify)		
PART 4. CLOSURE			**Detail**	**Copy to Log**
34	Feedback or Complaint Closed	yes/no		yes

35	Name of Feedback Provider or Complainant (if no anonymous)	Signature & Date		
	Company Function	Signature & Date		
	Company Function	Signature & Date		
	Company Function	Signature & Date		
	Any 3rd party involved	Signature & Date		

Feedback or Complaints Log:

1	Registration	
2	Date of Feedback or Complaint Received (DD/MM/YYYY)	
3	Location (community/general)	
4	Stakeholder category (community member, NGO, employee etc.)	
5	Severity (notable/minor/serious/major/catastrophic)	
6	Type of Feedback or Complaint	
7	Feedback or Complaint description	
8	Response / Corrective Action Description	
9	Feedback or Complaint Status (open/closed)	
10	Other notes	

Form may be digitized to fit into website or mobile application.

Feedback or Complaints Status Tracking Register:

Dashboard status as of	
Average Response Time	
Target Resolution Timeframe (days)	
%Satisfied with Process	
% Satisfied with Outcome	
Response Target (Days)	
Average Duration to Response	
Average Duration to Closure	

Status Report	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Open cases at beginning of month												
New cases this month												
Cases closed this month												
Open cases at end of month												
Average time between receipt and closing out of feedback or complaints												
% of closed cases that were closed on time												
% of feedback or complainants that were satisfied with the process												
% of feedback or complainants that were satisfied with the outcome												

6.5. Security Management Plan

6.5.1. Objectives

The main objectives of the security management plan during the construction phase of the RLNG Project are to:

- Ensure Safe and Secure Operations: Provide mitigation measures for the safe and secure management of site activities during construction.
- Protect Personnel and Assets: Safeguard all personnel, equipment, materials, and facilities from security threats.
- Comply with Regulations: Adhere to all relevant security laws, regulations, and ADNOC standards.

Effective Communication: Ensure that security policies and procedures for day-to-day site activities are communicated to all contractors and personnel working on site.

6.5.2. Regulatory Framework and Standards

The Security Management Plan aligns with the following regulatory frameworks, standards, and guidelines relevant to security management during construction:

UAE Laws and Regulations

- Federal Law No. 6 of 1973: Concerning Entry and Residence of Foreigners
- Federal Law No. 8 of 1980: Regulation of Labor Relations
- Federal Law No. 24 of 1999: Protection and Development of the Environment
- Federal Decree-Law No. 17 of 2019: Concerning Weapons, Ammunition, Explosives, Military Equipment, and Hazardous Materials
- Cabinet Decision No. 24 of 2017: On Security of Ports, Borders, and Free Zones

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST04: Incident Notification, Investigation, and Reporting
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-GA-ST08: HSE Performance Monitoring and Reporting
- HSE-GA-ST09: HSE Audit and Assurance
- HSE-OS-ST24: Security Management

International Standards and Guidelines

- ISO 28000: Specification for Security Management Systems for the Supply Chain

- IFC Performance Standard 4: Community Health, Safety, and Security

6.5.3. Security Roles

6.5.3.1 CICPA Authority and ADNOC Security

CICPA Authority and ADNOC Security are responsible for the perimeter of the existing facilities of the Ruwais Industrial City including fencing, access control, surveillance, manned guarding and direction of the emergency planning and response systems. All requirements of the CICPA or any other authority having jurisdiction with respect to access to restricted areas shall be complied with.

CICPA and ADNOC Security are responsible for:

- Perimeter Security: Securing the perimeter of the existing facilities in Ruwais Industrial City, including fencing and surveillance.
- Access Control: Managing access to the site through gates and checkpoints.
- Surveillance: Monitoring the perimeter and access points via surveillance systems.
- Security Control Room: Manning the control room and coordinating incident response.
- Manned Guarding: Providing security personnel for access control and emergency response.
- Security Inspections: Conducting oversight and inspections of contractor worksites, temporary offices, and laydown areas.

Key Responsibilities:

- Ensure all personnel accessing the site have the appropriate CICPA Security pass/access card.
- Process and approve access requests submitted by contractors and subcontractors.
- Enforce compliance with all CICPA and ADNOC security requirements.

6.5.3.2 Contractor Security for the Project

Contractor Security is responsible for securing their designated areas until official hand-over to ADNOC. This includes:

- Appointment of Qualified Security Staff: Engaging a Private Security Company (PSC) with trained personnel.
- Development of Security Plans: Preparing detailed security plans and procedures, approved by ADNOC.
- Access Control: Controlling entry and exit of personnel, goods, equipment, and vehicles within their area of control.
- Physical Security Measures: Implementing fencing, barricades, signage, and other measures to prevent unauthorized access.
- Emergency Response: Ensuring effective response to security incidents and reporting them promptly.

Key Responsibilities:

- Develop and implement a Site Security Plan reviewed and approved by ADNOC.
- Provide HSE and Security staff empowered to enforce security measures.
- Coordinate security activities with CICPA and ADNOC Security.
- Ensure compliance with all security instructions and requirements.

6.5.3.3 Security Measures

The Security Plan shall follow the security measures described in Table 6-6. Security Plan below in order to achieve an efficient and safe management of site and camp activities.

Table 6-6. Security Plan

Aspect	Mitigation Measures
Security Control	- Provide adequate fencing around worksite perimeters where required. - Arrange barricades and signs along the perimeter to prevent unauthorized entry - Designate parking areas for vehicles; employees proceed directly to worksites after parking. - Schedule deliveries and pickups during normal working hours unless special arrangements are made. - Log all deliveries and pickups; security personnel to monitor entry and exit. - Security guards maintain records of all visitors and vehicles entering the premises. - Discuss security matters during daily, weekly, and monthly safety meetings.
Gate Access Control	- All personnel must display their identity card to security guards at the gate before entry. - No removal of materials without a material pass signed by authorized personnel; passes to be handed over to security upon exit. - Personal equipment brought to site must be registered with the security officer. - All vehicles must stop at the gate; entry and exit passes to be issued and checked. - Visitors must obtain passes and identity cards from security personnel. - Visitors are required to attend a Visitors HSE Orientation Training before accessing the site. - All personnel must adhere to PPE requirements: safety helmet, safety shoes, and safety glasses. - Visitors must be accompanied by authorized personnel while on site. - Visitors must return identity cards upon leaving the site. - All materials, tools, and equipment must be approved and registered upon entry and exit.

	- Subcontractors must submit lists of equipment, tools, and materials to the Security Manager, approved by the Contractor Site Manager.
General Security Instructions	- All personnel must comply with security regulations issued for the project. - No entry for individuals under the influence of alcohol or narcotics; prohibited substances are not allowed on site. - Preparation of meals within the site area is not allowed; meals should be provided in designated areas. - Report any suspicious activities or security breaches immediately to security personnel. - Prohibit unauthorized photography or recording within the site. - Enforce strict control over the use of communication devices as per company policy.

6.5.4. Monitoring

To ensure the effectiveness of security measures and compliance with relevant standards, the monitoring activities in Table 6-7 will be conducted.

Table 6-7. Security Monitoring Plan During Construction Phase

Aspect	Parameter(s)	Monitoring Location	Frequency	KPI(s)
Access Control	- Number of unauthorized access attempts - Compliance with badge/pass requirements - Functionality of access control systems	- Site entry and exit points - Perimeter checkpoints	- Continuous monitoring - Daily checks	- Zero unauthorized entries - 100% personnel with valid passes - Access control systems operational
Security Incidents	- Number and type of security incidents - Response times - Incident investigation outcomes	- Throughout the project site	- Immediate reporting - Monthly summaries	- Reduction in incidents over time - All incidents investigated and closed - Lessons learned implemented
Visitor Management	- Visitor logs maintained - Compliance with visitor procedures - Number of visitors attending HSE orientation	- Security offices - Training facilities	- Daily monitoring - Monthly reviews	- Accurate visitor records - 100% visitors oriented and accompanied

				- No violations of visitor protocols
Equipment and Material Control	- Records of materials and equipment entering and exiting the site - Compliance with material pass procedures	- Security checkpoints - Storage areas	- Continuous monitoring - Monthly audits	- Accurate and complete records - No loss or theft of materials - Compliance with procedures
Security Personnel Performance	- Training and certification records - Adherence to post orders - Professional conduct	- Security posts - Control rooms	- Monthly performance evaluations - Regular training updates	- 100% security staff trained and certified - Positive performance evaluations - No reports of misconduct
Coordination with CICPA and ADNOC Security	- Joint security meetings held - Compliance with directives - Information sharing effectiveness	- Project security offices - CICPA coordination meetings	- Weekly meetings - As required	- Effective collaboration - Timely implementation of directives - Clear communication channels

6.5.5. Responsibilities

- Project Security Manager:
    - Oversee the implementation of the Security Management Plan.
    - Coordinate with CICPA and ADNOC Security.
    - Ensure all security personnel are properly trained and equipped.
- Security Supervisors:
    - Manage day-to-day security operations at their assigned areas.
    - Ensure compliance with security procedures.
    - Report incidents and coordinate responses.
- Security Guards:
    - Control access at gates and checkpoints.
    - Monitor and patrol assigned areas.

- Maintain logs and records as required.

- Contractor and Subcontractor Personnel:
    - Comply with all security policies and procedures.
    - Carry valid identification at all times.
    - Report any security concerns or incidents.

6.5.6. Reporting

- Incident Reporting:
    - Immediate notification to the Project Security Manager of any security incidents, breaches, or suspicious activities.
    - Complete incident reports detailing the nature of the incident, response actions, and outcomes.
- Daily Reports: Security guards to submit daily logs of activities, including visitor entries, vehicle movements, and any anomalies.
- Monthly Reports: The Project Security Manager to compile monthly summary reports of security activities, incidents, audits, and recommendations for improvements.

6.5.7. Training and Awareness

- Security Personnel Training - Ensure all security staff receive training in:
    - Security procedures and post orders.
    - Emergency response and incident management.
    - Legal requirements considerations.
    - Communication and reporting protocols.
- Employee Awareness Programs:
    - Conduct security induction training for all project personnel covering:
        - Security policies and procedures.
        - Access control requirements.
        - Reporting of security incidents or concerns.
    - Regular refreshers and updates during safety meetings.
- Visitor Orientation: Provide a brief security and HSE orientation to all visitors before granting site access.

6.5.8. Review and Update

- Periodic Review: Review the Security Management Plan quarterly or when significant changes occur in project activities or threat levels.
- Security Audits: Conduct regular security audits to assess the effectiveness of security measures and identify areas for improvement.
- Continuous Improvement: Update the plan based on audit findings, incident investigations, and feedback from security personnel and stakeholders.

6.5.9. Coordination with Authorities

- CICPA Coordination: Maintain close coordination with CICPA for access approvals, security directives, and compliance with regulations.
- Regulatory Compliance: Ensure all security operations comply with UAE laws and ADNOC standards.
- Emergency Services Liaison: Establish communication protocols with local police, emergency services, and other relevant authorities for incident response support.

7. OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PLAN

7.1. Objectives

The main objectives of the occupational health and safety management plan during the construction phase of the RLNG Project are to:

- Ensure a Safe and Healthy Working Environment: Provide a workplace that minimizes risks to the health and safety of all personnel involved in the project.
- Prevent Accidents and Occupational Illnesses: Implement proactive measures to prevent injuries, illnesses, and incidents arising from construction activities.
- Promote a Safety Culture: Foster an environment where safety is a core value, and all workers are committed to maintaining high safety standards.
- Comply with Regulations: Adhere to all relevant UAE laws, Abu Dhabi regulations, ADNOC standards, and international best practices related to occupational health and safety.

7.2. Regulatory Framework and Standards

The OHS Management Plan aligns with the following regulatory frameworks, standards, conventions, and guidelines:

UAE Laws and Regulations

- Federal Law No. 8 of 1980: Labor Law and its Amendments
- Ministerial Resolution No. 32 of 1982: Protecting Workers from Work Hazards
- Abu Dhabi Environment, Health, and Safety Management System Framework, 2009
- Abu Dhabi Occupational Safety and Health System Framework (OSHAD SF)
    - Element 2: Policy and Planning
    - Element 4: Hazard Identification and Risk Assessment
    - Element 9: Emergency Preparedness and Response
- UAE Fire and Life Safety Code of Practice, 2018

ADNOC Standards

- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST04: Incident Notification, Investigation, and Reporting
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-GA-ST07: HSE Design Philosophy
- HSE-GA-ST08: HSE Performance Monitoring and Reporting

- HSE-GA-ST09: HSE Audit and Assurance
- HSE-EN-ST02: Pollution Prevention and Control
- HSE-EN-ST04: Waste Management
- HSE-EN-ST05: Environmental Performance Monitoring
- HSE-OH-ST03: Occupational Health Risk Management
- HSE-OH-ST05: Health Screening & Surveillance
- HSE-CE-ST05: Emergency Response Plan

International Conventions and Protocols

- ILO Conventions:
    - No. 81: Labor Inspection Convention, 1947
    - No. 148: Working Environment (Air Pollution, Noise, and Vibration) Convention, 1977
    - No. 155: Occupational Safety and Health Convention, 1981
    - No. 170: Chemicals Convention, 1990
    - No. 187: Promotional Framework for Occupational Safety and Health Convention, 2006
- Basel Convention: Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal, 1989
- Rotterdam Convention: Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998
- Stockholm Convention: Persistent Organic Pollutants, 2001
- Protocol on the Control of Marine Transboundary Movements and Disposal of Hazardous Wastes, 1998

WHO Guidelines

- WHO Global Plan of Action on Workers' Health, 2008–2017
- WHO Guidelines on Occupational Health Risk Assessment

International Best Practices

- ISO 45001: Occupational Health and Safety Management Systems
- ISO 31000: Risk Management Guidelines
- ANSI/ASSP A10 Series: Safety Requirements for Construction and Demolition
- American Petroleum Institute (API) Standards

7.3. Roles and Responsibilities

7.3.1. ADNOC Group

- Senior Management:
    - Demonstrate commitment to OHS through active participation and resource allocation.
    - Approve and support the implementation of the OHS Management Plan.
- Group Health Safety and Environment Function (GHSEF):
    - Define appropriate standards for OHS, including methodologies for risk assessments.
    - Provide oversight and guidance on OHS matters.

7.3.2. Project Management

- Project Director/Manager:
    - Ensure implementation of the OHS Management Plan across all project activities.
    - Allocate resources necessary for effective OHS management.
- HSE Manager:
    - Oversee all OHS activities and ensure compliance with standards and regulations.
    - Lead the Hazard Identification and Risk Assessment process.
    - Coordinate with contractors and subcontractors on OHS matters.
- Occupational Health Subject Matter Expert (OH SME):
    - Facilitate and monitor the risk management process.
    - Assist in determining risk ratings and developing control measures.
    - Lead OHS training and awareness programs.

7.3.3. Contractors and Subcontractors

- Contractor Management:
    - Comply with all OHS requirements as per contractual agreements.
    - Develop and implement their own OHS plans compatible with this OHS Management Plan.
    - Ensure all workers are trained and competent in OHS practices.
- Supervisors and Foremen:
    - Enforce OHS policies on-site.
    - Conduct regular safety briefings and toolbox talks.

- Report any hazards or incidents promptly.

- Workers:
  - Comply with all OHS policies and procedures.
  - Use provided PPE correctly and report any unsafe conditions.
  - Participate in OHS training and meetings.

7.4. Hazard Identification and Risk Assessment

7.4.1. Process Overview

- Systematic Examination: Identify all potential hazards associated with construction activities, equipment, materials, and processes.
- Risk Assessment Methodology: Use qualitative and quantitative methods to assess risks, considering the likelihood and severity of potential incidents.
- Prioritization: Rank hazards based on risk levels to prioritize control measures.
- Documentation: Record all findings in the Risk Register (see Appendix A of this OHS Plan).

7.4.2. Key Hazards Identified

Some of the key hazards identified are listed below; however additional hazards also exist and need to be identified especially since construction also include marine works.

- Physical Hazards:
  - Working at Heights: Risks of falls during jetty construction and other elevated work areas.
  - Noise and Vibration Exposure: Use of heavy machinery, piling activities.
  - Exposure to Extreme Temperatures: Harsh weather conditions in Abu Dhabi.
  - Manual Handling: Lifting and moving heavy materials, especially during jetty construction.
  - Marine Environment Hazards: Slippery surfaces, tides, waves, and potential for drowning.
- Chemical Hazards:
  - Handling of Hazardous Substances: Fuels, solvents, marine coatings, and anti-fouling agents.
  - Exposure to Dust and Fumes: From welding, cutting, and demolition activities.
- Biological Hazards:
  - Exposure to Infectious Diseases: Due to close working conditions and potential for pandemics.
  - Marine Life: Risks from stings or bites from marine organisms during jetty construction.
- Ergonomic Hazards:

- Repetitive Tasks: Prolonged standing, bending, or awkward postures.
- Vibration Exposure: Use of vibrating tools and equipment.

- Safety Hazards:
  - Equipment Operation: Cranes, heavy machinery, vessels, and barges.
  - Electrical Hazards: Temporary power supplies, water and electricity interface.
  - Confined Spaces: Working inside tanks or enclosed areas on vessels.
  - Navigation Risks: Interaction with other marine traffic.
- Psychosocial Hazards:
  - Stress and Fatigue: Long working hours, shift work, and remote location.
  - Cultural and Language Barriers: Multinational workforce communication challenges.

7.4.3. Risk Assessment Matrix

A risk assessment matrix (Appendix A) will be used to evaluate the level of risk associated with each hazard, considering:

- Likelihood: The probability of occurrence.
- Severity: The potential impact on health and safety.

7.5. Control Measures

7.5.1. Hierarchy of Controls

Control measures will be implemented based on the following hierarchy:

1. Elimination: Remove the hazard where possible.
2. Substitution: Replace the hazard with a less dangerous option.
3. Engineering Controls: Isolate people from the hazard (e.g., guarding, ventilation).
4. Administrative Controls: Change work practices (e.g., training, procedures).
5. Personal Protective Equipment (PPE): Provide equipment to protect workers.

7.5.2. Specific Control Measures

- Physical Hazards:
  - Working at Heights:
    - Engineering Controls: Install guardrails, safety nets, and scaffolding.
    - Administrative Controls: Develop and enforce a Permit to Work system for work at heights.

- PPE: Provide fall arrest systems, harnesses, and lanyards.
- Training: Conduct work at height safety training and competency assessments.

- Noise Control:
  - Engineering Controls: Use low-noise equipment, install noise barriers.
  - PPE: Provide hearing protection devices.
  - Monitoring: Conduct regular noise level assessments.
- Temperature Exposure:
  - Administrative Controls: Schedule work during cooler hours, implement work-rest cycles.
  - Facilities: Provide shaded rest areas and hydration stations.
  - Training: Educate workers on recognizing signs of heat stress.
- Marine Environment Hazards:
  - Engineering Controls: Install non-slip surfaces, guardrails on platforms and vessels.
  - PPE: Provide life jackets, safety boots with good grip.
  - Procedures: Develop marine safety procedures, including man-overboard drills.

- Chemical Hazards:
  - Hazardous Substances:
    - Substitution: Use less hazardous materials where possible.
    - Engineering Controls: Provide proper ventilation systems.
    - Administrative Controls: Implement safe storage, labeling, and handling procedures.
    - PPE: Provide appropriate gloves, masks, and protective clothing.
    - Training: Chemical handling and spill response training.
  - Dust and Fumes:
    - Engineering Controls: Use dust suppression methods, local exhaust ventilation.
    - PPE: Provide respiratory protection suitable for the hazards.
    - Monitoring: Regular air quality assessments.
- Biological Hazards:
  - Infectious Diseases:
    - Administrative Controls: Implement health screening, vaccination programs.

- Hygiene Practices: Promote hand hygiene, provide sanitation facilities.
- Awareness: Educate workers on disease prevention.

- Marine Life:
  - Awareness Training: Inform workers about potential marine hazards.
  - First Aid: Provide treatment protocols for stings or bites.

- Ergonomic Hazards:
  - Manual Handling:
    - Engineering Controls: Use mechanical lifting aids like cranes and hoists.
    - Administrative Controls: Implement job rotation, reduce manual handling tasks.
    - Training: Educate workers on proper lifting techniques.
  - Vibration Exposure:
    - Engineering Controls: Use anti-vibration tools and equipment.
    - Administrative Controls: Limit exposure time, provide rest periods.
    - Monitoring: Regular health checks for vibration-related conditions.

- Safety Hazards:
  - Equipment Operation:
    - Engineering Controls: Ensure equipment is fitted with safety devices.
    - Administrative Controls: Implement equipment maintenance programs, operator certification.
    - Exclusion Zones: Establish and enforce no-go areas around operating equipment.
  - Electrical Safety:
    - Engineering Controls: Use Ground Fault Circuit Interrupters (GFCIs), proper insulation.
    - Administrative Controls: Lockout/tagout procedures, regular inspections.
    - Training: Electrical safety training for relevant personnel.
  - Confined Spaces:
    - Procedures: Develop confined space entry permits, emergency rescue plans.
    - Monitoring: Conduct atmospheric testing before and during entry.
    - PPE: Provide appropriate respiratory protection and communication devices.
  - Navigation Risks:

  - Coordination: Communicate with port authorities, use marine traffic control systems.
  - Training: Provide marine safety and navigation training.

- Psychosocial Hazards:
- Stress and Fatigue:
  - Administrative Controls: Manage workloads, ensure adequate rest periods.
  - Facilities: Provide comfortable accommodations and recreational facilities.
  - Support: Access to counseling services.
- Cultural and Language Barriers:
  - Communication: Use multilingual signage, employ interpreters if necessary.
  - Training: Cultural sensitivity training for all staff.

7.6. Training and Competency

7.6.1. Training Programs

- Induction Training:
  - Mandatory for all workers before starting work on-site.
  - Covers OHS policies, site rules, emergency procedures, and hazard awareness.
- Task-Specific Training: Provided for high-risk activities (e.g., working at heights, confined space entry).
- Ongoing Training: Regular refresher courses, toolbox talks, and safety briefings.
- Specialized Training: For roles such as first aiders, fire wardens, and safety representatives.

7.6.2. Competency Assurance

- Verification of Competency: Assess and document workers' skills and qualifications.
- Certification: Ensure operators of equipment have valid certifications.

7.7. Communication and Consultation

7.7.1. Communication Channels

- Safety Meetings: Regular meetings to discuss OHS issues, updates, and feedback.
- Notice Boards and Signage: Display safety information, emergency contacts, and hazard warnings.
- Safety Bulletins and Newsletters: Provide updates on OHS matters and share best practices.

7.7.2. Worker Involvement

- Safety Committees: Establish committees with worker representatives to participate in OHS decision-making.

- Feedback Mechanisms: Encourage reporting of hazards and suggestions for improvement.
- Consultation Processes: Involve workers in risk assessments and development of control measures.

7.8. Emergency Preparedness and Response

7.8.1. Emergency Response Plan

- Development: Create a comprehensive plan detailing procedures for various emergencies (e.g., fire, medical incidents, chemical spills).
- Roles and Responsibilities: Assign specific roles to personnel (e.g., Incident Commander, First Aiders).
- Resources: Ensure availability of emergency equipment (e.g., fire extinguishers, first aid kits, spill kits).

7.8.2. Drills and Exercises

- Regular Drills: Conduct evacuation drills and scenario-based exercises.
- Evaluation: Review drill performance and implement improvements.

7.8.3. Coordination with External Services

- Liaison with Authorities: Coordinate with local emergency services (e.g., fire department, medical services).
- Access Information: Provide site maps and access routes to emergency responders.
- Mutual Aid Agreements: Establish agreements with nearby facilities for assistance during emergencies.

7.9. Monitoring and Reporting

7.9.1. Inspections and Audits

- Routine Inspections:
    - Conduct daily site inspections to identify hazards and verify compliance.
    - Use standardized checklists (see Appendix E).
- Formal Audits:
    - Perform periodic audits against OHS standards and regulations.
    - Internal audits quarterly; external audits annually.

7.9.2. Incident Reporting

- Reporting Procedures:
    - Establish clear processes for reporting incidents, near-misses, and unsafe conditions.
    - Immediate verbal report followed by written report within 24 hours.
- Data Analysis:

- Track and analyze incident data to identify trends and areas for improvement.
- Use software tools for data management.

7.9.3. Performance Indicators

- Key Performance Indicators (KPIs): Set measurable targets (e.g., Total Recordable Injury Rate, Lost Time Injury Frequency Rate, Number of safety observations reported, Training hours per employee).
- Regular Reporting:
  - Provide OHS performance reports to management and stakeholders monthly.
  - Include KPI trends, significant incidents, and corrective actions.

7.10. Health Management

7.10.1. Health Surveillance

- Medical Examinations: Conduct pre-employment, periodic, and exit medical examinations.
- Exposure Monitoring: Monitor worker exposure to hazardous substances (e.g., noise levels, air quality).

7.10.2. Wellness Programs

- Health Promotion: Offer programs on nutrition, exercise, and smoking cessation.
- Mental Health Support: Provide access to counseling services and stress management resources.

7.10.3. Occupational Disease Prevention

- Early Detection: Implement screening programs for occupational diseases (e.g., hearing loss, respiratory issues).
- Intervention: Provide medical intervention and adjust work conditions as necessary.

7.11. Incident Investigation and Reporting

7.11.1. Investigation Procedures

- Immediate Response: Secure the incident scene, provide medical assistance, and prevent further harm.
- Investigation Team: Assign qualified personnel to investigate incidents.
- Root Cause Analysis: Identify underlying causes using methods like the Five Whys or Fault Tree Analysis.

7.11.2. Reporting

- Documentation: Complete incident reports detailing findings and corrective actions.
- Notification: Report incidents to relevant authorities as required by law.
- Corrective Actions: Implement measures to prevent recurrence and monitor effectiveness.

7.12. Audit and Management Review

7.12.1. Internal Audits

- Audit Schedule:
    - Develop an audit plan covering all aspects of the OHS Management System.
    - Include different audit types: compliance, system, and performance audits.
- Audit Criteria:
    - Assess compliance with OHS policies, procedures, and legal requirements.
    - Evaluate effectiveness of control measures.
- Audit Findings:
    - Document findings, non-conformities, and recommendations.
    - Classify non-conformities based on severity.

7.12.2. Management Review

- Review Meetings:
    - Senior management to review OHS performance quarterly.
    - Include Project Director, HSE Manager, and key stakeholders.
- Agenda Items:
    - Audit results
    - Incident trends and statistics
    - OHS objectives and KPIs
    - Resource needs
    - Opportunities for improvement
- Action Plans:
    - Develop and track implementation of action plans arising from reviews.
    - Assign responsibilities and timelines.

7.13. Document Control and Records Management

7.13.1. Documentation

- Policies and Procedures:
    - Maintain up-to-date OHS policies, procedures, and guidelines.

- Review and update annually or as needed.

- Forms and Templates:
  - Use standardized documents for consistency (e.g., inspection checklists, incident report forms).
  - Include version numbers and approval signatures.

7.13.2. Records Management

- Record Keeping:
  - Store records securely, ensuring confidentiality and accessibility.
  - Use electronic systems with backup protocols.
- Retention Periods:
  - Adhere to legal and organizational requirements for record retention.
  - Typically, retain OHS records for at least five years and until after completion of construction.
- Document Control:
  - Implement version control and approval processes for all OHS documents.
  - Maintain a Document Register listing all controlled documents.

7.14. Appendices

- Appendix A: Risk Assessment Matrix
  - Purpose:
    - A tool for evaluating and prioritizing risks based on likelihood and severity.
  - Contents:
    - Definitions of likelihood and severity levels.
    - Risk scoring methodology.
    - Risk Register template.
- Appendix B: Emergency Contact List
  - Key personnel and external services contact information, including:
    - Project Manager
    - HSE Manager
    - First Aiders
    - Fire Wardens

- Local Emergency Services (fire, ambulance, police, Coast Guard, Nearest Hospital)

- Appendix C: Training Matrix
  - Schedule and records of training sessions, including:
    - Types of training provided (Induction, Task-specific, Specialized roles)
    - Dates of training
    - Attendees
    - Trainers' details
    - Validity Periods
- Appendix D: Legal Register
  - Compilation of applicable laws, regulations, and standards relevant to the project.
- Appendix E: Forms and Templates
  - Standardized documents for reporting and record-keeping, such as:
    - Incident Report Form
    - Hazard Reporting Form
    - Inspection Checklist
    - Audit Report Template
    - Permit to Work Forms:
      - Hot Work Permit
      - Confined Space Entry Permit
      - Work at Height Permit
    - Job Safety Analysis (JSA) Template

8. EMERGENCY RESPONSE PLAN

8.1. Objectives

The main objectives of the Emergency Response Plan is:

- **Minimize Environmental and Social Impacts:** Ensure that all potential emergencies—both environmental and social—are managed to minimize their impact on marine ecology, community health and safety, worker wellbeing, and local infrastructure.
- **Risk-Specific Preparedness:** Develop tailored emergency procedures based on the specific environmental and social risks identified in the EIA, SIA, and ENVID studies, ensuring the project is equipped to handle emergencies effectively.
- **Rapid Response and Recovery:** Establish clear procedures for rapid response and recovery from incidents to mitigate any potential long-term environmental, social, or health impacts.
- **Ensure Compliance:** Adhere to all relevant laws, regulations, ADNOC standards, and international best practices related to emergency preparedness and response.

8.2. Regulatory Framework and Standards

The Emergency Response Plan aligns with the following regulatory frameworks, standards, conventions, and guidelines:

ADNOC Standards

- HSE-CE-ST05: Emergency Response Plan
- HSE-GA-ST02: HSE Management System Standard
- HSE-GA-ST04: Incident Notification, Investigation, and Reporting
- HSE-GA-ST06: Project HSE Plan and Standard
- HSE-GA-ST08: HSE Performance Monitoring and Reporting
- HSE-GA-ST09: HSE Audit and Assurance
- HSE-OH-ST03: Occupational Health Risk Management
- HSE-EN-ST02: Pollution Prevention and Control

UAE Laws and Regulations

- Federal Law No. 24 of 1999: Protection and Development of the Environment
- Federal Law No. 8 of 1980: Regulation of Labor Relations
- Ministerial Resolution No. 32 of 1982: Prevention Methods and Measures for Protecting Workers against Work Hazards

- Abu Dhabi Environment, Health, and Safety Management System Framework, 2009
- Abu Dhabi Occupational Safety and Health System Framework (OSHAD SF)
- Element 9: Emergency Preparedness and Response
- UAE Fire and Life Safety Code of Practice, 2018

International Standards and Guidelines

- International Finance Corporation (IFC) Performance Standards:
    - Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
    - Performance Standard 4: Community Health, Safety, and Security
- ISO 22320: Security and Resilience—Emergency Management—Requirements for Incident Response
- ISO 45001: Occupational Health and Safety Management Systems
- ILO Conventions:
    - No. 155: Occupational Safety and Health Convention, 1981
    - No. 170: Chemicals Convention, 1990

International Best Practices

- UNEP APELL: Awareness and Preparedness for Emergencies at Local Level
- NFPA Standards: National Fire Protection Association guidelines for fire safety

8.3. Risk Assessment

8.3.1. Overview

A risk assessment was conducted during the EIA and SIA to identify potential emergencies that could arise during the construction phase. The ERP is designed to address these key risks:

8.3.2. Identified Risks

- Marine Ecology Impact (Jetty Construction):
    - Potential Emergencies:
        - Accidental spills of hazardous materials into marine environments.
        - Unplanned disturbances to sensitive marine habitats.
        - Underwater noise impacts on marine fauna.
    - Consequences:
        - Damage to coral reefs, seagrass beds, and mangroves.

  - Disruption of marine life, including endangered species like dugongs and marine turtles.
  - Negative effects on fisheries and local livelihoods.

- Underwater Noise (Piling):
  - Potential Emergencies:
    - Exceedance of noise thresholds causing harm to marine mammals.
    - Disturbance leading to behavioral changes in marine species.
  - Consequences:
    - Injury or mortality of marine fauna.
    - Long-term ecological impacts on marine biodiversity.
- Community Health and Safety (Road Traffic Incidents):
  - Potential Emergencies:
    - Traffic congestion leading to accidents involving pedestrians and other road users.
    - Increased risk of collisions due to project-related vehicles.
  - Consequences:
    - Injuries or fatalities among community members.
    - Strain on local emergency services and infrastructure.
- Worker Wellbeing (Occupational Health and Safety):
  - Potential Emergencies:
    - Accidents resulting in serious injuries or fatalities.
    - Health emergencies due to exposure to hazardous substances or extreme conditions.
  - Consequences:
    - Loss of life or severe injuries.
    - Project delays and legal liabilities.
- Social and Community Risks (Migrant Workforce):
  - Potential Emergencies:
    - Social conflicts between migrant workers and local communities.
    - Incidents of inappropriate behavior causing community unrest.
  - Consequences:

- Damage to community relations.
- Negative publicity and reputational harm.

8.4. Organizational Structure And Responsibilities

An effective emergency response requires a well-defined organizational structure with clear roles and responsibilities:

- Project Director/Manager:
  - Overall responsibility for emergency preparedness and response.
  - Ensures resources are available for effective implementation of the ERP.
- HSE Manager:
  - Coordinates all emergency response activities.
  - Ensures compliance with ADNOC standards and regulatory requirements.
  - Liaises with external agencies and authorities.
- Emergency Response Team (ERT):
  - Team Leader: Manages the ERT during an incident.
  - Emergency Coordinators: Responsible for specific areas such as marine response, medical emergencies, and fire safety.
  - First Aiders and Medical Staff: Provide immediate medical assistance.
  - Fire Wardens: Manage fire prevention and response.
  - Security Personnel: Secure the site and control access during emergencies.
- Social Manager:
  - Manages social incidents involving the workforce and local communities.
  - Coordinates with community leaders and authorities to address social emergencies.
- Marine Ecologist and Biodiversity Experts:
  - Provide expertise during marine-related emergencies.
  - Ensure response actions align with the Biodiversity Action Plan (BAP) / Biodiversity Management Plan (BMP).
- Contractors and Subcontractors:
  - Must comply with the ERP.
  - Participate in training and drills.
  - Report any incidents immediately.

8.5. Emergency Response Procedures

8.5.1. General Response Principles

- Immediate Action: Ensure the safety of personnel and the public.
- Containment: Prevent escalation and minimize environmental and social impacts.
- Notification: Inform relevant internal and external stakeholders promptly.
- Documentation: Record all actions taken during the emergency.

8.5.2. Specific Emergency Scenarios

- Spill Response (Marine and Terrestrial) Procedures:
    - Immediate Notification: Alert the ERT and HSE Manager.
    - Containment: Deploy spill containment booms and absorbent materials.
    - Source Control: Stop the source of the spill if safe to do so.
    - Cleanup: Initiate cleanup operations using appropriate methods.
    - Reporting: Notify the Environment Agency - Abu Dhabi (EAD) and other relevant authorities.
    - Environmental Monitoring: Assess the impact on the environment and implement remediation measures.
- Fire and Explosion Response Procedures:
    - Alarm Activation: Raise the alarm and initiate evacuation procedures.
    - Evacuation: Guide personnel to designated assembly points.
    - Firefighting: Trained fire wardens to use firefighting equipment if safe.
    - Emergency Services: Contact local firefighting services immediately.
    - Site Security: Secure the area to prevent unauthorized access.
- Underwater Noise Exceedance and Marine Disturbance Procedures:
    - Monitoring: Continuous monitoring of noise levels during activities.
    - Shutdown: Cease operations if noise exceeds thresholds or marine fauna are observed in the vicinity.
    - Notification: Inform the Marine Ecologist and HSE Manager.
    - Assessment: Evaluate the situation and determine when it is safe to resume work.
    - Mitigation Measures: Implement additional noise reduction techniques as needed.
- Traffic Accident and Road Safety Response Procedures:

- Immediate Response: Secure the scene and provide first aid.
- Emergency Services: Call ambulance and police services.
- Traffic Management: Implement traffic control measures to prevent further incidents.
- Notification: Inform the HSE Manager and Social Manager.
- Investigation: Conduct a thorough investigation to determine causes.

- Worker Health and Safety Incidents Procedures:
  - Medical Assistance: Provide immediate first aid and arrange for medical evacuation if necessary.
  - Incident Reporting: Notify the ERT and HSE Manager.
  - Investigation: Conduct an incident investigation following ADNOC standards.
  - Support Services: Provide support to affected workers and their families.
- Social and Community Incidents Procedures:
  - Immediate Action: De-escalate tensions and ensure the safety of all parties.
  - Notification: Inform the Social Manager and HSE Manager.
  - Engagement: Coordinate with community leaders and authorities.
  - Communication: Use emergency communication channels to inform stakeholders.
  - Resolution: Implement measures to address the root causes and prevent recurrence.

8.6. Communication Plan

8.6.1. Communication Protocols

- Internal Communication:
  - Chain of Command: Follow established lines of communication within the project team.
  - Incident Reports: Use standardized forms and methods for reporting incidents.
- External Communication:
  - Authorities: Notify relevant authorities (e.g., EAD, civil defense, police) as required.
  - Community: Inform local communities of any incidents that may affect them.
  - Media Relations: Designate a spokesperson for any media inquiries.
- Emergency Contact List -Maintain an up-to-date list of contact details for:
  - Emergency services
  - Key project personnel

- Local authorities
- Community representatives

8.6.2. Communication Methods

- Alarms and Alerts: Use sirens, alarms, and public address systems for immediate notifications.
- Radios and Telephones: Equip key personnel with reliable communication devices.
- Incident Command Center: Establish a central location for coordinating communication during an emergency

8.7. Emergency Equipment

- Spill Response Equipment
  - Marine Spill Kits:
    - Containment booms
    - Absorbent pads and rolls
    - Skimmers
    - Storage containers
  - Terrestrial Spill Kits:
    - Absorbent materials
    - Shovels and drums
    - Personal protective equipment (PPE)
- Firefighting Equipment
  - Fire Extinguishers: Appropriate types for different fire classes.
  - Fire Hoses and Hydrants
  - Automatic Fire Suppression Systems
- Medical Equipment
  - First Aid Kits: Stocked according to the number of personnel.
  - Medical Supplies:
    - Stretchers
    - Defibrillators
    - Oxygen tanks
  - Ambulance Vehicles

- Rescue and Safety Equipment
    - Personal Protective Equipment (PPE): Helmets, gloves, goggles, high-visibility clothing, safety harnesses.
    - Rescue Tools:
        - Confined space rescue equipment
        - Life rings and flotation devices (for marine areas)
    - Communication Devices:
        - Two-way radios
        - Satellite phones
- Maintenance and Readiness
    - Regular Inspections: Routine checks to ensure all equipment is functional.
    - Inventory Management: Keep updated records of equipment locations and quantities.

8.8. Training And Awareness

Training and awareness efforts for all workers, including subcontractors, during the construction phase of the LNG plant include:

- Induction Training
    - Emergency Procedures: All personnel to receive training on the ERP during induction.
    - Roles and Responsibilities: Clear understanding of individual roles during an emergency.
    - Use of Emergency Equipment: Basic training on how to use fire extinguishers, spill kits, and first aid equipment.
- Regular Drills and Exercises
    - Quarterly Drills: Simulate different emergency scenarios (e.g., spills, fires, medical emergencies).
    - Marine Emergency Drills: Specific exercises for marine incidents involving spills or marine fauna disturbances.
    - Evaluation and Feedback: Post-drill debriefings to assess performance and identify improvements.
- Specialized Training
    - Emergency Response Team (ERT): Advanced training in emergency response techniques.
    - First Aiders and Medical Staff: Certified training in first aid and emergency medical care.

- Fire Wardens: Training in fire prevention and firefighting.

8.9. Coordination With Local Authorities

- Collaboration
  - Memorandums of Understanding (MOUs): Establish agreements with local emergency services and authorities.
  - Joint Planning: Participate in joint emergency planning sessions.
  - Information Sharing: Provide authorities with site plans, hazard information, and contact details.
- Emergency Services Integration
  - Access Facilitation: Ensure emergency services can access the site quickly.
  - Resource Sharing: Offer site resources to support local emergency responses if needed.
  - Community Notifications: Work with authorities to inform the public during emergencies.

8.10. Incident Reporting And Investigation

- Reporting Procedures
  - Immediate Notification: Report incidents to the HSE Manager and relevant authorities as required.
  - Documentation: Complete incident report forms with detailed information.
- Incident Investigation
  - Investigation Team: Assign qualified personnel to investigate the incident.
  - Root Cause Analysis: Use systematic methods to identify underlying causes.
  - Recommendations: Develop corrective actions to prevent recurrence.
- Corrective Action Plans (CAPs)
  - Implementation: Assign responsibilities and timelines for corrective actions.
  - Monitoring: Track progress and verify the effectiveness of actions taken.
- Feedback Integration
  - Continuous Improvement: Update the ERP based on lessons learned.
  - Communication: Share findings with all stakeholders to promote awareness.

8.11. Continuous Improvement

- Post-Incident Reviews

- Debriefings: Hold meetings after incidents and drills to discuss what went well and areas for improvement.
- Documentation: Record findings and lessons learned.

- ERP Updates
  - Regular Reviews: Review the ERP annually or after significant incidents.
  - Stakeholder Input: Incorporate feedback from workers, contractors, authorities, and the community.
- Audit and Assurance
  - Internal Audits: Assess the effectiveness of emergency preparedness and response.
  - Third-Party Audits: Engage external experts for unbiased evaluations.
- Training Enhancements
  - Curriculum Updates: Update training programs based on new risks or changes in procedures.
  - Skill Development: Encourage continuous learning and professional development for emergency response personnel.

9. CONCLUSION

The RLNG Project in Abu Dhabi has developed a comprehensive Construction Environmental and Social Management Plan (CESMP) to manage and mitigate environmental and social impacts during the construction phase. The CESMP includes a series of detailed management plans covering a wide range of environmental and social aspects, ensuring compliance with UAE laws, Abu Dhabi regulations, ADNOC standards, and international best practices relevant to the oil and gas sector.

Environmental Management Plans:

- Air Quality Management Plan: Addresses the control of air emissions to minimize impacts on ambient air quality.
- GHG Management Plan: Focuses on reducing greenhouse gas emissions associated with construction activities.
- Noise and Vibration Management Plan: Establishes measures to control noise and vibration levels to protect nearby communities and wildlife.
- Soil and Groundwater Management Plan: Aims to prevent contamination of soil and groundwater resources through proper handling of materials and waste.
- Waste Management Plan: Ensures the safe handling, storage, transportation, and disposal of waste materials, including hazardous waste.
- Effluent, Drainage, and Wastewater Management Plan: Manages effluents and wastewater to prevent pollution of water bodies.
- Marine Ecology Protection Plan: Protects marine habitats and species during marine construction activities.
- Navigational Risk Management Plan: Addresses risks associated with marine navigation to prevent accidents and environmental impacts.
- Hazardous Materials Management Plan: Manages hazardous materials to prevent contamination and accidents.

Social Management Plans:

- Worker Influx Management Plan: Manages the impacts of an influx of workers on local communities and resources.
- Labor and Working Conditions Management Plan: Ensures fair labor practices and safe working conditions in line with legal and international standards.
- Community Health and Safety Management Plan: Protects community health and safety from project-related activities.

- Stakeholder Engagement Plan: Facilitates transparent communication and engagement with stakeholders throughout the construction phase.
- Security Management Plan: Protects personnel, assets, and information through effective security measures and coordination with authorities.

Additional Plans:

- Occupational Health and Safety Management Plan: Ensures a safe and healthy working environment by identifying hazards and implementing control measures.
- Emergency Response Plan: Establishes procedures for rapid response to emergencies to minimize potential environmental, social, or health impacts.

These management plans provide a structured framework for addressing environmental and social risks, ensuring compliance, and promoting responsible project execution. The CESMP is designed to be a dynamic document, subject to regular reviews and updates to reflect the outcomes of ongoing monitoring activities and any changes in project conditions. This adaptive management approach ensures that the CESMP remains effective in responding to new environmental or social challenges, facilitating continuous improvement in performance.

Effective implementation of the CESMP requires active collaboration with all stakeholders, including local communities, regulatory authorities, and other relevant parties. Stakeholder engagement is essential for identifying potential impacts, incorporating feedback, and enhancing the overall environmental and social performance of the project.

In summary, the CESMP serves as a critical tool in managing the environmental and social aspects of the RLNG Project during the construction phase. By adhering to the guidelines and measures outlined in the CESMP, the project aims to minimize adverse impacts, ensure compliance with regulatory requirements, protect the health and safety of workers and communities, and contribute positively to the sustainable development of Abu Dhabi's energy sector.

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