

**ENVIRONMENTAL AND SOCIAL MANAGEMENT
(ESMP) PLAN**

FOR

**EXPANSION OF ONNE MULTIPURPOSE TERMINAL
(OMT) LOCATED IN ONNE PORT COMPLEX,
ELEME, RIVERS STATE**

BY

**ONNE MULTIPURPOSE TERMINAL, ONNE, ELEME,
RIVERS STATE**

**SUBMITTED TO
FEDERAL MINISTRY OF ENVIRONMENT, ABUJA
HEADQUARTERS, MABUSHI, ABUJA, NIGERIA**

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Abbreviation

ALD	Above Lagos Datum
BOD	Biochemical Oxygen Demand
CO	Carbon-Monoxide
COD	Chemical Oxygen Demand
CxHy	Total Hydrocarbon
DPR	Department of Petroleum Resources
EGASPIN	Environmental Guidelines and Standards for the Petroleum Industry in Nigeria
EHS	Environment Health and Safety
ESMP	Environmental and Social Management Plan
HAZID	Hazard identification
HAZOP	Hazard and operability
HSE	Health Safety and Environment
HSEF	Health Safety Environment and Fire
IFC	International Finance Corporation
MMSCM	Million Standard Cubic Meter
MMT	Million Metric Tone
MoU	Memorandum of Understanding
MT	Metric Tone
MTPD	Metric Ton Per Day
NG	Natural Gas
PM10	Particulate Matter -10µm
PM2.5	Particulate Matter -2.5µm
QHSE	Quality, Health, Safety and Environment
SOx	Sulphur Oxide
SPM	Suspended Particulate Matter
SCM	Standard Cubic Meter
VOC	Volatile Organic Carbon

EXECUTIVE SUMMARY

The Onne Multipurpose Terminal (OMT) proposes the expansion of operational infrastructure within the Onne Port Complex close to its existing facility to enhance cargo handling efficiency, increase container storage capacity, improve administrative operations, and support the terminal's transition toward cleaner energy utilization.

The proposed development comprises:

- Construction of a Warehouse and Administrative Office Complex.
- Paving and hard-surfacing of designated land areas for container storage.
- Installation of a Solar Photovoltaic (PV) Energy System and associated infrastructure.

Most of the identified impacts are rated minor considering the scope of work and the sensitivities of the receiving environment. However, with the implementation of the proposed mitigation measures, environmental and social impacts associated with the expansion work are expected to remain localized, short-term, reversible, and within acceptable regulatory limits. The project will deliver significant positive impacts through improved operational efficiency, employment generation, enhanced cargo handling capacity, and reduction of greenhouse gas emissions through the adoption of solar energy infrastructure.

This Environmental and Social Management Plan (ESMP) outlines mitigation measures, monitoring requirements, institutional responsibilities, emergency response procedures, stakeholder engagement mechanisms, and reporting obligations necessary to manage potential environmental and social impacts during pre-construction, construction, and operational phases.

It is the intention of the proponent to carry out this expansion project in line with the extant statutory requirement and international best practice to ensure sustainable development.

1.0 INTRODUCTION

This document presents the Environmental and Social Management Plan (ESMP) prepared for the proposed expansion project by Onne Multipurpose Terminal (OMT) in Onne Port Complex. The project involves the construction and operational activities associated with:

- Development of additional warehouse facilities;
- Installation of solar power infrastructure; and
- Paving of open yard areas for container box storage.

The ESMP provides a structured framework for the management of environmental and social impacts that may arise during the pre-construction, construction, operational and decommissioning phases of the project. The plan outlines mitigation measures, monitoring requirements, institutional responsibilities, reporting procedures and emergency response mechanisms necessary to ensure compliance with Nigerian environmental regulations and international best practices including IFC Performance Standards.

1.1 The Proponent

The project proponent is International Container Terminal Services Inc. (ICTSI) is a leading global brand in the business of terminal services for over 33 years. The company is headquartered in Philippines with over 7,000 employments and operational in so many countries for cargo and non-cargo services. The company's address in Nigeria is Berths 9-11, FOT, Onne Port complex, Eleme LGA, Rivers State.

The objectives of the proposed project are to:

- Expand cargo and storage handling capacity within the terminal;
- Improve operational efficiency and logistics management;
- Enhance renewable energy utilization through solar power installation;
- Improve paved storage surfaces for container handling operations; and
- Support economic growth and maritime trade activities within the port complex.

1.2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The ESMP shall comply with applicable Nigerian environmental legislation and relevant international standards including:

- i. Constitution of the Federal Republic of Nigeria (1999)**

The constitution, as the national legal order, recognizes the importance of improving and protecting the environment and makes provision for it. Relevant sections are:

Section 20 makes it an objective of the Nigerian State to improve and protect the air, land, water, forest and wildlife of Nigeria.

Section 12 establishes, though impliedly, that international treaties (including environmental treaties) ratified by the National Assembly should be implemented as law in Nigeria.

Section 33 and 34 which guarantee fundamental human rights to life and human dignity respectively, have also being argued to be linked to the need for a healthy and safe environment to give these rights effect.

ii. National Environmental Standards and Regulation Enforcement Agency (NESREA) ACT 2007

Administered by the Ministry of Environment, the National Environment Standards and Regulation Enforcement Agency (NESREA) Act of 2007 replaced the Federal Environmental Protection Agency (FEPA) Act. It is the embodiment of laws and regulations focused on the protection and sustainable development of the environment and its natural resources. The following sections are worth noting: -

Section 7 provides authority to ensure compliance with environmental laws, local and international, on environmental sanitation and pollution prevention and control through monitory and regulatory measures.

Section 8 (1)(K) empowers the Agency to make and review regulations on air and water quality, effluent limitations, control of harmful substances and other forms of environmental pollution and sanitation.

Section 27 prohibits, without lawful authority, the discharge of hazardous substances into the environment. This offence is punishable under this section, with a fine not exceeding, N1,000,000 (One Million Naira) and an imprisonment term of 5 years. In the case of a company, there is an additional fine of N50,000, for every day the offence persists.

iii. National Effluent Limitation Regulations.

Section 1 (1) requires industry facilities to have anti-pollution equipment for the treatment of effluent.

Section 3 (2) requires a submission to the agency of a composition of the industry's treated effluents.

iv. National Environment Protection (Pollution Abatement in Industries and Facilities producing Waste) Regulations (1991).

Section 1 Prohibits the release of hazardous substances into the air, land or water of Nigeria beyond approved limits set by the Agency.

Section 4 and 5 requires industries to report a discharge if it occurs and to submit a comprehensive list of chemicals used for production to the Agency.

v. Federal Solid and Hazardous Waste Management Regulations (1991).

Section 1 makes it an obligation for industries to identify solid hazardous wastes which are dangerous to public health and the environment and to research into the possibility of their recycling.

Section 20 makes notification of any discharge to the Agency mandatory.

Section 108 stipulates penalties for contravening any regulation.

vi. Environmental Impact Assessment (EIA) ACT. CAP E12, LFN 2010.

An Environmental Impact Assessment (EIA) is an assessment of the potential impacts whether positive or negative, of a proposed project on the natural environment:

The EIA Act, as it is informally called, deals with the considerations of environmental impact in respect of public and private projects. Sections relevant to environmental emergency prevention under the EIA include: -

Section 2 (1) requires an assessment of public or private projects likely to have a significant (negative) impact on the environment.

Section 2 (4) requires an application in writing to the Agency before embarking on projects for their environmental assessment to determine approval.

Section 13 establishes cases where an EIA is required and

Section 60 creates a legal liability for contravention of any provision.

vii. The Nigerian Urban and Regional Planning ACT CAP N138, LFN 2004

The Urban and Regional Planning Act is aimed at overseeing a realistic, purposeful planning of the country to avoid overcrowding and poor environmental conditions. In this regard, the following sections become instructive: -

Section 30 (3) requires a building plan to be drawn by a registered architect or town planner.

Section 39 (7) establishes that an application for land development would be rejected if such development would harm the environment or constitute a nuisance to the community.

Section 59 makes it an offence to disobey a stop-work order. The punishment under this section, is a fine not exceeding N10, 000 (Ten thousand naira) and in the case of a company, a fine not exceeding N50, 000.

Section 72 provides for the preservation and planting of trees for environmental conservation.

viii. Land Use ACT CAP 202, LFN 2004

The Land Use Act places the ownership, management and control of land in each state of the federation in the Governor. Land is therefore allocated with his authority for commercial, agricultural and other purposes.

ix. Harmful Waste (SPECIAL CRIMINAL PROVISIONS) ACT CAP H1, LFN 2004

The Harmful Waste Act prohibits, without lawful authority, the carrying, dumping or depositing of harmful waste in the air, land or waters of Nigeria. The following sections are notable:

Section 6 provides for a punishment of life imprisonment for offenders as well as the forfeiture of land or anything used to commit the offence.

Section 7 makes provision for the punishment accordingly, of any conniving, consenting or negligent officer where the offence is committed by a company.

Section 12 defines the civil liability of any offender. He would be liable to persons who have suffered injury as a result of his offending act.

x. Oil in Navigable Waters ACT, CAP 06, LFN 2004.

The Oil in Navigable Waters Act is concerned with the discharge of oil from ships. The following sections are significant: -

Section 1 (1) prohibits the discharge of oil from a Nigerian ship into territorial waters or shorelines.

Section 3 makes it an offence for a ship master, occupier of land, or operator of apparatus for transferring oil to discharge oil into Nigerian Waters. It also requires the installation of anti-pollution equipment in ships.

Section 6 makes punishable such discharge with a fine of N2, 000 (Two thousand naira).

Section 7 requires the records of occasions of oil discharge.

xi. The Endangered Species ACT, CAP E9, LFN 2004.

This Act focuses on the protection and management of Nigeria's wildlife and some of their species in danger of extinction as a result of overexploitation. These sections are noteworthy:

Section 1 prohibits, except under a valid license, the hunting, capture or trade in animal species, either presently or likely to be in danger of extinction.

Section 5 defines the liability of any offender under this Act.

Section 7 provides for regulations to be made necessary for environmental prevention and control as regards the purposes of this Act.

xii. Sea Fisheries ACT, CAP S4, LFN 2004.

The Sea Fisheries Act makes it illegal to take or harm fishes within Nigerian waters by use of explosives, poisonous or noxious substances.

Relevant sections include the following: -

Section 1 prohibits any unlicensed operation of motor fishing boats within Nigerian waters.

Section 10 makes destruction of fishes punishable with a fine of N50,000 or an imprisonment term of 2 years.

Section 14 (2) provides authority to make for the protection and conservation of sea fishes.

xiii. Inland Fisheries ACT, CAP I10, LFN 2004.

Focused on the protection of the water habitat and its species, the following sections are instructive:

Section 1 prohibits unlicensed operations of motor fishing boats within the inland waters of Nigeria.

Section 6 prohibits the taking or destruction of fish by harmful means. This offence is punishable with a fine of N3, 000 or an imprisonment term of 2 years or both.

xiv. Exclusive Economic Zone ACT, CAP E11, LFN 2004.

The Exclusive Economic Zone Act makes it illegal to explore or exploit natural resources within the Exclusive zone without lawful authority. The Federal Government regulates the activities of the Exclusive Zone.

xv. River Basins Development Authority ACT, CAP R9, LFN 2004.

The River Basins Development Authority is concerned with the development of water resources for domestic, industrial and other uses, and the control of floods and erosion.

xvi. Territorial Waters ACT, CAP T5, LFN 2004.

The Territorial Waters Act makes punishable any act or omission committed within Nigerian waters which would be an offence under any other existing law.

xvii. Nuclear Safety and Radiation Protection ACT, CAP N142, LFN 2004.

The Act is concerned with the regulation of the use of radioactive substances and equipment emitting and generating ionizing radiation. In particular:

Section 4 provides authority to make regulations for the protection of the environment from the harmful effects of ionizing radiation.

Section 15 and 16 makes registration of premises and the restriction of ionizing radiation sources to those premises mandatory.

Section 37 (1) (b) allows an inspector verify records of activities that pertain to the environment.

Section 40 clarifies that the same regulations guiding the transportation of dangerous goods by air, land or water should also apply to the transportation of radioactive substances.

xviii. Factories ACT, CAP F1, LFN 2004.

The Factories Act promotes the safety of workers and professionals exposed to occupational hazards. Under this Act, it is an offence to use unregistered premises for factory purposes. In particular:

Section 13 allows an inspector take emergency measures or request that emergency measures be taken by a person qualified to do so in cases of pollution or any nuisance.

xix. Water Resources ACT, CAP W2, LFN 2004.

The Water Resources Act is targeted at developing and improving the quantity and quality of water resources. The following sections are pertinent:

Section 5 and 6 provides authority to make pollution prevention plans and regulations for the protection of fisheries, flora and fauna.

Section 18 makes offenders liable, under this Act, to be punished with a fine not exceeding N2000 or an imprisonment term of six months. He would also pay an additional fine of N100 for everyday the offence continues.

xx. The Federal National Parks ACT, CAP N65, LFN 2004.

The National Parks Act is concerned with the establishment of protected areas used for resource conservation, water catchments protection, wildlife conservation and maintenance of the national eco-system balance.

xxi. Niger-Delta Development Commission (NDDC) ACT, CAP N68, LFN 2004.

The Niger-Delta Development Commission Act is concerned with using allocated funds to tackle ecological problems arising from the exploration of oil minerals in the Delta.

Section 7 (1) (b) empowers the Commission to plan and to implement projects for the sustainable development of the Delta in the field of transportation, health, agriculture, fisheries, urban and housing development, etc.

The Commission, under this Act, has a duty to liaise with oil and gas companies and advice stakeholders on the control of oil spillages, gas flaring and other related forms of environmental pollution.

xxii. Quarantine ACT, CAP Q2, LFN 2004.

The Quarantine Act provides authority to make regulations for preventing the introduction, spread and transmission of infectious diseases such as cholera, yellow fever, typhus, etc.

Under this Act, violation of any regulation is punishable with a fine of N200 or an imprisonment term of 2 years or both.

xxiii. Employee's Compensation Act, 2010

The Act provides for an open and fair system of guaranteed and adequate compensation for all employees or their dependants for any death, injury, disease or disability arising out of or in the course of employment. The Act also makes provision for rehabilitation of employees with work-related disabilities and establishment of a solvent compensation fund managed in the interest of employees and employers. One of the core objectives of the Act is to harness combined efforts and resources of relevant stakeholders for the prevention of workplace disabilities and the enforcement of occupational safety and health standards in Nigeria. Occupational accidents and injuries arising during the OMT upgrade work will be handled using the employee's compensation Act.

xxiv. The Nigeria National Health Act 2014

The aim of the Act is to establish a national framework for the Regulation, Development and Management of a National Health System, to set standards for rendering health services in Nigeria. Other key provisions include:

- Establishment of the National Health Systems,
- Provides for exemption from payment for health services in public health establishments, and
- Provides for the establishment of the Basic Health Care provision fund among others.

xxv. National FMEEnv EIA Procedural Guidelines 1995

The FMEEnv established the National EIA Procedural Guidelines in 1995 that indicate the process for conducting an EIA for projects in Nigeria in line with the requirements of the EIA Act CAP E12 LFN 2004. The process has been designed to ensure that the proposed project is implemented with maximum consideration for the environment. The basic steps in the EIA process include submission of Project Proposal/TOR, Initial Environmental Examination, Scoping, EIA Study, Review, Decision Making, Monitoring and Auditing. For smaller project with lower categorisation, the regulators allow the development of simple ESIA that will produce a focused ESMP for the project activities. In such case, the normal ESIA process may not be totally followed.

xxvi. Local Content Act) 2010

The Nigerian Oil and Gas Industry Content Development (Local Content Act) 2010 was enacted to promote the indigeneous participation in the Nigeria's oil and gas industry for the purpose of improving the economic and social wellbeing of those engaged in operating in the oil and gas industry. The Act provides for the development of Nigerian content in the Nigerian oil and gas industry, Nigerian content plan, supervision, coordination, monitoring, and implementation of the Nigerian content.

The sole purpose of the Local Content is to increase Nigerian participation in the oil and gas industry by prescribing minimum thresholds for the use of local services and materials for the promotion of technology and skill to the Nigerian labour in the oil and gas industry

xxvii. Natural Resources Conservation Act CAP 286 LFN 2004

The act gave the agency the responsibility to conserve natural resources Nigeria through formulation of policy on conservation of natural resources, collaborate with other agencies on coastal zone development to minimize erosion on National coastlines.

xxviii. National Guideline for Environmental Audit 1999

The guideline provides an overview of types of audits, frequency of audit, scope of audit and instruction note carrying out audits.

xxix. National Guidelines on Environmental Management Systems (EMS) 1999

Recognizing the value of EMS to EIA, this document sets out objectives and provides a guide on general scope and content of an EMS.

xxx. Criminal Code Act CAP C38, LFN 2004

The Criminal Code contains provisions for the prevention of public health hazards and for environmental protection. Hence, Sections 245-248 deal with offences ranging from water fouling, to the use of noxious substances.

State Environmental Laws

i. Rivers State Ministry of Environment

Rivers State Ministry of Environment is an apex decision making institution of the state on environmental protection and conservation. The Ministry is saddle with the responsibility of general protection and development of the environment, conservation of biodiversity, natural resources and sustainable development of the State. The Ministry collaborate with the FMEnv to ensure compliance with EIA Act and other relevant federal and state environmental laws, policies and guidelines. The functions of the SEPAs include:

- Routine liaison and ensuring effective harmonization with the FMEnv in order

- To achieve the objectives of the National Policy on the Environment
- Cooperate with FMEnv and other relevant National directorates/agencies in
- The promotion of environmental education
- Be responsible for monitoring compliance with waste management & standards
- Monitor the implementation of the EIA and the Environmental Audit Report (“EAR”) guidelines and procedures on all development policies and projects within the state.

ii. Rivers State Waste Management Agency (RIWAMA No. of 2014)

The Rivers State House of Assembly in 2014 passed the Waste Management Agency Bill into law, that was assented to by the Governor, Rt Hon. Chibuike Rotimi Amaechi. The Agency became a parastatal of Rivers State Ministry of Environment charged with the responsibility of enhancing the environmental cleanliness of the state. The objective of the Law is “achieving positive and substantial change in living conditions as well as reducing diseases or health problems in the state”

iii. Rivers State Environmental Protection Agency Law No. 2 of 1994

iv. Rivers State Private Health and Allied Establishments Authority Law, 2001

v. Rivers State Public Health Law, 1999

vi. Rivers State Noise Pollution Control Law of 198

The above listed Rivers state environmental laws (iii –vi) are aimed at protection of environment, natural resources and human being

Eleme Local Government Council Regulation

No bye-law relevant to this project

1.2.1 International Regulation

In addition to the national laws/regulations, Nigeria is signatory or party to several international conventions and treaties that support the use of ESIA as the key tool for achieving environmentally sustainable development. The ESIA shall be guided by the international environmental and social regulations from IFC/World Bank where applicable. All other relevant international guidelines and conventions, and industry best management practices shall also apply, including the international financing community.

IFC’s Sustainability Framework – 2012 Edition

The Sustainability Framework consists of:

- The Policy on Environmental and Social Sustainability, which defines IFC's commitments to environmental and social sustainability and responsibility in supporting project performance in partnership with clients.
- The Access to Information Policy, which articulates IFC's commitment to transparency.
- The Performance Standards, which define clients' responsibilities for managing their environmental and social risks and include requirements for IFC support.
- Environmental, Health and Safety (EHS) Guidelines. This is a technical guidance on environmental, health and safety issues, such as ambient air quality, chemical hazards, and disease prevention.

IFC's Performance Standards on Social and Environmental Sustainability

The 2012 edition of IFC's Sustainability Framework applies to all investment and advisory clients whose projects go through IFC's initial credit review process after January 1, 2012. IFC's Performance Standards define client roles and responsibilities for managing projects and requirements for IFC support. The standards include requirements to disclose information. The Guidance Notes are companion documents to the Performance Standards, providing guidance to clients (and IFC staff) in meeting the Performance Standards.

The standards are divided into the following issue-specific sections:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labour and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement **(Not Triggered)**
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 7: Indigenous Peoples **(Not Triggered)**
- Performance Standard 8: Cultural Heritage **(Not Triggered)**

Together, these eight Performance Standards establish standards that the client is to meet throughout the life of an investment by IFC:

IFC PS 1 (Assessment and Management of Environmental and Social Risks and Impacts): PS 1 defines the importance of implementing a robust and effective Environmental and Social Management System on the business activity drawing on the assessment findings of social and environmental impacts from the project to then implement systems to avoid, reduce or remove the impacts identified through mitigation. Particular reference is made towards affected communities, grievance mechanisms and community consultation.

IFC PS 2 (Labour and Working Standards): PS 2 recognizes that the pursuit of economic development through job creation and income generation should be accompanied by the protection of the worker's human rights. Safe and healthy working conditions can be a catalyst for tangible benefits for the project.

IFC PS 3 (Resource Efficiency and Pollution Prevention): PS 3 specifically addresses managing resource efficiency and pollution prevention within project life cycles. It encourages the project to actively utilize current internationally disseminated technologies and good practice.

IFC PS 4 (Community Health, Safety and Security): PS 4 specifies requirements for mitigating any potential for community exposure to risks and impacts arising from equipment accidents, structural failures and releases of hazardous materials. In addition, PS 4 realizes that communities may be affected by impacts on their natural resources, exposure to diseases and the use of security personnel.

IFC PS 5 (Land Acquisition and Involuntary Resettlement): This Standard outlines a policy to avoid or minimize involuntary physical resettlement as a consequence to the project. Where it is unavoidable, it requires suitable measures to mitigate adverse impacts on affected stakeholders, including appropriate compensation for any economic displacement such as loss of subsistence or commercial livelihood.

IFC PS 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resource): PS 6 sets out an approach to protect and conserve biodiversity including habitats, species, genes and genomes, all of which have potential social, economic, cultural and scientific importance, as well as means to ensure no net loss/no net reduction and biodiversity offset. This PS is guided by the Convention on Biological Diversity.

IFC PS 7 (Indigenous Peoples): This PS recognizes that indigenous people can be marginalized and vulnerable (for example, if their lands and resources are encroached upon

by or significantly degraded by a project). Their languages, culture, religions, spiritual beliefs and institutions may also be under threat. This PS sets out how to avoid this and include the people in the project.

IFC PS 8 (Cultural Heritage): The PS aims to protect irreplaceable cultural heritage and to provide guidance for protecting cultural heritage throughout a project life cycle. Out of the eight (8) Performance Standard (PS) listed above, only PS 1, 2, 3, 4, and 6 may be triggered based on the scope and condition of this upgrade work

IFC's Environmental, Health and Safety (EHS) Guidelines (2007)

The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC's Performance Standard 3 on Pollution Prevention and Abatement³. Reference to the EHS Guidelines by IFC clients is required under Performance Standard 3. IFC uses the EHS Guidelines as a technical source of information during project appraisal activities, as described in IFC's Environmental and Social Review Procedure.

The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC and are generally considered to be achievable in new facilities at reasonable costs by existing technology. For IFC-financed projects, application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to IFC, become project- or site-specific requirements.

When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

General EHS Guidelines

The General EHS Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors. It is designed and should be used together with the relevant industry sector guideline(s). It sets out specific minimum standards in regards to environmental protection, occupational health and safety, and community health and safety throughout the project life cycle impacts.

The General EHS Guidelines are organized in 4 main chapters:

- Environmental
- Occupational Health and Safety
- Community Health and Safety
- Construction and Decommissioning

IFC Sector Guidelines – Ports, Harbors and Terminal

This guideline provides a description of industry specific impacts and management including identification of air emissions including greenhouse gases (GHGs), wastewater, hazardous materials, wastes and noise, definition of detailed compliance requirements (emission/discharge limits, noise etc), abatement measures to ensure compliance, suggested performance indicators and monitoring requirements. It also provides advice on Occupational Health and Safety (e.g. management, storage and shipping of hazardous products, disposal of wastes among others).

2.0 PROJECT DESCRIPTION

Onne Multipurpose Terminal is one of Nigeria's major terminal/port facilities located within the Onne Port Complex in Rivers State. The terminal serves as a strategic logistics hub for containerized cargo, project cargo, oil and gas equipment, and general freight. Increasing cargo throughput and operational demand have necessitated expansion of existing infrastructure to improve efficiency, optimize land utilization, and enhance sustainability.

The proposed project will support:

- Increased container handling capacity.
- Improved warehousing and cargo management.
- Enhanced administrative and operational functions.
- Reduced dependence on grid electricity and diesel-powered generators.
- Improved safety and logistics management.

The project is located within the operational boundaries of Onne Multipurpose Terminal at:

- Terminal 2 and Terminal 3
- Onne Port Complex
- Eleme Local Government Area
- Rivers State, Nigeria

The project area lies within an established industrial and port environment characterized by:

- Existing cargo handling operations.
- Marine transportation activities.
- Port-related industrial facilities.
- Existing paved operational areas.

No encroachment into ecologically sensitive habitats, mangrove forests, or residential settlements is anticipated.

2.1 Warehouse Development

The project includes development of a modern warehouse and administrative office facility.

Proposed features include:

- Reinforced concrete foundation.
- Structural steel framework.
- Insulated roofing system.
- Cargo storage sections.
- Mechanical ventilation.
- Fire detection and suppression systems.
- Drainage channels.
- Security systems.

The office complex shall include:

- Administrative offices.
- Meeting rooms.
- Training room.
- Control room.
- Welfare facilities.
- Restrooms.
- ICT and communication facilities.
- Parking area.

2.2 Container Storage Yard Development

The project proposes paving designated areas for container stacking and storage operations.

Activities include:

- Site clearing and grading.
- Earthworks and compaction.
- Sub-base construction.
- Concrete/asphalt pavement installation.
- Stormwater drainage installation.
- Road markings.
- Traffic management systems.
- Lighting infrastructure.

Expected benefits include:

- Increased storage capacity.
- Improved cargo movement.
- Reduced dust generation.
- Enhanced operational safety.
- Reduced soil contamination risk.

2.3 Solar Installation

Installation of photovoltaic solar systems including:

- Solar panels;
- Mounting structures;
- Inverters and battery systems;
- Cabling and electrical connections; and
- Associated control equipment.

2.4 Project Activities

Pre-Construction Phase

- Detailed engineering design.
- Site surveys.

- Contractor mobilization.
- Procurement of materials.
- Workforce recruitment.
- Regulatory approvals.

Construction Phase

- Site preparation.
- Earthworks.
- Foundation works.
- Structural construction.
- Paving activities.
- Electrical installation.
- Solar system installation.
- Testing and commissioning.

Operational Phase

- Warehouse operations.
- Office administration.
- Container storage activities.
- Solar energy generation.
- Facility maintenance.

Project Completion schedule

Warehouse Operations	December 2026
Office administration	December 2028
Container storage activities	December 2028
Solar energy	December 2028

3.0 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

3.1 Physical Environment

Climate

Nigeria is characterised by the following distinct climatic zones: a tropical wet climate in the south, a tropical savannah climate for most of the central regions, and a Sahelian hot and semi-arid climate in the north of the Country. The Project falls within the tropical wet climatic zone. In the Project location, the mean annual temperature ranges between 17°C to 37°C. During the dry season, Harmattan winds bring dry air from the Sahara Desert to Nigeria, while during the rainy season moist air is brought from the Atlantic Ocean (USAID, 2019). The project area experiences a humid tropical climate characterized by:

- High rainfall;
- Elevated humidity; and
- Average annual temperatures ranging between 25°C and 32°C.

Topography and Drainage

The site is generally low-lying with existing industrial infrastructure and drainage systems associated with port operations.

Air Quality and Noise

The climate in the Study Area is characterized by two major seasons i.e., dry, and wet seasons, with the wet season from mid-March through to November and a dry season that runs from December through to March. The amount and distribution of rainfall in the Study Area plays an important role in moving pollutants from the atmosphere to other spheres of the environment. The Study Area experiences prevailing wind direction in the south westerly direction, therefore implying that in the event of air emissions from the Project Area, the pollutants in the air will be driven north-east where other industrial port activities exist.

At present, the Project Area has been filled and is devoid of vegetation. Moreover, it lies adjacent to other port operations. As a result, the existing conditions are not a true baseline, but are influenced by the presence of these activities within the Study Area. The ambient air quality is influenced by:

- Marine vessel operations;
- Vehicular movement;
- Cargo handling equipment; and

- Existing industrial activities.

Noise

An important part of the noise assessment is the quantification and understanding of the existing acoustic environment, including the identification of baseline noise levels at potentially Noise Sensitive Receptors (NSRs). The baseline environment can be defined as the conditions that would prevail in the absence of the proposed Project. Noise levels are already elevated due to port operations and heavy-duty machinery, but is within the prescribed permissible limits. Daytime noise levels (Leq) comply IFC guideline of 55dBA at all measured locations. Night-time noise levels (Leq) comply IFC guidelines of 45dBA at locations.

Regional Geology

Regionally, the Project Area is situated within the greater Niger Delta. The Niger Delta is one of the significant regressive deltaic sequences in the world. The delta is over 12km thick and occupies an area of 75,000km² in the Gulf of Guinea. The Niger Delta basin is underlain by three formations, which include Benin, Agbada and Akata Formations.

The Benin Formation belongs to the Pliocene-Pleistocene age (Owoyemi, August 2004) and is made up of over 90% massive, porous, coarse sands with clay/shale inter-beds.

The Quaternary deposits (which is 40-150 m thick) generally consist of rapidly alternating sequences of sand and silt/clay with the latter becoming increasingly more prominent seawards. The Niger Delta can be subdivided into three major inter-gradational geomorphologic units from land to sea (north to south), these are:

- Dry deltaic plain with rare freshwater swamps;
- Extensive freshwater swamps and meander belts; and
- Saltwater mangrove swamps, estuaries, creeks, and lagoons.

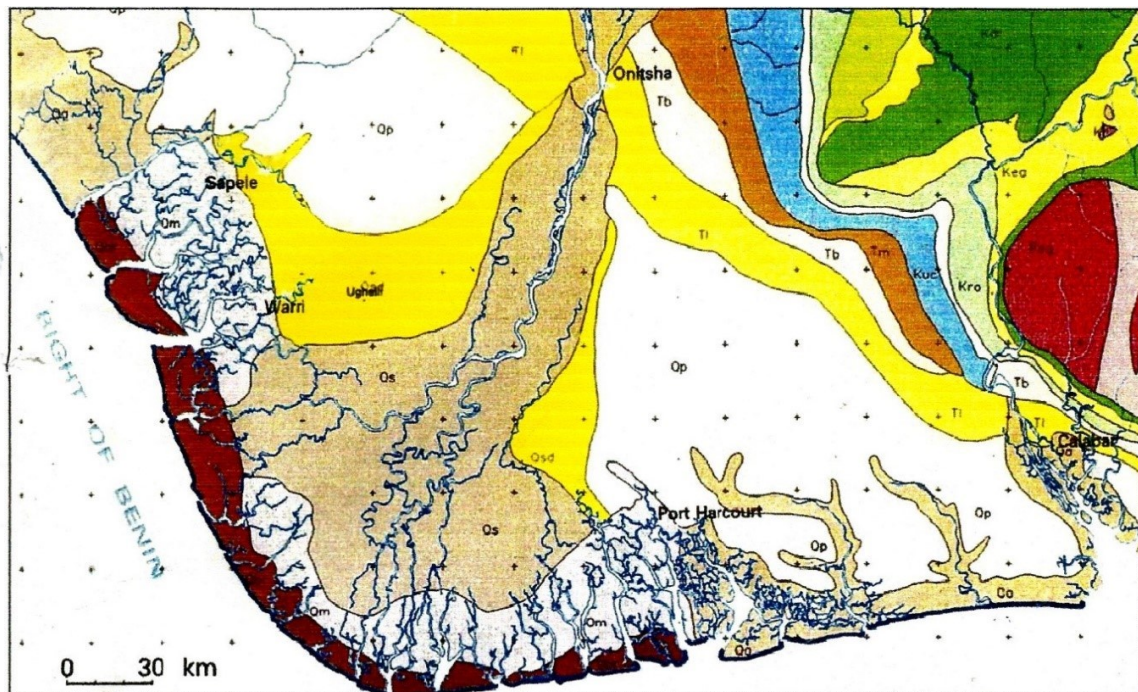
The dry deltaic plain is a geographically extensive low-lying area dominated by fluvial systems, some with braided characteristics. Few meander belts occur within this deltaic plain. Extensive lateritic soil (approximately 12 m in thickness) underlies this unit. A summary of the geological and lithological unit of the Niger Delta is provided in Table 1. A map of the geological characteristics of the Niger Delta is shown in **Error! Reference source not found..**

The Niger Delta hydrogeological set up can be classified into (a) Impermeable/Semi permeable horizons from ground level to 10 m below mean sea level. (b) A permeable/gravel sand layer up to 80 meters below sea level. (c) From 80 m to 225 m below sea level (mbsl),

the formation consists of a permeable sand/gravel layer with thin impermeable/semi permeable clay/silt layers.

Table 1: Geological and lithological units of the Niger Delta.

Geological Unit	Lithology	Age
Alluvium	Gravel, sand, clay silt	Quaternary
Freshwater back-swamp	Sand, clay, some silt, and grave	
Meander belt		
Mangrove and salt Water/backswamps		
Active/abandoned beach ridges	Sand, clay and some silt	
Benin Formation (Coastal Plain Sand)	Coarse to medium sand with Subordinate silt and clay lenses	Tertiary
Agbada Formation	Mixture of sand, silt and shale	
Akata Formation	Shale, sandy in some places	



QUATERNARY		CRETACEOUS	
meander belt, back swamps	Qa	Falsebedded sst. and U. coal measures	Kuc
fresh water swamps	Qs	lower coal measures	Klc
mangrove swamps	Qm	Nkporo shale group	Kro
abandoned beach ridges	Qbr	Cretaceous intrusion	Ki
Sombriero deltaic plain	Qsd	Awgu-Ndeabah shale group	Kwn
coastal plains sands	Qp	Eze Aku shale group	Kea
		Odukpani formation	Kc
		Asu river group	Kt
TERTIARY		PRE-CAMBRIAN TO UPPER CAMBRIAN	
lignite formation	Ti	basement complex	Pcg
Bende Ameki group	Tb	older granite	
Imo clay-shale group	Tm		

Figure 1 Geological and lithological of Niger Delta

Project environment geology

The Project site lies on the bank of the Bonny River. The geology of the site is composed of coarse-grained sands, medium to coarse grained sands, medium grained sands, medium to fine grained sands, sandy clay, silty clay, clayey sands, and organic clay.

The Project site is a reclaimed sand-filled area. The stratigraphic units in the area comprise of:

- Layer 1: Medium grained sands and medium to coarse grained sandy soils occupying between 4.50m to 7.0m below ground surface. This area is a sand-filled area, and the thickness of the sand-filled area decreases away from the shoreline;

- Layer 2: Underlying layer 1 is a thick layer of silty clay and organic clay which stretches to a depth between 12.0m and 14.0m. The 7.0m thick layer of clayey soils extends throughout the entire area and acts as a barrier that impedes surface infiltration from entering the subsurface environment;
- Layer 3: The thick clay layer is underlain by a continuous layer of sandy clay which extends to a depth ranging from 17.0m to 20.0m; and
- Layer 4: Layer 3 is underlain by medium sands, medium to coarse sands and coarse sands to a depth of 30.0m. This layer varies in thickness from 9.0m to 11.0m.

Soil

The soil of the area is reclaimed and sand filled with river sand and coarse aggregate which dominated soil aggregates within and around the facility. The soil particle size distribution was largely dominated by high percentage sand, followed by the clay and lastly the silt percentage, while soil texture were sandy soil and sandy loam. Soil pH level ranged from 5.53 – 7.05; the lowest concentration was noticed in the subsoil of the control station while the highest pH level was observed at the subsoil of station two (SS 2B). Conductivity level within and around the facility ranged between 34 - 457µs/cm. The lowest concentration recorded topsoil of station one (SS 1T) and the highest was recorded subsoil of the control station (SSC B) indicating low salt content (non-saline soil). THC values ranged between (0.65-2.21mg/kg) highest concentration of THC was recorded subsoil of station 1 (SS 1B), followed by the Topsoil of the same station (SS 1T). The highest metal concentration was recorded in Iron (Fe) with a range of 1875 and 4682mg/kg followed Zinc (Zn) 12.61 - 36.41mg/kg, however, this is typical of the Niger Delta soil environment.

Sediment

The sediment pH ranged from 6.02 – 6.45 with a mean of 6.26 in the dry season and 6.70 – 6.88 with a mean of 6.72 during the wet season. The control station had pH of 6.52 in the dry season and was higher in the wet season with value of 6.75. Electrical conductivity (EC) ranged from 17,730 – 34,600 µS/cm (mean = 29,307.5 µS/cm) in the dry season and in the wet season ranging from 25,400 – 32,400 µS/cm (mean =29,426.67 µS/cm). The control stations have an EC of 17,620 µS/cm in the dry season and higher in the wet season with 54,400 µS/cm. Sodium concentration ranged from 84.88 – 120.3 mg/kg (mean = 99.54 mg/kg) in the dry season and the control stations had a Na concentration of 86.87 mg/kg in the dry season. Potassium concentration ranged from 145.40 – 196.60 mg/kg (mean = 165.55 mg/kg)

in the dry season and the control stations had a potassium concentration of 246.10 mg/kg in the dry season. Calcium ranged from 196.10 – 347.80 mg/kg (mean = 165.55 mg/kg) in the dry season and the control station had Ca within the range of 173.1 mg/kg for the dry season. Magnesium was similarly higher in the dry season (1113 – 1159; mean 1137.5 mg/kg) with the dry season control (1123 mg/kg). The THC ranged from 9.13 – 68.37 mg/kg (mean 46.39 mg/kg) in the dry season and 34.60 – 52.5 mg/kg (44.03 mg/kg) in the wet season. At the control site the THC concentration was 57.63 mg/kg and 275.6 mg/kg in the dry and wet seasons respectively. Iron was the dominant heavy metal in the sediment ranged from 3532.0 – 5694 mg/kg with a mean of 5101.25.71 mg/kg in the dry season and was lower in the wet season ranging from 1958.3 – 2070.5 mg/kg with a mean of 2003.1 mg/kg.

Surface Water

Surface water collected comprising of four (4) sample stations and one (1) control station during the OMT EIA study field data gathering was compared against FMEnv Standard for water quality (Aquatic life). The surface water sampling was conducted on the Onne port channel which connects at 2km distance of the Bonny River system as a tributary and therefore subject to diurnal tidal inundation with tidal range averaging 2.5m. The mean pH values of the surface water samples were 7.50 and ranged from 7.35 – 7.64. The mean conductivity values recorded in this study was 10552.5 μ S/cm in the dry season. Chloride which exists in all natural waters in varying concentrations with a mean value of 1475 mg/l. Chloride values above 250 mg/l produce a salty taste which makes the water unpalatable. The mean DO values recorded in this study was 5.10 mg/l in the dry season. The BOD values ranged from 3.00 mg/l to 7.70 mg/l with a mean average of 6.27 mg/l in the dry season. The mean COD value was from 26.37 mg/l. Oil and grease was low with values ranging from between 0.35mg/l to 0.52 mg/l indicating an environment not polluted by petroleum hydrocarbons The concentrations of heavy metals in the water samples were generally low and in some cases not detected. All heavy metals had mean values less than the regulatory limits.

Ground Water

Concentration of hydrogen ion (pH) of the main supply borehole was 6.70 while the control from neighbouring facility was 6.55 which indicate the water was not acidic and was within the range of FMEnv limits of (6.5-8.5). Electrical Conductivity of the collected sample was 164.1

μScm^{-1} while the control was $425 \pm 1 \mu\text{Scm}^{-1}$. The turbidity of the groundwater collected at the facility was 0.8 NTU with control value of 0.6 NTU. This is in compliance with the FMEnv permissible limit standard for water quality 1.0 NTU. The concentrations were within the range for FMEnv standard for water quality.

3.2 Biological Environment

The project area is largely modified industrial land with limited natural vegetation. Ecological sensitivity within the immediate project footprint is considered low due to existing anthropogenic disturbance. The terrestrial biodiversity of the site has been impacted upon by anthropogenic disturbances, but still retains both plants and animals that form an integral part of the community's ecosystem services. The surrounding environment of the area in the vicinity of the Indorama complex can be divided into the following vegetation types, with very low acreage of primary forest:

- Grasses, weeds, and Herbaceous vegetation by the lawn bordering the cement walled fence of Indorama complex
- Bush follows lands vegetation
- Bankside vegetation other parts of Port complex.

The vegetation within the project environment includes lawns and ornamental and other aesthetic plants planted within the complex and along the dual carriageway leading into the complex.

This project will have no relationship or interface with the area's ecology. None of the wildlife species found in the area have been classified as endangered, according to the International Union for Conservation of Nature (IUCN 2009) list. Generally, the environment is a highly modified ecosystem, with no critical habitats identified within the project area.

Aquatic Biodiversity

Water is one of earth's most important natural resources. This study was aimed at assessing the physicochemical parameters, plankton, benthic macro-invertebrates and fish composition in the Federal Ocean Terminal vicinity, Bonny Estuary, Onne LGA, Rivers State. Samples were collected from 5 representative sampling stations. The number of species and relative abundance of phytoplankton, zooplankton, macrozoobenthos and fish were generally poor compared to results reported on some parts of the Bonny Estuary, which the FOT waters lie on the upper reaches. Fishes landed were dominated by bonga fish (*Ethmalosa fimbriata*). The relatively high numerical presence of *Anabaena sp.* in the entire study area shows that the FOT vicinity is vulnerable to harmful algal blooms (HABs), if the factors (e.g., increase

nutrient levels) that trigger bloom occurrence are not forestalled. Therefore, the following recommendations are made (1) wastes generated at the FOT be adequately treated before being discharged to the environment, (2) care should be taken to prevent sporadic input of nutrients, particularly nitrogen and phosphate, that could trigger harmful algal blooms, and (3) regular environmental monitoring should be carried out so as to determine the impact of the activities at the terminal.

Ecosystem Services

The ecosystems surrounding the Project Area such as secondary forest, riparian forest, marshy terrain, and freshwater swamp forest ecosystems have several habitats for different species of animals and plants. However, some of the ecosystems like the riparian and freshwater swamp forests have started losing their natural attributes due to human alterations in its structure, size and extent. The secondary forests, Guinea savanna etc. provide shade, cover, nesting and breeding grounds, seeds and nuts, food and nectar for birds and other wildlife in the area.

Ongoing anthropogenic activities in the Study Area, in terms of logging, regular hunting/trapping of animals, indiscriminate extraction of sand and gathering of non-timber forest products (NTFPs), and infrastructural developments are drivers of degradation to ecological systems in the Study Area. The ecosystem services of the study area are most likely not going to be affected as no direct removal of natural systems will be required for the Project, as well as no loss of functionality.

3.3 Socioeconomic Environment

The oil and gas sector is a critical component of the economy of the Federal Republic of Nigeria. The Niger Delta Region of the nation and Rivers state the home of the Onne Multipurpose Port Complex is a major hub of activities in this sector. Development of the sector as a whole, especially the port is therefore inevitable for the nation to continue generate revenue from it. Even though upgrade of the Port is beneficial to the Nation as a whole, it must be pursued with due consideration of the health, safety, economic development and of the host communities.

Livelihood activities

Among the working class, 47% are self-employed, 21% are government workers, 12% are company workers, while 20% are unemployed. Among the self-employed, 68% are engaged in various businesses or contracting, 29% are involved in farming, and 3% are in other

categories. The mean household size is 5, the same as the national average. This project may improve the quality of life for the population by creating business opportunities, generating employment, and fostering skill development. The area is densely populated, with host communities that have strong expectations for benefits.

Primary data collection shows that 53% of household monthly income is spent on food and housing. This is followed by healthcare, which accounts for 13% of monthly spending. Savings in the Study Area are traditionally made by investing in assets for primary economic activity, such as fishing gear or boats. Informal rotating savings clubs are also a standard feature.

Education

Nationally, Nigeria reports a literacy rate of 71.3% among males and 52.7% among females. This significant difference in literacy rates indicates lower levels of female school attendance.

Primary data show that, on average, 45.40% and 30.10% of respondents attained primary and secondary school levels of education, respectively. 12.10% had post-secondary education, and 12.4% had no formal education but could communicate in Pidgin English. This points to a literacy rate of roughly 87% in the Study Area, which is significantly higher than the national average but unsurprising given the area's urban nature.

Transportation

Movement within the area is by road, and the primary modes of transportation are motorbikes, bicycles, 2-stroke tricycles (popularly called Keke-NAPEP), and buses. Tricycles meet the settlements' transportation needs. In Onne and Ogu, motorbikes are the most important means of internal transport. Neighboring communities have both primary and secondary schools. The adult literacy rate in the nearby communities is over 80 percent. Energy demand in the study area is for lighting, cooking, and operating machines (including automobiles). Electricity supply is intermittent. Petroleum-based fuels are expensive; for instance, one liter of kerosene costs N200, and a modest bundle of wood costs N1,000.

Housing Types

A higher percentage (83.0%) of houses are constructed with concrete blocks and roofed with corrugated iron sheets. Other types of houses in the area include concrete-block houses roofed with asbestos (11.6%), earth-block houses with iron sheets (11.6%), and traditional

wattle-and-mud houses roofed with thatch or iron sheets (3.2%). The crowding index is 3.0, meaning a room is available to every 3 to 4 persons in the area. Four activities dominate the cultural calendar of the communities, namely wrestling, traditional marriages, the new yam festival, and dances. Social affiliation in the area includes politics, cooperatives, social clubs, education, religion, and cultural associations. The manpower requirements for this project are 70 for construction and 4 for operation, which will not significantly affect the socio-economic status of the host communities.

Health Assessment

The principal communicable diseases in the area are malaria, diarrhea, skin rashes, upper respiratory tract infections, and STIs. Prevalent non-communicable diseases in the area include hypertension, food poisoning, occupational injuries, and body pains. The general sanitary status of living environments in the communities is good. The majority of the communities have good sanitary conditions. All four communities have primary healthcare service centers. The General Hospital Nchia, Eleme, has good healthcare facilities that are close to the communities. These conditions and socioeconomic indices are expected to have a positive impact on the project.

Waste Management

Minimal waste is expected during the expansion work majorly cement bags, concrete, off spec rod, while during full operation it will be food waste, office waste and vessel related waste. All these will be handled by an accredited waste manager in accordance to both national and international law. Basically, waste evaluated will be manifest, track to treatment point and certificate of treatment retrieved from the waste manager.

4.0 IMPACTS ASSESSMENT

The project related impacts have been assessed in consideration of the project scope, receiving environment and project implementation phases (construction, operations and decommissioning).

Table 2: Severity rating criteria

Severity	Ranking	Description
Positive	0	<i>Magnitude:</i> Local to nationwide positive impact <i>Sensitivity:</i> Positive impact on natural environment and enhanced aesthetic values. <i>Legal:</i> 100% compliance of International/National regulations, Industry and/or operator standards and recognition/ awards from international/national professional bodies. <i>Public/Stakeholder:</i> No public/stakeholders concern or improves aspects of community importance. <i>Assets:</i> Tangible and nontangible benefits.
Negligible	1	<i>Magnitude:</i> Impact not visible and on a local scale being absorbed by the natural environment, area adjacent to impacted area absorb exodus of species able to disperse. <i>Sensitivity:</i> Restoration within 6 months without intervention. <i>Legal:</i> 100% compliance of International/National regulations, Industry and/or operator standards <i>Public/Stakeholder:</i> No Complaints from public/stakeholders, and no local media attention. <i>Assets:</i> No financial loss.
Minor	2	<i>Magnitude:</i> Local scale impact resulting in short term change and/or damage to the local natural environment and its ecological processes, Increased mortality of fauna species <i>Sensitivity:</i> Natural habitat restoration time 2years and requiring intervention. <i>Legal:</i> 10% exceedances of total monitored indicators/values in a year w.r.t. International/National regulations, Industry and/or operator standards <i>Public/Stakeholder:</i> Possible public/stakeholders perception /concern. <i>Assets:</i> Short term financial loss.

Severity	Ranking	Description
Moderate	3	Magnitude: Local to regional scale impact resulting in short term change and/or damage to the natural environment and its ecological process, Direct loss of habitat crucial for species, Introduction of exotic species of fauna or invasive species replacing resident natural environment Sensitivity: Natural habitat restoration time 2 to 5 years and requiring intervention. Legal: 20% exceedances total monitored indicators/values in a year w.r.t. International/National regulations, Industry and/or operator standards Public/Stakeholder: Direct complaints from public/stakeholders and possible local media attention. Assets: Medium term financial loss
Major	4	Magnitude: Regional to national scale impact resulting in medium term change and/or damage to the natural environment and its ecological process, Reduction in regional habitat and species diversity and/or Direct loss of habitat for endemic, rare and endangered species of fauna and or flora. Sensitivity: Natural habitat restoration time 5 to 10years and requiring intervention. Legal: 20 -50% exceedances total monitored indicators/values in a year w.r.t. International/National regulations, Industry and/or operator standards Public/Stakeholder: Legal petition from public/stakeholders and possible adverse national media attention. Assets: Significant medium term financial loss.
Severe	5	Magnitude: Trans-boundary and or national scale impact resulting in long term change and/or damage to the natural environment and its ecological process and/or Increase in threat for rare and endangered species of fauna and flora identifies in national and global listings. Sensitivity: Natural habitat restoration time greater than 10years and requiring large scale and long term intervention. Legal: Breach of statutory environmental regulations and/or company policy and/or greater than 50% exceedances total monitored indicators/values in a year w.r.t. International/ National regulations, Industry and/or operator standards

Severity	Ranking	Description
		<i>Public/Stakeholder:</i> Legal action by authorities, sustained demonstration/protest by public/stakeholders, Negative widespread national and international media coverage. <i>Assets:</i> Significant long term financial loss.

Table 3: Impacts mitigation measures

Impact	Impact Category	Mitigation Measures	Residual Ranking	Phase
Air Quality Deterioration and Dust Emissions	Minor Localized Shore term Reversible	OMT Shall carryout the following: • Regular water spraying on exposed surfaces and haul roads. • Covering of trucks transporting loose materials. • Speed limit enforcement (maximum 20 km/hr within the site). • Prompt stabilization of exposed soils. • Routine maintenance of construction equipment. • Prohibition of open burning. • Use of low-emission machinery where possible.	Negligible	Construction, Operation Decommissioning
Noise and vibration	Minor Localized Shore term Reversible	• Equipment maintenance, daytime work scheduling • Restrict noisy activities to daytime periods. • Regular maintenance of equipment. • Installation of mufflers and silencers. • Provision of hearing protection devices. • Noise awareness training. • Rotational work schedules to reduce exposure. • Establishment of noise exclusion zones	Negligible	Construction, Operation Decommissioning
Soil Contamination	Minor	• Designate refueling areas.	Negligible	Construction,

	Localized Shore term Reversible	• Secondary containment for fuel storage. • Spill response kits at strategic locations. • Immediate clean-up of spills. • Staff spill-response training. • Inspection of fuel tanks and hoses. • Use of impermeable surfaces for fuel storage.		Operation Decommissioning
Surface water Pollution	Minor Localized Shore term Reversible	• Construction of temporary drainage channels. • Installation of sediment traps. • Erosion control measures. • Immediate removal of debris. • Proper storage of chemicals. • Routine inspection of drainage systems.	Negligible	Construction, Operation Decommissioning
Waste Generation	Minor Localized Shore term Reversible	• Waste segregation and licensed disposal • Development of a Waste Management Plan. • Segregation of waste at source. • Recycling of metals and reusable materials. • Provision of labeled waste bins. • Use of licensed waste contractors. • Daily housekeeping practices. • Prohibition of indiscriminate dumping.	Negligible	Construction, Operation Decommissioning
Occupational Health and Safety Risks	Minor Localized	• Comprehensive HSE Plan implementation.	Negligible	Construction, Operation

	Shore term Reversible	• Mandatory PPE use. • Permit-to-work system. • Job Hazard Analysis (JHA). • Toolbox meetings. • First aid facilities. • Emergency response preparedness. • Fall protection systems. • Electrical lock-out/tag-out procedures.		Decommissioning
Traffic and Transportation Impact	Minor Localized Shore term Reversible	• Traffic Management Plan. • Designated haul routes. • Traffic marshals. • Speed restrictions. • Driver safety training. • Scheduling deliveries during off-peak periods.	Negligible	Construction, Operation Decommissioning

4.1 Impacts description

4.1.1 Impact Description during construction and operation

Air Quality Deterioration and Dust Emissions

During site preparation and construction activities, earth-moving operations such as excavation, grading, leveling, filling, compaction, and movement of heavy-duty vehicles will disturb exposed soil surfaces. These activities can generate dust particles (Particulate Matter – PM10 and PM2.5) which may become airborne, particularly during dry weather conditions. Transportation of construction materials such as sand, laterite, cement, aggregates, and paving materials can also result in dust emissions. Exhaust gases from construction machinery, trucks, generators, cranes, and forklifts will release pollutants including:

- Carbon monoxide (CO)
- Nitrogen oxides (NOx)
- Sulphur oxides (SOx)
- Volatile organic compounds (VOCs)
- Particulate matter (PM)

Workers operating within the project site are likely to be the most exposed receptors, while nearby port users and neighboring facilities may experience temporary reductions in air quality.

Noise and Vibration Impact

Construction activities involving pile driving, compaction, concrete mixing, paving operations, crane movements, welding, cutting, and vehicle operations will generate elevated noise levels. Heavy equipment such as: Excavators, Bulldozers, Rollers, Concrete mixers, Mobile cranes, Trucks may produce noise levels exceeding 85 dB(A). Vibration may result from compaction equipment and heavy vehicle movement across paved and unpaved surfaces.

Soil Contamination

Both construction and operational equipment will require fuel, lubricants, hydraulic oils, and maintenance fluids. Accidental spills or leakages may occur during:

- Refueling activities.
- Equipment maintenance.
- Storage of petroleum products.
- Generator operations.

When it occurs, it may lead to Soil degradation, Reduced soil quality, Contamination of drainage systems, Potential groundwater pollution.

Construction Waste Generation

Construction of the warehouse, office buildings, pavement works, and solar infrastructure will generate:

- Excavated soil.
- Concrete debris.
- Scrap metals.
- Wood offcuts.
- Packaging materials.
- Plastic waste.
- Domestic waste from workers.

Improper handling could result in environmental pollution and visual impacts.

Surface Water Pollution

Rainfall runoff may transport sediments, oils, grease, concrete residues, and construction debris into drainage systems connected to the port environment. Given the proximity of Onne Port to aquatic environments, uncontrolled runoff may impact receiving water bodies. This may lead to surface water pollution.

Traffic and Transportation Impact

Movement of construction and operational vehicles delivering materials and equipment may increase traffic within the port area. Heavy trucks may interact with existing terminal operations. Consequently, this may lead to traffic congestion, or delay to port operation

Increased Storm Water Runoff

The paved container storage yard will significantly increase impermeable surfaces, reducing natural infiltration and increasing runoff volumes during rainfall events. Leading to localized flooding/erosion, sediment transport. However, with a good drainage network, periodic desilting and routine drain separator impact will be reduced to its barest minimum.

Solar System and Battery Waste

Over time, damaged panels, batteries, inverters, and electrical components may require replacement. Improper disposal could introduce hazardous materials into the environment. However, with proper take-back schemes with manufacturer/used of approved recycling

contractors, and a secure temporary storage before it is collected will help to manage this impact to its barest minimum.

4.1.2 Decommissioning phase

At the end of the life span of the project, or otherwise, if Proponent and or Government decides to decommission the project, a plan would be drawn by OMT and approved by all concerned such as Regulators and Stakeholders before execution. All possible measures will be taken in order to ensure health of workers and environmental safeguards and to minimize the risk of possible incidental events during decommissioning phase. OMT commits itself to restoring environmental conditions existing before the realization of the project.

4.2 Cumulative Impacts assessment

The operation and proposed upgrade work is still within the existing OMT facility which share boundary with the WACT facility. Therefore, the cumulative impact assessment is in relation to the existing conditions of the facility surrounding area, which is important to ascertain the combined effects to the valued environmental components (VECs) and to propose adequate mitigation measures. The upgrade impacts are expected to last for a short period, thus, they are not long term impacts and as such not included in this assessment. The operational phase which is taken over 30 years of operation of OMT for assessment purpose may have some cumulative impacts.

4.2.1 Cumulative Positive Impacts

Business Opportunity/Economic enhancement/Skills acquisition by host communities

The host communities shall be opportune to gain employment and directly benefit from service contracts. This will enhance the income levels resulting in cumulative impact in increase in living standards. The host communities shall be exposed to various latest technology available and consequently trained during construction. This amplifies the skills improvement and result in more business opportunities. Various CSR projects which shall be undertaken by management in the host communities, will improve the overall living culture as well as serve as improvement in lifestyle.

Increase in revenue for the Government and economic benefits to OMT

The OMT operation and expansion work will generate revenue for the government and as well as employment within the region. Moreso, it will stimulate the local economy of the area by introduction of new business and also transfer skill.

4.2.2 Cumulative Negative Impacts

Increase in Road Traffic Volume/ Accidents & Incidents/Noise

Both the OMT upgrade work and operation will generate traffic which will add to the existing traffic generated by other port activities.

5.0 IMPACTS MITIGATION MEASURES

The measures that OMT intend to take to reduce (or eliminate) negative impacts and promote positive Environmental and Social impacts of the proposed project are presented in table 6.1 taking into account also Health and Safety topics. These actions are aimed at reducing impacts to as low as reasonably possible. The residual impacts that could arise despite these measures were also noted.

The associated and potential impacts on various components of the biophysical, health and social environments by the proposed project are presented in table 5.6 and 5.7. The identified positive impacts have been rated zero and identified negative impacts ranked accordingly.

To preserve the environment and ensure sustainability, the mitigation measures are proposed for negative impacts identified as a result of the proposed project, as well as enhance those impacts identified as positive.

The mitigation measures proposed for the predicted impacts took cognizance of the following:

- Performance Standards on Social and Environmental Sustainability;
- World Bank Group (WBG) General EHS Guidelines;
- WBG Industry Sector Guidelines;
- Best Available Technology for sustainable development;
- Feasibility of application of the measures in Nigeria;
- Expected concerns and views of stakeholders;
- Environmental laws at national, regional and international levels; and
- The residual effects that arise despite the mitigation measures, have also been discussed for effective mitigation to a low level.

Other Factors considered for determining implementation of measures are:

- Avoiding the impacts altogether by not taking a certain action or parts of an action;
- Minimizing impacts by limiting the degree or magnitude of the action and its Implementation;

- Rectifying the impact by repairing, rehabilitating or restoring affected Environment;
- Compensating for the impact by replacing or providing substitute resources;
- Feasibility;
- Ease of implementation;
- Local suitability;
- Institutional requirements;
- Training requirements;
- Monitoring requirements;
- Cost (capital and operating); and
- Cost-effectiveness.

The Required General and Specific measures, includes:

- Pre-construction;
- Construction;
- Operation; and
- Decommissioning.

The measures that OMT commits to implement for the proposed project activities likely to determine environmental, socio-economical and/or health impacts are detailed in table 6.1.

Table 4 environmental and social management plan during construction

Impact	Mitigation Measures	Responsibility	Monitoring Indicator
Air Quality Deterioration and Dust Emissions	OMT Shall carryout the following: • Regular water spraying on exposed surfaces and haul roads. • Covering of trucks transporting loose materials. • Speed limit enforcement (maximum 20 km/hr within the site). • Prompt stabilization of exposed soils. • Routine maintenance of construction equipment. • Prohibition of open burning. • Use of low-emission machinery where possible.	Consultant/HSE	Dust levels, complaints
Noise and vibration	• Equipment maintenance, daytime work scheduling • Restrict noisy activities to daytime periods. • Regular maintenance of equipment. • Installation of mufflers and silencers. • Provision of hearing protection devices. • Noise awareness training. • Rotational work schedules to reduce exposure.	Consultant/HSE	Noise monitoring records monthly/ Weekly by HSE

	Establishment of noise exclusion zones		
Soil Contamination	- Designated refueling areas. - Secondary containment for fuel storage. - Spill response kits at strategic locations. - Immediate clean-up of spills. - Staff spill-response training. - Inspection of fuel tanks and hoses. - Use of impermeable surfaces for fuel storage.	HSE/Consultant	Weekly inspections. Spill occurrence records. Soil quality assessments where required.
Surface water Pollution	- Construction of temporary drainage channels. - Installation of sediment traps. - Erosion control measures. - Immediate removal of debris. - Proper storage of chemicals. - Routine inspection of drainage systems.	Consultant/HSE	Monthly Monitoring of water quality and drainage inspection

Waste Generation	• Waste segregation and licensed disposal • Development of a Waste Management Plan. • Segregation of waste at source. • Recycling of metals and reusable materials. • Provision of labeled waste bins. • Use of licensed waste contractors. • Daily housekeeping practices. • Prohibition of indiscriminate dumping.	Contractor	Waste manifests
Occupational Health and Safety Risks	• Comprehensive HSE Plan implementation. • Mandatory PPE use. • Permit-to-work system. • Job Hazard Analysis (JHA). • Toolbox meetings. • First aid facilities. • Emergency response preparedness. • Fall protection systems. • Electrical lock-out/tag-out procedures.	HSE Team	Daily safety inspections. Incident reporting. PPE compliance audits

Traffic and Transportation Impact	• Traffic Management Plan. • Designated haul routes. • Traffic marshals. • Speed restrictions. • Driver safety training. • Scheduling deliveries during off-peak periods.	Contractor/HSE Team	Traffic incident records. Vehicle inspections.
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Table 5 environmental and social management plan during Operations

Impact	Mitigation Measures	Responsibility	Monitoring Indicator
Dust Generation	Water spraying, speed limits, covering trucks	Contractor	Dust levels, complaints
Noise	Equipment maintenance, daytime work scheduling	OMT Technical/HSE team	Noise monitoring records
Waste Generation	Waste segregation and licensed disposal	Contractor	Waste manifests
Oil/Fuel Spills	Spill kits, bunded storage areas	HSE Team	Spill reports
Traffic Disruption	Traffic management plan and signage	Contractor/HSE Team	Incident reports
Occupational Injuries	PPE provision and training	HSE team	Lost Time Injury Frequency Rate
Community Safety Risks	Restricted access and fencing	OMT Security team	Security records
Stormwater Runoff	Drainage maintenance and sediment traps	Contractor	Water quality inspections
Solar Installation Electrical Hazards	Qualified technicians and lockout-tagout procedures	OMT	Safety inspection reports
Battery Waste	Approved recycling and disposal contractors	OMT	Disposal certificates

6.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The essence of designing an Environmental and Social Management Plan (ESMP) is to monitor compliance with all the mitigation measures and commitments during project implementation. In addition, the plan checks the effectiveness of suggested mitigation measures, demonstrate that the project activities are carried out in accordance with the prescribed mitigation measures and existing compliance with regulatory procedures, and provide early warning signals whenever an impact indicator approaches a critical level.

From site preparation to the decommissioning phase of the proposed project, impacts may occur that are capable of interrelating with the environmental and social components of the sustaining environment. The impacts may be of qualitative nature (Beneficial, adverse, short term or long term etc.) or quantitative nature (magnitude, sensitivity etc.). The following is a summary of management plans/procedures to reduce/address the negative impacts so that environment can be protected and a backlash capable of creating social disharmony is prevented, while enhancing positive/beneficial impacts for a sustainable development of the project in the area.

OMT has developed and implemented a comprehensive regime for management of the Safety, Health, Environment and Social aspects and this will be shared with. The concept of sustainable development, which covers economic development, environmental protection and social responsibility, is clearly illustrated in the policies such as QHSE Policy. To address social aspects, Company has developed robust Stakeholder Engagement Plan which is effectively implemented.

The ESMS adopted at this project site is based on the best practices adopted in same kind of industries globally. The systems and procedures practiced at OMT are in line with globally accepted international standards, like ISO 14001, ISO 45001 etc. The upgrade work which is an expansion within the existing facility, so the same systems and procedures observed in running OMT will be extended to the upgrade work. As needed, updates, will be made to existing systems and procedures.

6.1 Environment and Social Management

From EMS evaluation OMT has well documented, communicated and implemented Environmental and Social management system and procedures guided by ISO 14001:2015, national/international rules/regulations/guidelines and best practices. For project these

existing plans/procedures shall be followed and implemented during construction phase, Construction contractor shall ensure that their plans and procedures are within the OMT ambit and in sync with OMT prevailing system. For project environment management plan/procedure will cover Training & awareness, Environmental monitoring program, Operational control for soil & water degradation, Prevention of air emissions & dust control, Noise control, Waste management, Hazardous materials management and incident reporting etc.

The social management plan/procedure will cover labor and social aspects specific to project activities. Some of the social management strategies will include:

- Consider the host communities first in any form of employment or contract
- Develop and implement Memorandum of Understanding (MoU) that will be binding on the two parties ie the OMT and the two host communities (Onne and Ogu)
- Form a Project Affect Committee (PAC) comprising of the two community's representative, the CLOs and the OMT management staff for peaceful co-existence and good relationship between the company and the communities.
- Deliberate on CSR projects with host community before they are implemented in order to confirm the need/benefit of such projects to the community.

6.2 Occupational Health and Safety Management

OMT has well documented, communicated and implemented Occupational Health and Safety management system and procedures guided by ISO 45001:2018, national/international rules/regulations/guidelines and best practices. For the upgrade work, the existing OHS plan shall be followed and implemented during construction phase. The Occupational Health and Safety (H&S) management plan will provide workers and vendors a safe and healthy work environment by establishing measures to prevent the likelihood of worker's accidents /incidents, provisioning adequate personnel protective equipment, conducted H&S training, provisioning first aid facilities and clinic, ensuring appropriate welfare workplace accommodations, hydration stations, good lighting, potable water supply, etc. The project relevant occupational health and safety elements will be shared with Construction contractor. The Construction contractor shall subscribe to the OHS management plan and in addition, the contractor will be required to present, to OMT HSE Lead, its specific OHS plan and procedures. As needed, OMT will update OHS plan/procedures for the operation phase of this project. A Communication and Training Programme about Occupational Health and Safety (OHS) aspects for employees involved in the project activities shall be conducted. Safety and emergency procedures shall cover handling some delicate container boxes. Furthermore, hazard and operability (HAZOP) studies will be conducted for some new port equipment during detailed engineering and recommendations shall be complied with.

6.3 Security Management

The OMT facility is currently under ISPS code with a well-documented and implemented security management plan. The facility and personnel security is assured based on the existing security architecture in accordance with ISPS code. The construction contractor will work with the existing security architecture to ensure material, equipment and men are secured under the existing security framework. However, number of security men may increase for adequate coverage of the entire facility in addition to the construction area. This actions will be monitored by the OMT Chief Security Officer to ensure that no use of force will be adopted according to the Voluntary Principles as stated in IFC Performance Standard 4.

6.4 Human Resources

The OMT operates a human resource department which includes the CLO team. The company has developed a high ethical standard for work conditions and relationship between management, staff and labor in strict compliance with IFC Performance Standard 2. A detailed employee handbook covering all areas of labor relationship developed and implemented.

6.5 Traffic Management

Traffic management should be a key aspect of the project during and after expansion activities to ensure public safety. Therefore, the following should be done:

- Ensure traffic/caution signs are posted at strategic locations in English and local languages, and engage personnel to manage traffic flow during peak periods.
- Hire drivers with the appropriate driver's license, train drivers, and enforce the speed limit.
- Mobilization of equipment and machinery shall be done during off-peak periods, such as Saturdays and Sundays.
- Cover the truck conveying materials to the site to prevent materials from falling and injuring pedestrians and motorists.

6.6 Noise exposure and hearing protection

Vehicular movement and other activities during the modification work may generate noise which can cause temporary or permanent hearing loss and increased stress for workers.

Personnel shall be provided with approved hearing protection devices such as earmuffs or earplugs, implement engineering controls like acoustic enclosures or vibration dampers, maintain safe distance from noise sources, conduct regular noise monitoring, and enforce hearing conservation programs in compliance with occupational safety standards. The use of low-energy/emission machines/equipment for effective process operation aimed at reducing NOx and CO emissions.

6.7 Climate mitigation & adaptation strategy

A climate mitigation and adaptation strategy for the facility shall include reducing greenhouse gas emissions, enhancing resilience to climate impacts, and promoting sustainable resource use. This includes measuring and monitoring the carbon footprint of operations (e.g., emissions from machines, fuel use, and auxiliary equipment), implementing energy efficiency and low-emission technologies, and developing climate resilience measures such as heat-resistant equipment, and emergency response planning. The strategy also aligns with circular economy principles by promoting waste minimization, recycling of lubricants and materials, recovery of vented gas, and resource-efficient facility design, thereby reducing environmental impact while supporting long-term operational sustainability.

Table 6: Environmental Monitoring Plan

S/N	Environmental Components	Indicator Parameters	Frequency	Location	Responsibility	Time Frame
1	Noise	Sound Pressure	Weekly during expansion work Monthly during Operation	Project Site	OMT – EHS Lead	Construction; Operations and Decommissioning
2	Waste management	Generated waste quantity	Regular evacuation schedule	Project Site	OMT – EHS Lead/MARPOL	Construction; Operations and Decommissioning
3	Ambient Air	PM2.5 and 10; NOx, CO, O ₃ , VOC, SOx, CxHy, PM ₁₀ , PM _{2.5}	Monthly both during expansion work and full operation	OMT Periphery & selected community based stations	Third Party (Environment Consultant); Monthly testing and Quarterly report to Regulators (FMEnv, NPA)	Construction; Operations; and Decommissioning
4	Surface Water	pH, Alkalinity, TSS, Conductivity, TDS, Ammonia, Nitrate Turbidity, DO, COD, BOD, PO ₄ , Metals etc.	Monthly both during expansion work and full operation	Upstream, OMT Berth 9-11 and Downstream of receiving water body	Third Party (Environment Consultant); Monthly testing and Quarterly report to Regulators (FMEnv, NPA)	Operations
5	Sediments	pH, Conductivity, Salinity, PO ₄ , SO ₄ , NO ₃ , TOC, THC, Metals etc.	Monthly both during expansion work and full operation	Upstream, OMT Berth 9-11 and Downstream of receiving water body	Third Party (Environment Consultant); Monthly testing and Quarterly report to Regulators (FMEnv, NPA)	Operations

7.0 CONCLUSION AND RECOMMENDATION

7.1 Conclusion

The Environmental and Social Management Plan (ESMP) summarized impacts both positive and negative applicable for the expansion project and operation of the OMT facility. Adequate management guideline and mitigation measures have been proffered for negative impacts identified to reduce them to barest minimum. With the effective implementation of the guidelines, mitigation measures and monitoring programs defined and listed in this study, OMT can indeed limit any negative impacts that may be associated with the upgrade work and full facility operation. These will be fulfilled by HSE and HR units, who will drive the mitigation action.

7.2 Recommendation

Discharge of untreated ballast water and other form of waste from OMT facility into the water body will definitely affect the chemistry and further affect life forms leaving in it. Therefore, we recommend handling this aspect in accordance with MARPOL regulation and best international practice.

The study recommends monthly environmental monitoring of the OMT facility during and after the expansion work to help detect any sudden change in the quality of environment for a swift mitigation action to arrest the situation. Furthermore, quarterly report from the monitoring exercise submitted to FMEnv, NESREA, RSMEEnv and NPA.

OMT management should develop regular medical outreach programme into the host communities.

Corporate social responsibility project should be discussed with host communities to arrive at program jointly acceptable to the generality of the people.