



Environmental and Social Management and Monitoring Plan (ESMMP)

IFF Line 2 Fertilizer Project

PREPARED FOR

INDORAMA

Indorama Fertilizer FZE

DATE

07 October 2026

REFERENCE

0802778



DOCUMENT DETAILS

DOCUMENT TITLE	Environmental and Social Management and Monitoring Plan (ESMMP)
DOCUMENT SUBTITLE	IFF Line 2 Fertilizer Project
PROJECT NUMBER	0802778
DATE	07 October 2026
VERSION (delete field if unneeded)	03
AUTHOR	ERM Team
CLIENT NAME	Indorama Fertilizer FZE

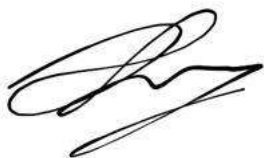
DOCUMENT HISTORY

				ERM ISSUE	APPROVAL TO	
VERSION	REVISION	AUTHOR	REVIEWED BY	NAME	DATE	COMMENTS
Version	001	Lumka Notuku, Sihle Dambuza	Nigel Seed	Nigel Seed	22 June 2026	
	002	Lumka Notuku, Sihle Dambuza				

Environmental and Social Management and Monitoring Plan (ESMMP)

IFF Line 2 Fertilizer Project

0802778



Nigel Seed

Partner

[Double click to insert signature]

Sihle Dambuza

Project Manager

ERM Southern Africa (Pty) Ltd
Building 27, 1st Floor
The Woodlands Office Park
Woodlands Drive, Woodmead, 2184
T +27 11 802 8263

© Copyright 2026 by The ERM International Group Limited and/or its affiliates ('ERM'). All Rights Reserved.
No part of this work may be reproduced or transmitted in any form or by any means, without prior written permission of ERM.

CONTENTS

1.	INTRODUCTION	1
1.1	TERMS OF REFERENCE	1
1.2	STRUCTURE OF ESMMP	1
1.3	PURPOSE AND OBJECTIVES OF THE ESMMP	2
1.4	DETAILS OF THE PROJECT TEAM	4
1.4.1	Project Proponent	4
1.4.2	ESIA Consultant	4
2.	SUMMARY OF PROJECT DESCRIPTION	5
2.1	PROJECT LOCATION AND BACKGROUND	5
2.2	PROJECT DESIGN	1
2.3	CONSTRUCTION PHASE	2
2.4	OPERATIONAL PHASE	2
2.4.1	Feed Conditioning Unit (FCU)	2
2.4.2	Ammonia production process	3
2.4.3	Urea production process	4
2.4.4	Urea formaldehyde concentrate (UFC-85) plant	5
2.4.5	Decommissioning phase	6
2.5	PROCESS UTILITIES	ERROR! BOOKMARK NOT DEFINED.
2.5.1	Power supply	6
2.5.2	Raw water supply	7
2.5.3	Demineralised water and boiler feed water	7
2.5.4	Steam generation	7
2.5.5	Cooling water system	7
2.5.6	Natural gas supply	7
2.5.7	Gaseous emissions	8
2.5.8	Wastewater generation and management	8
2.5.9	Wastewater recovery and reuse	10
2.6	SOLID WASTE MANAGEMENT	10
2.7	EMPLOYMENT AND WORKING HOURS	ERROR! BOOKMARK NOT DEFINED.
3.	ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM	13
3.1	INTRODUCTION	13
3.2	ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM	14
3.3	ESMS ARCHITECTURE AND FUNCTIONAL PROCEDURES	17
4.	LEGAL FRAMEWORK AND INTERNATIONAL BEST PRACTICE	ERROR! BOOKMARK NOT DEFINED.
4.1	INTRODUCTION	20
4.2	INSTITUTIONAL FRAMEWORK	20
4.2.1	Federal Ministry of Environment (FMEEnv)	20
4.2.2	National Environmental Standards and Regulation Enforcement Agency (NESREA)	21
4.2.3	NIGERIAN MIDSTREAM AND DOWNSTREAM PETROLEUM REGULATORY AUTHORITY (NMDPRA)	21
4.3	NATIONAL REGULATORY FRAMEWORK	21
4.3.1	Key Compliance Implications for IFF	1

4.4	STATE LAWS AND ADMINISTRATIVE INSTITUTIONS ON ENVIRONMENTAL PROTECTION	2
4.4.1	Rivers State Ministry of Environment	2
4.4.2	Rivers State Waste Management Agency (RIWAMA)	3
4.4.3	Rivers State Noise Control Edict, No. 20, 1985	3
4.4.4	Rivers State Environmental Protection and Management Law, CAP A42, 2019	3
4.5	INTERNATIONAL CONVENTIONS, PROTOCOLS AND AGREEMENTS	3
4.6	INTERNATIONAL BEST PRACTICE STANDARDS AND GUIDELINES	5
4.6.1	Equator Principles (EP4)	5
4.6.2	International Finance Corporation Performance Standards on Environmental and Social Sustainability, 2012 (IFC PSS)	6
4.6.3	African Development Bank (AfDB) Integrated Safeguards System (ISS)	10
4.6.4	ENVIRONMENTAL QUALITY STANDARDS CROSSWALK (Ambient Air, Noise AND TREATED EFFLUENT DISCHARGE)	12
4.7	PROJECT SPECIFIC EHS POLICIES AND STANDARDS	18
4.7.1	IFZ Non-Discriminatory Policy, 2026 (Rev. 2)	18
4.7.2	IFZ Child Labour Prohibition Policy, 2026 (Rev. 2)	18
4.7.3	IFZ Human Rights and Labour Policy, 2026 (Rev. 2)	19
4.7.4	IFZ Independent Contractors' Policy, 2026 (Rev. 2)	19
4.7.5	IFZ Gender Based Violence and Harassment Policy, 2026 (Rev. 2)	20
4.7.6	IFZ Anti-Retaliatory Policy, 2026 (Rev. 2)	20
4.7.7	IFZ Community and Stakeholder Policy, 2026 (Rev. 2)	21
4.7.8	IFZ Environmental & Climate Change Policy, 2026 (Rev. 2)	21
4.7.9	IFZ Occupational Health, Safety & Wellbeing Policy, 2026 (Rev. 2)	21
4.7.10	IFZ Product Stewardship Policy, 2026 (Rev. 2)	21
4.7.11	IFZ Responsible Business Policy, 2026 (Rev. 2)	22
4.7.12	IFZ Social Media Policy, 2026 (Rev. 2)	22
4.7.13	IFZ Confidential Reporting Policy, 2026 (Rev. 2)	22
5.	KEY SENSITIVITIES	23
5.1	KEY PHYSICAL ENVIRONMENTAL SENSITIVITIES	ERROR! BOOKMARK NOT DEFINED.
5.2	KEY BIOPHYSICAL SENSITIVITIES	ERROR! BOOKMARK NOT DEFINED.
5.3	KEY SOCIO-ECONOMIC SENSITIVITIES	ERROR! BOOKMARK NOT DEFINED.
6.	IMPLEMENTATION OF THE ESMMP	ERROR! BOOKMARK NOT DEFINED.
6.1	OVERVIEW OF THE ESMMP	ERROR! BOOKMARK NOT DEFINED.
6.2	INSTITUTIONAL FRAMEWORK	29
6.2.1	Federal Ministry of Environment (FMEnv)	Error! Bookmark not defined.
6.2.2	National Environmental Standards and Regulation Enforcement Agency (NESREA)	Error! Bookmark not defined.
6.2.3	Indorama Fertilizer FZE	Error! Bookmark not defined.
6.2.4	Contractors and Subcontractors	31
6.2.5	Lenders to the Project	32
6.3	CONTINUED STAKEHOLDER ENGAGEMENT	33
6.4	KEY COMPONENTS FOR IMPLEMENTATION OF THE ESMMP	34
6.4.1	Training	34
6.4.2	Emergency Response and Incident	35
6.4.3	Audit and Inspection	43
6.4.4	Reporting	45
6.4.5	Management of Change	47
6.5	ESMMP IMPLEMENTATION BUDGET	49

7.	ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS	50
7.1	INTRODUCTION	ERROR! BOOKMARK NOT DEFINED.
7.2	PHYSICAL ENVIRONMENTAL MANAGEMENT	53
7.2.1	Air Quality Management Plan	53
7.2.2	Climate Change Management	62
7.2.3	Noise Management	74
7.2.4	Soil and Erosion Control Management	Error! Bookmark not defined.
7.2.5	Groundwater Management	86
7.2.6	Surface Water Management	92
7.3	BIOPHYSICAL ENVIRONMENTAL MANAGEMENT	101
7.3.1	Objectives	101
7.3.2	Project Activities Resulting in Biodiversity Impacts	101
7.3.3	Responsibility	101
7.3.4	Performance Criteria	101
7.3.5	Management Measures	101
7.4	SOCIAL MANAGEMENT	107
7.4.1	Socio-economic Management	107
7.4.2	Employment and Procurement Management	115
7.4.3	Community Health and Safety	124
7.4.4	Cultural Heritage Management	136
7.4.5	Traffic Management	139
7.4.6	Security Management Plan and VPSHR Procedure	146
7.5	GENERAL MANAGEMENT	150
7.5.1	Waste Management (during the Construction Phase)	150
7.5.2	Spill Prevention, Control and Containment Management Plan (during the Construction Phase)	159
7.5.3	Emergency Response Management Plan	164
7.5.4	DECOMMISSIONING AND ABANDONMENT PLAN	167
7.5.5	Hazardous Materials and Resource Efficiency Management (Operational Phase)	170
7.6	INTEGRATION OF AOI INTO IMPLEMENTATION RESPONSIBILITIES	176
7.6.1	Roles and Responsibilities	Error! Bookmark not defined.
8.	ENVIRONMENTAL AND SOCIAL MONITORING	179
8.1	INTRODUCTION	179
8.2	CONSTRUCTION MONITORING	179
8.3	OPERATIONAL MONITORING	180
8.4	CUMULATIVE IMPACT MANAGEMENT AND MONITORING	1
8.5	MATERIAL ISSUES REGISTER AND PRIORITISATION FRAMEWORK	3
8.5.1	Purpose and Overview	3
8.5.2	Methodology for Issue Prioritisation	Error! Bookmark not defined.
8.5.3	Material Issues Register	1
8.5.4	Monitoring and Reporting Requirements	3
8.5.5	Review and Escalation Framework	3
9.	REFERENCES	1

APPENDIX A MASTER IMPACT-MITIGATION-MONITORING REGISTER

APPENDIX B STAFFING AND COMPETENCY MATRIX FOR ENVIRONMENTAL AND SOCIAL
MANAGEMENT

APPENDIX C ENVIRONMENTAL AND SOCIAL REPORTING FRAMEWORK

APPENDIX D WORKER GRIEVANCE PROCEDURE

APPENDIX E CHANCE FINDS PROCEDURE

APPENDIX A MASTER IMPACT-MITIGATION-MONITORING REGISTER

APPENDIX B STAFFING AND COMPETENCY MATRIX FOR ENVIRONMENTAL AND SOCIAL
MANAGEMENT

APPENDIX C ENVIRONMENTAL AND SOCIAL REPORTING FRAMEWORK

APPENDIX D WORKER GRIEVANCE PROCEDURE

APPENDIX E CHANCE FINDS PROCEDURE

LIST OF TABLES

TABLE 1-1 STRUCTURE OF THE ESMMP.	1
TABLE 1-2: PROPONENT DETAILS	4
TABLE 1-3: ESIA CONSULTANT DETAILS	4
TABLE 2-1 INDORAMA FREE ZONE COORDINATES	7
TABLE 2-2 WASTE TYPES AND ESTIMATED QUANTITIES DURING THE CONSTRUCTION PHASE	11
TABLE 3-1 ESMS ARCHITECTURE – PROCEDURES, TOOLS AND SYSTEM CONTROLS	17
TABLE 3-2 E&S COMMITMENTS REGISTER – MINIMUM STRUCTURE	19
TABLE 4-1 NATIONAL POLICIES AND REGULATIONS AND THE APPLICABILITY THEREOF	1
TABLE 4-2 LIST OF RELEVANT INTERNATIONAL CONVENTIONS AND REGULATIONS	1
TABLE 4-3 APPLICABILITY OF THE EQUATOR PRINCIPLES TO THE PROJECT ESIA PROCESS	5
TABLE 4-4 IFC PSS AND THE RELEVANCE TO THE PROJECT	7
TABLE 4-5 AFDB INTEGRATED SAFEGUARDS SYSTEM (ISS) AND RELEVANCE TO THE PROJECT	10
TABLE 4-6 AMBIENT AIR QUALITY STANDARDS	13
TABLE 4-7 NOISE – AMBIENT RECEPTOR STANDARDS	14
TABLE 4-8 POINT SOURCE AIR EMISSIONS (AMMONIA & UREA PLANTS)	15
TABLE 4-9 PROCESS WASTEWATER / EFFLUENT (AMMONIA & UREA PLANTS)	15
TABLE 4-10 OTHER PROCESS RELATED INDUSTRIAL REQUIREMENTS	17
TABLE 6-1 ESMMP ACCOUNTABILITY, REPORTING LINES	30
TABLE 6-2: SCENARIO-BASED EMERGENCY RESPONSE PLAN (ERP) ALIGNED WITH ESIA HAZARDS	37
TABLE 6-3 MINIMUM AUDIT AND INSPECTION FREQUENCIES	45
TABLE 6-4 INCIDENT CLASSIFICATION, NOTIFICATION AND INVESTIGATION REQUIREMENTS	46
TABLE 6-5 MANAGEMENT OF CHANGE – CLASSIFICATION, TRIGGERS AND REQUIRED ACTIONS	48
TABLE 6-6 BREAKDOWN OF THE INDICATIVE ESMMP IMPLEMENTATION BUDGET	49
TABLE 7-1 MANAGEMENT PLAN STRUCTURE	51
TABLE 7-2 PROJECT SPECIFIC GUIDELINES	55
TABLE 7-3: AIR QUALITY MANAGEMENT	57
TABLE 7-4 CLIMATE CHANGE MANAGEMENT MEASURES	66
TABLE 7-5 CLIMATE ADAPTATION AND RESILIENCE MEASURES	68
TABLE 7-6 GHG AND ENERGY PERFORMANCE TARGETS	70
TABLE 7-7 PROJECT NOISE CRITERIA FOR OPERATIONAL PHASE	75
TABLE 7-8 NOISE MANAGEMENT	76

TABLE 7-9	SOIL MANAGEMENT	83
TABLE 7-10	GROUNDWATER MANAGEMENT	88
TABLE 7-11	PROJECT-ADOPTED EFFLUENT QUALITY STANDARDS	94
TABLE 7-12	SURFACE WATER MANAGEMENT	96
TABLE 7-13	BIODIVERSITY MANAGEMENT DURING CONSTRUCTION	103
TABLE 7-14	BIODIVERSITY MANAGEMENT DURING OPERATIONS	105
TABLE 7-15	SOCIO-ECONOMIC MANAGEMENT	110
TABLE 7-16	MANAGEMENT OF EMPLOYMENT AND PROCUREMENT	117
TABLE 7-17	COMMUNITY HEALTH SAFETY AND SECURITY	126
TABLE 7-18	VGM ANALYSIS MATRIX	133
TABLE 7-19	CULTURAL HERITAGE MANAGEMENT	138
TABLE 7-20	TRAFFIC MANAGEMENT	142
TABLE 7-21	SECURITY MANAGEMENT	148
TABLE 7-22	WASTE TYPES AND ESTIMATED QUANTITIES DURING THE CONSTRUCTION PHASE	151
TABLE 7-23	WASTE MANAGEMENT (DURING THE CONSTRUCTION PHASE)	154
TABLE 7-24	SPILL PREVENTION, CONTROL AND CONTAINMENT MANAGEMENT (DURING THE CONSTRUCTION PHASE)	161
TABLE 7-25	EMERGENCY RESPONSE MANAGEMENT MEASURES	166
TABLE 7-26	OPERATIONAL RESOURCE EFFICIENCY PROGRAMME	171
TABLE 7-27	OPERATIONAL HAZARDOUS MATERIALS MANAGEMENT REQUIREMENTS	173
TABLE 7-28:	ROLES AND RESPONSIBILITIES FOR MANAGEMENT OF AOI COMPONENTS	176
TABLE 8-1	CONSTRUCTION MONITORING	1
TABLE 8-2:	OPERATIONAL MONITORING	4
TABLE 8-3	ALLOCATION OF CUMULATIVE IMPACT MANAGEMENT RESPONSIBILITIES	2
TABLE 8-4	PRIORITY LEVELS	3
TABLE 8-5	PROJECT-WIDE MATERIAL ISSUES REGISTER	1

LIST OF FIGURES

FIGURE 2-1	GOOGLE MAP SHOWING INDORAMA FREE ZONE (PERSIAN BLUE COLOUR)	7
FIGURE 2-2	PROJECT LOCALITY MAP	1
FIGURE 2-3	SITING AND LAYOUT OF KEY INFRASTRUCTURE ASSOCIATED WITH THE IFF LINE 2 FERTILIZER PROJECT	1
FIGURE 2-4	BLOCK DIAGRAM OF FEED CONDITIONING UNIT (FCU)	2
FIGURE 2-5	BLOCK DIAGRAM OF AMMONIA PLANT	4
FIGURE 2-6	BLOCK DIAGRAM OF UREA PLANT	5
FIGURE 2-7	PROCESS FLOW DIAGRAM OF UFC-85 PLANT	6
FIGURE 2-8	FLOW DIAGRAM OF EFFLUENT TREATMENT ASSOCIATED WITH THE PROJECT	10
FIGURE 3-1	THE MAIN ELEMENTS OF AN ESMS	15

ACRONYMS AND ABBREVIATIONS

Abbreviation Acronym	/	Description
AfDB		African Development Bank
AoI		Area of Influence

Abbreviation Acronym	Description
BOD	Biological Oxygen Demand
CAP	Corrective Action Plan
CESMP	Construction Environmental and Social Management Plan
CFP	Chance Finds Procedure
CLO	Community Liaison Officer
COD	Chemical Oxygen Demand
CSI	Corporate Social Investment
DCP	Document Control Procedure
DO	Dissolved Oxygen
EA	Environmental Assessment
EHS	Environmental, Health and Safety
EGASPIN	Environmental Guidelines and Standards for the Petroleum Industry in Nigeria
EMP	Environmental Management Plan
EPC	Engineering, Procurement and Construction
EPs	Equator Principles
EP4	Equator Principles (Version 4)
ERP	Emergency Response Plan
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management System
ESG	Environmental, Social and Governance
FME nv	Federal Ministry of Environment (Nigeria)
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
HSE	Health, Safety and Environment
HVAC	Heating, Ventilation and Air Conditioning
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
IFF	Indorama Fertilizer FZE
IFZ	Indorama Free Zone
ISBL	Inside Battery Limits

Abbreviation Acronym	Description
KPI	Key Performance Indicator
LDAR	Leak Detection and Repair
LFN	Laws of the Federation of Nigeria
LTI	Lost Time Injury
MoC	Management of Change
MoU	Memorandum of Understanding
NESREA	National Environmental Standards and Regulations Enforcement Agency
NEPZA	Nigeria Export Processing Zones Authority
NH ₃	Ammonia
NO _x	Nitrogen Oxides
NSDWQ	Nigerian Standard for Drinking Water Quality
NMDPRA	Nigerian Midstream and Downstream Petroleum Regulatory Authority
OHS	Occupational Health and Safety
OSBL	Outside Battery Limits
PAC	Project-Affected Communities
PDCA	Plan–Do–Check–Act
PM	Particulate Matter
PPE	Personal Protective Equipment
PR	Performance Requirement (EBRD)
PS	Performance Standard (IFC)
QA/QC	Quality Assurance / Quality Control
RSMENV	Rivers State Ministry of Environment
SEP	Stakeholder Engagement Plan
STP	Sewage Treatment Plant
TDS	Total Dissolved Solids
TMP	Traffic Management Plan
ToR	Terms of Reference
TSS	Total Suspended Solids
UN	United Nations
UNGP	United Nations Guiding Principles on Business and Human Rights
VEC	Valued Environmental Component
VPSHR	Voluntary Principles on Security and Human Rights
WBGT	Wet Bulb Globe Temperature

Abbreviation Acronym	/	Description
WBG		World Bank Group
WHO		World Health Organization

1. INTRODUCTION

1.1 TERMS OF REFERENCE

Indorama Fertilizer FZE (IFF) is a major producer of nitrogen-based fertilisers and operates within the wider Indorama manufacturing complex located in Eleme Local Government Area, Rivers State, Nigeria. The proposed IFF Line 2 Fertilizer Project will be developed within the Indorama Free Zone, adjacent to existing fertilizer and petrochemical facilities, and forms part of Indorama's broader expansion programme in the area. The Project is located within an established industrial zone and will utilise shared infrastructure and utilities where applicable.

IFZ has appointed Environmental Resources Management Southern Africa (Pty) Ltd (ERM) as the independent environmental and social practitioner to undertake the Environmental and Social Impact Assessment (ESIA) for the proposed IFF Line 2 Fertilizer Project. A Federal Ministry of Environment (FMEnv)-accredited Nigerian environmental and social consulting firm was also appointed by the Project Proponent to undertake baseline data collection, conduct stakeholder engagement activities, and act as the regulatory interface with the FMEnv, under the technical oversight and quality assurance of ERM.

The proposed IFF Line 2 Project comprises the development of a new brownfield ammonia and urea production line with an installed capacity of approximately 2,300 metric tonnes per day (MTPD) of ammonia and 4,000 MTPD of urea, together with a urea formaldehyde concentrate (UFC-85) unit of approximately 150 MTPD and Feed Conditioning Unit to process approximately 200 MMCFD Natural Gas. The Project will also include Inside Battery Limits (ISBL) process units and Outside Battery Limits (OSBL) facilities, including storage, utilities, effluent treatment, flaring systems, and supporting infrastructure. The total Project footprint is approximately 80 hectares. The process design and configuration replicate proven technology employed at existing Indorama fertilizer Lines within the complex.

As part of the environmental approval process for the proposed IFF Line 2 Fertilizer Project, an Environmental and Social Management and Monitoring Plan (ESMMP) is required to address the environmental and social risks and impacts identified during the ESIA process. This document presents the ESMMP for the proposed IFF Line 2 Fertilizer Project.

The ESMMP establishes a structured framework through which the Project's mitigation, monitoring, and management commitments will be implemented during the pre-construction, construction, and operational phases of the IFF Line 2 Fertilizer Project, in alignment with Nigerian regulatory requirements and applicable international lender standards.

1.2 STRUCTURE OF ESMMP

The structure of this ESMMP is outlined in Table 1-1 below.

TABLE 1-1 STRUCTURE OF THE ESMMP.

ESMMP Chapter	Description
Chapter 1: Introduction	Presents the terms of reference for the Environmental and Social Management and Monitoring Plan (ESMMP), the purpose and objectives of

ESMMP Chapter	Description
	the ESMMP, and details of the Project Proponent for the IFF Line 2 Fertilizer Project.
Chapter 2: Summary of Project Description	Provides an overview of the proposed IFF Line 2 Fertilizer Project, including key project components, design specifications, and construction and operational activities.
Chapter 3: Environmental and Social Management System	Describes the framework for the Environmental and Social Management System (ESMS) required for the integrated implementation and management of the ESMMP for the IFF Line 2 Fertilizer Project.
Chapter 4: Legal Framework and International Best Practice	Summarises the applicable national legal framework and relevant international good practice requirements related to environmental and social compliance for the IFF Line 2 Fertilizer Project.
Chapter 5: Key Sensitivities	Summarises key physical, biophysical, and socio-economic sensitivities associated with the IFF Line 2 Fertilizer Project area, providing context for the identification of priority environmental and social management interventions.
Chapter 6: Implementation of the ESMMP	Sets out the institutional arrangements, roles, and responsibilities required for the governance, implementation, monitoring, and reporting of the ESMMP for the IFF Line 2 Fertilizer Project.
Chapter 7: Environmental and Social Management Plan	Describes the objectives, performance requirements and standards, mitigation measures, and monitoring commitments applicable to construction and operational activities, organised by environmental and social receptors such as air quality, noise, water resources, biodiversity, labour and working conditions, and community health and safety.

1.3 PURPOSE AND OBJECTIVES OF THE ESMMP

This Environmental and Social Management and Monitoring Plan (ESMMP) has been prepared to cover the activities associated with the proposed IFF Line 2 Fertilizer Project across all relevant phases of the Project lifecycle, including design, pre-construction, construction, and operation. In line with the Environmental and Social Impact Assessment (ESIA) framework for the Project, the ESMMP provides the mechanism through which mitigation measures, monitoring requirements, and management commitments identified in the ESIA are implemented and tracked. The ESMMP addresses environmental and social management measures to be implemented by the Engineering, Procurement and Construction (EPC) Contractor and associated subcontractors during construction, as well as measures that fall under the responsibility of IFF¹ as the Project Proponent and future operator.

The ESMMP has been prepared in accordance with Nigerian regulatory requirements and aligned with applicable international good practice, including the IFC Performance Standards (PSs), AfDB Operational Safeguards (OSs) and the World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines, as reflected in the ESIA. It applies to all Inside Battery Limits (ISBL) and Outside Battery Limits (OSBL) components assessed as part of the IFF Line 2 Fertilizer

¹ As the proponent, the Indorama Fertilizer FZE (IFF) will have ultimate responsibility for implementing the ESMMP.

Project and is intended to operate as a live management document throughout Project implementation and operation.

The purpose of this ESMMP is to define appropriate environmental and social management strategies and actions to avoid, minimise, mitigate, and manage adverse impacts, while enhancing positive environmental and social outcomes associated with the IFF Line 2 Fertilizer Project. The ESMMP also provides a practical framework to guide on-site environmental and social management by Project staff, operational and maintenance personnel, contractors, and consultants with responsibilities for the construction and operation of the Project. Monitoring requirements are included to assess the effectiveness of mitigation measures and to enable adaptive management where monitoring results or Project conditions indicate the need for corrective action.

Each management measure included in this ESMMP has been designed to be practical, measurable, and auditable, consistent with the requirements of the Federal Ministry of Environment and international lender expectations. Given the anticipated long operational life of the IFF Line 2 Fertilizer Project, the preparation of a detailed decommissioning-specific ESMMP is not considered warranted at this stage. Decommissioning of the Project is not expected in the foreseeable future, and environmental and social baseline conditions at that time are likely to differ materially from those described in the current ESIA. Should decommissioning be required in the future, this would be subject to a separate environmental and social assessment process and the preparation of a dedicated decommissioning ESMMP, as required by applicable regulations and standards. Notwithstanding this, a high-level decommissioning and closure framework, covering the principles for site decontamination, hazardous materials and waste management, workforce demobilisation, community health and safety, stakeholder engagement and post-closure monitoring, is provided in Section 7.5.4. IFF commits to review and update this framework, and the associated environmental and social measures, periodically throughout the Project lifecycle as part of the scheduled ESMMP reviews, and in more detail as the Project approaches closure, when a detailed Decommissioning and Closure Plan will be prepared in accordance with Section 7.5.4.

The objectives of this ESMMP are to:

- Provide clear environmental and social management procedures and mitigation measures to manage Project-related impacts and demonstrate compliance with applicable Nigerian regulatory requirements and international standards.
- Define environmental and social performance indicators, monitoring requirements, responsibilities, and review procedures for activities associated with the IFF Line 2 Fertilizer Project.
- Provide government authorities, lenders, stakeholders, and the Project Proponent with assurance that mitigation measures identified through the ESIA are clearly documented, achievable, and implemented through a structured and auditable management framework.
- Provide stakeholders with assurance that environmental and social risks and impacts associated with the IFF Line 2 Fertilizer Project are appropriately managed, that adverse impacts are minimised, and that positive environmental and social benefits are optimised where practicable.

1.4 DETAILS OF THE PROJECT TEAM

1.4.1 PROJECT PROPONENT

The Project proponent is Indorama Fertilizer FZE (IFF), Indorama Free Zone, Eleme, Rivers State, Nigeria. It is the proponent's intent to establish the IFF Line 2 Project, and required associated facilities, from pre-design to construction and subsequent commissioning & operation in line with the National Guidelines on manufacturing sector and in accordance with international best practice. The contact details for the applicant are as follows:

TABLE 1-2: PROPONENT DETAILS

Item	Description
Project Proponent Name	Indorama Fertilizer FZE
Registered Company Name	Indorama Fertilizer FZE
Company Registration Number	NEPZA FORM RCI/ 01419
Country of Registration	Republic of Nigeria
Operational Address	Indorama Free Zone, Eleme Local Government Area, Rivers State, Nigeria
Contact Person	Dr Jain Mahendra
Position / Title	Head of Environment
Telephone	+234 807 032 4523
Email Address	mahendra.jain@indorama.com

1.4.2 ESIA CONSULTANT

The ESIA has been prepared by ERM, appointed as the independent international ESIA consultant for the Project. ERM is responsible for leading the ESIA process, including the integration of specialist studies, quality assurance of baseline data, and ensuring alignment with applicable Nigerian regulatory requirements and international best practice standards, including the IFC PSs, AfDB OSs and WBG EHS Guidelines. The details of the ESIA consultant and the project team are provided in Table 1-3 below.

TABLE 1-3: ESIA CONSULTANT DETAILS

Item	Description
Consultant Name	Environmental Resources Management Southern Africa (Pty) Ltd (ERM)
Registered Company Name	Environmental Resources Management Southern Africa (Pty) Ltd
Consultant Role	International ESIA Consultant responsible for technical oversight, quality assurance, and alignment with international lender standards
Office Address	ERM Southern Africa, Building 27, 1st Floor, The Woodlands Office Park, Woodlands Drive, Woodmead, Johannesburg, 2148, South Africa
Telephone	+27 11 802 8263

Item	Description
Email Address	Sihle.dambuza@erm.com
Website	www.erm.com
Project Manager	Sihle Dambuza
Partner in Charge	Nigel Seed
Local Environmental Consultant (LC)	Messrs Safespace Resources Limited (accredited Nigerian Consultant)

2. SUMMARY OF PROJECT DESCRIPTION

2.1 PROJECT LOCATION AND BACKGROUND

The proposed IFF Line 2 Fertilizer Project will be located within the Indorama Free Zone, an established 250□hectare industrial precinct situated within the broader Indorama Manufacturing Complex in Eleme Local Government Area of Rivers State, Nigeria. It is proposed to be adjacent to the existing fertilizer and petrochemical operations (refer to

Figure 2-2. Existing facilities shown outside the Line 2 footprint are presented for contextual purposes only and do not form part of the infrastructure being assessed or authorized under this ESIA). The IFF Line 2 development occupies an approximately 80□hectare plot positioned directly north of the existing IFF Line 1 (formerly IFZ-Train 3) facility. The site is bound by the wider Indorama Manufacturing Complex to the south, with undeveloped land to the north, east, and west. The geographic extent of the Indorama Free Zone, including the IFF Line 2 plot, is shown on



Figure 2-1 and ranges between approximately 4°49'33.64"N to 4°50'50.03"N and 7°06'16.72"E to 7°07'16.46"E as outlined in Table 2-1 below.

Indorama has progressively expanded fertilizer production at Eleme over the past decade. The existing fertilizer facilities within the Indorama complex comprise multiple ammonia and urea production lines that have demonstrated stable operational performance, high reliability, and strong process safety outcomes. The IFF Line 2 Fertilizer Project has been designed to replicate proven technologies and process configurations already employed at Indorama's existing fertilizer facilities, thereby reducing technical risk and supporting consistent environmental, health, and safety performance.

The IFF Line 2 Project comprises a new brownfield ammonia and urea production line with a design capacity of approximately 2,300 metric tonnes per day (MTPD) of ammonia and 4,000 MTPD of urea, supported by Feed conditioning and UFC-85 (urea formaldehyde concentrate) unit to enhance product quality. The Project includes both Inside Battery Limits (ISBL) process units, such as feed conditioning, ammonia synthesis, and urea production, and Outside Battery Limits (OSBL) infrastructure, including utilities, water treatment, effluent management, flaring systems, storage, and associated support facilities.

The Project is located adjacent to the approved and recently commissioned in June 2026 IFF Line 1 Fertilizer Project, and the ESIA for IFF Line 2 has therefore leveraged existing environmental and social data and operational experience from within the Indorama complex, supplemented with updated, Project-specific baseline data. This context is particularly relevant for environmental and social management, as cumulative interactions, shared infrastructure, and existing environmental sensitivities have informed the design of mitigation and monitoring measures incorporated into the ESMMP.

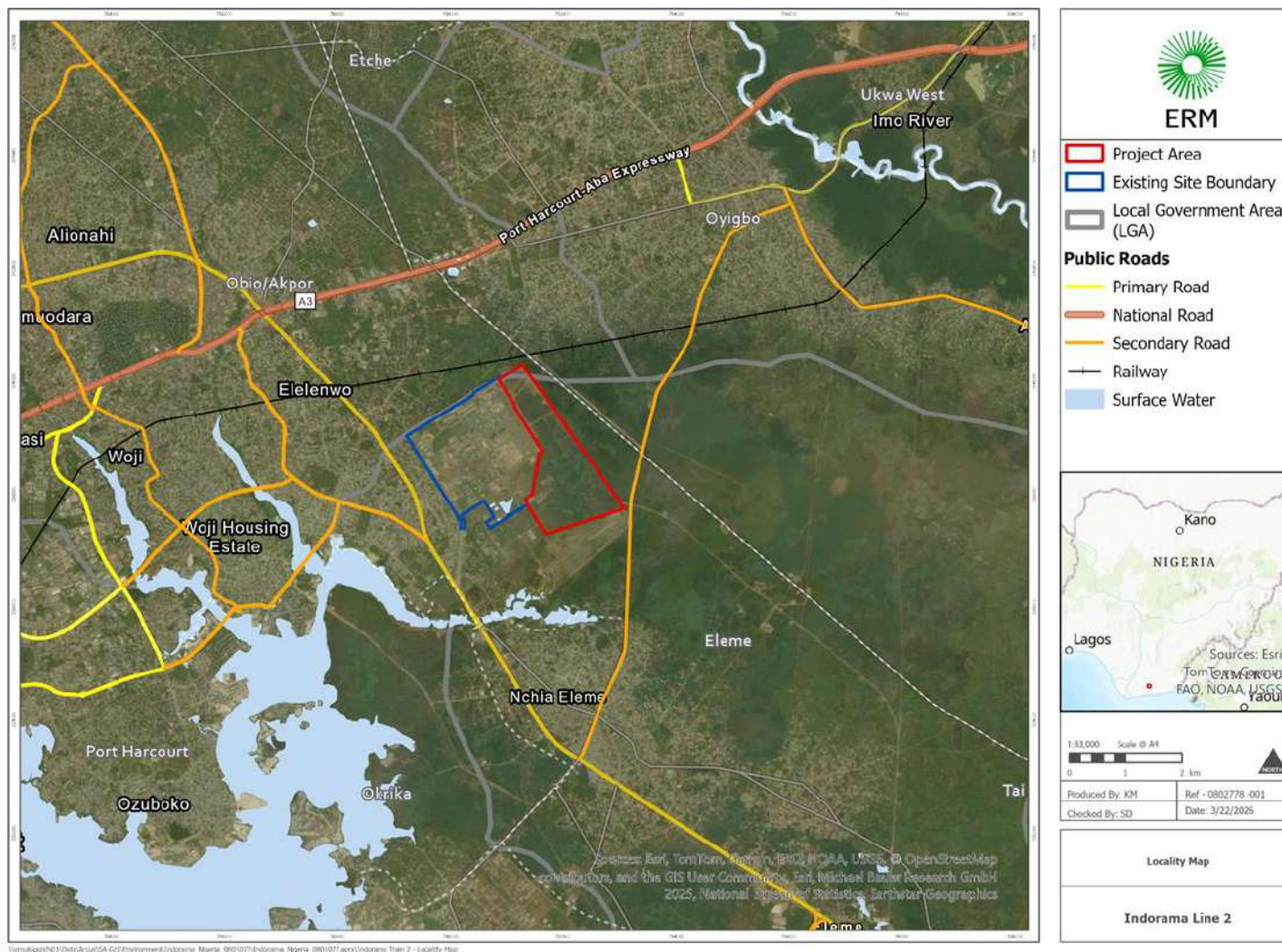
TABLE 2-1 INDORAMA FREE ZONE COORDINATES

Fertilizer Manufacturing		
S/no	Northing	Easting
A	4°50'50.03"N	7°06'29.97"E
B	4°49'44.76"N	7°07'16.46"E
C	4°49'33.64"N	7°06'58.97"E
D	4°50'41.79"N	7°06'16.72"E



FIGURE 2-1 GOOGLE MAP SHOWING INDORAMA FREE ZONE (PERSIAN BLUE COLOUR)

FIGURE 2-2 PROJECT LOCALITY MAP



2.2 PROJECT DESIGN

The proposed IFF Line 2 Fertilizer Project will be dimensionally defined such that all principal components of the Project can be fully described and assessed at the conclusion of the design phase. It is during this phase that the findings and recommendations of the Environmental and Social Impact Assessment (ESIA) inform Project layout, design decisions, and the integration of environmental and social mitigation measures.

Project planning, decision-making, and refinement will continue iteratively throughout the design phase, driven by detailed engineering studies and informed by the outcomes of the ESIA and the associated Environmental and Social Management and Monitoring Plan (ESMMP). Where required, additional post-ESIA environmental and social studies may be undertaken to refine mitigation measures and ensure ongoing alignment with regulatory and lender requirements.

The equipment design, process flow diagrams, and overall plant layout for the IFF Line 2 Fertilizer Project are based on proven technology and configurations implemented at existing Indorama fertilizer facilities within the Indorama manufacturing complex. The Proponent has engaged Engineering, Procurement and Construction (EPC) Contractors for the Project, ensuring continuity in design philosophy, constructability, and operational performance.

The Project has been designed for an anticipated operational lifespan of approximately 30 years, with planned major maintenance shutdowns occurring at approximately four-year intervals. The design operating capacity assumes plant operation for approximately 330 days per year, consistent with established performance benchmarks for large-scale ammonia and urea fertilizer facilities.

The IFF Line 2 Fertilizer Project comprises the following key infrastructure elements within the defined Project footprint (refer to the Project Description and layout figures in the ESIA):

- Ammonia Plant, with a nominal production capacity of approximately 2,300 metric tonnes per day (MTPD), including associated infrastructure such as:
 - Compressor units and associated process equipment; and
 - Stacks associated with reforming processes and steam generation.
- Urea Plant, with a nominal production capacity of approximately 4,000 MTPD, including:
 - A granulation unit and associated process stack.
- Urea Formaldehyde Concentrate (UFC-85) unit, supporting granulation and product quality.
- Feed conditioning unit to process approximately 200 mmscfd natural gas.
- Internal road and drainage network, with typical road widths ranging between approximately 8 and 10 metres, accommodating construction and operational traffic.
- Boundary fencing and controlled access features, including perimeter security infrastructure consistent with site security requirements.
- Truck parking, product handling, and bulk loading facilities, supporting internal logistics and product evacuation to port facilities.
- Administrative buildings, workshops, control rooms, and electrical substations, supporting Project operation, monitoring, and maintenance.
- Fire and emergency response infrastructure, including a dedicated fire station and associated fire and gas detection systems.

- Bulk urea storage facilities, designed to accommodate operational storage requirements.
- Cooling towers, serving both the ammonia and urea plants, integrated with the Project's water management and utilities systems.

This design philosophy, combined with the use of established technologies and shared operational experience from within the Indorama complex, provides a robust foundation for implementing and managing the environmental and social measures set out in the ESMMP.

2.3 CONSTRUCTION PHASE

The construction phase of the proposed IFF Line 2 Fertilizer Project will not commence prior to the approval of the associated Environmental and Social Impact Assessment (ESIA) by the Federal Ministry of Environment. Construction activities are currently anticipated to extend over a period of approximately 32 to 33 months, subject to detailed scheduling by the Engineering, Procurement and Construction (EPC) Contractor.

Activities undertaken during the construction phase will typically include establishment of site access controls and perimeter fencing, clearance of secondary vegetation within the approved Project footprint, land grading and earthworks, civil works, and the construction and installation of the Project infrastructure as described in the Project Description. These activities will be implemented in accordance with the mitigation and management measures set out in the ESMMP.

Construction activities will be undertaken during daytime hours only. No routine construction works will be carried out at night, except where emergency or safety-critical activities may be required, and such activities will be managed in accordance with applicable health, safety, and environmental procedures.

FIGURE 2-3 SITING AND LAYOUT OF KEY INFRASTRUCTURE ASSOCIATED WITH THE IFF LINE 2 FERTILIZER PROJECT

2.4 OPERATIONAL PHASE

The proposed IFF Line 2 Fertilizer Project comprises a single-train ammonia production facility integrated with supporting process units, including a Feed Conditioning Unit (FCU), and downstream urea and urea formaldehyde concentrate (UFC-85) plants. The principal process components and material flows are summarised below.

2.4.1 FEED CONDITIONING UNIT (FCU)

Natural gas supplied to the Project is first processed within the Feed Conditioning Unit (FCU), which prepares the feed and fuel gas for use in the ammonia plant. The FCU is designed to process approximately 200 MMSCFD of raw natural gas and performs dehydration, conditioning, and regeneration functions to ensure the gas meets the quality requirements for reforming and combustion processes.

Key elements of the FCU include:

- Feed gas dehydration to remove moisture
- Regeneration of dehydration media using heated regeneration gas
- A regeneration gas heater, which generates combustion emissions during operation
- Fuel gas conditioning and routing to relevant ammonia plant units

Conditioned process gas from the FCU is delivered to the ammonia plant as feedstock, while fuel gas supplies are distributed to reforming furnaces and associated combustion sources. Emissions from the regeneration gas heater are a defined operational emission source assessed within the ESIA and managed through the ESMMP.

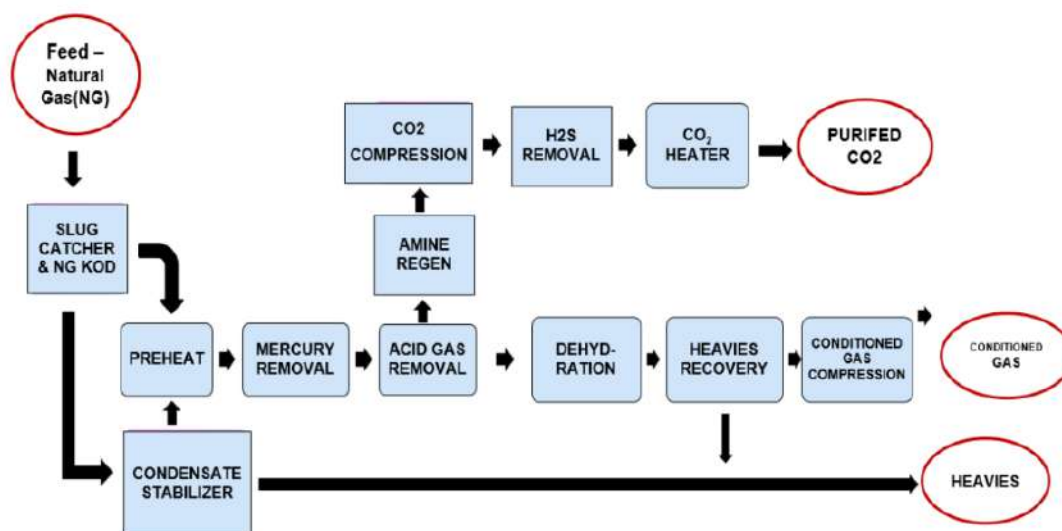


FIGURE 2-4 BLOCK DIAGRAM OF FEED CONDITIONING UNIT (FCU)

2.4.2 AMMONIA PRODUCTION PROCESS

The ammonia plant is a single-train facility designed to produce approximately 2,300 metric tonnes per day (MTPD) of ammonia. The plant receives conditioned feed gas from the FCU and processes it through the following key stages (refer to

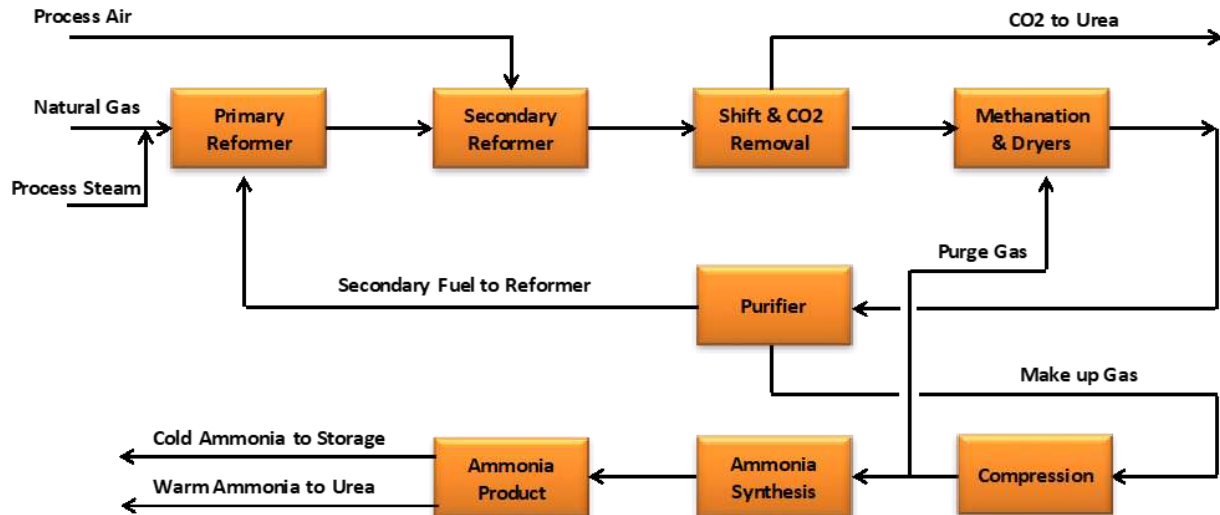


Figure 2-5).

- Feed and fuel gas supply from the FCU
- Feed gas desulphurisation
- Primary reforming
- Process air compression
- Secondary reforming
- Carbon monoxide shift conversion, including high-temperature shift (HTS) and low-temperature shift (LTS) conversion
- Carbon dioxide (CO₂) removal
- Methanation
- Synthesis gas drying
- Cryogenic purification
- Synthesis gas compression
- Ammonia synthesis
- Ammonia refrigeration system
- Loop purge ammonia recovery
- Process condensate stripping

Ammonia produced by the plant is conveyed via dedicated pipelines to the downstream urea plant. Where the urea plant is not operational, liquid ammonia can be transferred to an atmospheric storage tank for interim storage.

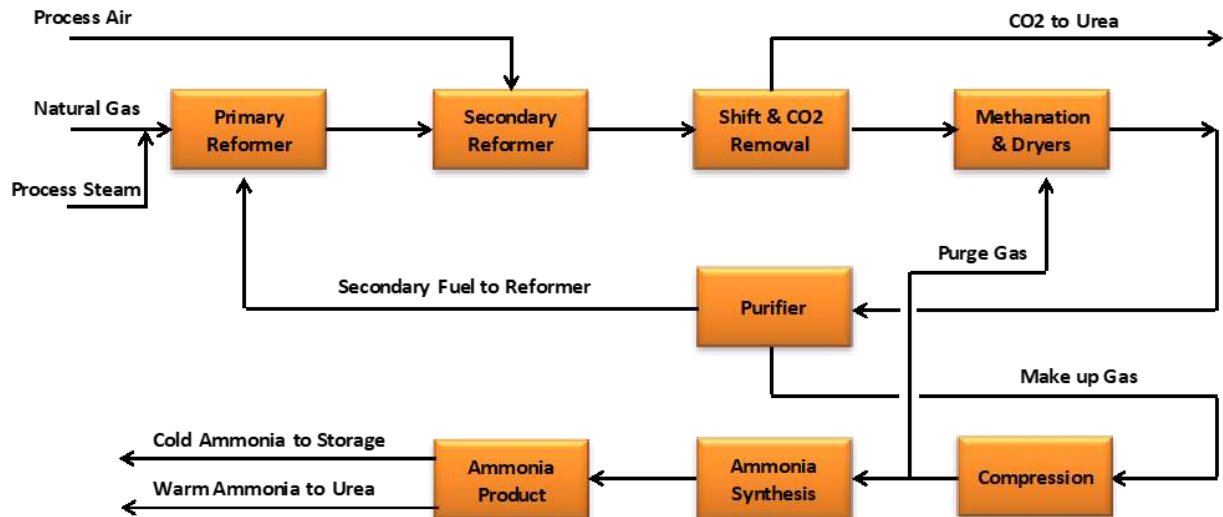


FIGURE 2-5 BLOCK DIAGRAM OF AMMONIA PLANT

2.4.3 UREA PRODUCTION PROCESS

The urea plant is designed to produce approximately 4,000 MTPD of urea and is fully integrated with the ammonia plant, receiving both ammonia and carbon dioxide as feedstock. The principal stages of the urea production process include the following (refer to

Figure 2-6):

- Urea synthesis, whereby ammonia reacts with carbon dioxide to form a urea solution
- Urea solution purification and recovery
- Concentration of the urea solution
- Conversion of urea melt into solid urea granules using spout bed fluidised granulation technology

The urea granules produced are conveyed to on-site bulk storage facilities prior to either bagging operations or bulk shipment for off-site distribution.

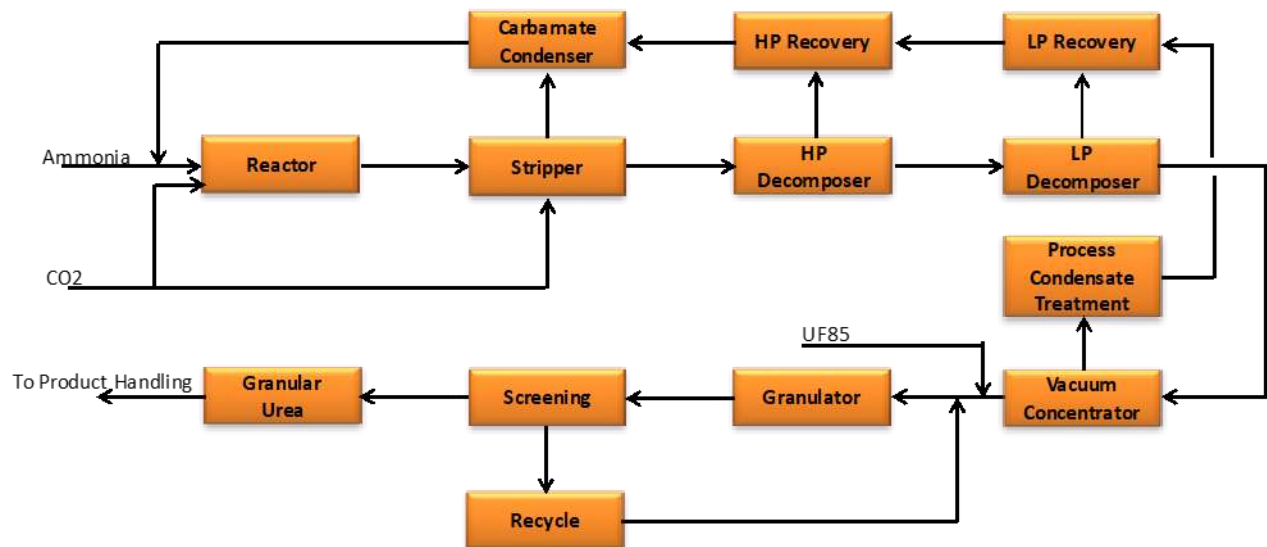


FIGURE 2-6 BLOCK DIAGRAM OF UREA PLANT

2.4.4 UREA FORMALDEHYDE CONCENTRATE (UFC-85) PLANT

The Project includes a Urea Formaldehyde Concentrate (UFC-85) unit, with a nominal capacity of approximately 150 MTPD, which supports urea granulation and product quality control. The UFC-85 plant produces a urea-formaldehyde solution used as a granulation additive to improve granule strength, reduce dust formation, and minimise caking during storage and handling.

The UFC-85 process involves:

- Controlled reaction of urea with formaldehyde
- Concentration and conditioning of the UFC-85 solution
- Dosing of the solution into the urea granulation process

The UFC-85 unit operates as an integral part of the urea production system and is managed within the same environmental, health, and safety control framework.

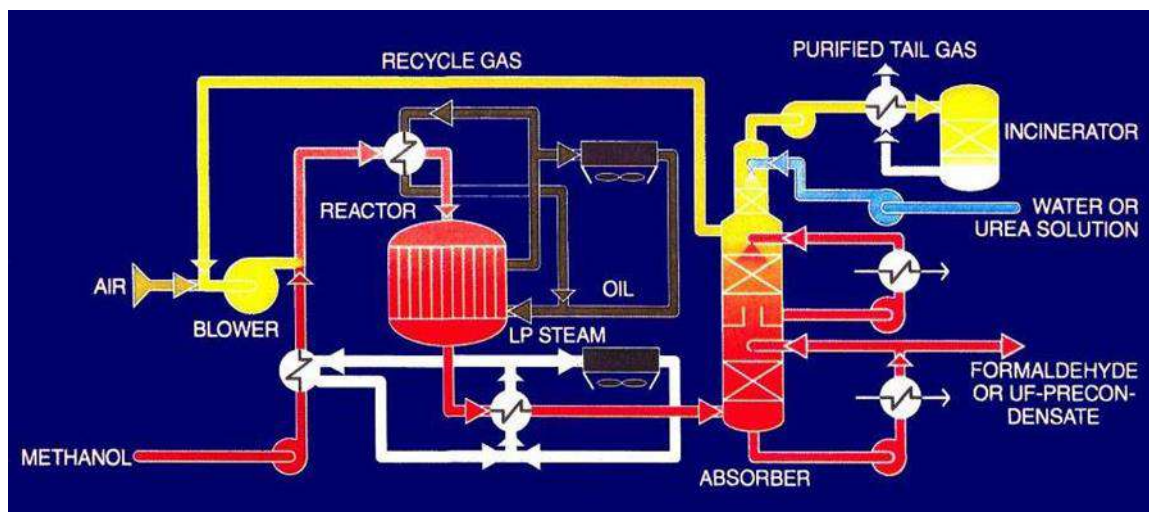


FIGURE 2-7 PROCESS FLOW DIAGRAM OF UFC-85 PLANT

2.4.5 DECOMMISSIONING PHASE

Decommissioning of the IFF Line 2 Fertilizer Project is not anticipated in the foreseeable future. Activities during a decommissioning phase would typically include demolition of the plant and associated infrastructure, site clean-up, waste segregation and disposal, workforce demobilisation, and a final site condition review. Environmental and social baseline conditions at the end of Project life are expected to differ significantly from current conditions.

Should decommissioning be required in the future, it would be subject to a separate Environmental and Social Impact Assessment (ESIA) process, and a dedicated decommissioning-specific Environmental and Social Management and Monitoring Plan (ESMMP) would be prepared in accordance with applicable Nigerian regulatory requirements and international good practice. In the interim, the high-level decommissioning and closure framework in Section 7.5.4 applies and will be periodically reviewed and updated as described in Section 1.3.

2.5 PROCESS UTILITIES

The IFF Line 2 Fertilizer Project will incorporate a range of process utilities and supporting infrastructure required to enable reliable construction and long-term operation of the FCU, ammonia, urea, and UFC-85 plants. Key process utilities associated with the Project are summarised below.

2.5.1 POWER SUPPLY

Power required during the construction and operational phases of the IFF Line 2 Fertilizer Project will be supplied from the existing captive power generation facilities within the broader Indorama industrial complex. Electricity is generated by gas turbine generators and distributed through the existing internal power network. The ESIA confirms that the

installed and planned generation capacity within the complex is sufficient to meet the incremental power demand of IFF Line 2, while maintaining operational reliability and redundancy. The existing captive power plant comprises seven (07) gas turbine generator (GTG) units with a total installed generation capacity of approximately 231 MW, of which approximately 142MW is currently utilized by existing operations. The incremental electrical demand of the IFF Line 2 Fertilizer Project is estimated at approximately 40MW during normal operation (approximately 2MW during construction), leaving a spare capacity margin of approximately 49MW during operation. (Refer 4.4.1 of ESIA)

2.5.2 RAW WATER SUPPLY

Raw water for the Project will be abstracted primarily from existing groundwater boreholes within the Indorama complex. Additional boreholes have been identified as contingency supply sources, and groundwater availability studies have been undertaken to support sustainable abstraction. Raw water use and abstraction rates are managed in accordance with Nigerian regulatory requirements and the Project's integrated water management strategy.

2.5.3 DEMINERALISED WATER AND BOILER FEED WATER

The Project includes a dedicated demineralised (DM) water system designed to produce high-purity water for process and utility use. Demineralised water will be further treated and deaerated to produce boiler feed water (BFW) suitable for high-pressure steam generation. The new DM plant will be integrated with existing Indorama DM systems to enhance supply resilience and operational flexibility.

2.5.4 STEAM GENERATION

Steam for ammonia, urea, and utility processes will be generated through a combination of:

- Heat recovery steam generation from gas turbine exhausts within the Indorama complex. The required steam will be supplied by existing steam network.
- Steam is primarily used for driving turbines associated with compressors, reforming reactions, and shift conversion processes, as well as for general process heating requirements.

2.5.5 COOLING WATER SYSTEM

Cooling water for the ammonia and urea processes will be supplied by two dedicated cooling towers installed as part of the Project. Cooling tower make-up water will be sourced from a combination of treated wastewater recovered through the water recovery plant and raw water. Continuous blowdown is provided to control dissolved solids, turbidity, and other water quality parameters in order to prevent scaling, fouling, and corrosion of equipment.

2.5.6 NATURAL GAS SUPPLY

Natural gas is required both as a feedstock for ammonia production and as a fuel for reforming, steam generation, and power generation. Gas is supplied to the Indorama

complex via existing and proposed underground pipelines from multiple suppliers. Gas receiving infrastructure includes separation, filtration, metering, and distribution systems. The ESIA confirms that existing gas supply including new gas supply agreement (GSA) and receiving capacity is adequate to support IFF Line 2 requirements.

2.5.7 GASEOUS EMISSIONS

Atmospheric emissions associated with Project operations arise primarily from combustion and process activities. Key emission sources include:

- Primary reformer stack in the ammonia plant
- Regeneration gas heater associated with the Feed Conditioning Unit (FCU)
- Urea granulation exhaust stack
- Emergency and non-routine flaring activities

Typical pollutants include nitrogen oxides (NO_x), carbon monoxide (CO), carbon dioxide (CO_2), ammonia (NH_3), particulate matter including urea dust, and trace sulphur oxides (SO_2). Emissions have been assessed in the ESIA through dispersion modelling and are managed through design controls, operational practices, and monitoring measures defined in the ESMMP.

2.5.8 WASTEWATER GENERATION AND MANAGEMENT

Liquid effluent streams generated by the Project include:

- Boiler blowdown
- Process condensates from ammonia and urea production
- Steam and turbine condensates
- Compressor intercooler drains
- Oily effluents from process areas

Where practicable, wastewater streams are treated and recycled through condensate polishing (as shown on

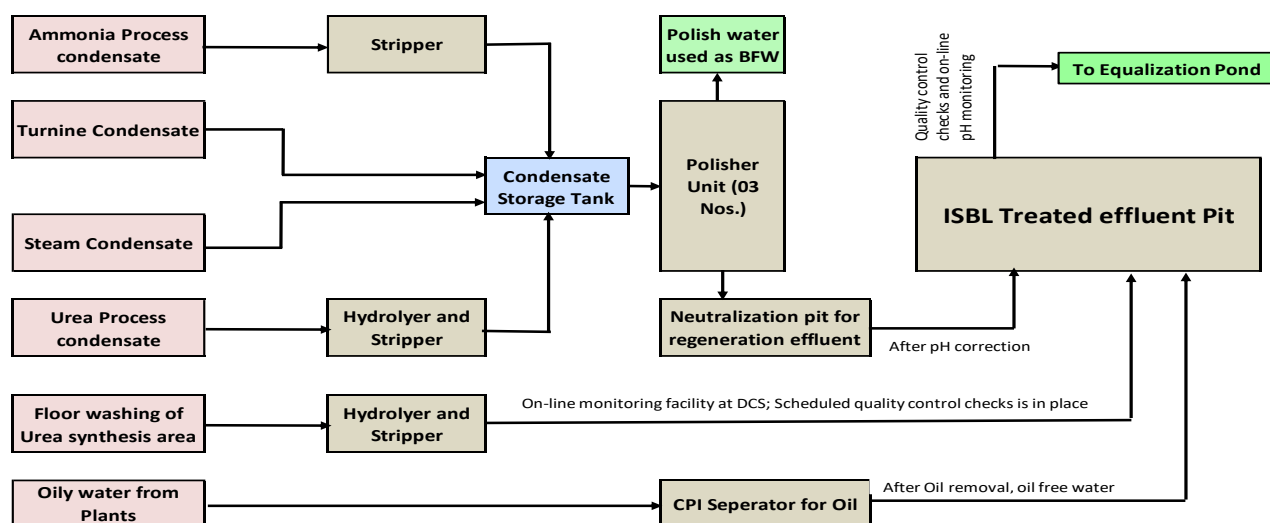


Figure 2-8) and wastewater recovery systems for reuse as boiler feed water or cooling tower make-up. Residual effluents that cannot be reused are treated and discharged in accordance with project applicable limits. The Project-applicable effluent discharge limits are those presented in the Project-Adopted Effluent Quality Standards table (Table 7-11) and the process effluent crosswalk in Section 4.6.4.2. They have been derived on a parameter-by-parameter basis, adopting the more stringent value, from: (i) the National Environmental Protection (Effluent Limitation) Regulations, 1991 (S.I. 8) and the applicable NESREA effluent standards; (ii) the IFC/World Bank Group General EHS Guidelines: Wastewater and Ambient Water Quality (2007); and (iii) the WBG EHS Guidelines for Nitrogenous Fertilizer Production (2007). Treated effluent is discharged via the retention pond to the Okulu River and is monitored at the final discharge point as set out in Chapter 8.

The liquid waste streams are segregated and managed as follows:

- **Domestic wastewater** (drinking, washing, showers and sanitation) – non-hazardous; collected separately and treated in the on-site sewage treatment plant before discharge or reuse, in compliance with the sewage effluent limits.
- **Industrial / process wastewater** (process condensates, boiler and cooling tower blowdown, intercooler drains, oily effluents) – treated through condensate polishing, the CPI oil separator and the effluent treatment and wastewater recovery plant, with residual effluent discharged only where it meets the Project-applicable limits.
- **Hazardous liquid wastes** (spent solvents and chemicals, used oils, laboratory wastes, recovered oil from the CPI separator) – not discharged; stored in bunded areas and transferred to licensed hazardous waste contractors for treatment, recovery or disposal under consignment tracking (refer to Sections 7.5.1 and 7.5.5).

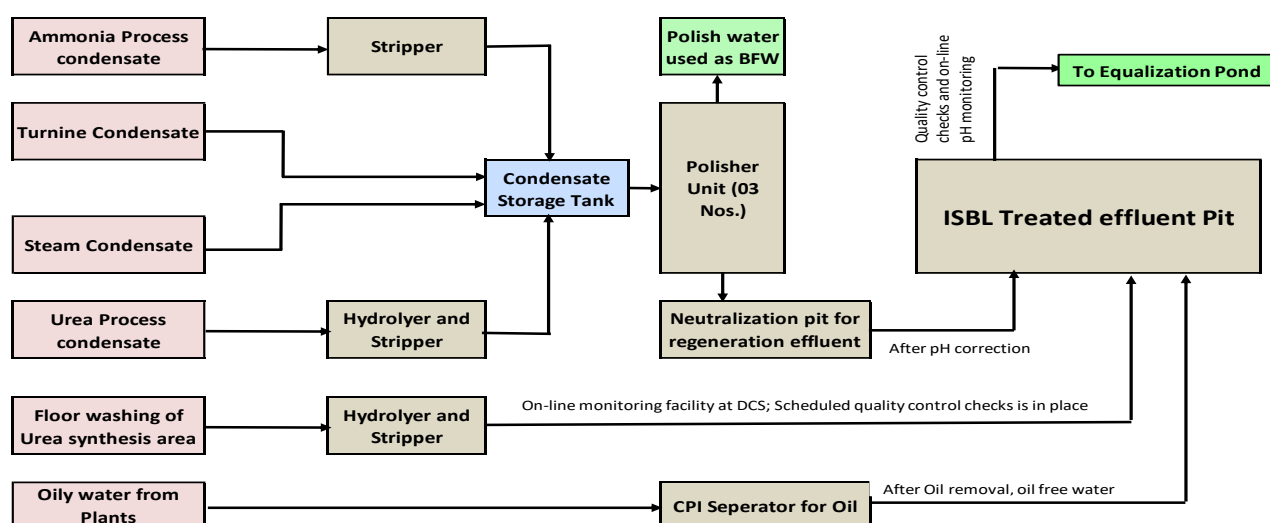


FIGURE 2-8 FLOW DIAGRAM OF EFFLUENT TREATMENT ASSOCIATED WITH THE PROJECT

2.5.9 WASTEWATER RECOVERY AND REUSE

A wastewater recovery plant forms part of the Project's water efficiency strategy. The system is designed to treat combined wastewater streams generated within the Indorama complex and recover a high proportion of treated water for reuse. Recovered water is primarily reused as cooling tower make-up, reducing freshwater abstraction and final discharge volumes.

2.6 SOLID WASTE MANAGEMENT

Solid wastes generated by Project activities during the construction and operational phases of the IFF Line 2 Fertilizer Project can be broadly categorised as non-hazardous or hazardous, based on their physical and chemical characteristics and associated environmental and health risks. Efforts will be made to optimise waste generation during construction and operation by optimisation of material consumption, reuse of suitable construction materials and exploring opportunities for recycling and recovery. The waste management practices will follow the waste hierarchy, prioritising waste avoidance and minimisation at source, followed by reuse, recycling and recovery, with treatment and disposal as the least preferred options.

During the construction phase, waste generation will be associated with site preparation, civil works, equipment installation, temporary facilities, and workforce accommodation. The duration of construction activities up to mechanical completion is anticipated to be approximately 32 to 33 months. The principal waste streams expected during the construction phase, together with indicative quantities and proposed management routes, are summarised in Table 2-2. The estimated quantities were derived from actual waste

generation records for the construction of IFF Lines 1, 2 and 3 at the Eleme Complex, scaled to the anticipated IFF Line 2 workforce, construction duration, material quantities and equipment requirements, which are comparable to those of the earlier lines. Unless otherwise stated, quantities are presented as annual generation rates (tonnes per year) averaged over the construction period; indicative total quantities for the construction period can be obtained by multiplying the annual rates by the construction duration (approximately 2.7 years). Domestic wastewater is presented as a per-capita daily rate.

TABLE 2-2 WASTE TYPES AND ESTIMATED QUANTITIES DURING THE CONSTRUCTION PHASE

Activity	Waste Description	Waste Category	Estimated Quantity	Destination / Management Method
Site preparation and foundations	Cement and concrete debris, soil containing cement residues	Non-hazardous	3,000–3,500 tonnes/year	Approved landfill
Construction activities	Scrap metal and wire including metal offcuts, supports, and wiring	Non-hazardous	200–500 tonnes/year	Reuse or resale through licensed recyclers
Construction activities	Scrap plastic and PVC materials	Non-hazardous	20–30 tonnes/year	Recycling facility
Maintenance activities	Paint residues and solvent wastes	Hazardous	0.3–0.5 tonnes/year	Approved hazardous waste management facility
Electrical installation and maintenance	Spent light bulbs and fluorescent fittings containing traces of mercury or other metals	Hazardous	Approx. 0.2 tonnes/year	Approved hazardous waste management facility
Workforce activities	Used personal protective equipment including gloves, goggles, and contaminated clothing	Hazardous	Approx. 5 tonnes/year	Approved incinerator or licensed hazardous waste facility
Pre-commissioning activities	Lubricating oil and seal flushing wastes containing oil, weld splatter, and metal residues	Hazardous	1.3–1.8 tonnes/year	Approved hazardous waste management facility
Camps, kitchens, and offices	Kitchen and food waste	Non-hazardous	10–20 tonnes/year	Municipal or approved disposal site

Activity	Waste Description	Waste Category	Estimated Quantity	Destination / Management Method
Camps, kitchens, and offices	Mixed municipal waste	Non-hazardous	150–200 tonnes/year	Municipal or approved disposal site
Camps, clinics, and first-aid stations	Medical waste	Hazardous	0.05–0.10 tonnes/year	Existing approved incinerator
Camps and offices	Domestic Wastewater from drinking, washing, showers, and sanitation	Non-hazardous	Approx. 150 litres/day per worker	On-site sewage treatment plant

During the operational phase, solid wastes generated by the IFF Line 2 Fertilizer Project will be managed as part of the existing integrated waste management system serving the Indorama complex. Indorama Fertilizer FZE will update and implement its site-wide Waste Management Plan to incorporate Project-specific operational waste streams, in accordance with Nigerian regulatory requirements and international good practice.

2.7 EMPLOYMENT AND WORKING HOURS

In addition to the workforce required during the construction phase the Project is anticipated to require an additional 50 expatriate and 110 national staff during the operational phase of the Project. Employment of Nigerians will be prioritised.

The established normal working hours for IFF employees is 40 hours per week and 176 hours per month as stipulated in Nigerian Labour Laws and International Labour Organization (ILO) conventions.

Under section 13 of the Nigerian Labour Act (Cap L1, LFN 2004), normal working hours are established by agreement, collective bargaining or an industrial wages board; hours beyond those normal hours constitute overtime. IFF's normal day-work schedule is eight working hours per day, Monday to Friday, or 40 hours per week.

The following arrangements apply to IFF's direct employees. Equivalent requirements will be included in contractor agreements and labour management plans and passed down to subcontractors and labour suppliers:

- **Normal hours:** Day-work employees normally work from 08:00 to 17:00, with a meal break from 12:30 to 13:30. Contractor personnel work the normal hours stated in their appointment letters and approved schedules; those hours may differ from IFF's 40-hour day-work week. Rosters and any applicable collective agreement will be communicated to workers before assignment.
- **Shift work:** Continuous process operations will follow documented rosters approved by Operations and HR. The employee handbook provides for either two 12-hour shifts or three shifts covering a 24-hour period; the roster selected for each role will specify

start and finish times, handovers, breaks and rest days. Construction work is planned for day shifts, with exceptional night work subject to prior authorisation

- **Overtime:** Overtime will be undertaken only when operationally necessary, authorised in advance, recorded and compensated in accordance with the applicable employment terms, employee handbook and collective agreement. For direct employees, approval is required from the immediate supervisor and Head of Department. Contractor overtime will be voluntary, pre-authorised and paid at the applicable rate. No overtime will be scheduled where it would prevent required breaks or weekly rest.
- **Rest periods:** A worker on duty for six hours or more will receive suitably spaced breaks totalling at least one hour. Every worker will receive at least 24 consecutive hours of rest in each seven-day period, subject only to the exceptions and compensatory arrangements permitted by law. Additional breaks will be provided where the nature of the work involves continuous strain.
- **Fatigue management:** a maximum shift length of 12 hours including overtime; no more than 12 consecutive working days, safety-critical tasks and drivers (including driving-hour limits under the Traffic Management Plan, Section 7.4.5); and provision of rest facilities.
- **Monitoring:** working hours and overtime of direct and contractor workers are reviewed monthly through timesheet and access-control records. For the contractors the same is maintained by the contractor HR team.

3. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

3.1 INTRODUCTION

The IFF Line 2 ESIA has identified potential impacts (both positive and negative) to the physical, natural, and socio-economic environments. In order to avoid, minimise and reduce negative impacts, and to ensure opportunities for the enhancement of positive impacts are realised, Environmental and Social Management Plans (Management Plans) have been prepared, and are listed and described in this ESMMP under Section 7. The Management Plans described in Section 7 include the following:

- Air Quality Management Plan
- Climate Change Management Plan
- Noise Management Plan
- Soil and Erosion Management Plan
- Ground Water and Surface Water Management Plan
- Biodiversity Management Plan
- Socio-economic Management Plan
- Cultural Heritage Management Plan
- Traffic Management Plan
- Labour, Employment and Procurement Management Plan
- Community Health and Safety Management Plan

- Waste Management Plan
- Emergency Preparedness and Spill Prevention, Control, and Response Plan

The above plans may be combined or included in an overall environmental and social plan as appropriate to streamline the execution of the Project. Each management plan listed above provides the following:

- The objectives and purpose of the plan;
- Applicable phases of the Project when the Management Plan is required;
- The Project related activity resulting in the impact, requiring the elaboration of each Plan;
- An overview of the responsibility for the implementation of each Plan;
- A summary of the Performance criteria to which the Plan must aim to comply (which included
- Nigerian legal requirements, the IFC performance standards, AfDB Operational Safeguards or applicable good practice), that is relevant to each Plan;
- Mitigation measures (actions) required during various Project phases (viz. pre-construction, construction, and operational phases), that were identified and described in the ESIA; and
- Monitoring requirements, including targets, performance indicators and reporting requirements.

3.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

The vehicle for the integrated management and implementation of these Management Plans is an Environmental and Social Management System (ESMS). Therefore, the ESMS is a key component of the ESIA process.

An ESMS is also a requirement of the IFC Performance Standards (PS 1: Assessment and Management of Environmental and Social Risks and Impacts) and AfDB Operational Safeguard OS 1. The objective of PS 1 and OS 1 is to:

- Planning – establishing the objectives and processes necessary to deliver results in accordance with the Project Guideline for Environmental and Social Management.
- Doing – Implementing the processes through defining mitigation measures and assigning responsibilities for undertaking or implementing such mitigation measures, typically through suites of Management Plans.
- Checking – Monitoring and measuring these processes against the policy, objectives and targets, legal and other requirements (such as those of the IFC, AfDB), and reporting of the results.
- Acting – Taking actions to continually improve performance of the ESMS through the training of personnel and auditing of results.



FIGURE 3-1 THE MAIN ELEMENTS OF AN ESMS

The ESIA for the IFF Line 2 Fertilizer Project has addressed the core planning elements of an Environmental and Social Management System (ESMS) through the identification of environmental and social impacts and the definition of mitigation measures within this ESMMP. The ESIA therefore provides the foundation for effective ESMS implementation.

The remaining ESMS elements related to implementation, monitoring, and continual improvement are addressed in Chapter 6 of this ESMMP, as follows:

- Planning and Implementation: Section 6.2 defines the institutional and organisational arrangements, including roles, responsibilities, and accountability for ESMS implementation. Section 6.3 addresses ongoing stakeholder engagement and grievance management.
- Checking and Acting: Section 6.4 describes core ESMS processes, including training, monitoring, inspections, audits, and reporting. Section 6.4.5 outlines the management of change process to address modifications during construction and operation.

The ESMS is implemented to:

- Support prioritisation and management of significant environmental and social impacts.
- Ensure mitigation measures identified in the ESIA and ESMMP are effectively implemented.
- Track and respond to changes in Nigerian legislation and applicable lender requirements.
- Provide a framework for compliance monitoring, auditing, and inspection.
- Integrate environmental, social, and Project-related health considerations into decision-making.
- Manage unforeseen impacts that may arise during construction or operation.
- Promote environmental and social awareness among staff, contractors, and subcontractors.

- Provide assurance to regulators, stakeholders, and lenders regarding environmental and social performance.

Management of new or previously unforeseen risks and impacts. New or unforeseen environmental and social risks and impacts may be identified through Management of Change (Section 6.4.5), environmental and social monitoring (Chapter 8), incident investigations (Section 6.4.2), audits and inspections (Section 6.4.3), stakeholder engagement and grievances (Section 6.3), or changes in regulatory or lender requirements. The ESMS will apply the following process:

- Record: the risk or impact is logged in the HIRA Register within five working days of identification, with its source and the date identified.
- Assess: the Site EHS Manager assesses its significance using the ESIA impact significance methodology and the priority levels of the Material Issues Register (Section 8.5).
- Assign: a named risk owner, the required controls and a target date are assigned and entered in the E&S Commitments Register (Table 3-2).
- Integrate: the controls are incorporated into the relevant management plan, CESMP, procedure or monitoring programme, through the MoC process where a change to the ESMMP is required.
- Track and close: implementation is tracked to closure and the effectiveness of the controls is verified through monitoring and audit.
- Communicate: material new risks are communicated to affected stakeholders through the SEP, and to the regulators and lenders through the reporting framework (Appendix C), within the timeframes in Section 6.4.4.

Indorama Fertilizer FZE has existing environmental, social, occupational health and safety, and human resources policies and procedures applicable across its operations within the Indorama complex. The commitments set out in this ESMMP will be implemented through an overarching ESMS that applies to the Project and broader operations.

In alignment with IFC Performance Standard 1 and AfDB Operational Safeguard 1, Indorama Fertilizer FZE, as the Project owner, is responsible for establishing and maintaining an ESMS comprising:

- An environmental and social policy.
- Processes for ongoing risk identification and management.
- Management programs, including the ESMMP.
- Organisational capacity and competency arrangements.
- Emergency preparedness and response procedures.
- A stakeholder engagement program, including grievance mechanisms.
- Monitoring and review systems to measure performance and support continual improvement.

3.3 ESMS ARCHITECTURE AND FUNCTIONAL PROCEDURES

To strengthen implementation of the Environmental and Social Management System (ESMS) in line with IFC PS1 and AfDB OS1, the Project will adopt a structured ESMS architecture supported by defined procedures, tools, and registers. This architecture operationalises the Plan–Do–Check–Act (PDCA) cycle, ensuring that all environmental and social risks—including climate-related risks and cumulative impacts—are systematically identified, managed, monitored, and improved over time.

The ESMS integrates findings from the ESIA, specialist studies, and risk assessments into a centralised management framework, ensuring consistency, auditability, and alignment with lender requirements.

Management of cumulative impacts within the ESMS. Because the Project is an incremental development within an established industrial complex, cumulative impacts are managed as a standing ESMS element, as follows:

- **Identification:** the valued environmental and social components (VECs) subject to cumulative pressure, identified in the ESIA cumulative impact assessment (air quality, water resources, traffic, waste management capacity, community health and safety and emergency preparedness), are flagged as cumulative risks. This is updated when existing or reasonably foreseeable developments in the Area of Influence change, and other planned Indorama units and third-party developments in the Eleme–Onne industrial corridor.
- **Monitoring:** cumulative indicators are monitored through the complex-wide programme described in Section 8.4, which distinguishes Project-specific source contributions from cumulative ambient conditions.
- **Review:** cumulative monitoring results and grievance trends are reviewed at least annually, and whenever a new development is announced or a cumulative trigger in Section 8.4 is reached, with the outcome reported in the annual E&S performance report.
- **Management and coordination:** risks within the Project’s control are managed through the Project management plans. Risks shared across the Indorama complex are managed through the complex-level EHS and social department. Risks outside Indorama’s control are addressed by coordination with the relevant authorities (FMEnv, NESREA, Rivers State Ministry of Environment, FRSC and Rivers State emergency services), neighbouring operators and host communities, as set out in Section 8.4.

TABLE 3-1 ESMS ARCHITECTURE – PROCEDURES, TOOLS AND SYSTEM CONTROLS

ESMS Component	Procedure / Tool	Description	Key Inputs	Outputs / Records	Responsibility
Legal Compliance	Legal Register and Compliance Obligations Procedure	Identification, tracking, and periodic review of applicable national and legislation	Regulatory requirements; permits; IFC PS; WBG EHS Guidelines;	Legal register; compliance audit reports; permits	Proponent (E&S Manager)

ESMS Component	Procedure / Tool	Description	Key Inputs	Outputs / Records	Responsibility
		IFC/WBG, AfDB standards/guidelines	AfDB ISS (2023) OS1-OS10; FMEnv ESIA approval conditions; lender E&S covenants and ESAP		
Risk Management	Environmental and Social Risk Register	Consolidated register of ESIA impacts, including climate risks and cumulative impacts	ESIA findings; specialist studies; stakeholder inputs	Risk register with ranking, controls, and residual risk	Proponent
Document Control	Document Control Procedure (DCP)	Control of ESMS documents, revisions, approvals, and distribution	ESMS documents; management plans; procedures	Controlled document register; version history; approvals	Proponent
Management of Change (MoC)	MoC Procedure and Change Register	Assessment and approval of changes to design, operations, or external conditions. The MoC screening criteria and thresholds that trigger updates to the ESIA, ESMMP, management plans, stakeholder engagement, regulatory approvals or lender notification are defined in Section 6.4.5	Design changes; new developments; regulatory updates; monitoring results; incidents; grievances	Approved change records; updated risk assessments	Proponent / Contractor
Inspection and Monitoring	Inspection Plan and Monitoring Programme	Routine site inspections and environmental/social monitoring	Management plans; monitoring parameters	Inspection reports; monitoring datasets	Contractor (construction); Proponent (operation)
Audit	Internal and External Audit Procedure	Periodic ESMS audits to assess compliance and effectiveness. Corrective-action workflow: findings documented and graded; CAPAs assigned to a named owner with a deadline; closure evidence submitted; closure verified by the Site E&S	ESMS requirements; legal register; monitoring data	Audit reports; corrective action plans	Proponent / Independent Auditor

ESMS Component	Procedure / Tool	Description	Key Inputs	Outputs / Records	Responsibility
		Manager; effectiveness verified at the next audit (refer to Section 6.4.3)			
Commitments Management	E&S Commitments Register	Single consolidated register of all E&S commitments and their implementation status (structure in Table 3-2)	ESIA; ESMMP; FMEnv approval conditions and permits; AfDB/lender ESAP, SEP grievance resolutions; audit findings	Commitments register with source, owner, due date, status, evidence and closure verification	Proponent (Site EHS and HR Manager)

The E&S Commitments Register is a core ESMS tool that consolidates, in one place, the commitments arising from the ESIA, this ESMMP, regulatory approvals and permits, the lenders' requirements (including the Environmental and Social Action Plan and loan covenants), stakeholder engagement, grievance resolutions and audits. The register cross-references the Master Impact-Mitigation-Monitoring Register (Appendix A) and is reviewed quarterly by the Site EHS and HR Manager. Its minimum structure is shown in Table 3-2.

TABLE 3-2 E&S COMMITMENTS REGISTER – MINIMUM STRUCTURE

Field	Content Required	Example
Commitment ID	Unique reference, cross-referenced to the Appendix A register and the source document	COM-ESMMP-7.2.6-05
Source commitment of	ESIA; ESMMP; FMEnv/RSMEnv approval condition or permit; AfDB/lender ESAP item or loan covenant; SEP/stakeholder engagement; grievance outcome; audit or monitoring finding	ESMMP Section 7.2.6, Surface Water Management Table
Commitment action /	Specific E&S commitment or action, stated in measurable terms	Install sediment traps at all construction drainage outlets before earthworks
Responsible party	Named owner (IFF, EPC Contractor, subcontractor or third party) and accountable IFF manager	EPC E&S Manager / IFF Site E&S Manager
Target / due date	Deadline or trigger (e.g. before mobilisation, before first discharge, quarterly)	Prior to earthworks in each work area
Implementation status	Not started / In progress / Implemented / Overdue	In progress
Evidence completion of	Records demonstrating implementation (photographs, inspection reports, monitoring data, approvals)	Weekly inspection report with photographs

Field	Content Required	Example
Verification / closure status	Verified by (name, date) and closure status; lender verification where required	Open – pending IFF verification
Outstanding corrective action	Any residual corrective action, owner and revised deadline	Replace damaged silt fence at Outlet 3 within 7 days of inspection

4. LEGAL FRAMEWORK AND INTERNATIONAL BEST PRACTICE

4.1 INTRODUCTION

This Chapter details the legislative and international good practice environmental and social requirements for the proposed IFZ Line 2 Project. National (Nigerian) laws deemed relevant for the successful implementation of all environmental and social components of the Project are presented in this Chapter. Furthermore, the applicable standards of international lending organisations are provided, and their applicability discussed².

4.2 INSTITUTIONAL FRAMEWORK

A summary of other authorities with the mandate to implement aspects of Nigerian legislation over aspects relating to the Project are provided in this Section.

4.2.1 FEDERAL MINISTRY OF ENVIRONMENT (FMENV)

FMEnv is the principal authority for the regulation and enforcement of environmental laws in Nigeria. The EIA Act, established by the Ministry, which ensures that all development and industrial activities, operations and emissions are within the limits prescribed in the national guidelines and standards and comply with relevant regulations for environmental pollution management in Nigeria as and when these are released by the Ministry. Further to the Mandate, FMEnv developed laws/ guidelines on various sectors of the national economy including the Environmental Impact Assessment (EIA Act CAP E12, LFN 2004) Act and procedures for evaluating EIA reports. Furthermore, in September 2021, through Official Gazette No. 105, Vol 108, the Federal Republic of Nigeria published S.I. No. 109, Environment Impact Assessment Procedures and Charges Regulations. This ESIA has considered these regulations, which outlines the EIA procedure from project conception to commissioning and describes the requisite follow up activities. FMEnv consults with State Ministries of Environment during the EIA permitting process.

² Whilst this Chapter has been prepared with all due care by ERM, it does not constitute legal advice and should not be construed as such. Furthermore, the Nigerian regulatory environment may be subject to changes to both regulatory instruments and authorities during the projected Project life cycle. It is therefore recommended that the regulatory framework is reviewed and assessed periodically. The sourcing of legislation was limited to a desktop survey (ERM's EHS database and other available online sources) and reliance on in-country contacts.

In addition, other regulatory agencies/authorities with oversight over specific industries have also issued guidelines to regulate the impact of such industries on the environment.

4.2.2 NATIONAL ENVIRONMENTAL STANDARDS AND REGULATION ENFORCEMENT AGENCY (NESREA)

The National Environmental Standards and Regulations Enforcement Agency (NESREA) was established in 2007 by the Federal Government of Nigeria as an Agency of FMEnv. The Agency is charged with the responsibility of enforcing the environmental laws, guidelines, standards, and regulations in Nigeria, specifically during the operational phase of development projects.

4.2.3 NIGERIAN MIDSTREAM AND DOWNSTREAM PETROLEUM REGULATORY AUTHORITY (NMDPRA)

The Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA) is the federal regulator responsible for overseeing Nigeria's midstream and downstream petroleum operations under the Petroleum Industry Act, 2021. The Authority regulates activities relating to natural gas processing, transportation, storage, distribution, and related infrastructure, as well as petroleum refining, importation, exportation, and product distribution. In the context of industrial projects such as the IFF Line 2 Fertilizer Project, NMDPRA plays a key role in regulating gas supply systems, gas processing facilities, pipelines, and associated installations, and in issuing permits, licences, and approvals relevant to gas handling, safety, and operational integrity. The Authority is also responsible for enforcing applicable technical standards, safety requirements, and environmental protection provisions across the midstream and downstream petroleum value chain, working in coordination with the Federal Ministry of Environment and other competent authorities.

4.3 NATIONAL REGULATORY FRAMEWORK

The national policies and regulations included in Table 4-1 below have E&S implications that pertain to the Project and associated ESIA study.

TABLE 4-1 NATIONAL POLICIES AND REGULATIONS AND THE APPLICABILITY THEREOF

Governing Documents	Description	Applicability
National Policies		
National Policy on the Environment, 1989	The National Policy on the Environment, 1989 (revised 1999 and 2017), provides a national mechanism for routine coordination and consultation among various tiers of local, state, and federal government to improve the development and implementation of environmental policy as well as establish effective relationships. In doing so, this Policy aims to achieve sustainable development through conserving the environment and natural resources, raising public awareness between environmental resources development, maintaining, and enhancing ecosystem processes, and co-operating with other countries, organisations, and agencies to reduce transboundary environmental degradation.	In line with the aims of the policy, this ESIA study includes an assessment of impacts to the physical, biological and socio-economical environments related with the different phases of the Project. Moreover, this ESIA includes mitigation measures and an associated ESMMP that aim to avoid /minimise/manage the severity of identified impacts. Once the ESIA is approved by the FMEnv, IFF will need to implement the commitments included and conduct periodic audits to ensure continuous improvement.
National Policy on Climate Change, 2013	The mission of the National Policy on Climate Change, 2013 is to strengthen national initiatives to adapt to and mitigate climate change and involve all sectors of society, including the poor and other vulnerable groups (e.g., women, elderly, youth etc.) within the overall context of advancing sustainable socio-economic development. Its main objectives are to: • Implement mitigation measures that will promote low carbon as well as sustainable and high economic growth; • Strengthen national capacity to adapt to climate change; • Raise climate change-related science, technology, and research and development to a new level that will enable the country to better participate in international scientific and technological co-operation on climate change; • Significantly increase public awareness and involve the private sector in addressing the challenges associated with climate change; and • Strengthen national institutions and mechanisms (policy, legislative and economic) to establish a suitable and functional framework for climate change governance.	In line with the National Policy on Climate Change, 2013 and the Climate Change Act, 2021, this ESIA has considered the climate change adaptation requirements for the Project and management relating to GHG emissions during all Project phases.

Governing Documents	Description	Applicability
Climate Change Act, 2021	The Climate Act 2021 provides a framework for achieving low greenhouse gas emission (GHG), inclusive green growth and sustainable economic development. The Act applies to the Ministries, Departments and Agencies (MDAs) of the Federal Government of Nigeria, and to public and private entities within boundaries of Nigeria for the development and implementation of mechanism geared towards fostering low carbon emission, environmentally sustainable and climate resilient society. Its main objectives are to: • Ensure that Nigeria formulates programmes for achieving its long-term goals on climate change mitigation and adaptation; • Facilitate the coordination of climate change action needed to achieve long-term climate objectives; • Mainstream climate change actions in line with national development priorities; • Facilitate the mobilization of finance, and other resources necessary to ensure effective action on climate change; • Ensure that climate change policies and actions are integrated with other related policies for promoting socio-economic development and environmental integrity; • Setting a target for year 2050-2070 for the attainment of a net zero GHG emission, in line with Nigeria's international climate change obligations; • Identify risks and vulnerabilities, building resilience and strengthening existing adaptive capacities to the impacts of climate change; • Implement mitigation measures that promote low carbon economy and sustainable livelihood; and • Ensure that private and public entities comply with stated climate strategies, targets, and National Climate Change Action Plan.	
The National Gender Policy, 2021	The National Gender Policy, 2021 presents a set of minimum standards to meet the mandate for gender equality, good governance, accountability, and being socially responsive to the	This ESIA process has (and continues) to be undertaken to ensure effective, transparent, and timely stakeholder engagement. Moreover, it has been structured such that

Governing Documents	Description	Applicability
	needs of vulnerable groups. The policy builds on the revision of the NGP, 2007 to respond to emerging issues across the sectors since 2006 and to incorporate current gender gaps to fulfil Nigeria's commitment to such global agenda as the SDGs. The strategic policy objectives are to bridge gender/social inclusion gaps, achieve parity in all spheres, to protect women's human rights, and mitigate sexual and gender-based violence through appropriate buffers and related services.	all stakeholder engagement activities will take into consideration in gender sensitivities, particularly when engaging with local communities. Moreover, the ESIA considers gender equality in recruitment and that no employee or job applicant discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, religion or sexual orientation.
National Policy on Occupational Safety and Health, 2021	The Occupational Safety and Health policy strengthens the National Labour Policy and extant labour legislations, provisions Cap 126, the workmen's Compensation Act Cap 470, Trade Union Act Cap 126, Trade Dispute Act Cap 432, wages Board and Industrial Councils Act 466 and the Labour Act Cap 198, and other relevant Laws of the Federation of Nigeria. The goal of the policy is to facilitate improvement of occupational safety and health performance by providing the framework for participative occupational safety and health protection of workers including the most vulnerable groups in all sectors of economic activities.	The safety, health and welfare of all the workers associated with the Project will need to be addressed in line with all the provisions of this Policy throughout the Project lifecycle (construction, operational and decommissioning phases).
National Policy on Solid Waste Management, 2022	The National Policy on Waste Management 2022 provides a guidance for efficient and sustainable solid waste management in Nigeria. The policy objective is to provide a national direction on solid waste management for the Federal, States, Local governments, private sector, and all stakeholders. In doing so, the policy aims to promote a healthy and aesthetically satisfactory environment by ensuring effective, sustainable, safe, and sanitary solid waste management.	The Project, during the construction, operational and decommissioning phases, will generate wastes, which will need to be disposed of as per the guidelines in this Policy. The ESMMP has considered these regulations and includes a section on solid waste management.
National Environmental Sanitation Policy, 2005 (revised 2018)	This Policy serves as the instrument for securing sustainable quality environment for good health and social wellbeing of present and future generations.	This ESIA process has been undertaken to cover events that could impinge on sanitation, hygiene, and health.
National Environmental (Hazardous Chemicals and Pesticides)	The Regulation establish a legal framework for the safe management of hazardous chemicals and pesticides throughout their lifecycle. The Regulations aim to protect human health and the environment by controlling the manufacture, import, export, storage, transport, use, and disposal of hazardous chemicals and	The Project, during the construction, operational and decommissioning phases, will maintain inventories of hazardous chemicals, keep Safety Data Sheets (SDS) readily available, Maintain records of chemical use and disposal, Report significant chemical accidents or spills,

Governing Documents	Description	Applicability
Regulations, 2014	pesticides. They also implement Nigeria's obligations under the Rotterdam Convention and strengthen compliance with other international environmental agreements	undertake risk assessments where necessary, provide the training to chemical handlers and the handling will be under strict supervision with using proper Personnel Protective Equipment.
The Agriculture Promotion Policy, 2016	The Agriculture Promotion policy builds on achievement of Agriculture Transformation Agenda (ATA), 2011-2015 and was readjusted to solve challenges faced by implementation of ATA and highlight Federal government (in partnership with State Government) priorities in the agricultural sector.	In line with this policy, IFF is required to abide to climate change and environmental sustainability in its operation and participation in agricultural promotion.
General Environmental		
Environmental Impact Assessment Act 86 of 1992 (amended by EIA Act CAP E12 LFN 2004) and regulation 2021	This is the primary governing Act for EIA in Nigeria. The Act establishes a procedure and methodology to be followed to undertake an EIA study. Section 2 (2) of the Act requires that an EIA study must be undertaken in accordance with the Act when the extent, nature, or location of the proposed project or activities is likely to affect the environment significantly.	As the proposed Project will entail the construction of a fertilizer Plant for Ammonia and Urea production, an ESIA study in line with the provisions of the EIA Act is therefore required prior to the project commencing. Accordingly, an ESIA study is currently being carried out in line with the requirements of this Act and has further considered the Environment Impact Assessment Procedures and Charges Regulation, 2021, IFF shall be required to commit to implementing the commitments included in the ESMMP laid out in this ESIA Report and any other conditions as laid out by FMEnv, should an ESIA license be issued for the Project.
National Environmental Impact Assessment Procedural and Sectoral Guidelines, 1994	FMEnv developed the National EIA Procedural Guidelines in response to the establishment of the EIA Act. The Procedural Guidelines assists proponents in conducting detailed E&S assessments by providing an overview of the baseline information, key issues, impacts, mitigation, and management plans to be considered as part of the EIA study.	An ESIA study is currently being undertaken for the Project. This ESIA has been undertaken to comply with the requirements of these Guidelines. IFF shall be required to commit to implementing the ESMMP laid out in this ESIA and any other conditions stipulated by FMEnv.
The National Environmental (permitting & Licensing System) Regulation, 2009	The purpose of this regulation is to enable consistent application of Environmental Laws, Regulations and Standards in all sectors of the economy and geographical regions.	In line with these regulations, this ESIA has considered the Environmental Laws, guidelines, standards, and regulations in Nigeria during all Project phases.
Waste and Pollution		

Governing Documents	Description	Applicability
National Environmental (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations, 1991, S.I.9	These Regulations impose restrictions on the release of toxic substances into the environment and stipulate requirements for pollution monitoring units, machinery for combating pollution, and contingency plans to be implemented by industries.	The Project, during the construction, operational and decommissioning phases, will generate wastes, which will need to be disposed of as per the guidelines in these Regulations. The ESMMP has considered these regulations and includes a section on the management of both non-hazardous and hazardous wastes.
National Environmental Protection (Effluent Limitation) Regulation 1991, S.I.8	The National Effluent Limitation Regulation, S.1.8 of 1991 (No. 42, Vol. 78, August 1991) makes it mandatory for industries such as waste generating facilities (including research institutes, clinics, hotels etc.) to install pollution prevention and pollution abatement equipment on site. The regulation is specific for each category of a waste generating facility with respect to limitations of solid and liquid discharges or gaseous emissions into the ecosystem. Appropriate penalties for contraventions are also specified in the regulation.	The Project, during the construction, operational and decommissioning phases, will generate waste effluent, which will need to be managed per the guidelines in these Regulations. This regulation requires the Project to install anti-pollution equipment for the detoxification of effluent and chemical discharges emanating from its activities and specify selected wastewater parameters for the industries in the First Schedule to the Regulations.
National Environmental (Management of Solid and Hazardous Wastes) Regulations, 1991, S.I.15	This instrument regulates the collection, treatment, and disposal of solid and hazardous waste streams from municipal and industrial sources. It gives a comprehensive list of chemicals and chemical waste by toxicity categories. The regulation requires the project proponent to practice waste segregation (at source) and engage the services of a government-approved waste management agents for appropriate waste disposal throughout the project's life cycle.	The Project, during the construction, operational and decommissioning phases, will generate wastes, which will need to be managed and disposed of as per the guidelines in these Regulations. The ESMMP has considered these regulations and includes a section on the management of both non-hazardous and hazardous wastes.
National Environmental (Sanitation and Wastes Control) Regulations, 2009, S.I.28	This Regulation aims to adopt sustainable and environment-friendly practices in environmental sanitation and waste management to minimise pollution.	The provisions included in this Regulation have been considered as part of the Project ESMMP.
Soils and Water		
National Environmental (Soil Erosion and	The overall objective of this Regulation is to ensure that projects developed on sites that are vulnerable to flooding, including	The provisions included in these Regulations will need to be considered by IFF as part of Project Engineering designs.

Governing Documents	Description	Applicability
Flood Control Regulations, 2011, S.I.12	facilities that serve such projects, are protected against flooding by appropriate design at the time of initial construction.	
National Environmental (Surface and Groundwater Quality Control) Regulations, 2011, S.I.12	The purpose of these Regulations is to enhance and preserve the physical, chemical and biological integrity and to maintain existing use of groundwater and surface water resources. The standards contained herein provide for the protection of surface and ground water from pollutants so that the waters shall be protected, used, developed, conserved, managed, and controlled in ways that take into account: • Citizens right of access to clean water and sanitation; • Protection of aquatic ecosystems and long term sustainability of water resources ; and • Reduction and prevention of pollution and degradation of surface water resources and recognition of preventive, precautionary, and polluter-pays-principles.	The Project will be associated with waste generation, more specifically solid and effluent wastes, which should be managed and disposed of in an environmentally friendly manner to avoid any form of pollution, including water pollution. This ESIA and associated ESMMP has considered these regulations.
Water Resources Act, CAP W2 LFN, 2004	This Act is aimed at promoting the optimum planning, development, and use of Nigeria's water resources; ensuring the coordination of activities that are likely to influence the quality, quantity; distribution, use, and management of water; providing the application of appropriate standards and techniques for the investigation, use, control, protection, and management of water resources; and facilitating technical assistance and rehabilitation for water supplies.	In line with the requirements of this Act, IFF will need to safeguard the integrity water systems within and surrounding the Project area throughout the implementation of the Project. This includes implementing proper waste management to prevent water pollution during the construction, operational and decommissioning phases.
Climate Change		
Climate Change Act, 2021	The Climate Change Act provides a legal and institutional framework for reducing GHG emissions in Nigeria. The objective of the law is to establish a framework for reducing GHG emissions and to embed climate change actions into national plans and programmes. The Act establishes the National Council on Climate Change (NCCC), which has been delegated the authority to make policies and decisions on all matters relating to climate change in Nigeria. The NCCC is directed to collaborate with the Federal Inland Revenue Service (FIRS) to develop a carbon tax in Nigeria. The proceeds from the carbon tax will go to the Climate Change Fund established under the Act. The Fund is to be used for the administration and general operation of the	In line with the requirements of this Act, this ESIA has considered the climate change adaptation requirements for the Project and management relating to GHG emissions during all Project phases.

Governing Documents	Description	Applicability
	NCCC, the funding of innovative climate change mitigation and adaptation projects, conducting assessments of climate change impacts on vulnerable communities, and incentivizing the transition to clean energy. The law is the first stand-alone comprehensive climate change legislation in West Africa. The Climate Change Act seeks to achieve net-zero GHG emissions in Nigeria between 2050 and 2070. It further provides a framework to help achieve Nigeria's NDCs and mandates the Ministry of Environment, in consultation with the Federal Ministry for Budget and National Planning, to set a carbon budget to keep the average increase in global temperature to within 2°C, and to help keep to 1.5°C rise above pre-industrial levels. The Act also requires the NCCC to collaborate with the FIRS to develop and implement a mechanism for carbon emission trading and empowers the Ministries to periodically revise the carbon budget, in line with Nigeria's NDCs with a view to complying with Nigeria's international obligations. The Climate Change Act also requires the preparation of a National Climate Change Action Plan (every five-years) to ensure that the carbon budgets are being met, and that climate change mitigation actions are identified and are being actively applied.	
Air Quality		
National Environmental (Air Quality and Control) Regulations, 2021, S.I.88	The objective of the Regulations is for the prevention, control, and reduction of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources such as mobile sources (e.g. vessels, motor vehicles) and stationary sources (e.g. industries). Emission limits for different areas and facilities have been set. The regulations make provision for designating controlled areas and the setting of objectives of air quality management plans for these areas.	The Project, during the construction, operational and decommissioning phases, will generate air emissions. As part of this ESIA process, an air quality study has been undertaken. The primary objective of the air quality study is to consider and assess the potential impacts which the Project may have upon existing air quality, during both construction and operational phases. The assessment of construction impacts focuses on the potential effect of construction dust and construction-related combustion emissions (including vehicles) at existing sensitive receptor locations immediately adjacent to the Project. The assessment of operational impacts focuses on the

Governing Documents	Description	Applicability
		potential negative effects of pollutants from a variety of sources. Impacts of emissions on air quality have been quantified by comparison of the predicted maximum concentrations with the Project applicable air quality standards (which have considered these Regulations). Moreover, the ESMMP includes specific controls to mitigate air quality emissions.
Noise		
National Environmental (Noise Standards and Control) Regulations, 2009, S.I.35	The Regulation highlights the permissible noise levels to which a person may be exposed, control and mitigate noise, permits for noise emissions above acceptable levels and enforcement maximum permissible noise levels a facility or activity to which a person may be exposed to.	The Project, during the construction, operational and decommissioning phases, will generate noise. As part of this ESIA process, a noise study has been undertaken. The study has considered noise emissions at the potentially most affected noise sensitive receiver (NSR) locations in proximity to the Project. The Project will be required to comply with these Regulations to promote a healthy and safe working environment throughout all Project phases. Noise impacts have been quantified by comparison of the predicted maximum concentrations with the Project applicable noise standards (which have considered these Regulations). Moreover, the ESMMP includes specific controls to mitigate noise emissions.
Biodiversity		
National Environmental (Control of Alien and Invasive Species) Regulations, 2013, S.I.32	This regulation seeks to prevent the decline and minimise the modification and destruction of the ecosystem and human health caused by alien and invasive species.	This ESIA and associated ESMMP has considered a range of potential ecological impacts associated with the Project, including the control of invasive alien plants in the immediate Project area and surrounds.
Endangered Species Act CAP E9 LFN, 2004 as amended 2016	This Act prohibits, except under a valid license, the hunting, capture, or trade-in animal species, either presently or likely being in danger of extinction, and defines the liability of any offender under this Act. It also provides for regulations to be made necessary for environmental prevention and control regarding the purposes of this Act.	These regulations have been considered in the biodiversity study for the ESIA and associated ESMMP.
Health and Safety and Labour		

Governing Documents	Description	Applicability
Employment Laws and Regulations Nigeria 2023	The Employment Laws and Regulation 2023 strengthens employment laws as stated in the constitution of the Federal Republic 1999, the Labour Act 2004, Federal and State laws that relate to labour and employment, and international conventions, treaties and protocols relating to labour and employment, industrial relations or matters connected therewith that have been ratified by Nigeria.	IFF will be bound to abide to Nigeria labour and employment laws and regulation during its Project lifecycle.
Factories Act, CAP F1 LFN 2004	The Factories Act 1990 (amended in 2004) is the primary law regulating the health, safety and welfare of workers in the country's factories. The Law holds management and staff personally responsible for violations of the provisions in the Act.	The safety, health, and welfare of all the workers associated with the Project will need to be addressed in line with all the provisions of this Act throughout the Project lifecycle.
Labour Act, CAP L1 LFN 2004	Nigeria has ratified all core International Labour Organisation Conventions. The Labour Act 1990 (amended in 2004) is the primary law protecting the employment rights of individual workers. The Act covers protection of wages, contracts, employment terms and conditions, and recruitment; and classifies types of workers and special workers.	IFF will be bound by this Act to abide to its stipulation on employee management and remuneration during its construction and operational phases.
Trade Unions Act, 2005	This Act contains provisions with respect to the formation, registration, and organization of trade unions. It includes stipulation of 'equal pay for equal workers without discrimination on account of sex, or any other ground whatsoever'.	The Proponent will respect workers' rights to join (or not join) unions of their choice and to engage with those unions which workers are members of in relation to collective bargaining, disciplinary proceedings, and retrenchment of workers.
National Minimum Wage Act, 2019	The Act prescribes the national minimum wage and provides for a legal framework for a seamless review of the stated national wage.	IFF will abide to the stipulation of this Act on employee remuneration during the Project lifecycle.
Employee Compensation Act, 2010	This Act repeals the Workmen's Compensation Act W6 LFN 2004 and makes comprehensive provisions for payment of compensation to employees that suffer from occupational diseases or suffer injuries from accident at workplace or in the course of the employment.	The safety, health, and welfare of all the workers associated with the Project will need to be addressed in line with all the provisions of this Act throughout the Project lifecycle.
Pension Reform Act, 2014	This Act makes provision for the contributory pension scheme for public and private sectors in Nigeria.	IFF will be bound by this Act to abide to its stipulation on employee remuneration during all Project phases.
Violence against Persons (Prohibition) Act, 2015	The Violence against Persons (Prohibition) Act (VAPP) was passed into law in May 2015. The Act was necessitated as a result of agitations for the protection of persons against different forms of violence. The Act has strengthened advocacy against rape, female genital mutilation, partner battery, stalking, harmful	The safety, health, and welfare of all the workers and communities associate with the Project will need to be addressed in line with all the provisions of this Act throughout the Project lifecycle.

Governing Documents	Description	Applicability
	widowhood practices while prohibiting all forms of violence, including physical, sexual, psychological, domestic, harmful traditional practices and discrimination against persons. It also provides maximum protection and effective remedies for victims and punishment of offenders.	
Land		
Land Use Act CAP L5 LFN, 2004	Land Use Act No. 6 was enacted in 1978 (revised in 1990 and 2004). The Act vests all land in the territory of each State (except land vested in the Federal Government or its agencies) solely in the Governor of the State, who holds such land in trust for the people and is solely responsible for the allocation of land in all areas, to individual resident in the State and to organizations for residential, agricultural, and commercial purposes.	IFF have legally secured rights to the land associated with development of the Project.
Other		
National Environmental (Ozone Layer Protection) Regulations, 2009, S.I.32	This regulation prohibits the use, emission, storage, and disposal of stratospheric ozone-depleting substances (ODS) and articles which contain those substances.	IFF will need to ensure that equipment containing ODS's will either not be used on site or, if currently being used, will need to be phased out.
National Environmental (Construction Sector) Regulations (S.I No. 19), 2011	The purpose of these Regulations is to prevent and minimize pollution from construction, decommissioning and demolition activities applicable to Nigerian projects. It stipulates that new projects in the construction sector shall apply cost-effective, up-to-date, efficient, use best available technology, to minimize pollution to the barest degree practicable.	This ESIA considers a variety of potential impacts that may result in pollution to the environment during the construction and decommissioning phases of the Project. IFF shall be required to commit to implementing the ESMMP laid out in this ESIA and any other conditions stipulated by FMEEnv.
Harmful Waste (Special Criminal Provisions) Act CAP H1 LFN, 2004	The Harmful Waste (Special Criminal Provisions) Act CAP H1 LFN, 2004 prohibits and declares unlawful activities relating to the purchase, sale, importation, transit, transportation, deposit, and storage of harmful wastes. Appropriate penalties for infringement are prescribed.	The Project is not anticipated to generate any harmful waste, ESMMP has considered these regulations and includes a section on the management of both non-hazardous and hazardous wastes.
The Standards Organization of Nigeria (SON) ACT NO. 14, 2015	The Standards Organisation of Nigeria was established by Act. No.56 of 1971 which vested it with the authority for: Standards elaboration, Specifications, Quality assurance system of commodities, manufactured industrial and imported products and services generally.	IFF shall be required to commit the quality standards as certified by SON throughout its operation.

Governing Documents	Description	Applicability
	The Act No. 14 of 2015 amended the previous SON Act, 2004, and was enacted for the purpose of providing additional functions for the Standards Organisation of Nigeria, increasing penalty for violations; and for related matters.	
Criminal Code of 1990 (now CAP 38 LFN, 2004)	The Act contains the primary criminal law offences related to environmental damage, public health, and natural resources. Some environmental crimes include causing a public nuisance, fouling the water of any spring, stream, well, or reservoir of a place, and violating the atmosphere in any position to make it harmful to the health of persons.	IFF shall be required to commit to implementing the ESMMP laid out in this ESIA and any other conditions stipulated by FMEEnv.
Nigeria Export Processing Zones Act 1992	This Act establishes the Nigeria Export Processing Zones Authority (NEPZA) and provides the legal framework for the designation, regulation, management, and supervision of Export Processing Zones (also referred to as Free Zones) in Nigeria. The Act defines approved activities within Free Zones, sets out licensing requirements for enterprises, and provides incentives including exemptions from customs duties, import and export controls, and certain taxes. It also grants NEPZA regulatory oversight over enterprises operating within designated Free Zones and allows for the issuance of subsidiary regulations governing Free Zone operations. Additionally, the Act outlines requirements relating to land use, security, movement of goods and persons, labour permits, and compliance with applicable laws not expressly excluded within Free Zones	The proposed IFF Line 2 Project is located within the Indorama Free Zone , which is a designated Export Processing Zone regulated under this Act. Accordingly, the Project is required to be registered as an approved enterprise and to operate in accordance with NEPZA licensing, operational, and reporting requirements. While certain fiscal and customs incentives apply by virtue of Free Zone status, the Project remains subject to applicable Nigerian environmental legislation, including the EIA Act, and to all environmental, health, safety, and labour obligations not explicitly exempted under the Act. Compliance with NEPZA approvals and conditions forms a prerequisite for Project development, construction, and operation.
Nigeria Export Processing Zones Authority (NEPZA), Investment procedures, Regulations and Operational Guidelines for Free Zones In Nigeria, 2004.	These Regulations, issued pursuant to Section 10(4) of the Nigeria Export Processing Zones Act, provide detailed procedural, regulatory, and operational guidance for the establishment, licensing, development, and operation of Free Zones and enterprises within them. The Guidelines set out requirements for enterprise registration, approved activities, land allocation and development, building permits, utilities, commencement of operations, incentives and concessions, movement of goods and persons, banking and customs procedures, environmental safety and pollution control, monitoring and reporting obligations, and enforcement mechanisms. They also clarify the application of environmental	The Project is required to comply with the procedural and operational requirements set out in these Guidelines, including registration as a Free Zone enterprise, adherence to approved activities, and compliance with environmental safety, pollution control, and reporting obligations. The Regulations reinforce the requirement for environmentally sound design, construction, and operation of facilities within the Free Zone and support the integration of ESIA commitments and ESMMP measures into Project implementation. Compliance with NEPZA monitoring, inspection, and reporting requirements will apply throughout the Project lifecycle.

Governing Documents	Description	Applicability
	protection, health, safety, and security provisions within Free Zones.	

4.3.1 KEY COMPLIANCE IMPLICATIONS FOR IFF

- **National Policy on the Environment:** General duty to assess and manage E and S impacts and implement mitigation.
- **National Climate Change Policy:** Integrate climate adaptation and GHG reduction actions.
- **Climate Change Act 2021:** Monitor emissions and align with national net zero targets.
- **National Gender Policy 2021:** Ensure gender responsive consultation and non-discrimination.
- **Occupational Safety and Health Policy 2021:** Maintain safe working conditions and worker protection systems.
- **National Solid Waste Management Policy 2022:** Apply proper waste segregation, safe handling and approved disposal.
- **Environmental Sanitation Policy:** Maintain site hygiene and protect public health.
- **Agriculture Promotion Policy:** Operate in an environmentally responsible manner that supports sustainable agriculture.
- **EIA Act (and 2021 Regulation):** Obtain FMEnv ESIA approval and comply with all licence conditions and the ESMMP.
- **EIA Procedural and Sectoral Guidelines:** Follow FMEnv methodology and reporting requirements.
- **Environmental Permitting and Licensing Regulation 2009:** Maintain applicable FMEnv environmental licences.
- **Pollution Abatement Regulations (S.I.9):** Install and maintain pollution control and response systems.
- **Effluent Limitation Regulations (S.I.8):** Meet effluent standards and operate compliant treatment units.
- **Solid and Hazardous Waste Regulations (S.I.15):** Segregate, store and dispose waste using licensed operators.
- **Sanitation and Waste Control Regulations (S.I.28):** Maintain clean work areas and prevent pollution.
- **Soil Erosion and Flood Control (S.I.12):** Incorporate flood and erosion controls in site design.
- **Surface and Groundwater Quality Control (S.I.22):** Prevent water pollution and meet water quality limits.
- **Water Resources Act:** Protect water resources and manage abstraction responsibly.
- **Climate Change Act 2021:** Integrate climate risk management and support national carbon budgeting.
- **Air Quality Regulations 2021:** Comply with emission limits and conduct air quality monitoring.
- **Noise Control Regulations (S.I.35):** Meet permissible noise levels at sensitive receptors.

- **Invasive Species Regulation (S.I.32):** Prevent introduction and spread of invasive species.
- **Endangered Species Act:** Avoid harm to protected species and comply with licensing rules if required.
- **Employment Laws:** Comply with national labour requirements.
- **Factories Act:** Maintain statutory workplace safety and welfare systems.
- **Labour Act:** Ensure lawful contracts, wages and employment conditions.
- **Trade Unions Act:** Respect workers' rights to organise.
- **National Minimum Wage Act:** Pay statutory minimum wages.
- **Employee Compensation Act:** Provide compensation for workplace injuries or disease.
- **Pension Reform Act:** Maintain contributory pension compliance.
- **VAPP (Violence Against Persons (Prohibition) Act:** Enforce zero tolerance for GBV and protect workers and communities.
- **Land Use Act:** Ensure lawful land allocation and secure tenure documentation.
- **Ozone Layer Protection (S.I.32):** Phase out ozone depleting substances and equipment.
- **Construction Sector Regulations (S.I.19):** Use best available techniques to minimise construction impacts.
- **Harmful Waste Act:** Prohibit creation or handling of harmful waste.
- **SON (Standards Organisation of Nigeria) Act:** Use materials and equipment certified to national standards.
- **Criminal Code:** Avoid actions that could constitute environmental or public health offences.

4.4 STATE LAWS AND ADMINISTRATIVE INSTITUTIONS ON ENVIRONMENTAL PROTECTION

Section 20 of the 1999 constitution of the Federal Republic of Nigeria, states that, "The State shall protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria". Furthermore, the EIA Act No. 86 of 1992 recommends the setting up of state environmental agencies to support the efforts of the FMEnv in regulating the consequences of project development on their environment.

4.4.1 RIVERS STATE MINISTRY OF ENVIRONMENT

Since the inauguration of the present democratic administration, Rivers State Government has established a full-fledged Ministry of Environment (RSMENV) headed by a commissioner. The Ministry was created from the Rivers State Environmental Protection Agency (RSEPA). RSMENV was empowered by the decree that set up the repealed FEPA (Decree 58 of 1988, as amended by Decree 59 of 1992), which encourages State governments to set up their own Environmental Protection Agencies.

Consequently, RSMENV is charged with the protection of the environment of Rivers State and operates with Edict No. 2 of 1994. In 2002, RSMENV published the Interim Guidelines and Standards on Environmental Pollution Control and Management in Rivers State which was revised in 2013. The guidelines seek to:

- Regulate the generation, handling, storage, disposal, and management of all wastes of whatever origin in Rivers State.
- Regulate physical development in compliance with the principle of sustainable development.
- Enhance and where possible, restore the quality of the environment and protect the biodiversity of the flora and fauna of Rivers State.

4.4.2 RIVERS STATE WASTE MANAGEMENT AGENCY (RIWAMA)

The Rivers State Waste Management Agency (RIWAMA) is responsible for the enhancement of the environment but is also mandated to positively change the living conditions and reduce diseases and health problems in the state. It was created in 2013 by the Rivers State House of Assembly and was assented by the state governor in July 2014. Prior to this, the agency functioned as the "Rivers State Environmental Sanitation Authority (RSESA)".

4.4.3 RIVERS STATE NOISE CONTROL EDICT, NO. 20, 1985

The law targets reducing occupational noise exposure of workers to noise from factories/industrial machines and exposure of the neighbouring population to noise from nearby factories. It also sets limits for other sources of noise including aircrafts, loud music and public address systems and recommends daily noise exposure limits for industry workers and communities.

4.4.4 RIVERS STATE ENVIRONMENTAL PROTECTION AND MANAGEMENT LAW, CAP A42, 2019

The objective of law is to exploit, develop and manage resources to achieve a higher quality of life by ensuring sustainable development. The law prescribing and listing activities that require environmental permits both in manufacturing and non-manufacturing sectors. The law also specifies terms for registration of environmental consultants in the state and conditions for issuance or renewal of the accreditation certificates / permits.

4.5 INTERNATIONAL CONVENTIONS, PROTOCOLS AND AGREEMENTS

Nigeria is a signatory to several international conventions and agreements targeted toward the conservation and protection of the environment to ensure sustainable development. The relevant international conventions and regulations most applicable to the project are highlighted below in Table 4-2.

TABLE 4-2 LIST OF RELEVANT INTERNATIONAL CONVENTIONS AND REGULATIONS

Conventions	Year Adopted	Overview	Project Implication for IFZ	Applicability /
The Paris Accord	2015	The Paris Accord is a legally binding international treaty on climate change. It was adopted by 196 Parties at the United Nations Climate Change Conference, COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016. The Paris Accord's long-term temperature goal is to keep the rise in mean global temperature to well below 2 °C (3.6 °F) above pre-industrial levels, and preferably limit the increase to 1.5 °C (2.7 °F), recognizing that this would substantially reduce the impacts of climate change. Emissions should be reduced as soon as possible and reach net-zero in the second half of the 21st century. It aims to increase the ability of parties to adapt to climate change impacts and mobilize sufficient finance. Under the Agreement, each country must determine, plan, and regularly report on its contributions.	Requires IFF to manage and reduce GHG emissions and align with Nigeria's national climate commitments reflected in the ESIA.	
International Health Regulations (IHR)	2005	The IHR is an international legal instrument that is binding on 196 countries across the globe, including all the Member States of World Health Organisation (WHO). This binding instrument of international law was first adopted in 1969, revised in 2005 and entered into force on 15 June 2007. The purpose and scope are "to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks and which avoid unnecessary interference with international traffic and trade".	Requires IFF to adopt internationally recognised public health measures, including disease prevention, emergency preparedness and worker health protocols.	
International Labour Organization (ILO): ILO OSH 2001 Guidelines	2001	These guidelines call for coherent policies to protect workers from occupational hazards and risks while improving productivity. The guidelines present practical approaches and tools for assisting organisations, competent national institutions, employers, workers, and other social partners in establishing, implementing and improving occupational safety and health management systems, with the aim of reducing work-related injuries, ill health, diseases, incidents and deaths. At the organisational level, the guidelines encourage the integration of OSH management system elements as an important component of overall policy and management arrangements. Organizations, employers, owners, managerial staff, workers, and their representatives are motivated in applying appropriate OSH management principles and methods to improve OSH performance. Nigeria ratified the guidelines in 2001.	Requires IFF to maintain a structured OSH management system in line with international good practice and reduce workplace risks.	
United Nations Convention on	1994	The Convention was adopted in 1994. The objectives of the Convention include the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.	Requires IFF to protect biodiversity, avoid unnecessary habitat disturbance and integrate	

Conventions	Year Adopted	Overview	Project Applicability / Implication for IFZ
Biological Diversity			biodiversity mitigation measures into the ESIA.
Rio Declaration on Environment and Development	1992	The Declaration was made in 1992 in Rio de Janeiro, reaffirming the declaration of the United Nations Conference on Human Environment adopted at Stockholm in 1972. The principle works towards international agreement which respects the interest of all and protects the integrity of the global environment and development. The principles of the declaration relevant to the proposed project include: Principle 4: In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. Principle 17: EIA as a national instrument shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.	Reinforces the requirement to undertake the ESIA and integrate environmental considerations into project planning and decision making.
United Nations Framework Convention on Climate Change	1992	The Convention on Climate Change was adopted in 1992 during the Rio Earth Summit in Rio De Janeiro, Brazil and entered into force in 1994 to limit Greenhouse Gas (GHG) emissions which cause global warming.	Requires IFF to support national GHG reduction and climate adaptation actions and incorporate climate change considerations into project design.
International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC)	1990	Parties to the International Convention on OPRC are required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries. Parties to the convention are required to provide assistance to others in the event of a pollution emergency and provision is made for the reimbursement of any assistance provided. Ships and operators are required to carry a shipboard oil pollution emergency plan, oil pollution emergency plans or similar arrangements which must be coordinated with national systems for responding promptly and effectively to oil pollution incidents.	Requires IFF to maintain emergency response plans, spill prevention systems and pollution control measures consistent with international expectations.
Montreal Protocol on Substances that Deplete the Ozone Layer	1987	The Protocol was adopted on 16 September 1987 as an international treaty to eliminate ozone depleting chemicals production and consumption.	Requires IFF to avoid and phase out ozone depleting substances in equipment, materials and operations.
Vienna Convention for the Protection of the Ozone Layer	1985	The Vienna Convention was adopted in 1985 and entered into force on 22 September 1988. It places general obligations on countries to make appropriate measures to protect the	Reinforces IFF's responsibility to avoid contributing to ozone depletion and adopt

Conventions	Year Adopted	Overview	Project Implication for IFZ	Applicability /
		environment against adverse effects resulting from human activities which tend to modify the ozone layer.	environmentally responsible technologies.	
Protocol Concerning Cooperation in Combating Pollution in Cases of Emergency in the West and Central African Region	1981	The objective of the protocol is to protect the marine environment, the coastal zones and the related internal waters falling within the jurisdiction of the States of the West and Central African region against pollution in cases of emergency. The Parties undertake to cooperate in all matters relating to the protection of their respective coastline and related interests from the threat and effects of pollution resulting from marine emergencies, especially by exchanging relevant information (arts. 4, 5, 6, 7, 8 and 10). They agree to assist each other, on demand, in cases of marine emergencies (art. 8). Finally, they are to endeavour to maintain and promote marine emergency contingency plans (art. 9) and take appropriate measures to prevent, reduce, combat and control the effects of pollution (art. 10).	Requires IFF to maintain pollution response capability and cooperate with national authorities in the event of any environmental emergency.	
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)	1979	This Convention, also known as the Bonn Convention, was adopted in 1979 and entered into force in 1983. It stipulates actions for the conservation and management of migratory species including habitat conservation.	Requires IFF to avoid harming migratory species, protect ecological corridors and apply protections in biodiversity-sensitive areas.	
West African Aquatic Mammals MoU (2008)	2008	This MoU concerns the conservation of the manatee and small cetaceans of Western Africa and Macaronesia. It is a Multilateral Environmental MoU and entered into effect on 3 October 2008 under the auspices of the Convention on the Conservation of Migratory Species of Wild Animals. The MoU aims to protect these species at a national, regional, and global level.	Requires IFF to avoid impacts on aquatic mammals during any water related activities and comply with species protection expectations.	
MoU concerning Conservation Measures for Marine Turtles of the Atlantic Coast (1999)	1999	This MoU requires signatories to endeavour to put in place measures for the conservation and, where necessary and appropriate, strict protection of marine turtles at all stages of their life cycle (including eggs, hatchlings, juveniles, sub-adults and adults. It came into effect in 1999 and is an agreement under Article IV, paragraph 4, of the Convention on the Conservation of Migratory Species of Wild Animals.	Requires IFF to avoid harming marine turtles and align any coastal or marine related project components with species protection expectations.	
African Convention on the Conservation of	1968	The African Convention on the Conservation of Nature and Natural Resources was adopted in Algiers, Algeria, on 15 September 1968, and entered into force on 16 June 1969. The Convention stipulates that the contracting States shall undertake to adopt the measures necessary to ensure conservation, utilization and development of soil, water, flora and	Requires IFF to conserve soil, water and biological resources and adopt environmentally	

Conventions	Year Adopted	Overview	Project Implication for IFZ	Applicability /
Nature and Natural Resources		fauna resources in accordance with scientific principles and with due regard to the best interests of the people.	responsible management practices throughout the project.	

4.6 INTERNATIONAL BEST PRACTICE STANDARDS AND GUIDELINES

4.6.1 EQUATOR PRINCIPLES (EP4)

The Equator Principles provide a set of 10 principles of voluntary standards that present a credit risk management framework for determining, assessing and managing social and environmental risk in Project financing. The Equator Principles are based on the IFC Performance Standards on social and environmental sustainability and on the World Bank Group EHS Guidelines. The Project has committed to complying with this set of principles, which together with the IFC Performance Standards and the EHS Guidelines will be used as a benchmark for IBP.

Details of the applicability of the Equator principles to the Project ESIA process are provided in Table 4-3.

TABLE 4-3 APPLICABILITY OF THE EQUATOR PRINCIPLES TO THE PROJECT ESIA PROCESS

Principle	Relevance to Project
1: Review and Categorisation	Category A project per FMEEnv.
2: Social and Environmental Assessment	IFF are currently undertaking an internationally compliant ESIA for the Project.
3: Applicable Social and Environmental Standards	The ESIA and associated ESMMP has been undertaken in accordance with standards and recommendations of IFC Performance Standards and EHS Guidelines.
4: Action Plan and Management System	At this stage, IFZ have a number of environmental, social, occupational health and safety and human resource plans, policies and procedures. These plans, policies and procedures that relate to all IFZ's operations in Port Harcourt will be extended to IFF. Over the life of all of IFF's operations, the vehicle by which the commitments set out in the ESMMP related to this ESIA and other plans, policies and procedures should be developed into specific actions which can be implemented through an overarching Environmental and Social Management System (ESMS).
5: Consultation and Disclosure	On-going stakeholder engagement, community consultation and disclosure are being undertaken (refer to Chapter 6 and SEP).
6. Grievance Mechanism	A Project's Grievance Mechanism has been developed and is being implemented (refer to Chapter 6 and SEP).
7. Independent Review	The Project lenders will need to appoint an independent review panel to review all Project documentation.

Principle	Relevance to Project
8. Covenants	Relevant Nigerian legislation is being complied with. IFF employees and activities will need to comply with commitments included in the ESMMP. Annual reports will need to be prepared documenting actions and activities demonstrating these commitments.
9. Independent Monitoring and Reporting	The Project lenders will need to appoint an independent review panel to review all Project documentation.
10. Equator Principle Founding Institute (EPFI) Reporting	Not IFF's responsibility.

4.6.2 INTERNATIONAL FINANCE CORPORATION PERFORMANCE STANDARDS ON ENVIRONMENTAL AND SOCIAL SUSTAINABILITY, 2012 (IFC PSS)

IFC's Sustainability Framework (International Finance Corporation, World Bank Group) articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards (PSs) on Environmental and Social Sustainability, and IFC's Access to Information Policy.

The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. IFC's Access to Information Policy reflects IFC's commitment to transparency and good governance on its operations and outlines the Corporation's institutional disclosure obligations regarding its investment and advisory services.

The PSs are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

IFC requires its clients to apply the PSs to manage environmental and social risks and impacts so that development opportunities are enhanced.

The IFC PSs are outlined in Box 4.1.

BOX 4.1 INTERNATIONAL FINANCE CORPORATION PERFORMANCE STANDARDS

Performance Standards:

- PS 1: Assessment and Management of Environmental and Social Risks and Impacts.
- PS 2. Labour and Working Conditions
- PS 3. Resources Efficiency and Pollution Prevention
- PS 4. Community, Health, Safety and Security
- PS 5. Land Acquisition and Involuntary Resettlement

- PS 6. Biodiversity Conservation and Sustainable Management of Living Natural Resources
- PS 7. Indigenous Peoples
- PS 8. Cultural Heritage

The requirements of each of the eight IFC PSs, and their relevance to the Project, are presented in Table 4-4.

TABLE 4-4 IFC PSS AND THE RELEVANCE TO THE PROJECT

Performance Standards	Key Requirement	Relevance to the Project
IFC PS1: Assessment and Management of Environmental and Social Risks and Impacts	This PS relates to integrating and managing E&S performance throughout the life of a project in line with national regulations and international standards. The standard requires the development of an Environmental and Social Management System (ESMS) that entails a structured approach to managing environmental and social risks and impacts. Moreover, the PS describes how E&S issues are to be handled in project development and serves as the core around which the other standards are framed. This standard requires that nearby communities be appropriately engaged on issues that could potentially affect them. Key requirements include: • Conducting an informed consultation and participation process with affected communities; • Working in an inclusive and culturally appropriate manner; • Addressing the needs of disadvantaged or vulnerable groups; and • Making available an effective grievance management system.	The Project poses a number of E&S risks and impacts, which will need to be appropriately managed. Appropriate management measures have been included in the ESMMP. Moreover, as part of the ESIA process stakeholders at the State and Local Government and Community level have been consulted and engaged and will continue being engaged during the ESIA process and post-ESIA. At this stage, IFZ have a number of environmental, social, occupational health and safety and human resource plans, policies and procedures. These plans, policies and procedures relate to all IFZ's operations in Port Harcourt will be extended to IFF. Over the life of all of IFF's operations, the vehicle by which the commitments set out in the ESMMP related to this ESIA and other plans, policies and procedures should be developed into specific actions which can be implemented through an overarching Environmental and Social Management System (ESMS).
IFC PS2: Labour and Working Conditions	This standard aims to ensure that the Proponent establishes, maintains and improves a worker-management relationship	Project workers (for all Project phases) will need to be provided

Performance Standards	Key Requirement	Relevance to the Project
	that promotes the fair treatment, non-discrimination and equal opportunity of workers, and compliance with national labour and employment laws and international standards (as defined by the International Labour Organisation (ILO). In particular, PS2 addresses child labour and forced labour, and promotes safe and healthy working conditions, and protecting and promoting the health of workers by recognising the role of employees.	with fair labour and working conditions. This will apply to all categories of workers irrespective of whether directly engaged by IFF or Contractor (direct workers), engaged through third parties (contracted workers), and workers engaged by the client's primary suppliers (supply chain).
IFC PS 3: Resource Efficiency and Pollution Preventions	This PS aims to abate pollution to air, water, and land that may threaten people and the environment at the local, regional, and global levels. This Performance Standard promotes the ability of private sector companies to adopt such technologies and practices where feasible.	Development of the Project will require a number of resources, which have the potential to cause some negative E&S impacts. All required resources will need to be used efficiently and all wastes needs to be managed in accordance with the waste management hierarchy, where avoidance of waste generation is the priority.
IFC PS 4: Community, Health, Safety and Security	The role of this PS is to anticipate and avoid adverse impacts on the health and safety of the affected communities throughout the life of the project as a result of routine and non-routine events. The PS also requires an assessment of how use of security by the project to safeguard personnel and property could impact on community security taking into account considerations of human rights.	Implementation of the Project will need to ensure that the health, safety and security of all Project affected communities are not compromised.
IFC PS5: Land Acquisition and Involuntary Resettlement	PS5 refers to the management of physical and economic displacement resulting from project-related land acquisition through resettlement and livelihood restoration processes. Objectives are to: • Avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs. • Avoid forced eviction. • Anticipate and avoid, or where avoidance is not possible, minimize adverse social	IFF have legally secured rights to the land associated with development of the Project. The securing of land and access restrictions to surrounding communities will need to be in line with the requirements of PS5.

Performance Standards	Key Requirement	Relevance to the Project
	and economic impacts from land acquisition or restrictions on land use by: - Providing compensation for loss of assets at replacement cost; and - Ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. • Improve, or restore, the livelihoods and standards of living of displaced persons. • Improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.	
IFC Biodiversity Conservation and Sustainable Management of Living Natural Resources	PS6: This PS aims to protect and conserve biodiversity based on the Convention on Biological Diversity. It divides habitat into three categories, modified, natural, and critical. For projects in natural habitat, mitigation measures should be designed to achieve no net loss of biodiversity where feasible. For projects in critical habitats, the project's mitigation strategy should be described in a Biodiversity Action Plan and be designed to achieve net gains of those biodiversity values for which the critical habitat was designated.	Assessment of the proposed Project's impacts on biodiversity has been carried out in line with the requirements of this PS.
IFC Indigenous Peoples	PS7: This PS deals with safeguarding Indigenous Peoples. The aim of this PS is to protect the interests of Indigenous Peoples (IPs) during project implementation. On a broader scale, it requires project implementation to avoid adverse impacts on Indigenous Peoples as well as ensuring their participation and consent.	No recognized IPs are impacted by this Project, hence PS7 is not triggered.

Performance Standards	Key Requirement	Relevance to the Project
IFC PS8: Cultural Heritage	Cultural heritage, according to this PS, refers to tangible forms of cultural heritage, such as tangible movable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.	As part of this ESIA process a cultural heritage impact assessment (considering both tangible and intangible forms of cultural heritage) have been undertaken.

4.6.3 AFRICAN DEVELOPMENT BANK (AFDB) INTEGRATED SAFEGUARDS SYSTEM (ISS)

African Development Bank (AfDB) Integrated Safeguards System (ISS) provides the environmental and social risk management framework applicable to projects financed by the Bank. The ISS comprises a series of Operational Safeguards (OSs) that establish requirements for the identification, assessment, management, monitoring, and reporting of environmental and social risks and impacts throughout the project lifecycle. The ISS is designed to promote environmentally sound, socially inclusive, climate-resilient, and sustainable development outcomes while ensuring that affected communities, workers, vulnerable groups, biodiversity, and cultural heritage are appropriately protected. Given the anticipated participation of the AfDB in the lender consortium, the Project has been reviewed against the applicable Operational Safeguards, and the relevance of each safeguard to the IFF Line 2 Fertilizer Project is summarised in Table 4-5 below. The implementation of the ESIA, ESMMP, Environmental and Social Management System (ESMS), and associated management plans will support alignment with the requirements of the AfDB ISS.

TABLE 4-5 AFDB INTEGRATED SAFEGUARDS SYSTEM (ISS) AND RELEVANCE TO THE PROJECT

AfDB Operational Safeguard	Key Requirement	Relevance to the Project
OS1: Assessment and Management of Environmental and Social Risks and Impacts	Requires identification, assessment, management and monitoring of environmental and social risks through an ESMS, stakeholder engagement process, grievance mechanisms and adaptive management.	The Project is subject to a comprehensive ESIA and ESMMP. Indorama will implement an ESMS, stakeholder engagement programme, monitoring framework and grievance

AfDB Operational Safeguard	Key Requirement	Relevance to the Project
		mechanisms consistent with OS1 requirements.
OS2: Labour and Working Conditions	Protects workers' rights, promotes fair treatment, non-discrimination, freedom of association, occupational health and safety, and prevention of child and forced labour.	The Project will employ a substantial construction and operational workforce. Labour and working conditions, contractor management, worker grievance mechanisms and OHS provisions are addressed through the ESMMP and company policies.
OS3: Resource Efficiency and Pollution Prevention and Management	Requires efficient use of resources, pollution prevention, GHG management, waste minimisation and application of good international industry practice.	The Project involves ammonia and urea production with associated emissions, effluent generation, waste streams, water consumption and energy use. Resource efficiency and pollution prevention measures are incorporated throughout the ESMMP.
OS4: Community Health, Safety and Security	Requires protection of affected communities from project-related risks including traffic, hazardous materials, emergency events, workforce influx and security arrangements.	Construction and operation may result in traffic, air quality, noise, emergency response and community safety risks. Dedicated Community Health and Safety, Traffic and Security Management Plans have been developed.
OS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Applies where projects result in physical or economic displacement, loss of assets, loss of access to resources or resettlement impacts.	The Project is located within the existing Indorama Free Zone on land already under the control of the Proponent. No physical or economic displacement has been identified. Any future land requirements will be managed in accordance with OS5 principles.
OS6: Habitat and Biodiversity Conservation and Sustainable Management of Living Natural Resources	Requires avoidance and minimisation of impacts on biodiversity, ecosystems and ecosystem services, with additional requirements for critical habitats.	Biodiversity impacts have been assessed through the ESIA. Biodiversity Management Measures have been included in the ESMMP to manage habitat disturbance, invasive species and impacts on ecosystem services.
OS7: Vulnerable Groups	Requires identification of vulnerable or disadvantaged individuals and groups and implementation of measures to avoid disproportionate adverse impacts and ensure equitable access to benefits.	The ESIA identified potentially vulnerable groups in surrounding communities. A Vulnerable Groups Analysis Matrix and targeted mitigation measures have been incorporated into the ESMMP.
OS8: Cultural Heritage	Requires protection of tangible and intangible cultural heritage and implementation of chance	Potential cultural heritage sensitivities have been identified in the Project area. A Cultural

AfDB Operational Safeguard	Key Requirement	Relevance to the Project
	finds procedures where appropriate.	Heritage Management Plan and Chance Finds Procedure have been included in the ESMMP.
OS9: Financial Intermediaries	Require financial intermediaries to establish and implement an Environmental and Social Management System (ESMS) to identify, assess, monitor, and manage environmental and social risks in their lending and investment portfolios	The Project is subject to a comprehensive ESIA and ESMMP. Indorama will implement an ESMS, management and monitoring framework consistent with OS1 requirements. The Project lenders will need to appoint an independent consultant to review E&S performance.
OS10: Stakeholder Engagement and Information Disclosure	Requires Stakeholder Identification, Engagement, Information Disclosure, and Grievance Mechanism provisions	As part of the ESIA process stakeholders at the State and Local Government and Community level have been consulted and engaged and will continue being engaged during the ESIA process and post-ESIA.

4.6.4 ENVIRONMENTAL QUALITY STANDARDS CROSSWALK (AMBIENT AIR, NOISE AND TREATED EFFLUENT DISCHARGE)

This section consolidates all numeric environmental quality standards relevant to the Project across three principal sources:

- Nigeria's statutory environmental standards,
- the IFC/WBG General Environmental, Health and Safety (EHS) Guidelines, and
- the IFC Sector-Specific EHS Guidelines for Nitrogenous Fertilizer Production.

The purpose the tables in this section is to provide a single, transparent reference point that shows how multiple standards may apply to the same environmental parameter; whether ambient air quality, ambient noise, or wastewater quality, and to clearly identify the Project-Adopted Standard for each parameter.

Because Nigeria's regulatory requirements and the IFC/WBG guidelines both apply to the Project, it is necessary to establish a clear and consistent method for determining which limit governs. The following logic is applied throughout the tables:

- **Legal compliance is the minimum requirement:** all Nigerian standards are mandatory and form the regulatory baseline.
- **International good practice applies concurrently:** where IFC/WBG guidelines include numeric limits for the same parameter, these are considered alongside Nigerian requirements.

- **Most stringent value prevails:** where different standards apply to the same parameter and averaging period, the Project adopts the more stringent limit to ensure compliance with both national expectations and lender requirements.
- **Completeness rule:** where one framework does not specify a numeric limit for a parameter, the Project adopts the applicable value from the other framework or a recognised international benchmark referenced in the ESIA.
- **Clarity and traceability:** the final column of the table ("Project-Adopted Standard") sets out the enforced benchmark used for impact assessment, modelling, and future monitoring.

4.6.4.1 HOW THE ADOPTED STANDARDS ARE USED IN THIS ESIA AND ESMMP

The Project-Adopted Standards identified in Table 4-6 and Table 4-7 below are applied consistently throughout the ESIA as: (i) the benchmark for air dispersion and noise modelling and impact evaluation at sensitive receptors; (ii) the compliance criteria used to determine significance and residual impact ratings; and (iii) the performance thresholds referenced in mitigation measures, operational controls, and monitoring commitments in the ESMMP. Where standards are expressed using different averaging periods, receptor definitions, or measurement metrics, the ESIA applies like-for-like comparisons and documents any necessary assumptions to ensure the adopted standard remains conservative and defensible.

TABLE 4-6 AMBIENT AIR QUALITY STANDARDS

Parameter	Nigeria Standard	IFC/WHO Ambient Guideline	Other International Benchmark	Project-Adopted Standard	Adoption Basis
NO ₂ (annual)	80 µg/m ³	40 µg/m ³	—	40 µg/m ³	IFC is more stringent
NO ₂ (1-hour)	200 µg/m ³	200 µg/m ³	—	200 µg/m ³	Equivalent; IFC adopted
PM ₁₀ (annual)	60 µg/m ³	70 µg/m ³ (IT-1)	—	60 µg/m ³	Nigeria more stringent
PM ₁₀ (24-hour)	150 µg/m ³	150 µg/m ³ (IT-1)	—	150 µg/m ³	Equivalent
PM _{2.5} (annual)	20 µg/m ³	35 µg/m ³ (IT-1)	—	20 µg/m ³	Nigeria more stringent
PM _{2.5} (24-hour)	40 µg/m ³	75 µg/m ³ (IT-1)	—	40 µg/m ³	Nigeria more stringent
NH ₃ (annual)	200 µg/m ³	No IFC/WHO value	180 µg/m ³ (UK EA)	180 µg/m ³	IFC silent; adopt recognised benchmark
NH ₃ (1-hour)	600 µg/m ³	No IFC/WHO value	2,500 µg/m ³ (UK EA)	600 µg/m ³	Nigeria more stringent

TABLE 4-7 NOISE – AMBIENT RECEPTOR STANDARDS

Parameter / Receptor	Nigeria Standard (Day/Night)	IFC General EHS (Day/Night)	IFC Additional Rule	Project-Adopted Standard	Adoption Basis
Operational Noise – Residential / Institutional / Educational	50 / 35 dB(A)	55 / 45 dB(A)	+3 dB above background allowed	55 / 45 dB(A) + 3 dB rule	IFC more stringent for receptor class
Construction Noise – Sensitive Receptors	60 / 50 dB(A)	No IFC construction limits	—	60 dB(A) daytime	IFC silent; Nigeria standard adopted
Mixed Residential / Industry	55 / 45 dB(A)	70 / 70 dB(A)	—	55 / 45 dB(A)	Nigeria more stringent

4.6.4.2 INDUSTRIAL / PROCESS EMISSION STANDARDS CROSSWALK (ATMOSPHERIC, EFFLUENT, OTHER)

This section consolidates the numeric industrial and process-related emission standards applicable to the Project, focusing on point-source stack emissions and process effluent quality associated with ammonia and urea production. It integrates requirements from Nigerian environmental regulations, the IFC/WBG General EHS Guidelines, and the Sector-Specific EHS Guidelines for Nitrogenous Fertilizer Production.

Because multiple frameworks apply simultaneously, the table identifies all relevant standards for each pollutant or parameter and then determines the Project-Adopted Standard using the same logic applied in Table:

- Nigerian emission and effluent limits form the regulatory baseline.
- IFC/WBG guidelines are applied concurrently as international good practice.
- Where both Nigerian and IFC/WBG limits apply to the same parameter, the more stringent value is selected as the adopted project standard.
- Where one framework is silent, the Project applies the relevant limit from the available framework or the applicable sector-specific guideline.

Table 4-8, Table 4-9 and Table 4-10 serve as the definitive reference for engineering design criteria, stack and process emission modelling, operational compliance, and monitoring commitment.

TABLE 4-8 POINT SOURCE AIR EMISSIONS (AMMONIA & UREA PLANTS)

Parameter / Emission Source	Nigeria Emission Standard	IFC General EHS Guideline (Air Emissions)	IFC Sector – Nitrogenous Fertilizer	Project-Adopted Standard	Adoption Basis
NH ₃ – Ammonia Plant Stack	Not specified	Not specified	50 mg/Nm ³	50 mg/Nm ³	Only sector guideline provides a value
NO _x – Ammonia Primary Reformer (flue gas)	National combustion standards may apply (varies by sector)	General combustion guidance (no numeric limit)	300 mg/Nm ³	300 mg/Nm ³	Sector guideline is the only defined numeric limit
Particulate Matter (PM) – Ammonia Plant	Not specified	Not specified	50 mg/Nm ³	50 mg/Nm ³	Only sector guideline provides a value
Urea Dust – Urea Granulation/Prilling	Not specified	Not specified	50 mg/Nm ³	50 mg/Nm ³	Sector guideline establishes limit
NH ₃ – Urea Granulation	Not specified	Not specified	50 mg/Nm ³	50 mg/Nm ³	Sector guideline establishes limit
PM – Urea Plant	Not specified	Not specified	50 mg/Nm ³	50 mg/Nm ³	Sector guideline applies to urea production

TABLE 4-9 PROCESS WASTEWATER / EFFLUENT (AMMONIA & UREA PLANTS)

(Note: Only parameters with numeric limits are listed)

Parameter	Nigeria Effluent Limit	IFC General EHS (Wastewater)	IFC Sector – Nitrogenous Fertilizer	Project-Adopted Standard	Adoption Basis
pH	6.5–8.5	6–9	6–9	6.5–8.5	Nigeria has narrower, more stringent range

Parameter	Nigeria Effluent Limit	IFC General EHS (Wastewater)	IFC Sector – EHS Nitrogenous Fertilizer	Project-Adopted Standard	Adoption Basis
Temperature Increase	Not specified	<3°C above ambient	<3°C	<3°C	IFC/Sector define numeric limit
TSS	30 mg/L	Approx. 50 mg/L (typical GIIP)	30 mg/L	30 mg/L	Nigeria = Sector → most stringent
NH ₃ (Ammonia)	5 mg/L	Not specified	5 mg/L	5 mg/L	Nigeria = Sector
Total Nitrogen	Not specified	Not specified	15 mg/L	15 mg/L	Only sector guideline provides a value
Urea	Not specified	Not specified	1 mg/L	1 mg/L	Only sector guideline provides a value
COD	150 mg/L	Principle-based ; no numeric value	No sector value	150 mg/L	Nigeria provides numeric limit
BOD	30 mg/L	Principle-based	No sector value	30 mg/L	Nigeria provides numeric limit
Oil & Grease	10 mg/L	Approx. 10 mg/L (typical GIIP)	No sector value	10 mg/L	Nigeria explicit limit
Heavy Metals (Pb, Cr, Ni, Cu, Zn, Hg, Cd, etc.)	Parameter-specific numeric limits: Zn 1.0; Cu 1.0; Cr 1.0; Pb 1.0; Ni 1.0; Cd 0.1; As 0.1; Hg 0.05; Fe 5.0 (all mg/L)	Non-numeric	None	Nigeria limits: Zn 1.0 mg/L; Cu 1.0 mg/L; Cr 1.0 mg/L; Pb 1.0 mg/L; Ni 1.0 mg/L; Cd 0.1 mg/L; As 0.1 mg/L; Hg 0.05 mg/L; Fe 5.0 mg/L (as adopted in Table 7-11)	Only Nigeria provides numeric values; values adopted as the Project limits and monitored monthly at the final effluent discharge point during operation (Chapter 8)

TABLE 4-10 OTHER PROCESS RELATED INDUSTRIAL REQUIREMENTS

Area	Nigeria Standard	IFC General EHS	IFC Sector EHS	Project-Adopted Standard	Adoption Basis
Flaring (During startup, shutdown & emergency) – Operational Emissions	Must comply with national flaring guidelines / rules Gas Flaring, Venting and Methane Emissions (Prevention of Waste and Pollution) Regulations, 2023. These Regulations are made under the Petroleum Industry Act, 2021;	Good practice: minimise flaring, complete combustion	Addresses non-routine emissions qualitatively	Compliance with national rules + IFC GIIP. No routine flaring; flaring limited to start-up, shutdown, process upset and emergency conditions. Smokeless flare design with continuously monitored pilot/flame; flare gas flow metered and every flaring event logged (refer to Section 7.2.2.5). Expected non-routine flaring activity: approximately 313 TJ/yr (8,514 tCO ₂ e/yr), based on the ESIA GHG assessment.	Combine legal compliance + lender expectation
Hazardous Materials (e.g., spent catalysts)	Controlled under hazardous waste regulations	Specifies GIIP for hazmat and chemical handling	Identifies typical wastes (e.g., catalysts)	Apply Nigeria rules + IFC GIIP	Nigerian legal framework + IFC GIIP
Oily Water / Drainage Systems	Discharge limits defined under effluent register	Requires oil-water separation and GIIP controls	Not specified numerically	Use Nigeria numeric limit + IFC GIIP controls. Segregated drainage: clean stormwater to the retention pond; potentially contaminated and oily runoff to the CPI oil separator and effluent treatment plant (drainage philosophy in Section 7.2.6.5)	Nigeria provides numeric limit; IFC provides method

4.7 PROJECT SPECIFIC EHS POLICIES AND STANDARDS

Below listed policies are implemented for Indorama Eleme Fertilizer & Chemicals FZE (IFZ) and the same policies will be extended to proposed IFF Line 2 Fertilizer Project.

4.7.1 IFZ NON-DISCRIMINATORY POLICY, 2026 (REV. 2)

IFZ is an equal opportunity employer and as per the Non-Discriminatory Policy does not and shall not discriminate against any employee or any applicant for employment on the basis of race, colour, religion (creed), gender expression, age, disability, military status, sexual orientation, and national origin in any of its activities or operations. These activities include but are not limited to employment – recruitment, selection, hiring, compensation, termination, upgrading, promotions, and other conditions of employment.

4.7.2 IFZ CHILD LABOUR PROHIBITION POLICY, 2026 (REV. 2)

IFZ does not and shall not offer employment nor employ any person below the age of eighteen (18) years. The Company maintains zero tolerance towards the breach of this policy.

In line with the Policy, IFZ shall maintain appropriate documents of all relevant details of employees including their age and these documents shall be open for verification by authorized personnel or the relevant statutory body. The Human Resources Department is responsible for the implementation of this Policy.

Age verification. Before any worker (direct, contractor, subcontractor or labour-supplier) is issued with a site identification card, the employer must verify their age using at least one government-issued identity document bearing a date of birth: the National Identification Number (NIN) slip or card, an international passport, a driver's licence, a permanent voter's card or a birth certificate. Where a document appears unreliable, a second document or a sworn declaration is required, and the worker is not mobilised until their age is confirmed. Copies of the documents are kept on the personnel file. Contractors must submit a verified workforce register to IFF HR.

Monitoring and audit. IFF HR team verify compliance through: (i) checks on 100% of new site-pass applications; (ii) Quarterly random audits of at least 10% of contractor and subcontractor personnel files during construction (iii) unannounced site spot-checks. The findings are reported in the labour audit report

Remediation if child labour is identified. If any person under 18 years of age is found working on the Project, the following actions apply:

- immediate removal of the child from work, and in all cases from hazardous work, while ensuring their safety and welfare (the child is not simply dismissed and left without support);
- notification of the IFF HR Manager and Site Manager within 24 hours, and investigation of how the child was recruited and of any systemic failure;
- remediation in the best interests of the child,

- contractor accountability: a major non-conformance with a corrective action plan, financial penalties under the contract and, for repeat or wilful breaches, removal of the responsible supervisor and/or termination of the contract;
- escalation of the incident to senior management and notification to the lenders as a serious incident (Section 6.4.4); and
- follow-up monitoring of the contractor (increased audit frequency for at least six months) and verification that the corrective actions have been closed out.

4.7.3 IFZ HUMAN RIGHTS AND LABOUR POLICY, 2026 (REV. 2)

The IFZ Human Rights Policy is guided by the International Human Rights Principles as enshrined in the Universal Declaration of Human Rights, the ILO Declaration on fundamental Principles of Rights at Work, and the African charter on Human Rights on the constitution of the Federal Republic of Nigeria 1999, as amended. Specifically, IFZ employees shall have the following rights:

- Freedom of association
- Freedom of expression
- Healthy work environment
- Safety at workplace
- Non-discrimination
- Freedom of worship
- Freedom from bullying, sexual harassment
- Freedom from forced, compulsory, bonded, trafficked or involuntary labour: IFZ prohibits all such labour. No worker may be required to pay recruitment fees or lodge deposits, identity documents may not be retained by the employer, and all workers are free to resign on reasonable notice.
- Right to fair hearing
- Any other such rights as necessary and recognized by the law of the Federal Republic of Nigeria.

The Policy, including its prohibition of forced and involuntary labour, applies to IFZ/IFF employees and is imposed contractually on all contractors, subcontractors, labour suppliers and primary suppliers.

4.7.4 IFZ INDEPENDENT CONTRACTORS' POLICY, 2026 (REV. 2)

For the purpose of this Policy, independent contractors are workers working for IFZ. IFZ directs all independent contractors working with the Company to strictly comply with the guidelines on the following internal policies: Employee Hand Book, Grievance Handling and Management Policy, Anonymous Grievance Handling Mechanism, Child Labour Prohibition Policy, Human Rights Policy, Non-discriminatory Policy, Retrenchment Planning (Redundancy) as stipulated in the National Labour Law, Work Place Discipline Policy,

Security and Safety Policy, Employee Compensation Policy and any other policy necessary for the wellbeing of the independent contractors and their employees.

The Gender Based Violence and Harassment Policy (Section 4.7.5), the Human Rights and Labour Policy (Section 4.7.3), the Child Labour Prohibition Policy (Section 4.7.2) and the Occupational Health, Safety & Wellbeing Policy (Section 4.7.9) apply equally to all contractors, subcontractors, labour suppliers, private security service providers and other third parties engaged on the Project. They apply both in the workplace and in these parties' interactions with nearby communities. Compliance is a contractual obligation: each contractor must incorporate the policies into its own procedures and CESMP, ensure every worker signs the Project Code of Conduct (including GBV/SEA/SH provisions) before site access, and is subject to the monitoring and enforcement mechanisms in Section 6.2.4.

4.7.5 IFZ GENDER BASED VIOLENCE AND HARASSMENT POLICY, 2026 (REV. 2)

IFZ is committed to promote gender diversity in the organization and recognizes the potential risk of Gender Based Violence and Harassment (GBVH). IFZ has a zero tolerance for GBVH and on continual basis endeavours to identify the risk areas, upgrade preventive measures; create awareness amongst both internal & external stakeholders, enhance capability building and increase effectiveness of grievance management system. The objective of this Policy is to define a policy framework and define strategies for addressing the issue of GBVH. This Document also aims to provide an integrated framework for stakeholder engagement and grievance management system with a focus on GBVH at all states of business cycle.

Scope of application. The Policy applies to all IFZ/IFF employees and to all contractors, subcontractors, labour suppliers, security personnel, drivers, visitors and other third parties working on or for the Project, including in their interactions with communities.

GBVH awareness and prevention training shall be provided to all employees and contractors. Training shall be conducted at least annually and additional awareness sessions shall be organized as necessary, based on identified risks, incidents or changes in workforce arrangements.

4.7.6 IFZ ANTI-RETALIATORY POLICY, 2026 (REV. 2)

IFZ is committed to providing access to effective grievance management systems for its employees, stakeholders, and local business partners. Further, IFZ also expects from its local business partners working with the company to provide access to effective grievance management systems for its employees and stakeholders for freedom of expression and grievance redressal without any fear of Retaliation or victimisation. The objective of this Policy is to provide a framework, establish organisational commitment, assess risk, build organisation capabilities for preventative and mitigation measures, as well as proffer an effective grievance management system for safeguarding the human rights values.

4.7.7 IFZ COMMUNITY AND STAKEHOLDER POLICY, 2026 (REV. 2)

IFZ is committed to respecting the rights, cultures, customs, and values of employees and communities affected by its activities and will manage its businesses in a fair and equitable manner to meet its social responsibilities. The objective of the Policy is to ensure proactive engagement with key stakeholders on sustainable development challenges and opportunities in an open and transparent manner and to ensure effective grievance mechanisms are in place.

4.7.8 IFZ ENVIRONMENTAL & CLIMATE CHANGE POLICY, 2026 (REV. 2)

IFZ is committed to effective environmental management. The aim of this Policy is to minimise impacts on the environment and reduce impacts on climate change throughout its operations. The objective of the Policy is to ensure the development and implementation of Environmental Management Systems that are compliant with applicable national, regional, and local environmental regulations, and good international practice.

4.7.9 IFZ OCCUPATIONAL HEALTH, SAFETY & WELLBEING POLICY, 2026 (REV. 2)

The Policy aims to promote the health and safety of employees, service providers, and any other person who is impacted by IFZ operations. The goal of the Policy is zero harm as well as safe and healthy workplaces.

The Policy is implemented in practice through the following:

- **Management systems:** the IFZ/IFF HSE Management System and the Process Safety Management (PSM) system (hazard identification and risk assessment, HAZOP, Management of Change, pre-start-up safety review, mechanical integrity and permit-to-work), supported by a Project-specific Construction HSE Plan and procedures.
- **Organisation:** a dedicated Project HSE team reporting to the Project Director, with an independent reporting line to the Head of HSE; HSE committees at site and management levels meeting monthly.
- **Contractor inclusion:** HSE pre-qualification of contractors; HSE requirements and KPIs in contracts; approval of contractor HSE plans before mobilisation; joint induction; permit-to-work, toolbox talks and stop-work authority applying to all personnel; and contractor HSE performance evaluation.
- **Monitoring and assurance:** leading and lagging indicators (e.g. near-miss reporting rate, inspections completed, LTIFR, TRIR and process safety events), daily and weekly inspections, monthly HSE audits, incident investigation with root-cause analysis (Section 6.4.4), and annual management review, applied consistently to employees and contractor personnel.

4.7.10 IFZ PRODUCT STEWARDSHIP POLICY, 2026 (REV. 2)

IFZ is committed to the highest standards of product safety, quality, and business integrity to meet customer expectations and achieve customer delight. The Policy goal is to minimise the health, safety, environmental, and social impacts of their products.

The Policy applies product stewardship principles across the fertilizer value chain (ammonia, urea and UFC-85), as follows:

- **Product information:** GHS-compliant Safety Data Sheets and labelling for all products, and product information for distributors and customers covering hazards, safe handling, storage, emergency response and disposal.
- **Safe handling and storage:** engineered storage (atmospheric ammonia tank with detection and water curtains; bulk urea storage designed to minimise caking and dust); loading procedures; and housekeeping and dust controls (refer to Sections 7.2.1 and 7.5.5).
- **Transport and distribution:** vetting of transporters and carriers; vehicle and driver standards; journey management; emergency information carried on vehicles; and incident reporting, as set out in the Traffic Management Plan (Section 7.4.5) and the hazardous materials transport requirements (Section 7.5.5).
- **Downstream users:** communication of product risks and responsible-use guidance to distributors and farmers (including 4R nutrient stewardship – right source, rate, time and place) to minimise nutrient run-off and misuse, and customer due diligence for ammonia sales in accordance with the IFZ product security procedure
- **Feedback and improvement:** customer complaints, product incidents and downstream feedback are recorded, investigated and used to improve product information and handling practices.

4.7.11 IFZ RESPONSIBLE BUSINESS POLICY, 2026 (REV. 2)

The Responsible Business Policy objective is to make positive contributions to the economic, environmental, and social progress at the locations where IFZ operates. IFZ is committed to promoting business practices that provide benefits to society, transparently and ethically, and address potential negative impacts associated with its operations.

4.7.12 IFZ SOCIAL MEDIA POLICY, 2026 (REV. 2)

The IFZ Social Media Policy provides a framework for use of social media for corporate or personal accounts to protect against damage to the organization. The policy objective is to provide practical ways to avoid issues that may arise from the improper use of social media.

4.7.13 IFZ CONFIDENTIAL REPORTING POLICY, 2026 (REV. 2)

IFZ is committed to high ethical standards and encourages reporting of any acts listed below by any employee irrespective of their position. The Policy prohibits anyone from retaliating against any person who in good faith raises or helps to resolve any of the acts below or any other ethical concern. Confidential reporting applies to:

- Any violation of Indorama's Code of Conduct.
- Any act that adversely affects the business interest of IFZ.
- Any act that is illegal under local or international law.
- Any abuse of authority.

5. KEY SENSITIVITIES

Key environmental and social sensitivities associated with the IFF Line 2 Fertilizer Project are summarised in Sections **Error! Reference source not found.** to **Error! Reference source not found.**. These sensitivities are derived from the ESIA baseline and impact assessment and are consistent with the identified sensitive receptors and cumulative impact context within the Indorama Free Zone. These sensitivities provide the contextual basis for defining environmental and social management requirements within this ESMMP.

5.1 KEY PHYSICAL ENVIRONMENTAL SENSITIVITIES

- The Project is located within the Niger Delta coastal environment, characterised by low-lying terrain and tidally influenced hydrological systems and the broader Project area is subject to climate-related hazards, including increasing temperatures, intense rainfall events, periodic water stress, and localised flooding, which may influence both Project infrastructure and environmental receptors. These sensitivities have been considered in Project design and operational planning. The design measures include: site levels and critical equipment elevated above the design flood level (1-in-100-year flood level); stormwater drainage and retention ponds sized for design storm intensities with a climate-change allowance; heat-tolerant equipment ratings and work-rest regimes; and wastewater recovery and reuse to reduce raw-water abstraction during dry periods. The specific adaptation and resilience measures, monitoring indicators, triggers and review arrangements are set out in the Climate Adaptation and Resilience Measures table in Section 7.2.2.5 and the climate-risk monitoring in Chapter 8 (Table 8-2).
- The presence of a shallow and relatively permeable groundwater system increases the sensitivity of underlying aquifers to potential contamination from surface activities. Shallow aquifers are identified as key community resources, and groundwater resources are of importance to surrounding communities and therefore represent a key receptor requiring protection. Groundwater protection measures, described in Sections 7.2.5, 7.5.2 and 7.5.5, include: secondary containment of at least 110% of the largest container for all fuel, chemical and hazardous material storage; impermeable, kerbed surfaces in process and storage areas; spill prevention and response; segregation and lined storage of hazardous materials and wastes; treatment of all wastewater before discharge; and groundwater quality and level monitoring at up-gradient and down-gradient boreholes and community wells. The monitoring programme applies two trigger levels (alert and action) with defined corrective actions (Groundwater Management table, Section 7.2.5.5).
- Soils within the Project area are susceptible to compaction and erosion, particularly during construction activities. Alterations to soil structure may increase surface runoff and sediment transport, with potential implications for nearby drainage systems and surface water bodies and local agricultural use. Communities in the wider area rely on soil resources for subsistence activities, increasing their sensitivity to contamination

and land disturbance. The potential for pre-existing soil contamination from historical industrial activity has been considered. Baseline soil sampling within the Project footprint did not indicate contamination. As a precaution, a pre-excavation screening protocol will nevertheless be applied before earthworks: visual and olfactory inspection, field screening (e.g. PID) and laboratory testing of suspect material against the EGASPIN (2018) target and intervention values. Suspect soils will be segregated and stored on lined, covered stockpiles pending test results; they will be reused on site only if confirmed clean, and otherwise treated or disposed of through licensed facilities (refer to Section 7.2.4.5).

- The presence of nearby surface water bodies and drainage systems, including downstream receiving environments, notably the Okulu River and associated drainage network, presents a potential pathway for contaminant transport. Accidental releases, untreated effluent discharges, or failure of containment systems could result in impacts to water quality and downstream users if not effectively managed. The ESIA identifies the Okulu River as the primary surface-water receptor, with downstream hydrological connectivity through the Aleto reach toward the Akpajo/Woji Creek system and ultimately the Bonny Estuary. Local communities are identified as indirect receptors through small-scale/subsistence fishing and limited domestic use of surface water. Fishing is primarily undertaken for household consumption and supplementary income. Response measures for accidental releases, untreated discharges or containment failures – immediate closure of the retention pond outlet, containment, sampling, notification of regulators and downstream community leaders, and provision of alternative water where uses are affected are set out in the Surface Water Management table (Section 7.2.6.5).
- Baseline environmental conditions within the Indorama Free Zone are already influenced by existing industrial activities, and the Project represents an incremental development within this context. As such, cumulative impacts on air quality, water resources, and waste management systems represent an important sensitivity requiring consideration. The key cumulative sensitivities are: air quality (NO₂, NH₃ and particulates from existing fertilizer and petrochemical units and IFF Line 1); water resources (shared aquifer abstraction and discharges to the Okulu River); traffic on the East–West Road and the Onne port corridor; waste management capacity; and community health and safety from ammonia storage across the complex. Risks within the Project boundary are managed at Project level through Chapter 7. Complex-wide risks (ambient air quality, groundwater, emergency response and waste infrastructure) are coordinated through the Indorama complex E&S coordination arrangements.. This allocation and the disclosure of monitoring results are set out in Section 8.4.

5.2 KEY BIOPHYSICAL SENSITIVITIES

- **Terrestrial biodiversity** within the Project area has been influenced by historical industrial development and land use; however, remaining habitats continue to provide ecological value and support local ecosystem functions. Disturbance or clearing of vegetation may result in habitat loss, fragmentation, introduction of invasive species, and changes in ecosystem functionality. Direct biodiversity sensitivity within the core

Project footprint is considered limited, but indirect impacts remain relevant. Practical controls are applied (Section 7.3): imported soil, fill and construction materials are sourced from approved sites and inspected for alien invasive plant material; vehicles and equipment arriving from outside the area are cleaned of soil and plant debris before entering site; topsoil is stockpiled separately and kept free of weeds; and disturbed areas are progressively revegetated with indigenous species, with alien invasive plants monitored and controlled for a 5 m buffer around the footprint.

- **Aquatic biodiversity** in nearby water bodies may be sensitive to changes in water quality arising from Project activities. While direct impacts are expected to be limited, there remains a risk of indirect effects through effluent discharge, runoff, or accidental contamination, particularly in already stressed receiving environments.
- **Ecosystem services** provided by the surrounding environment include provisioning, regulating and supporting services that may be affected through land disturbance, water abstraction, changes in water quality and other changes in ecological condition within the Project Area of Influence. The ESIA Priority Ecosystem Services screening did not identify any priority ecosystem services expected to be significantly affected by the Project; however, a number of ecosystem services and associated community users remain relevant to Project impact pathways and are therefore addressed through the ESIA/ESMMP. These include: (i) groundwater resources used for domestic supply through private and commercial boreholes, with reliance particularly evident in Akpajo, Elemenwo and Iriebe; (ii) aquatic resources of the Okulu River and associated downstream waters, supporting small-scale/subsistence fishing and limited domestic surface-water use; (iii) farmland and bush-fallow ecosystem services supporting crop production, household food supply, medicinal-plant use and other subsistence activities by local communities and farmers; and (iv) regulating and supporting services associated with freshwater swamp, mangrove and aquatic vegetation, including water purification, flood attenuation, shoreline/erosion control, nutrient retention and aquatic habitat functions.
- Mitigation and monitoring measures protecting these services include groundwater abstraction, level and quality monitoring (including accessible community wells), surface-water and aquatic monitoring upstream and downstream of discharge locations, erosion and sediment/runoff controls, spill prevention and containment, and grievance monitoring for water-availability and water-quality concerns. These measures are addressed principally in ESIA Sections 9.2.5, 9.2.6, 9.2.7 and 9.3 and consolidated in the Chapter 10 ESMMP.
- provided by the surrounding environment, including provisioning, regulating and supporting services, may be affected by land disturbance, water abstraction and changes in ecological condition within the Project Area of Influence. These services remain relevant to local communities, particularly in relation to water resources, livelihoods and environmental quality. Although the ESIA Priority Ecosystem Services screening did not identify any priority ecosystem services expected to be significantly affected by the Project, ecosystem services relevant to Project impact pathways

include: groundwater resources used for domestic supply through private and commercial boreholes; surface-water and aquatic resources of the Okulu River and associated creeks supporting small-scale/subsistence fishing and limited domestic use; farmland and bush-fallow systems supporting crop production and other subsistence uses; and regulating and supporting services provided by freshwater swamp, mangrove and aquatic vegetation, including water purification, flood attenuation, erosion control and nutrient retention. The mitigation and monitoring measures that protect these services – in particular groundwater and surface water quality and level monitoring, control of runoff and sediment, and grievance tracking of water-related complaints – are set out in Sections 7.2.5, 7.2.6 and 7.3.

- **Critical habitat** considerations are primarily associated with wetland, drainage, and riparian environments, as well as areas of relatively undisturbed vegetation. These habitats may support species of conservation concern and therefore require careful management to avoid or minimise impacts. While no critical habitat has been identified directly within the main development footprint, adjacent habitats require management to prevent indirect impacts.

5.3 KEY SOCIO-ECONOMIC SENSITIVITIES

- **Proximity of communities to the Project site:**
 - Communities located in close proximity to the Project area may experience disturbances during the construction phase, particularly those located to the north and north-west of the site.
 - Potential impacts include increased noise, dust generation, and traffic movement associated with construction activities. Careful planning of site access routes and entry points is required to minimise disruption to nearby communities.
 - Air quality has been identified as an existing stakeholder concern in relation to current operations within the Indorama complex. The potential for cumulative air quality impacts associated with the Project and existing Indorama operations requires particular consideration in the ESIA and ongoing monitoring during Project implementation. To address community concerns, the Project will enhance communication and engagement with affected communities, facilitate voluntary community participation in air-quality monitoring activities where practicable, and provide accessible information on relevant monitoring results through the stakeholder engagement mechanisms established under the SEP. Air-quality-related complaints will be managed in accordance with the SEP Grievance Management Procedure, including acknowledgement, investigation with reference to relevant monitoring and operational data, implementation of appropriate corrective actions, and provision of feedback to complainants within 30 working days, in accordance with the established grievance management protocol.
- **Labour and employment dynamics:**

- The Greater Port Harcourt area continues to experience inward migration associated with employment and economic opportunities, which may be further influenced by the Project.
- The IFF Line 2 Fertilizer Project is likely to create expectations around employment opportunities, both locally and regionally, which require proactive and transparent management through stakeholder engagement.
- Labour sourcing for construction and operation should be conducted in a transparent and structured manner, with clear communication regarding recruitment processes and criteria.
- The Project Proponent should define anticipated workforce numbers and skill requirements, and clearly communicate commitments regarding local employment and contractor use to manage expectations and reduce potential conflict.
- The construction phase is expected to involve a significant temporary workforce, which may contribute to labour influx and associated pressures on local infrastructure, housing, and services if not effectively managed. Labour influx risks are managed through the measures in Sections 7.4.1, 7.4.2 and 7.4.3. These include a local hiring plan and no hiring at the gate; worker Code of Conduct and induction; communicable disease prevention (HIV/AIDS, TB, malaria); GBV/SEA/SH prevention and a confidential reporting channel; monitoring of pressure on local services; and engagement with host communities and local government.
- **Community investment and social expectations:**
 - Indorama maintains existing Memoranda of Understanding (MoUs) with host communities within the Project area. These agreements form an important foundation for community relations.
 - The expansion of operations through the IFF Line 2 Fertilizer Project is likely to result in increased expectations for community investment and social development contributions.
 - Clear communication regarding the continuation or evolution of existing agreements, and the approach to future community investment, is important to maintain trust and manage expectations.
- **Town planning and development pressures:**
 - The Port Harcourt and Eleme areas have experienced rapid and, in some cases, unplanned urban expansion. This trend is expected to continue, driven by industrial development and economic opportunities.
 - The Project may contribute to incremental population growth and associated pressure on infrastructure and services, including housing, water supply, sanitation, and transport networks.
 - Although labour for the Project is expected to be sourced primarily locally, cumulative effects may still contribute to increased settlement density in surrounding communities.
- **Cultural heritage sensitivities:**

- An elevated area within the broader Area of Influence has been identified by stakeholders as being associated with local cultural and spiritual values. Although the site has been altered by development activities, its cultural significance has been considered as part of the cultural heritage assessment.
- Such areas may represent primarily intangible cultural heritage linked to community practices and beliefs, and require careful management, including appropriate consultation and the application of chance-find procedures during site preparation and construction.
- **Traffic and transport:**
 - The existing road network in the Project area, including the East–West Road and the Indorama access road, experiences congestion, particularly during peak periods.
 - Traffic volumes are influenced by industrial activities, including heavy vehicle movements associated with the Indorama complex and nearby port facilities.
 - Key sensitivities include:
 - Increased congestion at access road intersections, particularly where traffic control measures are limited;
 - Safety risks associated with increased heavy vehicle traffic; and
 - Localised impacts on communities along haulage routes, including the Onne Port corridor and surrounding road networks.
 - The Project has the potential to increase traffic volumes during both construction and operation, with cumulative transport impacts expected when considered alongside existing industrial activity, requiring targeted traffic management measures to minimise impacts on road users and nearby communities.

6. IMPLEMENTATION OF THE ESMMP

6.1 OVERVIEW OF THE ESMMP

During the ESIA process for the IFF Line 2 Fertilizer Project, a number of design and management recommendations have been developed to avoid, minimise, and mitigate adverse environmental, social, and health impacts, and to enhance potential positive impacts.

To ensure that both identified and unforeseen impacts are effectively managed, a suite of Environmental and Social Management Plans has been developed (refer to Section 7). These Management Plans will be refined as detailed design progresses and will form the basis for environmental and social management during construction and operation. Contractors and subcontractors will be required to align their method statements, procedures, and work practices with these Management Plans.

The Management Plans form an integral part of the Environmental and Social Management System (ESMS) (refer to Section 3), translating the findings of the ESIA into actionable requirements.

In line with the ESIA, the ESMMP serves as the operational bridge between the analytical findings of the ESIA and the practical implementation of mitigation and monitoring measures across all Project phases (pre-construction, construction, and operation).

The ESMMP fulfils the following core functions:

- Conversion of ESIA mitigation measures into defined and implementable Project actions;
- Establishment of monitoring and verification requirements to assess effectiveness of mitigation measures;
- Allocation of roles and responsibilities within the ESMS and project management structure; and
- Provision for adaptive management, including corrective actions and continuous improvement.

The Environmental and Social Management and Monitoring Plan (ESMMP) establishes the framework through which mitigation and monitoring commitments identified in the ESIA are implemented during the Project lifecycle. As such, it functions as the operational mechanism linking ESIA findings to practical implementation requirements.

In accordance with this framework, the Project's Area of Influence (AoI) extends beyond the immediate site boundary and includes associated facilities, transport routes, discharge receiving environments, emergency interface areas, and shared systems. Management of this AoI requires a clearly defined allocation of roles and responsibilities across the Proponent, Contractors, and third-party operators.

6.2 INSTITUTIONAL FRAMEWORK

6.2.1 FEDERAL MINISTRY OF ENVIRONMENT (FMENV)

The EIA Act established by the Ministry, which ensures that all development and industrial activities, operations and emissions are within the limits prescribed in the national guidelines and standards and comply with relevant regulations for environmental pollution management in Nigeria as and when these are released by the Ministry. Further to the Mandate, FMEnv developed laws/ guidelines on various sectors of the national economy including the Environmental Impact Assessment (EIA Act CAP E12, LFN 2004) Act and procedures for evaluating EIA reports. Furthermore, in September 2021, through Official Gazette No. 105, Vol 108, the Federal Republic of Nigeria published S.I. No. 109, Environment Impact Assessment Procedures and Charges Regulations. FMEnv consults with State Ministries of Environment and their Environmental Protection Agencies during the EIA permitting process.

In addition, other regulatory agencies/authorities with oversight over specific industries have also issued guidelines to regulate the impact of such industries on the environment.

6.2.2 NATIONAL ENVIRONMENTAL STANDARDS AND REGULATION ENFORCEMENT AGENCY (NESREA)

The National Environmental Standards and Regulations Enforcement Agency (NESREA) is responsible for the enforcement of environmental laws, standards, and regulations in Nigeria, particularly during the operational phase of projects. NESREA ensures compliance with approved environmental limits and regulatory requirements.

6.2.3 INDORAMA FERTILIZER FZE

As Project Proponent, Indorama Fertilizer FZE is responsible for overall environmental and social performance. Environmental, social, health, and safety (ESHS) requirements are embedded in contractor agreements and will be implemented through the ESMS and associated Management Plans.

The accountability and reporting structure for implementing the ESMMP is summarised in the table below and shown in the staffing and competency matrix (Appendix B).

TABLE 6-1 ESMMP ACCOUNTABILITY, REPORTING LINES

Role	Accountability / Responsibility
IFF Managing Director	Ultimately accountable for E&S performance and compliance with lender and regulatory requirements; approves the E&S policy, resources and budget (Section 6.5); chairs the quarterly E&S management review
IFF Project Director	Accountable for implementation of the ESMMP during construction; ensures E&S requirements are in EPC contracts and enforced; resolves escalated non-conformances
Head of Environment	Owns the ESMS and ESMMP; lender and regulator interface; approves CESMPs, and lender reports; oversees audits
IFF Site EHS Manager	Day-to-day implementation, inspection and monitoring of the ESMMP; manages the E&S Risk Register and Commitments Register; issues non-conformance reports; verifies corrective-action closure

Role	Accountability / Responsibility
IFF HR Manager	stakeholder engagement, grievances, labour and community issues
EPC Contractor HSE Manager	Implementation of the CESMP and mitigation measures; daily monitoring and inspections; monthly E&S reporting; flow-down to and supervision of subcontractors
All workers and visitors	Comply with the Code of Conduct, procedures and PPE; report hazards, incidents and concerns

Stop-Work Authority

All workers and supervisors are empowered to immediately stop or suspend activities where an imminent or significant ESHS risk is identified and must notify the responsible supervisor or ESHS representative. The IFF Project E&S Manager and EPC Contractor ESHS/HSE Manager have authority to issue formal Stop-Work Orders for activities presenting significant ESHS risks or serious non-compliance with applicable requirements.

A formal Stop-Work Order remains in effect until appropriate corrective and preventive measures have been implemented and verified as effective. Work may resume only following written authorisation by the issuing authority, in coordination with the IFF Project E&S Manager. All Stop-Work Orders, corrective actions, verification records and restart authorisations will be documented and maintained.

6.2.4 CONTRACTORS AND SUBCONTRACTORS

IFF has already engaged Engineering, Procurement and Construction (EPC) Contractors for the Project. It is understood that where subcontractors will be engaged, subcontractors will be responsible for managing potential environmental, social, safety and health impacts of their contract activities. To this end, Contractors and their associated Subcontractors will need to:

- Demonstrate compliance with the EHS conditions, which apply under the contract;
- Demonstrate commitment to the ESIA and its Management Plans in their management structure;
- Identify individuals responsible for overall environment, social, safety and health management; and
- Undertake regular environmental, social, health and safety inspections and provide reports to allow for the monitoring and evaluation of performance.

During the construction phase, Contractors and Subcontractors will be key implementers of mitigation measures, as defined in Management Plans, and will also be responsible for compliance with the listed Performance Criteria (as provided in each Management Plan).

IFF, as Proponent, retains overall responsibility for ensuring that contractor and subcontractor activities are managed in accordance with the Project's E&S commitments and the applicable lender requirements. IFF will monitor and enforce E&S performance as follows:

- **Contractual incorporation:** the ESMMP, the IFZ policies (Section 4.7), the Code of Conduct, the IFC PS2/PS4 and AfDB OS2/OS4 requirements and the reporting obligations are included in the tender documents and contract E&S specifications, with mandatory flow-down to all subcontractors and labour suppliers.
- **Reporting obligations:** monthly reports; notification of serious incidents to IFF immediately and in writing within 24 hours (Section 6.4.4).
- **Inspections and audits:** daily/weekly IFF inspections of work fronts, contractor EHS audits, quarterly labour audits and participation in lender monitoring visits.
- **Corrective actions:** non-conformances are raised through the IFF non-conformance report (NCR) system with deadlines by severity (critical – immediate containment and closure within 7 days; major – within 14 days; minor – within 30 days, consistent with the CAPA workflow in Section 6.4.3).
- **Consequences for non-compliance:** a graduated escalation – verbal instruction; written NCR; escalation to the contractor's senior management; Stop-Work Order; against unresolved NCRs; contractual financial penalties; removal of personnel; and, for serious or repeated breaches, termination of the contract.

6.2.5 LENDERS TO THE PROJECT

Lenders to the Project require that the Project, in addition to in-country national laws and regulations, apply their lender specific health, safety, environmental and social standards which include but not limited to:

- Equator Principles (EP4)
- International Finance Corporation Performance Standards on Environmental and Social Sustainability, 2012 (IFC PSs) African Development Bank Integrated Safeguards System (ISS) and Operational Safeguards (OS 1 – 10)
- World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines
- Industry Specific EHS Guidelines – Nitrogenous Fertilizer Production

It is anticipated that the lenders will use in-house environmental and social expertise or independent consultants, to monitor the Project's performance against these standards, during all phases of the Project.

6.3 CONTINUED STAKEHOLDER ENGAGEMENT

IFF will continue to engage with stakeholders throughout the life of the Project. The objectives of ongoing stakeholder engagement are outlined in the separate Stakeholder Engagement Plan (SEP) and include:

- To understand the interests, influence, and concerns of various Project stakeholders.
- To ensure effective, transparent, and timely communication between the Project and its stakeholders, to engender an environment of trust and mutual respect.
- To engage stakeholders on their concerns regarding the Project, and appropriately address these through dialogue and corrective actions.
- To establish effective means of communication to disseminate information from the Project to stakeholders.
- To design stakeholder engagement mechanisms and standards that respect local traditions and cultural norms.
- To effectively manage the expectations of stakeholders regarding socio-economic benefits derived from the Project.
- Establish the appropriate management mechanisms and identify necessary capacity building and training requirements for the effective implementation of the SEP.
- Stakeholder engagement will support identification of emerging risks and community concerns;
- Grievances will be logged, tracked, and resolved through a formal grievance mechanism; and
- Engagement outcomes will be used to inform adaptive management and continuous improvement.

Integration of engagement and grievance outcomes into the ESMS. The HR and Community Relations Manager reviews engagement records and the grievance register monthly. A recurring issue and any serious grievance, or a deteriorating trend triggers a root-cause review. Where warranted, it also triggers corrective action and an update to the relevant management plan through the MoC process (Section 6.4.5). Outcomes are reported back to stakeholders in accordance with the SEP. Confidential and sensitive complaints, including GBV, SEA and SH, are received through a dedicated confidential channel and handled under survivor-centred procedures with restricted access to case information, as set out in the SEP Grievance Management Procedure (SEP Sections 9.7.1, 9.8.1 and 9.10).

The key principles guiding the Project's approach to stakeholder engagement are as follows:

- **Transparency:** to be open and transparent with stakeholders.
- **Accountability:** to be willing to accept responsibility as a corporate citizen and to account for impacts associated with the Project activities.
- **Trust:** to have a relationship with stakeholders that is based on mutual commitment to acting in good faith.

- **Mutual Respect:** to respect stakeholders' interests, opinions, and aspirations.
- **Collaboration:** to work cooperatively with stakeholders to find solutions that meet common interests.
- **Responsiveness:** to coherently respond in good time to stakeholders.
- **Proactiveness:** to act in anticipation of the need for information or potential issues.
- **Fairness:** to engage with stakeholders such that they feel they are treated fairly, and their issues and concerns are afforded fair consideration.
- **Accessibility:** to be within reach of stakeholders so that they feel heard and to provide meaningful information as needed.
- **Inclusivity:** to proactively anticipate, identify and include all stakeholders.

6.4 KEY COMPONENTS FOR IMPLEMENTATION OF THE ESMMP

6.4.1 TRAINING

One of the most important mechanisms for the enhancement of the Project's environmental and social performance will be the continued implementation of a training programme for all Project personnel including all subcontractors and third parties. Training programmes will form part of the ESMS and support the "Do" and "Act" components of the Plan-Do-Check-Act cycle.

The key components of training requirements are to ensure that all Project personnel, including all Contractors and Subcontractors and third parties understand the:

- Environmental and Social policies of IFZ;
- Environmental and social requirements of the Project and how these will be implemented and monitored on site;
- Contents and relevant requirements of Project actions contained within the applicable Management Plans;
- Environmental and social sensitivities of the Project Footprint and surrounds;
- Procedures to be followed in the event of non-compliance with the environmental and social requirements;
- Process for addressing unforeseen environmental and social incidents; and
- Responsibilities with respect to environmental and social issues applicable to their roles.
- The linkage between ESIA impacts and ESMMP mitigation measures;
- Monitoring and reporting obligations associated with their roles;
- Key environmental and social risks identified in the ESIA; and
- Procedures for corrective actions and adaptive management.

Training should include:

- Induction training for all staff including modules on: health and safety, environmental awareness, accommodation rules, worker code of conduct, stakeholder engagement, grievance mechanisms and cultural heritage awareness;

- Training on the EHS legal requirements and EHS compliance commitments of the Project. It is critical that all staff on the Project understand the laws and regulations and rules the Project has committed to, and that staff understand the consequences of breaking these rules;
- Toolbox training for specific topics and tasks; and
- Training for individuals involved in tasks with specific responsibilities.

Refresher training programmes will also need to be implemented to ensure continual improvement in environmental awareness for all Project personnel.

Training should be provided at each stage of the Project, from initial establishment of logistical facilities through to construction and (to a lesser degree) operation. The training function will assist managers in developing and coordinating training programmes as required.

Training records should be maintained by the Project and an assessment of the effectiveness of the training.

Training effectiveness will be assessed and monitored through a training needs analysis and using the following indicators:

- Induction completion: 100% of personnel complete E&S and HSE induction before start of work.
- Training completion rate: at least 95% of the training required under the training matrix
- Refresher compliance: 100% of refresher training completed within the required interval (annually as a minimum, and more frequently where specified, e.g. GBV/SEA/SH and emergency response).
- Follow-up evaluation: behavioural observations and field verification 3 to 6 months after training to confirm that practices have changed.

Training gaps identified through audits, inspections, incident investigations, near misses or grievances are recorded as corrective actions. They are addressed through targeted retraining or toolbox talks within 30 days, followed by an update of the training matrix and verification at the next inspection or audit.

6.4.2 EMERGENCY RESPONSE AND INCIDENT

An Emergency Response Plan (ERP) must be in place for the Project, covering all incidents such as, but not limited to:

- All incidents and near-misses will be recorded, investigated, and reported;
- Root cause analysis will be undertaken to identify corrective actions;
- Lessons learned will be integrated into management plans and procedures;
- Traffic accidents;
- Wildfires;
- Flooding;
- Hazardous materials spills and containment; and

- Community and/or Employee uprisings or strikes etc.

An incident is any occurrence that has caused, or has the potential to cause, a negative impact on people, the environment, property, or production (or a combination thereof). It also includes any significant deviation from standard operating procedures. The reporting and investigation of all potential and actual incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps can be taken to reduce the potential, or actual impacts, as a result of all such incidents.

All incidents will be investigated for identification of causes and preventative actions. The actions resulting from any formal or informal investigations will be used to update the ERP.

The table below presents a scenario-based Emergency Response Plan (ERP) developed in alignment with the key hazard findings of the ESIA and associated specialist studies. It translates identified risks into clearly defined emergency triggers, structured response actions, and measurable performance criteria, in accordance with IFC Performance Standards, AfDB Operational Safeguards and good international industry practice. Each scenario incorporates early warning indicators, shutdown and isolation logic, off-site notification protocols, mutual aid arrangements, and targeted drill requirements, thereby ensuring a comprehensive and operationally practical approach to emergency preparedness and response. The ERP is designed to function as an integral component of the Project's Environmental and Social Management System (ESMS), supporting a proactive, risk-based and continuously improving framework consistent with the Plan-Do-Check-Act cycle

**TABLE 6-2: SCENARIO-BASED EMERGENCY RESPONSE PLAN (ERP) ALIGNED WITH
ESIA HAZARDS**

Scenario Hazard /	Warning Triggers	Emergency Actions (Including Shut-down / Isolation Logic)	Off-site Notification & Mutual Aid	Response
Extreme Rainfall / Flooding (Okulu River influence)	- Rainfall exceeding defined threshold (e.g. $\geq 1:10$-year storm event) - River level alarms / upstream flood warnings - Site drainage capacity exceeded - Meteorological alerts	- Initiate progressive shutdown of vulnerable operations in flood-prone zones - Isolate electrical systems in low-lying areas - Secure hazardous materials (bundling, container closure) - Suspend discharge to outfalls if dilution capacity compromised - Deploy temporary flood barriers and pumps Action: Complete/obtain Okulu River floodline delineation or equivalent defensible flood extent confirmation - Use floodline to verify adequacy of protection for hazardous installations and outfalls; upgrade protection where required	- Notify local authorities and water management agencies - Inform downstream users/communities of potential discharge risks - Activate mutual aid (pumping capacity, evacuation support)	Client (Lead), Operations Manager, Contractor
Wildfire Affecting Access or Plant	- Regional fire alerts - Smoke detection or visible fire within defined buffer (e.g. 5–10 km) - Access roads compromised	- Suspend non-essential operation - Shutdown air intake systems if smoke ingress affects safety - Isolate fuel storage and ignition sources - Establish firebreaks and deploy on-site firefighting systems - Secure evacuation routes and implement muster procedures - Maintain emergency access corridors	- Notify fire services and disaster management authorities - Coordinate with neighbouring facilities for fire suppression resources Community alerts where relevant	Client (Emergency Coordinator), Security, Contractor

Scenario Hazard /	Warning Triggers	Emergency Actions (Including Shut-down / Isolation Logic)	Off-site Notification & Mutual Aid	Responsibility
Prolonged Heat (Workers and Equipment)	- Temperature thresholds exceeded (e.g. $\geq 35-40^{\circ}\text{C}$ WBGT index) - Heat stress alerts - Equipment overheating alarms	- Adjust work-rest cycles and suspend high-risk activities - Provide cooling stations and hydration protocols - Reduce equipment load or shut down overheating systems - Reschedule work to cooler periods (night/early morning) - Increase supervision and medical monitoring	- Notify occupational health services - Coordinate with local health facilities if escalation required	Client Manager Contract Supervisor
Water Supply Stress / Scarcity	- Reduced abstraction availability - Regulatory restrictions - Declining storage levels below trigger thresholds	- Implement water use prioritisation hierarchy (critical processes first) - Reduce or suspend non-essential water use - Activate alternative water supply sources (if available) - Increase water recycling/reuse rates - Adjust production rates if required	- Notify water authorities and regulators - Inform stakeholders (communities dependent on shared resource) - Engage mutual aid (water supply agreements)	Operations Manager Environmental Manager
High-Consequence Industrial Events (Fire, Explosion, Major Spill)	- Gas detection alarms - Pressure/temperature excursions - Leak/spill detection systems - Equipment failure alarms	- Immediate emergency shutdown (ESD) of plant - Isolate affected process units and energy sources - Activate fire suppression and spill containment systems - Evacuate non-essential personnel and establish exclusion zones - Deploy spill kits and containment booms - Initiate incident command structure	- Immediate notification to emergency services and regulators - Notify neighbouring facilities and communities if off-site risk exists - Activate mutual aid (fire brigade, hazmat teams)	Client Command HSE Contract
Cross-Scenario: Communication, Notification & Control	Any emergency trigger activation	- Activate Emergency Control Centre (ECC) - Maintain incident log and decision trail - Issue internal alerts (sirens, SMS, radios)	- Notify regulators, emergency services, and stakeholders as per escalation matrix - Maintain contact list (updated quarterly)	Client HS Community Officer

Scenario Hazard /	Warning Triggers	Emergency Actions (Including Shut-down / Isolation Logic)	Off-site Notification & Mutual Aid	Respons
		Ensure clear chain of command and accountability		
Cross-Scenario: Training & Drill Programme	Scheduled drills and competency gaps identified	- Conduct scenario-specific drills: - Flood (pre-rainy season, annual) - Wildfire (pre-fire season, annual) - stress (seasonal toolbox drills) - Water stress (tabletop simulation, annual) - Industrial event (full-scale, biannual) - Evaluate performance and implement corrective actions	- Include external responders in selected drills - Share lessons learned with regulators and stakeholders (where required)	Client Manager Contract
Cross-Scenario: Monitoring and Review (ESMS PDCA Alignment)	- Incident occurrence - Audit findings - Change in risk profile or climate conditions	- Review ERP effectiveness post-incident/drill - Update based on ESIA updates, new hazard data, or regulatory changes - Integrate into Management of Change (MOC) system	- Report updates to regulators (if required) - Stakeholder disclosure where relevant	Client Environment Social M

The Proponent shall implement an enhanced Emergency Response Management System aligned with the ESMS “Plan–Do–Check–Act” framework, integrating ESIA risks into operations and explicitly addressing off-site receptors through defined procedures, roles and monitoring. A maintained off-site receptor register shall guide planning, prioritising vulnerable communities and critical infrastructure, with annual review and updates via Management of Change. A tested communication cascade system with escalation protocols and verified contact channels shall support a multi-channel warning system targeting full functionality and effective reach, with monitoring of response times, message receipt and closure of communication gaps. Interfaces with authorities and communities shall be formalised through coordination protocols and, where feasible, memoranda of understanding, with community participation in awareness and simulations. The ERP shall include scenario-based procedures, including flood and climate risks, with defined triggers linked to ESIA outputs, supported by a structured programme of drills testing evacuation, shelter, communication and coordination. All findings from drills, incidents and near misses shall be documented and integrated into continuous improvement processes, with

corrective actions tracked to closure to ensure effectiveness and alignment with IFC PS3 and PS4, and equivalent AfDB OS3 and OS4.

Off-site emergency preparedness and protection of communities.

The Indorama Complex has an Off-site Emergency Management plan. It covers emergencies that start inside the Complex and have effects beyond its boundary (site-originated), and emergencies during the transport of hazardous materials and products outside the Complex (transit-originated). Before commissioning, the IFF Line 2 facilities will be brought into the Off-SEMP through the Management of Change process (Section 6.4.5). This includes updating the off-site hazard zones using the IFF Line 2 quantitative risk assessment (QRA). The arrangements for protecting communities are summarised below.

(a) Credible off-site scenarios and communities that could be affected

- **Site-originated:** a major release of anhydrous ammonia is the main credible hazard that could reach beyond the Complex boundary, through a toxic gas cloud. Ammonia is stored in a 15,000 t double-wall, double-integrity atmospheric storage tank. The nearest communities are Eleme, Akpajo, Onne, Alode and Ebubu. How far a release spreads depends on wind conditions. The dominant wind is south-westerly, with a north-easterly component, and mean wind speeds are low (about 0.9 m/s), which limits dispersion.
- **Transit-originated, road tankers:** ammonia is carried about 29 km by road tanker from Eleme to the Onne Port export terminal, with about 26 tanker movements a day. The route passes through or near Ele, Ebubu, Eteo, Yaa, Wakana, Nomabom, Onne Town, Ikpokiri, Owo Ogono, Ele Coastal Village and Omadara Ana, and the Onne port terminals. The DNV QRA identifies a toxic ammonia release during tanker movement as a credible off-site scenario. Urea bulk trucks, propane tankers and slop-oil tankers are also covered.
- **Transit-originated, pipelines:** a release, fire or explosion on a pipeline outside the Complex. This covers the NG/NGL pipelines (about 83 km), the NOPL–Indorama gas pipeline (about 11 km) and the CC5 pipeline to PHRC (about 7.5 km). Twenty-seven communities in Rivers and Imo States lie along the pipeline corridor.

These communities, and the schools, health facilities and markets in them, are recorded in the off-site receptor register. The register is reviewed annually.

(b) Emergency levels and command

Emergencies are classified as Level 1, 2 or 3. A Level 3 emergency has actual or potential consequences beyond the Complex boundary.

The Main Incident Controller (MIC) decides the emergency level. On declaring Level 3, the MIC informs the NEMA Zonal Coordinator, the Rivers State Emergency Management Agency (RSEMA) and the Chairman of Eleme Local Government.

One of these authorities then acts as Offsite Emergency Controller and takes overall control of off-site operations, with Indorama providing technical support.

Response is coordinated from the Emergency Management Control Room, EMCR-1 (Laboratory building, first floor). The back-up control room, EMCR-2, is at the Main Fire Station.

(c) Off-site notification and coordination with authorities

The EMCR notifies and coordinates with the fire services, medical services, mutual-aid members, NEMA/RSEMA, the police and the regulators

Responsibilities within Indorama:

- Corporate Communications informs the Local Government and issues approved public and media statements.
- HSEF liaises with the Factories Inspectorate and the environmental regulators.
- Security liaises with the police on traffic control and cordons.
- Medical coordinates with government health authorities and the receiving hospitals: First Rivers Hospital, Rivers State University Teaching Hospital (RSUTH), the IEPL Industrial Medical Centre and the HMO hospitals.
- The Fire Chief activates mutual aid: PHRC Fire Station, TotalEnergies, Rivers State Fire Service and the Federal Fire Service.

External agency roles:

- The Local Government leads community evacuation and shelter-in-place.
- RSEMA coordinates government resources, and NEMA supports where an event exceeds State capacity.
- Community leaders and traditional authorities relay instructions and help account for residents.
- The police control traffic, access and public order.
- The fire services support firefighting, rescue and containment.
- The health services handle triage and treatment.
- The environmental regulators monitor air, water and soil.

(d) Warning and communication channels

Inside the Complex: site sirens with distinct codes:

- Site Emergency: 5 seconds on, 2 seconds off, for 2 minutes.
- Evacuation: 10 seconds on, 2 seconds off, for 2 minutes.
- All Clear: continuous for 2 minutes.

These are backed up by plant public-address announcements, plant intercom, VHF radios and safety ambassadors.

For communities: community awareness covers the meaning of the Complex sirens and alarms. On a Level 3 emergency, the EMCR / Fire Control Room informs the Local Government, Rivers State authorities and the Police. The HR/IR/Community Relations team liaises with NEMA, SEMA and the Local Government Chairman. The Local Government

disseminates emergency information to communities, working with community leaders and traditional authorities, who pass instructions to residents. The Police control traffic and access and assist with evacuation and crowd management.

Who issues warnings: the MIC decides the emergency level and whether to evacuate. On the MIC's instruction, the Evacuation-mode siren is sounded through the Fire Control Room. The Corporate Communications head, with the HR head, handles external communication and press briefings on the MIC's instruction. When the emergency is declared Level 3, the Offsite Emergency Controller (NEMA Zonal Coordinator, State Emergency Authority or Local Government Chairman) takes overall control of off-site operations. The Local Government leads community evacuation and shelter-in-place.

(e) Protective actions: shelter-in-place and evacuation

The Local Government decides on community shelter-in-place or evacuation, working with community leaders. Indorama advises on the hazard zone and the wind direction at the time.

Evacuation is upwind or crosswind. For road and pipeline incidents, an initial isolation distance of at least 300–500 m downwind is set, with the Incident Command Post 300–500 m upwind.

Indorama HR arranges transport and temporary shelter for evacuated people.

Vulnerable people get priority support: persons with disabilities, pregnant women and others with special needs.

Medical teams provide triage, oxygen therapy, nebulised 2% sodium bicarbonate for ammonia exposure, decontamination and transfer to hospital.

After the All Clear, Indorama will:

- support affected people's return home;
- follow up on community health;
- support environmental monitoring by the regulators;
- handle community concerns or claims through the grievance mechanism (SEP).

(f) Community awareness and preparedness

Community awareness is delivered through community engagement meetings, safety awareness campaigns, distribution of information materials, public safety demonstrations and collaboration with the Local Government. The programme aims to educate the public about potential industrial hazards, inform communities about the emergency warning systems, provide guidance on protective actions, and build trust and transparency between the Company and the communities.

It covers:

- the nature of potential hazards, in particular ammonia releases;
- the meaning of sirens and alarms;
- emergency response expectations; and
- recommended protective actions: remain calm, avoid panic, follow official instructions, extinguish ignition sources, and proceed to designated safe areas when instructed.

The Local Government supports public awareness by disseminating emergency information, coordinating evacuations, maintaining public order and supporting risk communication.

(g) Training and periodic testing

Training is tailored to the Emergency Management Team, Main Incident Controllers, Incident Controllers, the Auxiliary Fire Squad, security personnel, medical teams, corporate communication personnel and external stakeholders. It covers emergency response procedures, incident command and control, hazardous materials response, fire and explosion management, toxic gas exposure management, and crisis communication and media interaction.

Two categories of drill are conducted, planned with the statutory authorities according to the scope and complexity of the scenario:

- Tabletop exercises: discussion-based simulations for key decision-makers and emergency management personnel, covering scenario analysis, roles and responsibilities, strategic decision-making, and communication flow and escalation.
- Full-scale mock drills: field simulations that activate alarms and sirens, mobilise response teams, deploy firefighting and rescue equipment, coordinate with the police, fire services and medical responders, and include community interaction where applicable.

(h) Review

The Off-SEMP and the community arrangements above are reviewed at least once a year, after any Level 2 or Level 3 emergency or drills, and through Management of Change when IFF Line 2 is brought into the plan.

6.4.3 AUDIT AND INSPECTION

An audit programme detailing the aspects to be audited, the area (relevant department or section), and the frequency of audits will be established. The audits will be based on appropriate protocols prepared by the various environmental, social and health and safety functions.

In line with the ESIA and ESMS framework, the audit programme will form part of the "Checking" component of the Plan-Do-Check-Act cycle and will be used to systematically verify compliance with ESMMP mitigation measures, monitoring requirements, and applicable regulatory and lender standards.

Regular environmental, social and health audits and random spot checks will be undertaken by selected audit team members throughout all phases of the Project. The audit and inspection frequencies will be defined and may be increased or decreased according to the audit findings and degree of confidence in the audit programme, and will need to adapt to the Project work scope and locations, and Project activities (some of which will have higher risks). Audits will also assess compliance with agreed objectives and targets as well as the effectiveness of the management plans and their implementation.

Audits will include verification of:

- Implementation of ESIA-derived mitigation measures;
- Achievement of performance indicators and targets defined in the ESMMP;
- Compliance with applicable Nigerian regulatory requirements, IFC Performance Standards, AfDB Operational Safeguards and Project-adopted standards; and
- Effectiveness of management plans in preventing or minimising environmental and social impacts.

Audits will also assess compliance with agreed objectives and targets as well as the effectiveness of the management plans and their implementation.

Audit findings will be reviewed by the applicable management functions and where corrective actions are deemed necessary; the relevant management plans will be updated.

Audit findings, non-conformances, and corrective actions will be formally recorded, tracked to closure, and used to inform adaptive management and continuous improvement of the ESMS and ESMMP.

Social performance audit criteria. In addition to environmental and OHS compliance, the audit programme will assess social performance against defined criteria, including:

- Stakeholder engagement: implementation of the SEP schedule.
- Grievance management: registration, acknowledgement and resolution within the SEP timeframes, closure with complainant feedback, and confidentiality of sensitive cases.
- Labour and working conditions: written contracts, wages and deductions, working hours and overtime, the worker grievance mechanism, age verification and absence of forced labour, and freedom of association.
- Community health, safety and security: traffic management, emergency preparedness, communicable disease measures, the security provider's conduct
- Contractor performance: CESMP implementation, flow-down to subcontractors and NCR close-out.
- Vulnerable groups and GBV/SEA/SH: implementation of the Vulnerable Groups Analysis Matrix measures and of GBV/SEA/SH prevention and response.

The minimum audit and inspection frequencies are shown in the table below

TABLE 6-3 MINIMUM AUDIT AND INSPECTION FREQUENCIES

Audit / Inspection Type	Construction Phase	Operational Phase
Work-front E&S/HSE inspections/walkthrough (contractor)	Daily	Daily (operations and maintenance areas)
IFF E&S inspections	Weekly (all active work fronts)	Monthly
Contractor E&S compliance audit (IFF)	Monthly per major contractor	Quarterly for contractors on site
Internal ESMS audit (IFF E&S, against ESMMP, IFC PS and AfDB OS)	Quarterly	Six-monthly
external E&S audit	Lender monitoring visits, typically six-monthly)	as agreed with lenders
Statutory environmental audit / compliance monitoring	As required by FMEnv approval conditions	As required by FMEnv/NESREA

Corrective and preventive action (CAPA) workflow. Audit and inspection findings are documented in an audit report and graded as critical, major, minor or observation. Each finding is assigned a corrective and/or preventive action, a named responsible person and a completion deadline (critical – immediate containment and closure within 7 days; major – within 14 days during construction and 30 days during operation; minor – within 30 days during construction and 90 days during operation). Closure requires objective evidence, such as photographs, records, revised procedures or training attendance. The Site E&S Manager verifies closure. Effectiveness is checked at the next audit by confirming that the finding has not recurred; recurring findings are escalated one priority level.

6.4.4 REPORTING

The Project should implement a system of internal reporting that allows for appropriate assessment of the effectiveness of the ESMS. Public reports should also be prepared on defined issues of interest or concern to local communities and /or stakeholders.

In alignment with the ESIA, the reporting framework will include both internal performance reporting and external disclosure to regulators, lenders, and stakeholders, supporting transparency, accountability, and continuous improvement.

During the construction phase, Contractors and associated Subcontractors should take all appropriate measures detailed in the Project ESMS and related plans and procedures to identify and document incidents of environmental, social and health and safety non-conformance. Non-conformity reports should be produced at an appropriate frequency to ensure non-conformances are corrected.

EPC contractors and subcontractors will be required to prepare project-specific CESMPs that operationalise this ESMMP through detailed method-level controls. CESMPs will be

submitted to IFF (and, where applicable, lenders) for review and approval prior to mobilisation. E&S requirements will be contractually flowed down to all subcontractors, with implementation verified through monitoring, reporting, and audits. Contractors will provide regular performance reporting, including monitoring results, incidents, corrective actions, and compliance.

Nonconformity reports should identify the nature of the non-conformities and any subsequent actions taken and review the results or successes of any corrective actions taken. The resultant records should be reviewed in the appropriate management meetings so that required corrective actions can be taken, any opportunities for improvement.

These records are intended to facilitate the purposeful reduction of incidents of non-conformance, leading to a consequential reduction of the root causes of such incidents.

Incident classification, notification, investigation and close-out. All E&S and HSE incidents and near misses will be reported, investigated and closed out in accordance with the IFF incident management procedure and the minimum requirements in the table below. Significant incidents and material non-conformances are reported to the regulatory authorities as required by law and to the lenders within the timeframes stipulated in the financing agreements.

TABLE 6-4 INCIDENT CLASSIFICATION, NOTIFICATION AND INVESTIGATION REQUIREMENTS

Incident Level	Examples	Notification	Investigation and Close-out
Level 3 – Serious / Major	Fatality or multiple serious injuries; major release (e.g. ammonia) or fire/explosion; pollution with off-site impact or regulatory exceedance; serious community incident or security incident involving use of force; GBV/SEA/SH allegation; child or forced labour; significant cultural heritage find	Immediately (≤ 1 hour) to the Site E&S/HSE Manager and Project Director; senior management within 2 hours; regulators as required by law (e.g. FMEv/NESREA, Federal Ministry of Labour and Employment, NMDPRA where applicable); lenders initially within 24 hours (consistent with Appendix C) and in any case within the timeframe in the financing agreements.	Formal root-cause analysis by a team led by a person independent of the line, started within 24 hours; investigation report within 14 days; CAPAs approved by the Project Director; closure verified by the Head of E&S
Level 2 – Moderate	Lost-time injury; contained spill above reportable volume; monitoring trigger exceeded; property damage	Within 4 hours to the Site E&S/HSE Manager; written report within 24 hours; reported to lenders in the next periodic report	Root-cause analysis (e.g. 5-Whys or ICAM) within 7 days; CAPAs tracked; closure verified by the Site E&S Manager
Level 1 – Minor / Near miss	First-aid case; minor spill contained on hard standing; housekeeping	Same shift to the supervisor; logged within 24 hours	Supervisor investigation;

Incident Level	Examples	Notification	Investigation and Close-out
	or minor procedural breach; near miss		corrective action within 30 days;

Escalation: an incident is escalated to a higher level where its actual or potential severity increases, where it attracts media, regulatory or community attention, or where corrective actions are overdue. Incident statistics, investigation status and CAPA close-out are reported monthly and, in the E,&S performance report.

Monitoring data generated through implementation of the ESMMP will be collated, analysed, and used to evaluate the effectiveness of mitigation measures and to support decision-making and adaptive management.

Section 8 presents the monitoring plan, which details parameters that should be monitored. The results from this data will be reviewed by IFZ.

Periodic (e.g. monthly and quarterly) internal reports will be prepared to track environmental and social performance, including compliance status, key performance indicators, incidents, grievances, and corrective actions.

Annual reporting should be undertaken to review performance over the previous year and to set targets and objectives for subsequent years.

Annual reports will also be used to demonstrate compliance with lender requirements and may be subject to independent review or verification where required.

6.4.5 MANAGEMENT OF CHANGE

Even with a final design and an unchanging environment, impacts are difficult to predict with certainty. Uncertainty stemming from on-going development of the Project design is inevitable, and the social and biophysical environment is typically variable from season to season and year to year. Similarly, the organisational structure and roles and responsibilities may also change as the Project progresses.

Where such uncertainties are material to ESIA findings, they should be clearly stated and conservatively approached ('the precautionary approach') in order to identify the broadest range of likely residual impacts and necessary mitigation measures.

The ESIA process does not stop with the submission of the Final ESIA report. Therefore, this ESMMP will require a mechanism to manage change.

In line with the ESIA and ESMS framework, the Management of Change (MoC) process will ensure that any changes to Project design, activities, or operating conditions are systematically assessed to determine their potential environmental and social implications prior to implementation.

Changes will be assessed in terms of the severity to potentially alter the ESIA findings; i.e. those that result in adverse changes to the predicted significance of environmental and social impacts. Some changes may not result in a material change to the ESIA

findings; however, in other instances, these changes may be material, potentially influencing the original findings of the ESIA, and hence, the basis for its approval.

Such a mechanism to manage change, or a change management system, should ensure that changes to the scope of the proposed IFF Line 2 Project are subjected to a robust social and environmental assessment process.

The MoC process will include:

- Screening of proposed changes against ESIA commitments and impact assessments;
- Identification of any new or increased environmental and social risks or impacts;
- Definition of additional mitigation and monitoring requirements where necessary; and
- Integration of changes into the ESMS, ESMMP, and relevant Management Plans.

Any changes to Project scope or new substantive environmental and social findings through ongoing post-ESIA baseline studies or monitoring should be evaluated for their degree of significance, and will be incorporated into the appropriate Project documentation as follows:

- Minor changes will be reflected in updates to the applicable Management Plans included in the overall ESMMP; and
- Substantive design changes that might potentially alter the ESIA findings should be subject to reassessment, further stakeholder consultation, supplementary reporting, and revision of the Project's ESMMP. Typically, such substantive changes will be submitted as an addendum to this ESIA.

Where material changes occur, these will also be communicated to relevant stakeholders, regulators, and lenders, as required, to maintain transparency and compliance with applicable standards.

E&S screening of changes. No material change to Project design, technology, processes, infrastructure, production capacity or operating conditions will be approved unless an E&S screening has first been completed using the MoC screening checklist and signed off by the project Manager. Where the screening indicates new or increased risks, the impacts will be reassessed before approval. Changes are classified, and the required updates and notifications determined, as shown in the table below.

TABLE 6-5 MANAGEMENT OF CHANGE – CLASSIFICATION, TRIGGERS AND REQUIRED ACTIONS

MoC Class	Typical Triggers / Thresholds	Required Updates and Notifications
Class 1 Minor	No change to ESIA impact significance; like-for-like equipment replacement; minor layout changes within the approved footprint; procedural changes	Update of the relevant procedure/CESMP; internal MoC approval; recorded in the MoC register; no external notification
Class 2 Moderate	New or increased impact that remains within the ESIA envelope; new hazardous chemical below major-hazard thresholds; changes	Update of the relevant ESMMP management plan(s) and the Risk/Commitments Registers; information to affected stakeholders under the SEP where they are

MoC Class	Typical Triggers / Thresholds	Required Updates and Notifications
	to working hours, accommodation or workforce numbers; changes to construction logistics or transport routes; new contractor scope with E&S risk	affected; disclosure to lenders in the next periodic report
Class 3 – Material	Change that could alter ESIA conclusions or approval conditions, including: new emission source or stack, or increase in emissions or effluent above the ESIA basis; new or relocated discharge point; new raw-water source or increase in abstraction; footprint expansion or land acquisition beyond the approved site; new associated facility; new major-hazard inventory or change to QRA risk contours; on-site workforce camp; change to applicable standards or approval conditions	E&S reassessment (supplementary ESIA/addendum) and revision of the ESMMP; notification to FMEnv and other regulators and approval where required; prior notification to lenders and lender no-objection before implementation; stakeholder consultation and update of the SEP; update of the ERP where hazards change.

6.5 ESMMP IMPLEMENTATION BUDGET

The indicative budget for implementing this ESMMP during the construction phase is NGN 500 million. This is an indicative provision, and additional funds will be approved as required. It covers the IFF Owner's costs for E&S staffing, monitoring, audits, stakeholder engagement, training and external verification. E&S costs falling within the construction Contractor's scope (e.g. contractor E&S/HSE staff, construction-phase controls and contractor monitoring) are included in the contract price and are not duplicated here.

The indicative budget has been estimated from the E&S implementation costs incurred during construction of the earlier Indorama fertilizer lines, scaled to the IFF Line 2 construction period of approximately 32–33 months. Its breakdown by component is presented in the table below. The figures are indicative in nature.

TABLE 6-6 BREAKDOWN OF THE INDICATIVE ESMMP IMPLEMENTATION BUDGET

No.	Budget component	Scope	Indicative cost (NGN million)
1	E&S organisation and staffing	IFF E&S, social performance and HSE oversight roles including Community Liaison Officers	180
2	Environmental monitoring	Ambient air, noise, surface water, groundwater, effluent, soil	105

No.	Budget component	Scope	Indicative cost (NGN million)
		and biodiversity monitoring; accredited laboratory analysis	
3	Training and capacity building	E&S induction, GBV/SEA/SH, emergency response	30
4	Audits and external verification	Internal audits, support to lender monitoring (IESC) visits, statutory audits	60
5	Emergency preparedness	Drills and emergency equipment	35
6	Waste and hazardous materials oversight	Owner-scope hazardous waste disposal and spill response materials	20
7	Community health, safety, security and traffic	VPSHR training for security, road safety campaigns	25
8	Reporting and information management	E&S data management system, lender and regulatory reporting	10
9	Contingency	Unforeseen E&S requirements and adaptive management	35
	Total		500

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS

7.1 INTRODUCTION

The Environmental and Social Management Measures presented in this Chapter cover both the construction and operational phases of the proposed IFF Line 2 Project. During the construction phase, implementation of mitigation measures will be primarily the responsibility of the Engineering, Procurement and Construction Contractor(s), under the supervision of IFF, with specific roles also assigned to the Owner's Engineer and other supervisory parties. During the operational phase, responsibility will transition to IFF,

building on existing management systems, permits, and monitoring frameworks established for current operations at the facility. This Chapter has been developed in alignment with the ESIA impact assessment findings and provides the Project's practical management response to the impacts assessed in the ESIA. In this regard, the management measures presented below translate the ESIA mitigation commitments into implementable actions that will be applied during Project execution.

Each management plan provides the following detail:

TABLE 7-1 MANAGEMENT PLAN STRUCTURE

Component	Description
Objective	The management objective that applies to each aspect or impact.
Timing and Frequency	During detailed Project design phase, the pre-construction (site establishment) phase, or construction phase of the Project.
Project Activity	Project related activities resulting in the impact.
Responsibility	The party responsible for implementing the management plan.
Performance Criteria	Measurable performance criteria (outcomes) for each element.
Mitigation Measures	The strategies, tasks or action program (to nominated operational design standards) that will be implemented to achieve the performance criteria.
Monitoring Linkage	Reference to the relevant monitoring requirements presented in Chapter 8, where applicable.
Verification / Means of Compliance	The records, inspections, audits, or evidence required to demonstrate implementation and compliance.

PLEASE NOTE:

This ESMMP has been developed as a framework, which aims to address the specific impacts that are anticipated to occur as a result of the proposed IFF Line 2 project and associated activities as identified in the ESIA and associated impact assessment. These management measures set out a formal system by which the Project can manage mitigation measures that will reduce impacts to the receiving physical, biological and social environments.

This ESMMP should be considered a “living” document and should be amended considering the learning experienced during the implementation thereof.

This ESMMP should be considered a “living” document and should be amended considering the learning experienced during implementation thereof. In line with the ESIA, the management plans in this Chapter form the “implementation” component of the wider ESMS, while the associated monitoring, verification, reporting and adaptive management requirements are addressed in Chapters **Error! Reference source not found.** and 8.

Adaptive management. Adaptive management will be applied where monitoring results, inspections, audits, incidents, grievances or implementation experience show that impacts differ from those predicted in the ESIA, or that mitigation measures are not effective. The triggers are: exceedance of a Project-adopted standard or monitoring trigger level; an adverse trend over two or more consecutive monitoring periods; a recurring grievance theme; a serious incident; or an audit finding of ineffective controls. When a trigger occurs, IFF will:

- investigate the cause within the timeframes in Section 6.4.4 (and in any case within 30 days), drawing on monitoring data, operating records and specialist input as necessary;
- determine whether the deviation results from implementation failure, an unforeseen impact or ineffective mitigation, and define additional or revised mitigation measures;
- implement the revised measures through the MoC process (Section 6.4.5), updating the relevant management plan, CESMP, E&S Risk Register and Commitments Register;
- communicate material changes to affected stakeholders and the lenders through the reporting framework; and
- verify the effectiveness of the revised measures through follow-up monitoring and audit, escalating in accordance with the Review and Escalation Framework (Section 8.5.5) if the problem persists.

This Chapter includes the following Management Plans:

- Physical Environmental Management:
 - Air Quality Management (refer to Section 7.2.1)
 - Climate Change Management (Section 7.2.2)
 - Noise Management (Section 7.2.3)
 - Soil and Erosion Control Management (refer to Section **Error! Reference source not found.**)
 - Groundwater Management (refer to Section 7.2.5)
 - Surface Water Management (refer to Section 7.2.6)
- Biophysical Management (refer to Section 7.3)
- Socio-economic Management:
 - Socio-economic Management (refer to Section 7.4.1)

- Employment and Procurement Management (refer to Section 7.4.2)
- Community Health and Safety Management (refer to Section 7.4.3)
- Cultural Heritage Management (refer to Section 7.4.4)
- Traffic Management (refer to Section 7.4.5)
- General Management:
 - Waste Management during the Construction Phase (refer to Section 7.5.1)
 - Spill Prevention, Control and Containment Management during the Construction Phase (refer to Section 7.5.2)
 - Emergency Response Plan (refer to Section 7.5.3)

7.2 PHYSICAL ENVIRONMENTAL MANAGEMENT

7.2.1 AIR QUALITY MANAGEMENT PLAN

7.2.1.1 OBJECTIVES

The overall objective for air quality management during the construction and operational phases is to manage emissions to the point that impacts are negligible, or at worst, minor. Furthermore, a key objective is to keep local communities and regulators informed of activities (where required) and to respond quickly and effectively to issues and complaints.

Construction and operational activities are to be conducted in a manner that manages impacts on ambient air quality such that emissions are in compliance with the Nigerian legislative and IFC requirements.

These objectives are aligned with the ESIA findings, which indicate that construction dust and construction-related combustion emissions may affect nearby receptors during construction, while operational impacts are associated with process and combustion emissions from the IFF Line 2 facilities and in-combination emissions within the broader Indorama complex.

Error! Reference source not found. The operational compliance requirements for air emissions and effluent are set out in the emission standards crosswalk (Section 4.6.4), this Air Quality Management Plan, the Surface Water Management Plan (Section 7.2.6) and the monitoring programme (Chapter 8). The resource efficiency programme and the cradle-to-grave hazardous materials management requirements formerly presented in Appendix E are now set out in Section 7.5.5.

7.2.1.2 PROJECT ACTIVITIES RESULTING IN AIR QUALITY IMPACTS

With regard to the construction phase, there are potential impacts associated with emissions of dust arising from:

- Exposure of soils during site clearance and construction;
- Batching and mixing of cement, sand and aggregates
- Vehicle movement over unpaved surfaces;
- Vehicles exhaust emissions;

- Exhaust emissions from diesel powered generators used during construction; and
- Transport, handling and stockpiling of friable materials required for construction.

With regard to operations, there are potential impacts associated with emissions of pollutants arising from:

- Gas fired power plants;
- Primary reformer (ammonia plant)
- Gas fired boiler;
- Urea granulator.
- Feed Conditioning Unit regeneration gas heater;
- and
- Emergency/non-routine flaring as defined operational emission sources

7.2.1.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the air quality management system throughout life of the Project. During construction, field implementation of the air quality controls will be managed and executed by the Contractor. Other parties, such as the Engineer, will also assume certain responsibilities in this regard which are detailed below.

Contractors and subcontractors will be required to incorporate relevant air quality controls into their work procedures and method statements.

7.2.1.4 PERFORMANCE CRITERIA

The primary performance criteria associated with air quality management for the proposed IFF Line 2 Project include:

- Implement sufficient controls so as to cause no undue concerns expressed by surrounding stakeholders in terms of atmospheric emissions;
- Respond to all atmospheric emission related complaints received from surrounding stakeholders and implement mitigation measures.
- Zero exceedances, attributable to the Project, of the Project-adopted ambient air quality standards (Table 7-2) at the designated monitoring locations and sensitive receptors;
- 100% compliance of stack emission monitoring results with the Project-adopted point-source limits (Table 4-8), with any exceedance investigated and corrected under Ref. 20 of Table 7-3;
- Alert trigger: ambient concentrations at or above 80% of a Project-adopted standard, or an increasing trend over two consecutive monitoring periods, prompting review of source performance (refer to Section 8.4);
- 100% of air-quality complaints acknowledged within 2 working days and closed (investigated, actioned and fed back) within 15 working days, with the number of complaints tracked quarterly; and

- 100% of air-quality corrective actions closed within the agreed timeframe.

With reference to the ESIA, both the relevant Nigerian and IFC standards and guidelines have been used. As such, the Project specific guidelines (which consider Nigerian ambient air quality standards and air quality guidelines from the WHO/IFC and EAE) are presented in Table 7-2. The Project-adopted standards are to be used as the compliance criteria for management performance and for future monitoring as set out in Chapter 8.

TABLE 7-2 PROJECT SPECIFIC GUIDELINES

Pollutant	Averaging Period	Origin of Guideline	Value ($\mu\text{g}/\text{m}^3$)
NO ₂	Annual mean	IFC	40
	1 Hour Maximum	IFC	200
PM ₁₀	Annual mean	Nigeria	60
	24 Hour	Nigeria	150
PM _{2.5}	Annual mean	Nigeria	20
	24 Hour Maximum	Nigeria	40
NH ₃	Annual Mean	EAE	180
	1 Hour Maximum	EAE	2,500

7.2.1.5 MANAGEMENT MEASURES

The construction of the Project is not predicted to result in significant impacts. In terms of construction dust, with the correct implementation of the appropriate mitigation and management measures (refer to Table 7-3), residual impacts are considered to be Negligible or at worst Minor.

The operation of the proposed IFF Line 2 Project is not predicted to result in exceedances of the Project-adopted ambient air quality standards. Air quality modelling indicates that operational NO₂ impacts are generally of minor significance, with minor to moderate impacts predicted under certain in-combination operational scenarios due to the sensitivity of some receptors; however, all predicted concentrations remain below applicable standards. In-combination impacts with existing and planned Indorama operations are therefore considered acceptable and manageable through the application of proposed emission controls, environmental management measures, and ongoing monitoring. Cumulative emissions from existing, planned and proposed facilities in the Indorama

complex are monitored and managed collectively through the complex-wide programme in Section 8.4, which defines the alert, action and escalation triggers and the corrective and adaptive measures applied where ambient air quality deteriorates or a standard is exceeded.

The latest ESIA incorporates updated wet- and dry-season baseline data and expanded air dispersion modelling for cumulative operational conditions associated with IFF Line 1 and IFF Line 2. Accordingly, this management plan should be implemented in accordance with the latest ESIA findings and Project-adopted standards, with air quality monitoring, reporting, and adaptive management requirements implemented as set out in the ESMMP and relevant monitoring framework.

The management measures required for general construction-related activities are included in Table 7-3. Where relevant, verification of implementation should be by means of site inspections, contractor records, and grievance records, while ambient and stack monitoring requirements are to be set out in Chapter 8. Where monitoring results, complaints, incidents or other information indicate that air quality impacts are greater than predicted, that applicable standards are exceeded, or that existing mitigation measures are not effective, the Project will investigate the cause and implement additional or revised mitigation measures as necessary. The outcome of the investigation and the corrective actions will be documented, tracked to closure and incorporated into the relevant management plans (refer to Section 7.1).

TABLE 7-3: AIR QUALITY MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
Construction Dust Management				
1	Grievances	The Project will develop and implement a grievance procedure in the event of any dust complaints being received.	Start of construction	Grievance Procedure
2		All potentially impacted receptors will be informed of the nature of works to be carried out, the duration, as well as contact details for a Project representative that be contacted in the event of a complaint. All complaints will be managed as part of the Project's external feedback and grievance mechanism (mentioned above).	Throughout construction	Engagement records and grievance procedure
3		The Project will make efforts to prevent grievances by monitoring conditions and surroundings and taking action to prevent dust emissions off the Project site.	Throughout construction	
4	Vehicle Management	Impacts associated with construction road traffic during the construction phase will be mitigated by treating (dust suppression) unpaved road, to prevent or minimise dust emission from construction vehicles.	Throughout construction	Visual observations and dust complaints
5		Speed limits will be reasonably set on unpaved roads to minimise dust generation.	Throughout construction	
6		Work vehicles will be kept sufficiently clean to avoid tracking dirt around and off the site.	Throughout construction	
7		Work vehicles transporting friable materials will be kept adequately covered to prevent materials being spread around and off the site.	Throughout construction	
8		Where practically feasible and reasonable, vehicles that are compliant with recent emission standards (for example, EURO Tier 3) will be used. These vehicles will be maintained in reasonable working order. When not in use, vehicles will be switched off, unless impractical for health and safety reasons (for example maintenance of air conditioning).	Throughout construction	Vehicle inventory

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
9	Site Clearing and Earthworks	Where practical and feasible, surface binding agents will be used on exposed open earthworks (e.g. laydown yards).	Throughout construction	Visual observations and dust complaints
10		The smallest possible area for cleared ground for work will be exposed, and where practical feasible, surface binding agents will be used on exposed open earthworks. Where the use of surface binding agents is not possible, the use of localised dampening and activity-specific dampening will be used to reduce localised emissions of dust.	Throughout construction	
11	General	Drop heights of material will be minimised.	Throughout construction	Visual observations and dust complaints
12		Where feasible and necessary, windbreaks (perpendicular to the prevailing wind direction and at a height of approx. 0.5m) will be erected around active work sites.	Throughout construction	
14	Vehicle Management	Vehicles will be regularly serviced (at least annually or in accordance with manufacturers’ recommendations) and maintained in a reasonable working order to reduce emissions. In particular, exhaust emissions should not emit black exhaust fumes or smoke.	Throughout construction	Maintenance records
15	Diesel Type	When not in use, vehicles will be switched off, unless impractical for health and safety reasons (for example maintenance of air conditioning)	Throughout construction	Visual observations
16		Establish exclusion zones where the offloading of Project equipment / materials from trucks is not permitted.	Throughout construction	Visual observations
17		Diesel fuel will be sourced from Indorama’s filling station to fuel Project power driven machinery / vehicles / equipment.	Throughout construction	Records
Operational Air Quality Management				
18	Process Emissions Management	Ammonia, urea and associated combustion systems shall be designed, operated and maintained in accordance with manufacturer requirements and applicable IFC/WBG EHS Guideline emission limits.	Throughout operation	No emission limit exceedances;

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
				compliance monitoring records
19	NOx Emissions Control	Low-NOx burners, combustion optimisation systems and other applicable emission reduction technologies shall be maintained and operated effectively to minimise NO ₂ and NOx emissions.	Throughout operation	Emission control systems operational and maintained
20	Stack Emissions Monitoring	Periodic stack emission monitoring shall be undertaken for relevant parameters, including NOx, NH ₃ and particulate emissions, as required by permits and lender requirements. Where a stack result exceeds the applicable limit: (i) the result is verified by repeat sampling within 7 days; (ii) the cause is investigated (combustion tuning, burner or scrubber/dust-collection performance, process upset); (iii) immediate corrective action is taken (operational adjustment, load reduction or maintenance); and (iv) compliance is confirmed by re-testing, with the CAPA tracked to closure	As per monitoring programme	Monitoring results demonstrate compliance with applicable limits
21	Ambient Air Quality Monitoring	Ambient air quality monitoring shall be undertaken at designated monitoring locations to confirm that operational emissions do not result in exceedances of Project-adopted standards at sensitive receptors.	As defined in ESMMP	No ambient air quality standard exceedances
22	Preventive Maintenance	Preventive maintenance programmes shall be implemented for boilers, reformers, turbines, compressors, flares and other combustion equipment to minimise abnormal emissions.	Throughout operation	Maintenance records and inspection reports
23	Process Optimisation	Process efficiency shall be optimised to minimise fuel consumption and associated air emissions while maintaining production requirements.	Throughout operation	Operational performance records
24	Fugitive Emissions Management	Routine inspection and maintenance of valves, flanges, pumps, compressors and associated equipment shall be undertaken to minimise fugitive emissions.	Routine inspections during operation	Leak detection and maintenance records

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
25	Dust Management (Operational Traffic)	Internal roads, storage areas and material handling areas shall be maintained to minimise dust generation from operational vehicle movements.	Throughout operation	Visual inspections; absence of recurring dust complaints
26	Material Handling	Loading, unloading and transfer of bulk materials shall be managed to minimise dust generation, including use of enclosed systems where practicable.	Throughout operation	Visual inspections and housekeeping records
27	Housekeeping	Good housekeeping practices shall be maintained throughout the facility to prevent the accumulation and wind entrainment of dust and fine material.	Throughout operation	Housekeeping inspection records
28	Vehicle Emissions	Operational vehicles shall be serviced and maintained in accordance with manufacturer specifications and shall not emit visible black smoke.	Throughout operation	Maintenance and inspection records
29	Idling Control	Vehicle and equipment idling shall be minimised where operationally and safely feasible.	Throughout operation	Operational inspections
30	Complaints Management	Air quality-related complaints shall be recorded, investigated and addressed through the Project grievance mechanism. Corrective actions shall be implemented where required.	Throughout operation	Complaint register; corrective action records
31	Air Quality Performance Review	Monitoring results, complaints, incidents and non-compliances shall be reviewed periodically to identify trends and implement adaptive management measures where required.	Quarterly / annually	Management review reports
32	Emergency / Upset Conditions	Air emission releases associated with process upsets, equipment failure or emergency events shall be investigated, reported and corrective measures implemented to prevent recurrence.	As required	Incident reports and corrective action closure records
33	Contractor Management	Contractors undertaking operational activities shall comply with Project air quality requirements and incorporate relevant controls into task-specific procedures.	Throughout operation	Contractor audits and inspections

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
34	Compliance Verification	Periodic internal audits shall be conducted to verify implementation of the Air Quality Management Plan and compliance with applicable regulatory and lender requirements.	Annually	Audit findings closed out within agreed timeframes

7.2.2 CLIMATE CHANGE MANAGEMENT

7.2.2.1 OBJECTIVES

The overall objective of climate change management during the construction and operational phases is to minimise greenhouse gas (GHG) emissions to the extent practicable, such that the Project's contribution to climate change is reduced and maintained within acceptable industry benchmarks. A further key objective is to ensure that emissions are effectively monitored, managed, and reported, in alignment with applicable national legislation and international standards, including IFC Performance Standards and WBG EHS Guidelines. Construction and operational activities shall therefore be conducted in a manner that promotes energy efficiency, optimises process performance, and supports continuous improvement in emissions intensity, while ensuring transparent reporting and responsiveness to stakeholder and regulatory requirements. The plan is aligned with the AfDB Integrated Safeguards System (2023), in particular OS1 (climate risk and vulnerability screening and adaptation), OS3 (greenhouse gas emissions, energy and resource efficiency) and OS4 (climate-related community health and safety risks), as well as the IFC Performance Standards (PS1 and PS3) and the WBG EHS Guidelines. It addresses both climate change mitigation (GHG emissions) and adaptation (physical climate risks) throughout the Project lifecycle.

The ESIA confirms that climate change management for the Project must address both physical climate risks (including extreme heat, flooding, wildfire, and water stress) and the Project's contribution to greenhouse gas emissions across its lifecycle. Accordingly, this management plan should be understood as covering both climate resilience and GHG mitigation commitments identified in the ESIA. To distinguish the two clearly, the GHG mitigation measures are presented in Table 7-4, and the adaptation and resilience measures for the physical climate risks identified in the ESIA – flooding and extreme rainfall, extreme heat etc– are presented in a separate Climate Adaptation and Resilience Measures table, with the design measures incorporated in the Project, operational measures, responsibilities, monitoring indicators and triggers.

In addition to the above, this management plan specifically addresses the control and management of greenhouse gas (GHG) emissions associated with the Project, as identified in the ESIA. This includes emissions associated with fuel combustion, process emissions from ammonia and urea production, and flaring events. The objective is to minimise GHG emissions intensity and ensure alignment with applicable national climate commitments and international best practice.

7.2.2.2 PROJECT ACTIVITIES RESULTING IN CLIMATE CHANGE IMPACTS

Based on the ESIA and GHG Assessment, key sources of GHG emissions arise from both construction and operational activities.

During the construction phase, emissions are temporary and primarily arise from fossil fuel combustion associated with diesel-powered machinery, vehicle movements for transporting materials and equipment, power consumption, and site clearance and

earthworks. In contrast, the operational phase is expected to generate more substantial emissions due to the energy-intensive nature of ammonia and urea production.

Key sources and characteristics include:

- Natural gas use for process heating and reforming, along with process emissions from ammonia and urea production
- Operation of gas turbines, steam boilers, utility systems, and flaring during upsets
- Predominantly Scope 1 emissions under direct operational control
- Partial capture and reuse of CO₂ in urea production, contributing to emissions reduction
- Benchmarking of emissions against industry intensity metrics (tCO₂/tonne product) and international standards

GHG inventory boundary. The GHG inventory follows the GHG Protocol Corporate Accounting and Reporting Standard and the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, applying an operational-control approach consistent with the ESIA GHG assessment (ERM, 2026).

- **Scope 1 (included):** Direct emissions associated with Project-controlled activities, including natural-gas combustion in the primary reformer and other process heaters, boilers and gas turbine generators; process-related CO₂ emissions from reforming and ammonia/urea production; process off-gas combustion; flaring; emergency diesel generation; and fuel use by construction, maintenance and operational support equipment and vehicles. CO₂ generated during ammonia production and captured for use in urea synthesis is accounted for in accordance with the ESIA methodology to avoid double counting, and operational emissions are reported on a net facility-level basis after accounting for CO₂ utilisation in urea production. Emissions associated with shared steam and captive power infrastructure are proportionally allocated to IFF Line 2 based on Project consumption/utilisation and are accounted for as Scope 1 under the ESIA boundary.
- **Scope 2:** No Scope 2 emissions are reported in the ESIA because the Project is not connected to the national electricity grid. Electricity is generated within the Indorama complex using captive gas-fired generation, with Project-attributed emissions accounted for under Scope 1.
- **Scope 3 (excluded from the ESIA inventory):** Other indirect emissions, including upstream natural-gas production, material manufacturing, transportation outside Project control, employee commuting and downstream product use, fall outside the organisational and operational boundary adopted for the ESIA and have not been quantified.

7.2.2.3 RESPONSIBILITY

Indorama Fertilizer FZE (IFF), as Project Proponent, shall assume overall responsibility for climate change management throughout the Project lifecycle, including GHG monitoring, reporting, and compliance. During construction, the Engineering, Procurement and Construction Contractor will implement onsite mitigation measures, while during operation the Operations and Maintenance Teams will manage process emissions and ensure efficient plant performance. The Environmental Manager will oversee monitoring, reporting, and continuous improvement in line with the Project ESMS.

7.2.2.4 PERFORMANCE CRITERIA

The following performance criteria shall apply:

- Compliance with applicable national regulatory requirements for emissions reporting
- Alignment with IFC, AfDB and WBG EHS Guidelines for energy efficiency and emissions
- Tracking and reporting of annual GHG emissions (tCO₂e/year)
- Maintenance of emissions intensity within recognised industry benchmarks (tCO₂e per tonne of urea, gross basis), assessed against the benchmarks described below
- No uncontrolled or prolonged flaring events
- Implementation of energy efficiency measures across all major systems
- Demonstrable year-on-year improvement in energy efficiency where practicable, measured against the quantitative GHG and energy targets in the GHG and Energy Performance Targets table below

These criteria will be used to assess compliance and effectiveness of mitigation measures.

Benchmarks and applicability. Project GHG performance will be assessed using the sector benchmark adopted in the ESIA. For integrated natural-gas-based ammonia-urea production, the ESIA references benchmarking information reported by the International Fertilizer Society (Hoxha and Christensen, 2018), which indicates GHG emissions intensities of approximately 0.75–1.27 tCO₂e per tonne of urea across major producing regions. The benchmark is relevant because it relates to integrated ammonia-urea production based predominantly on natural-gas reforming. The ESIA estimates the Project's operational emissions at approximately 686,590 tCO₂e/year, corresponding to a net facility-level emissions intensity of approximately 0.49 tCO₂e per tonne of urea, after accounting for CO₂ generated during ammonia production that is utilised in urea synthesis. The Project's emissions intensity will therefore be tracked against this sector benchmark using a consistent accounting boundary and methodology.

Monitoring and verification of GHG emissions, energy performance, and climate-related indicators are addressed in Chapter 8, while this section focuses on the management measures required to implement the ESIA commitments.

7.2.2.5 MANAGEMENT MEASURES

The following mitigation measures are derived from the GHG Assessment and ESIA and presented in accordance with ESMMP requirements.

TABLE 7-4 CLIMATE CHANGE MANAGEMENT MEASURES

Ref No.	Aspect / Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
1	Construction equipment use	Use fuel-efficient machinery and maintain equipment regularly to minimise fuel consumption	Construction phase – continuous	Reduced fuel consumption rates; no excessive idling
2	Vehicle and equipment idling	Implement strict no-idling policy for construction vehicles and machinery	Construction phase – daily enforcement	Compliance with site idling policy
3	Material transport	Optimise logistics and transport routes to reduce fuel use	Construction – ongoing	Reduced transport-related fuel use
4	Energy use (construction)	Use energy-efficient temporary power systems where feasible	Construction phase	Reduced diesel consumption
5	Process emissions (ammonia/urea production)	Optimise process design and operation to minimise GHG emissions	Operation – continuous	Emissions intensity aligned with industry benchmarks
6	Carbon capture and utilisation	Maintain and optimise CO ₂ capture and utilisation in urea production	Operation – continuous	% CO ₂ captured and reused
7	Combustion systems (boilers, turbines)	Ensure high-efficiency combustion systems and routine maintenance	Operation – scheduled maintenance	Optimal efficiency and reduced emissions
8	Flaring	Minimise routine flaring through process control and maintenance. Minimise flaring through process control,	Operation – continuous	No unnecessary flaring; flaring only during emergencies, startup and

Ref No.	Aspect Activity /	Management Measure	Timing and Frequency	Target / Performance Indicator
		improved process stability and preventive maintenance of the flare and associated process systems. Flaring will be limited to operationally necessary start-up, shutdown, upset and emergency conditions, consistent with the approved plant operating philosophy and applicable regulatory requirements. Flare-related activity will be recorded and reviewed, including sufficient information to establish the occurrence, duration, cause and associated activity/emissions. Unplanned or abnormal flaring events will be investigated and corrective actions implemented where required.		shutdown; 100% of flaring events logged, investigated where required and reported; flared volume tracked
9	Energy efficiency	Implement energy management system (EnMS) covering all high-energy processes	Operation – ongoing	Reduction in energy intensity (GJ/tonne product)
10	Monitoring and reporting	Establish GHG inventory and annual reporting system (Scope 1 emissions)	Operation – annual reporting	Verified GHG emissions inventory
11	Benchmarking	Compare emissions intensity against industry benchmarks and thresholds	Operation – periodic (e.g. annual)	Performance within sector norms
12	Continuous improvement	Identify and implement feasible emission reduction opportunities. Climate adaptation and resilience: the climate risk management measures are reviewed annually and after any extreme weather event. Where monitoring (Chapter 8, Table 8-2, Refs 15–18) shows that climate hazards are becoming more frequent or severe, or that	Operation – ongoing	Documented improvement initiatives; annual climate-risk review completed and resilience measures updated where triggered

Ref No.	Aspect Activity /	Management Measure	Timing and Frequency	Target / Performance Indicator
		resilience measures are no longer adequate (e.g. repeated flooding of drainage, heat-related incidents or water-supply triggers), the measures are updated through the ESMS and the MoC process (Section 6.4.5).		
13	Training	Train personnel on energy efficiency and emissions management	Construction & Operation	Training records and competency
14	Maintenance	Prevent fugitive emissions through regular inspection and maintenance	Operation – routine	No significant leaks or losses

The adaptation and resilience measures for the physical climate risks identified in the ESIA are set out in the table below, separately from the GHG mitigation measures in Table 7-4.

TABLE 7-5 CLIMATE ADAPTATION AND RESILIENCE MEASURES

Physical Climate Risk	Design / Resilience Measures Incorporated in the Project	Operational Measures	Monitoring Indicator and Trigger	Responsibility	Review
Flooding and extreme rainfall (Okulu River influence, low-lying terrain)	- Finished floor levels and critical equipment (MCCs, substations, hazardous material stores) above the design flood level (1-in-100-year) - Stormwater drainage and retention pond sized for	- Pre-rainy-season inspection and clearing of drains and culverts - Flood emergency procedure (scenario-based ERP, Section 6.4.2)	- Rainfall/meteorological alerts; retention pond freeboard; flood incidents - Trigger: freeboard below design minimum or any flood ingress into process/storage areas	Utilities & Infrastructure Manager; HSE Manager	Annually and after each major storm

Physical Climate Risk	Design / Resilience Measures Incorporated in the Project	Operational Measures	Monitoring Indicator and Trigger	Responsibility	Review
	design storm with climate uplift and freeboard	Securing of hazardous materials when flood warnings are issued			
Extreme heat	- Equipment and electrical systems rated for elevated ambient temperatures; cooling tower design margin - Shaded rest areas and cooling stations	- Heat-stress management plan, hydration, acclimatisation) - Rescheduling of strenuous work	- WBGT Monitoring, heat-related illnesses; equipment overheating alarms - Trigger: WBGT above the action threshold or any heat-related illness	HSE Manager; Operations Manager	Seasonally and annually
Water stress / drought	- Wastewater recovery, reducing raw-water abstraction - Contingency boreholes; abstraction within sustainable yield	- Water-use prioritisation hierarchy - Water balance	- Abstraction volume versus sustainable yield; groundwater levels; water intensity (m³/t) - Trigger: groundwater level decline beyond the alert level or abstraction above 90% of the permitted/sustainable rate	Utilities / Water Management Lead	Monthly; annually
Wildfire (dry season)	- Firebreaks and vegetation management at the perimeter - Fire water and detection systems	- Dry-season vegetation clearance - Fire readiness checks and drills	- Perimeter inspections; fire incidents within the buffer zone - Trigger: fire within the defined buffer or regional fire alert	Fire & Emergency Response Lead	Annually before the dry season

Where monitoring indicates that climate hazards are becoming more frequent or severe, or that existing resilience measures are no longer adequate, the measures above are reviewed and updated through the ESMS and the MoC process (Section 6.4.5), and the climate-risk register is updated accordingly.

TABLE 7-6 GHG AND ENERGY PERFORMANCE TARGETS

Indicator	Baseline / Design Basis	Target / Performance Requirement	Reporting Frequency	Responsible Party
Operational GHG emissions and GHG intensity (Scope 1; <i>tCO₂e/year and tCO₂e/t urea</i>)	ESIA design estimate: 686,590 tCO₂e/year operational Scope 1 emissions and approximately 0.49 tCO₂e/t urea net facility-level intensity . Actual operational baseline to be confirmed following the first full year of stable operation.	Maintain and progressively improve GHG performance relative to the established operational baseline and track emissions intensity against the ESIA-adopted sector benchmark for integrated natural-gas-based ammonia-urea production. Implement and verify identified GHG-reduction initiatives and report actual reductions achieved.	Monthly internal tracking; annual consolidated GHG inventory	Operations Manager / Project Engineer / Sustainability team
Natural-gas / energy-use efficiency (<i>specific consumption per</i>	Establish actual baseline from commissioning/performance-test and stable-operation data. The ESIA requires monitoring of natural-gas consumption per tonne of	Optimise natural-gas use as feedstock and fuel and demonstrate continuous improvement against the performance-test/design basis	Monthly	Operations Manager / Process Engineer

Indicator	Baseline / Design Basis	Target / Performance Requirement	Reporting Frequency	Responsible Party
<i>tonne of ammonia/urea)</i>	ammonia/urea and trends in specific energy use.	and relevant process benchmarks.		
Urea production specific energy consumption	ESIA design value: 20.53 MMBtu/MT urea , equivalent to approximately 21.66 GJ/t urea .	Maintain performance at or better than the confirmed design/performance-test value, subject to normal operating conditions and production rate.	Monthly	Operations Manager / Process Engineer / Energy Manager
Flaring performance	ESIA GHG assessment assumes flare activity of 313 TJ/year for operational GHG estimation. The ESIA does not provide a confirmed equivalent MMSCF/year target.	Minimise flaring through operational controls, process stability and flare-system maintenance; comply with applicable national flaring requirements and IFC GIIP. Record flare-related activity and investigate uncontrolled, abnormal or prolonged flaring events. Any quantitative volumetric limit should be established from the approved design/operating basis before operation.	Monthly internal tracking; flare events reported in accordance with incident/reporting procedures; annual GHG inventory	Operations Manager / HSE Manager

Indicator	Baseline / Design Basis	Target / Performance Requirement	Reporting Frequency	Responsible Party
Fugitive emissions / LDAR performance	Baseline established through initial LDAR inspection programme after commissioning.	Implement the LDAR programme; track number of leaks identified, repair close-out rate, repeat leak points and time to repair. Corrective actions to be completed within the timeframes established in the approved Project LDAR procedure.	Quarterly and during shutdowns/maintenance periods	Maintenance Manager / Integrity Engineer / HSE Manager
GHG-reduction initiative implementation	ESIA identifies four efficiency/hardware initiatives with potential reduction of approximately 227,000 tCO₂e/year , plus an upstream supplier flare-reduction programme with potential reduction of approximately 343,000 tCO₂e/year , subject to implementation, verification and allocation.	Track implementation of each approved initiative and compare actual verified tCO₂e reductions against the estimated annual reduction . Reductions may only be attributed to the Project following appropriate verification and allocation.	Quarterly implementation review; annual verification	Project Head / Project Engineer / Sustainability Lead

7.2.3 NOISE MANAGEMENT

7.2.3.1 OBJECTIVES

The primary objective for noise management during the construction and operational phase of the Project is to minimise impacts on the closest and/or most affected noise sensitive receptors (NSR's) situated in the vicinity of the Project Area so that impacts remain negligible or otherwise within acceptable limits identified in the ESIA. Furthermore, a key objective is to keep local communities and regulators informed of activities (where required) and to respond quickly and effectively to issues and complaints.

7.2.3.2 PROJECT ACTIVITIES RESULTING IN NOISE IMPACTS

Predicted noise levels at nearby NSRs due to construction activities are predicted to comply with the relevant criteria at all assessment locations for the day and night- time operating periods. The predicted impact magnitude during the construction phase is anticipated to be **Negligible**.

Predicted noise levels at NSR locations due to the operation of the Project are predicted to comply with the relevant criteria for day and night-time period at all locations assessed. The predicted impact magnitude during the operational phase is anticipated to be **Negligible**. The latest ESIA confirms that noise was assessed using a dedicated noise impact assessment methodology based on receptor-specific criteria, including the National Environmental (Noise Standards and Control) Regulations, IFC General EHS Guidelines, and BS 5228 for construction activities.

7.2.3.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the noise management system throughout life of the Project. During construction, field implementation of the noise controls will be managed and executed by the Contractor. Other parties, such as the Engineer, will also assume certain responsibilities in this regard which are detailed below.

7.2.3.4 PERFORMANCE CRITERIA

The primary performance criteria associated with noise management for the proposed IFF Line 2 Fertilizer Project include:

- Implement sufficient controls so as to cause no undue concerns expressed by surrounding stakeholders in terms of noise emissions;
- Respond to all noise emission related complaints received from surrounding stakeholders and implement mitigation measures.

With reference to the ESIA, both the relevant Nigerian and IFC standards and guidelines have been used. As such, the Project specific guidelines are presented in Table 7-7.

TABLE 7-7 PROJECT NOISE CRITERIA FOR OPERATIONAL PHASE

Receptor	One Hour L_{Aeq} (dB(A))	
	Daytime (06:01 – 22:00)	Night (22:01 – 06:00)
Residential; institutional; educational	55	45

The daytime period will be based on the Nigerian criteria between 06:01 to 22:00 hours and the night-time period will be between 22:01 to 06:00 hours.

7.2.3.5 MANAGEMENT MEASURES

Given that the predicted impact magnitude for noise impacts during the construction and operational phases is anticipated to be Negligible, no further mitigation or design changes are proposed. Notwithstanding the low predicted significance, the Project will implement the general precautionary noise controls set out below in accordance with GIIP and to address any complaints or unforeseen changes in operating conditions.

The management measures required for general construction related activities are included in Table 7-8. Monitoring requirements for occupational and community noise are addressed in Chapter 8 and should not be duplicated here.

TABLE 7-8 NOISE MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
Construction Operational Noise Management				
1	Grievances	The Project will develop and implement a grievance procedure that will address any noise complaints being received.	Start construction	Grievance Procedure
2		All potentially impacted receptors will be informed of the nature of works to be carried out, the duration, as well as contact details for a Project representative that be contacted in the event of a complaint. All complaints will be managed as part of the Projects' external feedback and grievance mechanism (mentioned above).	Throughout construction	Engagement records and grievance procedure
3		The Project will make efforts to prevent grievances by monitoring conditions and surroundings and taking action to prevent excessive noise emissions off the Project site.	Throughout construction	
4	General	Where feasible and reasonable, the dropping of materials from height will be avoided.	Throughout construction	Records / visual observations
5		Where practically feasible and reasonable, metal-to-metal contact on equipment will be avoided.	Throughout construction	
6		Where needed and practically feasible, onsite chutes and bins will be lined with damp material.	Throughout construction	Visual observation

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
7		Effective mufflers, enclosures and low-noise tool bits and blades will be selected, where necessary.	Throughout construction	Records
8		The hours of operation for specific equipment or operations will consider community sensitivities (e.g., trucks or machines operating in or passing through community areas).	Throughout construction	Records / visual observations
9	Vehicle and Machinery Management	Where feasible and reasonable, mobile plant parking near residences and other sensitive land uses will be prohibited. Moreover, exclusion zones where the offloading of Project equipment / materials from trucks is not permitted will be established.	Throughout construction	Records / visual observations
10		Vehicles and equipment will be regularly inspected and maintained to ensure it is in good working order. The condition of mufflers will also be periodically checked.	Throughout construction	Maintenance records
11		Where feasible and reasonable, silencers or acoustic enclosures will be installed on stationary machinery. For example, procure equipment or install suitable mufflers on engine exhausts and compressor components as well as the use of portable sound barriers around equipment like generators.	Throughout construction	Records
12		Where feasible and reasonable, alternatives to diesel and petrol engines and pneumatic units will be used (such as hydraulic or electric-controlled units).	Throughout construction	Equipment inventory
13		Less annoying but equally safe alternatives to conventional audible reversing alarms will be considered (such as visual and/ or broadband noise emitting models i.e., 'squashed duck') that provide a safe system of work.	Throughout construction	Records / visual observations

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
14		The unnecessary use of truck honking systems will be prohibited (especially when in or passing residential areas or schools) and will only be used to prevent vehicle / pedestrian collision.	Throughout construction	
15		Where feasible and reasonable, equipment will be turned off when not being used.	Throughout construction	
16		Where possible, Project traffic routing through community areas will be avoided and the implementation of speed limits for all construction vehicles shall be ensured	Throughout construction	
17	Training	In addition to the above-mentioned management actions, training in noise control / occupational noise exposure control procedures will be provided to the relevant personnel.	Throughout construction	Training records
Operational Noise Management				
18	Grievances	Continue implementation of the Project grievance mechanism to receive, investigate and address operational noise complaints from surrounding communities and other stakeholders.	Throughout operation	Complaint register; corrective actions implemented
19		Maintain communication channels with potentially affected stakeholders and provide information on planned maintenance activities or abnormal operating events that may generate elevated noise levels.	Throughout operation	Engagement records
20	Vehicle & Machinery Management	Major noise-generating equipment (e.g. compressors, pumps, turbines, fans and blowers) shall be fitted with manufacturer-specified acoustic controls and maintained in good working order.	Throughout operation	Maintenance and inspection records

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
21		Silencers shall be installed and maintained on steam vents, blowdown systems, pressure relief valves and other intermittent venting systems where feasible and safe to do so.	Throughout operation	Silencers installed and operational
22		Compressors, gas turbines and other major plant equipment shall be enclosed within acoustically treated buildings or fitted with acoustic attenuation systems where required by design.	Throughout operation	Operational inspection records
23		A preventive maintenance programme shall be implemented to identify and rectify abnormal noise generated by worn bearings, loose equipment, vibration, damaged insulation or defective silencers.	Throughout operation	Maintenance records
24		Replacement or new equipment shall, where feasible, be selected with consideration of noise performance and low-noise design specifications.	As required during operation	Procurement specifications
25		Periodic operational noise monitoring shall be undertaken at facility boundaries and/or representative sensitive receptors to verify compliance with Project-adopted standards.	As per monitoring programme	Monitoring results demonstrate compliance
26		Non-routine releases, emergency depressurisation events and maintenance venting activities shall be minimised where practicable and managed in accordance with operational procedures.	As required	Incident and maintenance records
27		Operational vehicles shall be maintained in good working order and unnecessary use of horns, engine braking and prolonged idling shall be prohibited.	Throughout operation	Inspection records; complaints trend
28	Traffic Management	Operational traffic movements shall be managed to minimise noise impacts on nearby communities, including use of designated routes and speed controls where appropriate.	Throughout operation	Traffic management records

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
29	Occupational Noise Control	Occupational noise monitoring shall be undertaken and hearing protection provided where worker exposure may exceed applicable occupational exposure limits.	Throughout operation	Monitoring and training records
30	Training and Awareness	Relevant personnel shall receive training on operational noise management, equipment maintenance requirements and reporting of abnormal noise conditions.	Induction and refresher training	Training records
31	Performance Review and Adaptive Management	Noise monitoring results, complaints, incidents and audit findings shall be reviewed periodically to identify trends and implement additional controls where necessary.	Annually or as required	Management review records and action tracking

7.2.4 SOIL AND EROSION CONTROL MANAGEMENT

7.2.4.1 OBJECTIVES

The primary objectives of the soil management and monitoring plan is to:

- Undertake activities during the pre-construction, construction and operational phases in a manner that minimises impacts on the soil.
- To ensure alignment with the requirements set out in the International Finance Corporation (IFC) Performance Standards, AfDB Operational Safeguards and IFC Environmental, Health and Safety Guidelines.

This management plan responds to the ESIA findings that identified soil erosion, loss of topsoil, compaction, changes in soil-water balance, and contamination as the primary soil-related risks associated with the Project.

7.2.4.2 PROJECT ACTIVITIES RESULTING IN SOIL IMPACTS

The following activities could potentially lead to soil-related impacts:

- **Soil Compaction** – due to the increased vehicular movement on site during construction.
- **Soil Erosion and Loss of Topsoil** – this can occur as a result of site preparation and construction activities, de-vegetation, and the associated increased surface runoff during rainfall events.
- **Changes in the Soil-water Balance** – this could occur as a result of surface soil compaction and can lead to flooding due to reduced recharge into the soil.
- **Soil Contamination** – during the construction and operational phase there is the potential for hydrocarbon leakages from equipment, and/or chemical spills, and the subsequent intrusion of oil and chemical substance into the soil. The requirements for prevention, early detection, containment, investigation and remediation of contaminated soil – including removal, treatment or disposal, confirmatory sampling and restoration – are set out in the Soil Management table (Ref. 3) and in Section 7.5.2.

7.2.4.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the soil management system throughout life of the Project. During construction, field implementation of the soil and erosion controls will be managed and executed by the Contractor. Other parties, such as the Engineer, will also assume certain responsibilities in this regard which are detailed below.

7.2.4.4 PERFORMANCE CRITERIA

As there are no Nigerian specific standards for soil qualities, the screening of the soil qualities during construction and operation should be compared to both the baseline soil conditions (pre-construction) as well as against a set of control samples situated in an undisturbed area outside of the proposed Project area footprint.

Soil-related performance should be demonstrated by prevention of avoidable erosion, minimisation of exposed disturbed areas, implementation of spill prevention controls, and maintenance of soil quality conditions broadly consistent with baseline and control areas, subject to the monitoring programme in Chapter 8.

The following measurable performance indicators apply (monitored as set out in Table 8-1, Ref. 21 and Table 8-2):

- **Soil erosion:** 100% of active work areas have erosion and sediment controls installed before land disturbance and before each rainy season; no uncontrolled sediment discharge beyond the site boundary; TSS at construction stormwater outlets ≤ 30 mg/L (the Project effluent limit); and all erosion features (rills or gullies deeper than 10 cm repaired within 7 days of detection).
- **Soil compaction:** no vehicle movement outside designated access routes and laydown areas (zero recorded breaches); 100% of temporarily used compacted areas decompacted and reinstated before demobilisation; and successful revegetation ($\geq 70\%$ vegetation cover within 12 months).
- **Soil contamination:** 100% of spills to soil reported and remediated; soil quality results at or below the EGASPIN (2018) target values, or statistically similar to baseline and control samples; and 100% of remediated areas confirmed by confirmatory sampling before backfilling.

7.2.4.5 MANAGEMENT MEASURES

The management measures included in Table 7-9 will be implemented to reduce soil related impacts from the Project.

TABLE 7-9 SOIL MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
1	Loss of Topsoil and Soil Compaction from Vehicle and Equipment Movement	- Limit the zone of vehicle and equipment weight impacts (designate an area for parking and stacking of heavy equipment). - Designate and demarcate access routes, haul roads and laydown areas before mobilisation; prohibit unnecessary off-road vehicle and equipment movement outside them. - Strip and stockpile topsoil separately before compaction-prone activities. - On completion of works, decompact (rip or scarify to at least 300 mm) temporarily used compacted areas, reinstate topsoil and revegetate.	Ongoing throughout construction.	Designated areas to be clearly marked out. Zero vehicle movements outside designated routes; 100% of compacted temporary areas decompact and reinstated before demobilisation.
2	Soil Erosion from Foundations Excavation	- Identify and avoid areas with unstable soil and local factors than can cause soil instability. - Develop an erosion control and re-vegetation plan to delineate measures to minimize soil loss. - Contractors must limit vegetation clearing to a minimum. - Cleared areas should be re-vegetated with beneficial local species known to mitigate against erosion. - The erosion and sediment control (ESC) plan will specify, as a minimum: (i) stormwater runoff management – diversion of clean upslope runoff around disturbed areas using berms and cut-off drains; (ii) temporary drainage – lined or	ESC plan prepared before any land disturbance. Controls installed before earthworks start in each work area, then maintained, inspected weekly and after every significant rainfall event (> 99 mm per hour), and adjusted throughout construction – particularly during the rainy season – until the affected areas are stabilised and rehabilitated.	- Erosion control plan. - Re-vegetation plan

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
		stabilised channels with velocity controls and protected outlets; (iii) sediment traps, settlement basins, silt fences and check dams at all drainage outlets before discharge; (iv) slope stabilisation – benching, and fill slopes; (v) stockpile management – stockpiles located away from drains, kept to a limited height and covered or seeded if left for more than 30 days; and (vi) progressive rehabilitation – reinstatement and revegetation of each area as soon as works are complete.	Revegetation should be ongoing during operations	
3	Spillages of Chemicals and Fuels	- Implementation of the Spill Prevention, Control and Containment Management Plan (refer to Section 7.5.2). - Contaminated-soil response pathway following a spill or release: (i) immediate containment and control of the source (stop the leak, deploy absorbents and booms, prevent entry into drains); (ii) assessment and delineation of the affected soil (visual inspection, field screening and sampling to define extent and depth); (iii) remediation by excavation to the depth of contamination and treatment on a lined, bunded treatment pad (e.g. bioremediation of hydrocarbons) or off-site disposal through a licensed hazardous waste contractor under consignment tracking; (iv) confirmatory sampling of the excavation base and walls against baseline/control values and the EGASPIN target values before backfilling; and (v) backfilling with clean material and restoration of the surface. All steps are recorded in the incident and spill register.	Management plan to be developed once-off prior to any construction activities. Monitoring of the soil quality within project footprint to be undertaken annually during construction and every three years during operation.	- Implementation of Spill Prevention, Control and Containment Management Plan - Ensure soil qualities remain statistically similar to baseline and control samples; confirmatory sampling records for 100% of remediated areas

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
		Pre-existing contamination encountered during excavation (unexpected staining, odour or buried waste): stop work in the affected area, isolate and test the material, and manage it through the same pathway (refer to Section 5.1).		

7.2.5 GROUNDWATER MANAGEMENT

7.2.5.1 OBJECTIVES

The primary objectives of the groundwater management and monitoring plan is to:

- Undertake activities during the pre-construction, construction and operational phases in a manner that minimises impacts on the groundwater.
- To ensure alignment with the requirements set out in the International Finance Corporation (IFC) Performance Standards, AfDB Operational Safeguards (OS1 and OS3) and IFC Environmental, Health and Safety Guidelines.
- To ensure groundwater qualities remain compliant with the Nigerian Standard for Drinking Water Quality (NSDWQ). This standard sets parameters and maximum allowable limits in drinking water in Nigeria. It also includes normative references / laws guiding drinking water quality, definition of terminologies, institutional roles and responsibilities, monitoring, data management and compliance criteria.

This management plan addresses the ESIA finding that groundwater systems in the Project area are highly sensitive due to shallow aquifers and community dependence, and that the key risks relate to contamination, abstraction, and failures in wastewater/retention systems.

7.2.5.2 PROJECT ACTIVITIES RESULTING IN GROUNDWATER IMPACTS

The following activities could potentially lead to groundwater related impacts:

- **Construction Activities Resulting in Spillages of Chemicals and Fuels** - during the construction process heavy machinery will be operational on site. There is a risk of impacts to the groundwater quality through accidental spills of fuels and oils, as well as other contaminants related to the transportation of equipment and materials during the construction phase. The spill can enter the soil and migrate vertically into the underlying aquifers from where it will migrate away from site.
- **Operation of Water Treatment Plant** – there is a potential to introduce pollutants to the groundwater courses via:
 - Release of effluent that does not meet required standards due to i) malfunction or failures of treatment plant, ii) due to flood or overflow from retention pond; or
 - Accidental release or intentional dumping of solid waste from the effluent treatment plant.
- **Groundwater Abstraction** – groundwater will be abstracted for use in the proposed IFF Line 2 Project. Over abstraction can impact the sustainable groundwater supply in the surrounding sensitive receptors (communities).

7.2.5.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the groundwater management system throughout life of the Project. During construction, field implementation of groundwater controls will be managed and executed by the Contractor.

Other parties, such as the Engineer, will also assume certain responsibilities in this regard which are detailed below.

7.2.5.4 PERFORMANCE CRITERIA

The performance of groundwater management will be monitored in the following ways:

- Adherence of Project groundwater abstraction volumes.
- Monitoring/recording the levels of groundwater in Project boreholes;
- The quality of groundwater – as measured in Project boreholes – aligned with the legislation; and
- Groundwater sampling procedures and methodology are to be undertaken in line with the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) 2018 issued by DPR, now NMDPRA.

7.2.5.5 MANAGEMENT MEASURES

The management measures included in Table 7-10 will be implemented to reduce groundwater related impacts from the Project.

TABLE 7-10 GROUNDWATER MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
1	Grievances	The Project will develop and implement a grievance procedure in the event of any water complaints being received.	Start of construction.	Grievance Procedure
2	Spillages of Chemicals and Contaminants during Construction and Operation	- Existing operational areas, associated facilities and infrastructure within the Indorama Manufacturing Complex are currently maintained in a safe and orderly condition, including the use of bunded storage and parking areas, oil-water separators/silt traps, drainage controls and established waste management arrangements. Upon commissioning of IFF Line 2, these existing management practices will be maintained and extended, where required, to incorporate the new facilities. - Existing chemical storage, handling, spill prevention, and waste disposal procedures will continue to be implemented and extended to include chemicals associated with IFF Line 2. - Groundwater monitoring is already undertaken across the Indorama Manufacturing Complex and will continue, with the programme updated as necessary to incorporate IFF Line 2 operations. - The existing Spill Prevention, Control and Containment Management Plan (refer to 7.5.2 is currently implemented across the operational complex and will remain applicable following commissioning of IFF Line 2. The plan will be updated as necessary to incorporate Line 2 infrastructure, chemicals, storage areas and operational activities, and will continue to govern spill prevention, emergency response, containment and reporting requirements).	Ongoing throughout the operation. Monthly groundwater monitoring during construction and operation phase.	Ensure groundwater qualities remain compliant with regards to legislation
3	Release of Non-compliant Effluent from the wastewater	It must be ensured that the wastewater treatment plant is maintained according to the recommended schedule to prevent or minimise malfunction or failure.	Ongoing throughout the operation.	Maintenance checklist to be in place.

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
	Treatment Plant due to Malfunction or Failures of Treatment Plant	The wastewater treatment plant must be operated within the relevant specifications to prevent failure or malfunction.	Monthly groundwater monitoring during construction and operation phase. Continual monitoring of primary indicators in the treatment plant to ensure correct functioning and of discharge quantity.	Ensure groundwater qualities remain compliant with regards to legislation
4	Overflow of the water Treatment Plant Retention Pond(s)	The retention pond(s) must be appropriately sized and engineered to be able to accommodate surface run-offs. In addition, the retention pond(s) must be operated according to specification which includes maintaining the specified freeboard that allows for the management of flood events.	Once-off prior to the construction of the retention pond.	Operation and maintenance records. Ensure groundwater qualities remain compliant with regards to legislation
5	Intentional Dumping of Solid Waste from	The retention pond(s) must be appropriately sized and engineered to be able to accommodate flood events. In addition, the retention pond(s) must be operated according to	Once-off prior to the construction	Ensure effluent qualities remain

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
	the Effluent Treatment Plant	specification, which includes maintaining the specified freeboard that allows for the management of flood events. Solid waste from the Effluent Treatment Plant must be disposed of at the appropriate landfill sites or at an approved waste management facility.	of the retention pond. Ongoing throughout the operation.	compliant with the Project-specific limits Obtain disposal certificates from authorised landfill site or an approved waste management facility. Ensure groundwater qualities remain compliant with regards to legislation
6	Over Exploitation of the Aquifer	- An aquifer test must be performed on the Project newly drilled water supply wells and the sustainable yield of the water supply wells must be calculated. - The water supply wells must be located away from the local community water supply wells to prevent or minimise overlap of the groundwater level drawdown cones around the individual water supply wells. This will prevent or minimise the reduction in the sustainable yields of the water supply wells. - Groundwater levels must be monitored to ensure the aquifer is not being over abstracted.	Once-off aquifer test prior to groundwater abstraction for supply purposes. Half-yearly groundwater level measurements during operation.	Ensure groundwater levels do not drop to levels that affect local community supply wells.
7	Groundwater Quality Trigger	Groundwater quality is monitored at up-gradient (reference), down-gradient and community wells for pH, EC, TDS, NH₃-N/NH₄⁺, NO₃⁻, urea, total petroleum hydrocarbons, oil and grease, and heavy metals.	Monthly during construction; quarterly during	No action-trigger exceedances attributable to the

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
	Levels and Corrective Action	- Alert trigger: a parameter at or above 80% of the NSDWQ limit, or a statistically significant increase (> 2 standard deviations) above the baseline/up-gradient value, in a down-gradient well. Response: re-sample within 7 days, inspect potential sources (bunds, drains, ETP, retention ponds) and increase the monitoring frequency for the affected wells. - Action trigger: exceedance of the NSDWQ limit (or of baseline + 50% where the baseline already exceeds NSDWQ) that is attributable to the Project. Response: source investigation and immediate containment; notification of the regulator and lenders (Appendix C) and of users of affected community wells; provision of an alternative water supply if a drinking-water source is affected; design and implementation of remediation; and follow-up monitoring until levels return below the alert trigger.	operation; triggers evaluated at each monitoring round	Project; 100% of alert triggers investigated within 7 days

7.2.6 SURFACE WATER MANAGEMENT

7.2.6.1 OBJECTIVES

The primary objectives of the surface water management is to:

- Ensure that activities during the pre-construction, construction and operational phases are undertaken in a manner that minimises impacts on surface water resources including riverine sediments, aquatic habitats, and downstream water users, through the avoidance, minimisation, and mitigation of adverse impacts. To ensure compliance with applicable national regulatory requirements, the AfDB Integrated Safeguards System (ISS), IFC Performance Standards (PSs), and relevant IFC Environmental, Health and Safety (EHS) Guidelines. To ensure that the quality of effluent and stormwater discharged from site to receiving surface waters remains compliant with the Project-specific standards for effluent. The Project-specific standards for effluent are defined in Chapter 2 of the ESIA and are based on the more stringent requirements, on a parameter-by-parameter basis, from the following applicable standards: National Environmental Protection (Effluent Limitation) Regulation 1991, S.I.8, NESREA and international industry-specific best practice as per the IFC EHS Guidelines for Nitrogenous Fertilizer Production, 2007.
- To ensure that the Project does not contribute to any negative impact on the receiving surface water environment, through maintaining the quality and quantity of effluent and stormwater discharges released from the site, and through effective management of erosion, sediment transport, and runoff.

7.2.6.2 PROJECT ACTIVITIES RESULTING IN SURFACE WATER IMPACTS

The following activities could potentially lead to surface water related impacts:

- **Construction Activities Resulting in Spillages of Chemicals and Fuels** – during the construction process heavy machinery will be operational on site. There is a risk of impacts to surface water quality through accidental spills of fuels and oils, as well as other contaminants related to the transportation of equipment and materials during the construction phase. Spills can directly impact surface waters, and also indirectly impact through entering the soil and migrating through aquifers ultimately discharging to surface water.
- **Earthworks, Excavation and Site Grading** – these activities may result in temporary exposure of soil, increased surface runoff and localised erosion and sediment transport, particularly during rainfall events. Sediment-laden runoff from excavated and exposed areas could increase turbidity and sedimentation in site drains, the Okulu River and downstream aquatic habitats if not controlled (AfDB OS1, OS3 and OS6).
- **Operation of Wastewater Treatment Plant** – there is a potential to introduce pollutants to the surface water receiving environment via:
 - Release of effluent that does not meet required standards due to i) malfunction or failures of treatment plant, ii) due to flood or overflow from retention pond; or

- Accidental release or intentional dumping of solid waste from the effluent treatment plant.
- Nutrient loading, ammonia releases and eutrophication – ammonia, urea and nitrate in process effluent, in contaminated stormwater from product handling and storage areas, or released in spills, could increase nutrient loading and cause ammonia toxicity to aquatic life and eutrophication in the Okulu River and downstream waters. These are priority impact pathways for a fertilizer facility.
- Climate-related extreme rainfall and flooding – intense rainfall events or river flooding could overwhelm drainage systems, retention ponds or the effluent treatment plant, causing overflow or bypass of untreated or partially treated water (a potential failure mechanism addressed in the Climate Adaptation and Resilience Measures table and the Emergency Response Plan).
- **Discharge of Stormwater from Hard Surfacing and Treated Effluent** – the stormwater from site will be directed to the Retention Pond and discharged to the Okulu River. The hard surfacing and the volumes of water used in operations and treated and eventually discharged from the treatment plant both have the potential together to i) cause erosion at discharge location and ii) increase the flow regime in the Okulu River. Stormwater from hard surfaces may also carry contaminants (hydrocarbons, nutrients and suspended solids) that could affect aquatic ecological receptors in the Okulu River and downstream water users (fishing, washing and domestic use). These risks are managed through segregated drainage, treatment, monitoring and the response measures set out in Section 7.2.6.5.

7.2.6.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the surface water management system throughout life of the Project. During construction, field implementation of surface water controls will be managed and executed by the Contractor. Other parties, such as the Engineer, will also assume certain responsibilities in this regard which are detailed below.

7.2.6.4 PERFORMANCE CRITERIA

The quality of the effluent discharged from site is to adhere to the Project-specific standards for effluent are defined in Chapter 2 of the ESIA and are based on the more stringent per parameter of the three relevant water quality limits: National Environmental Protection (Effluent Limitation) Regulation 1991, S.I.8, NESREA and international industry-specific best practice as per the IFC EHS Guidelines for Nitrogenous Fertilizer Production, 2007.

Table 7-11 presents the effluent standards applicable to the Project.

TABLE 7-11 PROJECT-ADOPTED EFFLUENT QUALITY STANDARDS

Parameter(s)	Project Applicable limit
pH	6.5 – 8.5
Temperature Increase (°C)	<3
TSS (mg/l)	30
Chloride, Cl ⁻ (mg/l)	600
Sulphate, SO ₄ ²⁻ (mg/l)	500
Nitrate, NO ₃ ⁻ (mg/l)	20
Phosphate, PO ₄ ³⁻ (mg/l)	5.0
Cyanide CN ⁻ (mg/l)	0.01
Ammonium NH ₄ ⁺ (mg/l)	5
Urea (prilling/ granulation) (mg/l)	1
Total Nitrogen (mg/l)	15
DO (mg/l)	>4.0
BOD (mg/l)	30
COD (mg/l)	150
O & G (mg/l)	10
Sodium, Na (mg/l)	NS
Potassium, K (mg/l)	NS
Iron, Fe (mg/l)	5.0
Calcium, Ca (mg/l)	200
Magnesium, Mg (mg/l)	200
Zinc, Zn (mg/l)	1.0
Copper, Cu (mg/l)	1.0
Chromium, Cr (mg/l)	1.0
Lead, Pb (mg/l)	1.0
Mercury, Hg (mg/l)	0.05

Parameter(s)	Project Applicable limit
Cadmium, Cd (mg/l)	0.1
Nickel, Ni (mg/l)	1.0
Arsenic, As (mg/l)	0.1

Surface water sampling procedures and methodology are to be undertaken in line with the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) 2018 issued by DPR, now NMDPRA.

7.2.6.5 MANAGEMENT MEASURES

The ESIA identifies the Okulu River and associated drainage systems as key sensitive receptors. Surface water management must therefore specifically address contaminated runoff, stormwater segregation, wastewater treatment performance, retention pond integrity, and prevention of deterioration in downstream water quality.

Site drainage philosophy. The site drainage system segregates clean stormwater from potentially contaminated drainage, as follows:

- **Clean (non-contaminated) stormwater** from roofs, roads and non-process areas is collected in the surface drainage network and routed through silt traps to the retention pond, from which it is discharged to the Okulu River after visual inspection and monitoring against the Project effluent limits.
- **Potentially contaminated runoff** from process areas, banded storage areas, loading bays and workshops (including first-flush rainfall) is contained by kerbs and bunds. It is directed to the oily-water sewer and treated in the CPI oil separator, then routed to the effluent treatment plant. Bund drain valves are normally closed and are opened only after inspection confirms that the rainwater is uncontaminated.
- **Oily water** from equipment drains and compressor areas is treated in the CPI oil separator. Recovered oil is sent to licensed recyclers and the oil-free water is transferred to the effluent treatment plant.
- **Process effluent** (condensates and blowdown) is treated and recovered for reuse through the wastewater recovery plant. Residual effluent is discharged only when it complies with the Project-Adopted Effluent Quality Standards (Table 7-11); off-specification effluent is held and recycled for re-treatment.
- **Domestic sewage** is treated in the sewage treatment plant before discharge or reuse.

The management measures included in Table 7-12 will be implemented to reduce anticipated impacts from the Project.

TABLE 7-12 SURFACE WATER MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target Performance Indicator /
1	Grievances	The Project will develop and implement a grievance procedure in the event of any water complaints being received and ensure that all complaints related to water quality, flooding, erosion, surface water access, and downstream impacts are recorded, investigated, resolved, and reported within defined timeframes .	Start of construction.	Grievance Procedure
2	Spillages of Chemicals and Contaminants during Construction and Operation	All construction and operational areas and associated facilities will be maintained in a good and tidy condition. This will include bunding of vehicle parking areas, oil and silt traps in the workshop area and proper disposal of waste material. Secondary containment shall be provided for all fuel, oil, chemical, and hazardous material storage areas with a minimum containment capacity of 110% of the largest container Chemicals used on site must be stored in a properly constructed area, with sealed floor, roofing, and walls where applicable, and access control. Waste chemicals will be disposed of at a suitable landfill site or at an approved waste management facility Spill response kits shall be available at all fuel storage areas, workshops, refuelling areas, and chemical storage locations A Spill Prevention and Emergency Response Procedure shall be implemented and periodic spill response drills undertaken A surface water monitoring program should be implemented prior to the construction phase to monitor any potential construction and operational related impacts.	Ongoing throughout the operation. Monthly surface water monitoring at the sites included in the baseline study, during construction phase and during operation phase.	Zero uncontrolled releases of hazardous materials to surface waters 100% of spills contained, reported, investigated and corrected
3	Release of Non-compliant Effluent from the wastewater Treatment Plant due to Malfunction or	It must be ensured that the wastewater treatment plant is maintained according to the recommended schedule to prevent or minimise malfunction or failure. The wastewater treatment plant must be operated within the relevant specifications to prevent failure or malfunction.	Ongoing throughout the operation. Monthly surface water monitoring at the	Maintenance records . Ensure effluent qualities remain

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance / Indicator
	Failures of Treatment Plant		effluent plant ponds and discharge point monitored during baseline, during construction phase and during operation phase. Continual monitoring of primary indicators in the treatment plant to ensure correct functioning and of discharge quantity	compliant with the Project-specific limits.
4	Overflow of the water Treatment Plant Retention Pond(s)	The retention pond(s) must be appropriately sized and engineered to be able to accommodate surface run-offs. In addition, the retention pond(s) must be operated according to specification which includes maintaining the specified freeboard that allows for the management of flood events.	Once-off prior to the construction of the retention pond.	Ensure effluent qualities remain compliant with the Project-specific limits
5	Intentional Dumping of Solid Waste from the Effluent Treatment Plant	Solid waste must be disposed of at the appropriate landfill sites or at an approved waste management facility.	Ongoing throughout the operation.	Obtain disposal certificates from authorised landfill site or an approved waste management facility. Ensure surface water qualities remain compliant with regards to legislation

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance / Indicator
6	Potential Increase of Flow Rate in Okulu River from Hard Surfacing Increasing the Natural Runoff in addition to Release of Treated Effluent	Effluent generated will be minimised through minimising freshwater intake, regular monitoring and reporting on water utilisation and wastewater recycled as appropriate using available technology to the greatest extent possible.	Ongoing throughout the operation.	Freshwater intake stable or reducing over life of operations.
7	Dewatering of Construction Sites	Stormwater management of the construction site will be planned in advance and implemented to separate clean and dirty water systems to avoid the transport of contaminants and sedimentation into aquatic systems.	Throughout construction	Detailed project planning designs Site audit reports
8	Vehicle Management	The washing of Project vehicles in any surface water bodies in and around the Project Area will be prohibited. All Project vehicles will be washed at designated wash bays on site. These wash bays will include oil/grease and sediment traps for grey water. The maintenance of vehicles in and around the Project Area will as far as possible be avoided. Major planned maintenance will be performed at a designated workshop. The workshop will include containment and an oil/grease trap.	Throughout construction	Visual observations and records
9	Wastewater	Sufficient temporary toilets will be located in strategic locations near active work sites during the construction phase and sited away from any water bodies or wetlands. These toilets will have doors and locks and will be secured to prevent them blowing over. Temporary toilets will be serviced regularly by a competent and suitably qualified person. Emptied waste will be transported and suitably disposed of.	Throughout construction	Visual observations and records
10	Stormwater Infrastructure Blockage	Monthly inspections of stormwater infrastructure will be undertaken during the operations phase to check for blockages and erosion.	Monthly, ongoing from end of construction.	Monthly register of erosion incidents and actions taken to rectify incident

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance / Indicator
				and control future erosion (photos to be included of incident and corrective actions).
11	Erosion and Sediment Control (Construction)	- Implement the erosion and sediment control plan (Soil Management table, Ref. 2), comprising: stormwater runoff management (diversion of clean upslope runoff, berms and cut-off drains); temporary drainage (lined or stabilised channels with protected outlets); sediment traps, settlement basins, silt fences and check dams upstream of all discharge points; slope stabilisation (benching, geotextiles, hydroseeding); and progressive rehabilitation and revegetation of completed areas. - No direct discharge of construction runoff to the Okulu River or natural drainage lines without passing through sediment controls.	Before land disturbance; weekly and post-rainfall (>25 mm/24 h) inspections throughout construction	- ESC controls in place at 100% of active work areas - TSS at construction discharge points $\leq$ 30 mg/L
12	Surface Water Monitoring and Trigger Levels	- Monitor pH, temperature, TSS/turbidity, DO, BOD, COD, $\text{NH}_3\text{-N}/\text{NH}_4^+$, NO_3^-, PO_4^{3-}, urea, oil and grease and heavy metals at: the up-stream reference point on the Okulu River; the retention pond/final discharge point; and down-stream locations (mixing zone and the nearest downstream user point). - Alert trigger: discharge parameter at or above 80% of the Project limit, or downstream concentration more than 20% above the upstream reference. Response: verify by re-sampling, inspect treatment and drainage systems, and increase the monitoring frequency. - Action trigger: exceedance of a Project-Adopted Effluent Quality Standard at the discharge point, or a Project-attributable deterioration downstream. Response: suspend discharge (close the retention pond outlet) and divert/hold the effluent for re-	Discharge point: monthly (daily field parameters during discharge); up/downstream: monthly during construction, quarterly during operation	- Zero action-trigger exceedances 100% of alert triggers investigated within 7 days

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
		treatment; investigate the root cause; notify regulators within 24 hours and lenders as per Appendix C; and inform downstream community leaders.		
13	Accidental Release, Untreated Discharge or Containment Failure Affecting Downstream Users	• Activate the spill/emergency response procedure: stop the source, close the outfall, and deploy containment (booms, absorbents) in drains and at the outfall. • Sample at the outfall and downstream; notify FMEnv/NESREA and the Rivers State Ministry of Environment within 24 hours, and the lenders as per Appendix C. • Notify downstream community leaders through the Community Liaison Officers, advise them of any temporary restrictions on water use, and provide an alternative water supply where domestic uses are affected. • Remediate affected areas and monitor until conditions return to baseline; record the event in the grievance and incident registers and give feedback to the communities.	Immediately upon detection; follow-up until close-out	• Notification within required timeframes • No unremediated downstream impact

7.3 BIOPHYSICAL ENVIRONMENTAL MANAGEMENT

7.3.1 OBJECTIVES

To promote the sustainable management of biodiversity resources, maintain the ecological integrity of the broader Project Area and maintain the benefits from ecosystem services through the adoption of practices that integrate conservation needs and development priorities.

7.3.2 PROJECT ACTIVITIES RESULTING IN BIODIVERSITY IMPACTS

The following Project activities during the construction and operational phases may result in impacts to biodiversity and ecosystem services:

- The loss of area to be cleared for the proposed IFF Line 2 Project could directly affect the surrounding ecosystem through siltation, alien invasive species introduction, and changes to the functionality of the systems.
- While little to no direct impact is predicted to occur to the aquatic biodiversity of the Project Area, the possibility exists that effluent discharge could lead to contamination of these systems is thus a reduction in aquatic biodiversity, which is already under threat from a number of anthropogenic impacts.

7.3.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the biodiversity management system throughout life of the Project. During construction, field implementation of biodiversity controls will be managed and executed by the Contractor. Other parties, such as the Engineer, will also assume certain responsibilities in this regard which are detailed below.

7.3.4 PERFORMANCE CRITERIA

IFC PS6 discourages the loss of natural habitats and requires that any impacts to natural habitats are associated with No Net Loss of Biodiversity, which is to be achieved through the avoidance of sensitive features, minimising of impacts, rehabilitation and possible compensation. If Critical Habitat is present, IFC Performance Standard 6 sets out a goal of delivering a net biodiversity gain. Disruption of ecosystem services are to be avoided and engagement with stakeholders is crucial in understanding these effects. In the context of this Project, management should focus on avoiding unnecessary vegetation disturbance outside the approved project footprint, preventing invasive species spread, and protecting aquatic receptors from indirect water quality impacts.

7.3.5 MANAGEMENT MEASURES

The management measures are included in Table 7-13 and Table 7-14 below and will be implemented to reduce the impacts from the Project to minor or negligible. Where the construction table refers to aquatic biomonitoring, this should remain as a management commitment but the details of frequency and monitoring protocols should be cross-referenced to Chapter 8.

TABLE 7-13 BIODIVERSITY MANAGEMENT DURING CONSTRUCTION

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
1	Pre-clearing Checks for Fauna	Preclearing checks will be conducted ahead of any vegetation removal.	At the start of construction	Survey reports
2	Waste Management	Waste management will be in accordance with the waste management measures provided in Section 7.5.1.	Throughout construction	Waste Tracking Records
3	Potential Spillage, Water Quality Issues, and Increased Stormwater Discharge	In order to address the aquatic biodiversity impacts related to potential spillage, water quality issues and increased stormwater discharge, aquatic biomonitoring will be conducted in aquatic habitats supporting flowing water that may be affected by spills and discharge from the Project site. Biomonitoring must be undertaken using IBP techniques. Data will be consolidated to develop comprehensive assessments of the Present Ecological State of aquatic ecosystems. Preconstruction Aquatic Ecology baselines will be established and compared against data within the ESIA. Post construction Aquatic Ecology baselines will be established and compared against data from the preconstruction baselines.	Prior to construction and post construction.	No deterioration in aquatic present ecological state attributed to construction of the proposed Project.
4	Potential Spillage of Effluent	Implementation of those management measures included for surface water management (Section 7.2.6).	Refer to surface water management section (Section 7.2.6)	Refer to surface water management section (Section 7.2.6)
5	Potential Creep at the Boundary Areas	Ensure the construction area is demarcated and no activities take place outside of these demarcations.	Monthly inspection of demarcation boundary	Inspect boundary for completeness,

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
				and to ensure no creep of activities. Security to record any incidence of staff leaving the construction area.
6	Collection of Plant or Animal Products	Toolbox talks for all staff regarding fauna and flora, including the fact that collection of plant or animal products is prohibited.	Weekly during construction	Signed registers from toolbox talks, with a copy of all topics discussed during the toolbox talk.
7	Erosion during Construction	Implementation of those management measures included for soil and erosion management (Section Error! Reference source not found.).	Refer to soil and erosion management (Section Error! Reference source not found.)	Refer to soil and erosion management (Section Error! Reference source not found.)
8	Introduction of Alien and Invasive Species	An alien invasive plant control programme will be designed and implemented for the Project Area and immediately adjacent (5 m buffer) to the demarcated construction zone. All alien invasive plants will need to be controlled by an experienced contractor.	Minimum of Quarterly inspection and control during construction.	Quarterly reports of species identified per inspection, and appropriate

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
				control measure implemented (photos of before and after to be included in report).
9	Water Quality Degradation	Implementation of those management measures included for surface water management (Section 7.2.6).	Refer to surface water management section (Section 7.2.6)	Refer to surface water management section (Section 7.2.6)

TABLE 7-14 BIODIVERSITY MANAGEMENT DURING OPERATIONS

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
1	Contamination of Surface Water Resources	Implementation of those management measures included for surface water management (Section 7.2.6).	Refer to surface water management section (Section 7.2.6)	Refer to surface water management section (Section 7.2.6)

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance / Indicator
3	Collection of Plant or Animal Products	Toolbox talks for all staff regarding fauna and flora, including the fact that collection of plant or animal products is prohibited.	Monthly during operation	Signed registers from toolbox talks, with a copy of all topics discussed during the toolbox talk.
4	Project activities Outside the Boundary	Ensure the Project site is fenced, and no activities take place outside of the fence line.	Monthly inspection of boundary fence	Inspect boundary fence for completeness. Security to record any incidence of staff leaving the fenced site for illegal collection of faunal or floral products.
5	Introduction of Alien and Invasive Species	An alien invasive plant control programme will be designed and implemented for the Project Area and immediately adjacent (5 m buffer) to the demarcated zone. All alien invasive plants will need to be controlled by an experienced contractor.	Minimum of annual inspection and control during operation.	Annual reports of species identified per inspection, and appropriate control measure implemented (photos of before and after to be

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target Performance Indicator /
				included in report).

7.4 SOCIAL MANAGEMENT

7.4.1 SOCIO-ECONOMIC MANAGEMENT

7.4.1.1 OBJECTIVES

To manage the socio-economic aspects of the proposed IFF Line 2 Project during the construction and operations phases. The ESIA identifies both positive socio-economic benefits (employment, local procurement, income generation) and risks (labour influx, pressure on services, unmet expectations, community dissatisfaction, and cumulative social pressures). This management plan therefore aims to enhance positive outcomes while minimising adverse social effects.

7.4.1.2 PROJECT ACTIVITIES RESULTING IN SOCIO-ECONOMIC IMPACTS

- Construction and operation of the Project, as well as the movement of equipment, supplies and product through or near communities.
- The peak demand for temporary contract workforce during construction and the associated demand for accommodation, transport, healthcare, water supply, sanitation, and other community services.
- The demand for permanent operational staff as well as temporary contract workforce during the operational life of the asset.
- Improved economic, employment and business opportunities provided by the presence of the Project. The IFF Line 2 Fertilizer Project is expected to create about 6,213 jobs at construction peak (5,178 Nigerian and 1,035 expatriate). It will also create 151 permanent operations and maintenance (O&M) positions after commissioning, of which 101 (67%) will be filled by Nigerian nationals. The positive impacts are defined in monitorable terms as follows:
 - Local employment. This is measured as the number and percentage of the construction workforce recruited from host communities. The targets in the Local Hiring Plan are $\geq 60\%$ of unskilled, $\geq 40\%$ of semi-skilled and $\geq 20\%$ of skilled positions. These targets apply subject to suitably qualified candidates being available, and selection must be transparent and merit-based. Based on experience from Lines 1–3, the Plan projects that about 55% of the Nigerian construction workforce (around 2,855 workers) will come from Rivers State, including about 29% (around 1,501) from Eleme LGA. More than 90% is expected to come from the Niger Delta region.
 - Skills development. This is measured as:
 - the number of Nigerian graduate and diploma engineers who enrol in and complete the Graduate Engineer Internship (12 months) and the Diploma Engineer Internship (18 months);
 - the number of host-community candidates supported through the technical-test refresher course delivered with Rivers State University;
 - the number of local construction workers trained or certified.

- Gender inclusion. This is measured as the share of women in the IFF Line 2 O&M workforce, against a target of approximately 5–6%.
- IFF procurement of goods and services from national, regional, and local service providers and suppliers which may contribute to local economic development, supply-chain strengthening, and enterprise development.
- IFZ programmes with respect to local business development as part of their Community Development Plans.
- Influx of migrant workers and job seekers which may increase pressure on public services, housing, healthcare facilities, community infrastructure, and may create social tensions, unequal distribution of benefits, increased communicable disease transmission, and community safety concerns.
- IFF use of state and private security forces to secure their operations.
- Air quality and traffic concerns associated with existing and future operations within the broader Indorama complex, as identified through stakeholder engagement and cumulative impact assessment.
- Interactions between Project workers and local communities, with potential risks of conflict, nuisance behaviour, cultural tensions, communicable disease transmission and effects on community wellbeing.
- Influx of workers and job seekers and workforce–community interactions, potentially contributing to risks of gender-based violence (GBV), sexual exploitation and abuse (SEA) and sexual harassment (SH).
- Construction and operational emergencies, including fires, explosions, hazardous material (e.g. ammonia) releases and transport incidents, with the potential to affect neighbouring communities.
- Temporary or permanent changes to community access routes, land use, roads and public infrastructure resulting from Project construction and operation (e.g. traffic diversions and heavy-vehicle use of local roads).

7.4.1.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the socio-economic management system throughout life of the Project. During construction, field implementation of socio-economic controls will be managed and executed by the Contractor. Other parties, such as the community relation officer, Engineer, will also assume certain responsibilities in this regard which are detailed below.

7.4.1.4 PERFORMANCE CRITERIA

- Implementation of a Local Content / Procurement Plans.
- Engagement with local labour contractors on available skills.
- Gender inclusion targets to be implemented and tracked in line with applicable corporate policies, national requirements, and local labour market conditions.
- Registration of local (appropriately qualified) contractors from Host communities.
- Records of training and recruitment processes that reflect host communities.

- Updated and signed MOUs with Project-affected (host) communities.
- Stakeholder Engagement Schedule:
 - Including proposed dates of engagement, key stakeholders/group to be involved, purpose of meetings for construction and operational phases of the Project.
 - Includes local and regional governments.
- Monitoring, evaluation, and disclosure on progress against SEP.
- Record of contracts, total spend, and indirect employment provided by IFF.
- Record of CSI support given to target beneficiaries from affected communities. Number and list of beneficiaries for each CSI initiatives.
- Annual CSI planning and reviews reports / summary.
- Maintained community grievance register, including timeframe for close out of issues and manage measures.
- Community Health and Safety Plan and Emergency Preparedness and Response Plan in place and effective.
- Record of community incidents, emergency events and responses.
- Recruitment and appointment process in place to meet resourcing requirements for implementation of Health and Safety Plans.
- VPSHR-compliant security policy in place.
- Identification of potential SED/CSI/Infrastructure development interventions into which IFF can invest.
- Implementation of the Local Hiring Plan, monitoring of workforce composition (local vs non-local workers), and periodic disclosure of workforce statistics to relevant stakeholders.
- Workplace policies related to gender-based violence in place.
- Transparent recruitment procedures and communication of employment opportunities maintained throughout construction and operation.
- Grievance trends, community concerns, and commitment tracking to be reviewed periodically to support adaptive management.

7.4.1.5 MANAGEMENT MEASURES

The management measures included in Table 7-15 will be implemented to reduce socio-economic impacts from the Project.

TABLE 7-15 SOCIO-ECONOMIC MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
1	Increased Employment within the Broader Project Area Increased income and Spending within the Broader Project Area	• IFF will appoint local contractors (where reasonable and practical) and implement a Local Content / Procurement Plan as per the Local Hiring Plan for Construction & Operation phase of IFF Line 2 Project. • All appointments (direct or through contractors) must abide by national and international labour laws. • Before the construction phase commences IFF will meet with representatives from the Project-affected communities (through the PAC or other appropriate forum/s) to establish the existence of a skills and local small and medium sized enterprises database for the area. If such as database exists it should be made available to the contractors appointed for the construction phase. • The local authorities, relevant community representatives will be informed of the final decision regarding the Project and the potential job opportunities for locals and the employment procedures that IFF intends following for the construction phase of the Project. • Where feasible, a training and skills development programmes for local workers should be initiated prior to the initiation of the construction phase. ■ The recruitment selection process will seek to promote gender equality and the employment of women wherever possible.	At least six months before construction commences	• Implementation of a Local Content / Procurement Plans • Approximately 5 to 6% employment for operational phase should be female. • Update of existing Local Supplier Database (host communities). • Registration of local (appropriately qualified) contractors from host communities. • Records of training and recruitment processes that reflect host communities.

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target / Performance Indicator
2	Socioeconomic Development Benefits	• IFF must ensure that future SED interventions are governed by existing MOUs to reduce exposure to reputational and social risks. • A proactive community engagement campaign must be initiated with a view to manage community expectations of future SED plans and benefits. • Where possible and appropriate, IFF should seek to integrate any SED interventions into broader sectoral economic activities, as well as IFF's career progression plans, to ensure maximum benefit is delivered to recipients. •	Renewed MOU should be implemented during construction. Revised MOUs should be signed within the frequency prescribed.	• Existing MOUs with host communities. • Stakeholder engagement schedule, which includes the IFF Line 2 Fertilizer Project. • Monitoring, evaluation, and disclosure on progress against stakeholder engagement plan.
3	Socioeconomic Development Benefits Influx of Migrant Workers and Job Seekers into Adjacent Communities	• Implementation of Hiring Plan for Construction & Operation phase of IFF Line 2 Project. • Update of existing Local Supplier Database to include affected communities. • Registration of local contractors and service providers from Project-affected communities. • Record of development support given to local contractors and service providers from Project-affected communities. • Revision of existing CSI plans, programmes, and initiatives to account for IFF Line 2 Fertilizer Project (expansion of operations).	At least six months before construction commences.	• Local Supplier database in place. • Engagement with local labour contractors on available skills. • Record of contracts, total spend, and indirect employment provided by IFF. • Monitoring, evaluation, and disclosure of local business development activities. • Record of CSI support given to target beneficiaries from affected communities. • Number and list of beneficiaries for each CSI initiatives.

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target / Performance Indicator
				Annual CSI planning and reviews reports / summary.
4	Community dissatisfaction over Unmet Expectations	- IFF must ensure that MOU is signed with host communities and extends its scope to include the Project, if needed. - IFF will ensure that the increased socio-economic benefits derived to communities are commiserate with the expansion of Indorama's existing operations in line with 2023-2025 MoUs, 2026-2028 MoU which take cognisance of the upcoming IFF Line 2 Project. - IFF will ensure transparent and continued communication with all stakeholders to ensure that community expectations are aligned to what the Project can realistically deliver. This must include the update of the Stakeholder Engagement Plan every 3 years to include activities related to the Project, as well as continuous oversight to ensure the timely and effective implementation of this plan. - IFF will capacitate, on an ongoing basis, the PAC to serve as an effective vehicle of communication between the Project and community members. The PAC should serve as the primary means of expectation setting of community members. - IFF must ensure that an updated Incident and Grievance procedure is in place and that it covers the new activities undertaken in relation to the Project.	At least six months before construction commences.	- Stakeholder Engagement Schedule (including proposed dates of engagement, key stakeholders/group to be involved, purpose of meetings) for construction and operational phases. - Maintained community grievance register, including timeframe for close out of issues and manage measures. - Record of community incidents, emergency events and responses. - Updated and signed MOUs with host communities. - Record of grievances raised regarding construction or operation of IFF Line 2 .

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target / Performance Indicator
5	Public and Worker Health, Safety, and Human Rights Impacts	- Develop a Community Health and Safety Plan – including Emergency Preparedness and Response Plan for host communities. - Updated of existing Health and Safety Plans to cover the IFF Line 2 Fertilizer Project (including Emergency Preparedness and Response Plan). - Inclusion of community requirements in any new Health and Safety Plans. - Provision of additional resourcing to implement Health and Safety Plans. - Recording of community incidents, emergency events and responses. - A Traffic Management Plan shall be developed and implemented covering worker transport, delivery vehicles, abnormal loads, road safety awareness and emergency response procedures.	- At least two months before construction commences. - Management plans should be revised annually (if required) and comprehensively updated every 5 years.	- Community Health and Safety Plan and Emergency Preparedness and Response Plan in place and effective. - Recruitment and appointment process in place to meet resourcing requirements for implementation of Health and Safety Plans. - Track record of public incidents or accidents with traffic on public roads.
6	Public and Worker Health, Safety, and Human Rights Impacts	- Implementation of the Voluntary Principles on Security and Human Rights (VPSHR). - Draft security policies in line with the VPSHR. - Ensure that all security subcontractors are compliant with or onboarded into the VPSHR. - Proactively engage with state security forces to minimise risk of related human rights violations.	- At least two months before construction commences. - Policies should be revised annually (if required) and comprehensively updated every 5 years.	- Zero human rights infringements as a result of private security activities. - Membership status of VPSHR. - VPSHR-compliant security policy in place. - Proof of VPSHR-compliant subcontractors.
7	Influx of Migrant Workers and Job Seekers into the Broader Project Area	IFF will recruit locally and appoint local contractors (where reasonable and practical) and implement a Local Content / Procurement Plan.	- At least six months before construction commences. - Stakeholder engagement schedule should be	- Local recruitment and procurement policies in place. - Stakeholder engagement plan and schedule, which

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target / Performance Indicator
		- IFZ will engage with local and regional government to understand the impact of direct and cumulative influx. - Where possible, IFZ will partner with government and other industries in the area to undertake interventions which alleviate the impact of direct and cumulative influx. - Ongoing engagement with local authorities in terms of influx perceptions.	updated every 3 years.	- includes local and regional governments. - Identification of potential SED/CSI/Infrastructure development interventions into which IFF can invest.
8	Public and Worker Health, Safety, and Human Rights Impacts	- The IFF incident and grievance management process will be updated to appropriately accommodate grievances related to sexual assault or abuse by contractors, or gender-based harm as a result of Project activities. - Workplace policies will be designed in line with IFC guidelines, and ensuring that contractors do likewise, to prevent gender-based violence and sexual abuse of local communities.	- At least six months before construction commences. - Policies and management plans should be revised annually (if required) and comprehensively updated every 5 years.	100% of reported GBV, SEA and SH complaints investigated and managed through survivor-centred procedures. - Updated Grievance mechanism, which appropriately accommodates gender-based harm related grievances. - Workplace policies related to gender-based violence in place.

7.4.2 EMPLOYMENT AND PROCUREMENT MANAGEMENT

7.4.2.1 OBJECTIVES

The Project is committed to ensuring the rights and health and safety of all workers are respected and protected employed by Contractors and their Subcontractors. This Management Plan has been developed taking into account the requirements of Nigerian law and IFC Performance Standard 2, AfDB Operational Safeguard 2 and seeks to:

- Promote fair and transparent employment and procurement practices.
- Promote reasonable working conditions including health and safety at work, working hours, contracts etc.
- Ensure the fair treatment, non-discrimination, and equal opportunities of all workers.
- Protect Project workers including vulnerable workers from labour abuses.
- Prevent the use of all forms of forced and child labour.
- Support the principles of freedom of association and collective bargaining.
- Provide workers with a means to raise workplace concerns.
- Ensure that worker accommodation is provided in line with IFC/WB Worker Accommodation Guidance or reasonable housing allowance be paid.
- Manage retrenchment / contract termination of contracted workers.
- Require all workers, contractors and subcontractors to sign and comply with the Project Code of Conduct (including GBV/SEA/SH provisions).
- Provide induction training to all workers on their rights, the Code of Conduct, OHS and grievance channels before site access.
- Provide a confidential worker grievance channel, including anonymous reporting for sensitive complaints, free from retaliation.
- Require quarterly labour and working conditions reporting by contractors (workforce numbers, hours and overtime, wages, accommodation, grievances and incidents).
- Apply a survivor-centred approach to all GBV, SEA and SH cases.

This management plan aligns with IFC Performance Standard 2, AfDB Operational Safeguard 2 and the ESIA findings regarding labour, working conditions, local recruitment expectations, and the need for fair, transparent, and non-discriminatory employment practices.

7.4.2.2 PROJECT ACTIVITIES RESULTING IN EMPLOYMENT AND PROCUREMENT IMPACTS

Regardless of whether people are direct employees, Contractors or subcontractors, workers can be affected either by exposure to insufficient health and safety standards or exposure to insufficient labour and working standards. Exposure to insufficient standards increases the risks of accidents, injuries or of workers not receiving fair treatment.

7.4.2.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring implementation of the requirements under PS2 for employment and procurement management throughout the

life of Project. The Contractor will be responsible for ensuring the labour and working conditions of all Project employees (direct employees and subcontractors) are in line with the requirements of Nigerian law, ensuring workplace health and safety and access to grievance mechanisms. Other parties, such as the Engineer, will also assume certain responsibilities in this regard.

7.4.2.4 PERFORMANCE CRITERIA

- Fair and transparent recruitment and procurement procedures are in place.
- Policies in place related to discrimination, worker rights, freedom of association, including zero tolerance for any form of forced or child labour (direct employees, contractors or subcontractors).
- Contractor workers, have a contract in line with Nigerian Law and IFC PS2 outlining the terms and conditions of employment.
- For supplier and subcontractor workforces not directly managed by the Project, compliance will be promoted through contractual requirements, supplier engagement and periodic verification, recognising the Project's very limited ability to directly monitor individual employment arrangements.
- Accommodation for workers (direct employees and subcontractors) is provided in line with Nigerian Building Code and IFC / WB Worker Accommodation Guidelines or commensurate/compensatory allowances to be paid.
- Promote the fair treatment, non-discrimination, and equal opportunity of all workers.
- All workers have the right to associate and collectively bargain.
- Normal working hours and overtime to align with standard construction practices and Nigerian law.
- Wages for all workers are aligned with minimum wages and minimum industry standards.
- Worker Grievance Mechanism should be in place and implemented.
- Measures should be in place to ensure workers receive all necessary documentation at the end of their employment.

7.4.2.5 MANAGEMENT MEASURES

The management measures outlined in Table 7-16 will be implemented to manage impacts associated with employment and procurement.

TABLE 7-16 MANAGEMENT OF EMPLOYMENT AND PROCUREMENT

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target / Performance Indicator
Recruitment and Procurement				
1.	Recruitment of Workers and Procurement of Goods and Services	The Project will prioritise the recruitment of workers and procurement of goods and services from within the Eleme then Rivers State as economically appropriate. This will not apply to the provision of highly technical equipment.	Prior to and throughout construction and operations	Percentage of workers employed from host communities by skills level.
2.		The Project will develop a fair and transparent employment and procurement policy and processes to avoid any potential for nepotism or favouritism. The processes will be shared with the local community members through community leadership.	Prior to and throughout construction and operations	- Positive feedback from the local community and leadership regarding the employment and procurement policy and processes. - Mutually agreed metrics on employment and procurement to be shared quarterly with local leaders.
3.		A Local Recruitment Procedure will be developed/updated by the Project, which outlines the percentage of skilled, semi-skilled and unskilled employment, with high targets for unskilled workers. The procedure will also include an emphasis on recruitment of vulnerable groups (e.g., women, etc.). The Project will further engage both local and state Government, Traditional Rulers (Eleme Council) and Community Leaders among other key stakeholders in ensuring local employment is achieved. The requirements of this procedure will form part of the Conditions of Contract with subcontractors.	Prior to and throughout construction and operations	- At least 60% of unskilled workers from local recruitment process. - Percentage of workers employed from the affected areas by skills level and gender (unless this could result in identification of female employees). - Percentage of workforce who are women or from other vulnerable groups. - Percentage of suppliers based in the affected areas.

				Zero workers hired at the gate.
4.		Notification will be given to leaders in Eleme of the specific jobs and the skills required for the Project, prior to the commencement of construction phase. This will give the local population time to prepare and apply for the available job opportunities on time. This is mainly applicable to unskilled and semi-skilled workers who will be locally sourced.	Prior to and throughout construction and operations	- Meeting minutes. - Percentage of workers employed from the affected communities by skills level. - Percentage of suppliers based in the affected areas.
5.		Employment opportunities will be publicly advertised in appropriate mediums, for example: newspapers, public libraries, Eleme youth forums, Eleme Council of Chiefs and in all relevant languages in a timely manner, to allow fair competition.	Prior to and throughout construction and operations	Evidence of such advertisements.
6.		There will be no requirement for applicants to make payments for applying for, or securing, employment on the Project.	Prior to and throughout construction and operations	Any reports or grievances will be investigated, and corrective actions identified to be addressed and closed.
7.		The Project will develop and implement a program of up-skilling, training and development for workers to assist them in accessing opportunities associated with the Project and in finding work following completion of their contracts.	Prior to and throughout construction and operations	Number of workers who have received training.
8.		The Project will provide training on health and safety and quality standards required by the Project for provision of goods and services to the Project to ensure that local businesses have the opportunity to benefit.	Prior to and throughout construction and operations	Number of workers or companies who have received training.
9.		The Project will review the potential to unbundle contracts to allow a number of small businesses to provide goods and services rather than the supply being monopolised by one larger subcontractor.	Prior to and throughout construction and operations	Number of contracts with small businesses

Management System

10.	Management of Labour and Working Conditions	Labour and Employment Plan and Worker Grievance Mechanism will be implemented. These requirements will also be passed on to any subcontractors. Key issues to be covered by the Human Resource (HR) management will include, but not be limited to the following: • Provision of clear and understandable information regarding rights under national labour and employment law, and any applicable collective agreements, including those related to hours of work, wages, overtime, compensation, etc. • Provision of reasonable working conditions and terms of employment, including measures for working in extreme high temperatures to ensure worker safety. Measures could include rotating staff based outside and shifting working patterns. • Provision of adequate accommodation (where relevant). • Provision of employment, compensation/remuneration and working conditions, including working hours, based on equal opportunity and fair treatment, avoiding discrimination. • Provision of adequate welfare facilities (such as toilets, showers, canteens, smoking areas, prayer areas etc.) on site. • Implementation of a grievance mechanism for the Project workers. • Adoption and implementation of a sexual harassment policy. • Adoption of open attitude towards freedom of association.	Prior to and throughout construction and operations	• Grievances related to labour and working conditions, which breach law or IFC PS2, AfDB OS 2, will be investigated and corrective actions taken • Contracts in place for all workers in line with Nigerian Law, IFC PS2 and AfDB OS 2 • Monitoring and audit of implementation of employment contracts • Maintain grievance register • Freedom of association and right to collective bargaining not prohibited in work rules
11.		• The Project will develop a health and safety programme, which will include risk assessments (such as working at heights, confined space	Prior to and throughout construction and operations	• Grievances related to labour and working conditions, which breach

		machine guarding), work permit systems and a health and safety management system, in line with IFC PS2, including worker performance safety tracking (safety observations) to promote the safety of workers. All workers will receive induction and continuous training regarding this system.		law or IFC PS2, AfDB OS 2 will be investigated and corrective actions taken • Zero fatalities involving workers on site • All LTI and other incidents to be reported, investigated, corrective actions identified and implemented in agreed timeframes • 100% of workers receiving induction and training related to their position
12.		• The Project will employ practices to assist workers in finding subsequent employment by providing useful documents following completion of the construction activities relevant to each Section of the proposed IFF Line 2 Project alignment.	Prior to and throughout construction and operations	• Certificate of Service given to employees upon assignment complete • Documents showing qualifications earned
Subcontractor and Supplier Management				
13.	Management of Suppliers and Subcontractors	• Subcontractor and Supplier Contracts will reference the need to abide by applicable laws, standards and, policies relating to health and safety, labour, and welfare standards.	Prior to and throughout construction and operations	■ Contracts with suppliers and subcontractors will include these requirements. ■ Ongoing monitoring to ensure implementation
14.		• As part of the subcontractor and supplier selection process, the Project will take into consideration performance with regard to worker management, worker rights, health and safety as outlined in Nigerian law, international standards and the Proponent's policies.	Prior to and throughout construction and operations	■ Bidder will be informed of the requirements in the bidding process. ■ Contract with suppliers and subcontractors will include these requirements.

15.		The Project will provide support to subcontractors and suppliers to ensure that labour and working conditions are in line with Nigerian legislation and IFC PS2 through gap analysis, awareness raising and information provision, as necessary.	Prior to and throughout construction and operations	Training provided to subcontractors and suppliers
16.		Regular checks / audits by the Project will be undertaken to ensure the relevant labour laws are adhered to at all times.	Prior to and throughout construction and operations	- Audit reports of all subcontractors and suppliers - Corrective actions identified and closed out in the time required
Workers' Rights				
17.	Protection of Workers' Rights	A Project Policy prohibiting discrimination based on his or her gender, marital status, nationality, ethnicity, age, religion or sexual orientation will be employed.	Prior to and throughout construction and operations	- Percentage of workforce who are women or from other vulnerable groups - Grievances are investigated, monitored and tracked from workers or job seekers related to discrimination
18.		All workers (including those of subcontractors) will, as part of their induction, receive training on worker rights and responsibilities in line with Nigerian legislation.	Prior to and throughout construction and operations	100% of workers go through induction, which includes training on their rights and responsibilities - Workers being able to describe their rights as part of ongoing monitoring
19.		Every Project employee will receive clearly stated terms and conditions of employment. Employment contracts will be aligned with Nigerian labour law, the ILO core conventions and the requirements of IFC PS2. Contracts will be verbally explained to all workers where this is necessary to ensure that workers understand their rights.	Prior to and throughout construction and operations	100% of workers having contracts in line with Nigerian Law, AfDB OS 2 and IFC PS2 100% of workers having received training on their rights - Workers being able to describe their

		Worker condition requirements will be flowed down as appropriate to subcontractors and suppliers in their contracts.		- employment terms as part of ongoing monitoring - Tracking of grievances related to employment conditions
20.		The Project will put in place a worker grievance mechanism that will be accessible to all workers. The worker grievance mechanism will be open to the Contractor and the Subcontractor workforce in the event that their grievance is not adequately resolved by their direct employer. The Contractor would then seek to resolve this grievance.	Mechanism in place prior to construction; program active throughout construction and operations.	- Percentage of grievances received by direct employees, subcontractors and suppliers and resolved in agreed timeframes - Percentage of grievances received on a theme
21.		All workers (including those of the Contractors and their Subcontractors) will have access to training on communicable diseases, including HIV/AIDS, tuberculosis, malaria and other locally relevant public health risks.	Prior to and throughout construction and operations	100% of workers having received induction training - Percentage of workers having received training every other month
22.		Accommodation will be provided to workers in accordance with international good practice on workers' accommodation, including IFC / WB standards to prevent transmission of diseases associated with poor living conditions or commensurate/compensatory allowances to be paid for housing.	Prior to and throughout construction and operations	- Monthly inspections showing no breaches of requirements - Grievances or issues related to accommodation raised by workers to be closed out in targeted time frame
23.		The Project will undertake surveillance aimed at ensuring that no children or forced labour is employed directly, and to the extent possible by third parties related to the Project and primary suppliers where such risk may exist.	Prior to and throughout construction	Zero cases of forced or child labour found in direct employees, subcontractors or suppliers
AfDB OS2 / Category 1 Labour Measures				
	Gender Equality and Inclusion	Apply non-discriminatory recruitment, pay and promotion; set targets for the participation of women in the construction and operational workforce and in training.	Prior to and throughout construction and operation	- women in workforce and training - Gender-disaggregated workforce data reported half yearly

		• Provide separate, lockable sanitation and changing facilities, appropriate PPE for women, and maternity protection in line with the Labour Act.		
	SEA/SH Prevention	• All workers receive GBV/SEA/SH training (Section 4.7.5). • Appoint trained GBV focal points; operate a confidential reporting channel with referral pathways; apply survivor-centred case management and disciplinary measures.	Throughout construction and operation	• workers trained and signed Code of Conduct • 100% of reported cases handled through survivor-centred procedures
	Vulnerable Groups Inclusion	• Ensure equitable access to employment and training for vulnerable groups identified in the Vulnerable Groups Analysis (e.g. youth, women-headed households, persons with disabilities), including reasonable accommodation. • Protect young workers (18–21) from hazardous night work and excessive overtime, and protect migrant workers from recruitment-fee charges.	Throughout construction and operation	• vulnerable-group members employed/trained • Zero recruitment fees charged to workers
	Labour Monitoring and Reporting	• Contractors submit labour reports (workforce numbers by origin and gender, hours and overtime, wages paid on time, accommodation, grievances and incidents). • IFF conducts half-yearly labour audits (including payroll, contracts, age verification and accommodation) and reports results to the lenders.	Monthly reporting; quarterly audits	• contractor reports received on time • Audit non-conformances closed within agreed timeframes

7.4.3 COMMUNITY HEALTH AND SAFETY

7.4.3.1 OBJECTIVES

The Project is committed to ensuring the health, safety and security of all stakeholders who are affected by its activities including local communities and the broader public. Specifically, this plan aims to:

- Continuously identify, evaluate, and prioritise the risks and impacts of proposed activities on the health, safety, and security of local communities.
- Proactively prevent and avoid impacts to community health, safety, and security, and enhance any positive impacts related to community health and safety.
- Identify strategies that will support provision of adequate health related information and prevention measures through which communities can manage their own health and safety.
- Implement security that protects Project employees, assets and business continuity in a manner that adheres to Nigerian legislation and is consistent with the Voluntary Principles on Security and Human Rights (VPs).
- Avoid or minimise for the potential for community exposure to communicable and vector-borne diseases as well as accidents and injuries associated with site trespass and road traffic movements.

This management plan reflects the ESIA finding that community health and safety risks arise particularly during the construction phase through labour influx, communicable disease exposure, traffic movements, and community interaction with work sites, while operational risks relate to routine industrial hazards, emergencies, and traffic/product transport.

7.4.3.2 PROJECT ACTIVITIES RESULTING IN COMMUNITY HEALTH AND SAFETY IMPACTS

Project activities that could result in impacts to Community Health, Safety and Security include:

- Interaction between the workforce (particularly non-local workers) and communities.
- Presence of opportunistic job seekers / migrants in communities, who are attracted by potential Project opportunities.
- Management of work site notably hygiene, sanitation, waste management and environmental changes that could lead to the creation of breeding grounds for vectors and facilitate the transmission of diseases.
- Presence of work sites with large machinery and other equipment/ supplies that could result in accidents and injuries in case members of the public access the site.
- Movement of Project related traffic during construction.

7.4.3.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring implementation of the community health, safety, and security management system throughout the life of the Project. During construction, field implementation of the health, safety and security management controls will be managed and executed by the Contractor. Other parties, such as the Engineer, will also assume certain responsibilities in the design of the road (e.g., safety controls) in this regard which are detailed below.

7.4.3.4 PERFORMANCE CRITERIA

- Submit annual analysis and report on Vector borne and sexually transmitted diseases
- No outbreaks of diseases created by construction activities.
- Take preventative measures to avoid road traffic or site-based accidents during construction involving community members or assets created by Project activities.
- Take preventative measures to avoid incidents of use of excessive force by security personnel.
- No reduction in access to health care facilities for communities created by the Project.

The health and safety measures set out below should be read together with the Emergency Response Management Plan and Traffic Management Plan, and monitoring and incident reporting requirements should be addressed in Chapter 8.

7.4.3.5 MANAGEMENT MEASURES

The management measures included in Table 7-17 will be implemented to reduce community health safety and security related impacts from the Project.

TABLE 7-17 COMMUNITY HEALTH SAFETY AND SECURITY

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target / Performance Indicator
Vector Borne and Communicable Diseases				
1.	Prevention of Transmission of Vector Borne and Communicable Diseases	Project will put in place measures for creating awareness for vector borne diseases amongst workers through e-bulletins, posters, signages.	Throughout construction	100% of workers receiving training
2.		In the event of a new disease in an area, significant increase in transmission compared to the baseline or outbreak, the Project will interact with local health care facilities and health workers to ensure there is an appropriate response in place. This may involve community education and awareness, training of health care workers etc. depending on the situation. Report to Nigeria Ministry of Health and international Centre for Disease Control and Prevention (CDC) as per legal obligation to report certain disease profiles and outbreaks.	Throughout construction and operations	Response plans in place to address disease outbreaks
3.		A Worker Code of Conduct will be developed providing a code of behaviour including worker-worker interactions, worker-community interactions, and development of personal relationships with members of the local communities. This would apply to all Project workers and visitors to any Construction Sites.	Throughout construction	100% of workers received training - Construction design and operation to standards, confirmed in site inspection reports and periodic audits
4.		Accommodation will be provided to workers in accordance with international good practice on workers' accommodation, including IFC / WB standards to prevent transmission of diseases associated with poor living conditions or commensurate/compensatory allowances to be paid for housing.	Prior to and throughout construction	Construction design and operation to standards, confirmed in site inspection reports and periodic audits
5.		At worker accommodation and sites, the following will be implemented at a minimum in order to minimise disease transmission:	Throughout construction	Construction design and operation to standards, confirmed in site

	• Providing workers with appropriate sanitary facilities, which are appropriately designed to prevent contamination. • Developing a robust waste handling system to avoid the creation of new vector breeding grounds or attracting rodents to the area. • Implementing measures to reduce the presence of standing water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds. • Ensuring the accommodation is kept clean and free from any accumulation of wastes as well as supplied with clean potable water. • Ensuring appropriate food preparation and monitoring measures are in place. Conduct regular assessments of food handlers, kitchens fridges and freezers. • Provide for fumigation / mosquito repellents in the residential areas. • Monitoring to ensure that all standards are being met by the relevant departments.		inspection reports and periodic audits
6.	• The workforce will be provided with access to treatment at health facilities on site. The requirements for these health facilities will be based on a risk assessment taking into account access to existing health facilities and travel time to facilities that offer international standards of care. Access to health care will include direct employees, contractors and subcontractors working or based on site.	Prior to construction and throughout operations	• Construction design and operation to standards, confirmed in site inspection reports and periodic audits
7.	• Pre-employment screening will take place prior to mobilisation. The screening protocols will consider health conditions related to the nature of the work undertaken, employee country of origin and legal requirements.	Prior to construction and throughout	• 100% of workers having received pre-employment screening
8.	• The Project will ensure adequate health facility for diagnosis and treatment of vector borne diseases.	Prior to construction and throughout	• Construction design and operation to standards, confirmed in site

			construction operations	and	inspection reports and periodic audits
9.		Project will ensure adequate health facility for diagnosis, referrals, and treatment of TB.	Prior to construction operations	and	Compliance with measures in plan
10.		The Project will monitor the emergence of major pandemics through CDC and World Health Organisation (WHO) alerts and in the event of a pandemic review mobilisation and demobilisation of ex-patriate Project personnel and / or implement appropriate control measures and Emergency Response Plans.	Throughout construction operations	and	ERP in place and implemented as needed
Sexually Transmitted Infections					
11.	Prevention of Transmission of Sexually Transmitted Diseases	Project will manage Information, education, and communication (IEC) amongst site staff and workers with regards to STIs, STDs and HIV / AIDS. The plan should include, among other things, the following measures: - Awareness campaign through e-bulleting, posters and signages on HIV / AIDS STIs and STDs; awareness campaign will include avoidance behaviours, use of protections etc. - Encouragement of employees to determine their HIV status - Development of a comprehensive Construction Camp Management Plan, including rules for on-site behaviour, entrance and exit policies and prohibition of sex workers on site.	Prior to construction operations	and	IEC activities implement every other month with all Site Staff and immediate local communities
12.		As part of the IEC campaigns, information will be provided to workers on STI prevalence rates in Nigeria and/ or the relevant Counties, safe sexual practices and transmission of STIs, as well as the expectations of local communities if a woman becomes pregnant due to sexual activities with an contractor worker or employee (e.g. marriage, financial implications etc.).	Prior to construction operations	and	100% of workers receiving training

13.		Workers will have access to confidential health care for the treatment of STDs through medical facilities/ health care at Project sites.	Throughout construction operations and	100% of workers with knowledge about access to treatment
14.		If required, the Project will partner with other NGOs and CBOs to support the provision of information, education and communication campaigns around safe sexual practices and transmission of STDs. These activities will be targeted to address the drivers associated with the construction supply chain.	Throughout construction	Partnerships in place at high-risk locations
15.		A Grievance Mechanism will be implemented, whereby affected people can raise issues and concerns associated with social vices, prostitution and the behaviour of workers and drivers. As part of the Grievance Mechanism KPIs for grievance resolution will be established which may vary between the Sections to reflect local issues and concerns.	Throughout construction operations and	- Percentage of grievances received about social vices - Percentage of grievances resolved within agreed timelines

Construction Traffic Movements

16.	Prevention of construction traffic accidents	A Traffic Management Plan will be developed and implemented including consideration of: - Safe worksite layouts - Delivery routes to and from the Project Area considering community safety as well as traffic impacts. - Vehicle safety equipment standards (e.g., seat belts and first aid kits) - Driving rules (e.g., speed limits, hours of driving, required breaks, carrying passengers and use of mobile phones/ radios) - Driver qualifications and selection (e.g., defensive driving courses, accident history and 'practical' interviews to test skills); - Driver education and training (awareness raising, information on required standards and review of incidents)	Prior to and throughout construction	Plan prepared and available for review prior to construction, compliance assessed in site inspection reports and periodic audits
-----	--	--	--------------------------------------	--

	• Vehicle inspection and maintenance (in line with manufacture requirements for vehicle roadworthiness and Project standards) ■ Accident/ incident reporting and investigation; and ■ Disciplinary procedures.		
17.	The Project will ensure that all driver candidates meet specific requirements, including but not limited to: • Possessing a valid licence to drive each type/class of vehicle required; • Sufficient driving experience; • An incident-free driving record; • Pass an eye chart exam; and • Attend and complete the driver safety education and training course. These requirements should not be used as a basis for precluding trainees from accessing employment opportunities.	Prior to and throughout construction	• Employment record, training record, observation
18.	• During the construction phase, arrangements, and routes for unusual/ wide loads (if required) will be agreed in advance with the relevant authorities and the appropriate permit will be obtained for the use of public roads.	Prior to and throughout construction	• Agreements with IFF in place for wide load permits, etc.
19.	• The Project will undertake transport of workers by bus in the safest way possible.	Throughout construction	• Transport Plan prepared and implemented.
20.	• In the event of an incident caused by the Project in which a community member is harmed, the Project should organise transport for the injured person to an appropriate health facility capable of dealing with the injuries and facilitate access to medical treatment.	Throughout construction operations and	• Number of people assisted with treatment
21.	• Traffic incident reporting and investigation procedures will identify corrective measures to reduce the risk of the accident happening again.	Throughout construction	• 100% internal incident investigation closed out in an agreed timeframe

				based on the severity of the accident within 60 days. Where the police etc. are involved, this timeline should be extended accordingly. • Implementation of corrective actions documented.
22.		• A Grievance Mechanism will be developed, whereby affected people can raise issues and concerns associated with vehicle movements, driver behaviours and report accidents or damage to property they feel are caused by Contractor vehicles. As part of the Grievance Mechanism KPIs for grievance resolution will be established which may vary between the Sections to reflect local issues and concerns.	Throughout construction	• Percentage of grievances received about traffic movements. • Percentage of grievances resolved within agreed timeframes
Community Safety and Security				
23.	Protection of Community Safety and Security	• Project security will comply with Nigerian laws and regulations as well as the requirements of the Voluntary Principles for Security and Human Rights. The security will include, among other things, selection of personnel based on a careful background screening, training with regards to human rights requirements, and monitoring of performance. As part of the Grievance Mechanism KPIs for grievance resolution will be established which may vary between the Sections to reflect local issues and concerns.	Throughout construction operations and	• Security personnel recruited in line with the requirements of the Voluntary Principles as evidence by recruiting records • Any use of force to be avoided where possible and in the event of security personnel using force incident investigation should be undertaken to determine if the use of force was reasonable based on the circumstances • Number of grievances received related to the

				behaviour of security personnel
24.		The Project will implement a Security Management Plan containing measures to protect the Project facilities and personnel against potential violent protest or social unrest and to train security personnel in safeguarding of community human rights.	Prior to and throughout construction and operations	100% compliance with measures in plan
25.		High-risk or value elements of construction sites will be fenced to minimise the risk of trespass and robbery. In addition, clear and visible signage will be put in place where appropriate to advise community members of the risk of site trespass in multiple languages	Throughout construction	- Fencing and signage in place - All site trespass and theft will be investigated, and corrective actions implemented
26.		Sensitise local community members prior to the commencement of the construction phase so that they are aware of presence and role of security guards, the risk of site trespass and how to interact with the Project in the event of any concerns or issues.	Prior to and throughout construction	Records of stakeholder engagement meetings
27.		The Project will consult with local community. The consultations will be aimed at finding ways of ensuring trespass and attempted robbery are minimised	Prior to and throughout construction	Records of stakeholder engagement meetings
28.		The Project will develop and implement a grievance mechanism to address any security related grievances.	Throughout construction	- Number of grievances received about security issues - Percentage of grievances resolved within agreed timelines

7.4.3.6 VULNERABLE AND MARGINALISED GROUPS ANALYSIS

The identification and management of vulnerable groups is a key requirement of effective social risk management and community health and safety planning, particularly in the context of increased traffic, industrial activity and potential emergency scenarios. This Vulnerable

Groups Matrix (VGM) has been developed to systematically identify groups that may be disproportionately affected by Project activities, understand the nature and pathways of their exposure, including constraints related to flooding and emergency communication, and define targeted, proportionate measures to ensure equitable access to information, engagement processes, grievance mechanisms, health services and emergency response. The matrix supports a risk-based, differentiated approach to mitigation in line with international lender expectations, ensuring that vulnerable populations are not only consulted, but meaningfully included in Project planning, implementation and adaptive management processes.

TABLE 7-18 VGM ANALYSIS MATRIX

Group	Nature of Vulnerability	Exposure Pathways (incl. flood/emergency constraints)	Targeted Engagement Actions	Grievance Access Measures	Health Outreach Measures	Emergency Response Measures
Low-income households	Limited financial resilience; reliance on informal livelihoods	Proximity to haul routes, limited mobility, limited access to communication channels; higher exposure to flooding in low-lying areas	Community meetings in accessible formats; use of local leaders and languages; tailored disclosure materials	Multiple access points (in-person, phone, community focal points); no-cost grievance submission	Mobile clinics; awareness campaigns on road safety, air/noise risks	Prioritised notification; door-to-door alerts where needed; defined evacuation support
Women (including female-headed households)	Caregiving roles; limited participation in decision-making; heightened safety risks	Restricted mobility; exposure to traffic risks near markets/schools; barriers to receiving emergency information	Gender-sensitive engagement sessions; women-only forums; scheduling aligned with caregiving roles	Confidential grievance channels; inclusion of female liaison officers	Maternal and child health outreach; GBV awareness integration	Inclusion in early warning systems; safe evacuation planning; linkage with protection services
Children and youth	Dependence on adults; higher sensitivity to traffic and environmental risks	Exposure near schools, roads and play areas; limited understanding of hazards; vulnerability during emergencies	School-based awareness programmes; youth engagement campaigns	Teacher/guardian-supported grievance pathways	Child-focused health education (road safety, hygiene, pollution)	School emergency drills; child-specific evacuation procedures

Group	Nature of Vulnerability	Exposure Pathways (incl. flood/emergency constraints)	Targeted Engagement Actions	Grievance Access Measures	Health Outreach Measures	Emergency Response Measures
Elderly persons	Reduced mobility; potential social isolation; health conditions	Difficulty evacuating; limited access to real-time alerts; higher risk during floods/extreme events	Direct outreach through community networks; home visits where feasible	Assisted grievance submission via family/community representatives	Targeted screenings and support for chronic conditions	Priority evacuation support; assisted transport; tailored communication (non-digital)
Persons with disabilities	Mobility, sensory or cognitive limitations; accessibility barriers	Limited access to transport and alerts (visual/audio constraints); dependence on caregivers during emergencies	Inclusive engagement (accessible venues, formats such as braille/audio); stakeholder mapping	Accessible grievance channels (verbal, assisted, visual formats)	Inclusive health outreach; coordination with disability groups	Accessible warning systems; assisted evacuation plans; designated responders
Informal workers (e.g. roadside traders, transport operators)	Income dependence on traffic flows; limited protection	High exposure to road traffic accidents and logistics movements; presence along haul routes	Targeted engagement at markets and transport hubs; flexible timing	Simplified grievance process; on-site grievance contact points	Occupational health and safety awareness	Route management to avoid peak trading periods; temporary relocation support
Migrant workers / non-local populations	Language barriers; weaker social networks; limited awareness of systems	Reduced access to information; potential exclusion from communication channels; high exposure to transport routes	Multilingual communication; targeted induction and awareness sessions	Anonymous and multilingual grievance mechanisms	Workplace health programmes; information dissemination through employers	Inclusion in emergency notification systems; employer-supported evacuation
Communities in flood-prone areas	Geographic exposure to flooding; infrastructure constraints	Flooding may disrupt access routes, communication networks and emergency services	Early engagement on flood risks; participatory planning	Community-based grievance representatives	Public health campaigns on flood-related disease risks	Pre-defined evacuation routes, shelters and early warning integration

Group	Nature of Vulnerability	Exposure Pathways (incl. flood/emergency constraints)	Targeted Engagement Actions	Grievance Access Measures	Health Outreach Measures	Emergency Response Measures
Security-vulnerable groups (e.g. communities near industrial interfaces)	Exposure to cumulative industrial and transport risks	Proximity to high-traffic corridors and industrial activities; constrained movement during emergencies	Coordinated engagement with authorities; transparent communication	Trusted third-party grievance channels	Health awareness on cumulative exposure risks	Coordinated response with authorities; integrated incident communication

7.4.4 CULTURAL HERITAGE MANAGEMENT

7.4.4.1 OBJECTIVES

The objectives of the plan are to:

- Manage the Cultural Heritage in compliance with Nigerian laws and regulations as well as AfDB OS8, IFC PS8 and Good International Practice.
- Minimise the impact of the Project on the Cultural Heritage through the application of the mitigation hierarchy
- Develop tools, such as a Chance Finds Procedure (CFP) to minimize impacts to not yet identified Cultural Heritage that may be discovered during the Project
- Minimize Project delays by detailing out step-by-step processes to dealing with unexpected discoveries through a Chance Finds Procedure.
- Define the Company and Contractor roles and responsibilities for successfully implementing the plan.

The latest ESIA indicates that cultural heritage sensitivities are primarily intangible and associated with community practices and beliefs, and that no significant direct impacts are anticipated within the main Project footprint. Nevertheless, the potential for chance finds and the existence of culturally sensitive areas within the broader area of influence require implementation of the measures below.

7.4.4.2 PROJECT ACTIVITIES RESULTING IN CULTURAL HERITAGE IMPACTS

The primary sources of impact in relation to cultural heritage is during construction and mainly attributed to ground disturbance activities (earthworks).

7.4.4.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the cultural heritage management system throughout life of the Project. During construction, field implementation of cultural heritage controls will be managed and executed by the Contractor. Other parties, such as the Engineer, will also assume certain responsibilities in this regard which are detailed below.

The Local Regulator (National Commission for Museums and Monuments (NCMM)) is the regulatory body in charge of drafting, proposing, monitoring, and controlling the texts regulating and organising the conservation, management and protection of historical cultural heritage.

7.4.4.4 PERFORMANCE CRITERIA

Limiting impact to cultural heritage sites through implementation of the proposed Chance Finds Programme and implementation of the cultural heritage training program.

7.4.4.5 MANAGEMENT MEASURES

The management measures included in Table 7-19 will be implemented to reduce the minor to moderate impacts from the Project.

TABLE 7-19 CULTURAL HERITAGE MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing	Performance Indicator
1	All Project Staff/Contractors Operating in the Field who will be Engaged with Ground Disturbing Activities	The Project will implement a Cultural Heritage tool box briefing for all field staff. The objective of the Cultural Heritage tool box briefing is to manage potential impacts to known and unknown cultural heritage sites by facilitating the identification and reporting of potential Chance Finds encountered during construction works. The programme will consist of training; <i>Chance Finds</i> tool box talks/training for field staff; and the development of reference materials such as fliers, signage, and educational posters to be posted in the Construction Camps and facilities. The plan should cover: • Defining Chance Finds; • Identifying Chance Finds in the field; • Local sensitivity to damage to cultural heritage resources; • Sensitivity of cultural heritage sites to looting and legal penalties for looting or the destruction of cultural heritage sites; • Chance Finds reporting procedures; and • The consultation process with local and national stakeholders and regulatory agencies.	Prior to and throughout construction	• Plan in place and implemented. • Occurrences of impact to sub-surface cultural heritage resources

7.4.5 TRAFFIC MANAGEMENT

The Project shall implement an enhanced Traffic Management Plan aligned with ESIA findings and supported by approved route maps defining designated construction and operational haulage routes linking the Indorama Complex, East–West Road (Akpajo and Okulu Bridge sections), Agbonchia–Oyigbo corridor and site access points, based on surveyed high-volume industrial traffic conditions and peak flow periods. The TMP shall prioritise avoidance and control measures for sensitive receptors along these corridors, including communities, pedestrian areas and traffic pinch points affected by ongoing road rehabilitation and partial carriageway closures, through speed restrictions, controlled access points, buffering distances and traffic marshals at high-risk junctions. Community road-safety interventions shall include signage, awareness campaigns, pedestrian crossings, and coordination with local authorities to manage peak commuter and market-related traffic interactions. Worker transport shall be regulated through mandatory use of approved shuttle systems, licensed drivers, journey management plans, fatigue controls, and prohibition of informal transport, aligned with peak traffic windows identified in the survey (morning and evening peaks typical of an industrial corridor). Protocols for abnormal and oversized loads shall include route risk assessments, escort vehicles, timing restrictions (off-peak or night where appropriate), temporary traffic control measures and stakeholder notification.

During operations, logistics management shall be integrated with existing internal road infrastructure, including dedicated freight lanes, truck staging/parking areas and loading zones within the Indorama complex to minimise off-site congestion and interface risks. Monitoring requirements shall include traffic volumes, incident rates, compliance with designated routes, community complaints and effectiveness of mitigation measures, with adaptive management applied through the ESMS to address evolving traffic conditions and cumulative impacts.

7.4.5.1 OBJECTIVES

The purpose of this plan is to manage and reduce Project-related risks and potential impacts on traffic operations, road condition, and transportation safety risks along affected public roads. Project construction and operation will generate additional traffic, including heavy truck trips, on existing public roads between the proposed IFF Line 2 Project and surrounding areas.

The impact assessment for this plan identified transportation-related impacts in terms of traffic operations (i.e., congestion and delay), degradation of road facilities, and safety risks during both construction phase and the operations phase. Impacts on traffic congestion were found to be moderate due to the impact on the heavily travelled East West Road, while impacts on road condition and safety were found to be minor. This plan presents the recommended strategies and measures to prevent, mitigate, or reduce potential adverse impacts for affected public roads. This plan also describes monitoring and reporting processes, including identification of the performance indicators.'

The ESIA indicates that traffic-related impacts are associated with both construction and operation and include congestion, road safety risks, and localised nuisance effects along the East–West Road, access routes, and the Onne Port corridor.

7.4.5.2 PROJECT ACTIVITIES RESULTING IN TRAFFIC IMPACTS

A new access road to the Indorama Complex is under construction by the Rivers State Government. The new access road would intersect the East West Road approximately 800m east of the Onne Road/East West Road intersection. From the East West Road, the new access road would cross rural land to the east and north of Ogoni, Eleme, and other settlements; cross the Uzaku-Alese Road in a rural area north of Eleme; and enter the Project Area at its southeastern corner. The new access road would be 10.5 km long, constructed of asphalt, and with 2 lanes in each direction and street lighting. Except for the 800m segment east of the Onne Road, the new access road would bypass the heavily travelled East West Road.

The proposed IFF Line 2 Project construction period would require the following Project activities resulting in traffic impacts: approximately 448 daily one-way vehicle trips, including 400 bus trips and 48 truck trips. Many of the truck trips would be oversized loads originating at Onne Port. Most of the construction-related Project equipment movement, oversized loads, and employee buses would use the new access road. The route for other types of shipments (sand, aggregate, other deliveries) would depend upon where the trip originates.

Upon completion of construction, IFF Line 2 operations would increase operational traffic from the Indorama Complex by about 1,000 vehicle trips daily, including about 100 bus trips, 660 passenger vehicles, 200 trips by trucks transporting urea to Onne Port (including the return trip to the Indorama complex), and 40 additional truck trips.

7.4.5.3 RESPONSIBILITY

IFF will have responsibility for implementing the management measures by establishing and continually implementing standards and procedures for its own vehicles and employees and for its Contractors.

The new access road will require a new intersection with the heavily travelled East West Road and increased turning movements at the intersection of the East West Road and Onne Road. IFF is responsible for coordinating with the Rivers State Road authority and the Federal Roads Maintenance Agency to minimize congestion and maximize safety.

Road maintenance and improvement are governed and implemented by the Federal Roads Maintenance Agency (for the East West Road), the Rivers State Road Maintenance and Rehabilitation Agency (for the Onne Road, Uzaku-Alese Road, and other state roads) and the Nigerian Port Authority (for the Federal Ocean Terminal Roadway). This plan recognises that IFF has no direct authority or ability to direct or provide road maintenance and improvements but can advocate and provide guidance for such improvements.

7.4.5.4 PERFORMANCE CRITERIA

Performance criteria are listed in Table 7-20 and include the number of accidents or grievances and volume of spills.

7.4.5.5 MANAGEMENT MEASURES

The management measures included in Table 7-20 below will be implemented to reduce the minor to moderate impacts from the Project.

The traffic management measures below should be implemented through a dedicated Transportation Management Plan / Traffic Management Plan, consistent with ESIA recommendations, and coordinated with relevant authorities where public roads are affected. Monitoring of traffic incidents, grievances, and implementation effectiveness is addressed in Chapter 8

TABLE 7-20 TRAFFIC MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
1	Road Infrastructure Maintenance	- Work with appropriate national and state road authorities to advocate for maintenance of public roads to avoid continued pavement deterioration. - Periodically assess project-related road impacts and communicate findings to relevant road authorities	Provide advocacy at least annually	Road conditions are maintained at or better than pre-construction condition.
2		Maintain the existing Project access road and the proposed new access road in good condition	As needed	Project access roads are in good condition at all times.
3	Traffic Management for Improved Safety and Reduced Road Congestion	Schedule employee shifts and truck deliveries to minimise congestion and conflicts with local traffic at the intersection of the new access road with the Uzaku-Alese Road and East West Road. Avoid truck trips that would cross the Uzaku-Alese Road during time periods when the road is more likely used by school children, school buses or other sensitive receptors.	Maintain schedules daily for ongoing construction or operations; update in response to grievances or other need.	- Traffic management plan and schedule maintained by IFF and available for review. - Number of crashes or other traffic incidents at the intersection of the new access road with Uzaku-Alese Road and East West Road during morning and evening peak hours.
4	Enhanced Safety through Stakeholder Engagement and Education	Maintain (or initiate, where needed) relationships with local stakeholders to understand risks particular to the crossing of the Uzaku-Alese Road by the new access road.	Community / PAC meeting at least 6 months prior to construction;	IFF captures meeting notes and makes them available. Number of crashes or other traffic incidents at the intersection of the new access road with Uzaku-Alese Road during morning and evening peak hours.
5		Provide a grievance mechanism that is easy to access, transparent, and responsive. Accept grievances related to IFF road traffic in writing, electronically, by telephone, or verbally at community stakeholder meetings. Create written record of all grievances submitted verbally.	Ongoing availability during construction and operations; initial response within one week; timely	- Number of grievances received. - IFF maintains records of grievances, initial response, and final resolution or disposition.

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
			resolution or final response	
6	Enhanced Safety through Driver Qualification Standards and Training, both General and Project-specific	• Use only drivers with the required driving license. Enforce driver qualifications and training for all drivers, whether employees or sub-contractors. Include requirements in applicable contracts. • Establish driver training program specific to the vehicles, roads and risks encountered for the particular tasks. • Require regular truck driver safety training, defensive driving training, and testing.	Continual during construction and operations	• Annual verification of all driving licenses for Project drivers. • Provision of driver training to all Project drivers, including at least annual refresher training. • IFF and contractors retain relevant records of licenses and driver training program materials and record of completion for all drivers. • Number of IFF -related road crashes or other incidents.
7	Enhanced Safety through Consistent safe Driving Practices	• Establish and enforce rest and break standards that comply with industry and national standards. • Structure contracts with truck contractors to avoid incentives for speeding or insufficient fatigue break • To the degree permissible by law, require daily or periodic drug and alcohol testing for all drivers. • Equip trucks with speed governors or on-board GPS, and/or monitor vehicle speed and location. • To the agree allowed by law, enforce driver quality through loss of jobs or contracts for individual drivers for drug or alcohol offenses, chronic or egregious speeding, or other notable or repeated unsafe behaviours.	Continual during construction and operations	• IFF and contractors provide all drivers with written policies, and require drivers to sign agreement, indicating rest and break standards, drug and alcohol standards, and speeding; managers implement ongoing enforcement of policies. • IFF contracts prioritise safe driver practices. • Daily or periodic drug and alcohol testing (to the degree allowed by law). • Use of speed governors, GPS, or other monitoring efforts. • Number of IFF -related road crashes or other incidents.

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
8	Vehicles in Good Condition and Safe to Operate on Public Roads	- Require scheduled, preventative vehicle maintenance according to manufacturers' recommendations for all Project vehicles, whether owned by Project or a contractor - Require completion of a vehicle safety checklist daily prior to vehicle operation on public roads	Periodic during construction and operations	- Establishment of regular schedule for vehicle preventive maintenance. - Documented completion of scheduled maintenance. - IFF and contractor managers require completion of vehicle safety checklist by each driver daily prior to vehicle operation. - IFF retains completed checklists for one year.
9	Driver Communication in Case of Emergencies	- Provide uniform in-vehicle communications systems that enable contact with truck traffic controllers and other drivers - Road emergency response procedure for incidents involving Project vehicles (including vehicles carrying ammonia, urea or other hazardous materials): drivers stop, secure the scene and raise the alarm; notify the IFF Emergency Control Centre, FRSC, police and fire services; deploy on-board spill kits and emergency information (SDS, Tremcard); and cordon off and warn road users and nearby residents. IFF/contractor emergency teams respond and coordinate with the authorities, and the incident is investigated and reported (Section 6.4.4).	Continual during construction and operations	IFF and contractors provide (or require, for independent truck operators) and ensure proper operation of in-vehicle communication systems.
10	Noise Impact Reduction	Require that noise-control devices be in good operating condition.	Continual during construction and operations	IFF and contractors provide (or require, for independent truck operators) and ensure proper operation of noise-controlling devices.
11	Prevention of Nuisance and Visibility	Wash all trucks leaving the Project site using a dedicated wash station where water can be continually recycled.	Throughout construction	IFF or contractors provide wash station at construction site; require truck washing prior to leaving Project site.

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target / Performance Indicator
	Hazard from Airborne Dust or Dirt on Roads			
12	Prevention of Hazard and Nuisance from Truck Spills	Securely cover loads on trucks to minimise spillage and dust.	Throughout construction and operations	- IFF and contractors develop and enforce policies requiring truckload covers. - Record of all spill incidents from IFF and contractor vehicles.
13		Do not overload trucks	Throughout construction and operations	- IFF and contractors develop and enforce policies prohibiting truck overloading. - Record of all spill incidents from IFF and contractor vehicles.

7.4.6 SECURITY MANAGEMENT PLAN AND VPSHR PROCEDURE

The Project shall establish and implement a Security Management Plan (SMP) aligned with the Voluntary Principles on Security and Human Rights (VPSHR), IFC Performance Standards (notably PS1 and PS4), and applicable national legislation. The SMP addresses security-related risks identified in the ESIA, including potential impacts on workers, nearby communities, transport corridors, and other off-site receptors associated with increased industrial activity, workforce presence, and asset protection requirements.

The SMP shall be implemented as a controlled ESMS procedure, following the Plan–Do–Check–Act cycle. It shall integrate with the Community Health and Safety Plan, Emergency Response Plan (ERP), Stakeholder Engagement Plan (SEP), and Grievance Mechanism, ensuring that security risks are managed in a transparent, proportionate, and accountable manner.

7.4.6.1 OBJECTIVE

To ensure that all Project-related security arrangements:

- Protect personnel, assets and operations
- Avoid or minimise adverse impacts on communities and off-site receptors
- Are conducted in compliance with VPSHR and international good industry practice
- Promote respectful, lawful and proportionate interaction with stakeholders
- including off-site receptors.

7.4.6.2 PROJECT ACTIVITIES RESULTING IN IMPACT

- Interaction between security personnel and local communities
- Establishment of perimeter security, access control and surveillance systems
- Deployment of private security personnel and engagement with public security forces
- Security management along access roads and transport routes
- Response to security incidents, protests, labour unrest or unauthorised access
- Security support during emergency situations, including ERP activation
- Emergency response and coordination with authorities
- Protection of assets during construction and operation

7.4.6.3 RESPONSIBILITY

- Proponent (Client): Accountable for SMP implementation, VPSHR compliance and oversight of all security arrangements
- Security Manager (Client): Implementation of SMP, contractor management, reporting and performance tracking
- Security Contractor / Subcontractor: Execution of day-to-day security operations in accordance with SMP and Code of Conduct
- EHS Manager: Integration with ESMS, monitoring, auditing and reporting

- Community Relation Officer (CRO): Management of community interface, communication and grievance handling
- Public Security Forces (where applicable): Operate under agreed protocols consistent with VPSHR principles

7.4.6.4 PERFORMANCE CRITERIA

- 100% compliance with VPSHR principles and Project Code of Conduct
- Zero substantiated incidents of excessive or inappropriate use of force
- All security personnel trained prior to deployment and annually thereafter
- All complaints and incidents recorded, investigated and closed within defined timeframes
- Evidence of coordination with public authorities and community stakeholders

TABLE 7-21 SECURITY MANAGEMENT

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
1	Site access control during construction	Establish controlled access points with security personnel, fencing, and access registers for all personnel and visitors	Pre-construction establishment; continuous during construction	100% of site access points controlled and monitored; access logs maintained
2	Unauthorised entry to site	Install perimeter fencing and signage indicating restricted access	Pre-construction; maintained throughout project lifecycle	No unauthorised access incidents recorded
3	Workforce and visitor verification	Implement ID badge system and visitor sign-in procedures	Continuous throughout construction and operation	100% personnel identifiable on site at all times
4	Security personnel conduct	Train security staff in code of conduct, human rights, and community interaction protocols (aligned with IFC PS4)	Prior to deployment; refresher training bi-annually	No recorded incidents of misconduct; training records available
5	Community interactions with security	Develop and implement a grievance mechanism related to security behaviour	Pre-construction; operational throughout project	All grievances logged and resolved within defined timeframe (e.g. 30 days)
6	Use of force by security personnel	Apply proportional use-of-force procedures and prohibit excessive force	Continuous	Zero incidents of excessive force reported
7	Theft and vandalism of materials and equipment	Implement asset tracking, secure storage areas, and night-time surveillance (e.g. lighting, patrols, CCTV where applicable)	Construction and operation phases	Zero or minimal theft incidents; incident reports maintained
8	Emergency security incidents (e.g. breach, violence)	Develop and implement Security Emergency Response Plan including communication protocols with local authorities	Pre-construction; annually tested	Emergency response drills conducted; response times within acceptable limits
9	Traffic-related security risks at site access	Deploy security personnel to coordinate with traffic management at access points	During peak construction activities	No security-related traffic incidents at site access points

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
10	Community safety risks arising from project	Maintain visible but non-intimidating security presence and avoid use of armed personnel unless justified by risk assessment	Continuous	No community complaints regarding intimidation or unsafe security practices
11	Contractor security management	Require contractors to comply with Security Management Plan and include clauses in contracts	Pre-construction and procurement phase; ongoing monitoring	100% contractor compliance verified through audits
12	Security audits and inspections	Conduct regular internal audits of security systems, personnel, and procedures	Quarterly during construction; annually during operation	Audit reports completed; corrective actions closed within specified timeframe
13	Incident reporting and recording	Maintain security incident register and reporting protocol	Continuous	100% of incidents recorded and investigated
14	Lighting for site security	Install adequate lighting around perimeter, access points, and high-risk areas	Construction and operation phases; maintained regularly	Zero incidents attributable to poor visibility
15	Coordination with local law enforcement	Establish communication and cooperation mechanisms with local police and emergency services	Pre-construction; ongoing engagement	Evidence of coordination meetings and contact protocols

7.5 GENERAL MANAGEMENT

7.5.1 WASTE MANAGEMENT (DURING THE CONSTRUCTION PHASE)

7.5.1.1 OBJECTIVES

The objectives for waste management are:

- To ensure that the waste strategy for the proposed IFF Line 2 Project complies with the Nigerian legislative requirements and all applicable permit conditions, regulatory requirements, and Project commitments.
- To ensure alignment with the good practice requirements set out in the IFC Performance Standards and IFC Environmental, Health and Safety Guidelines and the African Development Bank Integrated Safeguards System (ISS) requirements.
- Identify high level waste streams associated with the construction phase of the proposed IFF Line 2 Project and periodically review waste streams throughout the Project lifecycle to identify opportunities for waste reduction, reuse, recycling, and improved resource efficiency.
- Categorise anticipated waste streams and ensure that the waste management hierarchy model is adopted for waste management, i.e., to **REDUCE** the amount of waste produced on site by procuring bulk goods rather than packaged goods and training workers on waste reductions, and to actively promote the **REUSE**, **RECYCLE** and **RECLAIM** waste management concept and subsequently minimising the amount of waste that needs to be disposed of.
- To ensure the end use of waste is as per its waste category assigned and that all waste is handled, transported, treated, recycled, recovered, and disposed of by appropriately licensed and authorised service providers.
- To prevent and protect soil; surface water and groundwater from contamination through hazardous substance (including sewage) spills.
- To prevent and protect flora, fauna and people from indirect impacts associated with contaminated soil and water (both surface- and groundwater).
- To prevent health impacts arising via contact with general and/ or hazardous waste.
- To manage waste storage facilities in such a manner to minimise social as well as visual impacts.
- To ensure that hazardous wastes are identified, segregated, labelled, stored, transported, treated and disposed of in accordance with legal requirements and good international industry practice.
- To establish waste monitoring, reporting, auditing and corrective action processes that support continual improvement in waste management performance.
- To maintain a documented waste inventory and tracking (consignment note) system recording waste generation, storage, transport, recycling, recovery, treatment and final disposal.

- To prevent adverse impacts on communities, ecosystem services, biodiversity and sensitive habitats arising from Project waste management activities.

The ESIA confirms that construction waste streams include both hazardous and non-hazardous wastes and that operational wastes will be integrated into the broader Indorama complex waste management system. This management plan therefore focuses on construction-phase waste controls, while operational waste should be managed under updated site-wide waste procedures.

7.5.1.2 PROJECT ACTIVITIES RESULTING IN WASTE

Waste generated from Project activities can be categorised as non-hazardous or hazardous according to their types and associated risks. The definitions of waste categories are as follows:

- **Non-hazardous Wastes** – wastes that do not exhibit any hazardous properties and are relatively low risk to human health and the environment. This category would include a range of materials that may be recycled or can safely be disposed of in a landfill.
- **Hazardous Wastes** – wastes that exhibit one or more characteristics which mean that the wastes are potentially harmful to human health and/or can cause damage to the environment (air, land, and/or water) or natural ecosystems. For example, the waste may be corrosive, reactive, toxic, mutagenic, teratogenic, infectious, carcinogenic, ecotoxic, flammable, or explosive.

Waste types and estimated quantities during the construction phase are shown in Table 7-22. The duration of construction activities up to mechanical completion is estimated at approximately 32 to 33 months.

TABLE 7-22 WASTE TYPES AND ESTIMATED QUANTITIES DURING THE CONSTRUCTION PHASE

Activity	Description	Waste Category	Quantity	Destination
Site preparation / Foundations	Cement / concrete – concrete debris, soil containing cement	Non-hazardous	3000-3500 ton/year	Land fill
	Scrap metal / wire – strips of metal, metal supports, pieces of wire	Non-hazardous	200-500 ton/year	Resale
Construction activities	Scrap plastic / PVC	Non-hazardous	20-30 ton/year	Recycle
Maintenance operations	Paints and solvents – traces of paint, solvents, etc.	Hazardous	0.3-0.5 ton/year	Approved waste management facility
	Light bulbs, fluorescent light fittings; Equipment which can contain traces of neon and tungsten	Hazardous	0.2 ton/year	Approved waste management facility

Activity	Description	Waste Category	Quantity	Destination
Personal Protective Equipment (PPE) from work activities	Used PPE – goggles, gloves, etc.	Hazardous	5 ton/year	Existing Incinerator or Approved waste management facility
Lube oil and seal flushing of machinery skid (Pre-Commissioning phase)	Lube and seal oil – oil containing weld splatter, chips, welding flux deposits, powdered metal oxides	Hazardous	1.3-1.8 ton/year	Approved waste management facility
Camps, kitchen, offices operations	Cooking organic wastes	Non-hazardous	10-20 ton/year	Municipal/Approved dump side
	Mixed urban wastes	Non-hazardous	150-200 ton/year	Municipal/Approved dump side
	Medical wastes	Hazardous	0.05-0.10 ton / year	Existing Incinerator
	Wastewaters (drinking, washing, shower, sanitary)	Hazardous	150 lt/day per worker	New STP

Note - during the operational phase, wastes contributed by the proposed IFF Line 2 Project will form part of the existing waste management system associated with the existing IEPL and IFZ operations. To this end, IFF will update their Waste Management Plan to accommodate operational aspects of the Project.

7.5.1.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring the waste management systems are implemented and aligned with the requirements under Nigerian Law. During construction, field implementation and management/storage/disposal of construction wastes are the responsibility of the Contractor. Other parties, such as the Engineer, will also assume certain responsibilities in this regard which are detailed below.

7.5.1.4 PERFORMANCE CRITERIA

- Zero incidents of illegal dumping of wastes, both general and hazardous.
- Zero discharge of raw sewage directly into the environment
- No unauthorised access to the waste storage facilities.
- No loss of health to personnel or third parties as a result on inappropriate waste management practices.
- All waste disposal to be carried out by a licensed waste contractor per the Nigerian legislated requirements.

7.5.1.5 MANAGEMENT MEASURES

The management measures included in Table 7-22 will be implemented to reduce waste related impacts from the Project.

TABLE 7-23 WASTE MANAGEMENT (DURING THE CONSTRUCTION PHASE)

Ref No.	Aspect Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
Waste Management Method Statements				
1.	Waste Management Procedure	Waste Management Procedure shall be prepared covering all waste expected to be generate during construction. The Waste Management Procedure will need to include methods associated with waste handling; waste transport; waste storage and segregation; and waste disposal / treatment / recycling / reclamation options identified for the proposed IFF Line 2 Project.	Prior to construction	Waste Management Procedure
Waste Handling				
2.	Waste Segregation	Waste will be segregated according to its composition, source, and type at source and contained in appropriately labelled and/or colour coded waste containers or waste skips.	Throughout construction	Proper segregation of waste in appropriately labelled waste containers
3.	Waste Containers	Appropriately labelled bins will be located in all locations onsite where waste is generated and will make provision for the sorting of solid waste.	Throughout construction	Adequate number of bins
4.		All bulk waste containers on site (skips, bins, drums etc.) shall be appropriately labelled to show what class and type of waste can be disposed of in them.	Throughout construction	Appropriately labelled waste containers
5.		Waste containers will be appropriately designed in terms of volume, composition, and shape. Containers that may react with the waste to produce a harmful substance will not be used. All waste containers will be secured to prevent spillage and interference from birds and animals.	Throughout construction	Provision of adequate waste containers
6.		Only one class or type of waste will be stored in each container.	Throughout construction	Waste separation
7.		All waste containers will be closed with a lid and kept at designated area.	Throughout construction	Enclosed waste containers in accessed controlled area

8.	Mixing of Wastes	Solid and liquid wastes will not be mixed.	Throughout construction	Segregation of solid and liquid wastes
9.	Waste Handling and Training	All waste will be handled in accordance with its class (hazardous or non-hazardous) and personnel collecting, handling, transporting, or disposing of waste will be trained in the proper procedures for dealing with the said waste class.	Throughout construction	Training records
10.	Waste Management	To promote "4Rs" (Reduce, Reuse, Recycle and Reclaim) waste management concept, all waste will be sorted and managed as appropriate, either for reuse, recycling, or disposal.	Throughout construction	Waste logs
11.	Wastewater (including sewage)	All wastewater (including sewage) will be treated onsite and treated wastewater discharge will be in compliance with the ambient water quality criteria for the area where discharge will take place.	Throughout construction	As per Section 7.2.6 on Surface Water management
12.	Concrete Waste Management	A concrete washing area will be set aside for concrete trucks, to avoid build-up of waste concrete in site areas.	Throughout construction	Concrete washing area. No build-up of waste concrete on site
13.	Vehicular Repair and Maintenance	Vehicle repair and maintenance pits will be regularly cleaned, and any liquid build-up will be removed and treated as necessary.	Throughout construction	No build-up of liquids
Waste Transport				
14.	Transport Containers	The nature, composition and integrity of transport packaging and containers will be appropriate to the type and class of waste being transported.	Throughout construction	Designated waste transport vehicles
15.	Transport Vehicles	Transport vehicles will cater for the type, class and quantity of waste being transported in terms of its composition, load capacity, covering etc.	Throughout construction	
16.		All transport vehicles will be equipped with suitable materials or equipment to contain, manage, and remove accidental spillages.	Throughout construction	
17.		Vehicles carrying hazardous wastes shall be labelled appropriately.	Throughout construction	Labelling of waste trucks
18.	Waste Loading and Unloading	Loading and unloading as per waste management procedure procedures to avoid waste loss will be followed.	Throughout construction	Training records, site inspection

19.	Training	Employees associated with transport of waste will be trained in the correct procedure to address accidents and emergencies.	Throughout construction	Training records
Waste Storage and Segregation for Non-hazardous Waste				
20.	Waste Segregation	Non-hazardous waste will be segregated into specific waste types, for those waste types that can either be recycled, reused, or reclaimed.	Throughout construction	Waste segregation
21.	Waste Storage Areas	Separate storage areas will be constructed and utilised where appropriate. Separate storage areas will be appropriately designated and labelled.	Prior to construction	Waste segregation
22.	Mixing of Wastes	If by error a hazardous waste is mixed with non-hazardous waste, the entire consignment will be regarded as hazardous.	Throughout construction	Operating procedure and waste management records
Waste Storage and Segregation for Hazardous Waste				
23.	Waste Storage Areas	Temporary hazardous waste storage facilities at the main waste handling facility will be appropriately designed to prevent any contamination of the physical, biological, and social environments.	Prior to construction	Provision of adequate hazardous waste storage facilities
24.		Where appropriate, hazardous waste will be stored in sealed containers and placed in a fenced and gated storage facility within the main waste handling facility. The facility will have an impermeable floor, bunded and be covered to prevent rain from entering.	Throughout construction	
25.	Hazardous Waste Storage Duration	Hazardous waste will be temporarily stored before being collected by an authorised contractor for removal and offsite disposal, in an accredited facility. Removal of hazardous waste from site will follow a regular schedule (frequency to be determined). In this respect, the Contractor will adopt the 'cradle to grave' principle. Tracking documents, proving that the disposal of hazardous wastes has been delivered to an accredited facility, and disposed of in such a facility, correctly, will be	Throughout construction	Record of up-to-date tracking documents

		retained by the Project for audit and verification purposes.		
26.	Sewage	Treated sewage will conform to recognised sewage effluent standards before discharge into the environment.	Throughout construction	
Disposal / Treatment / Recycling / Reclamation				
27.	Auditing Waste Contractors	The Project will audit waste contractors prior to agreeing any formal contracts and will ensure that all facilities that receive wastes from the proposed IFF Line 2 Project are suitable and in line with the Nigeria National policy on Solid Waste Management 2020 and IFC EHS General Guideline for Waste management (1.6). Waste contractors will need to keep detailed records on how waste from the Project has been disposed, or a facility as approved by respective authority.	Prior to construction	Audit records
28.	Removal of Waste	All remaining waste including (but not limited to) used materials, broken concrete, redundant fencing, fence posts, and litter will be removed when construction sites are closed. Waste will not be buried within the protected areas.	At the end of the construction phase for a specific section of the proposed IFF Line 2 Project	Audit records
Biodiversity and Community Protection				
29.	Biodiversity and Community Protection	Site waste storage and transfer areas away from drainage lines, wetlands and community boundaries; cover skips to prevent wind-blown litter and scavenging by fauna; daily litter picks along the perimeter and haul routes; no open burning or burial of waste; audit receiving facilities to confirm they do not create off-site impacts on communities or habitats.	Throughout construction	Zero waste-related community grievances unresolved; no waste found outside designated areas

7.5.2 SPILL PREVENTION, CONTROL AND CONTAINMENT MANAGEMENT PLAN (DURING THE CONSTRUCTION PHASE)

7.5.2.1 OBJECTIVES

The objectives for spill prevention, control and containment management are:

- Protect the environment and community members who are dependent on its natural resources through the development of spill response and containment strategies and capabilities.
- Identify the sources of potential land contamination associated with construction activities.
- Categorise potential spill hazards.
- Plan for rapid and efficient response to manage hazardous material spills during construction.
- Identify and document management measures to prevent, control and mitigate spill events during construction.

This management plan supports the ESIA findings for soils, groundwater, surface water, and biodiversity, all of which identify spills and leaks as key pathways for environmental impact during construction.

7.5.2.2 PROJECT ACTIVITIES RESULTING IN SPILLAGE IMPACTS

During the construction phase of the proposed IFF Line 2, dangerous or hazardous chemicals may accidentally be released into the environment in the form of small spills or a major unplanned event (e.g., oil tanker or cement truck accident). Spillages may occur as a result of leakage of containers used to store or transport the following pollutants:

- Hydrocarbons (including diesel, greases, oils and other lubricants);
- Hazardous chemicals / materials (e.g., paints, batteries, etc.);
- Cement; and
- Effluent.

7.5.2.3 RESPONSIBILITY

IFF, as Project owner, shall assume responsibility for ensuring spill management and prevention requirements are established and implemented on the Project. During construction, field implementation of the spill prevention and management controls will be executed by the Contractor.

7.5.2.4 PERFORMANCE CRITERIA

- No unplanned release of dangerous goods or hazardous substances.
- All transport, storage and handling of dangerous goods or hazardous and dangerous substances is performed in accordance with the materials data sheets for the chemicals and the management measures included in this ESMMP.

7.5.2.5 MANAGEMENT MEASURES

The management measures included in Table 7-23 will be for spill prevention, control, and containment management.

All spills, near misses, and contamination incidents should be recorded, investigated, and used to inform corrective action and continuous improvement in accordance with Chapter 6.

TABLE 7-24 SPILL PREVENTION, CONTROL AND CONTAINMENT MANAGEMENT (DURING THE CONSTRUCTION PHASE)

Ref No.	Aspect Activity	Management Measure	Timing Frequency and	Target / Performance Indicator
Spill Prevention				
1.	Training	• Training regarding proper methods for transporting, transferring, and handling hazardous substances that have the potential to impact surface- and groundwater resources.	Throughout construction	• Training records
2.		• Train personnel with responsibility for hazardous substances. No untrained staff shall be allowed to handle hazardous substances.	Throughout construction	• Training records
3.	General Management	• Concrete batching/mixing shall only take place at agreed specific areas on site and runoff from the batching area will not be allowed to flow into natural streams and watercourses.	Throughout construction	• No concrete batching in non-designated areas
4.		• Provide collection systems (i.e., drip trays or impervious linings) under machinery or stationary equipment that may dispense or leak hydrocarbons / hazardous substances (i.e., generators and pumps).	Throughout construction	• Collection systems in place
5.		• The bulk loading and unloading of hazardous materials and fuels will be confined to areas that are provided with secondary containment and in line with hazardous material handling procedures.	Throughout construction	• Suitably designed areas for loading and offloading
6.		• Maintain an inventory of all dangerous and hazardous goods onsite, together with all relevant Safety Data Sheets (SDS) for all contaminants on-site. These will include human health effects of chemicals handled and will be included in the required chemical environmental and safety training for all employees handling or otherwise exposed to the contaminants. All appropriate personal protective equipment, handling and response procedures will also be identified in the SDS or otherwise recommended by the suppliers / manufacturers and followed by all Project staff.	Throughout construction	• Inventory, SDS, training records and suitable PPE
7.		• Prior to introduction to site, a hazardous material / substance will be reviewed, and proper storage, handling and transportation procedures and spill risk analysis will be established.	Throughout construction	• All procedures in place prior to introduction to site

8.	Transport of Hazardous Materials	Transportation vehicles and tanks suitable for the hazardous materials being transported will be used. These vehicles and tanks will be maintained in adequate condition to ensure proper handling and safety of chemicals.	Throughout construction	Records of all deliveries
9.		Drivers will be trained in spill and emergency response and will have a means of communicating with the site, their administrative offices and emergency personnel for the entire transportation route.	Throughout construction	Provision of training records for drivers
10.	Storage of Hazardous Materials	Segregation of corrosive substances that are kept in bulk from incompatible goods and goods with which they may react dangerously.	Throughout construction	Suitable segregation of goods
11.		Fuel, lubricants / oils, chemicals, hazardous waste and hazardous material stores and handling areas will be provided with secondary containment capable of holding 110% of the largest stored container or 25% of the total volume for all liquids stored in the bunded area. The containment will be checked daily, and debris removed. The storage of such substances shall be maintained away from moving water source or water abstraction source. Further, fuels will be kept away from areas that are at more risk from wildfires (e.g. near dry grasslands).	Throughout construction	Bunding of hazardous stores
12.		Prevent the integrity and capacity of the bunded areas being compromised by rainwater and stormwater ingress.	Throughout construction	Records and visual observations
13.		A preventative maintenance program will be instituted that includes inspection schedules to confirm and maintain the mechanical integrity and operability of storage vessels and associated containment areas and process equipment for fuel, lubricants / oils, chemicals, hazardous waste, and hazardous materials.	Throughout construction	Evidence of maintenance records/inspection reports
14.		Hazardous and dangerous material storage areas will be equipped with emergency spill response and fire prevention equipment.	Throughout construction	Well maintained spill response kits in place at all hazardous and dangerous material storage areas
15.		Hazchem signage used where hazardous goods are being stored, hazardous materials to be clearly labelled and fencing and controlled access to limit unauthorised access.	Throughout construction	Signage and access controls in place

Spill Control and Containment

16.	Method Statement / Procedure	- Method Statements/Procedure detailing spill emergency response and clean-up procedures for spills will be developed. Emergency response measures will also include methods for response and clean-up for release into any natural stream, river, or wetland. - Emergency response procedures will be tested regularly to ensure rapid response to, containment of, and neutralisation of any spillages.	Start construction	of	Method Statements/Procedure
17.	Spills and Clean-up	- Areas where spillage of soil contaminants occurs will be excavated (to the depth of contamination) and suitably rehabilitated. If any other minor spillage occurs, the spillage will be cleaned immediately, and the contaminated area will be rehabilitated. All contaminated material will be suitably disposed of. Clean-up procedures will need to be fully recorded. - Contaminated soil and materials will be managed through the contaminated-soil response pathway (Soil Management table, Ref. 3): immediate containment, delineation by field screening and sampling, excavation to the depth of contamination, treatment on a lined pad or disposal via a licensed hazardous waste contractor with consignment notes, confirmatory sampling against baseline/EGASPIN target values, and backfilling and restoration. - Spill response equipment will be appropriate to the materials stored (e.g. hydrocarbon absorbents and booms; neutralising agents for acids and caustics; water curtains/fog for ammonia), and trained spill responders will be available on each shift.	Throughout construction		Detailed clean-up (incident) records
18.		Spill kits will be provided at any fuel or chemical storage location. Spill kits must be maintained.	Throughout construction		Inspection reports showing well maintained spill response kits in place
19.		Designated and qualified staff designated for responsibility to respond to emergencies.	Throughout construction		Training records
20.		A maintained emergency contact list will be placed at all spill response kit locations.	Throughout construction		Emergency contact list at spill response kit locations
21.		Development, implementation and regular training and testing of a Project wide Spill Response Plan will be implemented.	Throughout construction		Training records

7.5.3 EMERGENCY RESPONSE MANAGEMENT PLAN

7.5.3.1 OBJECTIVES

The overall objective of emergency response management during the construction and operational phases is to ensure that all potential emergency events are identified, prepared for, and effectively managed to minimise risks to human health, the environment, and project infrastructure. A further key objective is to ensure rapid, coordinated, and effective response to incidents, including fires, explosions, chemical releases, gas leaks, and other process-related emergencies, while maintaining clear communication with regulators and affected stakeholders.

Construction and operational activities shall therefore be conducted in a manner that ensures preparedness for emergency situations, effective incident containment, and timely recovery, in compliance with applicable Nigerian legislation, IFC Performance Standards, and WBG EHS Guidelines.

The ESIA confirms that the Project requires emergency preparedness for both construction and operations, including fire, explosion, gas release, flaring/system upsets, major spills, flooding, transport incidents, and hazardous materials events.

7.5.3.2 PROJECT ACTIVITIES RESULTING IN EMERGENCY RISKS

Emergency risks associated with the project arise from activities involving hazardous materials, combustion systems, and high-pressure industrial processes identified in the ESIA. During the construction phase, risks are linked to the storage, handling, and transport of fuels and hazardous substances, operation of heavy machinery, hot works, temporary power generation, and increased traffic movements. These activities may result in incidents such as fires, fuel spills, equipment accidents, and worker injuries. In the operational phase, risks are more significant due to natural gas handling, ammonia and urea production under high pressure and temperature, operation of boilers and turbines, chemical storage, flaring, and waste management systems.

Key emergency risk characteristics include:

- Potential for gas leaks, explosions, fires, major spills, and process failures
- Uncontrolled emissions during flaring events or system upsets
- Risks inherent to combustion systems and high-energy industrial operations
- Increased consequence severity during operations compared to construction
- Direct linkage to ESIA and GHG assessment findings (e.g. process emissions, flaring, and energy systems)

7.5.3.3 RESPONSIBILITY

Indorama Fertilizer FZE (IFF), as the Project Proponent, shall assume overall responsibility for emergency preparedness and response throughout the Project lifecycle. During construction, the Engineering, Procurement and Construction Contractors will be responsible for implementing site-specific emergency response procedures and ensuring workforce preparedness. During operations, the Operations and Maintenance Teams will manage process-related emergencies and ensure the functionality of emergency response systems. The Environmental, Health and Safety (EHS) Manager will oversee emergency planning, training, performance monitoring, and coordination with relevant authorities, ensuring alignment with the Project ESMS.

7.5.3.4 PERFORMANCE CRITERIA

The following performance criteria shall apply:

- A site-specific Emergency Response Plan (ERP) is developed, implemented, and maintained
- 100% of personnel trained in emergency response procedures relevant to their roles
- Emergency response equipment available, maintained, and fit for purpose at all times
- All emergency incidents reported, investigated, and closed out with corrective actions
- No uncontrolled escalation of emergency incidents due to lack of preparedness
- Emergency drills conducted at defined intervals (e.g. quarterly/biannually)
- Response times meet defined internal standards
- Compliance with national emergency response regulations and IFC/WBG EHS requirement

Emergency drills, inspections, incident reporting, and follow-up verification should be linked to the wider ESMS and reflected in Chapter 8 monitoring and Chapter 6 reporting and audit procedures.

TABLE 7-25 EMERGENCY RESPONSE MANAGEMENT MEASURES

Ref No.	Aspect / Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
1	Emergency preparedness	Develop and maintain a comprehensive Emergency Response Plan (ERP) covering all credible scenarios	Pre-construction and updated periodically	Approved and up-to-date ERP
2	Risk identification	Identify and assess emergency scenarios (fire, explosion, gas release, spills, etc.)	Pre-construction and periodic review	Emergency scenarios documented
3	Training	Provide role-specific emergency response training to all personnel	Construction & Operation - induction and refresher training	100% personnel trained
4	Emergency drills	Conduct regular emergency drills (fire, spill, gas leak scenarios)	Construction & Operation - quarterly/biannually	Drill reports and corrective actions
5	Communication systems	Establish effective emergency communication systems and alarms	Continuous	Functional communication systems
6	Emergency equipment	Provide and maintain firefighting and spill response equipment	Continuous with routine inspections	Equipment available and operational
7	Incident response	Implement immediate response procedures for all emergency incidents	As required	Timely response and containment
8	Coordination with authorities	Establish coordination protocols with local emergency services and regulators	Pre-construction and maintained	A mutual understanding and contact lists in place
9	Hazardous materials	Ensure safe storage and handling procedures to prevent emergency events	Continuous	No incidents due to poor handling
10	Maintenance	Maintain critical systems (e.g. alarms, suppression systems, gas detection)	Routine scheduled maintenance	Systems functional at all times
11	Incident reporting	Record, investigate, and report all incidents and near misses	Continuous	Incident reports and corrective actions implemented
12	Continuous improvement	Update ERP based on drills, incidents, and audits	Ongoing	Documented updates and improvements

Ref No.	Aspect / Activity	Management Measure	Timing and Frequency	Target Indicator / Performance
13	Community safety	Inform nearby communities (where relevant) of emergency procedures and communication channels	Pre-operation and periodic engagement	Community records awareness
14	Contractor management	Ensure contractors comply with Project emergency response requirements	Construction & Operation	Contractor records compliance

7.5.4 DECOMMISSIONING AND ABANDONMENT PLAN

7.5.4.1 INTRODUCTION

Decommissioning refers to the process of removing all the operating assets of a project after completion of its life cycle from the project site. The operation life span of the proposed IFF Line 2 plant and ancillary equipment is anticipated to be about 30 years. It is however highly unlikely that the plants would be decommissioned and abandoned as factory infrastructure of this nature is usually upgraded or rehabilitated to enable them to continue to function optimally for as long as possible.

7.5.4.2 DECOMMISSIONING PLAN

In the unlikely event that IFF decides to decommission and abandon the facility, IFF will carry out an assessment and inventory of the existing infrastructure to determine specific decommissioning requirements. This process will involve stock taking of existing components of the facility at the time. On completion of the assessment an appropriate and systematic decommissioning plan shall be designed.

The plan shall take into account the most cost-effective and practicable methods, environmental and social considerations, legal requirements and Global International Industry Practice (GIIP) at the time. In addition, the plan shall contain an adaptive management component that allows for the incorporation of lessons learned from monitoring data during the operation of the factory. The decommissioning plan shall specify all activities that will be undertaken during the decommissioning and abandonment of the project.

An effective Waste Management Plan (WMP) shall be developed as part of the decommissioning plan to ensure proper waste management and protection of the environment. The WMP shall adopt the waste hierarchy specified in this Report i.e., reduce, reuse, recycle, recover and disposal. IFF shall take advantage of the reuse and recycling opportunities identified for majority of the components of the infrastructure while all waste not fit for reuse or recycling shall be evacuated by an approved municipal waste contractor to be disposed-off in a government approved dump site.

Closure principles and periodic review. The decommissioning and closure approach will be guided by the following principles: (i) site decontamination – a pre-decommissioning contamination assessment, safe decontamination of process equipment, and remediation to standards

agreed with the regulators; (ii) hazardous materials – removal of all process chemicals, catalysts, ammonia and fuel inventories before dismantling; (iii) waste management – application of the waste hierarchy, with tracking of all waste to licensed facilities; (iv) workforce demobilisation – a retrenchment plan consistent with the Labour Act, IFC PS2 and AfDB OS2, with early consultation and support for affected workers; (v) community health and safety – control of traffic, dust, noise and site security during works; (vi) stakeholder engagement – consultation with workers, host communities and authorities on closure plans and post-closure land use; and (vii) post-closure monitoring – soil, groundwater and surface water monitoring for a period agreed with the regulators (normally at least **three** years). This framework and the associated E&S measures will be reviewed and updated periodically during the Project lifecycle – at least at each five-yearly ESMMP review and after any major change in Project configuration – and a detailed Decommissioning and Closure Plan will be prepared no later than five years before planned cessation of operations, for submission to the regulators as described above.

7.5.4.3 DECOMMISSIONING PROGRAMME

The activities that will be undertaken during decommissioning and abandonment of the project shall include the following:

- Stakeholders Consultation
- Dismantling and removal of Fertilizer plants, ancillary equipment, and other infrastructure
- Demolition of buildings and structures including site drainages.
- Evacuation of all dismantled materials, debris and waste
- Site reclamation including ground stabilization and levelling.
- Restoration of natural environment and resources including remediation of soil and water resources where necessary and revegetation in order to restore the environment back to pre-project state as practicable possible.
- Assessment of residual impacts, if any.
- Monitoring

7.5.4.4 STAKEHOLDERS CONSULTATION

The decommissioning, abandonment and remediation programme shall commence following the approval of the Plan with active engagement with stakeholders including facility workers (IFF staff and other operational staff), affected communities and other relevant local and national regulatory agencies. Relevant information regarding the plan shall be disclosed to workers to ensure they receive adequate notice of dismissal and severance payments mandated by law and collective agreements in a timely manner.

7.5.4.5 DISMANTLING AND REMOVAL OF PROJECT COMPONENTS

This process will entail dismantling and removal of project components including Fertilizer plants and other associated facilities. As some of these materials can be reused or recycled, IFF shall consider working with manufacturers or recycling industries to recycle these materials depending on their condition. Other non-recyclable or reusable materials shall be evacuated and disposed by an approved municipal waste contractor in line with the WMP.

7.5.4.6 DEMOLITION OF BUILDINGS AND STRUCTURES

Buildings and structures such as administrative buildings, offices, car parks, concrete drainages, etc. shall be demolished. All reusable materials from buildings such as metal scraps, pipes, doors, glass etc. shall be preserved for reuse or recycling, while rubbles shall be evacuated by an approved municipal waste contractor.

7.5.4.7 SITE REMEDIATION AND RESTORATION/REVEGETATION

Following actual decommissioning activities and evacuation of all equipment, rubbles and waste from the site, remediation and restoration including revegetation shall commence as soon as practicable. During this stage, the site will be stabilized and levelled back to its original state as much as possible to enhance drainage. Site restoration activities shall also include the following as appropriate:

- Re-contouring and grading of land to blend with natural topography.
- Planting of native plant species that are dominant within the plant communities in adjacent areas with similar soil conditions to re-establish vegetation. The cover, species composition, and diversity of the re-established plant community shall be similar to those present on-site prior to project development and in the vicinity of the site. The baseline data of existing ecological biodiversity of the project site contained in Chapter 4 of this Report shall be a benchmark for selecting the appropriate plant species for revegetation.
- Installation of erosion protection structures such as sediment traps, riprap, gabions, etc. wherever possible to capture run-off sediments and protect the new vegetation.

7.5.4.8 ASSESSMENT OF RESIDUAL IMPACTS

Following decommissioning, the project site shall be assessed for any residual impacts on the various components of the environment especially air, soil and surface water. Any suspected contaminated resource shall be remediated. Similarly, the residual impacts of the project on the socio-economic aspect of affected communities shall be assessed with appropriate compensatory measures established and implemented in conjunction with affected communities and regulatory authorities.

7.5.4.9 MONITORING

To ensure rapid and successful re-establishment of vegetation cover and site restoration, the abandonment, decommissioning and remediation plan shall specify site-specific measurable success criteria with target dates (monitoring data) to allow effective monitoring of the site. These

monitoring data shall be used to determine the success of reclamation activities and the need for changes in ongoing management or for additional reclamation measures. Periodic visual inspections, together with soil, groundwater and surface water monitoring, for a period agreed with the regulators (normally at least three years) following decommissioning activities shall be required to ensure that there is adequate restoration and minimal environmental degradation. This period shall be extended until satisfactory results are obtained. Vegetation re-establishment efforts shall continue until all success criteria have been met.

7.5.4.10 ENVISAGED RISKS AND IMPACTS OF DECOMMISSIONING ACTIVITIES

Significant potential environmental and social risks and impacts that may arise during the decommissioning phase are those associated with dismantling and removal of plants and equipment as well as demolition and evacuation of structures. The negative potential environmental and social risks and impacts may include:

- Improper abandonment of project site.
- Increased susceptibility of the site to soil erosion.
- Generation of non-hazardous and hazardous wastes including scrap metals, batteries, spent oils etc.
- Soil contamination from spills/leaks of fuels, oils and indiscriminate disposal of wastes.
- Sedimentation and contamination of surface water bodies and attendant loss of aquatic flora and fauna.
- Loss of employment for operational staff.
- Loss of business and economic livelihood for value chain workers.
- Increased susceptibility of surrounding communities to vector borne and water borne diseases.
- Risk of occupational health and safety accidents and injuries.

The management actions to avoid or minimize these impacts shall be included in the Decommissioning Plan which shall be developed. Other potential likely impacts which may not have been envisaged at this stage based on new legislations, changes in site conditions etc., shall also be included.

7.5.5 HAZARDOUS MATERIALS AND RESOURCE EFFICIENCY MANAGEMENT (OPERATIONAL PHASE)

7.5.5.1 OBJECTIVES

This plan replaces former Appendix E (IFC PS3 Compliance). It consolidates the operational resource efficiency programme and the cradle-to-grave hazardous materials management requirements, aligned with AfDB OS3 (Resource Efficiency and Pollution Prevention and Management) and OS4 (Community Health, Safety and Security), IFC PS3 and PS4, the WBG General and Nitrogenous Fertilizer EHS Guidelines, the National

Environmental (Hazardous Chemicals and Pesticides) Regulations, 2014, the National Environmental (Sanitation and Wastes Control) Regulations, 2009 and the Harmful Waste (Special Criminal Provisions, etc.) Act. Its objectives are to:

- manage hazardous materials on a cradle-to-grave basis – from procurement and receipt, through storage, transfer, use and transport, to waste generation and final disposal;
- prevent major accidents and protect workers, neighbouring communities and the environment from hazardous material releases, including off-site consequences;
- apply a resource efficiency hierarchy – avoid and reduce, then reuse, then recover and recycle, with treatment and disposal as the last resort – supported by measurable, time-bound targets and corrective actions where performance falls below target.

7.5.5.2 RESPONSIBILITY

IFF, as operator, is responsible for implementing this plan. The Operations Manager is accountable for process safety and resource efficiency performance, the HSE Manager for hazardous materials controls, emergency response and training, the Site E&S Manager for monitoring, reporting and verification, and the Procurement and Warehouse Managers for chemical pre-approval, receipt and storage. Contractors handling hazardous materials on site must comply with this plan.

7.5.5.3 RESOURCE EFFICIENCY PROGRAMME

The resource efficiency programme applies the hierarchy above to each key resource, as set out in the table below. Baselines will be established in the first full year of stable operation, and targets reviewed every three years. Where performance falls below target for two consecutive reporting periods, a root-cause review is completed within 30 days, a corrective action plan is approved by the Operations Manager and tracked in the E&S Commitments Register, and the outcome is reported in the annual E&S performance report.

TABLE 7-26 OPERATIONAL RESOURCE EFFICIENCY PROGRAMME

Resource	Hierarchy (Avoid/Reduce ☐ Recover/Recycle)	Measures Reuse ☐	Indicator	Target and Deadline	Corrective Action if Below Target	Responsibility
Water	• Avoid/reduce: site-wide water balance, leak detection, metering of major users		• Raw-water intensity (m³/t urea)	≤ 5 m ³ /t urea by year 3;	Leak and water-balance audit; optimise cycles of	Utilities Manager

Resource	Hierarchy (Avoid/Reduce ☐ Reuse ☐ Recover/Recycle)	Measures	Indicator	Target and Deadline	Corrective Action if Below Target	Responsibility
		- Reuse: wastewater recovery plant – recovered water used as cooling tower make-up - Recover: condensate polishing and return to boiler feed water			concentration; review recovery plant availability	
Energy and natural gas	- Avoid/reduce: energy management system, heat integration, combustion optimisation, steam trap programme - Recover: waste heat recovery and steam generation	GJ/t NH₃; GJ/t urea; natural gas per tonne of product	Refer to the GHG and Energy Performance Targets table (Section 7.2.2.5)	Energy audit; maintenance of underperforming equipment; process tuning	Energy Manager / Operations Manager	
Wastes	- Avoid/reduce: bulk purchasing, reduced packaging - Reuse/recycle: segregation at source; recycling of metals, plastics, paper and used oil through licensed recyclers	Hazardous waste generated (t/yr)	Hazardous waste ~ 100t/yr;	Waste stream review; additional segregation; supplier engagement	Site E&S Manager / Waste Management Officer	

7.5.5.4 HAZARDOUS MATERIALS MANAGEMENT (CRADLE-TO-GRAVE)

Hazardous materials (including ammonia, formaldehyde/UFC-85, catalysts, water-treatment and laboratory chemicals, fuels and lubricants) will be managed in accordance with the requirements in the table below. These requirements are linked to the Waste Management Plan (Section 7.5.1) and the site-wide Hazardous Waste Management Procedure, the Spill Prevention, Control and Containment Plan (Section 7.5.2) and the Emergency Response Plan (Section 6.4.2).

TABLE 7-27 OPERATIONAL HAZARDOUS MATERIALS MANAGEMENT REQUIREMENTS

Lifecycle Stage / Component	Key Requirements	Monitoring Verification /	Frequency	Responsibility	Records
1. Procurement and pre-approval	- HSE review and approval of every new hazardous material before purchase (SDS review, substitution with less hazardous alternatives, storage compatibility, disposal route) - Approved chemicals list; supplier requirements for GHS labelling and SDS	Chemical approval register review	Each new material; annual review	Procurement / HSE Manager	Chemical approval forms; approved list
2. Receipt and inventory	- Inspection of deliveries (container integrity, labels, SDS, quantities); rejection of non-conforming consignments - Up-to-date inventory of all hazardous materials and maximum quantities (National Environmental (Hazardous Chemicals and Pesticides) Regulations, 2014)	Delivery inspection; inventory audits	Each delivery; quarterly audit	Warehouse Manager	Goods-received notes; inventory register
3. Classification, labelling and SDS	GHS classification and labelling of all containers, including decanted containers; SDS available at point of use in English	Container and SDS spot-checks	Monthly	HSE Officer	Inspection checklists; SDS register
4. Storage and segregation	- Segregation of incompatible materials using a compatibility matrix; bunded storage of $\geq 110\%$ of the largest container (or 25% of total volume); impermeable floors, ventilation, fire protection and restricted access - Ammonia storage tank with gas detection, water curtains and emergency isolation	Storage inspections; bund integrity tests	Monthly	Warehouse Operations Manager	Storage inspection logs
5. Internal transfer and use	Controlled transfer procedures, dedicated hoses and couplings, drip trays and secondary containment at transfer points; permit-to-work for line breaking; task-specific PPE	Observations and Random checks	Monthly	Operations Supervisor	records

Lifecycle Stage / Component	Key Requirements	Monitoring Verification /	Frequency	Responsibility	Records
6. Off-site transport of hazardous materials and products	Labelling and placarding of vehicles in accordance with national requirements and UN dangerous goods classification; roadworthy vehicles and tankers suited to the material, with spill kits and fire extinguishers; driver competency (dangerous goods and defensive driving training, medical fitness); emergency information (SDS/Tremcard and emergency contacts) carried on board; approved routes avoiding sensitive receptors and peak hours; journey management and GPS tracking (refer to Section 7.4.5)	Pre-trip vehicle checks; carrier audits; GPS records	Each trip; carrier inspection	Logistics Manager / HSE Manager	Random inspection
7. Waste generation and disposal	- Management of hazardous wastes through the Hazardous Waste Management Procedure: contaminated containers (triple-rinsed or returned to supplier), absorbents and spill residues, spent chemicals, laboratory wastes, used oils (licensed recyclers), spent catalysts (metal reclaimers), ETP sludges and other potentially hazardous process wastes - Segregated, labelled and banded temporary storage; transport by licensed carriers with consignment notes; disposal only at licensed facilities that have been audited	Waste tracking and consignment	Monthly;	Waste Management Officer / Site E&S Manager	Consignment notes;
8. Training and competency	Initial induction for all personnel; task-specific competency training and assessment before personnel handle high-risk substances (ammonia, formaldehyde, catalysts, acids/caustics); refresher training at least annually; additional training after incidents, near misses or procedural/process changes (MoC)	Training matrix; competency assessments	Induction; refresher	HR / HSE Manager	Training and competency records

Lifecycle Stage / Component	Key Requirements	Monitoring Verification /	Frequency	Responsibility	Records
9. Spill prevention and response	Spill response equipment appropriate to the chemicals stored (e.g. water curtains/fog for ammonia, neutralising agents for acids and caustics, hydrocarbon absorbents and booms); trained spill response personnel on each shift; procedures for containment and recovery; management of contaminated soil and materials (Section 7.2.4); incident reporting and investigation (Section 6.4.4); and corrective and preventive actions tracked to closure	Spill kit inspections; drills; incident reviews	Monthly inspection; quarterly drill	HSE Manager	Spill register; drill reports; CAPA records
10. Process safety and major accident prevention	Hazard identification and risk assessment (HAZID, HAZOP, LOPA/SIL) and QRA, revalidated every five years and on change; Management of Change; pre-start-up safety reviews; emergency shutdown (ESD) and safety instrumented systems; fixed gas (NH₃, flammable, CO) and fire detection and alarm systems; mechanical integrity and inspection programme; permit-to-work; major accident prevention and response arrangements integrated with the ERP	PSM audits; SIS proof testing; gas detector calibration; Tier 1/Tier 2 process safety event (PSE) tracking	Per inspection plan; PSM audit annually	Operations Manager / Process Safety Lead	HAZOP/QRA reports; MoC register; test records
11. Off-site consequences and community protection	Off-site emergency planning zones based on QRA consequence modelling; community emergency notification and communication protocols; evacuation and shelter-in-place arrangements; and coordination with external emergency responders (RSEMA, fire service, police, health facilities) as set out in Section 6.4.2	Level 3 drills	Annual	Emergency Response Coordinator	Drill reports

7.5.5.5 PERFORMANCE CRITERIA

- Zero Tier 1 process safety events and zero uncontrolled releases of hazardous materials off site.

- 100% of hazardous materials pre-approved, inventoried, labelled and with an SDS available at the point of use.
- 100% of hazardous waste tracked from generation to licensed disposal (consignment notes reconciled).
- 100% of personnel handling high-risk substances assessed as competent, with refresher training current.
- Resource efficiency targets in the Operational Resource Efficiency Programme met, or corrective action plans in place.

7.6 INTEGRATION OF AOI INTO IMPLEMENTATION RESPONSIBILITIES

The AoI components defined in Section 6.1 are operationalised through the Project's Environmental and Social Management System (ESMS), ensuring that management measures are implemented consistently across all Project interfaces and dependencies.

The ESMS requires that:

- All mitigation measures are translated into **contractor procedures, method statements and work practices**;
- Contractors and subcontractors **implement and report on ESMMP requirements**, including monitoring data and incident reporting;
- The Proponent retains overall accountability for performance across the full AoI, including areas outside direct operational control;
- Independent oversight and QA/QC functions ensure that all AoI-related management measures meet applicable lender and regulatory standards.

7.6.1 ROLES AND RESPONSIBILITIES

The allocation of responsibilities for each AoI component is presented in Table 7-28.

TABLE 7-28: ROLES AND RESPONSIBILITIES FOR MANAGEMENT OF AOI COMPONENTS

AoI Component / Activity	Responsibility	Management Responsibility Description	Timing / Phase	Performance Indicator
Associated Facilities (e.g. pipelines, off-site infrastructure)	Proponent (Client)	Ensure ESMMP requirements are contractually extended to associated facility operators; define interface management protocols; verify compliance with applicable standards	Pre-construction, Construction, Operation	100% of associated facilities operating under aligned E&S requirements

AoI Component / Activity	Responsibility	Management Responsibility Description	Timing / Phase	Performance Indicator
Associated Facilities	Contractors / Third Parties	Implement required management measures within their scope of operation and report compliance to Proponent	Construction, Operation	No major non-compliances identified during audits
Transport Routes and Logistics Corridors	Proponent (Client)	Approve and oversee implementation of Transportation Management Plan (TMP); coordinate with authorities and stakeholders	Pre-construction, Construction, Operation	Approved TMP in place; no uncontrolled route usage
Transport Routes and Logistics Corridors	Contractors	Implement traffic controls, driver management protocols, and vehicle monitoring measures; report incidents and non-conformances	Construction, Operation	Reduction in traffic-related incidents; full compliance with TMP
Discharge Receiving Environments (surface water, groundwater, air, soil)	Proponent (Client)	Ensure discharge standards and monitoring programmes are defined and implemented; verify compliance through monitoring data review	Construction, Operation	100% compliance with discharge standards
Discharge Receiving Environments	Contractors	Implement pollution prevention measures, operate systems in compliance with standards, and undertake routine monitoring	Construction, Operation	No exceedances without corrective action
Emergency Interface Areas (off-site risk zones)	Proponent (Client)	Establish emergency planning zones; coordinate with external authorities; maintain emergency preparedness systems and communication protocols	Pre-construction, Construction, Operation	Functional emergency response plan including off-site scenarios
Emergency Interface Areas	Contractors	Participate in emergency training and drills; implement site-level emergency procedures; immediately report incidents	Construction, Operation	Completion of emergency drills; response times within defined thresholds
Shared and Third-Party Systems (utilities, roads, infrastructure)	Proponent (Client)	Define roles and responsibilities with third parties; formalise interface agreements; ensure alignment of E&S standards	Pre-construction, Construction, Operation	Interface agreements in place; no unmanaged shared risks

AoI Component / Activity	Responsibility	Management Responsibility Description	Timing / Phase	Performance Indicator
Shared and Third-Party Systems	Contractors / Operators	Comply with agreed interface requirements; coordinate operations to avoid cumulative risks	Construction, Operation	No cumulative impact exceedances identified
Cross-cutting Oversight	AoI Proponent (Client)	Maintain overall accountability for AoI performance; implement stakeholder engagement and grievance mechanisms; ensure adaptive management	All phases	100% grievance resolution within defined timeframes
Cross-cutting Implementation	AoI Contractors & Subcontractors	Implement all mitigation and monitoring measures; maintain records; report non-conformances and corrective actions	Construction, Operation	Complete and auditable reporting records

8. ENVIRONMENTAL AND SOCIAL MONITORING

8.1 INTRODUCTION

The purpose of the environmental and social monitoring programme is to ensure that management measures, identified and described in Section 7, are implemented and are effective at achieving an acceptable level of compliance with the ESMMP for the IFF Line 2 Fertilizer Project.

In line with the ESIA, the monitoring programme also provides the mechanism through which the effectiveness of mitigation measures is verified, performance is tracked against Project-adopted standards, and corrective actions are identified where required. Monitoring therefore forms the “checking” component of the wider ESMS and supports ongoing compliance, adaptive management, and continuous improvement over the life of the Project.

This Chapter should be read together with Chapter 7, which sets out the management measures, and Chapter 6, which defines the audit, inspection, reporting, and management of change processes through which monitoring results will be acted upon.

8.2 CONSTRUCTION MONITORING

Table 8.1 presents the monitoring specifics / requirements that will be monitored during the pre-construction and construction phase (including post-construction WHERE RELEVANT).

Construction activities will be monitored by Indorama Fertilizer FZE (IFF) on site, with regular audits against the requirements of this ESMMP. The ultimate target is to achieve 100% compliance with the ESMMP.

Key aspects to monitor during the pre-construction, construction, and operational phases include:

- Air Quality;
- Water Monitoring;
- Biodiversity Monitoring;
- Social Monitoring;
- Waste Monitoring; and
- Spill Monitoring.

In addition, the ESIA recommends that construction-phase monitoring should also explicitly include climate-related and GHG-related monitoring parameters where relevant, including fuel consumption, emissions-related performance, and selected climate-resilience indicators such as flood preparedness and water availability during dry periods.

Contractor work sites must be monitored during construction, under the guidance of key IFF environmental and social (E&S) personnel who will be responsible for reporting on E&S performance. IFF may undertake independent monitoring of selected parameters to verify Contractor results and to audit the implementation of environmental mitigation measures contained in this ESMMP and the construction contract for the Project.

The FMEnv holds overall responsibility for Project approval and for verifying that applicable environmental requirements are adhered to during Project implementation. FMEnv’s role is to review environmental monitoring and compliance documentation submitted to them, and it is

not typically expected to undertake direct monitoring of the Project unless a significant environmental issue arises.

8.3 OPERATIONAL MONITORING

Monitoring during the operational phase will form part of the existing monitoring programme associated with the Indorama complex. To this end, IFF will update its monitoring programme to accommodate the operational aspects of the IFF Line 2 Fertilizer Project.

Key aspects of ongoing monitoring during the operational phase will include:

- Ongoing monitoring of the Project's internal and external grievance mechanism (Appendix D) to ensure that complaints are appropriately recorded, managed, and closed out.
- Ongoing monitoring of water treatment systems to ensure operation within specified design parameters and to prevent system failure or malfunction.
- Ongoing monitoring of retention ponds to ensure compliance with design specifications, including maintaining adequate freeboard to manage potential flood events.
- Ongoing groundwater level and quality monitoring within the existing site monitoring network.
- Ongoing surface water quality monitoring at designated sampling locations within the monitoring network, including downstream receiving environments.
- Ongoing monitoring of stormwater and wastewater discharges to verify that effluent quality and volumes comply with applicable discharge standards.
- Continued monitoring and periodic review of biodiversity management measures, with adaptive updates made where required.
- Ongoing social monitoring, including:
 - Pre-employment health screening of Project workers;
 - Ongoing health, safety, education, and training programmes;
 - Driver training and road safety awareness;
 - Continued stakeholder engagement activities;
 - Grievance management and resolution;
 - Monitoring of recruitment practices, including local employment commitments;
 - Ongoing occupational health and safety induction and training; and
 - Compliance with labour and working conditions requirements in line with Nigerian legislation and IFC Performance Standard 2.
- Ongoing monitoring of waste handling, storage, transport, and disposal practices.
- Ongoing spill monitoring and response management.
- Tracking of climate risk indicators and cumulative climate-related performance;
- A structured GHG monitoring framework, including annual inventory compilation and performance benchmarking; and
- A more formal socio-economic monitoring framework to track local employment, procurement, labour influx, grievance trends, and community health and safety outcomes.

TABLE 8-1 CONSTRUCTION MONITORING

Ref No.	Monitoring Topic	Monitoring Measure / Parameter	Timing Frequency and	Target / Performance Indicator	Responsibility	Reporting
1	Air Quality	Undertake regular on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust and visible emissions. Carry out regular site inspections to verify compliance with the ESMMP dust and emissions controls. Increase the frequency of inspections during dry, windy, or high-dust activities.	Throughout construction	Recommendations and corrective actions taken when dust generation or combustion issues are noted. Complaints managed through the grievance mechanism.	Contractor / IFF E&S Team	Monthly construction E&S report
2	Construction GHG Emissions	Track diesel and other fuel consumption associated with construction vehicles, generators, and major equipment. Estimate construction-phase GHG emissions using Project-approved accounting methodology.	Monthly during active construction	Construction fuel use recorded and construction-phase tCO ₂ e estimated and reviewed.	Construction Contractor / Construction Manager / IFF HSE Manager	Monthly construction environmental report; quarterly ESMS / ESMMP report
3	Groundwater Levels	Groundwater levels in the shallow borewells included in the monitoring network will be monitored on a quarterly basis.	Pre-construction and 1 year post-construction; quarterly	Yield and water levels in private / community wells not adversely affected.	IFF / Specialist support	Quarterly water report
4	Groundwater and Surface Water Quality	Monitoring of groundwater and surface water quality will take place at the agreed monitoring network locations, including the Okulu River and relevant boreholes. Surface and groundwater samples will be collected for parameters suitable to identify contaminants from Project activities.	Pre-construction and 1 year post-construction; frequency to follow approved monitoring schedule	Water quality results compliant with performance criteria and no material deterioration attributable to construction.	IFF / Specialist support	Quarterly monitoring report
5	Effluent Discharge / Quality	Water quality monitoring of all discharge and stormwater outlets to determine that discharge meets applicable effluent limits.	Monthly during construction	Water quality reports and discharge point results compliant with Project-adopted limits.	Contractor / IFF / Specialist support	Monthly compliance report

Ref No.	Monitoring Topic	Monitoring Measure / Parameter	Timing and Frequency	Target / Performance Indicator	Responsibility	Reporting
6	Biodiversity – Aquatic Ecology	Aquatic biomonitoring in habitats potentially affected by spills and discharge, using recognised best-practice aquatic monitoring protocols. Pre-construction baseline and post-construction comparison to be undertaken.	Prior to construction and post-construction	No deterioration in aquatic ecological condition attributable to the Project.	IFF / Biodiversity specialist	Seasonal biodiversity monitoring report
7	Biodiversity – Site Control	Ensure the construction area is demarcated and no activities take place outside of these demarcations.	Monthly inspection	No unauthorised activity outside approved footprint; any incidents recorded and corrected.	Contractor / Security / IFF	Monthly site inspection report
8	Biodiversity – Awareness	Toolbox talks for all staff regarding fauna and flora, including prohibition on collection of plant or animal products.	Monthly during construction	Toolbox talk registers maintained.	Contractor / IFF	Monthly toolbox summary
9	Biodiversity – Invasive Species	Implement and inspect an alien invasive plant control programme within the Project site and adjacent buffer areas.	Quarterly during construction	Reports of species identified and control actions implemented.	Contractor / Specialist	Quarterly biodiversity report
10	Community Health & Safety – Health Surveillance	Maintain a confidential health surveillance and monitoring system for Project workers.	Throughout construction; reviewed quarterly	Cases of communicable/vector-borne/STIs tracked; pre-employment screening records maintained.	Contractor / IFF H&S	Quarterly CH&S report
11	Health Education and Training	Record details of health, education, and training provided to workers and relevant stakeholders.	Quarterly throughout construction	Records of training topics and attendance; aim of 100% worker coverage.	Contractor / IFF	Quarterly training report
12	Traffic and Driver Safety	Maintain a traffic database including driver training, incidents, non-compliances, and stakeholder road safety engagement.	Monthly during active construction; annual review	Number of drivers trained; number of incidents; roadworthiness issues tracked and addressed.	Contractor / IFF / Traffic lead	Monthly traffic summary; annual review

Ref No.	Monitoring Topic	Monitoring Measure / Parameter	Timing Frequency and	Target / Performance Indicator	Responsibility	Reporting
13	Grievance Mechanism	Maintain grievance register recording issues, actions, timelines, responsibilities, and closure status.	Quarterly throughout construction	Grievances tracked; % resolved within agreed timeframe.	IFF Community Relations	Quarterly grievance report
14	Stakeholder Engagement	Maintain stakeholder engagement database with dates, attendance, actions, and follow-up.	Quarterly throughout construction	Stakeholder engagement records maintained and actions closed in agreed timeframes.	IFF Community Relations	Quarterly stakeholder report
15	Recruitment and Procurement	Monitor local recruitment and procurement commitments using contractor and HR records.	Quarterly throughout construction	% of local skilled / semi-skilled / unskilled workers and procurement tracked; zero gate hiring.	IFF HR / Procurement / Contractors	Quarterly social performance report
16	Occupational Health and Safety	Monitor implementation of OHS induction, PPE, toolbox talks, incident records, and corrective actions.	Monthly throughout construction	OHS KPIs maintained; zero fatalities; LTIs and incidents tracked and addressed.	Contractor / IFF H&S	Monthly OHS report
17	Supplier and Subcontractor Labour Performance	Monitor suppliers and subcontractors for compliance with labour and working conditions requirements.	Annual throughout construction (or more frequently for high-risk contracts)	Contract clauses in place; non-conformances closed in agreed timeframes.	IFF / Contractors	Annual labour compliance review
18	Cultural Heritage	Monitor implementation of the Chance Finds Procedure during ground-disturbing activities.	Continuous throughout construction	Chance find incidents recorded and escalated appropriately.	Contractor / IFF / Cultural heritage lead	Incident / monthly summary
19	Waste Management	Audit waste contractors and inspect active work areas and waste storage areas for housekeeping and compliance.	At start of construction and regularly thereafter	Waste contractor facilities licensed; work areas clean and free of litter.	Contractor / IFF	Monthly waste report
20	Spill Monitoring	Weekly inspections of spill response equipment, quarterly review of preventative maintenance, biannual spill drills, and recording of all spills.	Weekly / quarterly / biannual / continuous	Spill response equipment available; drills undertaken; spill log maintained and corrective actions closed out.	Contractor / IFF	Weekly checklist; quarterly spill report

Ref No.	Monitoring Topic	Monitoring Measure / Parameter	Timing Frequency and	Target / Performance Indicator	Responsibility	Reporting
21	Soil – Erosion, Compaction and Contamination	Inspect erosion and sediment controls, exposed areas and stockpiles; record vehicle movements outside designated routes; check decompaction and reinstatement of temporary areas; sample soil after spills and at baseline locations (pH, TPH, heavy metals, nutrients) against baseline/control and EGASPIN target values.	Weekly and after rainfall > 25 mm/24 h (ESC); annually (soil quality); after each spill (confirmatory)	Indicators in Section 7.2.4.4 met (ESC in place at 100% of active areas; zero off-route breaches; 100% of remediated areas confirmed clean)	Contractor / IFF E&S Team	Monthly construction E&S report

TABLE 8-2: OPERATIONAL MONITORING

Ref No.	Monitoring Topic	Monitoring Measure / Parameter	Timing Frequency and	Target / Performance Indicator	Responsibility	Reporting
1	Grievance Management	Ongoing monitoring of the Project grievance mechanism to ensure that complaints are appropriately recorded, managed, and closed out.	Monthly	% grievances closed within agreed timeframe.	IFF Community Relations	Monthly dashboard
2	Water Treatment Systems	Monitor operation of water treatment systems to ensure operation within specified design parameters.	Continuous / monthly review	Systems operating within specified design parameters.	Utilities / Water Systems Manager	Monthly utilities report
3	Retention Ponds	Monitor retention ponds to ensure freeboard and design specifications are maintained.	Routine operational inspection; increased during wet season	Retention ponds functioning as designed.	Utilities Infrastructure Manager /	Monthly operations report
4	Groundwater Levels and Quality	Continue groundwater level and quality monitoring within the site monitoring network.	As per approved operational monitoring programme	Groundwater quality and levels remain within acceptable limits / no adverse trend attributable to operations.	IFF / Specialist support	Quarterly / annual groundwater report

Ref No.	Monitoring Topic	Monitoring Parameter	Measure /	Timing Frequency and	Target / Performance Indicator	Responsibility	Reporting
5	Surface Water Quality	Continue surface water quality monitoring at designated upstream, downstream, and reference locations, including the Okulu River.		As per approved operational monitoring programme	Water quality results within applicable criteria and no adverse operational trend.	IFF / Specialist support	Quarterly / annual surface water report
6	Stormwater and Wastewater Discharges	Monitor stormwater and wastewater quality and volumes to verify compliance with applicable discharge standards.		Routine / monthly / as required by permit	Effluent quality and discharge volumes compliant with Project-adopted standards.	IFF Operations / Water team	Monthly discharge compliance report
7	Biodiversity Management Measures	Continue monitoring implementation of biodiversity controls and selected ecological indicators where relevant.		Periodic / annual review	No unacceptable deterioration in biodiversity condition attributable to operation.	IFF / Biodiversity specialist	Annual biodiversity report
8	Waste Handling, Storage, Transport, Disposal	Ongoing monitoring of waste handling practices, contractor performance, and waste records.		Monthly / periodic audit	Waste managed in accordance with legal and ESMMP requirements.	IFF / Waste contractor	Monthly waste report
9	Spill Monitoring and Response	Continue spill inspections, response readiness checks, and maintenance of spill log.		Continuous / quarterly review	Spill response readiness maintained; all spills recorded and corrective actions closed.	IFF HSE	Quarterly spill report
10	Operational Scope 1 GHG Emissions	Track operational Scope 1 emissions from process heating, reforming, utilities, and flaring using fuel and plant operating data.		Monthly internal tracking; annual consolidated inventory	Total operational tCO ₂ e tracked; emissions intensity per tonne of product reported.	Operations Manager / Project Engineer / Sustainability or Energy Lead	Monthly dashboard; annual GHG inventory report
11	Natural Gas Use Efficiency	Monitor natural gas consumption relative to production output and process benchmarks.		Monthly	Natural gas consumption per tonne of ammonia / urea tracked and reviewed.	Operations Manager / Process Engineer	Monthly performance report
12	Fugitive GHG Emissions / LDAR	Implement LDAR inspection programme and track leaks, repair close-out, and repeat leak points.		Quarterly and during shutdowns / maintenance periods	Leaks identified and repaired; repeat leak points reduced.	Maintenance Manager / Integrity Engineer / HSE Manager	Quarterly LDAR summary

Ref No.	Monitoring Topic	Monitoring Parameter	Measure /	Timing Frequency and	Target / Performance Indicator	Responsibility	Reporting
13	Energy Efficiency and Operational Performance	Monitor energy performance and benchmarking indicators across high-energy systems.		Monthly review; annual benchmark summary	Energy intensity trend reviewed and actions implemented.	Energy Manager / Project Engineer / Operations Manager	Monthly internal report; annual efficiency review
14	Planned GHG Reduction Initiatives	Track status and effectiveness of planned GHG reduction initiatives, including flare reduction, hardware upgrades, and efficiency improvements.		Quarterly implementation review; annual verification	Reduction initiatives implemented and annual reduction verified where applicable.	Project Head / Project Engineer / Sustainability Lead	Quarterly management update; annual climate / sustainability report
15	Climate Risk – Extreme Rainfall / Flooding	Inspect drainage, culverts, flood-control features, incident logs, and flood-response preparedness.		Monthly during wet season; after major storm events; annual drill review	Flood incidents, drainage blockages, and flood drills tracked.	Site HSE Manager / Utilities & Infrastructure Manager / Emergency Response Lead	Monthly internal HSE report; wet-season summary
16	Climate Risk – Extreme Heat	Review weather data, occupational incident records, and temperature-sensitive equipment performance during hot periods.		Daily during extreme heat periods; monthly seasonal summary	Heat-related incidents, exceedances, and response actions tracked.	Site HSE Manager / Operations Manager / Electrical & Maintenance Lead	Monthly HSE report; quarterly climate resilience review
17	Climate Risk – Wildfire	Inspect perimeter vegetation, fire readiness, incident records, and drill outcomes.		Monthly in dry season; after any fire event; annual drill review	Wildfire / smoke incidents and firebreak actions tracked.	Fire & Emergency Response Lead / Site HSE Manager / Facilities Manager	Seasonal dry-season report; incident reporting
18	Climate Risk – Water Stress / Drought	Monitor water demand versus supply, storage status, and drought contingency activation.		Monthly; more often during prolonged dry periods	Water demand, supply triggers, and drought actions tracked.	Utilities / Water Management Lead / ESMS Manager	Monthly water resilience report; seasonal drought summary
19	Socio-economic Monitoring	Track local employment, training, local procurement, labour influx, infrastructure pressure, stakeholder engagement, community expectations, community health		Monthly / quarterly depending on indicator	Indicators tracked in line with socio-economic monitoring framework.	IFF HR / Procurement / Community Relations / HSE / ESMS	Monthly dashboard; quarterly social performance report

Ref No.	Monitoring Topic	Monitoring Parameter	Measure /	Timing Frequency	and	Target / Performance Indicator	Responsibility	Reporting
		and safety incidents, and cumulative trends.						

8.4 CUMULATIVE IMPACT MANAGEMENT AND MONITORING

Cumulative impacts associated with the Project arise from the interaction of Project activities with existing and planned industrial developments within the Indorama complex and the wider Port Harcourt industrial area. These include combined pressures on air quality, surface water and groundwater resources, greenhouse gas emissions, traffic networks, community health and safety, and shared emergency response systems. Effective management of cumulative impacts requires a coordinated, system-wide approach, aligned with AfDB ISS and IFC Performance Standards (particularly PS1, OS1, OS4 and PS4), and integrated within the Project's Environmental and Social Management System (ESMS).

Cumulative impact management will be implemented through coordination with adjacent operators and shared infrastructure users, including utilities, transport corridors, and emergency services. The Project will align with existing site-wide management frameworks, where applicable, to ensure consistency in monitoring, reporting, and mitigation measures across the broader industrial complex. This includes sharing relevant environmental and social performance data (e.g. air emissions, effluent discharges, traffic volumes), participating in joint forums where available, and maintaining communication channels with other facility operators to proactively manage cumulative risks.

Monitoring of cumulative effects will focus on key receptors and pathways identified in specialist studies, including:

- Air quality: Tracking ambient pollutant concentrations and comparing cumulative emissions against applicable standards and dispersion modelling results
- Water resources: Monitoring cumulative abstraction, discharge quality, and receiving environment capacity
- Climate: Consolidating GHG emissions data and benchmarking against industry intensity metrics
- Traffic: Assessing combined traffic volumes and road safety risks associated with multiple users of shared routes
- Community health and safety: Evaluating collective exposure to industrial risks (e.g. emissions, noise, accidents)
- Emergency preparedness: Coordinating with shared emergency response systems and neighbouring facilities

A grievance trend review mechanism will be implemented to identify cumulative community concerns across the wider industrial area. This will involve periodic analysis of grievances received through the Project's grievance mechanism, with particular attention to recurring or cross-cutting issues (e.g. air quality complaints, traffic disturbances, or safety concerns). Where patterns indicate broader cumulative issues, these will be escalated for coordinated investigation and response, including engagement with other operators where necessary.

Allocation of responsibilities. The allocation of cumulative impact management between the Project, the wider Indorama complex and external parties is summarised in the table below.

TABLE 8-3 ALLOCATION OF CUMULATIVE IMPACT MANAGEMENT RESPONSIBILITIES

Cumulative Issue	Managed at Project Level (IFF Line 2)	Coordinated at Indorama Complex Level	External other
Air quality (NO₂, NH₃, PM)	Line 2 source controls; stack monitoring; Line 2 emissions inventory Installation of Selective Catalytic Reactor (SCR) to reduce the Nox emissions from the primary reformer	Complex-wide ambient monitoring network; consolidated emissions inventory for all units (IFL/IFF lines, petrochemicals, power plant); joint review of trends and corrective actions	NESRE Environ other Elemen
Water resources	Line 2 abstraction metering; wastewater recovery; discharge quality	Shared aquifer management and sustainable yield; complex groundwater network; combined discharge to the Okulu River	Rivers Rivers Environ commu
Traffic	Line 2 Traffic Management Plan, scheduling and driver management	Complex gate and logistics scheduling; product dispatch planning	FRSC, author other East-V
Waste management capacity	Line 2 waste minimisation and segregation	Complex waste handling facilities and licensed contractors	RIWAM Rivers
Community health, safety and emergencies	Line 2 ERP, process safety and community measures	Integrated complex emergency response, mutual aid and community warning system	RSEMA facilitie facilitie

Collective monitoring of cumulative emissions and triggers. Ambient air quality (NO₂, NH₃, PM₁₀ and PM_{2.5}) is monitored at the complex-wide monitoring stations- 18 Nos, including the stations at the nearest sensitive receptors. Source emission data from all Indorama units are compiled into a consolidated emissions inventory, which is reviewed quarterly against the ESIA cumulative dispersion modelling. The following tiered triggers apply:

- **Tier 1 – Alert:** ambient concentration at or above 75% of a Project-adopted standard, or an increasing trend over two consecutive periods. Response: review the performance of all contributing sources, check combustion and abatement systems, and increase the monitoring frequency.
- **Tier 2 – Action:** exceedance of a Project-adopted ambient standard at a receptor. Response: source apportionment (using stack data and modelling) to determine contributions; operational adjustments at contributing units (load reduction, maintenance, abatement optimisation); notification of regulators and lenders (Appendix C); and communication to the affected communities.

- **Tier 3 – Persistent exceedance:** repeated Tier 2 events. Response: engineering upgrades or additional controls through the MoC process; coordination with other operators through the complex E&S forum and the authorities; and an update of the cumulative impact assessment.

Transparent disclosure. Cumulative monitoring results are disclosed to host communities on demand and copies are provided to the regulators and lenders as needed.

8.5 MATERIAL ISSUES REGISTER AND PRIORITISATION FRAMEWORK

8.5.1 PURPOSE AND OVERVIEW

To ensure effective implementation of the ESMMP and continuous performance improvement, the Project has established a Material Issues Register to identify, prioritise, and manage critical environmental and social risks across the Project's Area of Influence (AoI).

This register:

- Consolidates key environmental and social risks identified through the ESIA and specialist studies;
- Supports prioritisation of management actions and monitoring efforts;
- Provides a structured escalation and reporting mechanism;
- Enables adaptive management within the ESMS (Plan–Do–Check–Act) framework;
- Supports internal and external reporting requirements, ensuring transparency and accountability.

8.5.2 METHODOLOGY FOR ISSUE PRIORITISATION

Each issue is ranked based on:

- Impact significance (severity and likelihood);
- Receptor sensitivity (environmental and social importance);
- Regulatory and lender relevance;
- Potential for cumulative or off-site impacts.

Priority levels are defined as follows on Table 8-4:

TABLE 8-4 PRIORITY LEVELS

Priority Level	Definition	Management Requirement
Critical	High consequence with potential for major environmental/social harm, regulatory breach, or fatality risk	Immediate management action and senior-level oversight
High	Significant impact requiring active control and enhanced monitoring	Routine management review and reporting
Moderate	Manageable impact with standard controls	Managed through routine ESMMP measures
Low	Minor or negligible impact	Managed through standard procedures

8.5.3 MATERIAL ISSUES REGISTER

TABLE 8-5 PROJECT-WIDE MATERIAL ISSUES REGISTER

Material Issue	Primary Impact Driver	Priority Ranking	Key Receptors	Responsible Party	Monitoring Frequency	Review Level	Escalation Trigger
Flood Risk and Extreme Weather	Construction activities, site drainage, climate variability	Critical	Surface water systems, communities, infrastructure	Proponent; Contractor	Monthly (wet season: bi-weekly)	Senior Management	Flooding event, exceedance of design capacity, community impact
Off-site Emergency Scenarios (major accident risk)	Hazardous materials, process failures	Critical	Communities, workforce, adjacent facilities	Proponent; Contractor	Continuous monitoring; drills quarterly	Executive Incident Command /	Any Level 2+ incident, emergency activation
Community Exposure (health, safety, nuisance)	Traffic, noise, emissions, workforce presence	High	Local communities, road users	Proponent; Contractors	Monthly	Project Management	Increase in complaints, incident or injury
Effluent Compliance and Water Quality	Process discharges, wastewater treatment	Critical	Surface water, groundwater, ecological receptors	Proponent; Operator	Real-time weekly sampling /	Senior Management	Exceedance of discharge limits
GHG Emissions and Energy Performance	Energy consumption, process emissions	High	Global environment, regulatory stakeholders	Proponent	Quarterly	Senior Management	Failure to meet targets or reporting thresholds
Contractor Management and Compliance	Construction activities, subcontractor performance	High	All receptors	Proponent; Contractors	Weekly inspections	Project Management	Repeated non-compliances, audit failures
Biodiversity Residual Risk	Habitat disturbance, indirect impacts	Moderate-High	Aquatic terrestrial and ecosystems	Proponent	Quarterly seasonal /	Environmental Manager	Evidence of biodiversity loss beyond predicted residual impact

Material Issue	Primary Impact Driver	Priority Ranking	Key Receptors	Responsible Party	Monitoring Frequency	Review Level	Escalation Trigger
Grievance Trends and Stakeholder Concerns	Project-related activities and perceptions	High	Communities, vulnerable groups	Proponent	Monthly tracking	Senior Management	Increasing trend or unresolved grievances
Air Emissions Compliance	Stack emissions, fugitive dust	High	Communities, air quality receptors	Proponent; Operator	Continuous / monthly	Environmental Manager	Exceedance of emission standards
Traffic and Road Safety	Transport materials of and workforce	High	Road users, communities	Contractor; Proponent	Weekly / incident-based	Project Management	Traffic accident or near-miss trend increase

8.5.4 MONITORING AND REPORTING REQUIREMENTS

The monitoring programme for material issues:

- Is directly linked to mitigation measures defined in Chapter 7;
- Includes quantifiable indicators (e.g. discharge limits, emission thresholds, incident rates);
- Requires routine reporting from Contractors and Operators, integrated into the Project ESMS; and
- Ensures that all issues are tracked, reviewed, and updated based on performance trends

8.5.5 REVIEW AND ESCALATION FRAMEWORK

The Material Issues Register is subject to a structured review and escalation hierarchy:

Priority Level	Review Authority	Review Frequency	Escalation Requirement
Critical	Executive / Senior Management	Monthly (or immediately upon trigger)	Immediate escalation to senior leadership and regulators where required
High	Project Management Team	Monthly	Escalation if repeated exceedances or non-compliances
Moderate	Environmental / Social Manager	Quarterly	Escalation if trends worsen
Low	Site Supervisors	Routine	Not required unless issue escalates

9. REFERENCES

- African Development Bank (AfDB). Integrated Safeguards System (ISS). Available at: <https://www.afdb.org/en/topics-and-sectors/topics/environmental-and-social-assessment/integrated-safeguards-system-iss>
- Environmental Resources Management (ERM). (2025). Technical proposal for the Environmental and Social Impact Assessment (ESIA) for the Indorama Line 2 Fertilizer Project. ERM.
- Environmental Resources Management (ERM). (2026). Draft ESIA Report: Geology, Soils and Groundwater Resources – IFF Line 2 Fertilizer Project. Environmental Resources Management.
- Environmental Resources Management (ERM). (2026). ESIA Transportation Study – IFF Line 2 Fertilizer Project. Environmental Resources Management.
- Environmental Resources Management (ERM). (2026). Greenhouse gas (GHG) assessment for the Indorama Fertilizer FZE (IFF) Line 2 Project. Indorama Fertilizer FZE.
- Environmental Resources Management Southern Africa (Pty) Ltd (ERM). (2026). Noise Impact Assessment for IFF Line 2 Fertilizer Project.
- Equator Principles Association. 2020. Equator Principles (EP4). Available at: <https://equator-principles.com/>
- Federal Ministry of Environment (FMEEnv), Nigeria. Available at: <https://environment.gov.ng/>
- International Association for Impact Assessment (IAIA). Available at: <https://www.iaia.org/>
- International Finance Corporation (IFC). 2012. Performance Standards on Environmental and Social Sustainability. Available at: <https://www.ifc.org/en/insights-reports/2012/ifc-performance-standards>
- International Finance Corporation (IFC). 2021. Guidance Notes to the Performance Standards. Available at: <https://www.ifc.org/en/what-we-do/topics/environmental-social-governance>
- National Environmental Standards and Regulations Enforcement Agency (NESREA), Nigeria. Available at: <https://www.nesrea.gov.ng/>
- World Bank Group. EHS Guidelines for Nitrogenous Fertilizer Production. Available at: <https://www.ifc.org/en/what-we-do/topics/environmental-social-governance/ehs-guidelines>
- World Bank Group. Environmental, Health and Safety (EHS) Guidelines. Available at: <https://www.ifc.org/en/what-we-do/topics/environmental-social-governance/ehs-guidelines>
- United Nations Environment Programme (UNEP). Environmental Impact Assessment Resources. Available at: <https://www.unep.org/resources>

World Health Organization (WHO). Air Quality Guidelines. Available at:
<https://www.who.int/teams/environment-climate-change-and-health/air-quality-and-health/air-quality-guidelines>

Intergovernmental Panel on Climate Change (IPCC). Guidelines for National Greenhouse Gas Inventories. Available at:
<https://www.ipcc-nggip.iges.or.jp/public/2006gl/>

APPENDIX A MASTER IMPACT-MITIGATION-MONITORING REGISTER

MASTER IMPACT–MITIGATION–MONITORING REGISTER

This register consolidates all significant environmental and social impacts identified in the ESIA and specialist studies, linking each impact to its corresponding mitigation measures, monitoring requirements, and ESMS controls. The register provides a traceable, auditable framework to demonstrate compliance with IFC Performance Standards, AfDB Operational Safeguards and WBG EHS Guidelines, and to ensure alignment between impact identification, management actions, and monitoring outcomes. Each register entry is linked to the E&S Commitments Register (Table 3-2), which records the source of each commitment (ESIA, ESMMP, permits/regulatory approvals, AfDB/lender requirements, SEP/stakeholder engagement and grievance outcomes), the specific action, target/due date, implementation status and verification/closure status.

TABLE A1: MASTER IMPACT–MITIGATION–MONITORING REGISTER

ESIA Impact Ref	Phase	Receptor	Impact Description	Mitigation Management Measures /	Linked Management Plan	KPI Monitoring Parameter /	Frequency	Threshold Trigger /	Responsible Party	Reporting Route	Evidence Required
AQ-01	Construction	Ambient Air Quality	Dust emissions from earthworks and vehicle movement	Water spraying, speed control, covering of trucks, stockpile management	Air Quality MP	PM ₁₀ / TSP levels; visible dust	Weekly / during works	Exceedance of IFC/WBG limits or visible dust complaints	Contractor	Monthly ESMP report to Client	Monitoring logs, site inspection records
AQ-02	Operation	Ambient Air Quality / Communities	Emissions from combustion systems and process units	Emissions control systems, maintenance, stack monitoring	Air Quality MP	NOx, SO ₂ , CO, PM concentrations	Continuous / quarterly reporting	Exceedance of emission limits	Proponent	Regulatory reporting; annual ESG report	Stack monitoring data, maintenance logs
GHG-01	Operation	Climate	GHG emissions from natural gas use and process emissions	Energy efficiency measures, CO ₂ capture for urea production	Climate / Air Quality MP	tCO ₂ /tonne product	Annual	Deviation from benchmark intensity	Proponent	Annual sustainability reporting	GHG inventory, benchmarking records
WQ-01	Construction	Surface Water	Sedimentation from site clearance and earthworks	Erosion control, silt traps, drainage management	Surface Water MP	Turbidity, TSS levels	Weekly	Visible sedimentation or exceedance of standards	Contractor	Monthly ESMP report	Water quality results, inspection logs
WQ-02	Operation	Surface Water / Aquatic Ecology	Effluent discharge from plant operations	Effluent treatment, monitoring, compliance with discharge limits	Surface Water MP	pH, COD, BOD, nutrients	Monthly	Non-compliance with discharge standards	Proponent	Regulatory reporting	Lab results, discharge permits

APPENDIX B STAFFING AND COMPETENCY MATRIX FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT

STAFFING AND COMPETENCY MATRIX FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT

PURPOSE

This annex defines the minimum staffing, competencies, roles, reporting lines, and mobilisation requirements for the implementation of the Environmental and Social Management System (ESMS) across:

- Indorama (IFF – Proponent / Operator)
- EPC Contractor(s) (Design & Construction)
- Operations Phase Teams

It ensures that all key environmental and social risks and impacts identified in the ESIA are effectively managed through competent personnel with clearly defined responsibilities and accountability.

STAFFING AND COMPETENCY MATRIX

TABLE B1: CORE E&S ROLES – IFF (OWNER / OPERATOR)

Role	Key Functions	Minimum Experience	Qualification &	Required Training	Reporting Line	Mobilisation Requirement
Head of E&S (Corporate)	Strategic oversight of ESMS; lender compliance; resource allocation	MSc in Environmental/Social discipline; ≥15 years; IFC PS experience		IFC PS, climate risk, ESG reporting	Reports to Executive Management	Before financial close
Site E&S Manager	Overall ESMS implementation; coordination with EPC and regulators	Degree in Environmental Science/Engineering; ≥10 years		ESMS, auditing, incident investigation	Reports to Corporate E&S Head	Before mobilisation
Environmental Compliance Lead	Permits, monitoring, reporting, audits	Degree; ≥7 years environmental compliance		Air, water, waste compliance	Reports to Site E&S Manager	Before mobilisation
Social Performance Manager	Stakeholder engagement, grievances, community programmes	Degree in Social Sciences; ≥8 years		IFC PS5, PS7, grievance handling	Reports to Site E&S Manager	Before mobilisation

Role	Key Functions	Minimum Experience	Qualification &	Required Training	Reporting Line	Mobilisation Requirement
Climate Risk & Sustainability Specialist	Climate risk monitoring, GHG accounting, adaptation measures	Degree; ≥5 years climate risk/ESG		Climate scenario analysis, GHG protocols	Reports to Corporate E&S / Site E&S Manager	Before commissioning
Water & Effluent Specialist	Water balance, effluent compliance, treatment optimisation	Engineering/Environmental Degree; ≥5 years		Water quality monitoring, WBG EHS	Reports to Environmental Lead	Before commissioning
Biodiversity Specialist	Habitat management, offsets, monitoring	Degree in Ecology; ≥5 years		Biodiversity assessment, IFC PS6	Reports to Environmental Lead	Before mobilisation
Community Liaison Officer(s)	Local engagement, disclosure, stakeholder relations	Relevant diploma/degree; local language essential		Stakeholder engagement, conflict resolution	Reports to Social Manager	Before mobilisation
Grievance Officer	Grievance mechanism management, tracking and reporting	Degree or equivalent; ≥3 years		Grievance systems, mediation	Reports to Social Manager	Before mobilisation
Emergency Response Coordinator	Emergency preparedness and response, drills, coordination	H&S/Engineering background; ≥5 years		Emergency response, incident command	Reports to H&S Manager / Site EHS	Before commissioning

TABLE B2: EPC CONTRACTOR – MINIMUM E&S STAFFING

Role	Key Functions	Minimum Experience	Qualification	Required Training	Reporting Line	Mobilisation Requirement
EPC E&S Manager	Contractor implementation; ESMP interface with IFF	Degree; ≥10 years		ESMP, standards IFC	Reports to EPC Project Manager and IFF Site E&S Manager	Before mobilisation
Environmental Officer(s)	Daily site inspections, monitoring, reporting	Diploma/Degree; ≥5 years		Monitoring protocols	Reports to EPC E&S Manager	Before mobilisation

Role	Key Functions	Minimum Qualification & Experience	Required Training	Reporting Line	Mobilisation Requirement
Social / Community Officer	Worker-community interface, conflict prevention	Degree; ≥5 years	Stakeholder engagement	Reports to EPC E&S Manager	Before mobilisation
H&S Manager	Occupational health and safety compliance	Degree; ≥10 years	ISO 45001	Reports to EPC Project Manager	Before mobilisation
Waste Management Supervisor	Waste segregation, disposal compliance	Diploma; ≥5 years	Waste management standards	Reports to Environmental Officer	Before mobilisation
Emergency Response Lead	Site emergency readiness, drills	Relevant certification; ≥5 years	Emergency response	Reports to H&S Manager	Before mobilisation

TABLE B3: OPERATIONS PHASE STAFFING (MINIMUM REQUIREMENTS)

Role	Key Functions	Minimum Qualification & Experience	Required Training	Reporting Line	Timing
Operations Manager E&S	Ongoing ESMS implementation	≥10 years experience	ESMS auditing	Reports to Corporate E&S	Before commissioning
Monitoring Technicians	Sampling, monitoring (air, water, noise)	Diploma; ≥3 years	Monitoring protocols	Reports to Environmental Lead	Before commissioning
Community Relations Officers	Continued engagement and grievance management	≥3 years experience	Stakeholder engagement	Reports to Social Manager	During operation
Emergency Response Team	Incident response and drills	Certified personnel	Emergency drills	Reports to Emergency Coordinator	Before commissioning

FUNCTIONAL OWNERSHIP OF KEY E&S RISKS

TABLE B4: ACCOUNTABILITY MATRIX FOR CRITICAL FUNCTIONS

Function	Primary Owner	Supporting Roles	Phase Applicability
Climate Risk Monitoring & GHG Management	Climate Risk & Sustainability Specialist	Corporate E&S, Operations Manager	Commissioning & Operation
Water & Effluent Compliance	Water & Effluent Specialist	Environmental Lead, EPC Environmental Officer	All phases
Biodiversity Management	Biodiversity Specialist	EPC Environmental Team	Pre-construction & Construction
Stakeholder Engagement / Community Liaison	Social Performance Manager	CLOs, EPC Social Officer	All phases
Grievance Mechanism	Grievance Officer	Social Manager	All phases
Emergency Preparedness & Response	Emergency Response Coordinator	H&S Manager, EPC Emergency Lead	Construction & Operation

MOBILISATION REQUIREMENTS BY PROJECT PHASE

TABLE B5: MINIMUM E&S STAFFING BY PHASE

Role Category	Before Mobilisation	Before Commissioning	During Operation
Corporate E&S Leadership	✓	✓	✓
Site E&S Manager	✓	✓	✓
EPC E&S Team	✓	✗	✗
Environmental Monitoring Staff	✓ (baseline)	✓	✓
Social & Community Team	✓	✓	✓
Climate Specialist	✗	✓	✓
Water/Effluent Specialist	✓	✓	✓

TABLE B6: PRIMARY SUPPLY CHAIN LABOUR SCREENING

Aspect / Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
Identification of Primary Supply Chain	Identify primary suppliers of goods and materials essential to core project activities (e.g. construction materials, equipment suppliers, security services, labour brokers).	Pre-construction; updated annually	100% of primary supply chain mapped
Risk-Based Categorisation	Classify suppliers into high, medium, and low labour risk categories based on sector, geography (high-risk countries), commodity type, and known labour issues.	Pre-procurement; reviewed annually	Risk classification completed for 100% of primary suppliers
High-Risk Supply Categories	Define high-risk categories including: • Extractives (e.g. quarrying, mining inputs) • Agriculture/forestry inputs • Labour-intensive manufacturing • Security services and labour providers • Suppliers operating in high-risk jurisdictions	Pre-construction; continuously updated	High-risk categories formally documented and approved
Prequalification Screening	Conduct labour compliance screening during supplier prequalification, including: • Labour policies • Prohibition of child/forced labour • Working conditions compliance • Grievance mechanisms • Past violations or sanctions	Prior to contract award	100% of high-risk suppliers screened before engagement
Due Diligence Documentation	Require suppliers to submit documentation such as: • Codes of conduct • Labour policies • Certifications (where applicable) • Audit reports	Pre-contract award; updated periodically	Complete documentation obtained for all high-risk suppliers
Contractual Requirements	Include binding contractual clauses requiring: • Compliance with IFC PS2, AfDB OS 2 or equivalent • Prohibition of forced and child labour • Provision of worker grievance mechanism • Right of audit by the Project • Corrective action obligations	At contract award	100% supplier contracts include labour compliance clauses

Aspect / Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
Contractor Flow-Down Requirement	Require contractors to apply equivalent supply chain labour requirements to their subcontractors and suppliers (cascade requirement).	At contract award; monitored during implementation	100% contractors implement supply chain requirements
Ongoing Monitoring	Monitor supplier compliance through: - Self-reporting - Performance reviews - Site visits (where feasible)	Quarterly for high-risk suppliers; annually for others	Monitoring conducted per schedule
Audit Triggers	Initiate supplier audits under the following conditions: - High-risk classification - Credible allegations of labour violations - Repeated grievances linked to supplier - Regulatory non-compliance reports	As triggered	100% triggered audits conducted
Supplier Audits	Conduct labour audits focusing on: - Working conditions - Employment practices - Worker interviews - Health and safety compliance	As required; prioritise high-risk suppliers	Audit reports completed and documented
Grievance Linkage	Ensure supply chain workers have access to either: - Supplier grievance mechanism, or - Project-level grievance mechanism	Continuous	100% high-risk suppliers provide grievance access
Corrective Action Plans (CAPs)	Require suppliers to implement corrective action plans for identified non-compliances within defined timeframes.	Post-audit; tracked until closure	≥ 90% CAPs implemented within agreed timeframe
Escalation Measures	Escalate unresolved or severe non-compliances to senior management and procurement decision-makers.	As required	All major non-compliances escalated
Disengagement Criteria	Define and apply disengagement rules for suppliers in cases of: - Confirmed forced or child labour - Failure to implement corrective actions - Repeated serious violations	As required	100% non-compliant suppliers managed per procedure

Aspect / Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
Responsible Disengagement	Where disengagement is necessary, ensure it is conducted responsibly to avoid unintended harm to workers (e.g. phased approach).	As required	Responsible disengagement plans documented
Record Keeping	Maintain records of supplier screening, audits, CAPs, and decisions in a central system for auditability.	Continuous	100% documentation retained and auditable
Capacity Building	Provide guidance, training, or awareness to suppliers (especially SMEs) on labour standards and compliance expectations.	Annual / as needed	Training conducted for high-risk suppliers
Performance Reporting	Report supply chain labour performance as part of ESMS reporting (e.g. number of high-risk suppliers, audits conducted, non-compliances identified).	Quarterly	Reports include supply chain KPIs
Continuous Improvement	Periodically review and update supply chain screening procedures based on lessons learned, trends, and regulatory updates.	Annual review	Procedure reviewed and updated annually

APPENDIX C ENVIRONMENTAL AND SOCIAL REPORTING FRAMEWORK

TABLE C1: ENVIRONMENTAL AND SOCIAL REPORTING FRAMEWORK

Report Type	Scope / Content	Trigger / Frequency	Recipients	Responsibility	Reporting Method	Performance Indicator
Internal Site E&S Reports	- Daily/weekly environmental and social performance - Monitoring results (air, water, noise, waste) - Incidents, near-misses, non-conformances - Community grievances and workforce issues	- Daily logs - Weekly summaries	Site Management, HSE Team, Contractor Supervisors	Contractor (primary), Client HSE Manager (oversight)	Site logs, internal dashboards, reports	100% reporting completion rate - All incidents recorded within 24 hours
Monthly Corporate E&S Reports	Consolidated E&S performance
 • KPI tracking (compliance, incidents, grievances)
 • Summary of mitigation implementation
 • Corrective actions status	Monthly	Client Corporate E&S Team, Senior Management	Client Environmental & Social Manager	Formal monthly report	- On-time submission - All KPIs tracked and reported
Regulatory Compliance Reports	- Monitoring data (emissions, effluent, waste) - Permit compliance status - Incident notifications and follow-up reports	- As per permit conditions - Immediate in case of notifiable incidents	Environmental Regulators, Water Authorities, Local Authorities	Client Environmental Manager	Formal submissions (as required by law)	- Zero missed submissions - Full compliance with permit conditions
Lender (IFC / AfDB / Financial Institution) Reports	- ESMP/ESMMP implementation status - Material incidents and corrective actions - Audit findings - Stakeholder engagement summary	- Quarterly and annual - Immediate notification for serious incidents (per lender requirements)	Lenders (IFC / AfDB / Financial Institutions)	Client Manager E&S	Formal lender report	- Compliance with lender reporting timelines - No material omissions

Report Type	Scope / Content	Trigger / Frequency	Recipients	Responsibility	Reporting Method	Performance Indicator
Community-Facing Disclosure	- Key project updates - Environmental performance summaries (where required) - Incident communication (if community affected) - Grievance mechanism updates	- Quarterly or as needed - Immediate for community-impacting events	Affected Communities, Local Stakeholders	Client Stakeholder Engagement Lead	Public meetings, notices, website, community liaison channels	- Timely disclosure of relevant information - Grievances addressed within defined timeframe
Incident Reporting (Internal and External)	- Details of E&S incidents (spills, exceedances, injuries, security events) - Root cause analysis - Corrective and preventive actions	- Within 24 hours (internal) - As per regulatory/lender requirement (external)	Internal Management, Regulators, Lenders (if applicable)	Contractor (initial notification), Client HSE Manager (final reporting)	Incident reports, notification letters	- All incidents reported within required timeframe 100% closure of corrective actions
Immediate Notification – Serious Incidents and Emergencies	- High-consequence industrial events (fire, explosion, major spill) - Flood events affecting operations or causing release - Security incidents with potential E&S risk - Fatalities or serious injuries - Significant pollution events	Immediate (≤ 24 hours or as legally required) upon occurrence	Regulators, Lenders, Emergency Services, Local Authorities	Client Incident Commander, HSE Lead	Formal notification (email/phone + written follow-up)	- Immediate notification compliance (≤ 24 hours) - Zero delayed notifications
Immediate Notification – Major Exceedances	- Exceedance of emission limits, discharge standards, or environmental thresholds - Failure of critical control systems	Immediate upon detection; formal report within defined timeframe	Regulators, Client Management	Client Environmental Manager	Monitoring alerts + formal submission	- All exceedances reported promptly - Corrective action initiated

Report Type	Scope / Content	Trigger / Frequency	Recipients	Responsibility	Reporting Method	Performance Indicator
						within defined timeframe
Immediate Notification – Community Complaint Escalation	- Significant increase (“spike”) in community complaints - Repeated complaints on same issue indicating systemic problem	Immediate internal escalation; external reporting as required	Client Management, Stakeholder Engagement Team, Regulators (if required)	Community Liaison Officer, Client E&S Manager	Grievance register updates, escalation reports	- Complaint response within agreed timeframe - Reduction in repeat complaints
Climate and Environmental Event Reporting	- Extreme rainfall/flooding events - Wildfires affecting access or operations - Prolonged heat impacts - Water stress events affecting abstraction/use	Immediate notification where operational or compliance implications arise; summary reporting monthly	Regulators (where required), Lenders, Internal Management	Client Environmental Manager, Operations Manager	Incident reports and monthly summaries	- All climate-related events recorded and reported - No unreported operational disruptions
ERP Activation and Drill Reporting	- Records of ERP activations (actual events) - Drill outcomes (scenario-based performance) - Identified gaps and corrective actions	After each drill/event	Internal Management, Lenders (summary)	Client HSE Manager	Drill reports, ERP logs	≥90% drill completion as planned - Corrective actions tracked and closed
Annual E&S Performance Report	- Comprehensive review of environmental and social performance - Trends analysis (incidents, emissions, grievances) - ESMS effectiveness (PDCA cycle) - Updates to ESMMP/ERP	Annual	Corporate Management, Lenders, Regulators (if required)	Client Environmental & Social Manager	Annual E&S report	- Annual report completed and approved - Continuous improvement actions implemented

APPENDIX D WORKER GRIEVANCE PROCEDURE

Aspect / Activity	Management Measure	Timing and Frequency	Target / Performance Indicator
Coverage of Workforce	Establish a formal grievance mechanism applicable to all workers, including direct employees, contractor workers, and subcontractor personnel.	Pre-construction and maintained throughout project lifecycle	100% of workforce covered by grievance mechanism
Contractor Alignment	All contractors and subcontractors shall be contractually required to adopt the Project grievance mechanism or implement an equivalent system aligned with IFC PS2 standards, AfDB OS 2. Compliance to be verified during prequalification and audits.	Pre-contract award; verified quarterly	100% contractor compliance with grievance requirements
Grievance Channels	Provide multiple grievance submission channels including: • Anonymous (suggestion boxes, hotline) • Non-anonymous (supervisor, HR, email, grievance forms) • Digital and physical options	Operational throughout project	Minimum of 3 accessible grievance channels available at all times
Anonymous Submissions	Ensure workers can submit grievances anonymously without obligation to disclose identity. Anonymous grievances shall be investigated with equal priority.	Continuous	100% of anonymous grievances investigated
Non-Retaliation	Implement and communicate a strict non-retaliation policy to protect complainants, witnesses, and participants in grievance processes.	During induction; reinforced periodically	Zero substantiated retaliation cases
Confidentiality	Maintain strict confidentiality of grievance information. Limit access to authorised personnel only and ensure secure record-keeping.	Continuous	No breaches of confidentiality reported
Registration and Tracking	Establish a grievance register/log capturing: date received, category, complainant type (if known), status, and resolution.	Continuous; updated per grievance	100% of grievances recorded and tracked
Acknowledgement	Acknowledge receipt of grievances within 2 working days (or equivalent defined standard).	Per grievance	≥ 95% grievances acknowledged within timeframe
Screening and Assignment	Screen grievances and assign responsibility (HR, Contractor Management, HSE, etc.) for investigation and resolution.	Within 3 working days of receipt	100% grievances assigned within timeframe
Investigation and Resolution	Investigate and resolve grievances within 15 working days (or as defined based on complexity). Provide documented outcomes.	Per grievance	≥ 90% grievances resolved within timeframe
Communication with Complainant	Maintain regular communication with complainants (except anonymous cases), including updates on progress and outcomes.	Throughout resolution process	100% non-anonymous grievances receive status updates
Escalation Mechanism	Define escalation procedures for unresolved or complex grievances to senior management or independent review.	As required	All escalated grievances formally reviewed
Appeals Process	Provide an accessible appeal process allowing workers to challenge grievance outcomes within a defined timeframe (e.g., 10 working days).	As required	100% appeal requests addressed
Resolution Closure	Close grievances only after confirmation of resolution and documentation of corrective actions and lessons learned.	Per grievance	100% closed grievances documented
Trend Analysis	Conduct periodic analysis of grievances to identify recurring issues, systemic risks, or patterns (e.g., labour conditions, supervisor conduct).	Monthly/Quarterly	Trend reports produced and reviewed regularly
Corrective Actions	Develop and implement corrective actions based on grievance trends and findings. Integrate into ESMS continuous improvement cycle.	As identified	100% identified systemic issues addressed
Reporting	Include grievance statistics (number, type, resolution rate, outstanding cases) in internal and external ESMMP reporting.	Monthly and quarterly	Reports submitted as per ESMS requirements
Training and Awareness	Communicate grievance mechanism during: • Worker induction • Toolbox talks • Refresher training sessions	Induction; monthly toolbox talks	100% workers informed of grievance procedures
Accessibility	Ensure grievance procedures are accessible to all workers, including literacy-appropriate formats, local language translation, and gender-sensitive approaches.	Continuous	Verified accessibility for all workforce segments
Record Retention	Maintain grievance records securely for audit purposes in line with legal and lender requirements.	Continuous	Records retained and auditable for required duration

APPENDIX E CHANCE FINDS PROCEDURE

CHANCE FINDS PROCEDURE (TO BE READ WITH CULTURAL HERITAGE MANAGEMENT PLAN)

Aspect	Requirement / Management Measure
Objective	To ensure that any previously unidentified cultural heritage encountered during Project activities is managed in a manner that avoids damage, ensures legal compliance, and aligns with IFC PS8, AfDB OS8 and national requirements.
Project Phase	Pre-construction, construction, and any operational activities involving ground disturbance.
Impact / Risk	Disturbance or loss of unknown archaeological resources, burial sites, artefacts or culturally significant features during excavation, earthworks or infrastructure development.
Management Measures	A formal Chance Finds Procedure shall be implemented as follows: (i) Stop-work: all works in the immediate area of the find shall cease immediately and equipment secured; (ii) Exclusion zone: a clearly demarcated no-go area (minimum 20–50 m or as defined by the E&S Manager) shall be established and access restricted; (iii) Securing the find: the site shall be protected from disturbance, removal or damage, and security deployed where necessary; (iv) Notification: the Contractor shall notify the Site Supervisor and Project E&S Manager immediately, who shall activate the notification protocol set out below (immediate internal notification; notification of the competent authorities within 24 hours or as legally required; and lender notification where the find is material); (v) Specialist inspection: a qualified cultural heritage specialist shall be appointed to assess the find and recommend appropriate management actions; (vi) Authority engagement: the competent heritage authorities (see “Competent Authorities and Statutory Approvals” below) shall be notified and consulted, and any required permits or approvals obtained, and, where the find has cultural or spiritual significance, affected communities shall be consulted as set out below; (vii) Documentation: all findings shall be recorded in a Chance Finds Register, including GPS location, description, photographs, actions and decisions; (viii) Decision and mitigation: management actions (e.g. preservation in situ, controlled excavation, redesign or buffering) shall be implemented based on specialist and authority guidance; (ix) Restart authorisation: work shall only recommence following written clearance from the competent authority (where applicable) and formal approval from the Project E&S Manager.
Notification Protocol	• Immediate internal notification: the person making the find notifies the Contractor’s site supervisor at once; the supervisor notifies the Project E&S Manager within 1 hour. • Competent authorities: the Project E&S Manager notifies the National Commission for Museums and Monuments (NCMM) and the relevant Rivers State heritage authority promptly, within 24 hours or as legally required; human remains are also reported to the police. • Lenders: where a find is material (e.g. human remains, a site of national or community significance, or a find requiring redesign or a prolonged work stoppage), or triggers reporting under the financing agreements, the lenders are notified as a serious incident in accordance with Section 6.4.4 and Appendix C.
Competent Authorities and Statutory Approvals	• Federal: National Commission for Museums and Monuments (NCMM), under the National Commission for Museums and Monuments Act (Cap N19, LFN 2004). State: Rivers State Ministry of Culture and Tourism / Rivers State Council for Arts and Culture • Statutory clearance from the NCMM (and the State authority where applicable) is required before works resume in the affected area where the find comprises human remains, archaeological objects or features (antiquities), or a site of cultural or spiritual significance, or where the authority so directs. For other finds, works may resume

Aspect	Requirement / Management Measure
	on written approval by the Project E&S Manager on the advice of the heritage specialist.
Community Consultation (finds of cultural or spiritual significance)	- Where a find may have cultural or spiritual significance to local communities, the Project will consult the affected communities and their traditional rulers, chiefs, custodians of shrines and other recognised community representatives (through the Community Relations team, in line with the SEP) on the appropriate treatment of the find, including any rites to be observed, relocation or in-situ preservation. - Consultation will respect confidentiality and cultural sensitivities (e.g. restricting the disclosure of sacred site locations and the handling of human remains); outcomes and agreements will be documented in the Chance Finds Register, and any related grievances managed through the GRM.
Monitoring	Inspection of work fronts for compliance; verification that exclusion zones are maintained; review of Chance Finds Register; audit of notification timelines and corrective actions.
Performance Indicators	100% compliance with stop-work requirements; all chance finds reported within 24 hours; no unauthorised disturbance or removal of finds; documented closure and approvals prior to restart of works.
Responsibility	Contractor (implementation at site level); Project Proponent (oversight); E&S Manager (procedure activation, reporting and approval); Cultural Heritage Specialist (technical assessment).
Reporting	Inclusion of chance finds incidents and actions in monthly E&S reports; immediate notification to authorities where required; maintenance of auditable documentation within the ESMS.
Training / Awareness	All personnel shall receive induction training on identification and reporting of chance finds; toolbox talks shall reinforce stop-work and reporting obligations.
Contractor Requirements	This procedure shall be incorporated into Contractor method statements, Construction Environmental and Social Management Plans (CESMPs), risk assessments and induction materials. Contractors shall demonstrate alignment prior to mobilisation and compliance shall be verified through audits and inspections.



ERM HAS OVER 140 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina	Mexico
Australia	Mozambique
Belgium	Netherlands
Brazil	Panama
Brunei	Peru
Canada	Poland
Chile	Portugal
China	Romania
Colombia	Singapore
France	South Africa
Germany	South Korea
Guyana	Spain
Hong Kong	Switzerland
India	Taiwan
Indonesia	Thailand
Ireland	United Arab Emirates
Italy	United Kingdom
Japan	United States
Kenya	Vietnam
Malaysia	

ERM's [Office name]

Add	address	1
Add	address	2
Add	address	3
State, Zip/Post code		
T	+1 000 000 000	0000
F +1 000 000 0000		

www.erm.com

Back cover

Update the ERM address details for the location owning this project.

Delete this box when not required.