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MINDANAO CONTAINER TERMINAL

An ICTSI Group Company

Mindanao International Container Port (MICP) Project

Environmental and Social Impact Assessment (ESIA)

Version History

Version	Date	Subject of Amendment
V1.0	January 22, 2026	Initial disclosure of full draft

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1. EXECUTIVE SUMMARY

1.1. Project overview and scope

The Mindanao International Container Port (MICP) Project is an existing port facility located within the PHIVIDEC Industrial Estate in Tagoloan, Misamis Oriental, along the shoreline of Macajalar Bay. The approved project footprint covers 46.47 hectares and an 800-meter container wharf under Environmental Compliance Certificate No. 9907-035-215, with only a portion of the approved facilities developed and operational to date.

The current enhancement program proceeds in phases within the approved footprint. The project description identifies: (i) an extension of the wharf by 160 meters (Phase II component within the approved certificate), and (ii) an additional 140 meters of wharf enhancement identified as Phase III-A. Development of remaining yard areas (Phase III-B) is part of the long-term master plan and is presented for reference only and is not included in the scope of this Environmental and Social Impact Assessment (ESIA). These works are intended to modernize port infrastructure, improve operational efficiency, and increase cargo-handling capacity while remaining within the previously approved environmental boundaries.

To achieve the revised operational requirement of a 600-meter continuous wharf, an additional 140-meter extension is proposed under Phase III-A. Phase III-A extend beyond the original ECC boundary and are therefore subject to an ECC amendment. The total developed wharf length will thus be 600 meters, reduced from the originally approved 800 meters.

1.2. Environmental and social assessment approach and report basis

This Environmental and Social Impact Assessment report is prepared as an integrated assessment document intended to support decision-making, permitting, and implementation planning by identifying and managing environmental and social risks and impacts across the project lifecycle. The report structure and coverage follow the Asian Infrastructure Investment Bank (AIIB) indicative outline for an ESIA, including discussion of project scope, key risks and impacts, mitigation and management measures, consultations conducted, and disclosure approach.

1.3. Project setting and baseline context

The project is located in a coastal and marine setting along Macajalar Bay. The broader setting supports marine habitats including coral reefs, seagrass beds, and mangrove stands that provide fisheries productivity and coastal protection functions. The existing port complex is situated within an industrial estate and functions as a major logistics hub in Northern Mindanao.

1.4. Summary of key environmental and social risks and impacts

Based on the reviewed Project description, Environmental Compliance Certificate (ECC), and supporting environmental documentation, the principal environmental and social risks and impacts associated with the Mindanao International Container Port (MICP) Project arise primarily during site preparation, civil works, and construction activities, as well as during the long-term operational phase of expanded port activities.

Construction and Civil Works Phase

During pre-construction and construction, the key anticipated risks and impacts include:

- Land and earthworks-related effects, such as localized alteration of landform, temporary soil exposure, erosion, sediment transport, and generation of construction wastes associated with excavation, grading, piling, and foundation works.
- Air quality and noise impacts, primarily from dust generation during earthmoving and material handling, and intermittent noise and vibration from heavy equipment and construction activities.
- Marine and coastal water quality impacts, associated with stormwater runoff, sediment disturbance, and potential siltation during shoreline works and dredging, requiring appropriate controls to prevent degradation of receiving waters.
- Occupational health and safety (OHS) risks to workers, including exposure to heavy machinery, lifting operations, marine works, and construction hazards, necessitating strict safety management systems, training, and use of personal protective equipment (PPE).

These impacts are generally temporary, localized, and manageable through standard construction management and environmental control measures.

Operational Phase

During operation, the principal environmental and social risks and impacts relate to the expanded scale and intensity of port activities, including:

- Solid and hazardous waste generation, requiring continued implementation of waste segregation, storage, transport, and disposal through DENR-accredited service providers.
- Wastewater and effluent management, requiring effective operation and maintenance of wastewater treatment systems, compliance with applicable effluent standards, and ongoing effluent and ambient water quality monitoring.
- Traffic and logistics impacts, associated with increased internal movement of cargo, service vehicles, and equipment within the port estate, requiring implementation of an internal traffic management scheme and coordination with local traffic management systems to maintain safety and efficiency.

Overall, operational impacts are characteristic of an industrial port setting and can be effectively managed through established environmental and operational controls.

1.5 Summary of mitigation and management measures

Mitigation and management measures for the Project are based on preventive controls, construction management practices, operational safeguards, and systematic monitoring, consistent with the mitigation hierarchy applied in integrated environmental and social assessments (avoid, minimize, restore/rehabilitate, and address residual impacts).

Key mitigation and management measures identified in the Project documentation include:

- Dust control measures, such as regular watering of exposed surfaces, maintenance of access roads, covering of haul trucks, and good housekeeping practices during earthmoving activities.
- Noise management measures, including scheduling of high-noise activities where practicable, use of well-maintained equipment, and periodic noise monitoring within work areas and at site boundaries.
- Water quality protection measures, including stormwater and runoff management, sediment and erosion controls during construction, and routine monitoring of suspended solids and related parameters in receiving waters during critical marine works.
- Occupational health and safety controls, including provision and enforcement of PPE, safety training and toolbox meetings, hazard identification and risk assessments, and implementation of emergency preparedness and response procedures.
- Wastewater and effluent management, through continued operation of wastewater treatment systems and regular effluent monitoring during the operational phase to ensure compliance with applicable standards.

These measures are consolidated in the Environmental and Social Management Plan (ESMP) and will be implemented throughout the Project lifecycle.

1.6 Stakeholder engagement, consultation, and disclosure

As part of the public participation process for the Project application, an information and consultation activity was conducted on 19 November 2025 at the PHIVIDEC-IA Auditorium, Tagoloan, Misamis Oriental. The consultation was designed to facilitate early engagement between the environmental regulator, the Project Proponent, and potentially affected stakeholders.

The consultation provided an opportunity for stakeholders to receive information about the Project, raise concerns, and provide inputs to ensure that relevant environmental and social issues were appropriately considered and addressed in the environmental assessment and management planning process.

1.7 Environmental and social monitoring and institutional arrangements

Environmental and social monitoring commitments for the Project include monitoring of air quality, noise, water quality, and wastewater effluent during pre-construction, construction, and operational phases. Monitoring parameters, frequencies, and methodologies are defined in the Project's compliance documentation and the ESMP.

The implementation framework includes clearly defined institutional responsibilities, participatory monitoring arrangements, and coordination with relevant regulatory agencies. Adequate budgetary provisions will be allocated by the Project Proponent to support the implementation of monitoring activities, reporting, and adaptive management measures, ensuring that environmental and social performance is tracked and that corrective actions are taken as necessary.

All ESMP measures identified as requiring financial resources, including monitoring, third-party surveys, community engagement, and emergency preparedness, shall be supported by dedicated allocations integrated into design budgets, construction contracts, and annual operational expenditures of MICP.

2. Introduction

2.1 Objectives of the ESIA Study

This Environmental and Social Impact Assessment (ESIA) for the Mindanao International Container Port Project (MICP) has been undertaken to provide a comprehensive, systematic, and integrated evaluation of potential environmental and social risks and impacts associated with the planned modernization and port enhancement. The ESIA serves as a key decision-support tool to ensure that the Project is designed, implemented, and operated in a manner that is environmentally sustainable, socially inclusive, and fully compliant with applicable national regulatory requirements and international good practice.

The ESIA also aims to ensure alignment with the Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework (ESF), including compliance with the Environmental and Social Exclusion List (ESEL), to confirm the Project's eligibility for AIIB financing.

This ESIA seeks to:

Establish Baseline Conditions

- Document and analyze the existing environmental and social baseline conditions within the Project's Area of Influence (AoI), encompassing physical (e.g., climate, air quality, noise, water resources, coastal and marine processes), biological (e.g., terrestrial and marine ecology, habitats, and biodiversity), and socio-economic components (e.g., demographics, livelihoods, land and resource use, community health and safety, cultural heritage, and vulnerable groups). This baseline provides a reference point against which potential Project-related changes and impacts are assessed.

Identify and Evaluate Potential Impacts Across Project Phases

- Systematically identify, predict, and assess the significance of potential direct, indirect, cumulative, and induced environmental and social impacts that may arise during the pre-construction, construction, operation, and decommissioning phases of the Project. Impact evaluation considers the magnitude, spatial extent, duration, reversibility, and likelihood of impacts, as well as the sensitivity and vulnerability of affected receptors.

Assess Regulatory and Policy Compliance

- Evaluate the Project's consistency and compliance with relevant Philippine environmental and social laws, regulations, and policies, including the Philippine Environmental Impact Statement (EIS) System and applicable sectoral regulations, as well as with the AIIB Environmental and Social Policy (ESP) and associated Environmental and Social Standards (ESS). Where gaps exist between national requirements and international standards, the ESIA aims to apply the more stringent or protective provisions.

Define Mitigation and Enhancement Measures

- Identify and recommend appropriate mitigation, enhancement, and management measures following the mitigation hierarchy (avoidance, minimization, mitigation, and compensation) to address adverse environmental and social impacts, while enhancing potential positive impacts such as employment generation, local economic development, and improved port efficiency and safety.

Integrate Environmental and Social Considerations into Project Design

- Ensure that environmental and social risks and opportunities are meaningfully integrated into Project planning, engineering design, construction methodologies, and operational procedures, thereby supporting informed decision-making and promoting sustainability and resilience throughout the Project lifecycle.

Support Stakeholder Engagement and Social Acceptance

- Provide a robust analytical basis to support meaningful consultation and engagement with stakeholders, including affected communities, government agencies, port users, and other interested parties. The ESIA facilitates transparent disclosure of Project information, incorporation of stakeholder concerns, and strengthening of social license to operate.

Inform Environmental and Social Management Instruments

- Serve as the foundation for the preparation of the Environmental and Social Management Plan (ESMP) and related supplementary instruments, such as monitoring programs, emergency response plans, stakeholder engagement mechanisms, grievance redress mechanisms, and biodiversity or livelihood-related action plans, as applicable. These instruments guide the effective implementation, monitoring, and adaptive management of environmental and social commitments throughout the Project's implementation and operation.

2.2 Scope of the ESIA Study

The scope of the ESIA covers environmental and social risks and impacts associated with construction and operations for the enhancement works identified in project documentation, including the Phase II extension of the container wharf by an additional 160 meters, implemented within the approved Environmental Compliance Certificate (ECC) footprint and the Phase III-A wharf expansion (140 meters), to be covered in the ongoing amendment of the existing ECC.

The ESIA is designed to meet the requirements of national environmental regulations under the Philippine Environmental Impact Statement (EIS) System and to comply with international best practices and safeguard frameworks of multilateral development banks especially AIIB, ensuring environmental sustainability, social inclusiveness, and risk-informed decision-making.

2.2.1 Project Lifecycle Coverage

The ESIA addresses potential environmental and social risks and impacts across the full Project lifecycle, including the following phases:

Pre-Construction and Project Planning Phase

Project planning, pre-operation and preparation phase will include the following activities, which are not expected to generate adverse environmental impacts.

- Securing agreements with other permit holders in the area, as necessary
- Other Government Permitting and Clearance Requirements such as the LGU
- Environmental Baseline Studies – water quality, biodiversity, air quality, and noise
- Engineering confirmatory investigations – bathymetric and topographic surveys, geotechnical, UXO, dilapidation, and others
- Engineering studies – mooring, navigation, sediment transport, and others
- Detailed engineering design and drawings
- Various Contractor's management plans – quality, HSE, environmental, procurement, and others
- Various construction methodologies
- Mobilization
- Contractor's temporary facilities – offices, pre-cast, motor pool, temporary platform, mooring, and others

Construction and Redevelopment Phase

During this phase, the contractor will start the clearing of the project area. Permanent equipment, structures and materials will be constructed and installed in place. Proper occupational safety and health procedures would be implemented to ensure the welfare of the workers. As the construction would proceed along with the operation of the existing facilities for a certain period, additional guidelines on work delineation and management would be implemented to avoid any delays and conflicts on both activities.

Operational Phase

The operational phase covers the continued use of the terminal under a 24/7 operating regime. Activities assessed include:

- Ongoing port and terminal operations, including cargo handling and equipment use;
- Employment of skilled operational personnel;
- Implementation of established operational procedures and technologies; and
- Continued application of existing occupational health and safety systems and operational controls.

No changes are proposed to the operational processes, systems, or terminal operating technology. However, operational throughout and equipment utilization will increase commensurate with the expanded wharf length and additional quay cranes.

Decommissioning or Abandonment Phase

Decommissioning or abandonment of the Project is not anticipated under normal operating conditions and would only occur under exceptional circumstances, including:

- Corporate decisions or changes in business direction;
- Bankruptcy or insolvency;
- Significant changes in peace and order conditions;
- Occurrence of major natural calamities; or
- Approval by the Project's Implementing Agency (PIA).

NO CHANGES to existing decommissioning or abandonment practices are proposed. Should this phase become applicable, appropriate environmental and social measures would be implemented in accordance with regulatory requirements.

2.2.2 Thematic Scope of Assessment

The Environmental and Social Impact Assessment (ESIA) adopts a multidisciplinary and integrated assessment approach, consistent with applicable Philippine regulatory requirements and international lender standards. The thematic scope of assessment has been defined based on the nature of the Project, its location within an established industrial port estate, and the impact pathways identified during scoping and baseline data collection.

The assessment focuses on environmental and social components that have a plausible interaction with Project activities, and is proportionate to the scale, footprint, and operational context of the Mindanao International Container Port (MICP) expansion.

Physical Environment

The physical environment assessment addresses baseline conditions and potential Project-related impacts on land, geology, geomorphology, hydrology, climate, and environmental quality within the Project footprint and its Area of Influence. Specifically, the assessment covers:

- Land use and land classification, including consistency with PHIVIDEC Industrial Estate zoning, municipal land use plans, and interface sensitivities at project boundaries and access corridors;
- Environmentally Critical Areas (ECAs), including screening for proximity to protected areas and assessment of indirect impact pathways such as materials sourcing, sediment transport, runoff, and spill risk;
- Land tenure and administrative context, focusing on institutional land management within the industrial estate and areas where Project components extend beyond previously approved footprints;
- Visual aesthetics, considering construction-phase visual disturbance and long-term changes to the industrial coastal landscape;
- Solid waste generation and management, reflecting the operational characteristics of an existing container port and coastal sensitivity to mismanaged waste;
- Geomorphology and slope, with emphasis on the deltaic coastal plain setting, drainage behavior, and low-elevation sensitivities;
- Geology and sub-surface conditions, including the presence of heterogeneous Quaternary alluvial deposits (Cagayan Gravel) and implications for settlement and ground performance;
- Geohazards, including seismicity, liquefaction susceptibility, flooding (riverine, pluvial, coastal, and compound), and storm surge exposure;
- Pedology and soil quality, focusing on soil disturbance, erosion risk, and contamination pathways in an engineered port environment;
- Hydrology and hydrogeology, limited to surface drainage systems, nearshore receiving waters, and groundwater relevance within an industrial estate context;
- Oceanography and water quality, including nearshore marine waters of Macajalar Bay and treated wastewater effluent discharge;
- Air quality and noise, based on ambient monitoring data and applicable Philippine standards;
- Climate and meteorology, including baseline climatology and projected trends relevant to flood risk, heat exposure, and operational resilience;
- Greenhouse gas emissions, assessed qualitatively in relation to construction and operational activities and existing energy-use practices.

Biological Environment

The biological environment assessment evaluates baseline ecological conditions and potential Project-related impacts on biological receptors within the marine and estuarine setting, consistent with the mitigation hierarchy and international biodiversity safeguards, including IFC Performance Standard 6 (PS6) and AIIB Environmental and Social Standard 1 (ESS1).

The scope includes:

- Marine ecology, based on field surveys and observations in nearshore waters adjacent to the Project Site, including:

  - Benthic habitat characterization (sand, silt, soft-bottom substrates);
  - Seagrass presence and condition within the 0–15 m nearshore belt;
  - Absence of coral reef communities within the Project footprint;
- Plankton communities, including phytoplankton and zooplankton composition and abundance in nearshore marine waters and the downstream estuarine interface;
- Macro-invertebrates and fish biota, with emphasis on nearshore and small-scale artisanal fishing grounds adjacent to the port;
- Marine megafauna, based on key informant interviews documenting occasional dolphin presence in the wider bay and absence of regular megafauna use of the Project frontage;
- Freshwater ecology, limited to the downstream reach of the Alae River that is hydrologically relevant to the Project frontage, including plankton and macro-invertebrate observations;
- Coastal ecosystem context, drawing on published coastal resource assessments for Macajalar Bay to situate site-specific findings within broader regional trends;
- Mangrove resources, assessed at the municipal scale using CLUP data, with confirmation that no mangrove stands occur within or adjacent to the Project footprint.

Critical Habitat Screening

A Critical Habitat Screening and Assessment was undertaken as part of the biological thematic scope to determine whether the Project interacts with habitats or species meeting the definition of Critical Habitat under IFC PS6 and AIIB ESS1.

This assessment included:

- Spatial screening for protected areas and Key Biodiversity Areas (KBAs);
- Species-level screening for Critically Endangered and Endangered species using IBAT and IUCN data;
- Evaluation of habitat suitability, ecological dependency, and functional connectivity.

The assessment confirmed that the Project Area is a long-established, highly modified coastal-industrial environment and does not support Critical Habitat or Critical Habitat–triggering biodiversity values.

<u>Social Environment</u>

Assessment of baseline social conditions and potential project-related social risks and impacts within the Project's Area of Influence, informed by socioeconomic surveys, stakeholder consultations, desktop review of secondary data, and regulatory datasets. The assessment is undertaken in line with applicable international safeguard frameworks, including IFC PS2–PS4, ADB SPS, AIIB ESS1 - ESS3, and World Bank ESS1, demographic profile and population dynamics in the Project's Area of Influence, and is integrated with the mitigation hierarchy, including:

- Demographic profile and population dynamics in the Project's Area of Influence;
- Land use, land tenure, and livelihoods, including fisheries, coastal resource use, and informal economic activities;
- Employment and economic opportunities, including local hiring and skills development;
- Traffic, transport, and access, including impacts on public roads and marine navigation;
- Community health and safety, including exposure to construction and operational hazards, vessel traffic risks, and emergency preparedness;
- Labor and working conditions, including occupational health and safety, worker accommodation, and contractor management;
- Gender considerations, gender-differentiated impacts, and opportunities for inclusive participation;
- Vulnerable and disadvantaged groups, including fisherfolk, informal settlers (if any), women, elderly, and other at-risk populations;
- Cultural heritage, including tangible and intangible heritage, chance finds, and culturally significant coastal resources.

2.2.3 Cumulative and Induced Impacts

The ESIA includes an assessment of cumulative and induced environmental and social impacts, consistent with international good practice and the requirements of the Asian Infrastructure Investment Bank (AIIB), taking into account:

- Existing, Approved, and Reasonably Foreseeable Developments
    - Existing port facilities and phased expansion activities within the Mindanao International Container Port, as well as other industrial and logistics developments within the PHIVIDEC Industrial Estate, Tagoloan, Misamis Oriental, and the surrounding coastal environment of Macajalar Bay.

- Combined Environmental and Social Impacts
    - Potential combined impacts on marine and coastal water quality, sediment conditions, air emissions, noise levels, traffic movements, occupational and community health and safety, and overall community well-being arising from the interaction of the Project with ongoing port and industrial activities.

- Potential Induced Development
    - Indirect and induced effects associated with increased port capacity, improved operational efficiency, and enhanced regional connectivity, including potential growth in logistics services, transport activities, and related industrial and commercial operations within and around the PHIVIDEC Industrial Estate.

- Regional Carrying Capacity and Sustainability Considerations
    - Consideration of the long-term capacity of the coastal, marine, and surrounding urban–industrial environment to accommodate incremental development, taking into account existing environmental management systems, regulatory controls,

and the continued implementation of monitoring and mitigation measures to support sustainable port operations.

2.2.4 Area of Influence (AoI)

The spatial scope of the ESIA is defined through an Area of Influence (AoI), consistent with national and AIIB requirements. The AoI encompasses the following:

- Core Project Footprint and Immediate Interface Areas: The Phase 3 Project footprint and adjacent operational interface areas within the terminal.
- Associated and Ancillary Facilities: Supporting infrastructure and facilities required for construction and operation, including utilities, temporary facilities, and marine-related works.
- Marine and Coastal Areas: Nearshore marine waters and coastal zones that may be affected by project-related activities, including turbidity plumes, sediment disturbance, runoff, and marine navigation routes.
- Transportation and Access Corridors: Offsite road networks and access routes used by construction and operational traffic.
- Communities and Resource Users: Nearby communities and coastal resource users that may be affected by direct, indirect, cumulative, or perception-based impacts related to safety, nuisance, access constraints, and community interactions.

The AoI boundaries will be refined and confirmed once the final Phase 3 construction sequence and the extent of marine works are established.

2.3 ESIA Methodology

The ESIA methodology adopts a structured, iterative, risk-based, and adaptive approach, consistent with the Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework (ESF), which comprises three Environmental and Social Standards (ESSs). The methodology is also aligned with applicable Philippine environmental and social regulatory frameworks and internationally recognized ESIA good practice.

The methodology is designed to:

- Identify, assess, and manage potential environmental and social risks and impacts throughout the Project lifecycle (pre-construction, construction, operation, and, where applicable, decommissioning);
- Ensure compliance with national legal requirements, including the Philippine Environmental Impact Statement (EIS) System;
- Apply the precautionary principle, the mitigation hierarchy, and proportionality to risk; and
- Support informed decision-making, stakeholder engagement, and sustainable Project design.

2.3.1 Desk Review and Regulatory Framework

A comprehensive desk review was undertaken to establish the legal, institutional, and policy context applicable to the Project. This review ensured consistency between national regulatory requirements and the AIIB Environmental and Social Framework.

National and Local Framework

The desk review covered applicable Philippine environmental and social laws, regulations, and administrative issuances, including those governing:

- Environmental Impact Assessment (Presidential Decree 1586 and DENR-EMB EIS System guidelines);
- Marine and coastal resource management;
- Biodiversity conservation and protected areas;
- Occupational health and safety;
- Labor, gender, and social protection;
- Land use planning, port operations, and local government mandates.

Relevant local ordinances, comprehensive land use plans, and development frameworks of affected barangays, the municipality, and the province were also reviewed.

International and Lender Framework

The review considered applicable international conventions and treaties ratified by the Philippines, as well as the AIIB Environmental and Social Framework, including:

- ESS 1 (Environmental and Social Assessment and Management),
- ESS 2 (Involuntary Resettlement),
- ESS 3 (Indigenous Peoples, if applicable),

Other international guidance materials (e.g., environmental, health, and safety guidelines) were referenced solely as technical or methodological good practice, where relevant, and do not supersede AIIB ESF requirements.

2.3.2 Environmental Approvals

The ESIA includes a review of prior environmental approvals issued for the Mindanao International Container Port (MICP) Project, including Environmental Compliance Certificate (ECC) No. ECC-9907-035-215, issued on 18 October 1999 by the Department of Environment and Natural Resources (DENR) and currently implemented by the PHIVIDEC Industrial

Authority for the existing port facilities and phased developments within the approved 46.47-hectare project area and 800-meter container wharf.

The review covers the ECC conditions, associated permits (including Discharge Permit and Permit to Operate), compliance requirements, and environmental management and monitoring commitments currently being implemented by MICP. This review informs the identification of any legacy issues, continuing compliance obligations, and environmental and social commitments relevant to the proposed enhancement works, ensuring that the ESIA builds upon existing approvals and remains consistent with applicable regulatory requirements and AIIB environmental and social standards.

Table 2-1. Summary of ECC Coverage and prior environmental approvals

ECC No.	Issued to	Date Issued	Coverage
ECC-9907-035-215	PHIVIDEC INDUSTRIAL AUTHORITY (PIA)	October 18, 1999	Container Wharf - 800 meter long Port Facilities - 46.47 Hectares • Container Yard • Warehouse/ Storage Area • General Cargo Yard • Operations and Administrative Offices • Grain Terminal • Parking/ GReen Zone • Roadway

2.3.3 Project Description and Alternatives Analysis

The Project Description provides a comprehensive and systematic account of the Mindanao International Container Port (MICP) Project, including:

- Project location and setting within the PHIVIDEC Industrial Estate, Tagoloan, Misamis Oriental, and its regional, provincial, municipal, and barangay context;
- Key project components and facilities, including container wharf extensions, container yards, support buildings, utilities, and internal road networks;
- Design features and engineering specifications, as reflected in the approved master development plan and phase-specific layouts;
- Construction methodologies and phased development, covering Phase 1 (existing facilities), Phase 2 wharf extension and yard development, and planned future phases within the approved ECC footprint;
- Operational processes and terminal technology, including the Terminal Operating System (TOS), gate operations, yard and vessel process automation, and 24/7 terminal operations;

- Ancillary and support facilities, such as substations, drainage systems, fuel depots, workshops, and administrative buildings; and
- Resource requirements, including power supply, water demand, manpower, materials, and land area requirements.

An Alternatives Analysis was undertaken at a level commensurate with the Project's scale and risk profile. Where applicable, this included:

- Site selection alternatives, which evaluated other potential port locations within and outside Misamis Oriental and identified the PHIVIDEC Industrial Estate as the most suitable option due to existing infrastructure, available space, and alignment with regional development objectives;
- The "no project" scenario, which considered the implications of not proceeding with the expansion, including continued congestion, constrained capacity, and foregone economic and employment opportunities; and
- Phased development within the approved ECC area, confirming that all proposed enhancements remain within the previously approved 46.47-hectare project boundary and 800-meter wharf coverage.

The analysis demonstrates the rationale for the selected project configuration and phased enhancement approach, and shows how environmental, social, technical, and economic considerations were integrated into project planning while remaining consistent with existing environmental approvals.

2.3.4 Area of Influence

The Area of Influence (AoI) defines the spatial extent within which the Project's direct, indirect, and cumulative environmental and social impacts may reasonably occur, consistent with AIIB Environmental and Social Standard 1 and established ESIA good practice. For the Mindanao International Container Port Project, the AoI has been delineated with reference to the Project's phased development within the PHIVIDEC Industrial Estate and its interaction with the surrounding coastal and socio-economic environment.

The AoI was determined based on the following considerations:

- Nature and scale of Project activities, including phased wharf development, yard expansion, and terminal operations within the approved ECC footprint;
- Potential impact pathways, such as marine and surface water interactions, air emissions, noise, traffic movements, and socio-economic linkages associated with port operations;
- Sensitivity and exposure of environmental and social receptors, particularly coastal and marine environments, transport corridors, and nearby communities; and
- Professional judgment, informed by baseline environmental conditions, and the operational experience at the existing terminal.

Components of the Area of Influence

The AoI comprises the following spatial components:

- Project Footprint and Immediate Facilities: All permanent and temporary Project components located within the approved MICP development area, including wharf structures, container yards, support buildings, utilities, internal roads, and temporary construction facilities as described in the PDR.

- Primary Impact Area (Direct Impact Area – DIA): Areas directly affected by construction and operational activities, including:
  - The port site and associated on-site facilities;
  - Internal circulation roads and designated access points within the PHIVIDEC Industrial Estate;
  - Immediate marine waters adjacent to the wharf that may be influenced by vessel movement, port operations, and construction-related activities during phased development.

- Secondary Impact Area (Indirect Impact Area – IIA): Areas that may experience indirect or secondary effects due to Project-related activities, including:
  - Marine and coastal areas beyond the immediate wharf where navigation activities and port-related marine traffic occur;
  - External road networks used by port-related vehicles;
  - Surrounding areas within the PHIVIDEC Industrial Estate that may experience changes in logistics activity, traffic levels, or economic interactions; and
  - Broader socio-economic areas potentially influenced by employment generation and enhanced trade and logistics capacity associated with the Project.

The boundaries of the AoI will be refined, where necessary, as detailed construction sequencing and operational arrangements are finalized, consistent with the phased development approach documented in the PDR.

2.3.5 Baseline Data Collection

Baseline environmental and social conditions were established to provide a robust benchmark against which Project-related impacts are assessed.

Baseline data collection employed a tiered and integrated approach, including:

- Review of secondary data from national, regional, and local government sources;
- Field surveys and site inspections;

- Environmental sampling and monitoring (includes air, water, noise, marine conditions);
- Socio-economic profiling of potentially affected communities, including demographic, livelihood, and service access indicators.

Where relevant, baseline information reflects seasonal variability, particularly for environmental parameters and resource-dependent livelihoods, in line with AIIB and international best practice.

2.3.6 Impact Identification and Assessment

Impact significance was evaluated based on a structured consideration of:

- Impact magnitude, including scale, spatial extent, duration, reversibility, and likelihood; and
- Receptor sensitivity, informed by baseline conditions and conservation or social value.

Significance ratings were assigned for each identified impact prior to mitigation, providing an indication of inherent project risk. Elevated receptor sensitivity was applied to:

- Natural habitats and biodiversity receptors assessed under the Critical Habitat Assessment (CHA); and

The assessment also took into account applicable legal and policy thresholds, stakeholder concerns, and the anticipated effectiveness of proposed mitigation measures in determining final impact significance.

2.3.7 Mitigation and Management Measures

Mitigation measures were developed in accordance with the mitigation hierarchy:

- Avoidance;
- Minimization;
- Mitigation;
- Compensation or offset (where residual impacts remain).

All measures are consolidated into the Environmental and Social Management Plan (ESMP), which:

- Specifies mitigation actions for each identified impact;
- Assigns roles and responsibilities;
- Defines monitoring indicators, methods, and frequency;
- Establishes reporting and corrective action procedures.

The ESMP is designed as a living document, to be updated as Project design evolves and throughout implementation, consistent with AIIB ESS requirements.

2.4 ESIA Study Timeline and Project Development Lifecycle

The ESIA was undertaken in a phased, iterative, and risk-based manner, aligned with the Project development lifecycle, national regulatory requirements, and the AIIB Environmental and Social Framework (ESF). The timeline was designed to ensure that environmental and social considerations informed Project design, siting, scheduling, and risk management decisions at the earliest possible stage and throughout implementation.

Table 2-1 ESIA Study and Project Implementation Tentative Timeline

Phase	Activity	Key Outputs	Indicative Schedule
ESIA Preparation Phase	Scoping and Inception	Inception Report; definition of Area of Influence (AoI); regulatory and ESF gap analysis; stakeholder mapping	October 2025
	Baseline Data Collection	Environmental and social baseline datasets (physical, biological, socio-economic); field surveys and secondary data review	October – January 2026
	Impact Assessment and Analysis	Identification and evaluation of direct, indirect, and cumulative impacts; analysis of alternatives; climate risk screening	December 2025
	Draft ESIA and Supplementary Studies	Draft ESIA and ESMP incorporating stakeholder analysis, gender analysis, and other thematic plans	December 2025
	Final ESIA and ESMP	Final ESIA and ESMP incorporating regulatory and lender comments	January 2026
Permitting and Pre-Construction Phase	Licenses, Permits, and Registrations	ECC and other national/local permits; compliance conditions[1]	February 2026
	Land/Building Acquisition and Improvement	Land acquisition and/or asset improvement consistent with national law and AIIB ESF requirements	November 2024 – July 2026
Construction Phase	Site Preparation and Civil Works	Implementation of ESMP; environmental and social monitoring; contractor compliance	December 2025 – March 2027
	Dredging Activities	Dredging Method Statement and Sediment Monitoring	June – August 2026
Commissioning and Operatio	Equipment Installation, Staffing, and Trial Run	Installation of machinery; hiring and training; trial operations with ESMP implementation	December 2025 – March 2028

n Phase	Commercial Operations	Operational ESMP implementation; monitoring and reporting	March 2028 onwards

2.5 Structure of the ESIA Report

[1] Only Phase III-A will require the processing of ECC since the existing ECC already covers Phase II.

The ESIA Report is structured to provide a comprehensive, systematic, and transparent evaluation of the potential environmental and social impacts of the proposed project, consistent with Philippine regulations and AIIB ESF requirements. The report includes the following sections:

Executive Summary

- Concise summary of the ESIA findings, key environmental and social impacts, and proposed mitigation measures.
- Highlights compliance with national laws (e.g., Philippine EIA System under DAO 2017-25) and AIIB ESF requirements.
- Includes a summary of stakeholder engagement outcomes and key social considerations such as resettlement and labor impacts.

Introduction

- Background and rationale for the project.
- Objectives and scope of the ESIA study.
- Overview of methodology used for environmental and social assessments, including baseline data collection, risk analysis, and impact evaluation.
- Structure of the report.

Policy, Legal, and Administrative Framework

- National legislation, regulations, and standards applicable to environmental protection, social safeguards, labor, and health & safety (e.g., DENR Administrative Orders, RA 9003, RA 10752, RA 9710).
- Relevant local government regulations and permitting requirements.
- International standards, including AIIB ESF, IFC Performance Standards, and relevant UN Conventions.
- Institutional responsibilities for environmental and social governance.

Project Description

- Detailed description of the proposed project, including design, components, and operational characteristics.
- Project location, map, and Area of Influence (AoI).
- Technical specifications, construction phases, and operational scenarios.
- Expected lifetime of the project and decommissioning considerations.

Associated Facilities

- Identification of facilities or activities connected to the project that may have significant environmental or social impacts (e.g., access roads, worker camps, transmission lines, pipelines).
- Assessment of cumulative impacts from associated facilities, consistent with AIIB ESF's requirement to consider project-related cumulative and induced impacts.

Analysis of Alternatives

- Evaluation of project alternatives, including the “no project” option.
- Consideration of location, technology, design, and operational alternatives.
- Environmental, social, technical, and economic rationale for the selected alternative, consistent with AIIB ESF Principle 1 (avoiding, minimizing, or mitigating adverse impacts).

Baseline Environmental and Social Data

- Comprehensive assessment of the current environmental conditions, including:
- Physical environment (air, water, soil, climate, noise).
- Biological environment (terrestrial, freshwater, marine biodiversity).
- Socioeconomic environment (demographics, livelihoods, cultural heritage).
- Community health and safety.
- Mapping of sensitive receptors and protected areas.
- Data collection methods and seasonal considerations.

Evaluation / Assessment of Environmental and Social Risks and Impacts

- Identification and evaluation of potential adverse and positive impacts during pre-construction, construction, operation, and decommissioning phases.
- Risk assessment framework aligned with AIIB ESF (likelihood, severity, reversibility).
- Cumulative, induced, and transboundary impacts analysis.
- Special consideration for vulnerable groups, indigenous peoples, and gender-based impacts.

Environmental and Social Management Plan

- Proposed measures to avoid, minimize, or offset adverse environmental and social impacts.
- Environmental and Social Management Plan (ESMP) framework, including monitoring, reporting, and performance indicators.
- Alignment with national standards (DENR-EMB requirements) and AIIB ESF mitigation hierarchy.
- Climate change adaptation and resilience measures if relevant.

Institutional Mechanism for Implementing ESMP and RP

- Roles and responsibilities of implementing agencies and contractors.
- Organizational structure for environmental and social management.
- Capacity building and training requirements.
- Monitoring and reporting mechanisms to ensure compliance with ESMP and RP commitments.

Stakeholder Engagement Plan / Public Consultation and Information Disclosure

- Stakeholder identification and mapping.
- Public consultation methods, including focus group discussions, key informant interviews, and community meetings.

- Disclosure of project information in accessible formats, in compliance with AIIB ESF Principle 6 and DENR-EMB public consultation requirements.
- Documentation of stakeholder concerns and incorporation into project planning.

Grievance Redress Mechanism (GRM)

- Clear, accessible, and culturally appropriate procedures for receiving and addressing grievances from affected communities and workers.
- Tracking, reporting, and resolution mechanisms.
- Integration with AIIB ESF requirements to ensure timely and fair handling of grievances.

3. Policy, Legal, and Administrative Framework

The Project will be implemented in compliance with applicable local, national, and international policies, laws, and regulations. This framework provides the legal and institutional basis for environmental and social assessment, planning, implementation, and management measures. It ensures adherence to the Philippine Environmental Impact Statement (EIS) System, national labor and occupational safety standards, and the Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework (ESF).
The framework is aligned with international good practice, including the IFC Performance Standards (PS 1–8), and emphasizes risk-based assessment, stakeholder engagement, grievance redress, climate resilience, gender equality, and social inclusion.

3.1 Local and National Environmental Framework

3.1.1 Philippine Laws and Regulations

PD 1586 – Environmental Impact Statement (EIS) System

- Establishes the requirement for an Environmental Compliance Certificate (ECC) for projects that may significantly impact the environment.
- Mandates systematic identification, assessment, and management of environmental impacts, including cumulative and transboundary effects.
- Provides the legal basis for public consultation, stakeholder engagement, and disclosure of environmental information, ensuring transparency in project planning and decision-making.

DENR DAO 2017-25 – Revised Procedural Manual for EIS System

- Provides detailed procedural guidance on scoping, baseline data collection, impact assessment, mitigation planning, monitoring, and reporting.
- Ensures standardization of ESIA practices in the Philippines and facilitates alignment with international best practices such as AIIB ESF and IFC PS.

RA 8749 – Clean Air Act of 1999

- Establishes ambient air quality standards and emission limits for industries, vehicles, and other pollution sources.
- Requires air pollution prevention and control measures, including monitoring and reporting.
- Supports protection of community health and climate-sensitive initiatives by reducing greenhouse gas emissions and other pollutants.

RA 9275 – Clean Water Act of 2004

- Mandates protection of surface and groundwater resources through wastewater management, effluent treatment, and water quality monitoring.
- Supports climate-resilient water management and sustainable use of freshwater resources.

RA 9003 – Ecological Solid Waste Management Act of 2000
- Promotes solid waste segregation, reduction, recycling, and environmentally sound disposal.
- Encourages community involvement and participation in sustainable waste management programs.

RA 7586 – NIPAS Act of 1992 / RA 11038 – ENIPAS Act of 2018
- Establishes the legal framework for the conservation and management of protected areas, habitats, and biodiversity.
- Requires projects to avoid or mitigate impacts on ecologically sensitive areas and integrate biodiversity considerations into planning.

RA 9147 – Wildlife Resources Conservation and Protection Act
- Requires protection of wildlife species and habitats;
- Regulates activities that may cause wildlife disturbance or habitat loss; and
- Supports biodiversity assessment and mitigation measures.

RA 6969 – Toxic Substances and Hazardous and Nuclear Wastes Control Act
- Regulates handling, storage, transport, and disposal of hazardous chemicals and wastes.
- Protects human health and ecosystems and mandates emergency preparedness and response planning.

RA 10752 – Right-of-Way Act
- Provides the legal framework for land acquisition, involuntary resettlement, and compensation.
- Ensures fair and timely compensation, livelihood restoration, and meaningful consultation with affected persons, aligning with AIIB ESS2 / IFC PS5.

RA 7279 – Urban Development and Housing Act
- Establishes the legal framework for housing and urban development, including safeguards for underprivileged and informal settler families affected by development projects.

- Requires humane and coordinated relocation processes, adequate consultation, and provision of basic services at resettlement sites.

- Prohibits demolition or eviction without due process, adequate notice, and relocation assistance, where applicable.

- Provides a statutory basis for social safeguards applied in the Resettlement Plan, complementing AIIB ESS2 requirements on involuntary resettlement and livelihood restoration.

Local Government Code (RA 7160)

- Defines LGU roles in project permitting, environmental monitoring, enforcement, and community engagement.
- Ensures that local stakeholders are actively involved in decision-making and monitoring compliance.

RA 11201 – DHSUD Act

- Establishes DHSUD as the primary national agency responsible for housing, resettlement, and urban development.
- Provides institutional oversight for resettlement planning, housing assistance, and coordination with LGUs and national agencies.
- Supports alignment of the Project's Resettlement Plan with national housing policies and standards.

RA 9710 – Magna Carta of Women

- Promotes gender equality and social inclusion in project planning and implementation.
- Ensures women's participation in consultations, grievance mechanisms, and livelihood opportunities, and protection from discrimination or occupational risks.

3.1.2 Labor and Occupational Safety Framework

Labor Code of the Philippines (PD 442)

- Governs employment standards, labor rights, and workplace conditions, including fair treatment, minimum wage, working hours, and dispute resolution.
- Aligns with AIIB ESS 1 requirements on labor and working conditions.

RA 11058 – Occupational Safety and Health Standards Act

- Mandates implementation of occupational safety and health systems in workplaces.
- Requires risk assessments, hazard identification, preventive measures, and worker training to ensure safe working environments.

Relevant DOLE Guidelines and Department Orders

- Provide detailed guidance on labor inspections, occupational health, and grievance handling.

RA 11199 – Social Security Act

- Ensures social protection for workers, including coverage for work-related illness, injury, and other contingencies.

RA 11210 – Expanded Maternity Leave Law

- Provides maternity benefits and protection for female employees.

- Supports gender equity and social welfare in the workplace.

3.2 International Policy Framework

3.2.1 AIIB Environmental and Social Framework

- AIIB Environmental and Social Policy (ESP)
    - Established the overarching principles governing the management of environmental and social risks and impacts for projects financed by AIIB.
    - Provides the policy foundation for the application of the Environmental and Social Framework (ESF) and its associated Environmental and Social Standards (ESS), ensuring that projects are developed in a manner that is environmentally sound, socially inclusive, and aligned with international good practice.
    - Emphasizes engagement that is proportionate to project risks and impacts and that gives particular attention to affected communities, vulnerable and disadvantaged groups, and other interested stakeholders

- AIIB Environmental and Social Standards (ESS)
    - ESS1 – Environmental and Social Assessment and Management: Requires systematic identification, assessment, and management of environmental and social risks and impacts throughout the project lifecycle, including integration of mitigation measures into project design, implementation, and operations, and establishment of appropriate monitoring and management systems.
    - ESS2 – Involuntary Resettlement and Land Acquisition: Sets requirements for avoiding or minimizing involuntary resettlement; ensuring fair compensation, livelihood restoration, and support for affected and vulnerable populations; and meaningful consultation with displaced persons.
    - ESS3 – Indigenous Peoples: Aims to ensure that Indigenous Peoples are treated with dignity, respect, and cultural sensitivity; that adverse impacts are avoided or minimized; and that Indigenous Peoples receive culturally appropriate benefits, with meaningful consultation and, where applicable, Free, Prior, and Informed Consent (FPIC).

- AIIB Environmental and Social Exclusion List (ESEL)
    - The AIIB Environmental and Social Exclusion List (ESEL) defines activities that are ineligible for AIIB financing due to their unacceptable environmental and social risks, adverse impacts, or inconsistency with international conventions and good practice. The ESEL serves as a safeguard instrument that complements the AIIB Environmental and Social Policy (ESP) and the Environmental and Social Standards (ESS), ensuring that AIIB-financed projects do not support activities that would cause irreversible harm to people, biodiversity, cultural heritage, or the environment.

The ESEL prohibits AIIB financing for, among others:

- Activities that cause significant conversion or degradation of critical habitats;
- Projects involving illegal, unreported, or unregulated fishing, or trade in endangered species;
- Activities that violate international environmental agreements, including CITES and the Convention on Biological Diversity;
- Projects involving forced labor, child labor, or serious violations of labor rights;
- Activities that result in large-scale involuntary resettlement without adequate safeguards; and
- Projects that contravene national environmental or social laws or international obligations of the host country.

3.2.2 Alignment with International Best Practices

- IFC Performance Standards (PS 1–8)
  - Provides a globally recognized framework for environmental and social risk management, stakeholder engagement, resettlement, labor management, and biodiversity protection.

- Stakeholder Engagement & Grievance Redress
  - Requires inclusive, culturally sensitive consultation with communities, workers, and stakeholders.
  - Establishment of a transparent Grievance Redress Mechanism (GRM) consistent with AIIB and IFC requirements.

- Climate Resilience & Environmental Sustainability
  - Incorporates climate risk assessment, adaptation measures, and mitigation of greenhouse gas emissions.
  - Promotes resource efficiency and sustainable environmental management.

- Gender Equality & Social Inclusion
  - Ensures gender-responsive project planning, equal participation, and protection of vulnerable groups.
  - Considers impacts on women, children, indigenous peoples, and marginalized populations in all phases of the project.

- Unexploded Ordnance (UXO) Risk Management and Safety Protocols
  - Requires a desk-based historical review and, where warranted, geophysical surveys prior to dredging.
  - Establishes “stop-work” procedures in the event of suspected UXO discovery, including site isolation and notification of authorities.
  - Ensures that no dredging resumes in affected areas until UXO clearance is formally confirmed by authorized agencies, consistent with national

regulations and international good practice.**2.3 International Commitments of the Philippines**

Environmental Commitments

United Nations Framework Convention on Climate Change (UNFCCC) – 1994
The Philippines, as a Party to the UNFCCC, commits to mitigating greenhouse gas (GHG) emissions, promoting climate-resilient development, and integrating climate change considerations into national planning. For ESIA purposes, this commitment requires the inclusion of climate risk assessments, adaptation strategies, and measures to minimize greenhouse gas emissions during project planning, construction, and operation. Projects must account for potential climate hazards and vulnerabilities in their environmental and social management plans.

Paris Agreement – 2016
Under the Paris Agreement, the Philippines submits Nationally Determined Contributions (NDCs) aimed at limiting global warming and enhancing national resilience to climate impacts. For ESIA, this commitment emphasizes climate-responsive project design, adoption of low-carbon technologies, and integration of adaptation measures to ensure projects are aligned with national climate goals and sustainable development pathways.

Convention on Biological Diversity (CBD) – 1993
The Philippines is committed to conserving biodiversity and promoting its sustainable use. This requires ESIA studies to conduct comprehensive biodiversity assessments, identify potential impacts on ecosystems and species, and propose appropriate mitigation measures. The CBD also guides the development of conservation strategies and monitoring frameworks to ensure the project avoids or minimizes adverse effects on sensitive habitats.

Ramsar Convention on Wetlands – 1994
As a signatory to the Ramsar Convention, the Philippines is obliged to protect wetlands of international importance and promote their sustainable use. ESIA studies must evaluate the potential impacts of projects on wetlands, including alterations to hydrology, pollution risks, and habitat loss, and implement mitigation measures to preserve ecological integrity and support community livelihoods dependent on these ecosystems.

CITES – 1981
The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) requires the Philippines to regulate the trade of endangered species and ensure their conservation. Projects undergoing ESIA must ensure that no activities contribute to illegal trade or exploitation of protected species, and include monitoring and mitigation measures to safeguard threatened flora and fauna.

Montreal Protocol – 1989

The Philippines' commitment to the Montreal Protocol focuses on reducing ozone-depleting substances. ESIA studies for relevant projects must ensure the use of alternative, ozone-friendly substances in industrial and refrigeration processes, thereby minimizing adverse environmental effects and aligning with global environmental protection initiatives.

Stockholm Convention – 2004

As a Party to the Stockholm Convention on Persistent Organic Pollutants (POPs), the Philippines is committed to reducing and eliminating harmful chemicals. ESIA studies must consider the management of hazardous substances, safe handling and disposal of chemical wastes, and measures to prevent contamination of human and ecological receptors.

Basel Convention – 1994

The Philippines has ratified the Basel Convention to control transboundary movements of hazardous wastes and their disposal. Projects must comply with stringent waste management practices, including storage, transport, and environmentally sound disposal, ensuring that both workers and communities are protected from hazardous exposure.

Minamata Convention on Mercury – 2017

The Minamata Convention commits the Philippines to reduce mercury emissions and prevent environmental contamination. ESIA processes must integrate mitigation measures in project design and operations to minimize mercury release, particularly in industrial, mining, and artisanal activities, safeguarding environmental and public health.

Human Rights and Labor Commitments

Universal Declaration of Human Rights (UDHR) – 1948

The UDHR establishes fundamental human rights, including equality, non-discrimination, and protection from abuse. ESIA processes must ensure that project design, operations, and mitigation measures respect human rights, promote equitable access to benefits, and prevent adverse social impacts on affected communities.

International Covenant on Civil and Political Rights (ICCPR) – 1986

The ICCPR guarantees civil and political rights such as freedom of expression, assembly, and due process. ESIA studies should facilitate meaningful participation of communities in consultations, ensure transparency in project decision-making, and protect communities from coercion or undue influence.

International Covenant on Economic, Social and Cultural Rights (ICESCR) – 1986

The ICESCR establishes rights to work, health, education, and an adequate standard of living. ESIA must assess potential social impacts, ensure that affected populations have access to social services, and design mitigation measures that promote community welfare and social inclusion.

ILO Core Conventions

The Philippines has ratified key International Labour Organization (ILO) conventions covering the prohibition of forced and child labor, freedom of association, collective bargaining, and elimination of workplace discrimination. ESIA studies must incorporate labor management plans, ensure safe working conditions, uphold labor rights, and establish grievance mechanisms.

Social, Gender, and Indigenous Peoples Commitments

Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) – 1981 CEDAW obligates the Philippines to promote gender equality and protect women from discrimination. ESIA processes should integrate gender-responsive planning, ensure women's participation in consultations and decision-making, and include mitigation measures addressing gender-specific risks and opportunities, including in livelihood restoration and grievance redress mechanisms.

United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) – 2007
UNDRIP recognizes the rights of indigenous peoples to their lands, resources, and cultural heritage. ESIA must incorporate Free, Prior, and Informed Consent (FPIC), culturally appropriate consultation, and safeguards to ensure that indigenous communities are meaningfully engaged, that their rights are respected, and that project benefits are equitably shared.

Convention on the Rights of the Child (CRC) – 1990
The CRC commits the Philippines to protect the rights of children, including their health, safety, and access to education. ESIA studies must consider child-sensitive safeguards, prevent exposure to project-related risks, and ensure that community programs do not adversely impact children.

Sustainable Development and Climate Commitments

2030 Agenda / Sustainable Development Goals (SDGs) – 2015
The SDGs guide the Philippines in pursuing inclusive, equitable, and sustainable development. ESIA processes should align project impacts and mitigation measures with relevant SDGs, addressing poverty reduction, health, education, gender equality, environmental protection, and climate action to maximize positive social and environmental outcomes.

Sendai Framework for Disaster Risk Reduction – 2015
The Philippines' commitment to the Sendai Framework emphasizes reducing disaster risks and enhancing resilience to natural hazards. ESIA studies should include disaster risk assessments, climate adaptation measures, and resilience-building strategies for vulnerable communities, ensuring the project can withstand and adapt to extreme events and climate-related hazards.

Maritime, Shipping, and Marine Environmental Commitments
International Convention for the Prevention of Pollution from Ships (MARPOL)

Establishes controls on marine pollution from ships, including oil, hazardous substances, sewage, garbage, and air emissions. For ESIA purposes, MARPOL informs pollution prevention measures, waste handling, spill prevention, and operational controls for port-related activities and vessel traffic.

International Maritime Organization (IMO) Conventions and Instruments
Relevant IMO instruments provide international standards for maritime safety, marine environmental protection, and ship–port interface management. These standards inform port operational practices, navigation safety, vessel traffic management, and emergency preparedness.

These maritime commitments complement national regulations and reinforce pollution prevention, marine ecosystem protection, and safety requirements applicable to port redevelopment projects.

3.3 Gap Analysis: Philippine EIA and AIIB ESF

The Philippine Environmental Impact Assessment (EIA) System and the Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework (ESF) share a common objective of promoting environmentally and socially responsible project development. However, they differ in scope, emphasis, and level of integration of environmental and social risk management.

The Philippine EIA System, established under Presidential Decree (PD) 1586 and implemented through relevant DENR Administrative Orders, provides a structured regulatory mechanism for assessing environmental impacts and securing environmental approval through the issuance of an Environmental Compliance Certificate (ECC). The system emphasizes baseline environmental data collection, identification and evaluation of environmental risks, formulation of mitigation measures, and compliance monitoring. Public consultation is a mandatory component of the Philippine EIA process; however, engagement is generally focused on statutory requirements linked to ECC issuance. Social issues such as land acquisition and resettlement are addressed through separate national legislation, while labor, occupational safety, gender, and governance considerations are typically managed outside the EIA process.

In contrast, the AIIB Environmental and Social Framework provides an integrated approach to environmental and social risk management applicable throughout the project lifecycle. The AIIB ESF comprises three Environmental and Social Standards (ESSs):

- ESS 1 – Environmental and Social Assessment and Management, which addresses environmental risks, pollution prevention, resource efficiency, biodiversity, labor and occupational health and safety, community health and safety, stakeholder engagement, grievance mechanisms, gender, and climate and disaster risk considerations;
- ESS 2 – Land Acquisition and Involuntary Resettlement; and
- ESS 3 – Indigenous Peoples.

ESS 1 serves as the overarching standard governing environmental and social risk identification, assessment, mitigation, monitoring, and adaptive management. It requires a proportional, risk-based approach that integrates environmental and social considerations into project design, implementation, and operation.

A comparison of the two frameworks highlights several differences in emphasis rather than contradictions. The Philippine EIA System focuses primarily on environmental impacts and regulatory compliance, while the AIIB ESF emphasizes integrated environmental and social risk management, proportionality to risk, stakeholder engagement beyond statutory consultation, and the establishment of formal management systems and grievance mechanisms. While the national system provides a strong foundation for environmental protection, additional elements required under the AIIB ESF—particularly under ESS 1—are incorporated through the ESIA and the Environmental and Social Management Plan (ESMP).

For this Project, the ESIA has been prepared to bridge procedural and substantive differences between the Philippine EIA System and the AIIB ESF by:

- Building upon the environmental baseline and regulatory compliance requirements of the Philippine EIA System;
- Expanding the scope of assessment under ESS 1 to include labor and occupational health and safety, community health and safety, gender considerations, stakeholder engagement, and climate and disaster risk screening;
- Applying the mitigation hierarchy and proportionality principle to environmental and social risks; and
- Consolidating mitigation, monitoring, institutional responsibilities, and adaptive management measures into an integrated ESMP.

This approach ensures that the Project meets both national regulatory requirements and AIIB environmental and social safeguard expectations without duplication or conflict.

Table 3-1 Detailed Gap Analysis

Aspect	Philippine EIA System	AIIB ESF	Gap / Limitation	Recommendation / Bridging Measures
Scope of Assessment	Primarily environmental impacts; social considerations included only indirectly through consultation; resettlement addressed under RA 10752 (ROW).	Integrated environmental, climate, social, labor, and governance risk assessment across all ESS.	Philippine EIA lacks a systematic social, labor, and cultural heritage assessment framework; limited integration of ESG factors.	ESIA expands scope to include environmental, labor, community, and social risks to align with ESS 1
Environmental Management	Environmental mitigation and monitoring required	ESS 1 requires systematic risk management, monitoring, and	ESF places stronger emphasis on management	ESMP integrates environmental mitigation,

Aspect	Philippine EIA System	AIIB ESF	Gap / Limitation	Recommendation / Bridging Measures
	for ECC compliance	adaptive management	systems, mitigation hierarchy including biodiversity offsetting, and critical habitat, cumulative impacts and ecosystem services considerations	monitoring, and corrective actions
Land Acquisition & Resettlement	Addressed under separate national laws (e.g., ROW legislation)	ESS 2 applies when resettlement impacts are identified	Payment of full replacement cost and livelihood restoration requirement	A standalone resettlement plan has been prepared in accordance with AIIB ESS2 and national regulations
Indigenous Peoples	Addressed through separate laws and permitting	ESS 3 applies where Indigenous Peoples are present	No significant gap	ESS 3 screening conducted; not applicable to the Project
Labor & Occupational Health and Safety	Governed by Labor Code and OSH laws; not central to EIA	Addressed under ESS 1	Labor risks not systematically assessed in EIA	Labor and OSH risks assessed and managed through ESMP
Community Health and Safety	Addressed indirectly through environmental controls	Covered under ESS 1	ESF requires explicit assessment	Community health and safety risks assessed under ESS 1
Stakeholder Engagement	Public consultation required for ECC	ESS 1 requires structured and ongoing engagement	Engagement under EIA often limited in duration	Stakeholder Engagement Plan developed and implemented
Grievance Redress Mechanism	Not standardized	ESS 1 requires accessible and transparent GRM	GRM not mandatory under EIA	Project-level GRM established
Biodiversity	Focus on protected areas and regulatory thresholds	Biodiversity addressed under ESS 1	Different depth of assessment	Biodiversity risks assessed proportionately under ESS 1
Climate & Disaster Risk	Not systematically required	ESS 1 requires consideration of climate and disaster risks	Climate risk not formalized under EIA	Climate and disaster risk screening incorporated

Aspect	Philippine EIA System	AIIB ESF	Gap / Limitation	Recommendation / Bridging Measures
Monitoring & Reporting	Focus on ECC compliance	ESS 1 requires integrated monitoring and adaptive management	Broader monitoring scope under ESF	ESMP includes environmental and social indicators
Gender & Vulnerable Groups	Not explicitly required	Addressed under ESS 1	Gender not systematically assessed	Gender risks assessed and mitigation integrated into ESMP

4. Project Description

4.1 Project Background and Overview

The Mindanao International Container Port Project (MICP) is an existing container terminal and RORO facility located within the PHIVIDEC Industrial Estate, Tagoloan, Misamis Oriental. The Project is covered by Environmental Compliance Certificate (ECC) No. ECC-9907-035-215, issued on 18 October 1999, which authorizes the development of port facilities within a total area of 46.47 hectares and a container wharf with a total length of 800 meters.

Development of the port has been implemented in phases. To date, Phase I has been completed and is operational, comprising approximately 18 hectares of developed port facilities and a 300-meter container wharf. The current Project covered by this Environmental and Social Impact Assessment focuses exclusively on Phase II and Phase III-A development, which forms part of the remaining infrastructure already approved under the existing ECC.

Scope of the ESIA and AIIB Financing

This Environmental and Social Impact Assessment (ESIA) has been prepared to assess the environmental and social impacts associated with the proposed Phase II implementation and Phase III-A expansion of the Mindanao International Container Port (MICP), in accordance with Philippine regulatory requirements and the Environmental and Social Framework (ESF) of the Asian Infrastructure Investment Bank (AIIB).

Phase II development activities are covered under the approved Environmental Compliance Certificate (ECC) for the MICP and shall proceed in accordance with the conditions of that ECC. Phase III-A expansion activities form part of the AIIB-financed Project and are included in this ESIA for assessment of their environmental and social impacts. A portion of the Phase III-A wharf extension involves a partial realignment of the container wharf, with approximately 140 meters located outside the original ECC-approved footprint. Accordingly, an ECC amendment is being processed under the Philippine Environmental Impact Statement (EIS) System.

This ESIA adopts a consolidated assessment approach, evaluating the cumulative and incremental environmental and social impacts of both Phase II and Phase III-A developments. This approach ensures that potential interaction effects between development phases are adequately assessed; mitigation and management measures are coherently designed across project stages; and environmental and social risks are addressed in a consistent and integrated manner, notwithstanding staggered ECC approval timelines.

Any additional findings, mitigation measures, or management requirements identified through the domestic Environmental Impact Assessment process—including those arising from the ECC application for Phase III-A—shall be incorporated into the Project's environmental and social management instruments, consistent with AIIB requirements.

Nothing in this ESIA alters or supersedes the regulatory status of Phase II under its approved ECC, nor does it pre-empt the outcome of the ECC application for Phase III-A. Rather, the ESIA provides an integrated framework for environmental and social risk management to support regulatory review and project implementation.

Integration with Domestic EIA Process

The Project remains governed by the existing ECC issued by the Department of Environment and Natural Resources (DENR), which covers the full 46.47-hectare port development, including both Phase I and Phase II components. The Phase II development assessed in this ESIA falls within the scope of the approved ECC and does not require a new ECC issuance. However, coordination with DENR is ongoing to ensure that Phase II implementation remains fully aligned with the conditions and commitments stipulated in the ECC, as well as any applicable amendments or supplemental approvals that may be required under Philippine environmental regulations.

Phase III-A expansion activities, while included in this ESIA to enable a comprehensive and integrated assessment of potential environmental and social impacts, are subject to a separate ECC application under the Philippine Environmental Impact Statement (EIS) System. Inclusion of Phase III-A in this ESIA does not pre-empt or supersede the outcome of the domestic EIA review process for that phase.

Change Management and Adaptive Assessment

Given the phased nature of the Project, an adaptive management approach is adopted. Environmental and social performance during Phase II and Phase III-A will be monitored and evaluated through the Project's Environmental and Social Management Plan (ESMP). Should site conditions, regulatory requirements, or operational parameters change during implementation, mitigation measures and management plans will be updated accordingly to ensure continued compliance with both national regulations and AIIB standards.

4.1.1 Project Location and Area

The proposed Project enhancement is located entirely within the existing 46.47-hectare MICP footprint inside the PHIVIDEC Industrial Estate in the Municipality of Tagoloan, Misamis Oriental. Phase III-A includes a planned extension and partial realignment of the container wharf and associated marine works, a portion of which extends beyond the original ECC-approved footprint and is therefore subject to an ECC amendment under the Philippine Environmental Impact Statement (EIS) System.

Tagoloan is situated east of Cagayan de Oro and lies along the southern coastline of Macajalar Bay. The municipality has a total land area of approximately 7,938 hectares, representing about 2.24% of the total land area of Misamis Oriental. The area is characterized by a mix of industrial estates, port facilities, and coastal communities, with PHIVIDEC serving as a designated industrial growth zone.

Macajalar Bay: Physical Setting, Classification, and Uses

Macajalar Bay is a semi-enclosed, deep-water bay of the Bohol Sea located along the north-central coast of Mindanao, bounded by multiple municipalities including Tagoloan and the highly urbanized city of Cagayan de Oro. The bay functions as a regional maritime and economic hub, hosting several ports and industrial estates—including the PHIVIDEC Industrial Estate and the Mindanao International Container Port (MICP)—and providing sheltered navigation, anchorage, and logistical support for regional trade. The bay also receives riverine inputs from surrounding catchments, including the Cagayan de Oro River system, which influence nearshore water quality and sediment dynamics.

Under Philippine water quality and beneficial-use classification, coastal waters adjacent to industrial and port zones are generally managed to support navigation, industrial activities, and fisheries, and are typically designated under the SB, SC, or SD coastal water classes depending on shoreline segment and regulatory determination. Project assessments and permitting therefore reference the DENR Water Quality Guidelines and General Effluent Standards (DAO 2016-08), together with relevant DENR–EMB classification guidance, in evaluating marine water quality conditions and compliance requirements.

Ecologically and socially, Macajalar Bay is an extensive coastal system that serves as an important fishing ground for surrounding coastal communities and has been the focus of multi-stakeholder conservation and integrated coastal management initiatives due to its ecological and socio-economic value to the Misamis Oriental coastal zone and adjacent municipalities. These efforts include programs led by local government units, the Macajalar Bay Development Alliance (MBDA), and academic institutions such as Xavier University through the McKeough Marine Center. Baseline studies and the widely referenced *Ecological and Fisheries Profile of Macajalar Bay* prepared by Xavier University (Roa-Quiaoit et al., 2008/2009) provide foundational information on fisheries resources, habitat distribution, and priority management actions.

While the broader Macajalar Bay seascape contributes to regional biodiversity and fisheries productivity, the specific Project Area is confined to a long-established, highly modified coastal-industrial port environment characterized by engineered shorelines, dredged navigation channels, reclaimed land, and sustained vessel traffic. Nearshore habitats in industrialized sections of the bay have already been altered by historical dredging, port operations, and coastal development. As such, the Project Area does not functionally support the habitat attributes, ecological connectivity, or species dependencies that would meet the criteria for Critical Habitat under IFC Performance Standard 6 or AIIB Environmental and Social Standard 1—an important contextual consideration for assessing Project-related impacts and cumulative effects within the bay.

4.1.2 Project Area Mapping

The Project site falls within an established industrial zone and is surrounded by a mix of industrial, agricultural, and developed land uses.

The Project area is illustrated through the following figures, which show the spatial extent of existing and planned developments, as covered by the issued ECC:

- Figure 4-1. General Existing Map of the Area per issued ECC
- Figure 4-2. Phase 2 Development per issued ECC
- Figure 4-3. Site Development Plan for Phase 2
- Figure 4-4. Site Development Plan for Phase III-A
- Figure 4-5. Project Location vis-à-vis Regional Boundaries
- Figure 4-6. Project Location vis-à-vis Provincial Boundaries
- Figure 4-7. Project Location vis-à-vis Municipal Boundaries

These figures collectively present the Project's location within regional, provincial, municipal, and barangay boundaries, as well as the spatial relationship between existing facilities and planned developments under the ECC.

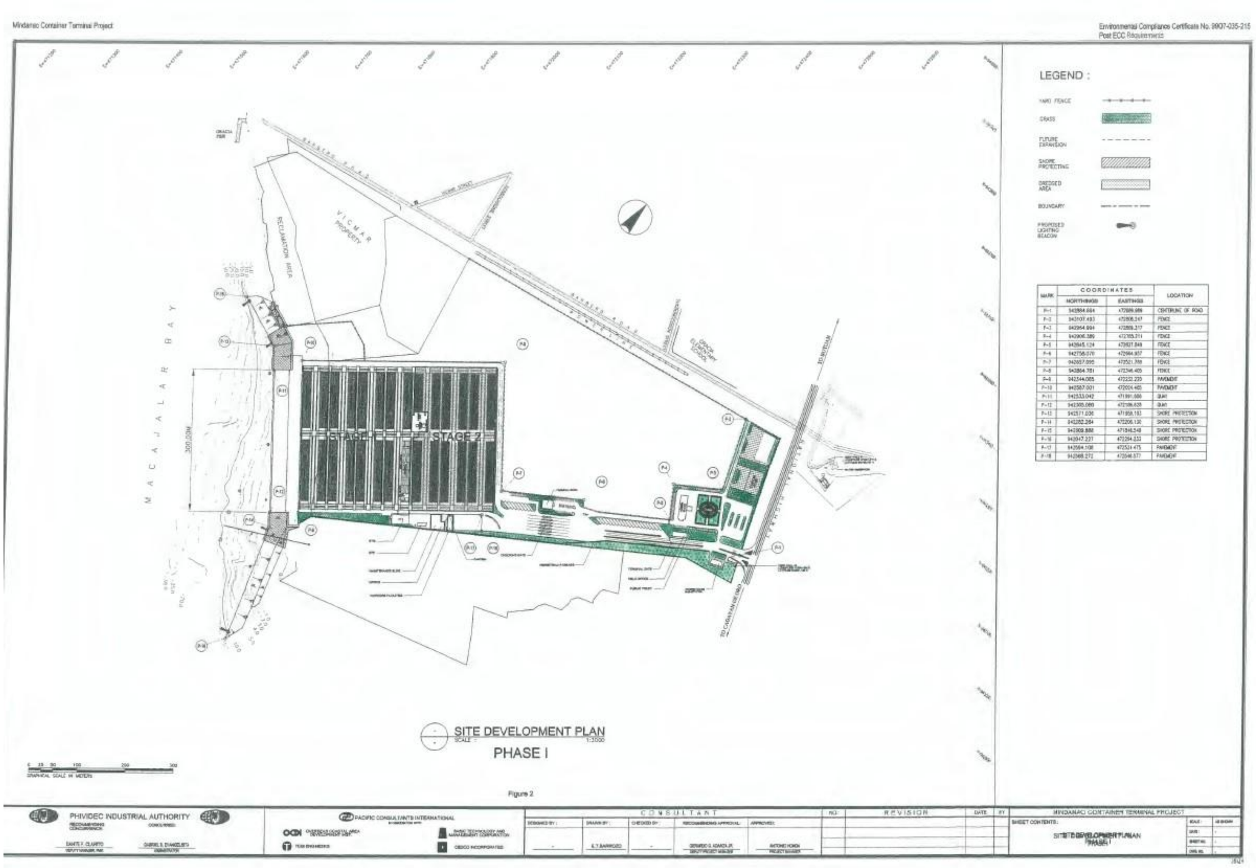


Figure 4-1. General Existing Map of the Area per issued ECC

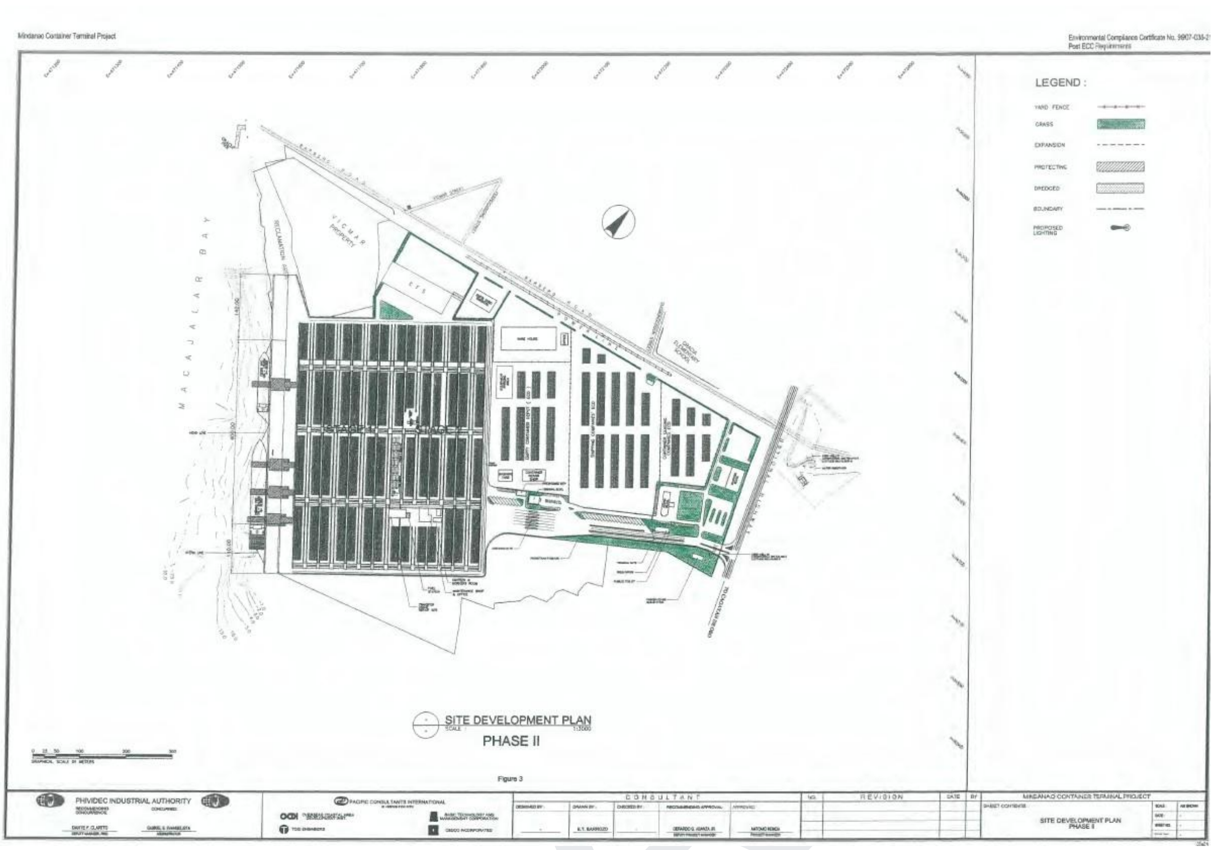


Figure 4-2. Phase 2 Development per issued ECC

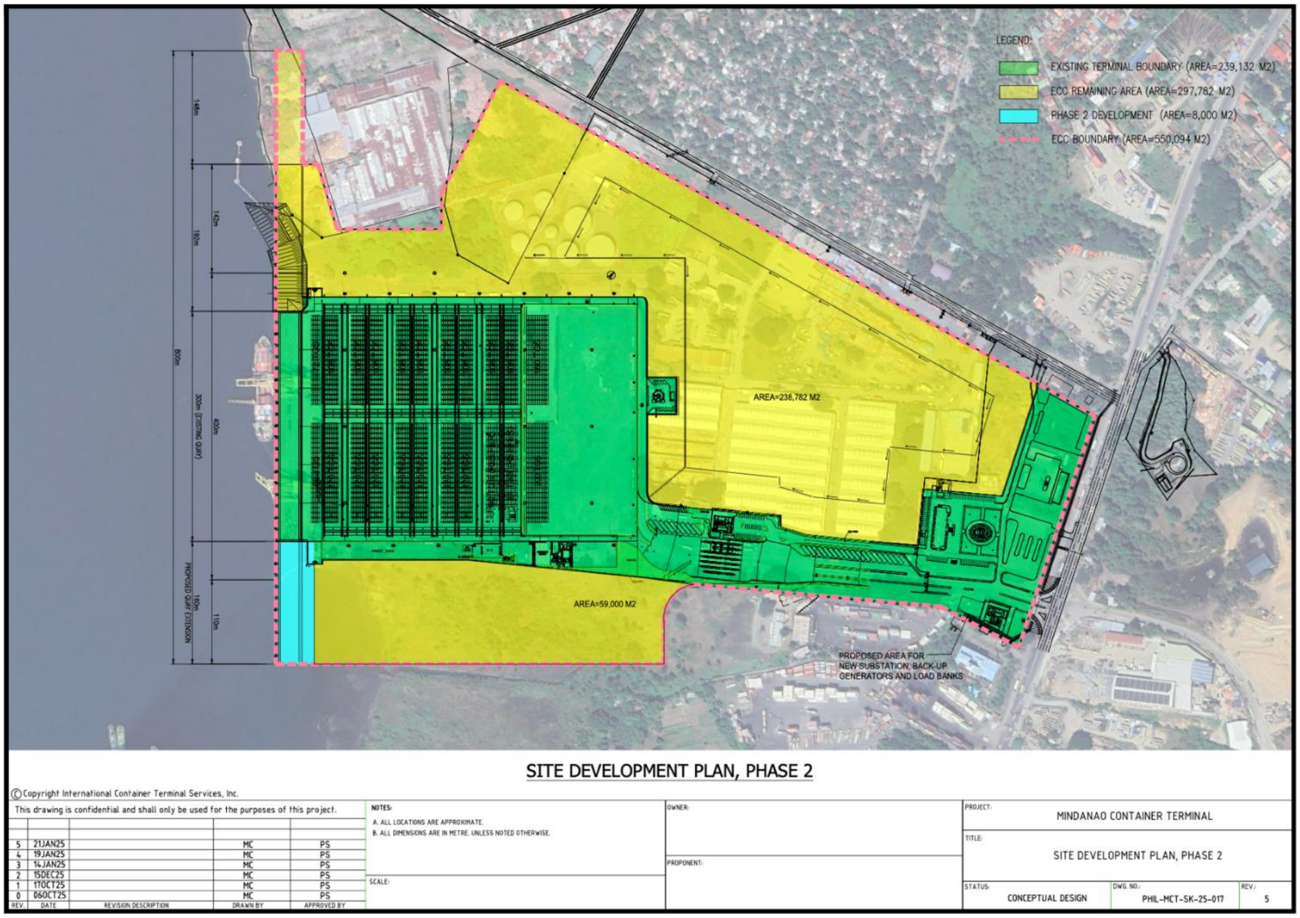


Figure 4-3. Site Development Plan for Phase 2

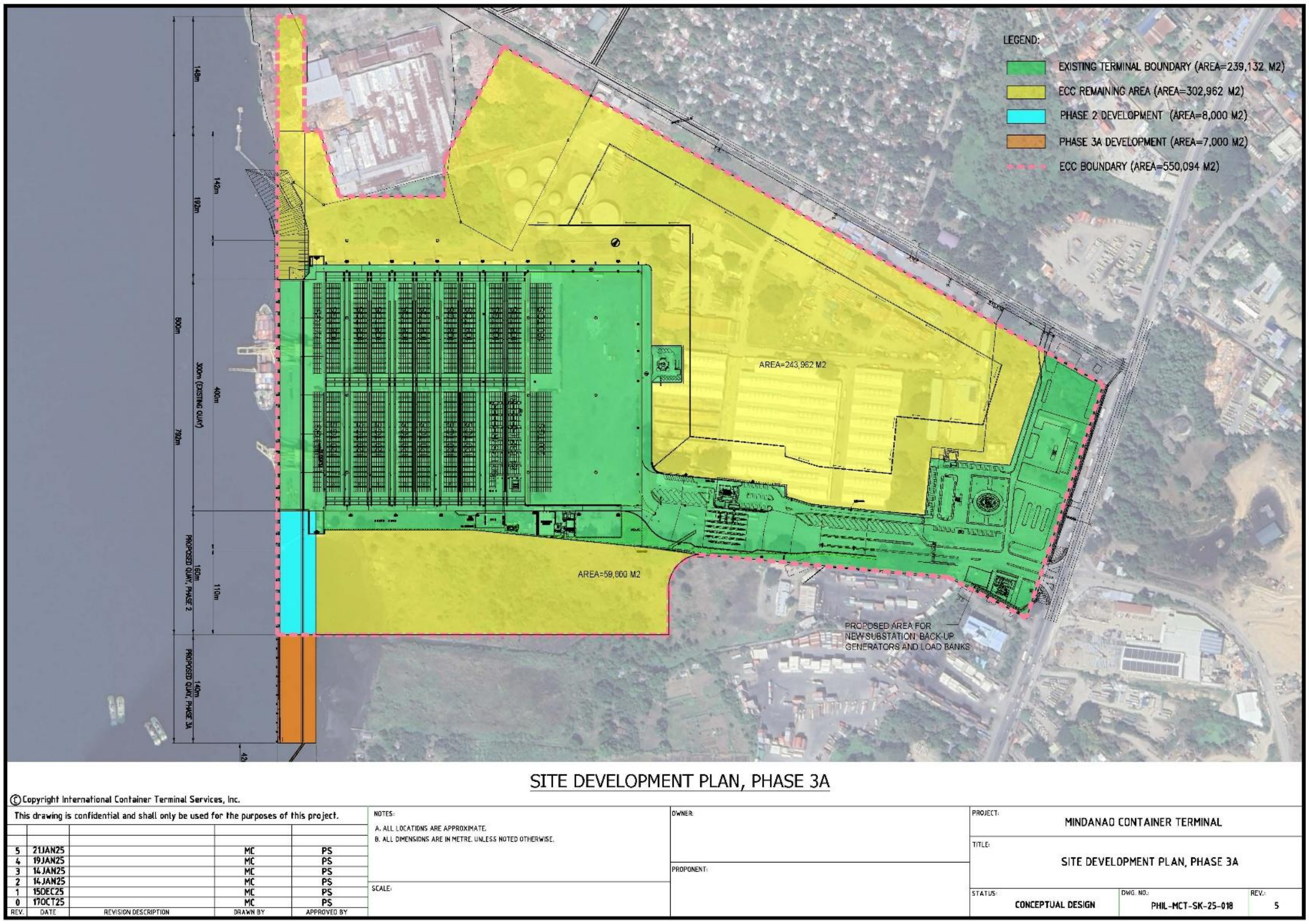


Figure 4-4. Site Development Plan for Phase III-A

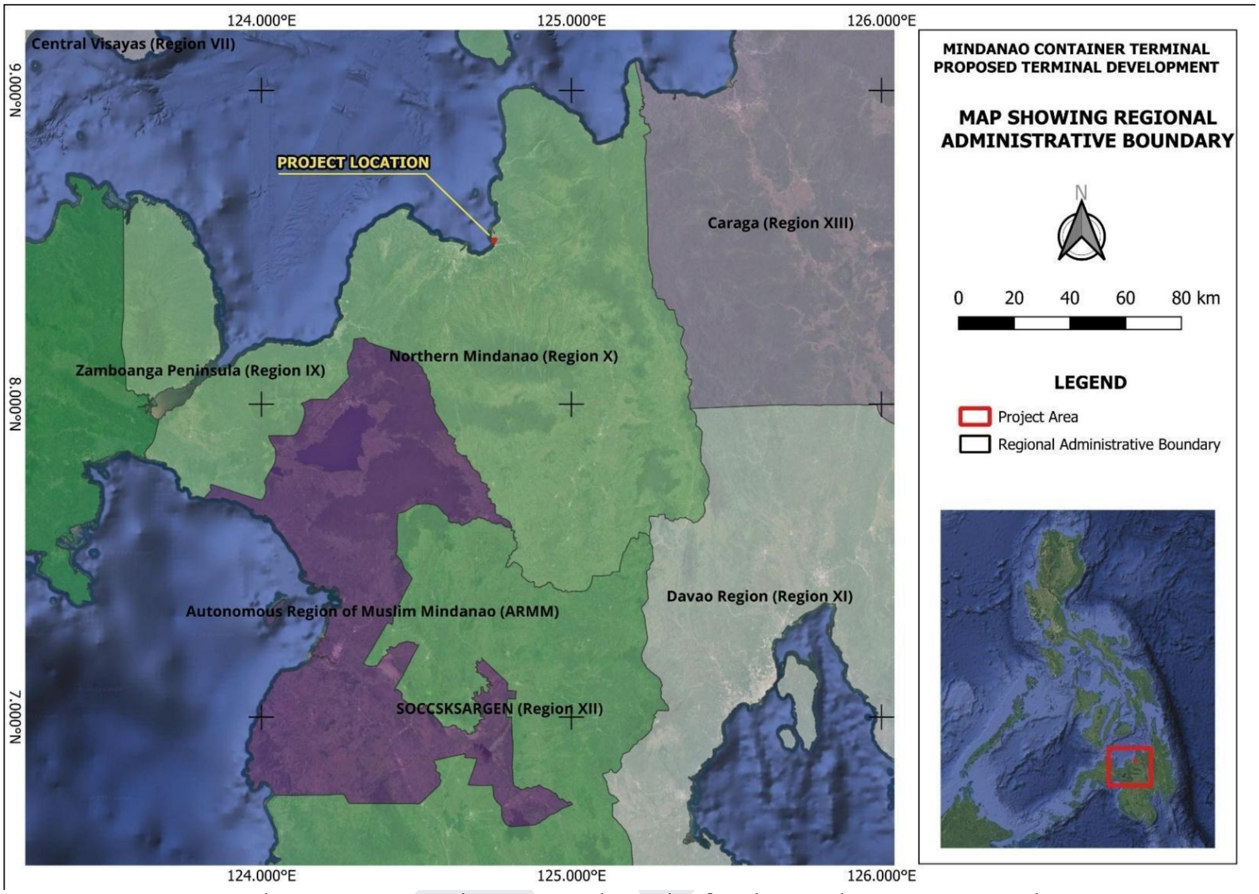


Figure 4-5. Project Location vis-à-vis Regional Boundaries

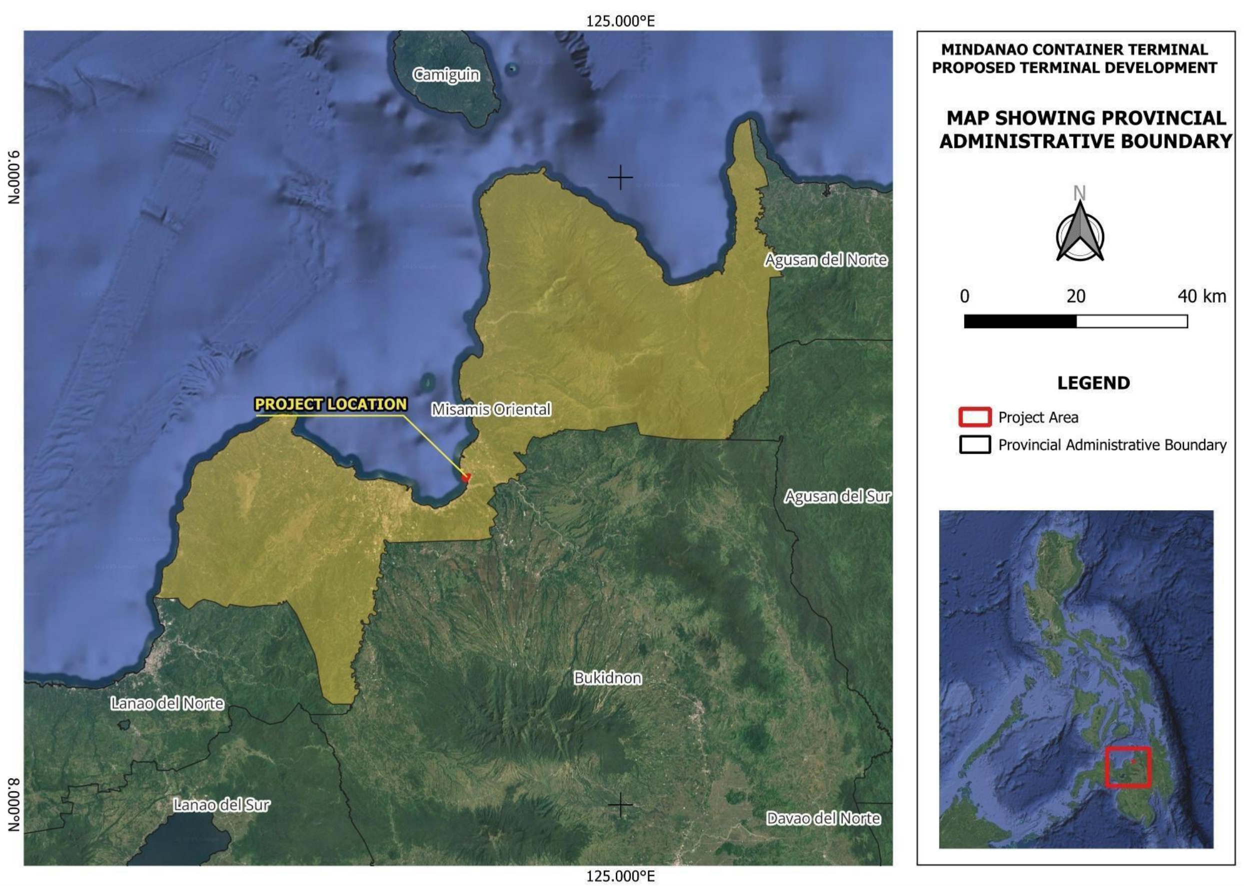


Figure 4 6. Project Location vis-à-vis Provincial Boundaries

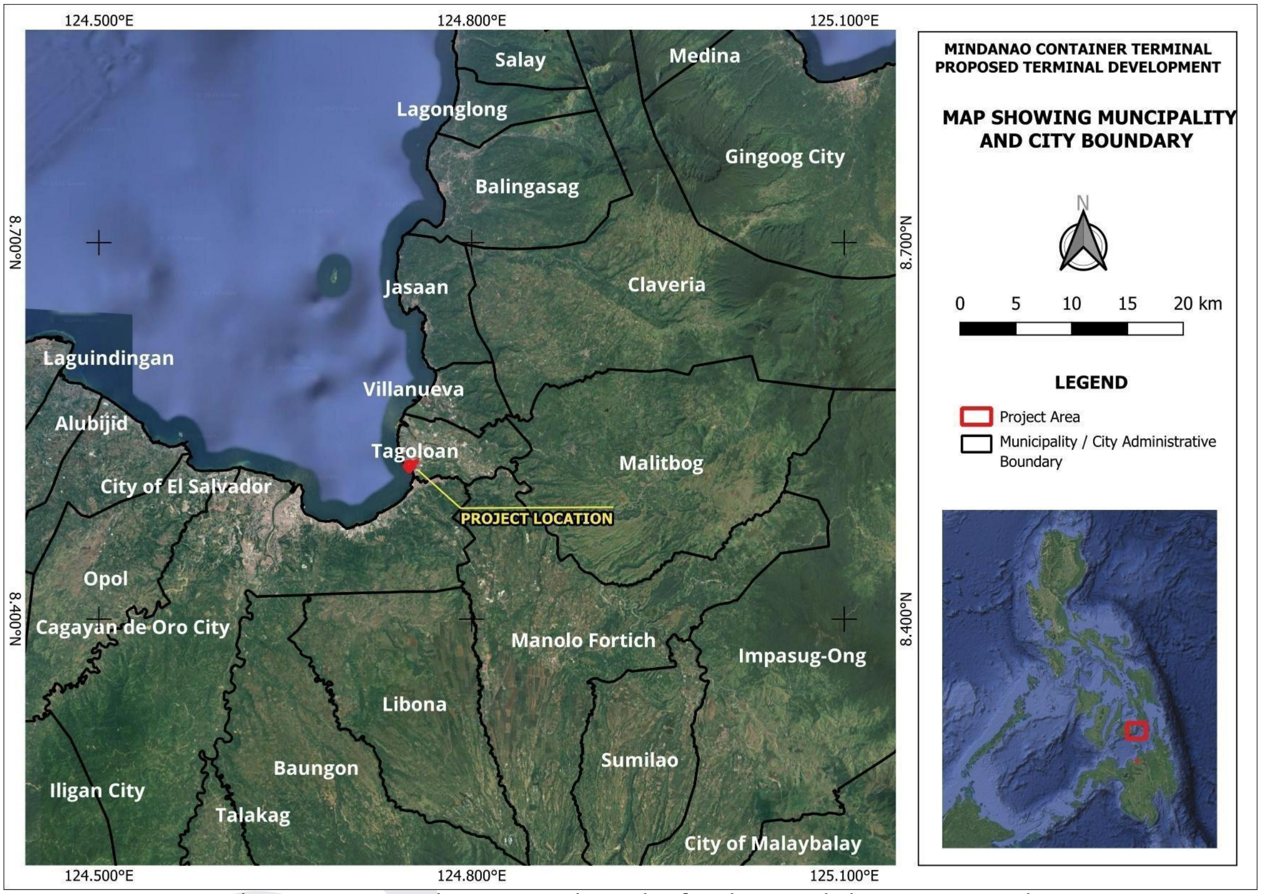


Figure 4-7. Project Location vis-à-vis Municipal Boundaries

4.1.3 Geographical Coordinates

The geographic boundaries of the Project Area, covering the entire 46.47 hectares, are defined using WGS 84 coordinates. The coordinates for Lot 1 (Phase I), Lot 2 (Phase I), and Lot 3 (Phase II) are presented in Table 4-1 in both degree-minute-second and decimal degree formats. These coordinates establish the spatial limits of the ECC-approved Project Area.

Table 4-1. Geographical Coordinates of Land Area

Corner	Degree, Minute Seconds		Degree Decimal	
	Latitude	Longitude	Latitude	Longitude
LOT 1 PHASE 1				
1	8°31'34.43"	124°45'22.63"	8.526231155	124.7562866
2	8°31'32.16"	124°45'23.56"	8.525598837	124.7565457
3	8°31'31.48"	124°45'20.28"	8.525412469	124.7556338
4	8°31'28.26"	124°45'15.69"	8.524517237	124.7543584
5	8°31'27.11"	124°45'15.44"	8.524198581	124.7542877
6	8°31'25.55"	124°45'11.63"	8.523762611	124.7532302
7	8°31'19.73"	124°45'3.29"	8.522146859	124.7509133
8	8°31'15.76"	124°44'58.63"	8.521043617	124.7496202
9	8°31'15.66"	124°44'58.73"	8.521016993	124.7496471
10	8°31'15.24"	124°44'58.21"	8.520900511	124.7495024
11	8°31'15.92"	124°44'57.57"	8.521090209	124.749324
12	8°31'15.09"	124°44'56.55"	8.520859535	124.7490428
13	8°31'22.49"	124°44'50.19"	8.522913968	124.7472763
14	8°31'23.21"	124°44'50.99"	8.523112817	124.7474984
15	8°31'23.55"	124°44'51.02"	8.523209329	124.7475052
16	8°31'24.87"	124°44'49.89"	8.523575411	124.7471922
17	8°31'25.25"	124°44'49.29"	8.523681907	124.7470239
18	8°31'25.86"	124°44'49.65"	8.523850804	124.7471249
19	8°31'26.08"	124°44'49.72"	8.523912372	124.7471451
20	8°31'32.08"	124°44'53.84"	8.525578037	124.7482901
21	8°31'30.07"	124°44'56.87"	8.525018933	124.7491314
22	8°31'33.79"	124°45'1.27"	8.52605394	124.750353
23	8°31'30.66"	124°45'4.01"	8.525182005	124.7511143
24	8°31'31.51"	124°45'5.02"	8.525418293	124.7513936
25	8°31'30.27"	124°45'6.14"	8.525075509	124.7517066
26	8°31'29.37"	124°45'5.1"	8.524825909	124.7514172
27	8°31'26.92"	124°45'7.22"	8.524143668	124.7520069
28	8°31'26.91"	124°45'7.23"	8.524141702	124.7520086
29	8°31'26.9"	124°45'7.24"	8.524139765	124.7520104
30	8°31'26.9"	124°45'7.24"	8.524137858	124.7520122

Corner	Degree, Minute Seconds		Degree Decimal	
	Latitude	Longitude	Latitude	Longitude
31	8°31'26.89"	124°45'7.25"	8.524135982	124.752014
32	8°31'26.88"	124°45'7.26"	8.524134136	124.7520158
33	8°31'26.88"	124°45'7.26"	8.524132323	124.7520177
34	8°31'26.87"	124°45'7.27"	8.524130542	124.7520196
35	8°31'26.86"	124°45'7.28"	8.524128794	124.7520215
36	8°31'26.86"	124°45'7.28"	8.524127079	124.7520235
37	8°31'26.85"	124°45'7.29"	8.524125399	124.7520255
38	8°31'26.85"	124°45'7.3"	8.524123752	124.7520275
39	8°31'26.84"	124°45'7.31"	8.524122141	124.7520296
40	8°31'26.83"	124°45'7.31"	8.524120565	124.7520316
41	8°31'26.83"	124°45'7.32"	8.524119024	124.7520338
42	8°31'26.82"	124°45'7.33"	8.52411752	124.7520359
43	8°31'26.82"	124°45'7.34"	8.524116053	124.752038
44	8°31'26.81"	124°45'7.34"	8.524114623	124.7520402
45	8°31'26.81"	124°45'7.35"	8.524113231	124.7520424
46	8°31'26.8"	124°45'7.36"	8.524111877	124.7520447
47	8°31'26.8"	124°45'7.37"	8.524110561	124.7520469
48	8°31'26.79"	124°45'7.38"	8.524109284	124.7520492
49	8°31'26.79"	124°45'7.39"	8.524108046	124.7520515
50	8°31'26.78"	124°45'7.39"	8.524106848	124.7520538
51	8°31'26.78"	124°45'7.4"	8.52410569	124.7520562
52	8°31'26.78"	124°45'7.41"	8.524104572	124.7520586
53	8°31'26.77"	124°45'7.42"	8.524103495	124.7520609
54	8°31'26.77"	124°45'7.43"	8.524102458	124.7520633
55	8°31'26.77"	124°45'7.44"	8.524101463	124.7520658
56	8°31'26.76"	124°45'7.45"	8.52410051	124.7520682
57	8°31'26.76"	124°45'7.45"	8.524099598	124.7520707
58	8°31'26.76"	124°45'7.46"	8.524098729	124.7520731
59	8°31'26.75"	124°45'7.47"	8.524097902	124.7520756
60	8°31'26.75"	124°45'7.48"	8.524097117	124.7520781
61	8°31'26.75"	124°45'7.49"	8.524096376	124.7520806
62	8°31'26.74"	124°45'7.5"	8.524095678	124.7520831
63	8°31'26.74"	124°45'7.51"	8.524095022	124.7520857
64	8°31'26.74"	124°45'7.52"	8.524094411	124.7520882
65	8°31'26.74"	124°45'7.53"	8.524093843	124.7520908
66	8°31'26.74"	124°45'7.54"	8.524093319	124.7520933
67	8°31'26.73"	124°45'7.55"	8.524092839	124.7520959
68	8°31'26.73"	124°45'7.55"	8.524092403	124.7520985
69	8°31'26.73"	124°45'7.56"	8.524092011	124.7521011

70	8°31'26.73"	124°45'7.57"	8.524091664	124.7521037

Corner	Degree, Minute Seconds		Degree Decimal	
	Latitude	Longitude	Latitude	Longitude
71	8°31'26.73"	124°45'7.58"	8.524091361	124.7521063
72	8°31'26.73"	124°45'7.59"	8.524091103	124.7521089
73	8°31'26.73"	124°45'7.6"	8.52409089	124.7521115
74	8°31'26.73"	124°45'7.61"	8.524090721	124.7521141
75	8°31'26.73"	124°45'7.62"	8.524090597	124.7521168
76	8°31'26.73"	124°45'7.63"	8.524090518	124.7521194
77	8°31'26.73"	124°45'7.64"	8.524090484	124.752122
78	8°31'26.73"	124°45'7.65"	8.524090495	124.7521246
79	8°31'26.73"	124°45'7.66"	8.52409055	124.7521272
80	8°31'26.73"	124°45'7.67"	8.524090651	124.7521299
81	8°31'26.73"	124°45'7.68"	8.524090796	124.7521325
82	8°31'26.73"	124°45'7.69"	8.524090986	124.7521351
83	8°31'26.73"	124°45'7.7"	8.524091221	124.7521377
84	8°31'26.73"	124°45'7.71"	8.5240915	124.7521403
85	8°31'26.73"	124°45'7.71"	8.524091824	124.7521429
86	8°31'26.73"	124°45'7.72"	8.524092192	124.7521455
87	8°31'26.73"	124°45'7.73"	8.524092605	124.7521481
88	8°31'26.74"	124°45'7.74"	8.524093062	124.7521507
89	8°31'26.74"	124°45'7.75"	8.524093563	124.7521532
90	8°31'26.74"	124°45'7.76"	8.524094108	124.7521558
91	8°31'26.74"	124°45'7.77"	8.524094696	124.7521584
92	8°31'26.74"	124°45'7.78"	8.524095329	124.7521609
93	8°31'26.75"	124°45'7.79"	8.524096004	124.7521634
94	8°31'26.75"	124°45'7.8"	8.524096723	124.7521659
95	8°31'26.75"	124°45'7.81"	8.524097485	124.7521684
96	8°31'26.75"	124°45'7.82"	8.52409829	124.7521709
97	8°31'26.76"	124°45'7.82"	8.524099137	124.7521734
98	8°31'26.76"	124°45'7.83"	8.524100027	124.7521759
99	8°31'26.76"	124°45'7.84"	8.524100958	124.7521783
100	8°31'26.77"	124°45'7.85"	8.524101932	124.7521808
101	8°31'26.77"	124°45'7.86"	8.524102946	124.7521832
102	8°31'26.77"	124°45'7.87"	8.524104002	124.7521856
103	8°31'26.78"	124°45'7.88"	8.524105099	124.7521879
104	8°31'26.78"	124°45'7.89"	8.524106236	124.7521903
105	8°31'26.79"	124°45'7.89"	8.524107413	124.7521926
106	8°31'26.79"	124°45'7.9"	8.52410863	124.7521949
107	8°31'26.8"	124°45'7.91"	8.524109887	124.7521972

108	8°31'26.8"	124°45'7.92"	8.524111182	124.7521995
109	8°31'26.81"	124°45'7.93"	8.524112516	124.7522017

Corner	Degree, Minute Seconds		Degree Decimal	
	Latitude	Longitude	Latitude	Longitude
110	8°31'26.81"	124°45'7.93"	8.524113889	124.752204
111	8°31'26.82"	124°45'7.94"	8.524115299	124.7522062
112	8°31'26.82"	124°45'7.95"	8.524116747	124.7522083
113	8°31'26.83"	124°45'7.96"	8.524118231	124.7522105
114	8°31'26.83"	124°45'7.97"	8.524119753	124.7522126
115	8°31'26.84"	124°45'7.97"	8.52412131	124.7522147
116	8°31'26.84"	124°45'7.98"	8.524122903	124.7522168
117	8°31'26.85"	124°45'7.99"	8.524124531	124.7522188
118	8°31'26.85"	124°45'7.99"	8.524126194	124.7522208
119	8°31'26.86"	124°45'8"	8.524127891	124.7522228
120	8°31'26.87"	124°45'8.01"	8.524129622	124.7522248
121	8°31'26.87"	124°45'8.02"	8.524131385	124.7522267
122	8°31'26.88"	124°45'8.02"	8.524133182	124.7522286
123	8°31'26.89"	124°45'8.03"	8.52413501	124.7522304
124	8°31'26.89"	124°45'8.04"	8.52413687	124.7522323
125	8°31'26.9"	124°45'8.04"	8.524138761	124.752234
126	8°31'26.91"	124°45'8.05"	8.524140683	124.7522358
127	8°31'26.91"	124°45'8.06"	8.524142634	124.7522375
128	8°31'26.92"	124°45'8.06"	8.524144614	124.7522392
129	8°31'26.93"	124°45'8.07"	8.524146623	124.7522409
130	8°31'26.94"	124°45'8.07"	8.52414866	124.7522425
131	8°31'29.82"	124°45'12.18"	8.524950709	124.7533841
132	8°31'29.5"	124°45'12.53"	8.524860853	124.7534817
133	8°31'29.93"	124°45'13.6"	8.524980661	124.7537779
134	8°31'32.64"	124°45'17.49"	8.525734453	124.7548572
135	8°31'31.97"	124°45'17.99"	8.525546421	124.7549986
136	8°31'31.92"	124°45'18.26"	8.525532277	124.7550735
137	8°31'32.05"	124°45'18.51"	8.525570549	124.755141
138	8°31'32.03"	124°45'18.69"	8.525563893	124.7551923
139	8°31'33.78"	124°45'21.18"	8.526051236	124.7558843
Lot 2 Phase 1				
1	8°31'22.49"	124°44'50.19"	8.522913968	124.7472763
2	8°31'15.09"	124°44'56.55"	8.520859535	124.7490428
3	8°31'11.15"	124°44'51.89"	8.519762945	124.7477473
4	8°31'18.55"	124°44'45.53"	8.521819672	124.7459805
Lot 3 Phase 1				

1	8°31'25.55"	124°45'11.63"	8.523762611	124.7532302
2	8°31'26.41"	124°45'13.72"	8.52400202	124.7538113
3	8°31'23.69"	124°45'15.49"	8.523247393	124.754303

Corner	Degree, Minute Seconds		Degree Decimal	
	Latitude	Longitude	Latitude	Longitude
4	8°31'22.22"	124°45'14.34"	8.522838047	124.7539834
5	8°31'220.35"	124°45'13.61"	8.522318876	124.7537814
6	8°31'19.5"	124°45'11.37"	8.522082586	124.7531589
7	8°31'18.06"	124°45'12.47"	8.521682807	124.7534634
8	8°31'16.21"	124°45'13.66"	8.52117029	124.7537949
9	8°31'9.25"	124°45'3.76"	8.519235866	124.7510451
10	8°31'12.03"	124°45'0.24"	8.520007141	124.7500659
11	8°31'113.34"	124°45'0.61"	8.520371561	124.7501702
12	8°31'15.38"	124°44'58.38"	8.520938576	124.7495493
13	8°31'15.66"	124°44'58.73"	8.521016993	124.7496471
14	8°31'15.76"	124°44'58.63"	8.521043617	124.7496202
15	8°31'19.73"	124°45'3.29"	8.522146859	124.7509133
Lot 3 Phase 2				
1	8°31'11.15"	124°44'51.89"	8.519762945	124.7477473
2	8°31'15.09"	124°44'56.55"	8.520859535	124.7490428
3	8°31'15.92"	124°44'57.57"	8.521090209	124.749324
4	8°31'15.24"	124°44'58.21"	8.520900511	124.7495024
5	8°31'15.38"	124°44'58.38"	8.520938576	124.7495493
6	8°31'13.34"	124°45'0.61"	8.520371561	124.7501702
7	8°31'12.03"	124°45'0.24"	8.520007141	124.7500659
8	8°31'9.25"	124°45'3.76"	8.519235866	124.7510451
9	8°31'8.36"	124°45'5.14"	8.51898751	124.7514288
10	8°31'3.02"	124°44'58.9"	8.517506524	124.7496957

4.1.4 Impact Areas

The impact areas of the Project are presented through a series of thematic maps corresponding to land, water, air, and people, as shown in Figures 4-7 to 4-12. These figures spatially illustrate the areas potentially affected by the Project based on its location, footprint, and surrounding environment.

Figure 4-7 shows the relative location of the Project Area in relation to protected areas and NIPAS sites within the wider regional context of Northern Mindanao. The Project Area is shown in relation to legislated protected landscapes, watershed forest reserves, natural parks, critical habitats, Indigenous and Community Conserved Areas (ICCA), and Ramsar-listed sites. The figure indicates that the Project is not located within any protected area and illustrates the approximate distances between the Project site and the nearest protected areas, with the closest identified protected area located at approximately 10.59 km from the Project site. This figure provides a regional-scale context for the Project's location relative to environmentally protected areas.

Figure 4-8 presents the vicinity map of the Project Area within the PHIVIDEC Industrial Estate and the Municipality of Tagoloan. The map shows the Project footprint in relation to nearby industrial facilities, educational institutions, religious establishments, commercial areas, health facilities, government offices, and residential areas, as well as existing road networks and coastal features. This figure illustrates the immediate surroundings of the Project site and the distribution of nearby human activities and land uses.
The thematic impact area maps are presented as follows:

Map of Impact Areas – Land (Figure 4-9)

- Illustrates the land impact area of the Project. The figure delineates the Project Area, the direct land impact area, and the indirect land impact area, as identified in the legend. These areas are shown in relation to surrounding terrestrial features and built-up areas. The map defines the spatial coverage considered for land-based interactions associated with the Project footprint and adjacent land areas.

Map of Impact Areas – Water (Figure 4-10)

- Presents the water impact area of the Project. The map shows the Project Area in relation to adjacent coastal and marine waters and delineates the direct and indirect water impact areas using distinct shading. This figure defines the spatial extent of marine and coastal areas associated with the Project's waterfront location and port-related facilities.

Map of Impact Areas – Air (Figure 4-11)

- The figure identifies the direct air impact area, defined as within 40 meters from the Project site, and the indirect air impact area, defined as within 1 kilometer from the site, as indicated in the legend. These distances establish the spatial boundaries used to represent air-related impact areas surrounding the Project footprint.

Map of Impact Areas – People (Figure 4-12)

- The map delineates the direct and indirect impact areas for people in relation to the Project Area and nearby barangays and populated areas. The figure illustrates the spatial relationship between the Project site and surrounding communities within the defined impact boundaries.

Together, Figures 4-7 to 4-12 define the spatial coverage of the Project's impact areas across different environmental and social components, forming the basis for subsequent impact identification and assessment in later chapters of the ESIA.

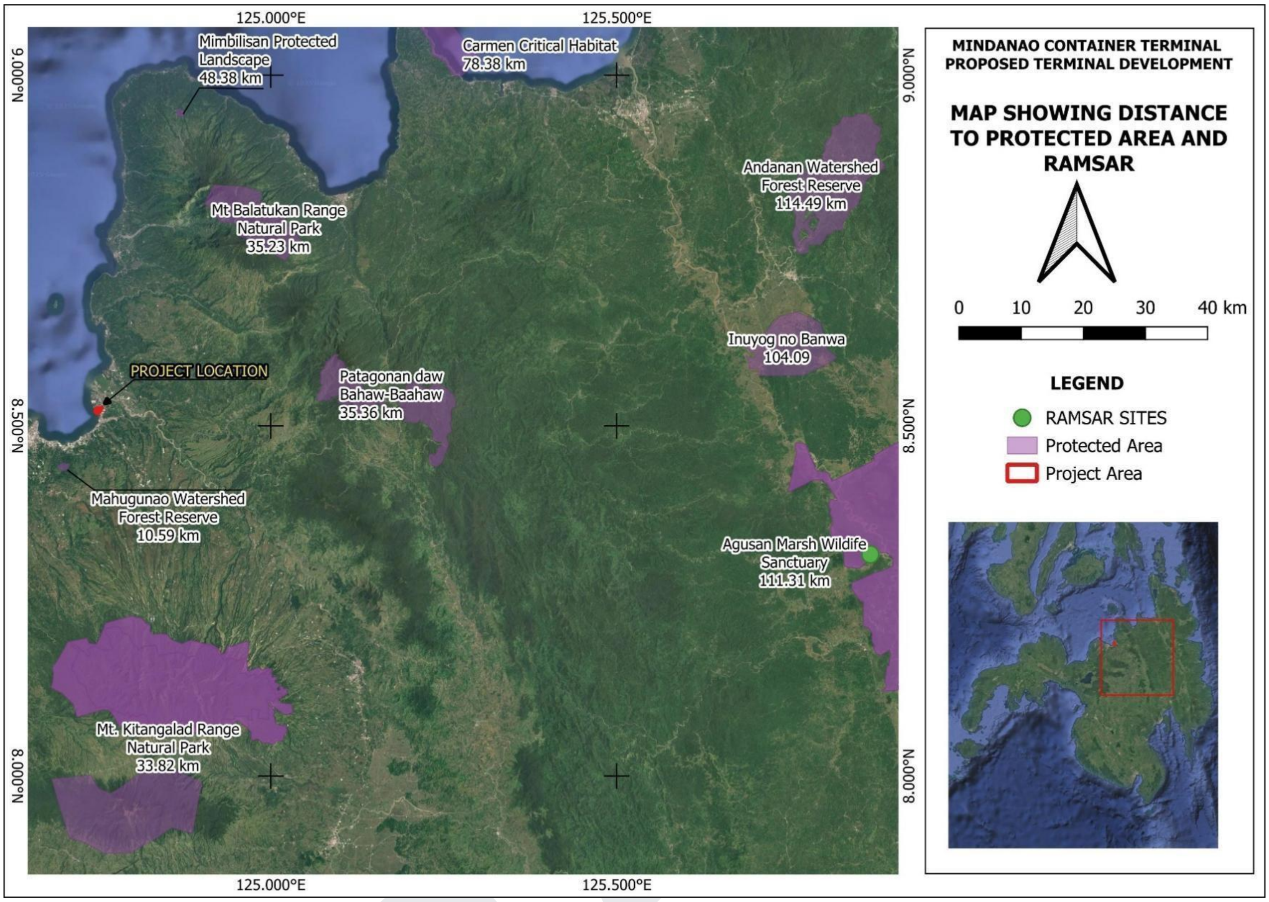


Figure 4-7. Relative Location of Project Area and Protected Areas and NIPAS

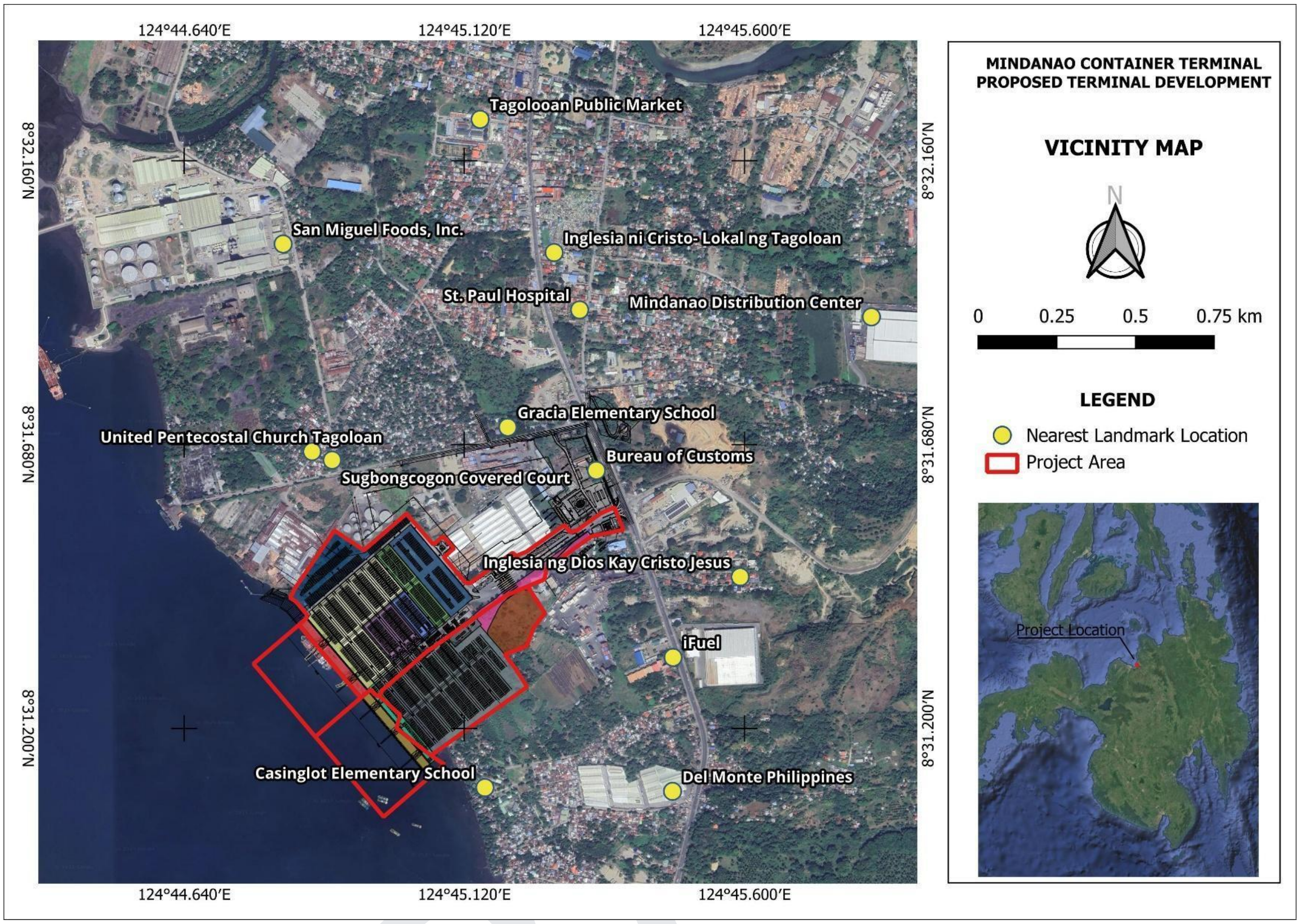


Figure 4-8. Vicinity Map

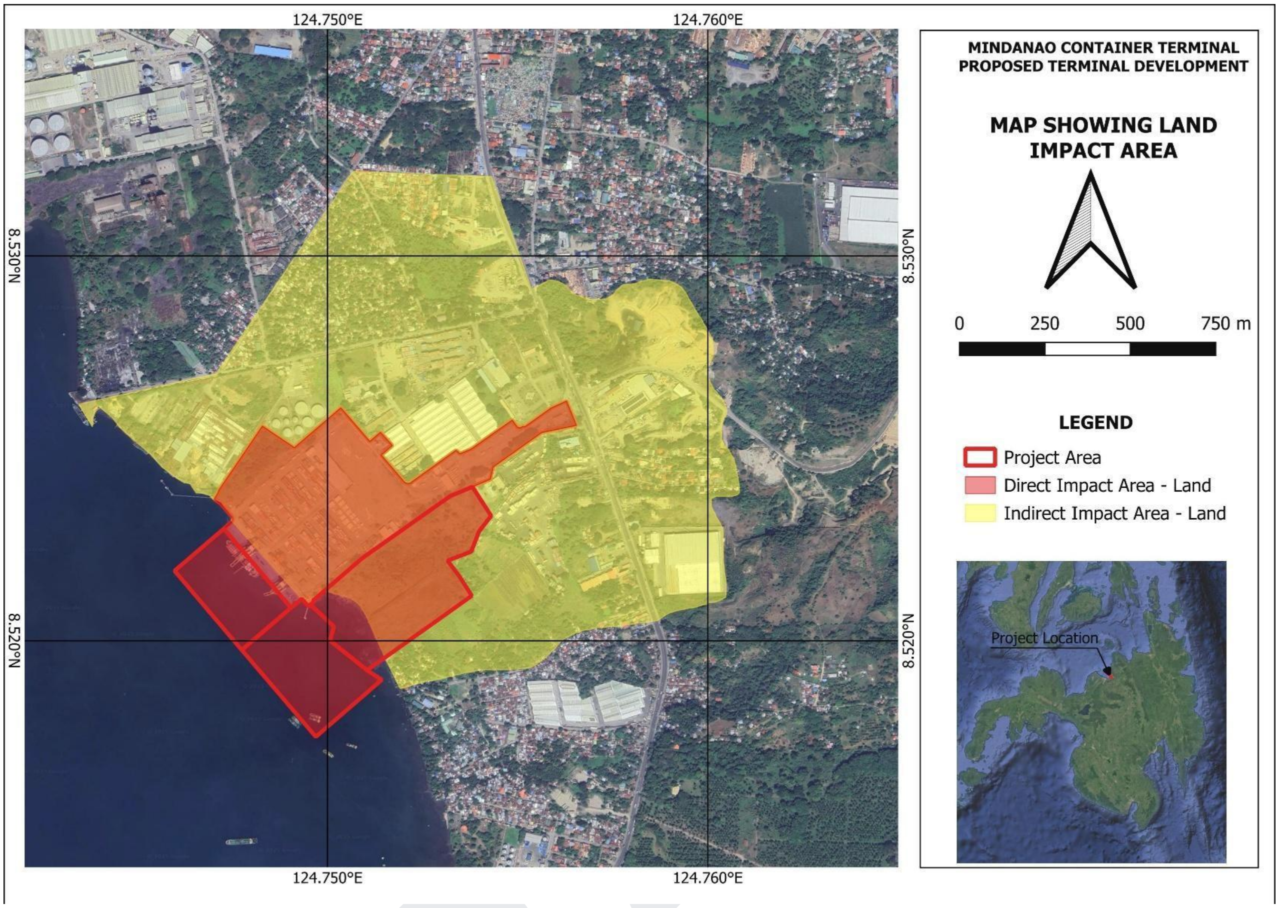


Figure 4-9. Map of Impact Areas - LAND

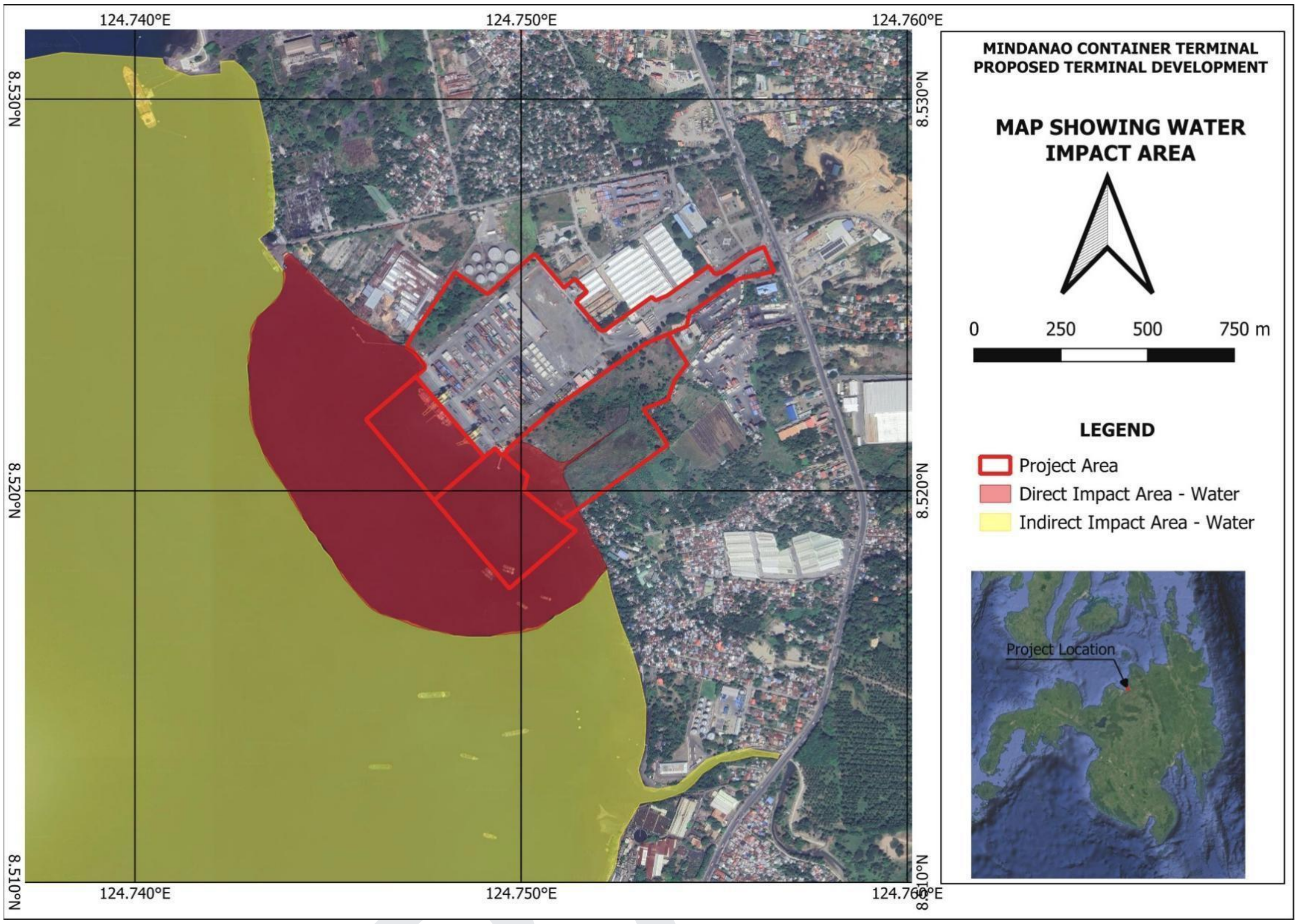


Figure 4-10. Map of Impact Areas - WATER

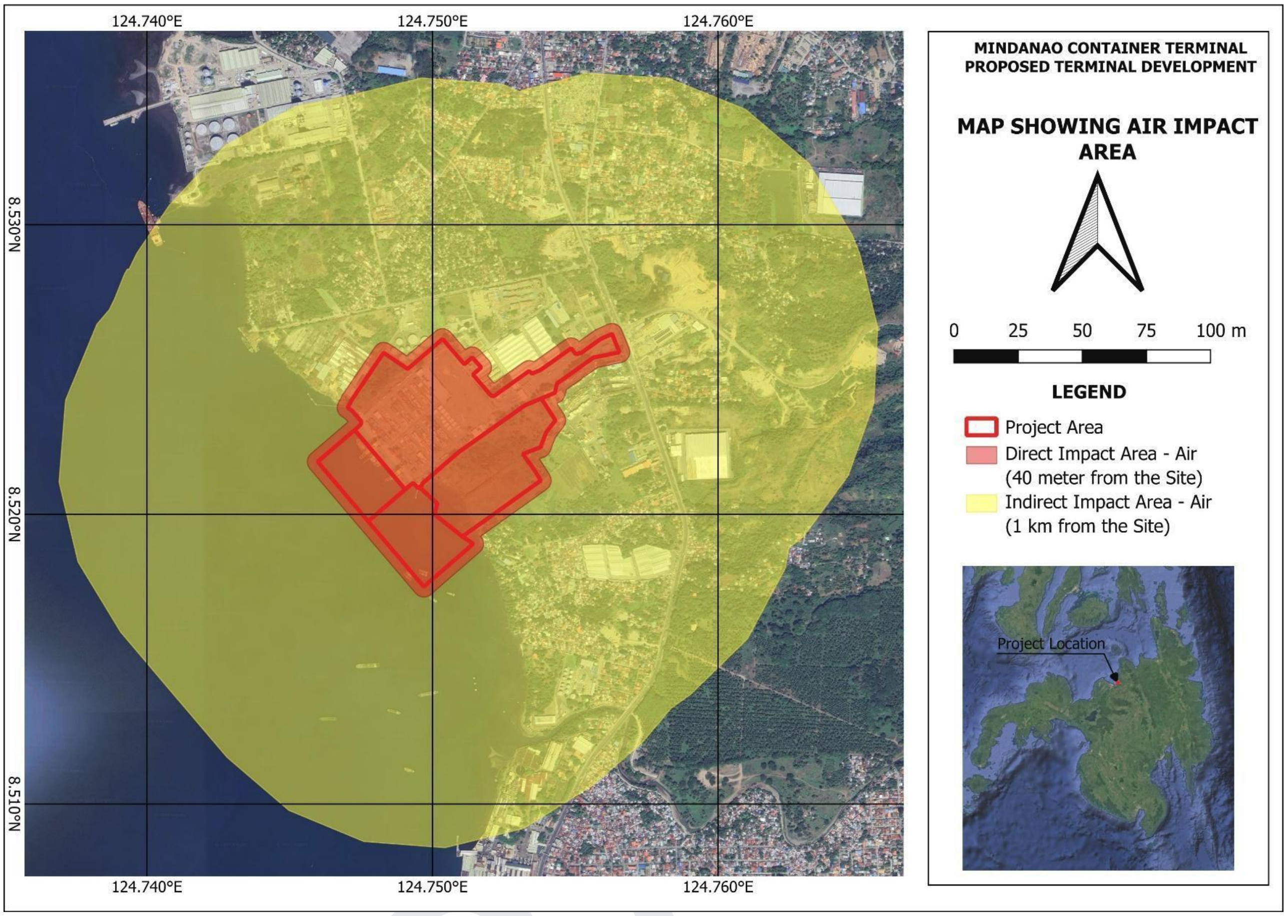


Figure 4-11. Map of Impact Areas – AIR

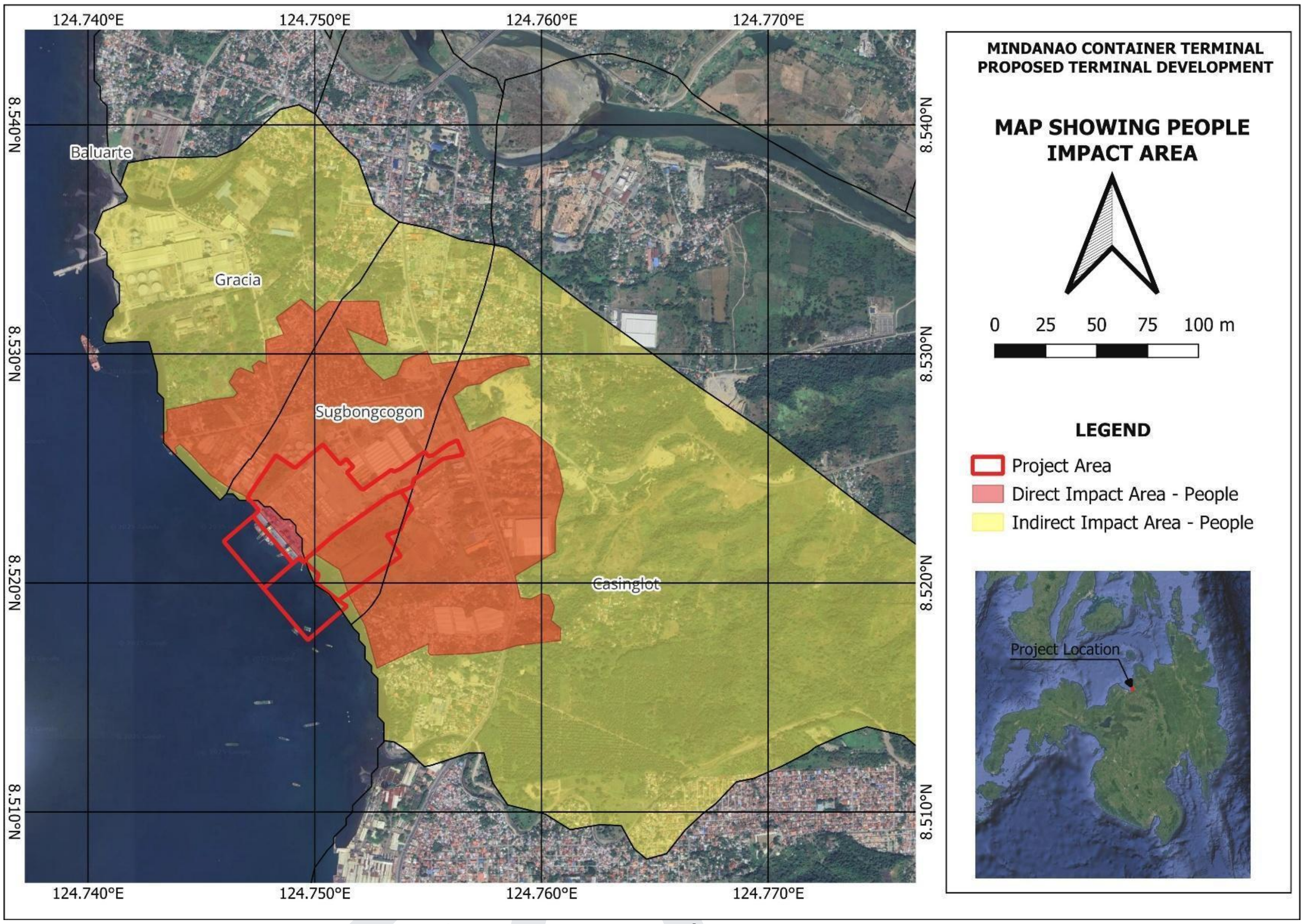


Figure 4-12. Map of Impact Areas - PEOPLE

The impact area maps presented in Figures 4-7 to 4-12 define the spatial extent of areas associated with the Project in relation to its surrounding environmental and social setting. By delineating impact areas for land, water, air, and people, the maps describe the geographic coverage within which the Project is situated and the areas shown to be spatially connected to the Project footprint.

The distinction between direct and indirect impact areas, as illustrated in the maps, differentiates the Project Area from surrounding areas identified based on their proximity and spatial relationship to the Project site. This delineation provides a consistent geographic reference for describing existing land uses, environmental features, coastal and marine areas, air impact boundaries, and nearby communities in relation to the Project.

Direct and Indirect Impact Areas

The primary impact area encompasses the 46.47-hectare ECC-approved Mindanao International Container Port (MICP) footprint and immediately adjacent interface areas that may experience direct or indirect interactions with Project activities. This area includes the existing port facilities and the zones where infrastructure improvements and phased development will occur under the approved project scope. The location represents an established harbor area with suitable bathymetric and navigational conditions for large vessel berthing and port operations.

Within the ECC-approved port footprint, approximately 31 hectares are designated for developed port infrastructure, including wharf structures, container yards, internal roads, and operational support facilities. The remaining areas within the footprint function as open or undeveloped spaces, providing operational buffers, circulation areas, and flexibility for staging, safety clearances, and long-term operational optimization consistent with the approved master development plan. These areas are not indicative of new or expanded development beyond the approved ECC scope.

4.1.5 Description of the Vicinity and Accessibility of the Project Site

The Project site is located approximately 20 to 30 minutes east of Cagayan de Oro City and is accessible via the Butuan–Cagayan–Iligan National Highway. The area is well connected by road infrastructure, facilitating the movement of cargo, personnel, and service vehicles. Public transportation, including buses and vans, regularly service routes to Tagoloan. The final access to the terminal may require local transport such as tricycles or motorcycles. The nearest airport is Laguindingan International Airport, located approximately 1.5 to 2 hours away by road via Cagayan de Oro.

The Project site is located within an active industrial estate, and access to the terminal is subject to security protocols, including coordination with port personnel and presentation of valid identification.

4.1.6 Proximity to the Nearest Protected Areas and Ramsar Sites

Several protected areas and conservation sites are located within the broader regional influence of the Project. These include NIPAS-designated areas, critical habitats, and Indigenous and Community Conserved Areas (ICCA).

The nearest identified protected area is the Mahugunao Watershed Forest Reserve, located approximately 10.59 km from the Project site. Other protected areas are located at distances ranging from 33.82 km to 114.49 km.

Details on the legal basis, protection status, and distance of each site from the Project area are provided in Table 4-3: Proximity of the Project Area to NIPAS and RAMSAR Sites, and illustrated in Figure 4-7.

Table 4-3. Proximity of the Project Area to NIPAS and RAMSAR Sites

Name	Legal Basis	Legal Status	Approximate Distance from the Project Site
Mahugunao watershed Fores t Reserve	Presidential Proclamation No. 59, issued on August 4, 1966, by then-President Ferdinand E. Marcos, declares specified public timberland areas in Agusan, Surigao del Sur, and Davao as forest reserves for watershed protection, soil conservation, timber production, and other forest uses.	Legislated	10.59 km
Mt. Kitangalad Range Natural Park	Presidential Proclamation No. 896 (October 24, 1996): This proclamation declared the Mt. Kitanglad Range as a natural park, recognizing its ecological, biological, scientific, and aesthetic importance. Republic Act No. 8978 (November 9, 2000): Known as the "Mt. Kitanglad Range Protected Area Act of 2000," this law formally established the MKRNP and its buffer zones, providing a legal framework for its protection	Legislated	33.82 km

	and management.		
Mt. Balatukan Range Natural Park	Presidential Proclamation No. 1249, issued on March 6, 2007, by then-President Gloria Macapagal-Arroyo	Legislated	35.23 km

Name	**Legal Basis**	**Legal Status**	**Approximate Distance from the Project Site**
Patagonan da w Bahaw-Baahaw	Listed in the Indigenous and Community Conserved Area (ICCA) registry		35.36 km
Mimbilisa n Protected Landscap e	Republic Act No. 9494, known as the Mimbilisan Protected Landscape Act. Enacted on August 22, 2007	Legislated	48.38 km
Carmen Critica l Habitat	Department Administrative Order (DAO) No. 2012-08, issued by the Department of Environment and Natural Resources (DENR) on October 8, 2012. This designation is in accordance with Republic Act No. 9147	Legislated	78.38 km

Inuyog no Banwa	Established through a formal act of Congress, it holds legal recognition as an Indigenous Community Conserved Area (ICCA)		104.09
Agusan Marc h Wildlife Sanctuary	Presidential Proclamation No. 913, issued on October 31, 1996, by then-President Fidel V. Ramos	Legislated	111.31 km
Andanan Watershed Fores t Reserve	Presidential Proclamation No. 734, issued on May 29, 1991, by then-President Corazon C. Aquino	Legislated	114.49 km

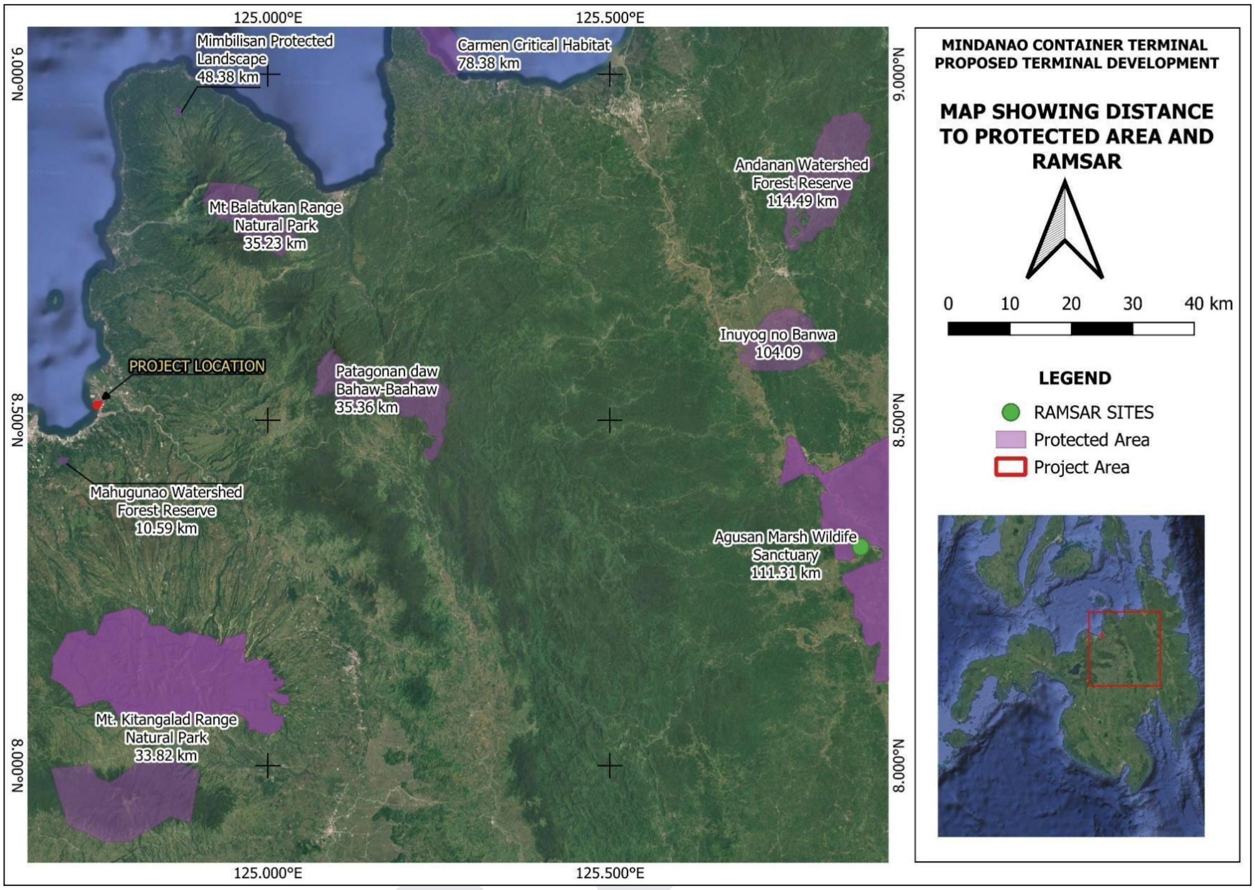


Figure 4-7. Relative Location of Project Area and Protected Areas and NIPAS

4.2 Project Rationale

The Mindanao International Container Port Project is covered by Environmental Compliance Certificate (ECC) No. ECC-9907-035-215, which authorizes the development of port infrastructure within a total area of 46.47 hectares and a container wharf with an overall length of 800 meters. Development of the port has been structured in phases corresponding to the progressive implementation of the ECC-approved scope.

To date, Phase I has been completed and is operational, consisting of approximately 18 hectares of developed port facilities and a 300-meter container wharf, together with associated yard and support infrastructure. The remaining components of the ECC-approved development have not yet been fully implemented.

The current Project focuses exclusively on Phase II development, which represents the next stage of construction within the already approved ECC boundaries. Phase II involves the construction of additional wharf infrastructure and associated supporting facilities required to extend the operational footprint of the port within the limits of the ECC. No expansion beyond the approved land area or project type is included in the current scope.

The rationale for proceeding with Phase II is therefore grounded in the completion of a portion of the infrastructure already authorized, rather than the introduction of a new project, a change in land use, or an expansion of the approved development envelope. The Project remains confined to an existing industrial port setting and forms part of the phased realization of the approved master development.

Key Drivers for the Port Redevelopment

The Project is driven by the implementation of Phase II development within the scope of the existing Environmental Compliance Certificate (ECC). Phase II corresponds to a defined portion of the port infrastructure already authorized under the ECC that has not yet been constructed.

The proposed works under Phase II (160 m) and Phase III-A (140 m) involve the construction of an additional 300 meters of container wharf, together with associated port support facilities, within the approved project area. Of this total, approximately 140 meters extend beyond the spatial coverage of the existing ECC and therefore require an ECC amendment. The proposed development does not introduce changes to the approved project category, overall land and marine use designation, or the general development character of the port.

The current assessment is limited to Phase II and Phase III-A Development. Other phases of the ECC-approved development are not included in the scope of this Project.

4.3 Project Existing Components

4.3.1. Major Facilities (Existing)

The existing facilities of the Mindanao International Container Port correspond to Phase 1 development, which occupies approximately 18 hectares within the ECC-approved area. The major existing facilities include:

- Container wharf with a total length of 300 meters
- Container yard
- Warehouse and storage areas
- General cargo yard
- Operations and administrative offices
- Parking and designated green zones
- Internal roadways and circulation areas

These facilities form the core operational infrastructure currently in use at the port.

4.3.2 Supporting Facilities

Supporting facilities associated with the existing port operations include the following Phase 1 components:

- Two (2) Panamax quay cranes serving the existing wharf

- RTG yard covering 6.89 hectares, with a total of 1,776 ground slots (TGS)

- Reefer blocks covering 0.90 hectares, with 174 TGS
  Empty Container Depot (ECD) covering 0.83 hectares, with 152 TGS
- Road network, truck holding areas, parking, walkways, and entry/exit gates covering 4.27 hectares
- Additional development areas totaling 7.53 hectares, consisting of:
  - RTG yard (1.74 hectares)
  - ECD (5.79 hectares)
- Fuel depot with tank and dispenser
- RTG repair area
- Workshop and warehouse building
- Engineering building

These facilities support cargo handling, equipment maintenance, logistics flow, and administrative functions of the port.

4.3.3 Full Development Implementation (Within the Existing Port Footprint)

The project components are presented in Table 4-5, distinguishing between the ECC-approved development envelope, existing Phase I facilities, and the Phase II components covered by the current Project. Existing facilities constructed under Phase I occupy approximately 18 hectares of the ECC-approved area and include a 300-meter container wharf, container yards, and associated operational and support facilities. The wharf consists of a deck-on-pile quay structure, with revetment rock placed beneath the deck to provide wave attenuation and scour protection.

Table 4-4. Project Components

ECC Coverage	EXISTING FACILITIES	PLANNED IMPLEMENTATION (within ECC area)	PLANNED EXPANSION (Phase 3)
Container Wharf - **800 meters long** Port Facilities - **46.47 Hectares** • Container Yard • Warehouse / Storage Area • General Cargo Yard • Operations and Administrative	Container Wharf - **300 meters long** Port Facilities – **18 Hectares** • Container Yard • Warehouse / Storage Area • General Cargo Yard • Operations and Administrative	Container Wharf - **160 meters long** Port Facilities – **0.8 Hectares** 1. One (1) Post panamax quay cranes 2. New 15 MVA electrical substation	Container Wharf - **140 meters long** Phase III-A development: 1. Two (2) Post panamax quay cranes *Phase III-B development:*[1]

[1] This component forms part of the Project's long-term master plan and is presented for reference only. It is not included within the scope

Offices • Grain Terminal • Parking / Green Zone • Roadway	Offices • Parking / Green • Zone • Roadway Phase 1 existing facilities: 1. 300 meters of wharf with two (2) units Panamax quay cranes 2. 6.89 hectares of RTG yard with 1,776 total ground slots (TGS) 3. 0.90 hectares of reefer blocks with 174 TGS 4. 0.83 hectares of empty container depot (ECD) with 152 TGS 5. 4.27 hectares consisting of road network, truck holding, parking walkway, entry and exit gates 6. 7.53 hectares of further development, RTG yard (1.74 hectares) and ECD (5.79 hectares) 7. Fuel depot (tank and dispenser) 8. RTG repair area		*1. Proposed additional 10 hectares of RTG yard with 2,370 TGS* *2. Proposed additional 8.4 hectares of ECD with 148 TGS* *3. Proposed additional workshop and warehouse* *4. Proposed additional RTG repair area 5. Proposed additional access road and exit gate* *6. Proposed OOG, pre-trip inspection (PTI) area and Customs inspection area* *7. 6 new reefer racks with 180 reefer outlets at phase 1's existing RTG yard* *8. New elevated fire water tank with firehouse* *New high mast lights (HML)*

of this Environmental and Social Impact Assessment.

	9. Workshop and warehouse building 10. Engineering building		

4.4 Project Planned Expansion

The planned expansion covered by the current Project includes Phase II and Phase III-A developments of the Mindanao International Container Port (MICP), as assessed under this Environmental and Social Impact Assessment (ESIA).

The Project is implemented within the overall 46.47-hectare port development area previously evaluated under the Philippine Environmental Impact Statement (EIS) System. Phase II development is fully covered by the existing Environmental Compliance Certificate (ECC) issued by the Department of Environment and Natural Resources (DENR) and is implemented entirely within the approved development envelope.

Phase III-A development, while located within the existing developed port area, is not covered by the existing ECC and is therefore included within the scope of this ESIA as part of the Project's defined near-term development plan. Phase III-A represents an incremental expansion of port capacity that is sufficiently defined at this stage to allow assessment of its potential environmental and social impacts, and remains consistent with the approved land use, coastal setting, and project classification.

The configuration, scale, and timing of Phase III-B facilities remain subject to change and refinement and are therefore presented for reference purposes only. Phase III-B is not included in the scope of the current ESIA and will be subject to a separate environmental assessment and regulatory process, as may be required, once the development details are finalized.

4.4.1 Major Component

The Project includes the following major components under Phase II (ECC-approved) and Phase III-A (ECC application stage):

Phase II (Covered by Existing ECC)

- Construction of a container wharf with a berthing length of 160 meters; and
- Development of approximately 0.8 hectares of associated port facilities, all within the ECC-approved 46.47-hectare port area.

Phase II infrastructure includes:

- One (1) post-Panamax quay crane.

Phase III-A (Included in this ESIA; Not Yet Covered by ECC)

- Construction of an additional container wharf section with a berthing length of approximately 140 meters; and
- Installation and operation of two (2) post-Panamax quay cranes.

Phase III-A development does not involve expansion of the overall port land area but represents an increase in operational capacity requiring environmental review and regulatory clearance under the Philippine EIS System.

4.4.2 Supporting Facilities for the Expansion

Supporting facilities associated with Phase II and Phase III-A development include:

- Installation of a new 15 MVA electrical substation to meet increased power demand from expanded quay crane operations; and
- Installation of twenty-four (24) reefer racks, providing a total of 180 reefer outlets, to support refrigerated container handling.

All supporting facilities are located within areas already designated for port use and are integral to the operation of the Phase II and Phase III-A infrastructure. These facilities do not involve new land acquisition or changes to the approved port footprint.

4.5 Process Technology and Terminal Operating System

4.5.1 Terminal Operating System (TOS)

MICP will run a highly integrated TOS platform which provides full coverage of the entire terminal operations. The entire operation is managed under a single integrated umbrella through combined planning, operation, EDI and KPI Dashboard analysis.
The TOS main components are as follows:

- TOS – the main system for planning and performing real-time operational control.
- Ancillary Software Systems – supporting systems interfaced with the TOS.
- EDI and Internet Interfaces with external stakeholders – customer-centered interfaces.
- Administration systems – back-end support systems for operations.
- Business Intelligence Reporting capability – organization, reporting systems.
- Technology Support Essentials – solutions which enable continuous operational availability.

4.5.2 TOS ancillary systems:

If required by business, TOS shall have additional software support from various equipment suppliers covering the following requirements:

- Weighing System – as recording the actual weight of shipping containers is included as mandatory (SOLAS compliant) operational information recorded, MICP will implement the automatic recording of container weights into the TOS. The weighing system can be embedded into CHE twist locks to weigh containers under the spreader. This weighing system will contribute to higher efficiencies in terminal operations. Fixed weighing scales could also form part of Gate lanes.
- Reefer Monitoring – eliminates time-consuming manual inspections, reduces human error in planning reefer parameters, improves personnel safety by organization time

spent in reefer areas, and improves cargo quality through an early-alert protocol enacted prior to potential problems with cargo temperature integrity.

4.5.3 In-Gate and Out-Gate

A TOS module for Gates will be employed. The main features include the following:

- Gate Configuration – provides for a fully configurable gate which allows different gate configurations for internal and external trucks, gate staging that makes up the gate flow for each gate such as the In-gate, Inspection, and Out-gate. It also allows for optional gate stages for detours from normal flow of gate operations, such as washing a container. In this configuration the data is set that is required to identify a truck driver for a truck visit, truck license number and driver's license number.
- Transaction Management – provides the user interface to manage the gate transactions. This includes a full set of truck visit and associated gate transaction details with the related gate performance statistics and an integrated trouble desk. The feature allows for processing of container bundles, hazardous details, and reefer details. It also provides configuration for cancelling gate transactions.
- Gate Lane Monitor – provides a view to display status of the gate lanes and continually updates and displays the lane status in real time as the trucks are interacting with the lanes. It allows for detecting trouble in a gate lane and reprocesses trucks with corrected data.
    - Inspections – provides the ability to create inspections for containers arriving at the gate. System can be set for inspections such as seal numbers, damage and hazardous details, observed placards, over-dimensions, temperature or vent requirements for reefer containers, and bundled containers.

4.5.4 Track and Trace:

Transparency and visibility are key factors in building excellent relationships with our customers. To guarantee the said commitment, MICP will implement Track and Trace, an online solution that provides container visibility from its first movement from the vessel to gate-out and vice versa. Track and Trace has the following features:

- Container search module that includes container movement, Billing Status and Hold Status.
- Truck search module that monitors truck entry and departure from the terminal.

Thus, MICP can guarantee that our customers have meaningful information available anytime.

4.5.5 Yard and Vessel Process Automation

Another feature of the TOS is that MICP is able to provide full EDI B2B (Business to Business) and B2G (Business to Government) real-time communication with shipping lines, agents, Customs Authorities and Port Authorities including:

- Container vessel stowage positions – BAPLIE
- Container stowage instructions – MOVINS
- Container discharge/loading report – COARRI
- Container gate-in and gate-out movement report – CODECO
- Container discharge/loading order – COPRAR
- Container Release Order – COREOR
- Automatic real-time e-mail reporting on recorded container damages
- Automatic real-time e-mail reporting on recorded Reefer Temperature or Reefer Alarms

5. Associated Facilities and Environmental Management

5.1 Water Supply

The current water source of MICP is provided by the local Tagoloan Water District, which will continue to supply water for the proposed enhancement. The estimated water requirement for the expansion is projected at 15.3 m^3/day for domestic use and 16.8 m^3/day for the port's operation.

The Project will implement water use efficiency and conservation measures, including installation of low-flow fixtures, routine leak detection and repair, monitoring of water consumption, and awareness programs for employees and contractors. Water abstraction and usage will be managed to avoid adverse impacts on local water availability and to ensure compliance with applicable national regulations.

5.2Power Supply

The Mindanao International Container Port (MICP) is committed to environmental protection and full compliance with Republic Act 8749 (Philippine Clean Air Act of 1999) and its implementing rules and regulations. Existing port operations generate limited air emissions, primarily associated with cargo-handling equipment, internal vehicle movements, and standby power generation.

Standby generator sets within the port are operated only during emergency and contingency situations and are covered by valid DENR Permits to Operate (PTO). To minimize air emissions and protect worker and community health during both construction and operational phases, the Project will implement the following air quality management measures:

- Strict enforcement of a No-Idling Policy for trucks, service vehicles, and cargo-handling equipment within port premises;
- Optimization of internal traffic circulation, queuing, and scheduling to reduce congestion and unnecessary vehicle movements;
- Regular preventive maintenance of vehicles, equipment, and generator sets to ensure efficient fuel combustion and compliance with emission standards;
- Use of energy-efficient machinery, lighting, and electrical systems where feasible; Gradual adoption of lower-emission and modernized port equipment as part of fleet upgrades; and
- Strict implementation of a No Smoking Policy within all port facilities and designated work areas.

These measures contribute to maintaining acceptable air quality conditions, reducing greenhouse gas emissions, and safeguarding the health and safety of workers and nearby communities.

5.3 Air Pollution Management

MICP is committed to environmental protection and full compliance with Republic Act 8749 (Philippine Clean Air Act of 1999) and its implementing rules and regulations. Current port operations generate minimal air emissions, primarily associated with vehicle movements and standby power generation.

A standby generator set, covered by a valid DENR Permit to Operate, is maintained for emergency and contingency use only. To minimize air emissions and protect worker and community health, the Project will implement the following air quality management measures:

- Strict enforcement of a No-Idling Policy for all vehicles and equipment within terminal premises;
- Optimization of service vehicle routing and scheduling to reduce unnecessary trips and congestion;
- Regular preventive maintenance of vehicles, equipment, and generators to ensure efficient combustion and emission control;
- Use of energy-efficient appliances and equipment;
- Promotion of low-emission technologies where feasible; and
- Strict implementation of a No Smoking Policy within all terminal facilities.

These measures contribute to the protection of air quality, reduction of greenhouse gas emissions, and safeguarding of worker and community health.

5.4 Waste and Wastewater Management

Domestic wastewater generated from port offices, administrative buildings, and support facilities at MICP is collected and treated through on-site treatment systems designed in accordance with applicable Philippine sanitation, building, and environmental standards. These systems will continue to be used during port redevelopment and will be upgraded as necessary to accommodate increased demand and ensure continued regulatory compliance.

Site drainage systems are designed to control runoff and prevent uncontrolled discharge of wastewater or contaminated stormwater to adjacent land areas and nearshore marine waters.

MICP implements an approved Solid, Liquid, and Hazardous Waste Management Plan, consistent with the requirements of RA 9003 (Ecological Solid Waste Management Act) and RA 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act). The Plan provides for:

- Waste segregation at source;
- Designated, labeled, and secure storage areas;
- Proper handling and documentation of hazardous wastes; and
- Transport, treatment, and disposal through DENR-accredited haulers and treatment, storage, and disposal (TSD) facilities.

The Waste Management Plan will be fully enforced during both construction and operational phases of the Project to ensure environmentally sound waste handling and to minimize risks to workers, communities, and the receiving environment.

5.5People (Safety) Management

The Mindanao International Container Port Project places strong emphasis on the health, safety, and welfare of workers, contractors, port users, and visitors. Occupational health and safety (OHS) management systems are aligned with Republic Act 11058 (Occupational Safety and Health Standards Act), relevant DOLE Department Orders, and applicable national safety regulations.

Key safety management measures include:

- Systematic hazard identification and risk assessment for construction and operational activities;
- Implementation of safe work procedures and permit-to-work systems for high-risk activities;
- Provision, use, and enforcement of appropriate personal protective equipment (PPE);
- Safe storage, handling, and disposal of materials, fuels, and chemicals;
- Regular safety orientation, toolbox meetings, and refresher training for workers and contractors; and
- Establishment and periodic review of Emergency Preparedness and Response Plans addressing fire incidents, spills, accidents, natural hazards, and other emergency situations.

These measures will be implemented throughout the construction and operational phases of the Project to protect workers and surrounding communities.

6. Analysis of Alternatives

6.1 Site Selection

In terms of site selection, various project alternatives were considered for the development of the Mindanao International Container Port (MICP). Alternative locations included areas within the Cagayan de Oro Port Zone, other coastal municipalities in Misamis Oriental such as Villanueva and Jasaan, and even port locations in nearby provinces such as Iligan and Ozamiz.

However, these alternatives presented several limitations, including inadequate infrastructure, limited space for future expansion, higher potential for traffic congestion, closer proximity to established residential settlements, and greater potential for environmental or social impacts. In particular, several alternative sites would have required port development in areas adjacent to or overlapping with densely populated coastal communities, increasing the likelihood of displacement, nuisance impacts, and conflicts with existing land uses.

The final site selected within the PHIVIDEC Industrial Estate in Tagoloan, Misamis Oriental was determined to be the most suitable option due to its strategic proximity to key economic zones, availability of a large contiguous area suitable for phased development, and integrated access to transport and utility infrastructure. The location also allows the Project to be developed within a designated industrial estate, thereby avoiding direct encroachment on residential settlements and minimizing potential social disruption.

Additionally, the location offered minimal urban disruption and strong alignment with long-term regional development plans. The site was also granted an Environmental Compliance Certificate (ECC), ensuring that the project complies with environmental regulations. Compared to the “no project” alternative, which would have resulted in continued congestion and inefficiencies in existing port facilities, the selected site supports both operational viability and sustainable economic growth for Northern Mindanao.

6.2 Consequences of Not Proceeding with the Project or the “No Project Scenario”

By not proceeding with the proposed expansion project, the following scenario will be affected:

- Without the support of modern port infrastructure, the ability of the region to attract investments will be compromised and will severely hamper economic growth.
- The region is predominantly an industrial zone and business development in the area will slow down significantly.
- The Local Government Units (LGU) and Barangay will lose the opportunity for taxes to be paid during the construction and payment of yearly real estate taxes during the operation phase.
- Employment opportunities during construction will not be realized.
- Livelihood opportunities for the community during operations will not materialize.

Overall, the facility is a critical port supporting the country's international and inter- island trade and commerce.

Based on the considerations stated above there is no other area considered for the proposed project.

7. Baseline Environmental and Social Data

This section describes baseline land conditions relevant to this Project within the PHIVIDEC Industrial Estate, Tagoloan, Misamis Oriental.

7.1. Physical Environment

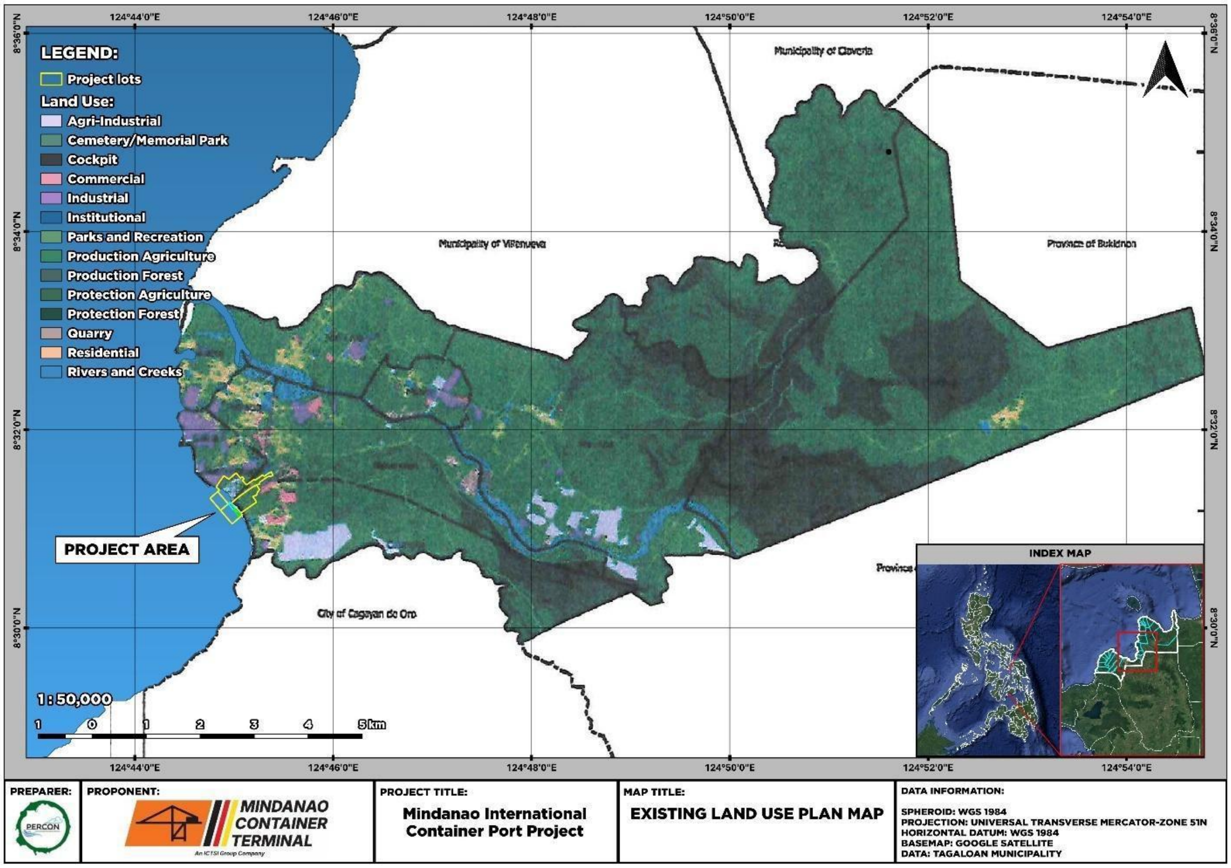
7.1.1 Land

7.1.1.1 Land Use and Land Classification

The Project is located within the PHIVIDEC Industrial Estate in Tagoloan, Misamis Oriental (PIE-MO), an established industrial development area intended to accommodate large-scale infrastructure and logistics uses. Within the immediate Project footprint, the prevailing land use is industrial and port-related, defined by existing wharf and terminal facilities, container yard hardstands, internal circulation roads, utilities, and operational support areas. The Phase 3 expansion builds on this existing industrial land use pattern and is consistent with the functional character of the estate.

Available Existing Land Use Plan Map ***(Figure 7-1)*** shows the Project Site situated at the coastal margin with surrounding land uses dominated by industrial areas and associated built-up components. Adjacent and near-field land uses mapped within the municipality include commercial and institutional clusters along road corridors, localized residential areas, and multiple agricultural classes inland, including production agriculture and protection agriculture. Upland portions of the municipality are mapped as production forest and protection forest. Rivers and creeks form key linear land use features that control drainage pathways and receptor connectivity between upland and coastal zones ***(Figure 7-2)***.

Generally, the baseline land use and class indicate high compatibility of the core footprint with existing industrial land use, while interface sensitivities remain at public access corridors, nearby community receptors, and drainage alignments.



Source: Municipality of Tagaloan CLUP

Figure 7-1. Existing Land Use Map of Municipality of Tagaloan in Relation to the Project Site

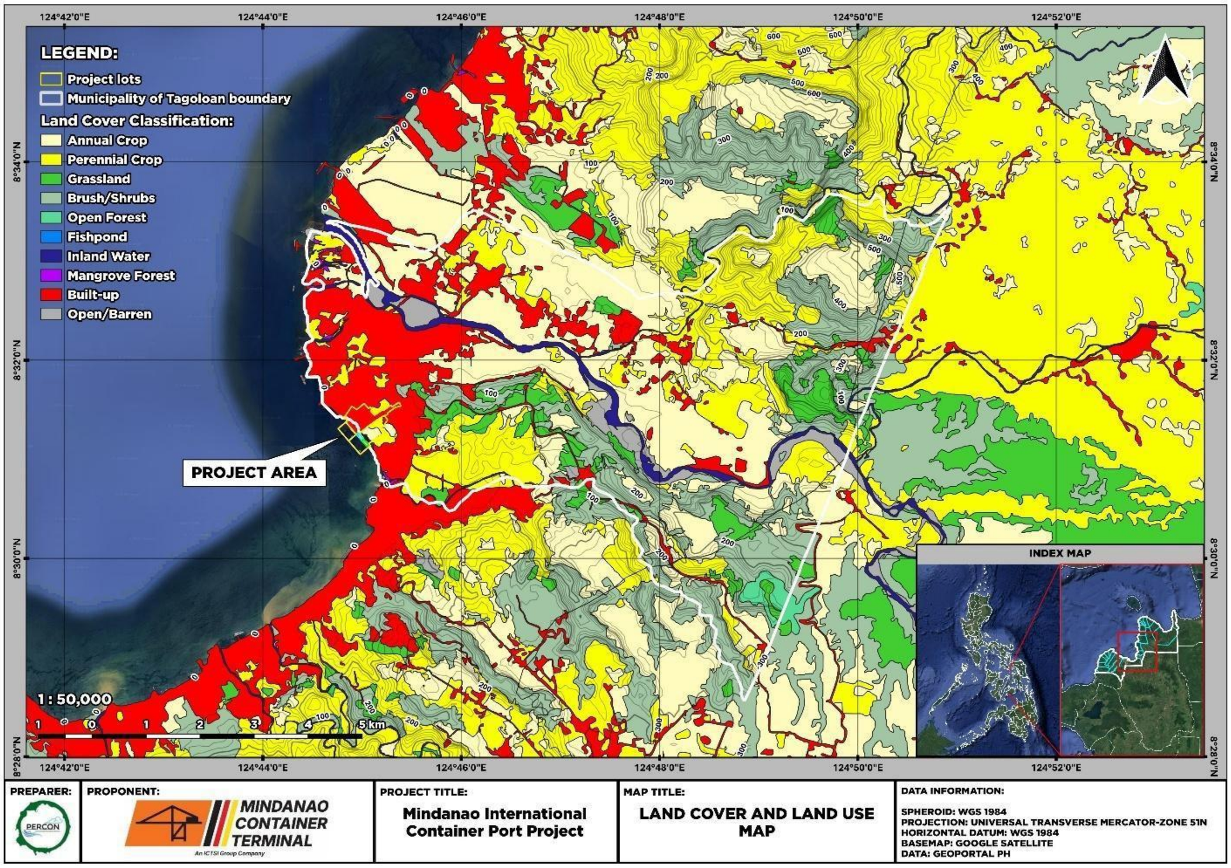
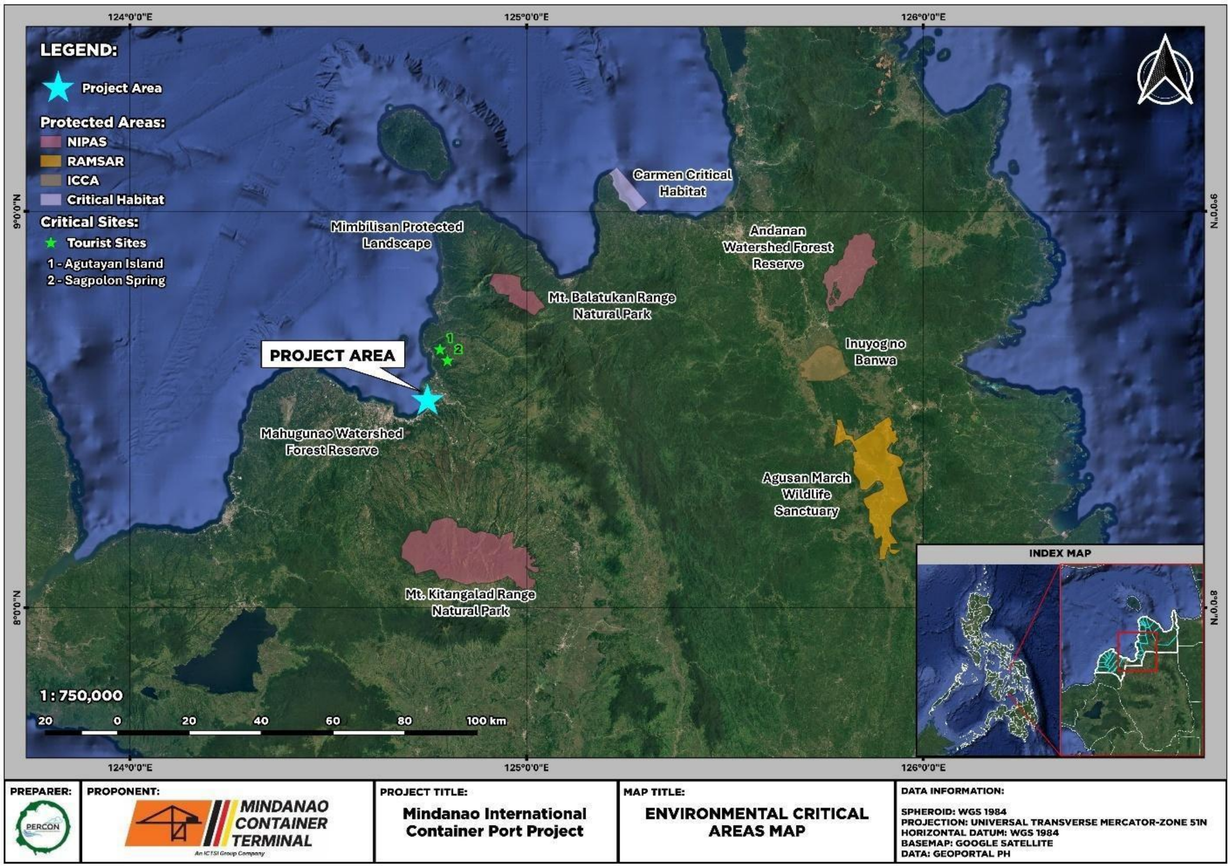


Figure 7-1. Land Map of Municipality of Tagaloan in Relation to the Project Site

7.1.1.2 Environmentally Critical Areas

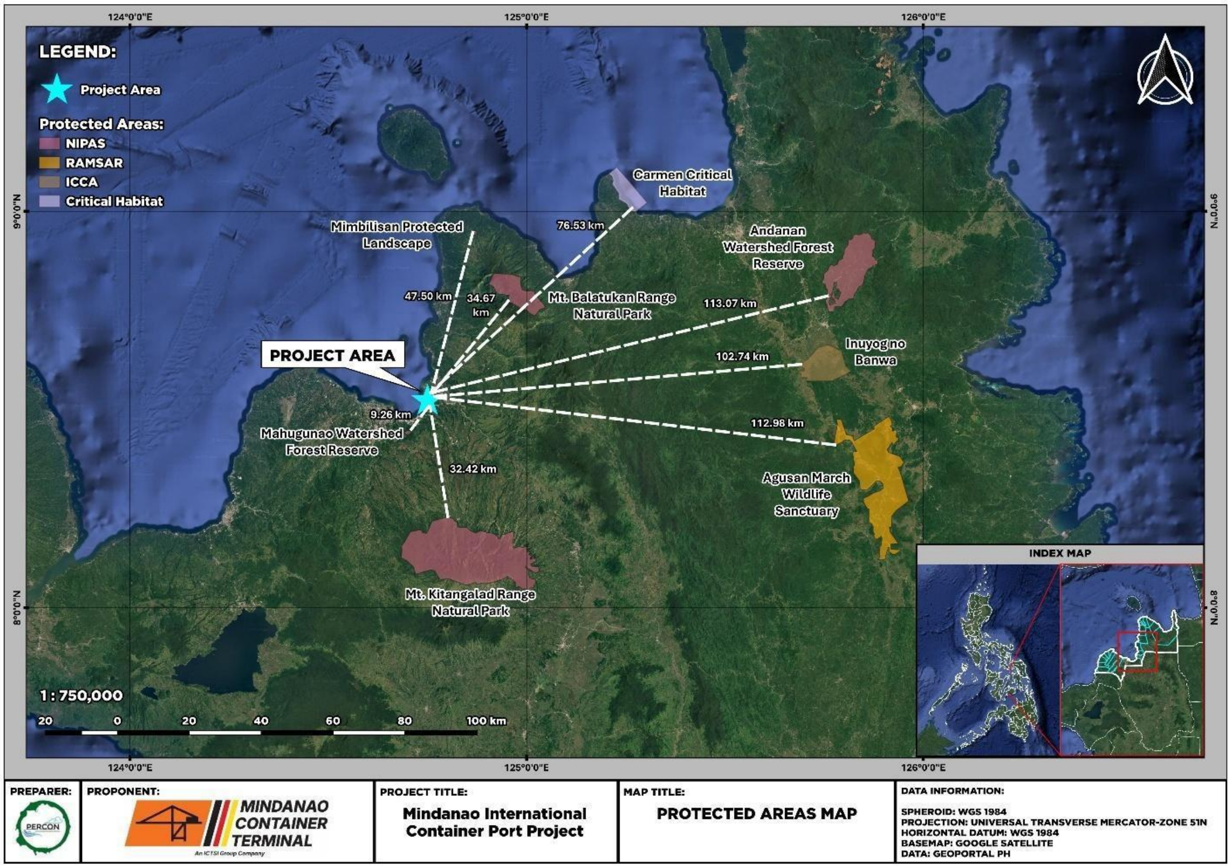
Environmentally Critical Areas were screened using the provided ECA mapping and the Project Description Report proximity listing for protected areas. The Project Site is not located within a protected area footprint; however, several legislated protected areas (Philippine NIPAS/ E-NIPAS), Ramsar sites, and Indigenous and Community Conserved Areas (ICCA) and other conservation designations (Philippine KBAs) are present within the broader regional setting.

Figures 7-3 and ***7-4*** present the general ECA locations and Protected Areas of the Project Site and vicinity. The nearest protected area shown is the Mahuganao Watershed Forest Reserve at approximately 10.59 km. Other regionally significant sites include Mt. Kitanglad Range Natural Park at approximately 32.42 km, Mt. Balatukan Range Natural Park at approximately 34.67 km, Mimbilisan Protected Landscape at approximately 47.50 km, Carmen Critical Habitat at approximately 76.53 km, Inuyogno Banwa (ICCA) at approximately 102.74 km, Agusan Marsh Wildlife Sanctuary (Ramsar) at approximately 112.98 km, and Andanan Watershed Forest Reserve at approximately 113.07 km. Given these distances and the industrial character of the footprint, direct land conversion impacts to protected areas are not expected. Nonetheless, ESIA management measures remain necessary to control indirect pressures via materials sourcing, waste management, spill risks, and runoff pathways that could affect connected downstream or coastal receptors.



Source: NAMRIA Geoportal; PDRS

Figure 7-3. ECA Map in Relation to the Project Site



Source: NAMRIA Geoportal; PDRS

Figure 7-4. Protected Areas Map in Relation to the Project Site

7.1.1.3 Land Tenure

The Project is located within the PHIVIDEC Industrial Estate, implying an institutional land administration context typical of planned industrial estates. The Project also has an existing ECC (ECC-9907-035-215, issued 18 October 1999) associated with the established MICP facilities, and Phase 3 includes components extending beyond previously approved areas. Data from the Project Description Report (PDRS) indicates the existing facilities include an 800m wharf and approximately 46.47 hectares of port facilities and identifies Phase III-A as a 140 m wharf extension with Phase III-B involving additional container yard development.

7.1.1.4 Visual Aesthetics

The visual landscape of the Project Site is dominated by existing coastal-industrial infrastructure and active port operations. Key visual elements include engineered shoreline structures, cargo handling equipment, container stacks, high mast lighting, paved yard areas, and internal roadways. Within an industrial estate, visual sensitivity is typically lowest within operational zones and highest at the interface with nearby communities, public roads, and coastal viewing corridors.

Because Phase 3 is an expansion of an existing port, this suggests the project will intensify an already industrial visual setting rather than introduce a new land use type.

7.1.1.5 Solid Waste Management

Solid waste conditions in the Project Site are characteristic of an established port and industrial estate setting where waste is generated by administrative activities, workforce presence, maintenance works, and logistics operations. Waste streams typically include municipal-type wastes such as food waste, paper, plastics, and packaging, as well as operational wastes including pallets, strapping, dunnage, scrap materials, and maintenance wastes. Depending on site practices, hazardous waste streams may also occur at low to moderate volumes, such as oily rags, spent lubricants, used filters, paint residues, batteries, and contaminated containers from equipment servicing and facility upkeep.

Moreover, sensitivity is influenced by the coastal location and drainage connectivity, where mismanaged waste can enter storm drains and migrate nearshore receiving waters, contributing to marine litter and degradation of water quality.

7.1.2 Geology and Geomorphology

7.1.2.1 Geomorphology and Slope

The Project Site is situated on the actively depositing delta of the Tagoloan River, which represents a depositional landform formed at the transition between river and marine environments ***(Figure 7-5)***. In deltaic settings, the reduction in transport energy promotes deposition of suspended and bedload sediments, resulting in low-lying and evolving ground surfaces that may remain geomorphically dynamic over time. This delta context is a key baseline control on near-surface material distribution and ground response to loading and saturation.

Within the port platform and immediate Project footprint, terrain is expected to be predominantly gentle and low-relief, consistent with coastal plain geomorphology and engineered ground surfaces ***(Figure 7-6)***. While gentle slopes generally reduce susceptibility to on-site rainfall-triggered slope failures, a low-elevation deltaic surface can be more sensitive to drainage performance constraints, high groundwater conditions, and coastal or riverine inundation processes ***(Figure 7-7)***.

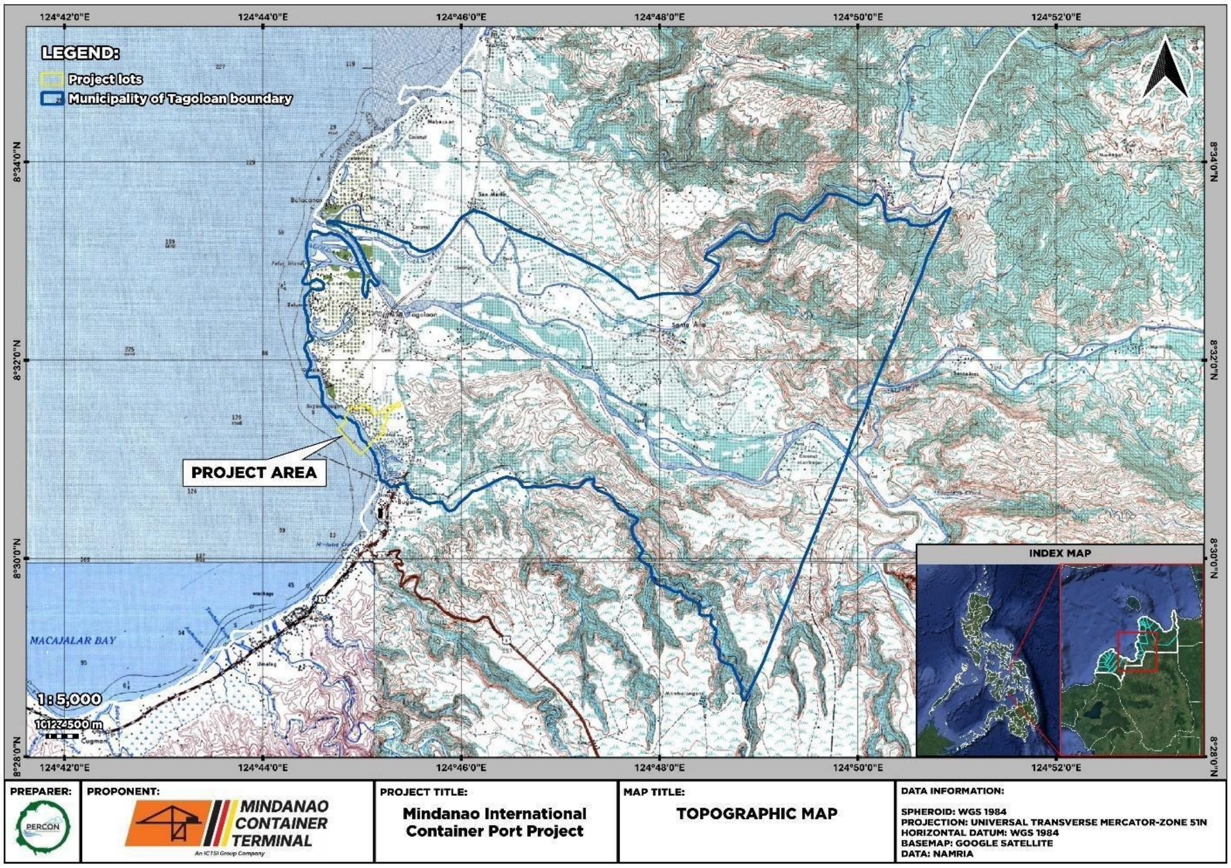


Figure 7-5. NAMRIA Topographic Map in Relation to the Project Site

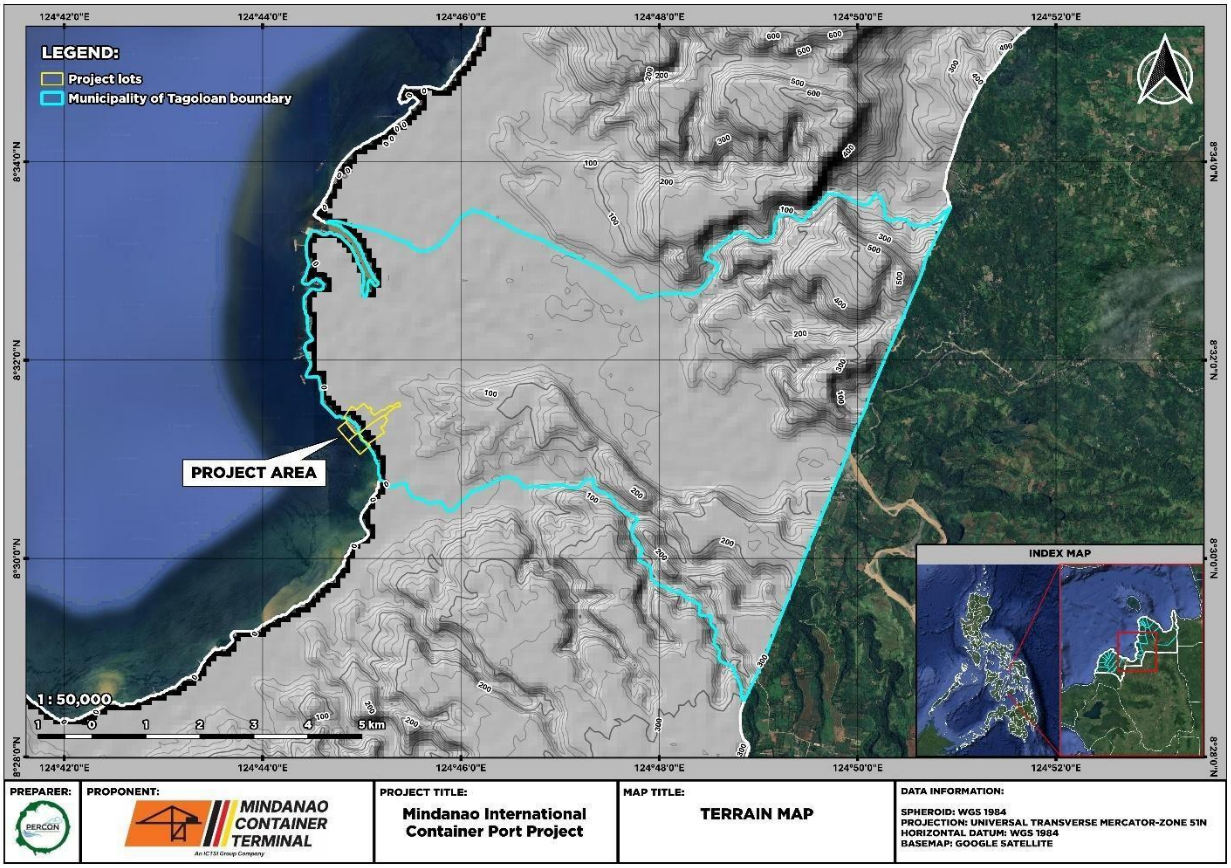


Figure 7-6. Generated Terrain Map in Relation to the Project Site

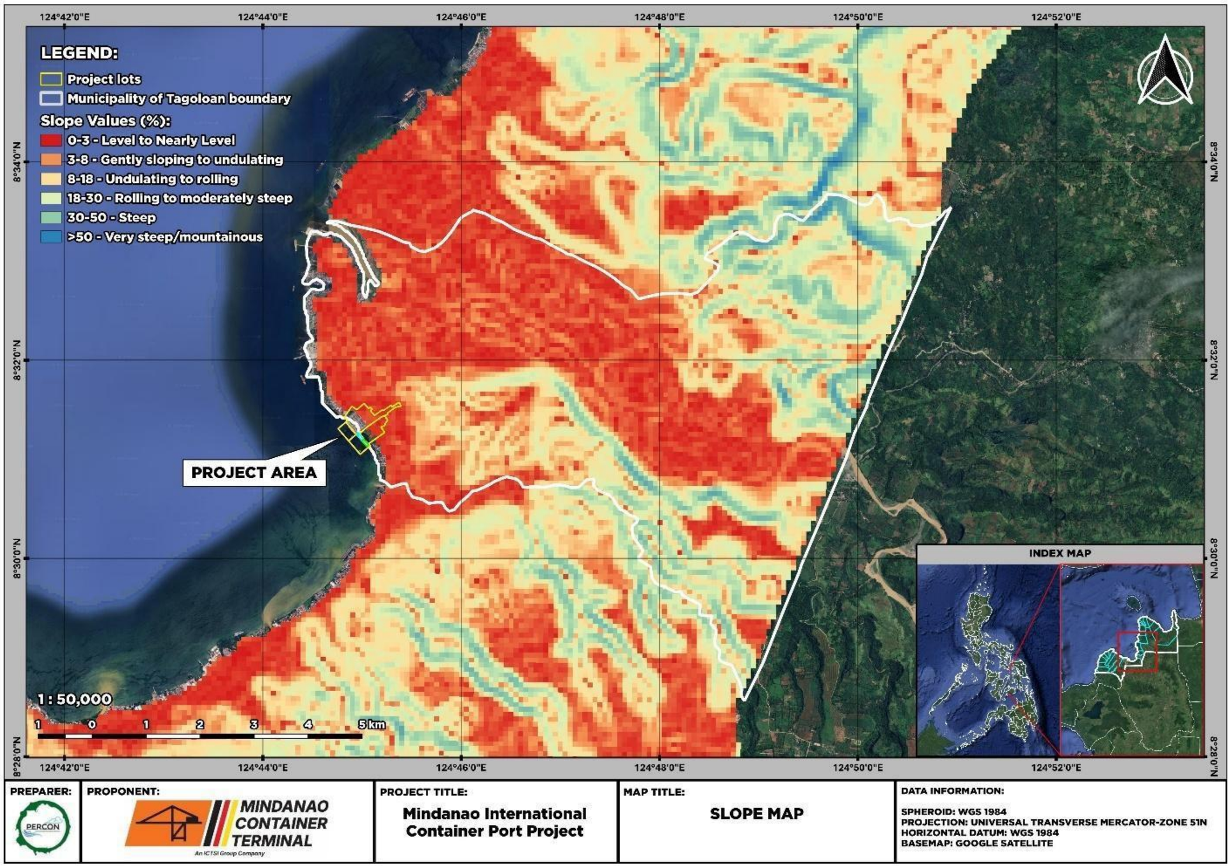


Figure 7-7. Generated Slope Map in Relation to the Project Site

7.1.2.2 Geology and Sub-surface Conditions

The Project Site consists of the Project Lots, Phase 2 area, and the proposed expansion footprints are predominantly underlain by Quaternary alluvial deposits mapped as Cagayan Gravel. This unit consists of young deltaic and coastal plain sediments that are typically heterogeneous and locally saturated, with engineering implications for settlement and deformation under heavy loads.

The alluvial deposit is compositionally variable because the Tagoloan River drains a large watershed reported to exceed 1,600 km², integrating sediments from multiple source terrains and lithologies. The Philippines Lexicon of Stratigraphy (Pena, 2008) and the Geology of the Philippines (Aurelio and Pena, 2010) identify sediment provenance including recent volcanic and volcaniclastic rocks associated with the Kitanglad Mountain Range, clastic sedimentary rocks (sandstone and conglomerates) linked with the Bukidnon Formation, coralline limestone, ophiolitic rocks (including ultramafics and gabbroic components), and metamorphic rocks such as schist, slate, and amphibolite.

Moreover, ***Figure 7-8*** specifically shows the Bukidnon Formation in the broader inland area, representing older, more consolidated geologic materials relative to the coastal alluvium. For Phase 3, the baseline engineering relevance is the spatial dominance of Cagayan Gravel in the waterfront and yard expansion footprint, necessitating careful geotechnical characterization, ground improvement where required, and design tolerances for long-term serviceability of wharf and yard assets.

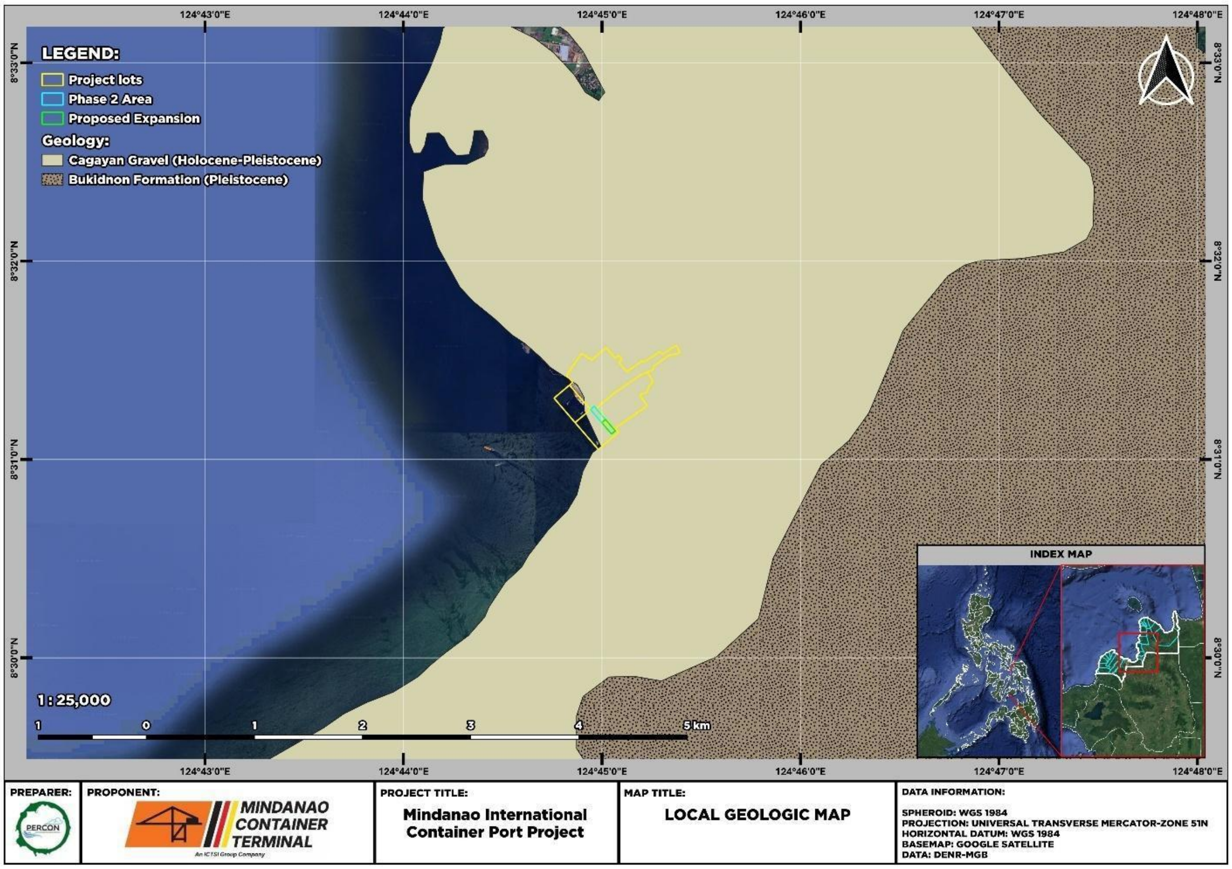


Figure 7-8. Local Geologic Map of Project Site

7.1.2.3 Inducement of Subsidence, Liquefaction, Landslides, Mud or Debris Flow, and Related Hazards

Seismicity and ground shaking context. The Project Site is within a region of high seismicity influenced by active fault systems and subduction-related sources in Northern Mindanao ***(Figure 7-9).***

The Tagoloan River Fault ***(Figure 7-10)*** is identified as the closest mapped structure at approximately 6.4 km from the site, with an interpreted trace length of approximately 15 km and a normal faulting component. Using empirical relationships, the Philippine Volcanology and Seismology (PHIVOLCS) estimates a maximum credible event on this fault on the order of Mw
6.4 and derives indicative peak ground accelerations of approximately 0.41g for average conditions and approximately 0.57g where soft deltaic or alluvial soils amplify shaking.

The corresponding macroseismic intensity is discussed as approximately Intensity VIII ***(Figure 7-11)***, implying very strong to destructive shaking and underscoring the need for code-compliant seismic detailing for permanent port structures and critical lifelines.

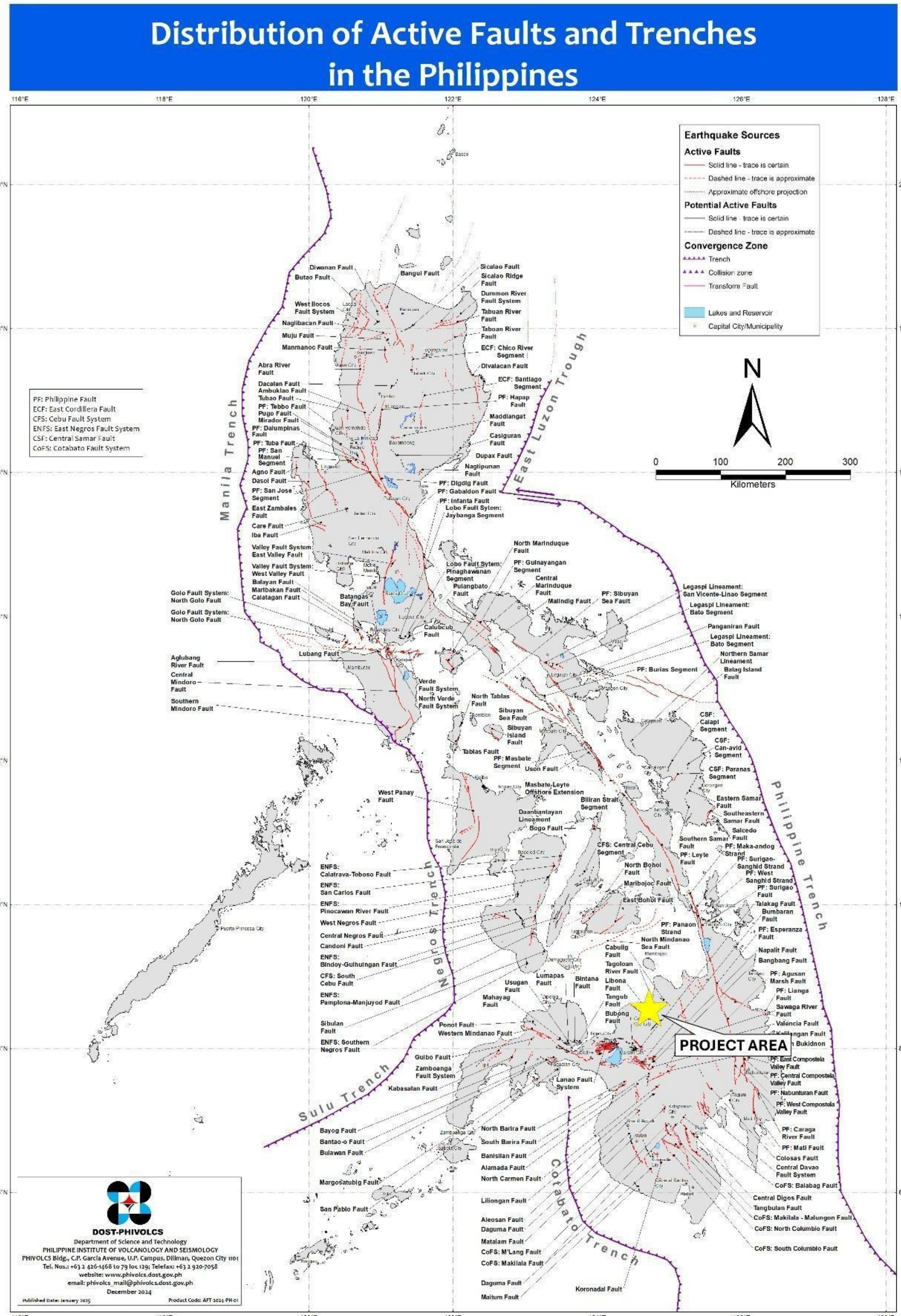
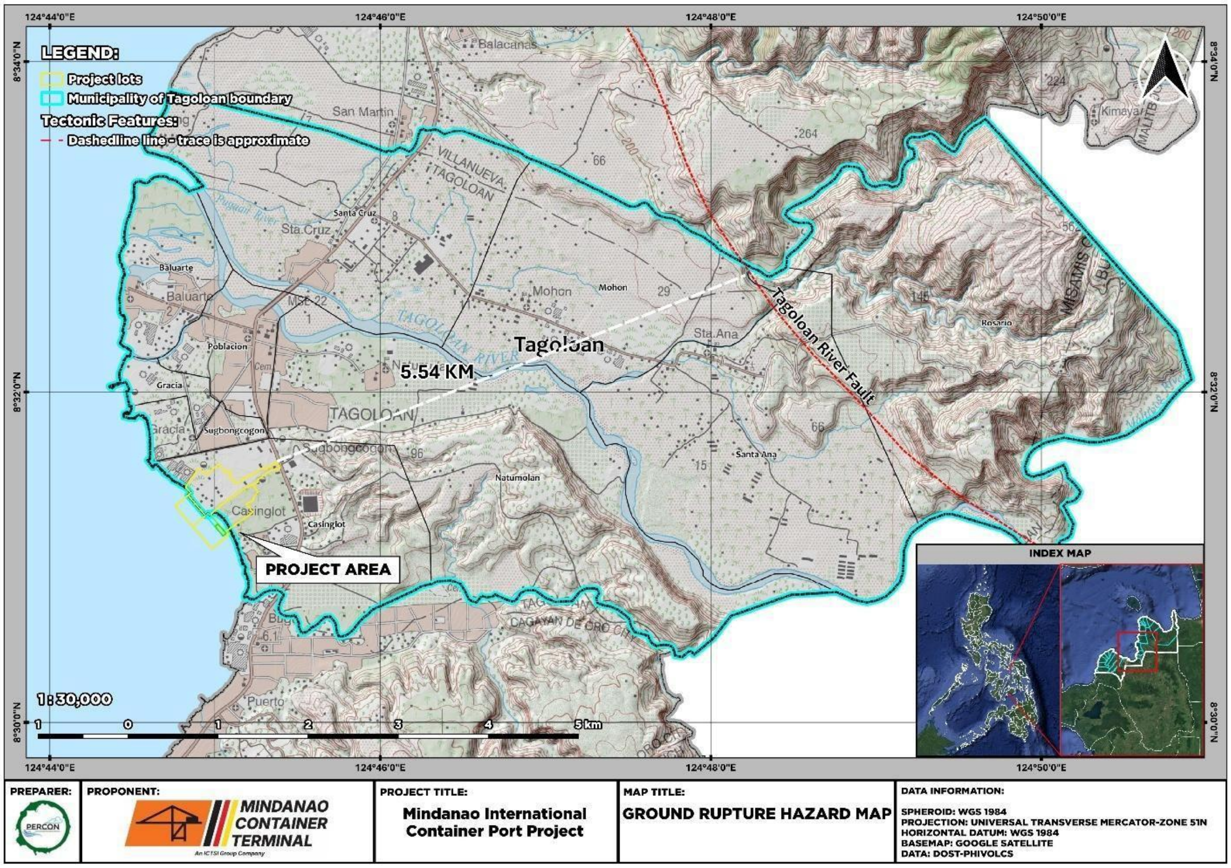


Figure 7-9. Active Faults and Trenches Map in Relation to the Project Site



Source: PHIVOLCS

Figure 7-10. Ground Rupture Hazard Map in Relation to the Project Site

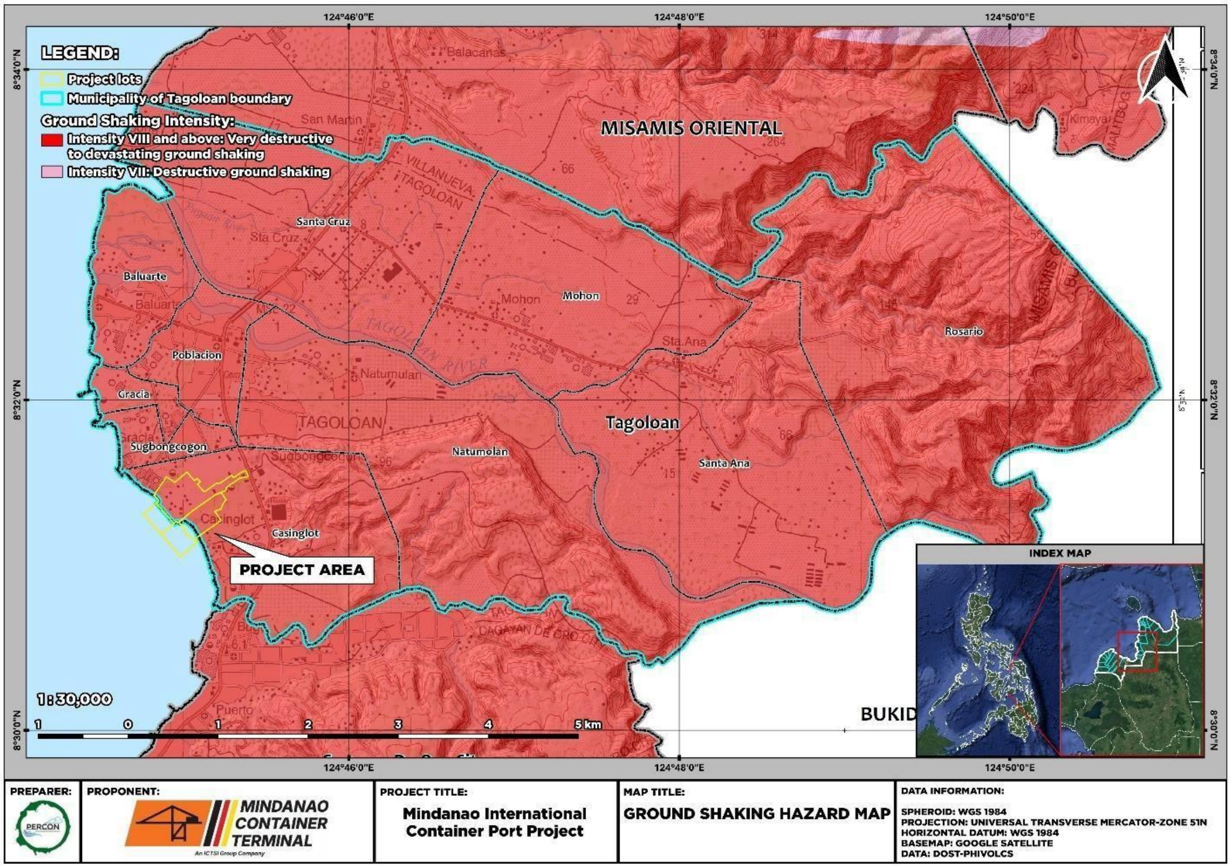


Figure 7-11. Ground Rupture Hazard Map in Relation to the Project Site

Liquefaction susceptibility. Liquefaction hazard map from PHIVOLCS ***(Figure 7-12)*** classifies the Project Site as generally susceptible to liquefaction. This classification reflects the combination of young alluvial and coastal deposits, shallow groundwater conditions, and low-lying terrain. Under strong shaking, these conditions may lead to loss of bearing capacity, differential settlement, and lateral spreading, particularly near riverbanks and in artificially filled ground, and highly recommends site specific geotechnical investigation to quantify liquefaction potential and inform foundation or ground improvement solutions.

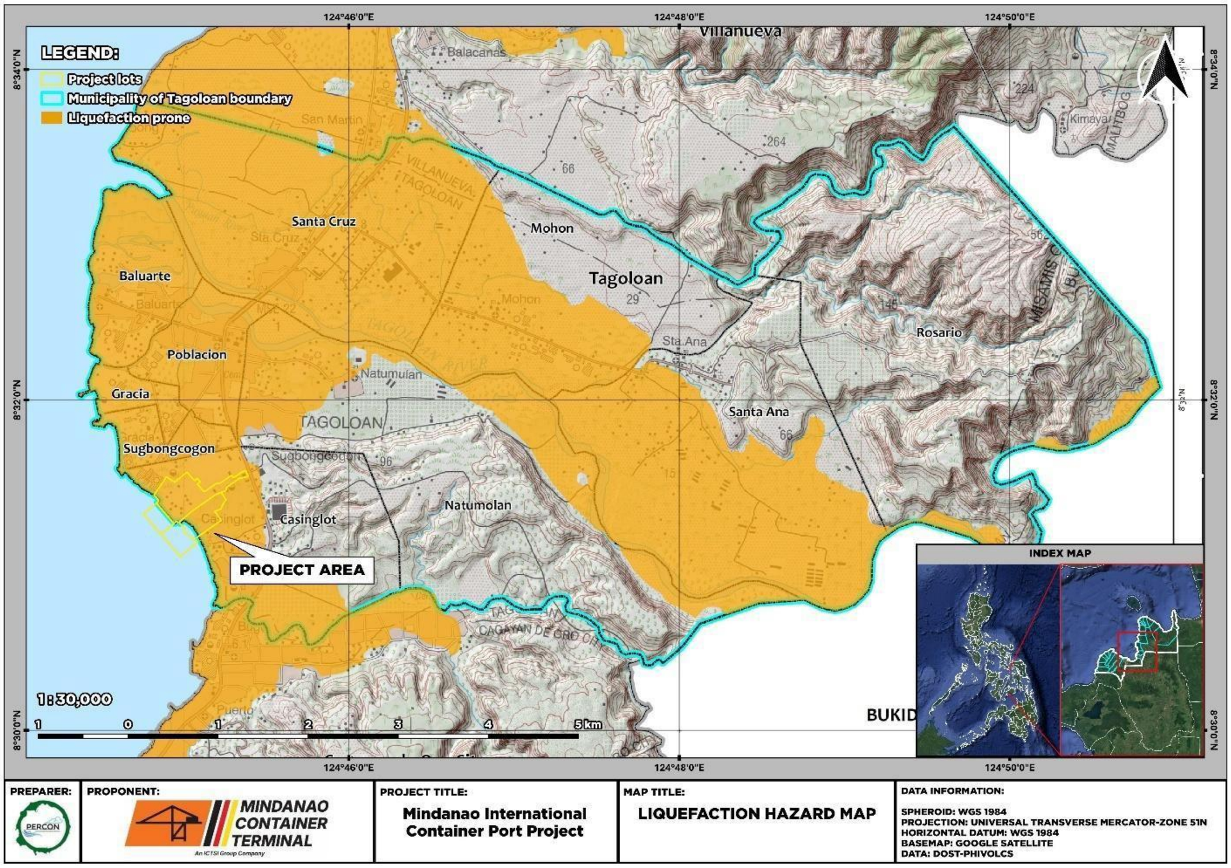


Figure 7-12. Ground Rupture Hazard Map in Relation to the Project Site

Slope-related hazards. Earthquake-induced landslides and mass waisting information for the Project Site are unavailable both from PHIVOLCS and the Mines and Geosciences Bureau (MGB) database; however, given that the immediate Project Site lies on a relatively gentle coastal plain, on-site slope-failure hazard is expected to be low.

Steeper slopes farther inland may still be susceptible and should remain within the broader area of influence screening where access roads, drainage lines, or borrow and spoil logistics could interact with slope processes.

Flooding (Riverine, Pluvial, and Compound Flooding). The Project Site lies within a low-lying deltaic and coastal plain that is hydraulically connected to the Tagoloan River system and coastal backwater conditions. Across the mapped scenarios obtained from the UPRI-NOAH (formerly Project NOAH), the broader floodplain exhibits moderate to high flood susceptibility, reflecting flood conveyance constraints and overbank flow pathways typical of delta environments.

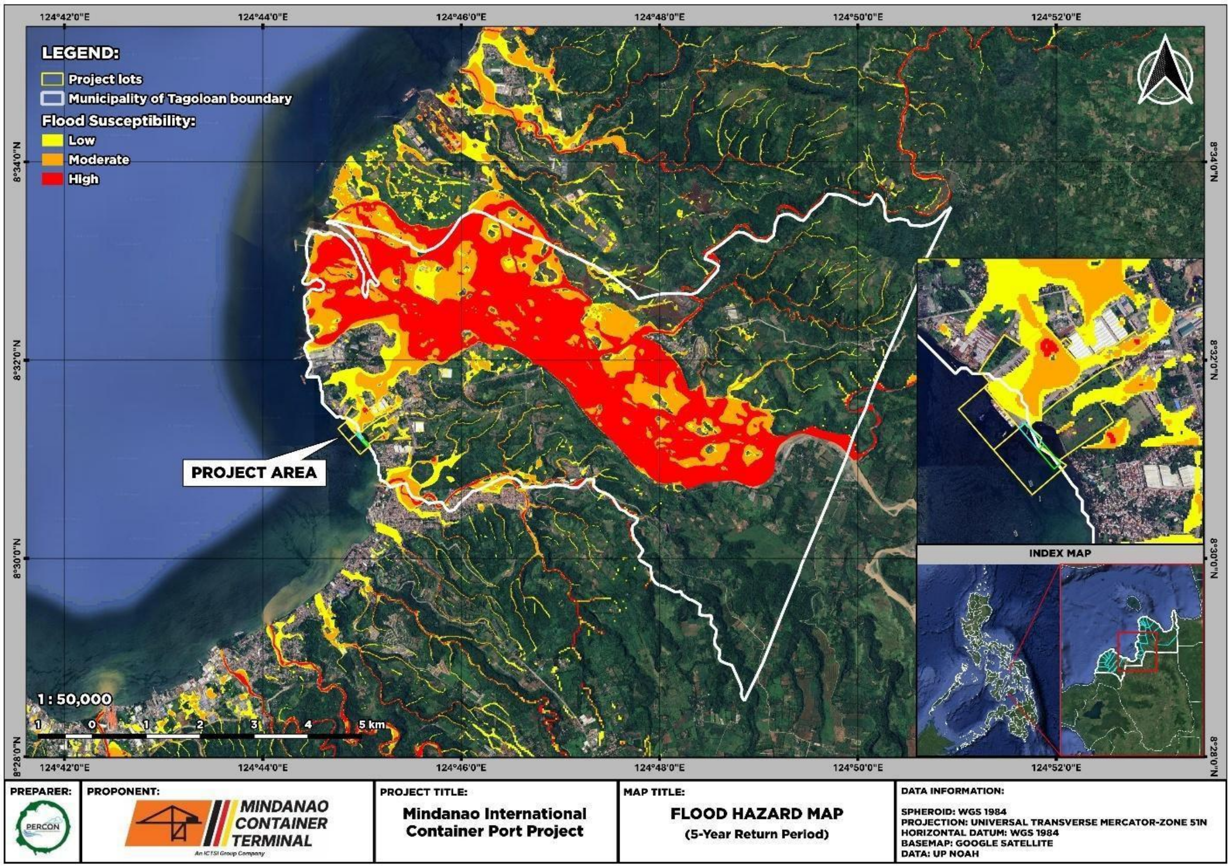


Figure 7-13. 5-Yr RP Flood Hazard Map in Relation to the Project Site

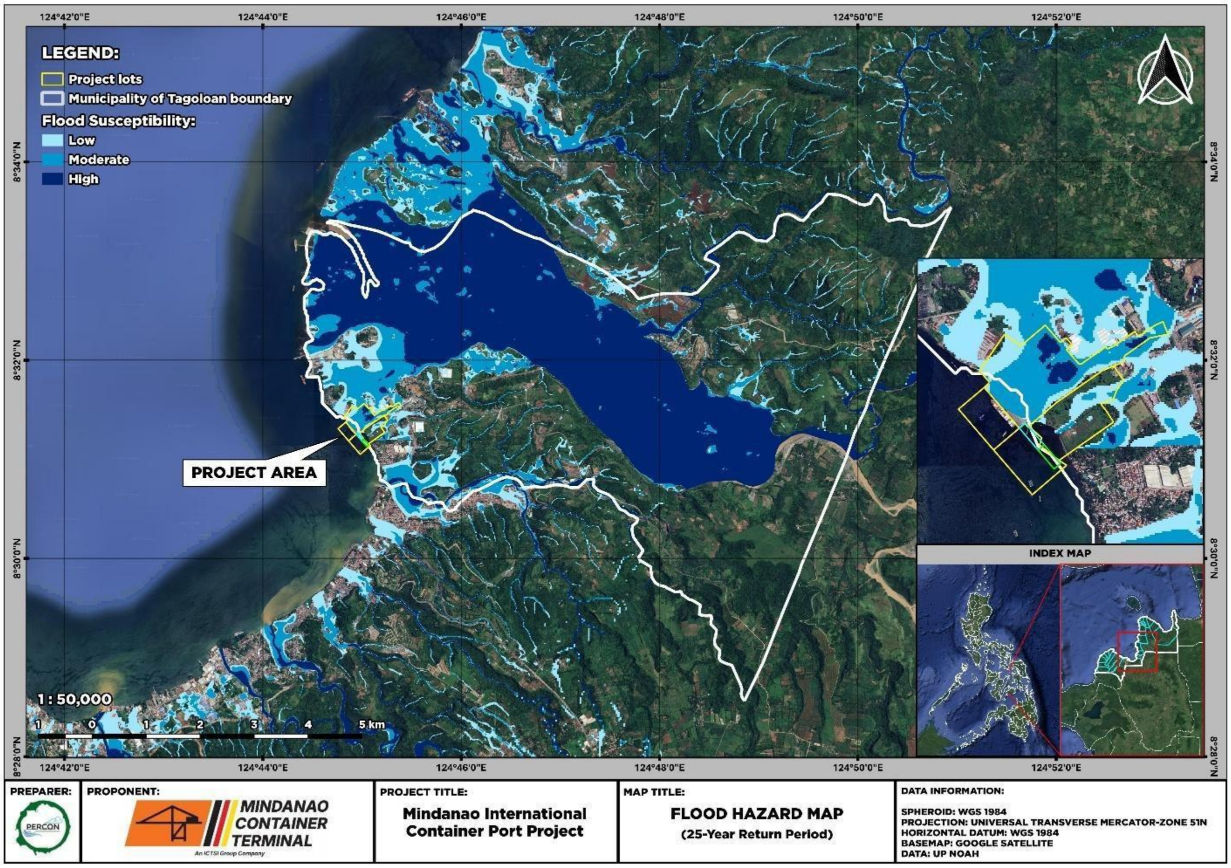


Figure 7-14. 25-Yr RP Flood Hazard Map in Relation to the Project Site

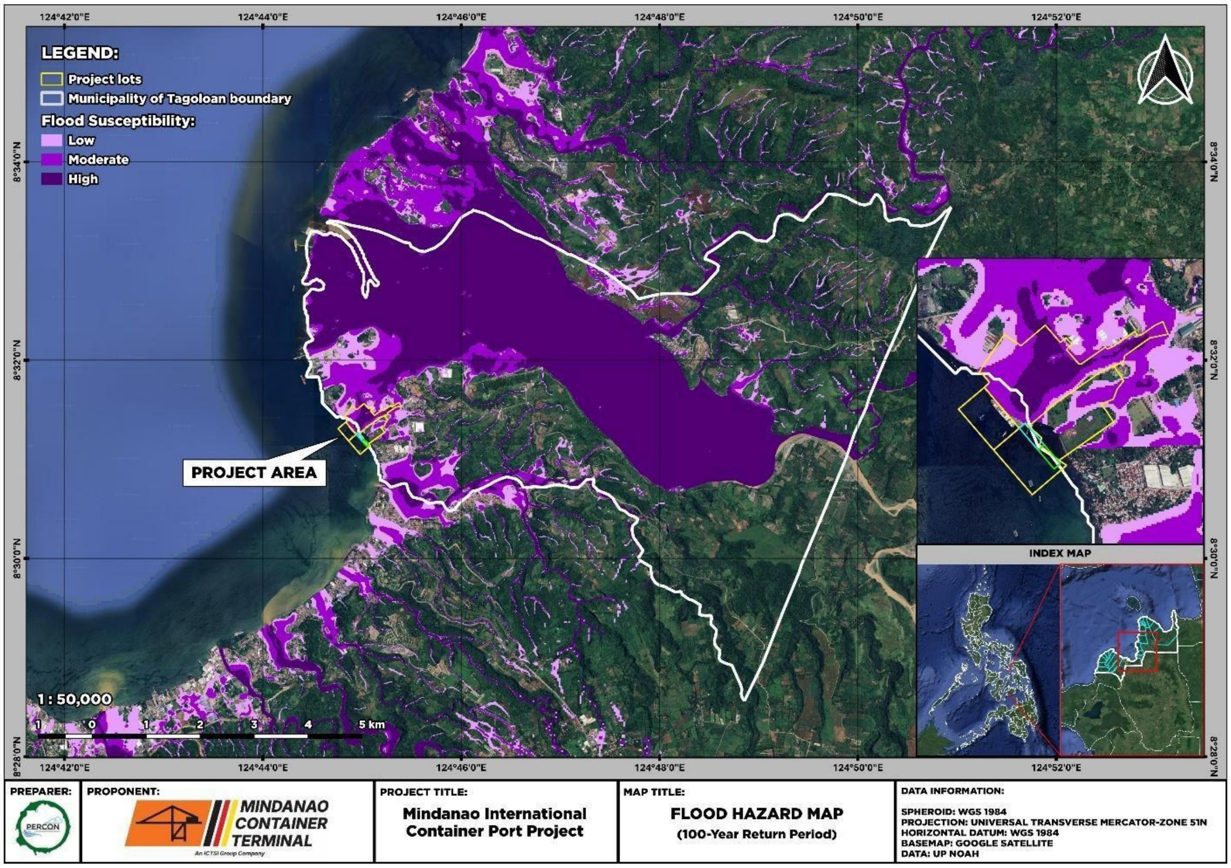


Figure 7-15. 100-Yr RP Flood Hazard Map in Relation to the Project Site

Storm Surge (Coastal Inundation). The Storm Surge Advisory #1 map below indicates that storm surge susceptibility is concentrated along the coastline and the port-facing margins, consistent with the Project's setting. The UPRI-NOAH specifies a 2-meter predicted storm surge height for the advisory scenario. The coastal strip encompassing the port shoreline is mapped with moderate to high storm surge susceptibility, and the Project Site includes areas within this susceptible zone, particularly at waterfront and nearshore interfaces.

This hazard is strongly influenced by cyclone track, onshore winds, tide phase, and local shoreline configuration. In port settings, storm surge effects can be amplified by wave setup, overtopping, and the interaction with river discharge, producing compound inundation.

At the 5-year return period ***(Figure 7-13)***, the Project Site is shown in the low to moderate susceptibility zone in portions of the footprint, with localized higher susceptibility in nearby low-lying areas and along drainage alignments in the vicinity of the port platform.

At the 25-year return period ***(Figure 7-14)***, the mapped flood susceptibility expands substantially, and the Project Lots fall largely within moderate to high susceptibility classes, indicating sensitivity to more frequent extreme rainfall events and floodplain inundation.

At the 100-year return period ***(Figure 7-15)***, the mapping indicates that high susceptibility conditions dominate the lowland floodplain and extend into the Project vicinity, suggesting that the Project is exposed to significant flooding potential under extreme rainfall and compound riverine-coastal conditions.

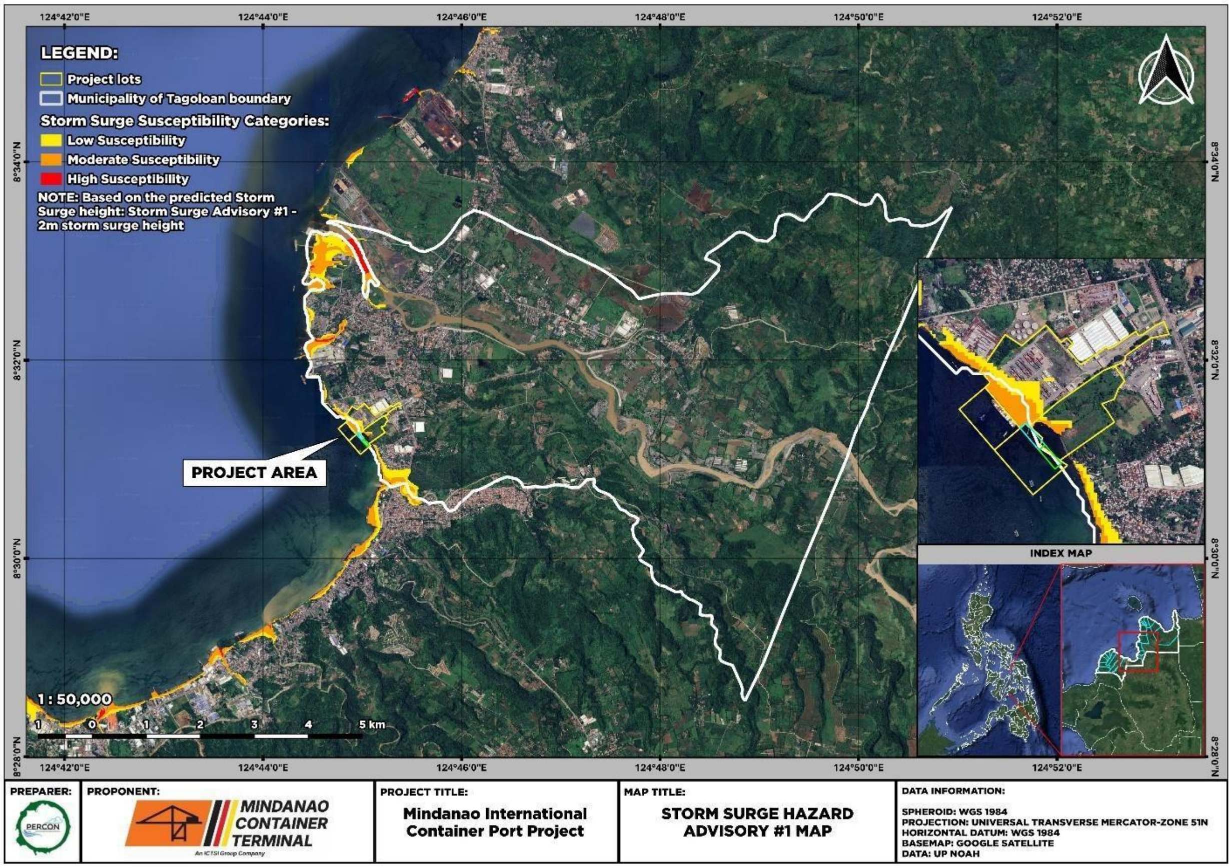


Figure 7-16. Storm Surge Advisory No. 1 Hazard Map in Relation to the Project Site

Table 7-1. Summary of Geohazards

Natural/ Geologic Hazard	Hazard Rating	Explanation	Source

Ground Shaking	Intensity VIII and above (Very Destructive)	The Ground Shaking Hazard Map classifies the Project Area within the Intensity VIII and above zone, indicating potentially very destructive shaking during a strong earthquake event, with implications for quay walls, cranes, yards, buried utilities, and critical equipment.	MICPP Ground Shaking Hazard Map (1:30,000)

Natural/ Geologic Hazard	**Hazard Rating**	**Explanation**	**Source**
Liquefaction	Prone	The Liquefaction Hazard Map categorizes the Project Area as liquefaction prone, consistent with the low-lying coastal/delta setting and young saturated deposits. Liquefaction-related settlement and lateral spreading are most critical at waterfront edges and reclaimed pads.	MICPP Liquefaction Hazard Map (1:30,000)
Subsidence / Differential Settlement	Moderate (chronic)	The site is underlain by young alluvial/coastal deposits where long-term consolidation and differential settlement may occur under new loads from filling, yard surfacing, and heavy operational loading. Settlement can reduce drainage gradients and effective freeboard over time.	MICPP Local Geologic Map (1:25,000); MICPP Terrain/Topographic Maps (1:50,000)
Flooding (Riverine/Pluvial/Compound)	Prone (varies by return period)	Flood hazard mapping shows increasing susceptibility from 5-year to 25-year to 100-year events. The Project vicinity exhibits low–moderate susceptibility in more frequent events, escalating to moderate–high/high susceptibility under higher return periods, reflecting deltaic low relief and backwater potential.	MICPP Flood Hazard Maps (5-yr, 25-yr, 100-yr; 1:50,000)

Storm Surge (Advisory #1)	Prone (low–moderate with localized high)	The Storm Surge Advisory #1 map (≈ 2 m surge scenario) indicates the Project shoreline lies within a storm surge belt showing low to moderate susceptibility, with localized high susceptibility pockets near coastal interface/outfall zones.	MICPP Storm Surge Hazard Advisory #1 Map (1:50,000)
Landslide / Slope Instability	Low (onsite); localized risk during works	Slope and terrain mapping indicate the Project footprint is generally flat/low relief (engineered platform). Landslides are not a dominant onsite hazard; however, localized instability can occur at temporary cut/fill edges, stockpiles, and drainage excavations if unmanaged.	MICPP Slope Map (1:50,000); MICPP Terrain/Topographic Maps (1:50,000)
Mudflow / Debris Flow	Low (onsite); indirect	Debris-flow processes are not expected within the flat port footprint; relevance is primarily indirect, where upstream	MICPP Slope/Terrain/Topographic

Natural/ Geologic Hazard	**Hazard Rating**	**Explanation**	**Source**
	watershed-link ed	sediment pulses may contribute to drainage clogging and siltation, exacerbating flood behavior and maintenance dredging needs.	Maps (1:50,000); Geology & Geohazards technical file
Coastal Erosion / Scour (including outfalls and quay toes)	Moderate (asset-specific)	Coastal structures, outfalls, and quay toes may experience localized scour/erosion driven by concentrated discharges, waves, vessel prop wash, and storm surge conditions, requiring armor protection and inspection.	MICPP Storm Surge Map (1:50,000); MICPP Topographic/Terrain Maps (1:50,000)
Tsunami (event-driven)	Potentially Affected (qualitative)	No available government-issued tsunami hazard map is included as baseline; however, as a coastal port in Macajalar Bay, the Project treat tsunami as a low-frequency/high-consequence hazard addressed through warning integration, evacuation, and marine operational protocols.	Site coastal setting (project maps)

Volcanic / Ashfall (event-driven)	Potential (low–moderate contingency)	No available government-issued tsunami hazard map is included as baseline; ashfall is treated as a regional contingency that can disrupt operations (visibility, equipment wear) and clog drainage when remobilized by rainfall, requiring preparedness measures.	Geology & Geohazards

7.1.3 Pedology

7.1.3.1 Soil

The soil environment within the Project footprint reflects an industrial port platform condition where ground surfaces are largely engineered, paved, compacted, or otherwise disturbed. Available soil data from the Philippine Bureau of Soil and Water Management (BSWM) for the project area indicates coastal and lowland soil units consistent with a shoreline and coastal plain setting, while inland areas transition to other mapped soil series and upland soil units.

Figure 7-17 indicates that the Project Site are situated on a narrow coastal strip mapped as Beach Sand, consistent with the project's location along the shoreline and deltaic margin. The mapped Beach Sand unit forms a continuous band along the coast and encompasses most of the currently delineated port footprint and the Phase 3 expansion interface at the coast. Immediately inland of the coastal strip, the soils transition to Umingan clay loam extending across lowland areas south and east of the Project.

Moreover, farther inland and toward higher relief, the soil units shift to Jasaan clay and Jasaan silt loam / Jasaan clay loam, while the upland interior includes areas mapped as Mountain soil (undifferentiated). Local pockets of San Manuel loam occur in the mid-slope to lowland transition zones.

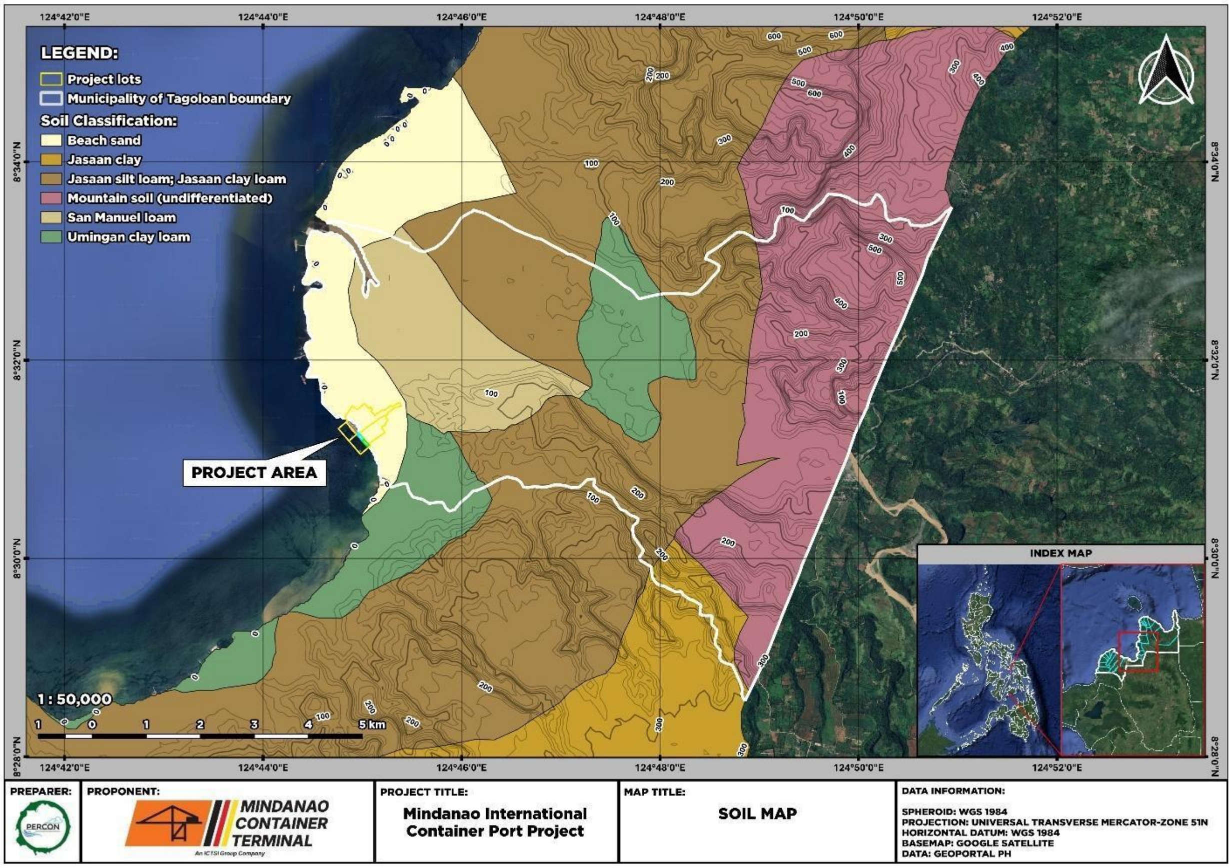


Figure 7-17. Soil Map of the Project and Vicinity

7.1.3.2 Soil Quality and Fertility

In the current industrial estate setting of the Project Site, soil quality and fertility are not baseline values in the same way they would be in an agricultural landscape. Baseline relevance is instead associated with functional soil quality for stabilization and revegetation of peripheral buffer zones and drainage easements, and with environmental soil quality management in areas where industrial activities could influence soil condition.

7.1.4 Hydrology/Hydrogeology

7.1.4.1 Hydrology and drainage setting

The Project Site is located on the coastal fringe of Tagoloan, Misamis Oriental, directly draining to Macajalar Bay. The local hydrologic regime is controlled by a trunk river system that conveys runoff from the eastern uplands across a broad, low gradient coastal plain prior to discharge at the coast.

Available topographic map ***(Figure 7-5)*** indicates a mature fluvial network with pronounced meanders and multiple lowland flow paths within the Tagoloan plain, reflecting an alluvial setting where flood conveyance is distributed across wide valley floors during high flow events. In this physiographic context, the project footprint lies within the coastal receiving zone where relief is subdued and drainage gradients flatten toward the bay, increasing sensitivity to short duration, high intensity rainfall and to backwater effects near the river mouth.

At site scale, the existing and proposed port platform functions as an engineered catchment. Surface runoff is primarily governed by yard grading, paved surface continuity, and the capacity and maintenance condition of drains, culverts, and outfalls rather than by natural channels.

Consequently, localized ponding potential is typically driven by micro topography, temporary obstructions, or outfall constraints, particularly during coincidence heavy rainfall and elevated coastal water levels.

Given the project's proximity to the coastline, the receiving boundary condition at outfalls can be influenced by high tide and storm surge, which can temporarily reduce discharge capacity and elevate upstream water levels in drainage lines. This interaction is a key consideration for drainage design and for construction sequencing to always ensure drainage continuity.

7.1.4.2 Hydrogeology and groundwater availability

The hydrogeological map ***(Figure 7-18)*** classifies the coastal sector of Tagoloan, including the vicinity of the Project Site, within groundwater availability zones characterized by productive aquifer conditions, ranging from extensive and highly productive aquifers to fairly extensive and productive aquifers, with localized areas identified as local and less productive aquifers.

In contrast, portions of the surrounding uplands and other terrain are mapped as rocks with limited groundwater potential and low to moderate permeability, and in some areas as rocks without any known significant groundwater obtainable through drilled wells, indicating a spatial transition from more productive lowland aquifers to more constrained upland hydrogeologic conditions.

Moreover, the map also identifies multiple groundwater extraction points within Tagoloan, sever

al of which are concentrated in the lowland and coastal zone near the Project Site. This distribution indicates that groundwater is an active local resource and that the nearshore aquifer system is part of the broader municipal water supply and industrial use context.

For a coastal aquifer, the baseline sensitivity is not limited to yield. It also includes susceptibility to salinity dynamics. Where groundwater heads are reduced through abstraction or prolonged dewatering, the risk of saline intrusion and saline doming increases, especially near the shoreline.

Lastly, the permeability characteristics implied by productive aquifer mapping increase the importance of preventing contaminant migration from surface sources because spills and chronic wash off can reach shallow groundwater pathways if containment is inadequate.

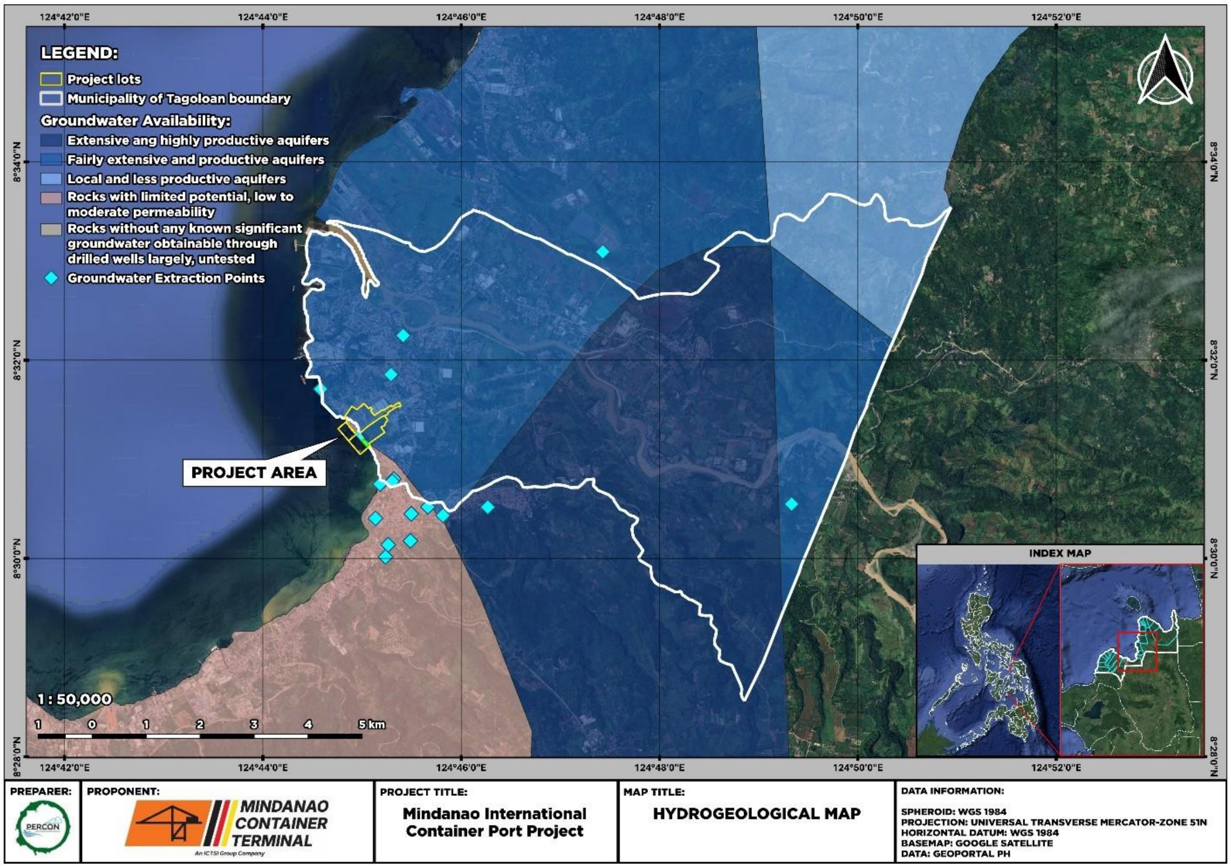


Figure 7-18 Hydrogeological Map of the Project Site and Vicinity

7.1.4.3 Project water supply context

The Project's current water source is supplied by the Tagoloan Water District and will continue to supply water for the proposed enhancement. As discussed in the PDR, an estimated water requirement for the expansion of 15.3 m^3/day for domestic use and 16.8 m^3/day for port operations. This supply arrangement reduces the likelihood that the project will drive direct and sustain groundwater abstraction at the site.

However, groundwater remains a relevant receptor for construction activities that may require excavation and temporary dewatering, as well as for accidental releases associated with fuel, lubricants, and chemicals during construction and operations

7.1.5 Oceanography

7.1.5.1 Regional Oceanographic Setting

The Mindanao International Container Port (MICP) is located along the southern shoreline of Macajalar Bay, a semi-enclosed embayment opening westward to the Bohol Sea. The bay forms part of a broader, wind- and tide-influenced coastal system that supports commercial navigation, fisheries, and industrial port operations. Oceanographic processes in Macajalar Bay are governed by the interaction of regional wind regimes, astronomical tides, locally generated waves, and bathymetric controls imposed by the bay geometry and engineered port structures.

Given the coastal and marine nature of the proposed wharf enhancement and associated dredging works, oceanographic conditions were assessed to understand baseline hydrodynamic behavior and to inform the evaluation of potential project-related impacts on waves, currents, sediment transport, and nearshore water circulation.

7.1.5.2 Data Sources and Assessment Approach

The oceanographic baseline for the Project is based primarily on the Port Wave Study prepared by GHD (Draft Final Report), which provides numerical modeling and analysis of wave climate, nearshore wave transformation, and operational wave conditions in the vicinity of the MICP. This study represents the most site-specific and technically robust source of oceanographic data available for the Project.

The GHD wave study was supplemented by:

- Regional climatological information on wind and wave regimes in northern Mindanao;
- Existing bathymetric and shoreline configuration data for Macajalar Bay; and
- Port layout and infrastructure characteristics relevant to wave interaction and sheltering.

The assessment focuses on physical oceanographic processes relevant to port development, including wave climate, wave propagation and attenuation, and implications for nearshore hydrodynamics. Detailed biological or ecological interpretations are addressed separately under marine ecology and biodiversity sections of the ESIA.

7.1.5.3 Wave Climate and Exposure Conditions

Results of the GHD wave study indicate that the Project Site is located within a moderately sheltered nearshore environment, owing to the semi-enclosed nature of Macajalar Bay and the orientation of the shoreline relative to prevailing regional wave directions.

The dominant offshore wave climate influencing the bay is associated with seasonal wind patterns, with higher wave energy conditions occurring during periods of stronger monsoonal winds. However, as waves propagate into Macajalar Bay, wave heights are progressively reduced through:

- Directional spreading and refraction;

- Energy dissipation due to bathymetric shoaling; and
- Partial sheltering by existing port infrastructure and shoreline geometry.

Nearshore wave conditions at the Project Site are therefore characterized by attenuated wave heights relative to offshore conditions, resulting in a wave climate generally suitable for port operations under normal conditions.

The GHD modeling demonstrates that extreme wave conditions capable of affecting operability are infrequent and are typically associated with regional storm events rather than locally generated conditions.

7.1.6 Sediment Transport and Coastal Processes

Sediment dynamics within Macajalar Bay are influenced by prevailing wave climate, tidal currents, and nearshore circulation patterns that govern sediment transport, deposition, and resuspension along the coastline. At present, no site-specific numerical sediment transport modeling has been completed for the Project area.

To address this data gap and to support a robust assessment of potential changes to coastal processes, a detailed sediment transport modeling study is scheduled to be conducted by February 2026. The study will establish baseline (pre-development) sediment transport conditions and will be used to evaluate potential alterations during the post-development phase of the Project.

The sediment transport modeling is considered necessary to: (i) characterize existing sediment movement pathways and deposition patterns within and adjacent to the Project footprint; (ii) assess potential Project-induced changes to sediment dynamics, including localized erosion or accretion; and (iii) inform the development of appropriate design measures and long-term maintenance requirements.

In addition, the sediment transport study will be a critical input prior to the conduct of any maintenance dredging activities, as it will support the identification of sediment sources and sinks, potential areas of re-deposition, and appropriate dredging frequency and management approaches. The modeling results will also provide a technical basis for determining the need, frequency, and spatial extent of post-development and operational-phase monitoring, including potential annual sediment assessments, where warranted.

7.1.7 Water Quality

Baseline water quality conditions for the Project were characterized using recent wastewater effluent monitoring data from the Mindanao International Container Terminal (MCT) complex as primary data, supplemented by municipal-level land use and environmental context from the Municipal Comprehensive Land Use Plan (CLUP) of Tagoloan, Misamis Oriental as secondary information. The monitoring data provide an indication of the quality of treated effluent discharged from port operations and form a relevant proxy for assessing potential interactions with receiving coastal and drainage waters.

The CLUP identifies the Project area as part of a designated industrial and port development zone, supported by engineered drainage systems and subject to existing environmental management and regulatory oversight, including DENR water quality standards and effluent controls. Surface waters within the municipality include coastal waters of Macajalar Bay, short engineered drainage channels, and modified river systems influenced by urban and industrial land uses rather than pristine hydrological conditions

Wastewater Effluent Quality (Primary Baseline Data)

Quarterly wastewater effluent monitoring conducted in 2025 at the MCT complex indicates that treated effluent quality is generally characterized by low suspended solids (3–28 mg/L), minimal oil and grease (1–2 mg/L), and low nutrient concentrations. Measured pH values ranged from
7.28 to 8.37, remaining within the acceptable range for treated industrial effluent under international good practice.

Biochemical oxygen demand (BOD_5) concentrations were consistently low during the first three monitoring quarters, with a single elevated result recorded in the fourth quarter. Fecal coliform levels were below detection limits for most of the year, with one higher reading observed during the same period. The concurrence of these elevated values suggests episodic operational or hydraulic variability rather than persistent or systemic treatment deficiencies.

Comparison of monitoring results with the World Bank Group General Environmental, Health, and Safety (EHS) Guidelines (Table 7-2) indicates that effluent quality generally complies with international performance benchmarks for industrial wastewater discharges. pH, total suspended solids, and oil and grease concentrations met applicable guideline values across all monitoring periods. The isolated exceedance of the BOD_5 guideline value in the fourth quarter does not represent a recurring trend and does not alter the overall assessment of treatment system performance.

Wastewater Sampling Station

Wastewater sampling for the Mindanao International Container Port (MICP) is conducted at the designated effluent discharge point located within the port compound, as shown in Figure 7-19. The sampling station is situated downstream of the internal wastewater collection and treatment systems, prior to final discharge to the receiving environment.

The sampling point represents a combined effluent location, capturing domestic wastewater generated from port offices, administrative buildings, and support facilities, as well as any allowable ancillary wastewater streams conveyed through the site's internal drainage and treatment infrastructure. The location was selected to ensure that collected samples are representative of actual effluent quality leaving the facility and are suitable for regulatory compliance monitoring and environmental assessment.

The sampling station is accessible under normal operating conditions and allows for safe, controlled sample collection without disrupting port operations or posing safety risks to personnel.

Figure 7-19. Effluent Water Sampling Station Wastewater

Sampling Methodology
Wastewater sampling was undertaken in accordance with DENR-EMB guidelines, applicable provisions of DAO 2016-08 (Water Quality Guidelines and General Effluent Standards), and generally accepted environmental monitoring practices.

Sampling was conducted using the following methodology:

- Grab sampling was employed to characterize effluent quality at the time of sampling, consistent with EMB requirements for routine compliance and baseline assessments.
- Samples were collected directly from the effluent flow at the designated sampling station using clean, pre-labeled, and contaminant-free sampling containers provided by a DENR-accredited laboratory.
- All sampling containers were appropriate for the target parameters and pre-preserved where required (e.g., for nutrients, oil and grease, or bacteriological parameters).
- Field personnel observed proper sampling hygiene and avoided disturbance of sediments or debris to prevent sample contamination.

Table 7.2 Wastewater Effluent Results

Pollutant	**Q1 2025**	**Q2 2025**	**Q3 2025**	**Q4 2025**	**EHS Guidelines**
pH	8.37	7.28	8.04	7.64	6-9
Total Suspended Solids (TSS), mg/L	3	13	13	28	50
Oil and Grease, mg/L	1	2	1	1	10
Biochemical Oxygen Demand (BOD5, 20ºC), mg/L	7	7	6	49	30

Overall, the effluent data demonstrate that Project-generated wastewater is effectively treated prior to discharge, and that baseline effluent quality is generally better than ambient nearshore marine water quality conditions, reflecting effective operational controls and wastewater management practices at the facility.

Coastal Waters (Macajalar Bay)

Marine water quality baseline conditions for the Mindanao International Container Port (MICP) Project were established through field sampling and laboratory analysis conducted in January 2026 at four marine stations (S1–S4) within Macajalar Bay, adjacent to the PHIVIDEC Industrial Estate Port Area. The sampling locations were selected to represent nearshore waters potentially influenced by port operations, drainage outfalls, and vessel activity. All samples were analyzed by FAST Laboratories, a DENR-accredited laboratory, using Standard Methods for the Examination of Water and Wastewater (APHA–AWWA–WEF, 2023).

Microbiological Characteristics

Baseline results indicate elevated total and fecal coliform concentrations across all four sampling stations. Total coliform levels ranged from approximately 2,300 to 13,000 MPN/100 mL, while fecal coliform concentrations ranged from approximately 450 to 7,900 MPN/100 mL. These values exceed guideline levels typically associated with recreational or high-quality coastal waters and reflect microbiological contamination consistent with nearshore waters influenced by urban runoff, port activities, and riverine discharges, rather than pristine marine conditions.

The observed coliform levels are characteristic of developed industrial–urban coastal environments such as Macajalar Bay, which receives drainage from multiple upstream catchments and supports active port, shipping, and industrial operations. These baseline conditions indicate that background microbiological water quality is already modified, and that the presence of coliform bacteria cannot be attributed solely to Project activities.

Physico-Chemical Characteristics

Physico-chemical parameters measured during the survey—including pH, temperature, dissolved oxygen (DO), and biochemical oxygen demand (BOD_5)—indicate generally stable and acceptable baseline conditions for a coastal industrial setting:

- pH values ranged from 7.6 to 7.7, remaining within the acceptable range under both DAO 2016-08 Coastal Water Class SC and World Bank Group EHS Guidelines for ambient marine waters.
  Water temperatures ranged from 30.3°C to 30.8°C, consistent with ambient tropical coastal conditions and within allowable deviation thresholds.
- Dissolved oxygen concentrations ranged from 6.1 to 7.0 mg/L, exceeding the minimum guideline value of 5.0 mg/L and indicating conditions capable of supporting marine life. BOD_5 concentrations were generally low, with values mostly below or near applicable guideline levels, indicating limited organic loading at the time of sampling. A single elevated BOD_5 value at one station reflects localized or short-term variability rather than a persistent water quality issue.

Other parameters, including reactive phosphate and surfactants (MBAS), were detected at very low concentrations, suggesting limited nutrient enrichment and detergent-related contamination during the sampling period.

Parameters Pending Analysis

Several parameters—including chemical oxygen demand (COD), total suspended solids (TSS), oil and grease, nutrients (nitrate and ammonia), chloride, and mercury—are currently marked as *to follow* pending completion of laboratory analysis and will be finalized and incorporated into the ESIA by end-January 2026. These parameters will be incorporated into the baseline dataset once available and will be evaluated against applicable DENR water quality standards and World Bank EHS Guidelines. Any exceedances or notable trends identified upon receipt of the results will be assessed in the impact analysis and addressed through appropriate mitigation and management measures under the Environmental and Social Management Plan (ESMP).

Table 7-3 Coastal Marine Water Analysis Results

Parameter	**Unit**	**DAO 2016-08 Coastal Water Class SC**	**World Bank EHS Guidelines (Marine/Coastal Waters)**	**Station S1**	**Station S2**	**Station S3**	**Station S4**
pH	–	6.5 – 8.5	6.5 – 8.5 (ambient water quality objective)	7.7	7.7	7.6	7.6
Temperature	°C	ΔT ≤ 3°C from ambient	ΔT ≤ 3°C from ambient	30.3	30.4	30.8	30.3
Dissolved Oxygen (DO)	mg/L	≥ 5.0	≥ 5.0	7.0	6.1	6.5	7.0
Biochemical Oxygen Demand (BOD_5)	mg/L	≤ 7	≤ 7 (good international practice for receiving waters)	< 3	6	8	5
Chemical Oxygen Demand (COD)	mg/L	–	No specific guideline for marine ambient waters	To follow	To follow	To follow	To follow
Total Suspended Solids (TSS)	mg/L	≤ 80	No numeric ambient guideline; control of turbidity emphasized	To follow	To follow	To follow	To follow
True Color	TCU	≤ 75	No specific guideline	5	5	5	5
Oil and Grease	mg/L	≤ 3	≤ 10 (effluent guideline; no visible sheen in receiving waters)	To follow	To follow	To follow	To follow

Reactive Phosphate	mg/L	–	No numeric guideline; nutrient enrichment to be minimized	< 0.01	< 0.01	< 0.01	0.01

Parameter	Unit	DAO 2016-08 Coastal Water Class SC	World Bank EHS Guidelines (Marine/Coastal Waters)	Station S1	Station S2	Station S3	Station S4
Surfactants (MBAS)	mg/L	–	No specific guideline	< 0.02	< 0.02	< 0.02	< 0.02
Nitrate (as NO_3-N)	mg/L	–	No numeric guideline; eutrophication prevention emphasized	To follow	To follow	To follow	To follow
Ammonia (as NH_3-N)	mg/L	–	No numeric guideline; toxicity to aquatic life to be avoided	To follow	To follow	To follow	To follow
Chloride	mg/L	–	No specific guideline	To follow	To follow	To follow	To follow
Mercury	mg/L	–	0.001 mg/L (typical ambient benchmark for surface waters)	To follow	To follow	To follow	To follow

Overall, the baseline marine water quality conditions in Macajalar Bay reflect a well-mixed coastal environment subject to tidal exchange, with physico-chemical conditions generally meeting applicable ambient water quality objectives, while microbiological indicators demonstrate existing anthropogenic influence. These findings are consistent with the bay's role as a working industrial and port area and provide a realistic and defensible baseline against which potential Project-related impacts can be assessed.

Surface Water and Drainage Channels

Surface water features in the Project area consist primarily of engineered drainage channels designed to convey stormwater and treated effluent away from industrial facilities. The CLUP identifies these systems as part of the municipality's built drainage infrastructure serving industrial and urban land uses, rather than natural streams with high ecological sensitivity

Freshwater

There are no natural freshwater bodies (such as rivers, streams, creeks, or lakes) within or in the immediate vicinity of the Mindanao International Container Port (MICP) Project site. The Project is situated in a coastal setting fronting Macajalar Bay, and surface hydrology within the site is limited to engineered drainage systems designed to convey stormwater runoff directly to the marine environment.

Groundwater

Groundwater is not used as a primary domestic water supply within the Mindanao International Container Port (MICP) and the surrounding PHIVIDEC Industrial Estate. However, groundwater has been included in the ESIA due to the proposed dredging, pile installation, and subsurface construction activities associated with the wharf extension, as well as the Project's location within a coastal alluvial setting characterized by shallow groundwater conditions.

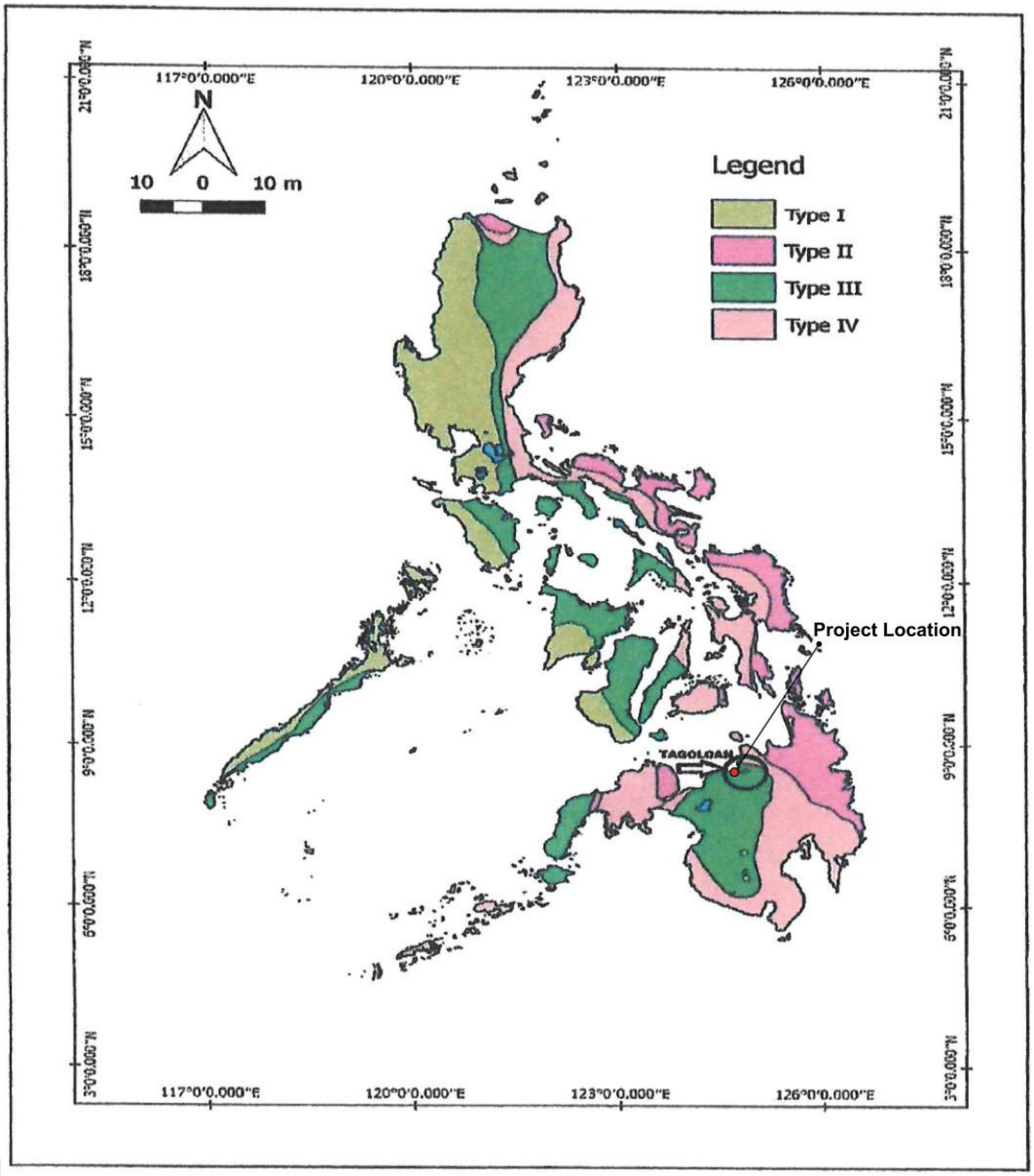
At the time of ESIA preparation, site-specific groundwater quality data are not yet available. A preliminary baseline assessment has therefore been undertaken based on regional hydrogeologic information, existing geotechnical data, and the known characteristics of coastal deltaic environments.

Groundwater quality testing will be conducted prior to or during the early stages of construction, in accordance with applicable DENR-EMB requirements and good international practice. The results of this testing will be used to confirm baseline conditions and to further assess potential Project-related impacts.

Should the monitoring results indicate any Project-related changes or exceedances of applicable standards, appropriate mitigation and management measures will be identified and incorporated into the Environmental and Social Management Plan (ESMP), and the impact assessment will be updated accordingly through adaptive management.

7.1.8 Climate/ Meteorology Climate

The Climate classification where the municipality of Tagoloan falls under third Type climate based on the Modified Corona's climate classification of the Philippines. This type is characterized by not very pronounced seasons which imply relatively similar climatic conditions throughout the year. Wet and dry seasons along these parts of the country are not clearly defined as the seasons do not have that apparent difference. Although drier months usually occur during the months of February until April and for the rest of the year, it is generally wet and rainy.



Source: Tagoloan CLUP

Figure7-20 Climate Type

Climatological Normals and Extremes

Table 7-4 and 7-5 present the climatological and meteorological characteristics of the project site based on PAGASA Climatological Normals and Extremes.

Table 7-4 Climatological Normals - Lumbia - El Salvador, Misamis Oriental

STATION: **LUMBIA AIRPORT, MISAMIS ORIENTAL**
PERIOD: **1991 - SEPTEMBER 2013**

LATITUDE: **08°24'32.70"N**
LONGITUDE: **124°36'43.57"E**
ELEVATION: **182m**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16a)	(16b)
MONTH	RAINFALL		TEMPERATURE						VAPOR PRESS. (mbs)	RH (%)	MSLP (mbs)	WIND		CLOUD AMT. (okta)	NO. OF DAYS W/	
	AMOUNT (mm)	NO. OF RD	MAX (°C)	MIN (°C)	MEAN (°C)	DRY BULB (°C)	WET BULB (°C)	DEW POINT (°C)				DIR (16pt)	SPD (mps)		TSTM	LTNG
JAN	97.6	10	29.8	21.7	25.8	25.2	23.2	22.4	27.2	85	1010.2	N	2	5	3	1
FEB	85.3	8	30.3	21.6	26.0	25.3	23.1	22.2	27.0	84	1010.3	N	2	5	2	1
MAR	57.6	6	31.4	21.9	26.7	26.0	23.4	22.4	27.2	81	1010.1	N	2	4	5	2
APR	62.1	6	32.6	22.7	27.6	27.0	24.0	22.8	27.9	79	1009.4	N	2	4	7	4
MAY	128.9	11	33.0	23.3	28.1	27.3	24.4	23.4	28.9	80	1008.9	N	2	5	17	10
JUN	220.1	16	32.1	22.9	27.5	26.5	24.2	23.3	28.8	83	1009.0	S	1	5	17	9
JUL	247.3	17	31.7	22.6	27.2	26.2	24.0	23.1	28.4	84	1009.0	S	1	6	16	8
AUG	197.4	14	32.2	22.6	27.4	26.4	23.9	23.0	28.2	82	1009.1	S	1	6	13	8
SEP	220.8	15	32.1	22.5	27.3	26.3	23.9	23.0	28.2	83	1009.4	S	2	6	15	8
OCT	191.6	14	31.5	22.4	27.0	26.1	23.9	23.1	28.4	84	1009.1	S	2	5	16	11
NOV	127.1	10	31.1	22.2	26.7	26.0	23.9	23.0	28.3	84	1008.8	S	2	5	10	7
DEC	137.5	9	30.4	22.1	26.3	25.7	23.6	22.9	28.0	85	1009.2	S	2	5	5	4
ANNUAL	**1,773.3**	**136**	**31.5**	**22.4**	**27.0**	**26.2**	**23.8**	**22.9**	**28.0**	**83**	**1009.4**	**S**	**2**	**5**	**126**	**73**

Table 7-5 Climatological Extremes - Lumbia - El Salvador, Misamis Oriental

STATION: **LUMBIA AIRPORT-EL SALVADOR, MISAMIS ORIENTAL**
YEAR: **AS OF 2023**

LATITUDE: **08°24'32.70"N**
LONGITUDE: **124°36'43.57"E**
ELEVATION: **182m**

MONTH	TEMPERATURE (°C)				GREATEST DAILY RAINFALL (mm)		STRONGEST WINDS (mps)			SEA LEVEL PRESSURES (mbs)			
	HIGH	DATE	LOW	DATE	AMOUNT	DATE	SPD	DIR	DATE	HIGH	DATE	LOW	DATE
JAN	36.2	01-08-2016	16.1	01-03-1991	104.4	01-13-2009	17	NNE	01-15-2022	1018.1	01-27-1983	982.8	01-21-1989
							17	NE	01-24-2023				
FEB	36.0	02-14-2003	17.1	02-05-1980	107.8	02-05-1999	19	NNE	02-26-2022	1018.8	02-25-2016	1000.6	02-10-2023
MAR	37.6	03-28-1998	17.1	03-10-1992	87.6	03-06-2022	15	N	03-06-2022	1018.9	03-07-1981	1002.0	03-19-1982
APR	37.0	04-11-1998	18.0	04-13-1983	88.4	04-14-2014	20	NNW	04-29-1983	1017.3	04-14-1993	1002.8	04-01-2000
MAY	38.7	05-05-2021	20.7	05-28-1984	121.8	05-30-2021	18	W	05-27-1998	1015.6	05-10-2016	1003.3	05-05-2002
JUNE	38.4	06-06-2009	20.0	06-11-1992	124.2	06-21-2016	18	WNW	06-10-1997	1015.6	06-20-1982	1002.4	06-17-2007
JULY	38.6	07-25-2021	20.0	07-17-1994	142.0	07-13-1999	22	W	07-31-1999	1016.0	07-22-2015	1001.0	07-03-2001
			20.0	07-02-2015									
AUG	37.8	08-28-1990	19.4	08-26-1995	129.3	08-21-1998	25	SW	08-05-1997	1015.6	08-11-1997	1002.9	08-17-1990
	37.8	08-02-2021											
SEP	36.7	09-02-1992	19.0	09-23-1991	117.0	09-09-2017	24	NNW	09-23-1996	1016.1	09-26-1982	983.8	09-16-1988
OCT	35.2	10-20-2015	19.0	10-31-1982	114.1	10-20-1980	18	SW	10-04-2014	1017.7	10-09-2023	1000.3	10-28-2022
			19.0	10-25-2015									
NOV	34.7	11-30-2006	18.0	11-25-1992	237.1	11-24-2009	18	NW	11-20-1990	1016.3	11-17-1982	1000.7	11-06-1996
DEC	34.4	12-08-1996	17.8	12-31-1990	180.9	12-16-2011	34	S	12-04-2012	1017.8	12-28-2015	1000.1	12-30-2023
ANNUAL	**38.7**	**05-05-2021**	**16.1**	**01-03-1991**	**237.1**	**11-24-2009**	**34**	**S**	**12-04-2012**	**1018.9**	**03-07-1981**	**982.8**	**01-21-1989**
Period of Record	**1979 - 2023**				**1977 - 2023**		**1979 - 2023**			**1979 - 2023**			

Note: *The station transferred from Lumbia to El Salvador on September 2013*

Rainfall

The municipality experiences a cyclical pattern of rainfall throughout the years with rainiest months occurring from June to October. Monthly rainfall is below the average monthly amounts

during the rest of the year. Rainfall statistics gathered from PAGASA, Lumbia Station, showed that the heaviest rainfall was in June 1994 recorded at 477.60 millimeters.

It was also noted that the Calendar Years 1980, 1985, 1990, and 1995 were recorded as rainiest years with an annual average rainfall of 155.7mm; 167.4mm; 163.2mm and 153.8mm respectively. The recorded driest years were CY 1987, 1992, and 1998 where we experienced the El Niño Phenomenon with an annual average rainfall of 91.1mm; 100.2mm and 110.7mm respectively.

Generally, there is a reduction in rainfall in most parts of the country during the summer (MAM) season. However, rainfall increase is likely during the southwest monsoon (JJA) season until the transition (SON) season in most areas of Luzon and Visayas, and also, during the northeast monsoon (DJF) season, particularly, in provinces/ areas characterized as Type II climate in 2020 and 2050. There is, however, a generally decreasing trend in rainfall in Mindanao, especially by 2050.

The decrease of rainfall in the Province of Misamis Oriental happens mostly during the summer months of March, April, and May (MAM) with an average rainfall of 296.00mm down to 265.2mm (10.4% decrease) in 2016 to 2035 and further down to 218.0mm (17.8% decrease) in 2036 to 2065. The decrease continues from June, July, and August (JJA) where the average rainfall is from 615.7mm to 592.9mm (3.7% decrease) in 2016 to 2035, and further down to 562.1mm (5.2% decrease) in 2036 to 2050.

Temperature

All areas of the Philippines will get warmer, more so in the relatively warmer summer months. Mean temperatures in all areas in the Philippines are expected to rise 0.9 ºC to 1.1 ºC in 2020 and by 1.8 ºC to 2.2 ºC in 2050. Likewise, all seasonal mean temperatures will also have increases in these time slices; and these increases during the four seasons are quite consistent in all parts of the country. The largest temperature increase is projected during the summer (MAM) season.

In Misamis Oriental, particularly Tagaloan, the highest seasonal temperature increase will be happening on the months of June, July, and August (JJA) or southwest monsoon locally known as “Habagat” season in the next twenty (20) years experiencing a total temperature from 26.9 ºC to 28.1 ºC (1.2 ºC increase). The months of December, January, and February (DJF) or northeast monsoon locally known as “Amihan” season have low temperature increases ranging from 25.4 ºC to 26.4 ºC (1.0 ºC increase).

Similar months (JJA) will also have the highest increase in temperature from 2036 to 2065 which will reach a total temperature of 29.3 ºC (4 ºC increase).

Tropical Cyclones

The Philippines experiences an average of 20 typhoons every year. Most of these typhoons passed through Luzon and Visayas. Since Mindanao is situated in the southernmost rim of the Philippine typhoon belt, it only received 11 typhoons over a 20-year period that occur mostly in the months of March, November, and December. There were six (6) typhoons that brought devastation to the municipality.

Local Micro-Climate

The proposed expansion of the Project is not expected to initiate or cause any significant change of microclimate. Existing climatological and meteorological conditions, as indicated by PAGASA data, will remain unaffected. The current port operations have not impacted local weather patterns; therefore, the planned modifications are likewise not anticipated to result in climatological changes.

7.1.9 Contribution in Terms of Greenhouse Gas Emissions

Greenhouse gases (GHGs) are atmospheric gases that trap heat by preventing the escape of infrared radiation from the Earth's surface, thereby contributing to global warming. When present in excessive concentrations, GHGs intensify climate change effects—raising global temperatures, influencing storm and rainfall patterns, and increasing the risk of sea level rise and extreme weather events such as storm surges.

The primary GHGs include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and chlorofluorocarbons (CFCs). While these gases play a crucial role in maintaining a habitable climate, elevated levels—especially since the Industrial Revolution—have led to widespread climate disruptions. Among them, CO_2 is the most significant due to its high emission volume and long atmospheric lifespan.

Given the global nature of climate change, the most relevant reference for national GHG emissions is the inventory submitted by the Philippine Climate Change Commission to the UNFCCC in 2004, as presented in Table 7-6.

Table 7-6 Philippine GHG Emissions in Gg (2000) Based on the latest submission by the Philippine Government to UNFCCC

Sector	CO_2, Gg	CH_4, Gg	N_2O, Gg	*CO_2eEmission,Gg
Energy	62,499.10	304.14	2.52	69,667.24
Industrial Processes	8,604.74	0.24	-	8,609.78
Agriculture	-	1,209.79	37.41	37,002.69
LUFC	(104,040.29)	(46.28)	(0.32)	(105,111.37)
Waste	-	500.67	3.50	11,599.07
Totals	(32,936.45)	1,968.56	43.11	21,767.41

CH4 GW Potential – 21; N_2O GW Potential-310; * - CO_2 + (CH4*21) + (N_2O*310)

Climate change phenomenon as induced by GHG emissions needs to be reckoned from the global context. Thus, in assessing the local/site specific contribution in terms of greenhouse gases, the Philippine inventory should serve as the starting point/basis for an evaluation of a project. The Philippine GHG inventory based on the 2nd NFCC and on global inventory records are shown below.

Notwithstanding the micro contribution of the project to GHG emissions, the Company will undertake the following initiatives to help mitigate global climate change, while at the same time providing cobenefits to the project:

Greenhouse gases come from all sorts of everyday activities, such as using electricity, heating our homes, and driving around town. The principal forcing greenhouse gases are; 1) Carbon Dioxide (CO_2), 2) Methane (CH_4), 3) Nitrous Oxide (N_2O) and 4) Fluorinated Gases. The principal greenhouse gases that enter the atmosphere because of human activities are emitted into the atmosphere by the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). This is removed from the atmosphere (or —sequestered‖) when absorbed by plants as part of the biological carbon cycle.

The proposed expansion of the port is expected to result in minimal greenhouse gas (GHG) emissions. During construction, emissions will primarily originate from heavy equipment and delivery trucks. In the operational phase, vehicular traffic entering and exiting the facility serves as the main emission source, while standby generators—used only during power interruptions—contribute marginally. Overall, the project is not anticipated to generate significant air pollutants.

An emission-reduction strategy was recently started, operating exclusively on solar power during daylight hours. The Mindanao Container Terminal (MCT) started sourcing solar power on February 14, 2025 under a retail supply contract with PrimeRES Energy Corporation within the Philippine energy department's Retail Competition and Open Access (RCOA) framework. MCT will use solar power generated by PrimeRES's solar power supply during daylight hours. At night, the terminal will draw power from PrimeRES's supply portfolio including the Wholesale Electricity Sport Market (WESM), ensuring 24/7 energy supply. This hybrid solution maximizes the use of renewable energy while maintaining operational stability.

7.1.10 Air Quality and Noise

Ambient air quality and noise level monitoring were conducted to establish baseline environmental conditions within the Project area. The assessment was undertaken in accordance with the provisions of Department Administrative Order (DAO) 2013-13 and subsequently reaffirmed in DAO 2020-14. The validated results of the air quality and noise monitoring are expected to be available by the end of January 2026 and will be incorporated into this ESIA upon finalization, including any necessary updates to the impact assessment and corresponding mitigation and monitoring measures.

Ambient Air Quality

Table 7-7 Ambient Air Quality Monitoring Results

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.t	Sep.	Oct.	Nov.	Dec.
Air Qualit y (PM2.5), $\mu g/m^3$	13	21	17	11	12	25	22	20	21	17	12	14

Based on the results of ambient air quality monitoring, the recorded concentrations of fine particulate matter ($PM_{2.5}$) ranged from 11 $\mu g/m^3$ in April to 25 $\mu g/m^3$ in June, with most monthly values falling between 12 $\mu g/m^3$ and 22 $\mu g/m^3$and an approximate annual average of about 17–18 $\mu g/m^3$. When compared with the DENR Provisional National Ambient Air Quality Guideline Values for $PM_{2.5}$ under DAO 2020-14, which set the short-term (24-hour) limit at 35 $\mu g/m^3$ and the long-term (annual) limit at 25 $\mu g/m^3$, all measured concentrations are within the allowable limits. Even the highest observed value of 25 $\mu g/m^3$ in June remains compliant with the DENR annual guideline, while all monthly values are well below the 24-hour standard of 35 $\mu g/m^3$. This indicates that ambient $PM_{2.5}$ levels in the monitoring area meet national air quality standards throughout the year, reflecting generally good air quality conditions with respect to fine particulate matter.

Additionally, the monitored $PM_{2.5}$ concentrations were compared against the World Bank Group / WHO Ambient Air Quality Guidelines. All observed monthly $PM_{2.5}$ values (11–25 $\mu g/m^3$) are below the WHO 24-hour guideline value of 25 $\mu g/m^3$ and are within the interim target levels, indicating compliance with international good practice for ambient air quality in industrial settings.

Ambient Noise Level

Ambient noise standards applicable to the project area are governed by the National Pollution Control Commission (NPCC) Memorandum Circular No. 002, Series of 1980, specifically Section 78 – Ambient (Noise) Quality and Emission Standards for Noise. This regulation prescribes the maximum allowable noise levels in various general areas, with limits differentiated according to land use classification (e.g., residential, commercial, industrial) and time of day (daytime and nighttime periods).

Table 7-8 Environmental Quality Standards for Noise in General Areas, NPCC 1978

Category	Maximum Allowable Noise (dBA) by Time Periods		
	Daytime	Morning/Evening	Night time
AA	50	45	40
A	55	50	45
B	65	60	55
C	70	65	60
D	75	70	65

Note:** [1]**Class AA** - a section of contiguous area, which requires quietness, such as areas within 100 meters from school sites, nursery schools, hospitals and special houses for the aged; **Class A**- a section of contiguous area,* *which is primarily used for residential areas;* ***Class B *– a section or contiguous area, which is primarily a commercial area;* ***Class C*** *– a section primarily zoned or used as a light industrial area and* ***Class D*** *– a section, which is primarily reserved, zoned or used as a heavy industrial area. [2]* ***Morning*** *- 5:00 A.M. to 9:00 AM;* ***Daytime*** *- 9:00 A.M. to 6:00 P.M;* ***Evening*** *- 6:00 P.M. to 10:00 P.M.;* ***Night time*** *- 10:00 P.M. to 5:00 A.M.*

Table *7-9* presents the measured monthly ambient noise levels in comparison with the applicable classification under the Philippine Ambient Noise Standards prescribed in NPCC Memorandum Circular No. 002, Series of 1980 (Section 78 – Ambient Noise Quality and Emission Standards for Noise).

Based on the land-use characteristics of the project area, which is situated within and adjacent to port and light-industrial facilities, the applicable noise classification corresponds to a Class C (light industrial/commercial) area. The monitored noise levels ranged from 62.9 dB in September to 75.1 dB in December, with most monthly values between 64 and 73 dB.

These levels are generally consistent with the maximum allowable daytime noise limits for Class C areas under the NPCC standards, indicating that the prevailing acoustic environment remains within acceptable regulatory thresholds for a light-industrial setting.

As reflected in the monthly variations, higher readings recorded during certain months (e.g., May, July, August, and December) are likely attributable to intermittent operational activities, vehicular movement, and other port-related or urban sources, while lower values observed in months such as September and January reflect relatively reduced activity levels.

Overall, the results indicate that existing ambient noise conditions in the project area are typical of a working port and light-industrial environment and do not exhibit persistent exceedances of the applicable Philippine ambient noise standards.

Table 7-9 Ambient Noise Level Monitoring Results

	Jan.	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**	**Jul.**	**Aug.t**	**Sep.**	**Oct.**	**Nov.**	**Dec.**
Noise, db	64.1	64.4	65.6	69.6	70.8	65.2	71.9	72.6	62.9	67.2	70.6	75.1
World Bank Noise Level Guidelines	70	70	70	70	70	70	70	70	70	70	70	70
Diff	5.9	5.6	4.4	0.4	-0.8	4.8	-1.9	-2.6	7.1	2.8	-0.6	-5.1

Measured monthly ambient noise levels at the Project Site range from **62.9 to 75.1 dB(A)** and are generally **within or near the World Bank/IFC EHS Guideline value of 70 dB(A)** applicable to industrial and commercial areas. **Occasional exceedances** observed in some months likely reflect periods of higher port activity and do not indicate persistent deviation from good international industry practice for an operating port environment.

7.2. Biological Environment

7.2.1 Terrestrial Ecology

7.2.1.1 Municipal Terrestrial Ecosystem Context (Tagoloan)

Based on the Tagoloan Comprehensive Land Use Plan (CLUP) CY 2017-2027 and supporting data from DENR–PENRO Misamis Oriental, the terrestrial environment of Tagoloan Municipality is characterized by a combination of forestlands, agricultural areas, grasslands and shrublands, and built-up/industrial zones.

Tagoloan has a total land area of approximately 8,535.79 hectares, of which about 1,802.38 hectares (21.12%) are classified as forestland, while 6,733.41 hectares (78.88%) are classified as alienable and disposable lands. Forestlands are primarily concentrated in the upland barangays, including Casnglot, Natumolan, Sta. Ana, and Tagpangi–Malitbog, where they provide important terrestrial ecosystem services such as soil stabilization, watershed protection, erosion control, and regulation of surface runoff.

The CLUP indicates that only a small portion of forestlands (61.52 hectares or approximately 3.41%) is covered by formal tenure instruments, specifically a Forest Land Grazing Management Agreement (FLGMA) located in Barangay Casnglot. The remaining open-access forestlands (approximately 1,740.86 hectares) are subject to development pressure and degradation risks, including encroachment and land conversion, particularly in areas experiencing population growth.

7.2.1.2 Terrestrial Vegetation Types

Outside of forestlands, the terrestrial landscape of Tagoloan includes agricultural lands, grasslands, shrublands, and secondary vegetation, particularly in transitional zones between upland forest areas and lowland settlements. These areas are typically characterized by mixed cultivation, fallow lands, and regenerating vegetation, reflecting long-term human use and land conversion.

Within built-up and industrial zones, terrestrial vegetation is generally limited to managed green spaces, roadside vegetation, and landscaped areas, with minimal ecological complexity and low biodiversity value.

7.2.1.3 Project Site Terrestrial Ecology

The Mindanao International Container Port (MICP) Project Site is located entirely within the PHIVIDEC Industrial Estate, a long-established industrial and port development zone along Macajalar Bay. The Project footprint occupies reclaimed and engineered land that has been historically designated for industrial and port use under national and local land use plans.

Within the Project Site and its immediate terrestrial surroundings:

- No forestlands or forest tenure areas occur within or adjacent to the Project footprint;
- No natural terrestrial habitats are present, as the area has been extensively modified through reclamation, construction, and long-term port operations;

- Terrestrial vegetation is limited to maintained landscaping, grassed areas, and scattered ornamental or ruderal plant species typical of industrial estates.

The nearest forest ecosystems identified in the Tagoloan CLUP are located in upland barangays several kilometers inland and are ecologically disconnected from the Project Site by intervening industrial facilities, transportation infrastructure, and urban development.

7.2.1.4 Terrestrial Fauna

Consistent with the highly modified industrial setting, terrestrial fauna within the Project Site is expected to be limited to common, disturbance-tolerant species (e.g., small rodents, reptiles, and synanthropic bird species) typically associated with built-up environments. No habitat conditions suitable for forest-dependent or sensitive terrestrial species are present within the Project footprint.

From a terrestrial biodiversity perspective, the MICP Project Site is classified as a highly modified habitat with low ecological sensitivity. The Project does not overlap with:

- Forestlands or upland watershed protection areas;
  Tenured or open-access forest areas identified in the CLUP;
- Terrestrial protected areas, NIPAS sites, or ICCAs; or
- Areas identified for terrestrial biodiversity conservation or rehabilitation.

7.2.2 Marine Ecology Baseline

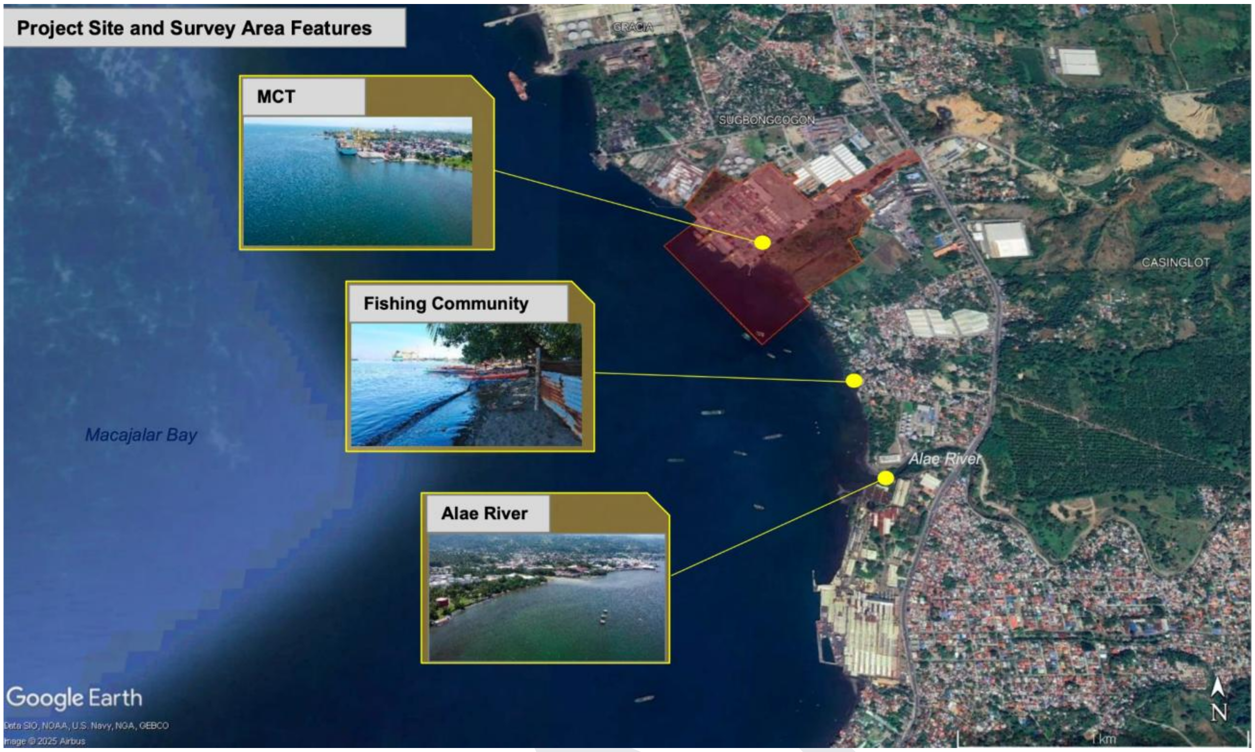


Figure 7-21 Project Site and Survey Area Features

7.2.1.1 Scope of Baseline Assessment for Marine Ecology

The Mindanao International Container Port (MICP), site of the proposed Wharf Enhancement Project, is located in Barangay Sugbongcogon, Tagoloan, Misamis Oriental, with Barangay Casinglot situated nearby. Both barangays lie along the coastal stretch of Macajalar Bay, where the Tagoloan River discharges freshwater, sediments, and nutrients that influence the ecological conditions of the nearshore zone.

The marine ecological baseline assessment was undertaken to establish a reference dataset of benthic habitats and associated marine resources. Surveys and spot dives were carried out to identify and characterize marine habitats such as tidal flats, sandy and muddy bottoms, scattered seagrass patches, coral reef communities, and associated plankton assemblages. Observations extended within a radius of 200 meters to 1 kilometer from the existing and proposed wharf facilities, allowing for direct inspection of benthic conditions, substrate types, and biological assemblages, while water column assessments provided information on plankton productivity and hydrological characteristics.

These ecosystems perform critical ecological functions such as shoreline stabilization, nutrient cycling, and provision of nursery habitats for fish, crustaceans, and mollusks. They are also directly linked to the small- scale fisheries practiced by coastal communities in Sugbongcogon and Casinglot, including hook-and-line fishing, net operations, and shellfish gleaning, which contribute to both subsistence and supplemental livelihoods.

Figure 7-22. Arial view of coastal community at barangay Casinglot (left) and Mindanao Container Terminal (right). September 6-7, 2025 (wet season)

7.2.1.2 Methodology

- **Manta tow**

A single manta tow transect was conducted along the nearshore shelf fronting Barangay Sugbongcogon and extending towards Barangay Casinglot to provide a broad reconnaissance survey of benthic habitats in Macajalar Bay. The primary objective of this method was to obtain wide-area visual information on the potential distribution of seagrass beds and coral reef communities across sandy flats and shallow substrates in the immediate impact area of the proposed wharf expansion.

The manta tow technique enabled rapid coverage of the coastal zone, generating preliminary baseline data on benthic conditions that may be influenced by future port development activities. Importantly, this approach is designed to describe the broader area of the seafloor, serving as an initial screening tool. Should significant patches of corals or seagrasses be identified during the tow, these areas will be subjected to more in-depth ecological assessments such as detailed transects, quadrat sampling, and photographic documentation to establish species composition, density, and overall health condition.

Table 7-10. Manta Tow Stations for Determination of the Presence of Seagrass and Coral Communities in the Nearshore Shelf of Brgy. Sugbongcogon and Brgy. Casinglot, Tagoloan, Misamis Oriental

Transect Segment	**Latitude (N)**	**Longitude (E)**
Start	8.5162917 N	124.7522266 E
Start–T01	8.5171933 N	124.7519757 E
T01–T02	8.5188796 N	124.7514649 E

T02–T03	8.5188796 N	124.7514649 E
T03–T04	8.5196430 N	124.7509249 E
T04–T05	8.5204063 N	124.7505101 E
T05–T06	8.5202918 N	124.7495838 E
T06–T07	8.5204683 N	124.7486817 E
T07–T08	8.5207832 N	124.7478664 E
T08–T09	8.5213604 N	124.7471433 E
T09–T10	8.5221047 N	124.7466704 E
T10–T11	8.5229489 N	124.7463084 E
T11–T12	8.5235060 N	124.7455567 E
T12–T13	8.5243647 N	124.7453443 E
T13–EndTow	8.5248194 N	124.7446053 E

- **Spot dives**

A total of four spot dives were undertaken in front of the project site to validate benthic conditions in areas not fully covered by manta tow surveys. The purpose of the dives was to confirm the presence or absence of coral reef communities and seagrass beds in deeper sections of the coastal shelf and to provide supplemental information on benthic conditions and substrate characteristics.

Table 7-11. Coordinates of Spot Dives during the Baseline Assessment, Barangays Sugbongcogon and Casinglot, Tagoloan, Misamis Oriental

Code	Latitude	Longitude	Remarks
SPD1	8.5232953 N	124.7452911 E	26.8meters water depth
SPD2	8.5199995 N	124.7446023 E	29.8 meters
SPD3	8.5196517 N	124.7477902 E	29.8 meters
SPD4	8.5188731 N	124.7509832 E	13 meters

- **Seagrass Monitoring**

Seagrass monitoring will follow the McKenzie (Seagrass-Watch) protocol for field procedures and data capture, with percent-cover results reported using the Braun–Blanquet cover–abundance scale. Fixed transects will be established in shore-parallel or shore-perpendicular orientation as dictated by site geometry, with 0.25 m² quadrats placed at set intervals. Within each quadrat, percent cover will be estimated as a continuous value from 0 to 100 using photo standards, and the following attributes will be recorded: species composition, leaf length, substrate type, tide stage, water depth, GPS coordinates in N and E format, and photo identifiers. Observer calibration will be conducted at the start of each survey day to standardize visual estimation. Monitoring rounds will be repeated in the same season and tidal window to ensure temporal comparability, after which continuous percent covers will be binned to Braun–Blanquet classes for reporting and mapping.

Table 7-12. Braun–Blanquet scale used (cover–abundance)

Code	Description	Percent cover guide
0	Absent	0%
0.1	Solitary, negligible cover	<1%
0.5	Few, small cover	<1%
1	Many, small cover	<5%
2	Any cover	5–25%
3	Any cover	25–50%
4	Any cover	50–75%
5	Any cover	75–100%

- **Offshore and nearshore fisheries**

Fisheries resources were assessed using two complementary approaches: rapid appraisal through Key Informant Interviews (KIIs) with local fishers and leaders, and field-based experimental/actual fishing surveys.

The Fisheries Rapid Appraisal via KIIs documented the types of fishing gears used (e.g., hook-and-line, gill nets, beach seines), target species, bycatch, catch composition, and seasonal fishing trends within the municipal waters of Sugbongcogon and Casinglot. These interviews provided insights on fishing practices, productivity levels, and local perceptions of resource availability, which are critical for contextualizing ecological findings with socio-economic activities.

In parallel, Fish Biota surveys were carried out through experimental fishing and actual catch observation to validate reported catch composition and gear performance. These stations were strategically located within the nearshore waters adjacent to the project site.

Table 7-13 *Coordinates of Fish Biota Assessment Stations during the Baseline Survey, Barangays Sugbongcogon and Casinglot, Tagoloan, Misamis Oriental.*

Code	**Latitude**	**Longitude**	**Remarks**
Fisherman1	8.5168672 N	124.7459578 E	Experimental Fishing; 4 hours fishing duration from 5;00AM to 9:00 AM
Fishman2 and Fisherman 3	8.5237284 N	124.7456097 E	Actual Fishing; 2 fisherman using simple handline; 7.5 hours fishing duration from 4 AM to 11:30 AM.

2.3.5. Macroinvertebrates

Macroinvertebrate sampling was conducted in the nearshore waters of Barangays Sugbongcogon and Casinglot to document benthic invertebrate communities that play important roles in coastal ecosystem functioning. Two stations were established offshore at depths ranging from 26–29 meters, while one station was placed along the beach coast to capture intertidal macroinvertebrate occurrence. Sediment samples were collected using hand trowel and sieved through a metal mesh to separate live specimens from silt, sand, and shell fragments. Collected organisms were identified and documented in the field for preliminary assessment, with representative specimens preserved for laboratory verification.

Table 7-14. Coordinates of Macroinvertebrate Sampling Stations during the Baseline Survey, Barangays Sugbongcogon and Casinglot, Tagoloan, Misamis Oriental.

Code	Latitude	Longitude	Remarks
Mac1	8.5196517	124.7477902	Grab and hand trowel collection at 29.8 meter; silt to muddy benthos
Mac2	8.5232953	124.7452911	Grab and hand trowel collection at 26.2 meter; silt to muddy benthos
Mac3	8.5165354	124.7526343	Beach coast near along fishing village community in Brgy. Casinglot

- **Plankton Community**

Plankton assessment was undertaken to characterize the composition and abundance of phytoplankton and zooplankton in the waters directly adjacent to the project site. Three sampling stations were established within the nearshore zone of Barangays Sugbongcogon and Casinglot, corresponding to areas where spot dives were also conducted. At each station, ten 1-liter surface water samples were collected and composited to represent the plankton population. Phytoplankton samples were preserved in Lugol's iodine solution, while zooplankton, if present, were preserved in 10% buffered formalin. Laboratory analysis involved both qualitative and quantitative methods, with enumeration carried out using a

Sedgwick–Rafter counting chamber. Phytoplankton were identified to the lowest possible taxonomic level, generally up to genus, using a compound microscope and standard identification keys.

Table 7-15. Coordinates of Plankton Sampling Stations during the Baseline Survey, Barangays Sugbongcogon and Casinglot, Tagoloan, Misamis Oriental.

Code	Latitude	Longitude	Remarks
MW1	8.5196517 N	124.7477902 E	Water depth 29.8 meter; hauling depth 10m
MW2	8.5199995 N	124.7446023 E	Water depth 29.8 meter; hauling depth 10m
MW3	8.5232953 N	124.7452911 E	Water depth 26 meter; hauling depth 10m

- **Information Gathering on Occurrence of Megafauna**

Key Informant Interviews (KII) with fisherfolk from Barangays Sugbongcogon and Casinglot reported intermittent sightings of pods of dolphins approximately ten (10) kilometers from the shoreline within Macajalar Bay over the past five years, but no specific year was mentioend. These sightings were described as involving feeding activity and transient movement within the wider bay area, rather than localized or repeated use of specific nearshore areas.

During the baseline period, no sightings of dolphins, whale sharks, large whales, dugongs, or marine turtles were reported within the immediate nearshore Project footprint. While a dolphin stranding was reported in a nearby barangay outside the Project area, no strandings or direct observations of marine megafauna have been recorded within the Project footprint to date.

The baseline assessment relies primarily on key informant interviews with local fisherfolk who have long-term familiarity with fishing grounds and nearshore conditions in Macajalar Bay. The consistency of responses across multiple informants, combined with the absence of reported sightings within the Project footprint and the spatial separation of reported observations from the nearshore area, provides reasonable confidence in the reliability of the data for baseline characterization. While interview-based data are inherently qualitative and may not capture rare or transient occurrences, they are considered appropriate for identifying regular presence, critical habitat use, or recurring interactions with the Project area.

Based on the available information, marine megafauna presence in Macajalar Bay is considered occasional and largely confined to offshore or wider bay areas, with no evidence of regular use, critical habitat, breeding grounds, or established migratory pathways within the Project footprint.

7.2.1.3 Results of Marine Ecology Baseline

- **Manta Tow Results**

A single manta-tow transect with a total length of 1,399 meters was completed along the nearshore of Barangays Sugbongcogon and Casinglot under fair sea and weather conditions. For security and safety, towing was confined to a corridor between fifty and one hundred meters from the existing Mindanao Container Terminal wharf.

At the starting point of the tow, directly in front of the coastal community and residential shoreline, a seagrass patch was observed. Patchy seagrass occurred within the inner three segments near the shoreline. Across all observable segments, no live hard coral, no soft coral, no dead coral, and no dead coral with algae were recorded. Where the seabed was visible, bottom type was dominated by unconsolidated sand and silt with minor hard bottom or rubble. The mean cover of coral rubble or rock was approximately 4.67 percent and the mean cover of sand or silt was approximately 35.33 percent. Substrate character graded from coarse to fine sand in mid-nearshore segments to fine sand and mud farther seaward. From the mid-transect outward, several consecutive segments registered deep water with no bottom visible, and the outer end was characterized by turbid conditions.

Intermittent discoloration of the water surface was observed along the transect. The water appeared brown in some sections, yellowish in others, with areas of dark brown and stretches of dark red toward the outer portions.

The berth area in front of the wharf is dredged and leveled, producing an abrupt drop in depth toward the basin. This engineered morphology places portions of the transect beyond the depth range that can be visually assessed by manta tow and accounts for the deep-water and no-observation segments recorded near the wharf face. Based on the completed track, the surveyed corridor depicts a sand- and silt-dominated nearshore with localized seagrass patches nearshore at the starting point in front of the coastal community and no measurable coral community within the limits of visibility.

Table 7-16. Manta tow transect conducted in the coastal impact area fronting the nearshore of Brgys. Sugbongcogon and Casinglot, Tagoloan, Misamis Oriental.

Item	Description
Site Name	MCT and nearshore of Brgys. Subongcogon & Casinglot, Tagoloan, Misamis Oriental
Date / Time	06 August 2025 (wet season) / 09:00 AM (tow start)
Tow Speed	3.0 km/h (average)
Visibility	±8–10 m
Weather	Sunny and fair
Wave	Rolling crests of approx. ±10 cm
Current	None
Tide	Slightly rising (flood); reference: Cagayan de Oro – Macabalan Wharf, Misamis Oriental (NAMRIA WXTide)
Water Temperature	Approx. ±29–30 °C
Wind Speed	Beaufort Scale #2
Cloud Type(s)	Cumulus clouds
Observers	Mark Joseph G. Culaste and Saturnino P. Miano Jr.

Transect Segment	Latitude	Longitude	LHC	SC	DC	DCA	R	S	Remarks
Start	8.5162917 N	124.7522266 E	0	0	0	0	25	75	Seagrass patches
Start–T0 1	8.5171933 N	124.7519757 E	0	0	0	0	25	75	Seagrass patches
T01–T02	8.5188796 N	124.7514649 E	0	0	0	0	20	80	Seagrass patches
T02–T03	8.5188796 N	124.7514649 E	0	0	0	0	0	100	Coarse sand to fine sand
T03–T04	8.519643 N	124.7509249 E	0	0	0	0	0	100	Coarse sand to fine sand
T04–T05	8.5204063 N	124.7505101 E	0	0	0	0	0	100	Fine sand to muddy
T05–T06	8.5202918 N	124.7495838 E	0	0	0	0	0	0	Deep water; No observation
T06–T07	8.5204683 N	124.7486817 E	0	0	0	0	0	0	Deep water; No observation
T07–T08	8.5207832 N	124.7478664 E	0	0	0	0	0	0	Deep water; No observation
T08–T09	8.5213604 N	124.7471433 E	0	0	0	0	0	0	Deep water; No observation
T09–T10	8.5221047 N	124.7466704 E	0	0	0	0	0	0	Deep water; No observation
T10–T11	8.5229489 N	124.7463084 E	0	0	0	0	0	0	Deep water; No observation
T11–T12	8.523506 N	124.7455567 E	0	0	0	0	0	0	Turbid water
T12–T13	8.5243647 N	124.7453443 E	0	0	0	0	0	0	Turbid water
T13–End Tow	8.5248194 N	124.7446053 E	0	0	0	0	0	0	Turbid water
Average benthic composition			0	0	0	0	4.67	35.33	Coarse sand to fine sand

Legend (Benthic Categories) Live hard coral (LHC) – coverage of stony or hard corals on the bottom or part of the bottom Live soft coral (SC) – coverage of soft corals attached to the bottom Dead coral (DC) – recently dead coral still attached and recognizable at the bottom in original upright position, coral usually white with no living tissue Dead coral with algae (DCA) – coralites still visible, skeletal structure can still be seen but algae dominate the structure (often appears greenish to brownish) Coral rubble / rock (R) – loose broken fragments of stony corals, consolidated hard bottom or large blocks of hard reef materials not attached or easily moved around Sand / silt (S)

- **Spot Dive Results**

Two divers conducted spot dive surveys at four nearshore stations within and adjacent to the proposed wharf enhancement footprint to validate whether the area inside the enhancement works is devoid of corals or has any coral presence. Recorded depths were 26.8 meters at SPD1, 29.8 meters at SPD2, 29.8 meters at SPD3, and 13 meters at SPD4. Across all stations the seabed was uniformly sandy to muddy, with unconsolidated sand grading to silt. No live hard corals, no soft corals, no coral framework, and no seagrass beds were observed at any station.

Table 17 Spot dive results

CODE	***Latitude***	***Longitude***	***Depth (m)***	**LHC**	**SC**	**DC**	**DCA**	**R**	**S**	***Remarks***
SPD1	*8.5232953 N*	*124.745291 E*	*26.8*	0	0	0	0	0	100	*Coarse sand to fine sand*
SPD2	*8.5199995 N*	*124.744602 E*	*29.8*	0	0	0	0	0	100	*Coarse sand to fine sand*
SPD3	*8.5196517 N*	*124.74779 E*	*29.8*	0	0	0	0	0	100	*Coarse sand to fine sand*
SPD4	*8.5188731 N*	*124.750983 E*	*13*	0	0	0	0	0	100	*Coarse sand to fine sand*

Live hard coral (LHC) - coverage of stony or hard corals on the bottom or part of the bottom Live soft coral (SC) - coverage of soft corals attached to the bottom
Dead coral (DC) - recently dead coral still attached and recognizable at the bottom in original upright position, color usually white with no living tissue
Dead coral with algae (DCA) - corallites still visible, skeletal structure can still be seen but algae dominate the structure (often appears greenish to brownish)
Coral rubble/rock (CR) - loose broken fragments of stony corals, consolidated hard bottom


Figure 7-23. SCUBA Diver on sandy bottom (left), and fine sand to silt bottom substrate (right).

Figure 7-24. Location of Manta Tow Transects inside and outside of project site. September 6, 2025 (wet season)

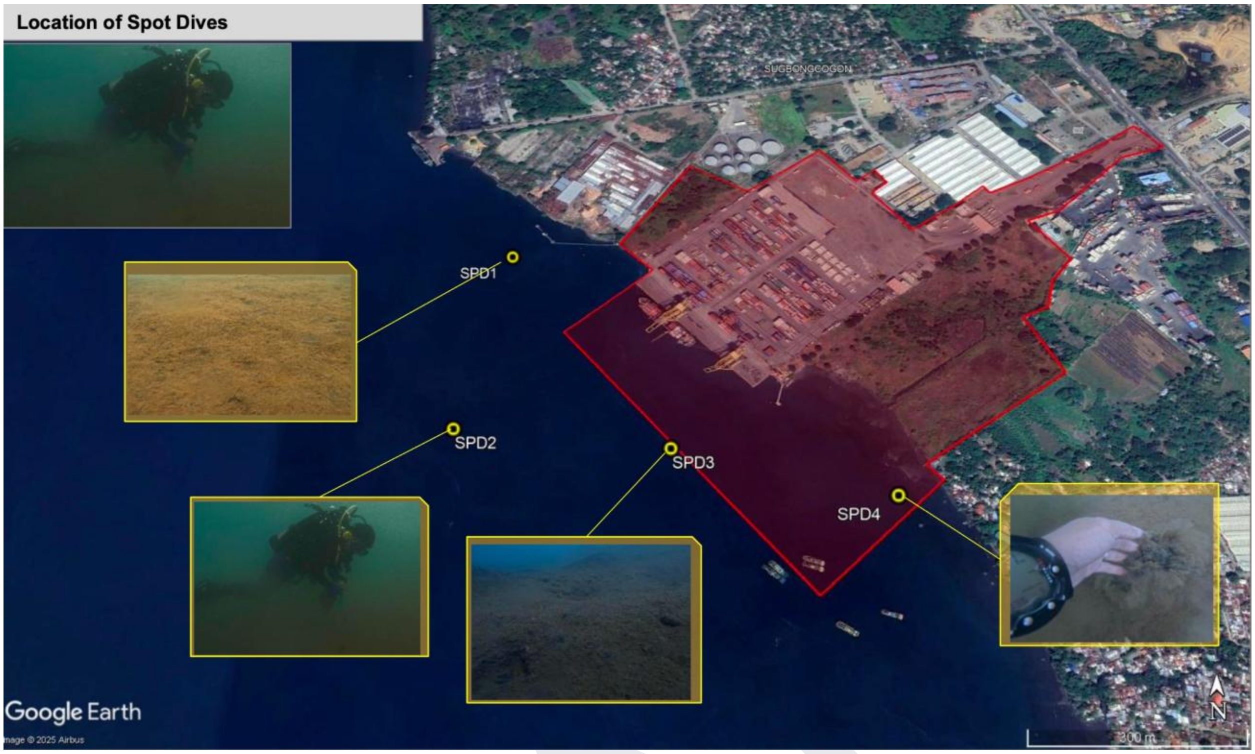


Figure 7-25 Location of Spot Dive Stations inside and outside of project site. September 6-7, 2025 (wet season)

- **Mangrove Results**

The coastline adjacent to the project site at the Mindanao Container Terminal, covering the nearshore of Barangays Sugbongcogon and Casinglot, is devoid of mangrove stands. No existing mangrove forest and no wide-area mangrove vegetation were noted within the project footprint or within an approximate radius of 200 to 500 meters from its perimeter. Along the coastal community, beach vegetation consists of talisay trees and associated coastal trees, with scattered ornamental and ruderal plantings typical of developed shorelines.

- **Seagrass**

Monitoring recorded a monospecific seagrass meadow of Cymodocea rotundata with a mean leaf length of about 6 cm. Seagrass occurred only within the 0–15 m belt from shore on all three shore-parallel transects and was absent from 20–50 m. Non-zero cover was confined to the 5 m, 10 m, and 15 m quadrats. The highest point cover was 55% at T1–10 m.

Integrated over the full 0–50 m profiles, average percent cover was 10.0% on T1, 1.82% on T2, and 1.36% on T3, with an overall mean of 4.39% across all 33 quadrats. Seagrass was recorded in 9 of 33 quadrats. Assigning Braun–Blanquet cover–abundance classes to percent cover values shows that the meadow is dominated by Class 2 (5–25%) occurrences, with isolated higher-cover quadrats on T1.

Table 7-18. Braun–Blanquet class distribution for Cymodocea rotundata

Transect	Quadrats with seagrass (n/11)	Distance band with seagrass	Classes observed (counts)	Modal class
T1	3	5–15 m	Class 2 ×1; Class 3 ×1; Class 4 ×1	—
T2	3	5–15 m	Class 2 ×3	Class 2
T3	3	5–15 m	Class 2 ×3	Class 2
All	9/33	5–15 m	Class 2 ×7; Class 3 ×1; Class 4 ×1	Class 2

The dataset describes a narrow, patchy nearshore meadow limited to the inner 15 m of the profile, with low overall cover and a Class 2 dominance where seagrass is present. Localized higher cover on T1 (Classes 3 and 4) indicates small patches of denser C. rotundata, while T2 and T3 exhibit uniformly low cover at their seagrass points. The uniform absence of seagrass beyond 15 m defines the outer limit of the meadow within the surveyed corridor during the sampling period. All substrate type is coarse sand to fine sand.

- **Marine Megafauna**

Key informant interviews with fisherfolk from Barangays Sugbongcogon and Casinglot reported intermittent sightings of pods of dolphins approximately three to eight kilometers from the shoreline within Macajalar Bay over the past five years. These sightings were described as involving feeding and transient movement within the wider bay area.

No sightings of dolphins, whale sharks, large whales, dugongs, or marine turtles were reported within the immediate nearshore footprint during the baseline period. A dolphin stranding was reported in a nearby barangay outside the Project area, however, no strandings have been recorded within the project footprint to date.

Based on available interview-based information, marine megafauna presence is considered occasional and limited to the wider Macajalar Bay, with no evidence of resular use, critical habitat, or migratory pathways within the project footprint. As such, while the occasional occurrence of marine megafauna in the wider bay cannot be ruled out, interaction with the Project area is not expected.

Figure 7-26. Conduct of Key Informant Interview on the presence of Marine mega-fauna

- **Fish Biota Results**

Key informant interviews with fisherfolk leaders and active fishers in Barangay Casinglot indicate that fewer than fifty fishers are presently active. Fishing within the vicinity and immediately offshore is largely artisanal and oriented to household consumption. Operations use small motorized and non-motorized boats and rely mainly on hook and line gear, including simple handline and multiple handline. Based on interviews and field validation, Barangay Casinglot fishers primarily operate in coastal and offshore waters south of the Project Site, including areas near the Alae River mouth and toward Sugbongcogon, outside the immediate Mindanao Container Terminal (MCT) frontage. As shown in Figure X (Project Site and Survey Area Features), fishing activities occur beyond the Project's direct marine interface, while the MCT frontage forms part of an active navigation and port operations zone and is not a designated fishing ground.

Effort typically starts at 0400H and ends at 1200H. Interviewees reported trip catches between 0.5 and 2.0 kilograms. Goatfishes are the primary target, with bream, emperor fish, lizardfish, sardines, and occasional grouper also taken. Indicative beach prices are about ₱150 to ₱200 per kilogram depending on size and freshness. Interviews also recorded a change in livelihood, with many former full-time fishers doing bartering and small cargo transport to nearby industrial facilities including the Mindanao Container Terminal. A portion of residents work as crew in commercial fisheries operating beyond the fifteen kilometer municipal waters on purse seine, ring net, and tuna handline fleets.

Field observations of actual fishing were made in front of the Mindanao Container Terminal and in adjacent coastal waters. Most activity near the terminal occurred around the jetty where fishers report that fish aggregate near the pillars. Handline sets in this area produced bream Scolopsis spp., emperor fish Lethrinus spp., and occasional grouper Cephalopholis spp., together with goatfish Parapeneus heptacanthus and bandtail goatfish Upeneus taeniopterus. The experimental handline set in front of the terminal yielded 0.48 kilogram in 4 hours, which is a CPUE of 0.120 kilogram per fisher hour and a landed value of about ₱86.40 at ₱180 per kilogram. An actual set in the same frontage yielded 1.14 kilograms in 8 hours, which is a CPUE of 0.1425 kilogram per fisher hour and a value of about ₱205.20 at the same price.

A separate set undertaken near Barangay Sugbongcogon yielded 2.80 kilograms in 8 hours, which is a CPUE of 0.350 kilogram per fisher hour and a value of about ₱560.00 at ₱200 per kilogram. This set consisted largely of bigeye scad (Selar crumenophthalmus).

Comparison with interview information shows that catches from the Mindanao Container Terminal (MCT) frontage and jetty area, located within Barangay Sugbongcogon and within the Project's Direct Impact Area (water), fall within the lower end of the reported range of 0.5 to 2.0 kilograms per trip. Higher catches recorded from fishing grounds offshore of Barangay Sugbongcogon reflect the presence of schooling small pelagic species in more productive areas beyond the immediate port frontage. The species composition observed during field surveys is consistent with assemblages described by fishers for handline operations in the immediate coastal area. CPUE values confirm that fishing activity within the port frontage is low-yield and incidental, as these waters form part of an active navigation and port operations zone rather than designated fishing grounds. Accordingly, productive fishing grounds and fisherfolk livelihoods will not be affected by the Project.

Table 7-19. Fish catch composition, handline catch, effort, and indicative value from experimental and actual fishing in front of the Mindanao Container Terminal and nearby Brgy. Sugbongcogon.

Code	Fishing Gear	Common Name	Species	Pieces	Fishing hours	Weight (g)	Price/kg (₱)	Total Price (₱)	Remarks
Fisherman 1	Simple hand line	Bandtail goatfish	Upeneus taeniopterus	5	4	210	180	37.8	Front of MCT / Experimental fishing
		Goatfish	Parapeneus heptacanthus	4	4	270	180	48.6	Front of MCT / Experimental fishing
Fisherman 2	Simple hand line	Bream	Scolopsis spp.	3	8	150	180	27	Front of MCT
		Lizardfish	Saurida spp.	1	8	10	180	1.8	Front of MCT
		Sardines	Sardinella spp.	1	8	5	180	0.9	Front of MCT

		Emper or fish	Lethrinu s spp.	1	8	170	180	30.6	Front of MCT
		Goatfish	Parape n eus heptaca n thus	6	8	360	180	64.8	Front of MCT

Fisherm a n 3	Simple hand line	Goatfish	Parape n eus heptaca n thus	8	8	370	180	66.6	Front of MCT
		Grouper	Cephal o pholis spp.	1	8	25	180	4.5	Front of MCT
		Bream	Scolop si s spp.	2	8	50	180	9	Front of MCT
		Bigey e scad	Selar crumen o phthalm u s	17	8	2,800	200	560	Brgy. Sugbon gc ogon

Figure 7-27 Location of experimental fishing and observation of actual fishing and seagrass patch. September 6-7, 2025 (wet season)

- **Macro-Invertebrates**

During the sampling, offshore station Mac1 at approximately twenty-nine meters depth and offshore station Mac2 at approximately twenty-six meters depth yielded silt and mud. After sieving and filtering, no live macro invertebrates were recovered from either offshore station. At shoreline station Mac3 along the narrow sandy coast of Barangay Casinglot, two live hermit crabs from the family Paguridae were recorded. Empty shells of cowries and bivalves were also present at this shoreline station. Empty shells are physical remains and are not used in diversity calculations.

Computation of the Shannon–Wiener diversity index requires counts of live individuals by taxon for each station. The offshore stations have no live counts and the index cannot be computed there. The shoreline station has a single live taxon with two individuals, which gives a taxon richness of one and a proportional abundance of one. Under these conditions the Shannon–Wiener index equals zero and evenness is not defined for a single taxon sample.

Given the limited observation of live macro invertebrates during the sampling, particularly the absence of live fauna offshore and the single taxon recorded at the shoreline, the Shannon–Wiener index is not informative for this dataset and was not applied for comparative assessment across stations in this baseline.

- **Plankton Community**

Phytoplankton community

During the sampling, a noticeable discoloration of the surface water was recorded by the field team and in aerial drone imagery, appearing as brown, yellowish, dark brown, and dark red patches in the nearshore zone fronting the survey area. The discoloration was observed concurrently with turbid conditions described for several nearshore segments. Its specific cause was not established in this survey; the plankton results below characterize the water column during the same period.

The phytoplankton community in nearshore waters off Barangays Sugbongcogon and Casinglot was consistently diatom-dominated. Two chain-forming genera accounted for the majority of cells at every station. At MW1, Chaetoceros represented 46.18% and Bacteriastrum 34.03% of total abundance (~80% combined). At MW2, Bacteriastrum contributed 44.73% and Chaetoceros 29.90% (~75% combined). At MW3, Chaetoceros reached 49.53% and Bacteriastrum 28.53% (~78% combined). Thalassionema was a recurrent secondary diatom (≈1–7%). Dinoflagellates occurred at lower proportions, with Gymnodinium at 14.15% at MW1, 12.68% at MW2, and 5.64% at MW3, alongside minor Protoperidinium, Tripos, and other taxa. Pseudo-nitzschia was detected only at MW3 at 0.47%. Low counts of Dinophysis caudata and
D. fortii occurred at MW1, each <1%.

Shannon–Wiener diversity reflected this dominance by a few diatom genera: H′ = 1.29, J′ = 0.49 (MW1; 14 taxa), H′ = 1.46, J′ = 0.61 (MW2; 11 taxa), and H′ = 1.45, J′ = 0.56 (MW3; 13 taxa).
These values indicate moderate richness but uneven structure, typical of productive coastal waters where several diatoms dominate the assemblage.

From an environmental-indicator perspective, the prevalence of Chaetoceros, Bacteriastrum, and Thalassionema is characteristic of nutrient-influenced, well-mixed nearshore conditions. HAB-associated genera were present at trace to low densities: Pseudo-nitzschia at MW3 (1.40

cells L^{-1}; 0.47%) and Dinophysis spp. at MW1 (≤1.40 cells L^{-1}; ≤0.29%). Gymnodinium was recorded at all stations (≈17–69 cells L^{-1}) but remained a minor component relative to diatoms. No Alexandrium or Karenia were observed. Taken together with the diversity indices, the data indicate a non-bloom, diatom-dominated state during sampling, with HAB genera present but not proliferating and well below commonly reported bloom thresholds.

With respect to conservation status, these microalgal taxa are not assessed under the IUCN Red List; most are "Not Evaluated." For management and risk assessment, water-quality interpretation therefore relies on cell densities, community composition, and toxin surveillance rather than IUCN categories. The results provide a defensible baseline for a diatom-dominated nearshore community with low dinoflagellate contribution and only trace occurrences of HAB-relevant genera.

Zooplankton

Zooplankton counts were low at all three stations and comprised only a few neritic taxa. At MW1, the assemblage consisted solely of calanoid copepods with a count of six, indicating a simple community dominated by herbivorous grazers that typically exploit diatom-rich waters. At MW2, the catch totaled twelve individuals and was dominated by cirripede larvae with eight counts, while cladocerans contributed four counts, equivalent to about two thirds and one third of the sample respectively. At MW3, only three individuals were recorded, again led by cirripede larvae with two counts and calanoid copepods with one count, repeating the two-to-one pattern observed at MW2.

The presence of calanoid copepods at MW1 aligns with the diatom-dominated phytoplankton community documented at the same time, reflecting a typical grazer–producer linkage in nearshore waters. The dominance of cirripede larvae at MW2 and MW3 indicates active coastal reproduction and larval dispersal of barnacles in the vicinity of shoreline structures, including jetties and wharf pilings. Cladocerans at MW2 further point to a neritic, near-coastal signal often associated with stratified or mildly brackish surface layers.

Overall richness and abundance were low, with only one taxonomic group recorded at MW1 and two groups at MW2 and MW3. These results represent a point-in-time snapshot under calm conditions and should be interpreted as a minimal baseline rather than a full characterization of zooplankton variability. No gelatinous zooplankton or predatory forms were encountered during the sampling, and the assemblage is best described as a sparse, early-life-stage community typical of sheltered, infrastructure-adjacent coastal waters.

Table 7-20. Phytoplankton counts, cell densities, and relative abundance at stations MW1–MW3 MW1

Taxon (as recorded)	Count	Cell density (cells L^{-1})	Relative abundance (%)
Dinophysis caudata	3	1.40	0.29

Dinophysis fortii	2	0.93	0.19
Prorocentrum micans	3	1.40	0.29
Tripos spp.	12	5.60	1.15
Pyrophacus spp.[1]	6	2.80	0.57
Thalassionema spp.	13	6.07	1.24
Dictyocha spp.	2	0.93	0.19
Chaetoceros spp.	483	225.49	46.18
Ornithocercus spp.	3	1.40	0.29
Bacteriastrum spp.	356	166.20	34.03
Protoperidinium spp.	8	3.73	0.76
Asteromphalus spp.[2]	4	1.87	0.38
Hemiaulus spp.	3	1.40	0.29
Gymnodinium spp.	148	69.09	14.15
Total count	1,046		

Sample metadata: sample volume 264 mL; haul depth 10.0 m (1,000 cm); plankton net mouth area 706.86 cm^2; Vs = 565,488 (units as recorded).
MW2

Taxon (as recorded)	Count	Cell density (cells L^{-1})	Relative abundance (%)
Bacteriastrum spp.	395	181.61	44.73
Ornithocercus spp.	2	0.92	0.23
Protoperidinium spp.	29	13.33	3.28
Tripos spp.	11	5.06	1.25
Thalassionema spp.	42	19.31	4.76
Chaetoceros spp.	264	121.38	29.90
Coscinodiscus spp.	11	5.06	1.25

Asteromphalus spp.[2]	6	2.76	0.68
Oxytoxum spp.	2	0.92	0.23
Pyrophacus spp.[1]	9	4.14	1.02
Gymnodinium spp.	112	51.50	12.68
Total count	883		

Sample metadata: sample volume 260 mL; haul depth 10.0 m; plankton net mouth area 706.86 cm^2; Vs = 565,488 (units as recorded).
MW3

Taxon (as recorded)	Count	Cell density (cells L^{-1})	Relative abundance (%)
Pseudo-nitzschia spp.	3	1.40	0.47
Asteromphalus spp.[2]	13	6.05	2.04
Thalassionema spp.	45	20.93	7.05
Tripos spp.	10	4.65	1.57
Protoperidinium spp.	19	8.84	2.98
Pyrophacus spp.[1]	4	1.86	0.63
Chaetoceros spp.	316	146.97	49.53
Bacteriastrum spp.	182	84.65	28.53
Coscinodiscus spp.	3	1.40	0.47
Ornithocercus spp.	2	0.93	0.31
Podolampas spp.	2	0.93	0.31
Goniodoma spp.[3]	3	1.40	0.47
Gymnodinium spp.	36	16.74	5.64
Total count	638		

7.2.2 Freshwater Ecology

7.2.2.1 Scope of Baseline Assessment

This baseline is limited to the downstream reach of the Alae River in Barangay Casinglot, specifically from the Alae Bridge to the estuarine interface with Macajalar Bay. The selected reach lies approximately 900 meters from the MCT wharf enhancement area and represents the most hydrologically relevant freshwater input to the project frontage during the survey period. To ensure consistency, efficiency, and comparability, two common sampling stations were established and used for plankton, macro-invertebrates, and fish biota at the same coordinates.

The entire Alae River was not assessed; only the bridge-to-mouth corridor was surveyed to capture conditions most likely to influence the nearshore marine zone and to ensure safe, repeatable access for monitoring.

For context, the Tagoloan River was not included because it is approximately two kilometers from the project shoreline and exhibits minimal direct influence on the immediate MCT frontage relative to the Alae River. Coordinates for the two stations are provided in the accompanying station table and map figures.

Figure 7-28. Arial view of Alae River that connects to the Macajalar Bay

Table 3-1. Alae River downstream sampling stations and coordinates (plankton, macro-invertebrates, and fish biota)

Code	Latitude	Longitude	Remarks
RvrS1	8.5122016	124.753566	Sampling station: Plankton
RvrS2	8.5127896	124.756967	Sampling station: Macro-invertebrates; Fish biota

Figure 7-29. Location of river sampling stations for fish biota, macro-invertebrates and plankton community

7.2.2.2 Methodology

- **Fish biota**

Experimental fishing and actual fishing observations were not conducted in the downstream Alae River reach. Key informant interviews with Barangay officials and local residents indicated that no fishing practice currently exists in this section of the river and that the channel is consistently shallow, particularly at and below the bridge. Informants also reported no occurrence of significant fish or species typically targeted by fishers in the downstream area in recent years. In view of these conditions and the absence of commonly used river fishing gear appropriate to the site, the survey team decided not to undertake experimental fishing. The fish biota assessment therefore relied on direct visual observations at the designated stations, supported by anecdotal accounts from key informants, and CPUE metrics were not generated for this freshwater component.

- **Macro-invertebrates**

Macro-invertebrates were surveyed at two fixed stations within the downstream reach of the Alae River, namely RvrS1 immediately below the Alae Bridge and RvrS2 farther downstream toward the estuarine interface. Each station was visited under typical flow for the period, with date, time, recent rainfall, tide stage where applicable, and GPS coordinates recorded on the field datasheet. Sampling combined manual collection by handpicking and shallow core scoops, visual searches on submerged wood and stone, and fine-mesh kick-net or dip-net sweeps. Effort followed a consistent multi-habitat sweep that proportionally covered the dominant substrates present, including sand, mud, pebble and stone, submerged branches, and any marginal vegetation.

Based on actual sampling, no live riverine macro-invertebrate specimens were intercepted, collected, or recorded at RvrS1 or RvrS2. At RvrS1, secondary evidence consisted of empty cowrie shells from the family Cypraeidae, a sea urchin test from the class Echinoidea, cockle valves from the family Cardiidae, and oyster shells from the family Ostreidae. These remains indicate that shells and exoskeletons occur within the corridor during the survey period, but they do not confirm the presence of live populations at the stations. The significance of the result is limited because of the absence of live observations. Moreover, the location of RvrMac1 in a downstream reach means that river flow and tidal action can transport and deposit empty shells from upstream or adjacent areas. The findings of empty shells and exoskeletons are therefore considered indicative only and cannot be used to represent actual diversity or abundance at the sites.

7.2.2.3 Results

- **Plankton Community**

The freshwater plankton assemblage in the downstream Alae River was consistently diatom-dominated at both sampling stations. At FW1, located below the Alae Bridge, total cell density was about 2,354 cells L−1, with Chaetoceros comprising 60.83% (≈1,432 cells L−1), followed by Bacteriastrum at 24.52% (≈577 cells L−1) and Thalassionema at 8.28% (≈195 cells L−1); minor components were Tripos (2.87%), Thalassiosira (2.23%), Coscinodiscus (0.64%), and Dinophysis caudata at trace level (0.64%). At FW2, nearer the estuarine interface, total cell density was about 967 cells L−1 and the community was overwhelmingly dominated by Chaetoceros at 91.51% (≈885 cells L−1), with small contributions from Coscinodiscus (4.25%), Asteromphalus (3.47%), and Tripos (0.77%). HAB-associated genera were detected only at very low densities, with Dinophysis recorded at FW1 and absent at FW2. Overall, results indicate a non-bloom, diatom-dominated freshwater–estuarine corridor during the survey window and provide a defensible baseline for subsequent monitoring.

Table 7-21. Phytoplankton composition, cell density, and relative abundance at Alae River downstream stations RvrS1 (below Alae Bridge) and RvrS2 (near estuarine interface).

Species	RvrS1 Count	RvrS1 Cell Density (Cells/L)	RvrS1 Relative Abundance (%)	RvrS2 Count	RvrS2 Cell Density (Cells/L)	RvrS2 Relative Abundance (%)

Dinophysis caudata	4	15.00	0.64	–	–	–
Chaetoceros spp.	382	1,432.11	60.83	237	885.15	91.51
Bacteriastrum spp.	154	577.34	24.52	–	–	–
Thalassione m a spp.	52	194.95	8.28	–	–	–
Tripos	18	67.48	2.87	2	7.47	0.77
Coscinodisc u s spp.	4	15.00	0.64	11	41.08	4.25
Thalassiosira spp.	14	52.49	2.23	–	–	–
Asterumphal u s spp.	–	–	–	9	33.61	3.47
Total population	**628**			**259**		
Sample volume	**265**			**264**		
Hauling Depth in cm:	**100**			**Hauling Depth in cm:**	100	
Plankton net Area	**706.86**			**Plankton net Area**	706.86	
Vs=	**70686**			**Vs=**	70686	

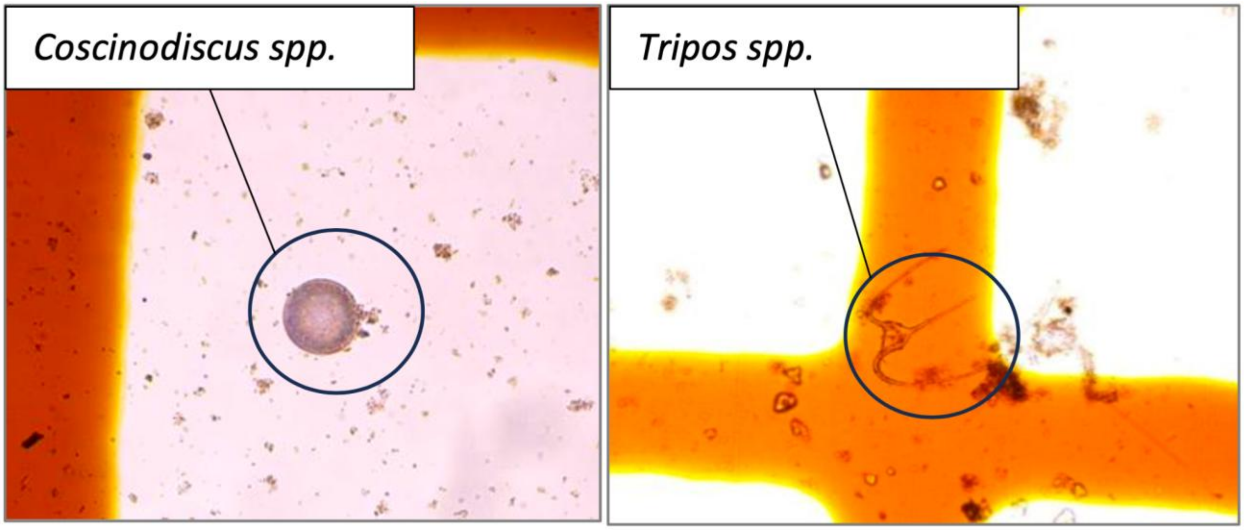


Figure 7-30. Phytoplankton observed in Alae River

- **Other Observations**

Based on key informant interviews and field observations at the riverine stations there were no freshwater megafauna observed during the survey period. The estuarine section did not support extensive mangrove stands and no significant mangrove vegetation was recorded. Adjacent land use is predominantly industrial complexes and residential areas, and the riverbanks along the assessed reach have been developed with concrete flood control walls. Surface water discoloration was noticeable during sampling, with hues ranging from yellowish to bright brown.

7.2.3 Coastal Ecosystem (Macajalar Bay and Tagoloan-VIllanueva Coastline)

Baseline information on the coastal ecosystem of Tagoloan and the adjacent municipality of Villanueva is drawn from coastal resource assessments conducted by Roa-Quiaoit (2008) and Roa-Quiaoit et al. (2008; 2010), which provide a comparative evaluation of coral reefs, seagrass beds, reef fish biomass, macro-benthic fauna, and mangroves within Macajalar Bay.

These assessments indicate that coral reef conditions along the Tagoloan coastline are generally degraded. In Tagoloan, hard coral cover was reported at approximately 16%, with dead coral cover reaching 62%, indicating a predominance of degraded reef structures. In contrast, Villanueva exhibited higher hard coral cover at 52%, although this represented a decline from earlier assessments (85% in 1998), suggesting progressive reef degradation over time. The mean hard coral cover for Macajalar Bay was reported at 38%, reflecting overall stressed reef conditions across the bay.

Degradation of coral reefs in Tagoloan has been attributed primarily to sediment loading from river systems draining into Macajalar Bay, with fine sediments smothering corals and degrading reef habitats, particularly near river mouths. This has implications for reef recovery potential and indicates strong land–sea interaction pressures within the bay.

In terms of reef fish biomass, Villanueva recorded 8.55 mt/km², while Tagoloan recorded 7.71 mt/km², both lower than the Macajalar Bay mean of 12.81 mt/km². Biomass of commercially important target reef fish species was relatively low in both municipalities, particularly in Villanueva (0.71 mt/km²), indicating potential overfishing pressure. Tagoloan exhibited a higher target species biomass (2.52 mt/km²), although still below regional benchmarks. Overall reef fish biomass classification for Tagoloan and Villanueva was assessed as low, compared to a medium classification for Macajalar Bay as a whole.

Seagrass cover within Tagoloan was reported at 21.4%, lower than Villanueva (37.9%) and the Macajalar Bay mean (25.1%), with seagrass species diversity indices comparable across sites. Seaweed cover in Tagoloan was notably low (1.2%) compared to Villanueva and the bay-wide mean. Macro-benthic fauna diversity and abundance in Tagoloan were also lower relative to bay-wide averages, further reflecting cumulative environmental stress.

Overall, the coastal ecosystem of Tagoloan is characterized by degraded coral reefs, reduced reef fish biomass, and moderate to low seagrass and benthic diversity, consistent with long-term anthropogenic pressures including sedimentation, coastal development, and fishing activities. These conditions form part of the broader ecological context of Macajalar Bay but are not indicative of high-quality or intact reef ecosystems in the immediate vicinity of the MICP site.

7.2.4 Mangroves Resources

Baseline information from the Tagoloan Comprehensive Land Use Plan (CLUP) indicates that mangrove resources within the municipality are limited in spatial extent and distribution and are primarily confined to the coastal areas of Barangays Baluarte and Casinglot, away from the industrial shoreline where the Mindanao International Container Port (MICP) is located.

Naturally occurring mangroves in Tagoloan consist mainly of Rhizophora species (bakhaw), with an estimated 400 standing individuals, and approximately 30 trunks of Sonneratia alba (pagatpat). Assessment data indicate that about 70% of the Rhizophora population is composed of mature trees, while Sonneratia alba exhibits a mix of young and mature growth stages. Mangrove seedling recruitment was reported to be limited, with stands dominated by saplings, flowering, and fruiting individuals.

In addition to natural stands, mangrove rehabilitation efforts have been implemented at the municipal level. Records from the Municipal Agriculture Office show that approximately 6,800 propagules of Rhizophora apiculata were planted over an area of about 6,800 square meters in Barangay Baluarte (Nabulod area) between 2014 and 2016. These initiatives were undertaken by various institutions, schools, civic organizations, and local government units as part of localized coastal rehabilitation programs. While these planted mangroves supplement natural stands, they remain fragmented and spatially narrow.

Mangrove areas in Tagoloan are typically associated with river mouths and sheltered estuarine environments, where they occur alongside nipa palms (Nypa fruticans) and beach forest species. They do not form extensive or continuous mangrove forests and are subject to long-standing anthropogenic pressures, including coastal development, riverbank modification, sedimentation, and land-use change. The species diversity index for mangroves in Tagoloan was reported at H′ = 0.56, lower than the Macajalar Bay mean, indicating relatively low diversity.

At the municipal level, the CLUP notes that coastal resource management (CRM) implementation remains constrained by limited institutional capacity, enforcement challenges, and the absence of specific municipal ordinances for mangrove protection and fisheries management. While support from national agencies and non-government organizations has enabled rehabilitation initiatives, sustained protection and management remain a challenge. The local government has identified the preparation of an Integrated Watershed Management Plan as a priority to address cumulative pressures on riverine and coastal systems and to align efforts with national and inter-LGU planning initiatives.

Importantly, no mangrove stands occur within or adjacent to the MICP Project footprint or its immediate Area of Influence. The Project site is located along a fully engineered and industrialized shoreline within the PHIVIDEC Industrial Estate, characterized by reclaimed land, reinforced quay walls, and long-standing port operations. There is no direct spatial overlap, hydrological linkage, or ecological connectivity between the Project site and the mangrove areas documented in Barangays Baluarte and Casinglot.

Accordingly, mangrove resources in Tagoloan are considered part of the broader municipal coastal biodiversity context, but they do not form part of the site-specific biological baseline for the MICP Project. Management and rehabilitation of these mangrove areas fall under municipal coastal and watershed management programs, rather than Project-specific mitigation or monitoring measures.

7.2.5 Critical Habitat Screening

7.2.5.1Purpose and Regulatory Context

This Critical Habitat Assessment (CHA) has been undertaken to determine whether the proposed Phase II enhancement of the Mindanao International Container Port (MICP) is located within, functionally linked to, or likely to cause adverse impacts on Critical Habitat, as defined under:

- IFC Performance Standard 6 (PS6): Biodiversity Conservation and Sustainable Management of Living Natural Resources; and
- Asian Infrastructure Investment Bank (AIIB) Environmental and Social Standard 1 (ESS1).

Under both IFC PS6 and AIIB ESS1, Critical Habitat represents a subset of modified or natural habitats that are of exceptionally high biodiversity value, including habitats essential to the survival of Critically Endangered (CR) and/or Endangered (EN) species. Projects located in or affecting Critical Habitat are subject to stringent requirements, including demonstration of no measurable adverse impacts and no reduction in species populations.

The objective of this CHA is therefore to determine, through a structured and evidence-based process, whether the Project triggers any Critical Habitat criteria and whether additional mitigation or offset measures are required.
The presence of threatened species within a country, region, or database output does not automatically constitute Critical Habitat.

Under IFC PS6 and AIIB ESS1, Critical Habitat is identified only when all of the following conditions are met:

1. The Project Area contains or supports habitat that is essential for the survival of CR or EN species (e.g., breeding grounds, nurseries, feeding areas, or migration bottlenecks);
2. The species is ecologically dependent on that habitat; and
3. Project activities could cause measurable adverse impacts on those biodiversity values.

Accordingly, the CHA focuses not on regional biodiversity richness, but on site-specific habitat suitability, ecological dependency, and functional interaction with Project activities.

7.2.5.2 Project Location and Environmental Setting

The Mindanao International Container Port Project (MICP) is located along the coastal margin of Macajalar Bay, within the northern Mindanao seascape. While Macajalar Bay forms part of a broader marine system supporting fisheries and coastal ecosystems at the regional scale, the Project footprint itself is situated entirely within a long-established, highly modified coastal-industrial port environment, characterized by:

- Engineered and reinforced shorelines;
- Reclaimed and compacted land surfaces;
- Dredged and routinely maintained navigation channels; and
- Sustained vessel traffic and industrial port operations.

The Project Area represents a long-established, highly modified coastal-industrial environment, rather than a natural or semi-natural ecosystem.

7.2.5.3 Identification of Relevant Biomes

Basis for Biome Scoping

In accordance with IFC PS6 Guidance Note 6, biodiversity assessment must be proportionate and relevant to actual project impact pathways. Accordingly, an initial screening was conducted to determine which ecological biomes could plausibly be affected by Project activities.

Marine Biome
Project activities with potential ecological interaction are confined to:

- Wharf enhancement works;
- Shallow dredging;
- Vessel movement and berthing;
- Temporary sediment disturbance in nearshore waters.

As such, the marine biome represents the only biome with a plausible pathway for direct or indirect Project interaction.

Freshwater and Terrestrial Biomes
Freshwater and terrestrial environments within the Project Area consist of:

- Short, engineered drainage channels;
- Modified estuarine reaches influenced by port operations;
- Reclaimed land and industrial infrastructure.

There are no upland rivers, lakes, forest streams, mangroves, or intact terrestrial habitats within the Project footprint or its Area of Influence. Importantly, there is no hydrological or ecological connectivity between the Project Area and inland freshwater or terrestrial ecosystems supporting CR or EN species.

Freshwater and terrestrial CR/EN species identified through regional screening are associated with upland forest streams, lacustrine systems, or forested habitats that are absent from the Project Area. These species were therefore screened out at an early stage as not applicable to Critical Habitat determination, consistent with IFC PS6 good international practice.

7.2.5.4 Data Sources and Screening Tools

The CHA was undertaken using a tiered and transparent assessment approach, combining multiple lines of evidence:

- Primary Data: Marine ecological baseline surveys conducted within and adjacent to the Project footprint, including characterization of benthic substrates, nearshore habitats, and general biological assemblages.
- Secondary Data: Published scientific literature on Macajalar Bay and regional marine ecology; Government and institutional datasets on coastal and marine environments.
- Screening Tools: Integrated Biodiversity Assessment Tool (IBAT) for:
    - Protected Areas;
    - Key Biodiversity Areas (KBAs);
    - IUCN Red List–assessed species.
    - World Database on Protected Areas (WDPA) for verification of legal protection status.

IBAT was used strictly as a screening and risk-identification tool, not as a determinant of Critical Habitat status.

Spatial Screening Approach

To ensure both site-specific relevance and regional context, IBAT screening was conducted using graduated buffers:

- 10 km radius: to identify biodiversity features with potential for direct interaction with Project activities;
- 50 km radius: to identify regionally important biodiversity features and wide-ranging or migratory species, consistent with IFC PS6 and AIIB ESS1 guidance.

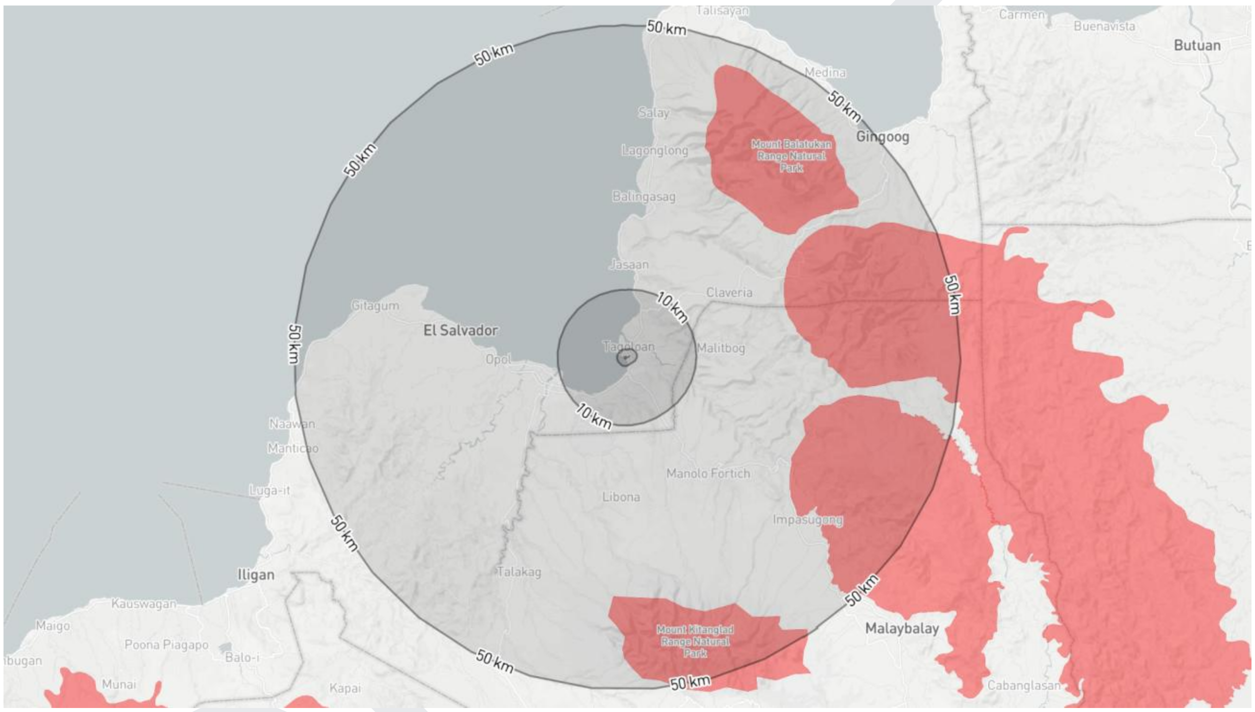


Figure 7-31. Key Biodiversity Area in relative to the Project Location (10km and 50km buffers)

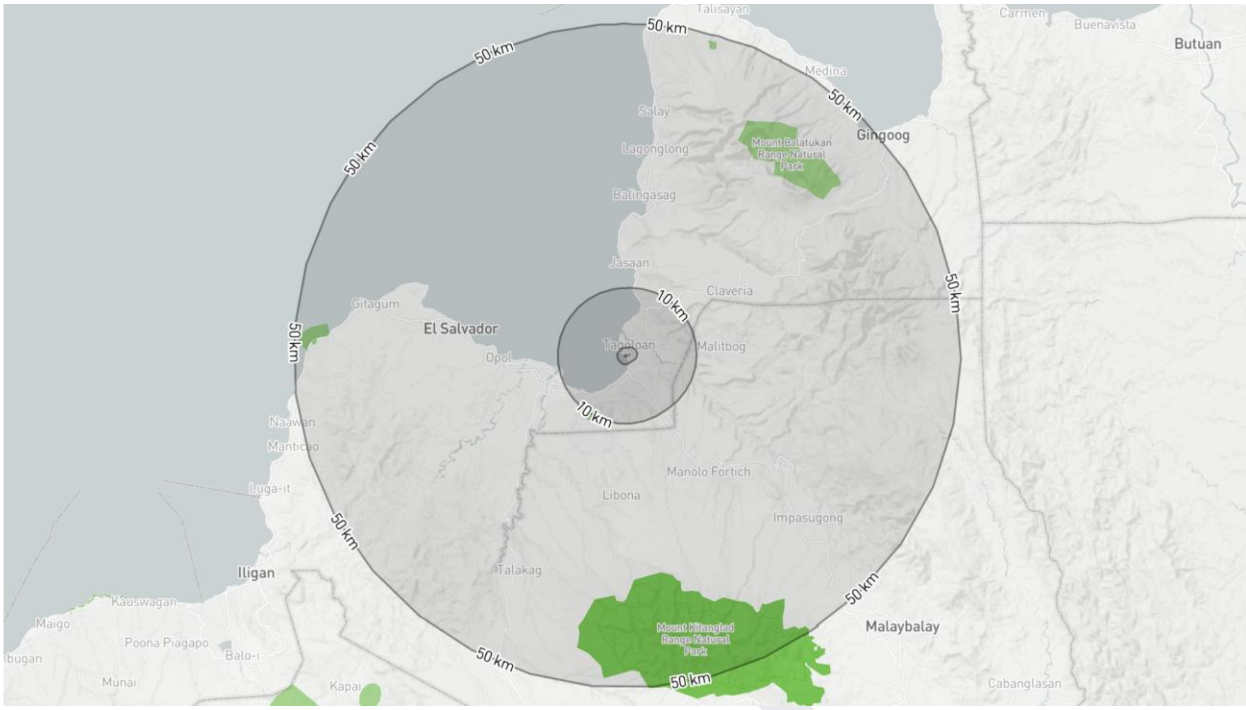


Figure 7-32. World Database of Protected Areas relative to the Project Location (10km and 50km buffers)

7.2.5.5 Protected Areas and Key Biodiversity Areas

IBAT and WDPA screening identified several legally protected and internationally recognized areas within the broader regional context (50 km radius). However:

- No protected areas or KBAs overlap the Project footprint or Area of Influence;
- No ecological corridors, hydrological linkages, or habitat continuities connect the Project Area to these sites;
- The biodiversity values for which these areas are designated are spatially and functionally distinct from the Project's coastal-industrial environment.

Accordingly, the Project does not intersect or affect any protected area or KBA in a manner that would trigger Critical Habitat criteria.

7.2.5.6 Species Screening Methodology

Initial Species Dataset

IBAT screening within the 50 km buffer returned a large number of IUCN Red List–assessed species, reflecting the high regional biodiversity of Philippine marine and terrestrial systems. This long-list represents potential regional occurrence, not site-specific relevance.

Filtering Criteria

To identify species relevant to Critical Habitat assessment, the dataset was systematically filtered using the following criteria:

1. Conservation Status
   - Retained only Critically Endangered (CR) and Endangered (EN) species.
2. Biome Relevance
   - Retained marine species for assessment of marine works.
   - Freshwater and terrestrial species screened out where no habitat or connectivity exists.
3. Habitat Suitability
   - Assessment of depth range, substrate type, geomorphology, and habitat features relative to Project conditions.
4. Functional Dependency
   - Evaluation of whether the Project Area provides breeding, feeding, nursery, shelter, or migration functions.

Species failing to meet habitat suitability or ecological dependency criteria were screened out as not applicable to Critical Habitat determination.

7.2.5.7 Assessment of Potential Project-Species Interaction

Detailed ecological review was undertaken for shortlisted CR and EN marine species (including sawfishes, sharks, rays, turtles, and whale shark) using IUCN Red List species profiles and relevant scientific literature.

This review confirmed that:

- The Project Area consists of shallow, engineered nearshore waters; associated with an existing port environment
- No mangroves, coral reefs, seagrass meadows of ecological significance, estuarine habitats, or deep-water benthic environments occur within the Project footprint;
- Maximum dredging and operational depths are substantially shallower than the depth ranges and habitat conditions required by pelagic, offshore, or deep-water CR/EN species;
- The Project Area does not function as a breeding ground, nursery area, feeding aggregation site, or migration bottleneck for any CR or EN species assessed.

Several assessed species are known to range widely across coastal or offshore waters and may occur intermittently within the broader Macajalar Bay or adjacent marine environment. However, such occurrence does not indicate ecological dependency, as the Project Area does not provide the habitat features required to support key life-cycle processes.

In accordance with IFC Performance Standard 6, the incidental or occasional presence of wide-ranging species in the absence of habitat dependency does not constitute Critical Habitat.

7.2.5.8 Application of Critical Habitat Criteria

Based on the above analyses, the Project was evaluated against IFC PS6 Critical Habitat criteria:

- Habitat of significant importance to CR/EN species: Not present
- Support to globally significant populations: Not present
- Support to critical life-cycle processes: Not present
- Ecological dependency on the Project Area: Not present

No species assessed relies on the Project Area for survival, reproduction, or population maintenance.

Table 7-22. Critical Habitat Assessment Matrix

Species	IUCN Status	Primary Habitat	Key Ecological Requirements	Suitable Habitat in Project Area	Potential Project Interaction[2]	Critical Habitat Trigger
Rhincodon typus (Whale Shark)	EN	Pelagic / coastal marine	Open waters; plankton-rich feeding areas; seasonal aggregation sites	None (engineered shallow port waters; no aggregation or feeding habitat)	Highly mobile species with broad home range; may occur intermittently within wider Macajalar Bay but exhibits no ecological dependency on the Project Area	Not Triggered
Pristis pristis (Largetooth Sawfish)	CR	Coastal, estuarine, riverine	Shallow estuaries, mangroves, river mouths	None (no mangroves, estuaries, or freshwater connectivity within Project Area)	No expected interaction; estuarine and riverine habitats required by the species are absent from the Project Area.	Not Triggered
Pristis zijsron (Green Sawfish)	CR	Shallow coastal marine	Sandy or muddy coastal flats, estuaries	None (engineered shoreline; dredged navigation area)	No expected interaction; suitable shallow coastal or estuarine habitats are absent from	Not Triggered

[2] *Information on species threat status, habitat preferences, movement patterns, and potential interactions is sourced from the IUCN Red List assessment, including Threats and Habitat & Ecology sections.*

					the Project Area.	
Carcharhinus longimanus (Oceanic Whitetip Shark)	CR	Pelagic oceanic	Open ocean, deep offshore waters	None (Project waters shallow and nearshore)	No expected interaction; species is associated with offshore pelagic habitats absent from the Project Area.	Not Triggered
Sphyrna lewini (Scalloped Hammerhead Shark)	CR	Coastal–p elagic	Shelf edges, seamounts, deeper coastal waters	None (depths and habitat unsuitable)	No expected interaction; species is associated with deeper offshore and shelf-edge habitats absent from the Project Area.	Not Triggered
Chelonia mydas (Green Turtle)	EN	Coastal marine	Seagrass beds for foraging; sandy beaches for nesting	None (no seagrass or nesting beaches within Project Area)	Species may occur intermittently within wider coastal waters but exhibits no habitat dependency on the Project Area.	Not Triggered

Eretmochelys imbricata (Hawksbill Turtle)	CR	Coastal marine	Coral reefs for foraging; nesting beaches	None (no coral reef habitat within Project footprint)	Species may occur intermittently in wider coastal waters but exhibits no habitat dependency on the Project Area.	Not Triggered
Dermochelys coriacea (Leatherback Turtle)	CR	Pelagic	Open ocean; jellyfish prey	None (nearshore industrial waters unsuitable)	Pelagic species; may occur intermittently in wider offshore waters but exhibits no habitat dependency on the Project Area.	Not Triggered
Mobula japanica (Spinetail Devil Ray)	EN	Pelagic / coastal	Open waters; plankton feeding	None (no aggregation or feeding habitat)	Pelagic species with no dependency on shallow port waters; no suitable habitat in the Project Area.	Not Triggered

Note: The species included in this Critical Habitat Assessment Matrix represent a shortlisted subset of the IUCN Red List species identified through IBAT screening within the regional buffer. Species were selected for inclusion based on their Critically Endangered (CR) or Endangered (EN) status, marine biome relevance, and the existence of a plausible ecological interaction pathway with Project activities. Freshwater and terrestrial CR/EN species identified through regional screening were excluded from detailed assessment where no suitable habitat, hydrological connectivity, or ecological dependency exists within the Project footprint or Area of Influence. Inclusion of a species in this matrix does not imply its presence within the Project Area, but reflects a conservative screening approach undertaken to evaluate potential Critical Habitat triggers under IFC Performance Standard 6 and AIIB Environmental and Social Standard 1. Species not included in the matrix were screened out due to the absence of habitat suitability, ecological dependency, or functional linkage to Project activities and therefore do not meet the criteria for Critical Habitat determination.

7.2.5.9 Critical Habitat Determination

Based on site-specific baseline data, spatial screening, species-level ecological analysis, and application of IFC PS6 and AIIB ESS1 criteria:

- No Critical Habitat is present within the Project footprint or Area of Influence;
- No Critical Habitat is functionally linked to Project activities;
- No measurable adverse impacts on CR or EN species are predicted;
- No reduction in populations of CR or EN species is anticipated.

Accordingly, the Project meets all conditions under AIIB ESS1 and IFC PS6 for activities outside Critical Habitat, and no additional Critical Habitat mitigation or biodiversity offsets are required.

7.3. Socio-Economic and Cultural Environment

In 2024, the total population of the Municipality of Tagoloan is approximately 87,775, based on data from the Municipal Population and Development Office. Among the barangays, Sta. Cruz has the highest population with 16,522 people, making up 18.82% of the total population. Poblacion follows closely with a population of 13,686, accounting for 15.59%. Both Baluarte and Casinglot show steady growth, with populations of 11,322 and 11,314, respectively, representing 12.9% and 12.89% of the total population. Natumolan has 10,901 people, contributing 12.42%, while Sta. Ana with 10,213 people accounts for 11.64%, indicating moderate growth in these areas. Sugbongcogon has a population of 5,108, representing 5.82%, and Mohon has 4,865, contributing 5.54% to the total population. Gracia, with 2,376 people, accounts for 2.71%, showing a decline in population. The rural barangay Rosario has 1,468 people, making up 1.67% of the total population, reflecting its more sparsely populated nature.

Table 7-23 Population of the Municipality of Tagoloan

2024		
Barangay	Population	%
URBAN	**86,307**	**98.33**
Baluarte	11,322	12.90
Casinglot	11,314	12.89
Gracia	2,376	2.71
Mohon	4,865	5.54
Natumolan	10,901	12.42
Poblacion	13,686	15.59
Sta. Ana	10,213	11.64
Sta. Cruz	16,522	18.82
Sugbongcogon	5,108	5.82
RURAL	**1,468**	**1.67**

Rosario	1,468	1.67
TOTAL	**87,775**	**100.00**

7.3.1 Population Size and Growth Rate

Table 7-24 Comparative Population Size by Barangay, 2015, 2020 and 2024

Barangay	Total Population			Average Annual Growth Rate (2015-2024)
	[a]2015	[a]2020	[b]2024	
URBAN	**72,105**	**79,189**	**86,307**	**2.00%**
Baluarte	9,612	10,860	11,322	1.82%
Casinglot	9,711	10,207	11,314	1.69%
Gracia	2,574	2,935	2,376	-0.88%
Mohon	4,037	4,349	4,865	2.07%
Natumolan	8,466	10,878	10,901	2.82%
Poblacion	10,235	10,326	13,686	3.25%
Sta. Ana	8,140	9,010	10,213	2.53%
Sta. Cruz	14,758	16,022	16,522	1.25%
Sugbongcogon	4,572	4,602	5,108	1.23%
RURAL	**1,045**	**1,130**	**1,468**	**3.81%**
Rosario	1,045	1,130	1,468	3.81%
TOTAL	**73,150**	**80,319**	**87,775**	**2.03%**

The growth of barangay populations from 2015 to 2024 reflects a combination of urbanization, migration, and local factors influencing demographic changes. Barangays like Poblacion (3.25% annual growth), Natumolan (2.82%), and Sta. Ana (2.53%) are experiencing significant growth, indicating ongoing urbanization and increasing migration as people seek economic opportunities, services, and infrastructure in these areas. Mohon (2.07%) and Baluarte (1.82%) also show steady growth, suggesting moderate development driven by residential and commercial expansion. In contrast, Gracia has seen a decline in population (-0.88%), which may be attributed to a combination of outmigration due to limited economic opportunities, a shift towards more urbanized areas, and displacement caused by land acquisition for industrial development. The latter factor likely resulted in residents being forced to relocate, further contributing to the population decrease. While Casinglot (1.69%) and Sta. Cruz (1.25%) show stable growth, their population increases are slower compared to rapidly growing barangays. Sugbongcogon (1.23%) has seen gradual population growth, likely due to ongoing development but at a slower pace. Interestingly, Rosario has the highest growth rate (3.81%), reflecting a trend of migration from urban centers to more affordable, less densely populated areas. These trends highlight the ongoing urbanization in key barangays, while some areas are seeing a shift in population as people move to less crowded regions for affordable living and space. Understanding these growth patterns, along with factors like displacement, is crucial for effective planning, resource allocation, and ensuring sustainable development across all barangays.

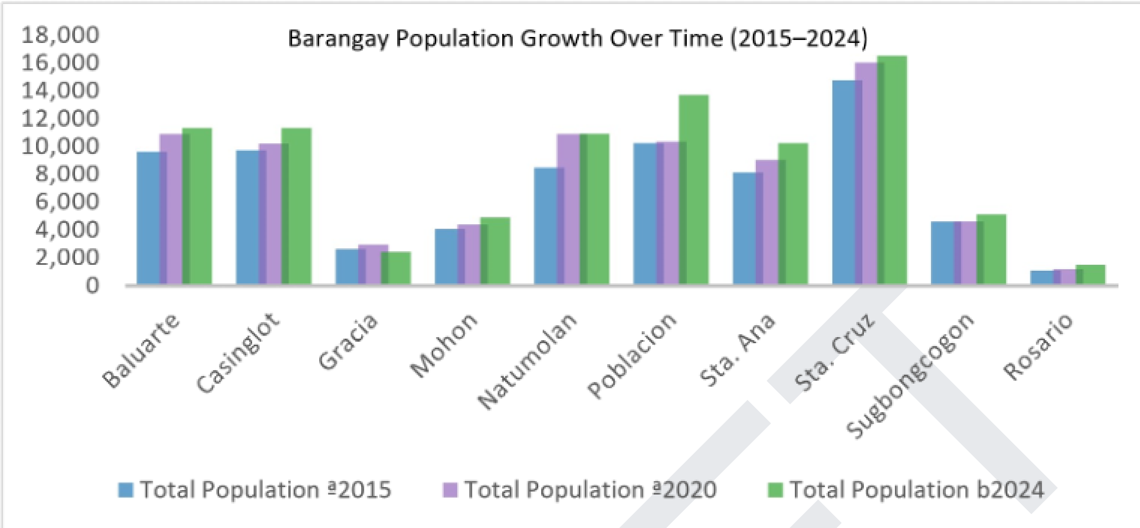


Figure 7-33 Population Size by Barangay 2015, 2020, and 2024

7.3.2 Migration Patterns

The Municipality of Tagoloan, located in Misamis Oriental, has experienced notable shifts in population migration over recent years. As an emerging industrial and economic hub in Northern Mindanao, Tagoloan attracts both internal and external migrants seeking employment, education, and better living conditions.

This pattern of migration has significantly influenced the municipality's demographic structure, urban development, and public service demand. Understanding these migration trends is crucial for effective planning and sustainable development in the area.

7.3.2.1 In-Migration

Table 7-25 Distribution of In-Migrants by Barangay and Gender (2021–2024)

Barangay	In-migrants							
	2021		2022		2023		2024	
	Male	Female	Male	Female	Male	Female	Male	Female
Baluarte	36	30	27	15	33	25	22	24
Casinglot	0	0	0	0	0	0	0	0
Gracia	0	0	0	0	0	0	0	0
Mohon	0	0	4	2	0	0	0	0
Natumolan	3	2	74	15	19	12	0	0
Poblacion	11	14	0	4	0	0	0	0

Rosario	0	0	0	0	0	0	0	0
Sta. Ana	135	105	21	18	32	40	2	3
Sta. Cruz	42	44	3	5	0	0	0	0
Sugbongcogon	4	6	1	3	1	1	0	0
TOTAL	**231**	**201**	**130**	**62**	**85**	**78**	**24**	**27**

The in-migration data for Tagoloan from 2021 to 2024 reveals several important trends across its barangays. Sta. Ana consistently recorded the highest number of in-migrants throughout the four year period, peaking in 2021 with 135 males and 105 females, and continuing to receive smaller but steady numbers in the following years. Baluarte also showed consistent in-migration, with a relatively balanced gender distribution and slight fluctuations from year to year. In contrast, Natumolan experienced a dramatic spike in 2022 with 74 male and 15 female in-migrants suggesting a temporary driver such as employment or relocation projects followed by a sharp decline in subsequent years. Sta. Cruz and Poblacion recorded moderate in-migration in 2021 and 2022 but none afterward, possibly indicating saturation or reduced attractiveness. Meanwhile, Sugbongcogon maintained a low yet consistent number of in-migrants in the early years, while barangays like Casinglot, Gracia, and Rosario reported no in-migrants at all, pointing to limited migration activity or possible data gaps. Males generally outnumbered females, particularly in highinflux areas like Natumolan and Sta. Ana, suggesting that work-related or temporary relocation may have influenced migration patterns.

7.3.2.2 Out-Migration

In contrast to the in-migration data, the out-migration trends in Tagoloan from 2021 to 2024 reveal a different dynamic. Baluarte experienced a significant rise in residents leaving the barangay, peaking in 2023 with 65 male and 69 female out-migrants. This sharp increase offset the gains from previous in-migration years and may reflect shifting economic or social conditions that prompted people to relocate. Sugbongcogon also recorded consistently high levels of out-migration throughout the period, though the numbers gradually declined over time. Despite this decrease, it remained one of the barangays with the highest number of residents moving out, suggesting persistent challenges or limited opportunities. Sta. Cruz saw a high number of people leave in 2021, with fewer departures in subsequent years, which may have been driven by early pandemic-related adjustments or relocations. Interestingly, Natumolan experienced a notable rise in out-migration in 2022 the same year it had a spike in in-migration indicating short-term or transitional migration, possibly linked to temporary employment or resettlement programs. On the other hand, Sta. Ana and Poblacion recorded relatively low out-migration, with Sta. Ana showed almost no residents leaving in the later years, reinforcing its image as a stable and potentially desirable place to live. Barangays such as Casinglot and Gracia registered only minimal out-migration, while Mohon and Rosario reported no out-migrants during the entire period, which may reflect either a stable population base or limitations in data reporting.

Table 7-26 Distribution of In-Migrants by Barangay and Gender (2021–2024)

Barangay	**Out-migrants**							
	2021		**2022**		**2023**		**2024**	

	Male	Female	Male	Female	Male	Female	Male	Female
Baluarte	30	21	28	18	65	69	0	0
Casinglot	0	0	0	3	0	0	0	0
Gracia	0	0	0	3	0	0	0	0
Mohon	0	0	0	0	0	0	0	0
Natumolan	1	0	21	31	0	0	0	0
Poblacion	0	0	0	6	4	6	1	1
Rosario	0	0	0	0	0	0	0	0
Sta. Ana	8	5	11	14	0	0	0	0
Sta. Cruz	45	20	4	1	0	0	0	0
Sugbongcogon	42	38	31	16	23	21	22	14
TOTAL	**126**	**84**	**95**	**92**	**92**	**96**	**23**	**15**

These trends suggest that 2021 was the peak year for population movement in Tagoloan, likely influenced by the effects of the COVID-19 pandemic, which led many individuals to return to their hometowns, relocate for safety, or take advantage of remote work setups. The gradual decline in migration activity from 2022 to 2024 may reflect the normalization of work and mobility, stabilization of living conditions, or saturation in some barangays.

7.3.3 Population Size and Density

Tagoloan, a coastal municipality in Misamis Oriental, covers an area of 50.4644 square kilometers. From a population of 73,150 in 2015, it has grown to 87,775 residents as of 2024, according to the Municipal Population and Development Office of Tagoloan. This steady increase reflects the municipality's evolving demographic profile, which combines both urban and rural characteristics, largely influenced by its proximity to the highly urbanized city of Cagayan de Oro. Understanding these population size and density trends is vital for informed urban planning, resource management, and infrastructure development to support the municipality's continued growth.

Table 7-27 Population Density by Barangay (2025, 2020, and 2024)

Barangay	Land Area (km^2)	2015		2020		2024	
		Population	Density/ (km^2)	Population	Density/ (km^2)	Population	Density/ (km^2)
URBAN	44.457	72,105	1,622	79,189	1,781	86,307	1,941
Baluarte	1.6092	9,612	5,973	10,860	6,749	11,322	7,036
Casinglot	7.4849	9,711	1,297	10,207	1,364	11,314	1,512
Gracia	0.8113	2,574	3,173	2,935	3,618	2,376	2,929
Mohon	2.4039	4,037	1,679	4,349	1,809	4,865	2,024
Natumolan	6.9189	8,466	1,224	10,878	1,572	10,901	1,576
Poblacion	1.2406	10,235	8,250	10,326	8,323	13,686	11,032
Sta. Ana	18.0442	8,140	451	9,010	499	10,213	566
Sta. Cruz	5.3068	14,758	2,781	16,022	3,019	16,522	3,113
Sugbongcogon	0.6372	4,572	7,175	4,602	7,222	5,108	8,016
RURAL	6.0074	1,045	174	1,130	188	1,468	244
Rosario	6.0074	1,045	174	1,130	188	1,468	244
TOTAL	**50.4644**	**73,150**	**1,450**	**80,319**	**1,592**	**87,775**	**1739**

From 2015 to 2024, all barangays in Tagoloan experienced an increase in population density, indicating consistent population growth throughout the municipality. However, the most significant changes occurred in urban barangays, suggesting intensified urbanization. Poblacion saw the most dramatic increase, rising from 8,250 people per square kilometer in 2015 to over 11,000 in 2024, reflecting a strong pull toward the town center where jobs, education, and services are concentrated. Baluarte and Sugbongcogon also recorded high population densities, growing steadily and reaching 7,036 and 8,016 people per square kilometer respectively in 2024. Sta. Cruz showed moderate but steady growth, while barangays like Casinglot, Mohon, and Natumolan exhibited gradual increases, indicating their transition from rural to more urbanized areas. Notably, Gracia's density dropped from 3,618 in 2020 to 2,929 in 2024, which may point to population movement out of the area or a change in land use. In contrast, Rosario, the only rural barangay listed, maintained the lowest density throughout the years, growing slowly from 174 in 2015 to just 244 in 2024. This pattern suggests that urban areas are experiencing more rapid population growth, putting increasing pressure on infrastructure and resources, while rural areas remain less developed. These trends highlight the need for balanced urban planning to manage growth, prevent overcrowding, and ensure equitable development across all barangays.

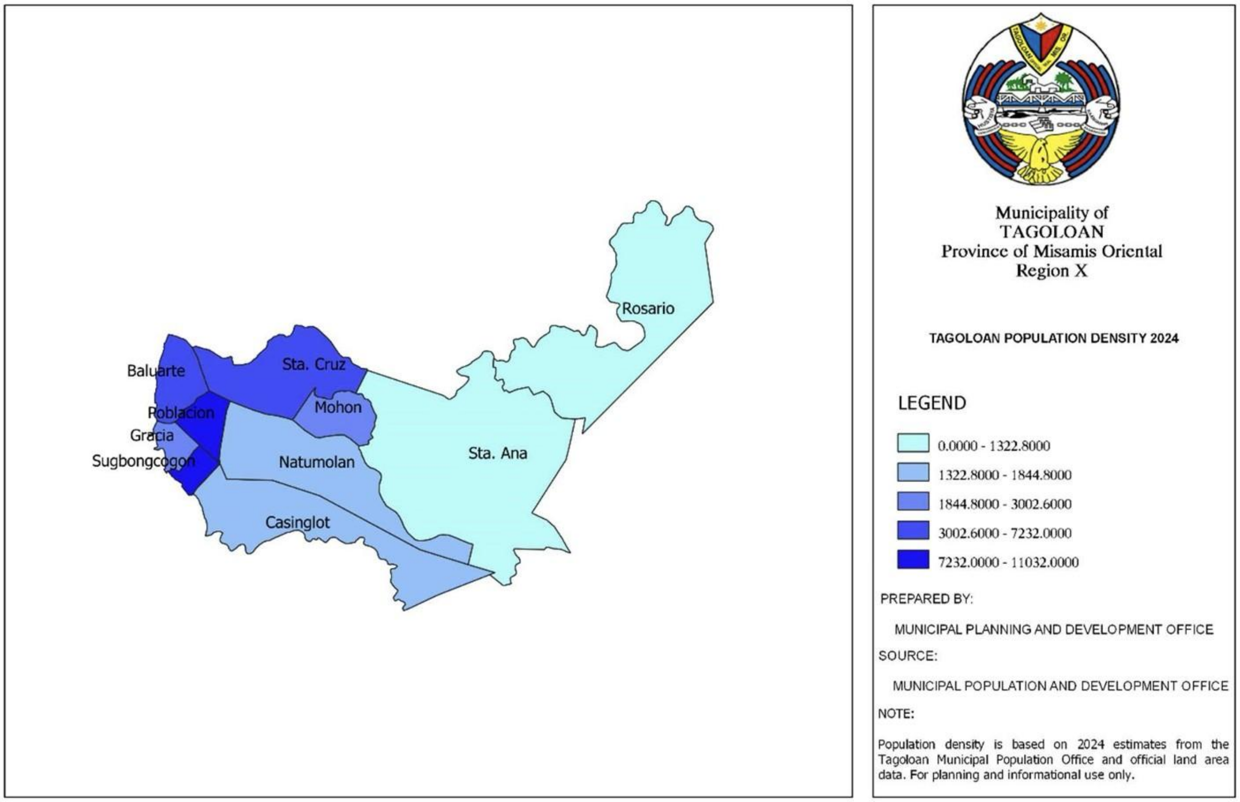


Figure 7-34 Spatial Distribution of Population Density in Tagoloan (2024)

7.3.4 Household Distribution

From 2020 to 2024, the household distribution across Tagoloan's barangays reveals an overall decline in household numbers in most areas. Out of ten barangays, six experienced a decrease, while only four showed increases. The most significant drop occurred in Sugbongcogon, with a 22.1% decrease, followed by Gracia at 13.9%, Mohon at 6.5%, Natumolan at 4.5% and Baluarte at 2%. Notably, several of these barangays, like Sugbongcogon and Mohon, saw population growth despite the decline in the number of households suggesting that more people are now living together under one roof possibly due to shared housing arrangements, economic constraints, or the rise of extended family households. Even Sta. Cruz, with one of the largest populations, saw a slight 1.2% decrease in households.

Only a few barangays showed household growth: Casinglot had the highest increase at 33.9%, pointing to significant residential development or in-migration, followed by Rosario at 15.9%, and Sta. Ana at 7.3%.

Interestingly, Poblacion, which experienced the largest population increase, had only a modest 4.3% growth in households, indicating that household sizes may be expanding due to population pressures. These trends highlight the need for responsive housing and infrastructure planning, particularly in areas where household numbers are shrinking while populations are growing.

Table 7-28 Household Distribution and Growth Rate by Barangay, 2024

Barangay	2020		2024		HH Growth Rate (%)	Population Growth
	Population	Households	Population	Households		
Baluarte	10,860	2,685	11,322	2,630	-2.0	↓
Casinglot	10,207	2,512	11,314	3,365	33.9	↑
Gracia	2,935	703	2,376	605	-13.9	↓
Mohon	4,349	1,164	4,865	1,088	-6.5	↓
Natumolan	10,878	2,554	10,901	2,440	-4.5	↓
Poblacion	10,326	2,776	13,686	2,895	4.3	↑
Sta. Ana	9,010	2,194	10,213	2,355	7.3	↑
Sta. Cruz	16,022	3,806	16,522	3,761	-1.2	↓
Sugbongcogon	4,602	1,135	5,108	884	-22.1	↓
Rosario	1,130	270	1,468	313	15.9	↑

7.3.4.1 Average Household Size

Between 2020 and 2024, most barangays in Tagoloan experienced an increase in average household size, pointing to changes in family structure, housing availability, and economic conditions. In urban areas, the average household size grew from 4.1 to 4.3 persons, suggesting more individuals are living together within the same household. This trend may be driven by rising housing costs, limited space, or the growing prevalence of multigenerational living arrangements.

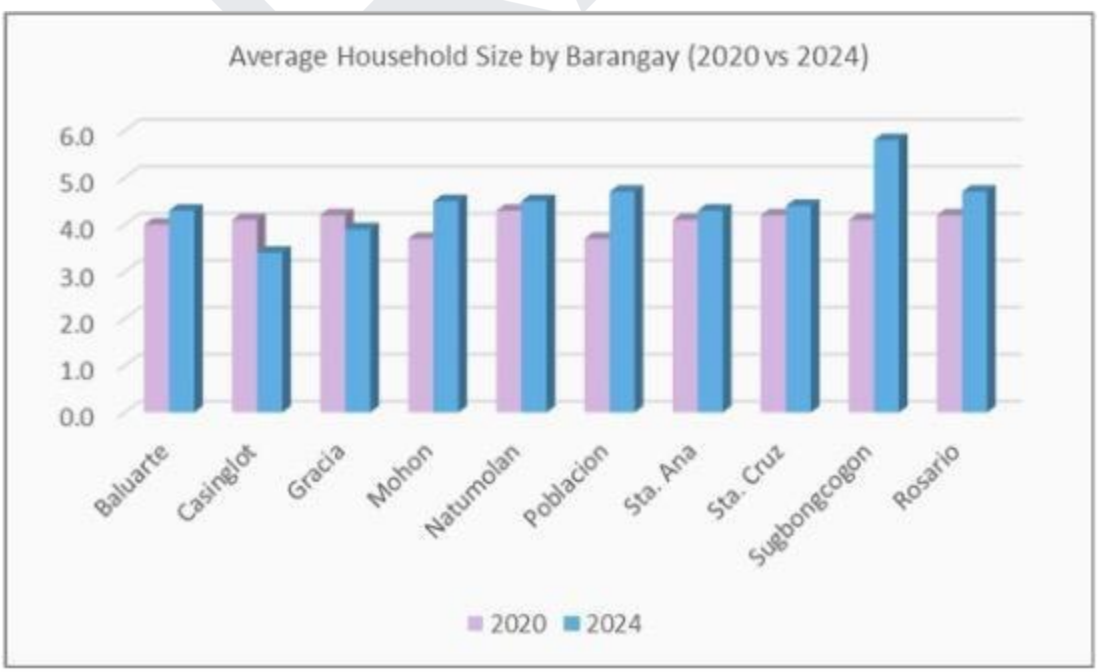


Figure 7-35 Average Household Size by Barangay, (2020 and 2024)

Several barangays showed particularly notable increases. For instance, Poblacion increased from 3.7 to 4.7, and Mohon from 3.7 to 4.5, indicating denser household compositions. Sugbongcogon recorded the highest average household size in 2024 at 5.8, a significant rise from 4.1 in 2020, which may reflect housing shortages or a tendency toward extended family living. In contrast, Casinglot was an exception, with household size dropping from 4.1 to 3.4, despite population growth. This suggests a trend toward smaller, possibly nuclear households, or improved housing availability that allows families to live more independently. The rural barangay of Rosario also saw an increase from 4.2 to 4.7 indicating that household expansion is not limited to urban centers. These shifts in household size provide important insights for local planners, particularly in addressing housing demand, infrastructure needs, and community services in both densely populated and developing areas.

7.3.5 Urban – Rural Distribution

Between 2020 and 2024, the population and household figures reveal a notable contrast in growth trends between the urban and rural areas of the municipality. The urban population increased by 8.99%, indicating steady but modest growth, which may suggest that urban centers within the municipality are reaching a level of saturation or that population movement toward urban areas is beginning to stabilize. In contrast, the rural population grew significantly by 29.91%, pointing to a strong demographic shift that may be influenced by factors such as reverse migration, rural development programs, or improved living conditions in rural communities. Urban households saw a minimal increase of 2.53%, possibly indicating limited new housing or a trend toward larger or shared households. On the other hand, rural households rose by 15.93%, reflecting the rapid population growth and an increasing demand for housing and infrastructure in rural barangays. While urban areas still contain the majority of the municipality's population, the faster growth in rural areas highlights the need for balanced development planning and targeted investment to support this emerging rural expansion.

Table 7-29 Urban-Rural Distribution and Percentage Growth, 2024

Year	Urban Population	Rural Population	Urban Households	Rural Households
2020	79,189	1,130	19,529	270
2024	86,307	1,468	20,023	313
Percentage Growth	8.99	29.91	2.53	15.93

7.3.6 Age – Sex Distribution

The population of Tagoloan, totaling 87,775, is predominantly composed of younger age groups, with children aged 0–14 years accounting for 29.4% and youth aged 15–24 years comprising 18.7% of the total. Combined, these two groups make up nearly half (48.1%) of the municipality's population, underscoring a young and expanding demographic. The working-age population (25–64 years) constitutes the largest single segment at 47.5%, forming the backbone of economic productivity and family support. In contrast, seniors aged 65 and above represent only 4.3%, a smaller yet significant group that increasingly requires attention to age-appropriate services. The population is also nearly gender-balanced, ensuring equitable opportunities for both men and women across all age cohorts. The following sections provide a detailed interpretation of each age group, highlighting demographic patterns and their implications for strategic local planning in education, employment, healthcare, and social development.

Table 7-30 Age-Sex Distribution by Barangay, 2024

BARANGAY		**POBLACION**	**BALUARTE**	**CASINGLOT**	**NATUMOLAN**	**GRACIA**	**SUGBONGCOGON**	**MOHON**	**ROSARIO**	**STA. CRUZ**	**STA. ANA**	**TOTAL**
Under 1	Male	185	184	5	192	31	84	86	16	216	79	1,078
	Female	198	219	6	150	26	79	63	18	200	96	1,055
1-2	Male	408	136	132	180	30	82	87	25	307	285	1,672
	Female	350	173	153	187	42	75	75	27	295	239	1,616
2-4	Male	462	190	433	217	38	80	78	21	278	159	1,956
	Female	365	210	331	220	45	97	74	22	363	143	1,870
5-6	Male	338	154	256	245	41	56	73	30	362	178	1,733
	Female	325	210	238	213	39	59	77	23	348	182	1,714
7-9	Male	346	191	381	384	67	83	125	46	511	285	2,419
	Female	344	270	307	322	65	84	132	48	496	264	2,332
10-14	Male	659	450	584	584	100	180	202	83	892	527	4,261
	Female	643	420	742	511	103	136	210	77	871	425	4,138
15-19	Male	726	496	654	491	115	150	227	75	839	498	4,271
	Female	632	475	731	495	104	185	219	93	748	493	4,175
20-24	Male	576	542	495	459	106	183	275	70	822	377	3,905
	Female	591	544	581	488	115	213	254	65	837	409	4,097
25-	Male	423	523	465	510	126	246	268	57	749	363	3,730

29	Female	451	488	515	496	114	221	238	63	669	377	3,632
30-34	Male	435	423	185	504	105	237	229	68	713	352	3,251
	Female	413	468	484	449	107	220	209	64	664	341	3,419
35-39	Male	424	347	335	392	115	225	209	58	579	415	3,099
	Female	391	355	255	354	86	228	174	49	516	330	2,738
40-44	Male	411	419	353	325	76	249	158	50	546	446	3,033
	Female	370	320	247	330	66	209	157	33	473	379	2,584
45-49	Male	379	415	364	283	80	211	149	36	428	344	2,689
	Female	349	327	330	277	58	209	110	34	371	356	2,421
50-54	Male	335	422	279	246	49	203	106	29	389	332	2,390
	Female	304	349	255	226	48	210	109	23	363	340	2,227
55-59	Male	369	373	230	209	43	168	99	20	300	261	2,072
	Female	274	270	250	196	43	184	74	19	328	269	1,907
60-64	Male	160	239	129	143	36	28	69	28	295	112	1,239
	Female	204	231	107	173	44	28	59	19	233	147	1,245
65-89	Male	383	243	234	200	49	81	85	30	253	156	1,714
	Female	448	246	256	247	63	83	99	49	266	247	2,004
90-99	Male	8	0	6	3	0	41	0	0	0	2	60
	Female	7	0	5	4	1	0	3	0	0	5	25
100 above	Male	0	0	0	0	0	1	0	0	0	0	1
	Female	0	0	1	0	0	0	0	0	2	0	3
TOTAL	**Male**	**7,027**	**5,747**	**5,520**	**5,567**	**1,207**	**2,588**	**2,525**	**742**	**8,479**	**5,171**	**44,573**
	Female	**6,659**	**5,575**	**5,794**	**5,338**	**1,169**	**2,520**	**2,336**	**726**	**8,043**	**5,042**	**43,202**

7.3.6.1 Children (00-14 years)

The age–sex distribution for children aged 0–14 years in the municipality of Tagoloan reflects a youthful and dynamic population, totaling 25,844 individuals comprising 13,119 males (50.8%) and 12,725 females (49.2%). The barangays of Sta. Cruz (19.9%), Poblacion (17.9%), and Casinglot (13.8%) account for over half of the municipality's child population, highlighting them as key areas for investments in early childhood education, healthcare, and community development. In contrast, Gracia (2.4%) and Rosario (1.7%) have the smallest shares, suggesting either smaller populations or different demographic trends. Most barangays exhibit balanced gender distributions, although Natumolan and Sta Ana show a higher number of male children, while Baluarte shows a strong female majority. These variations are important for designing targeted programs that address the specific needs of children in each community, ensuring inclusive growth and well-distributed ser vices across Tagoloan.

7.3.6.2 Youth (ages 15–24)

The youth population (aged 15–24) in Tagoloan totals 16,448, making up approximately 18.7% of the municipality's population. The gender distribution is nearly equal, with 8,176 males and 8,272 females, showing a balanced participation of both sexes in this vital transitional age group. Sta. Cruz has the largest share of youth at 19.7%, followed by Poblacion (15.4%) and Casinglot (15.0%), highlighting these barangays as strategic areas for youth-centered programs such as employment training, higher education access, and community engagement. In contrast, barangays like Rosario and Gracia have smaller youth populations, but still require tailored services to support young people's development. Given that this group represents the bridge between schooling and the workforce, targeted interventions in this sector can greatly enhance Tagoloan's future economic and social resilience.

7.3.6.3 Adults (25-64 years)

Based on the latest data, the total adult population (ages 25 to 64 years) across the ten barangays is 41,676, with males making up 51.6% (21,503 individuals) and females comprising 48.4% (20,173 individuals). This near-equal gender distribution indicates a balanced adult community with a slight male majority.

Among the barangays, Sta. Cruz has the largest share of the adult population, representing approximately 18.3% of the total. This highlights Sta. Cruz as a key area where adult-focused programs, services, and infrastructure should be prioritized to meet community needs.

Following Sta. Cruz, Baluarte (14.3%), Poblacion (13.7%), Sta. Ana (12.4%), and Natumolan (12.3%) together account for nearly 72% of the adult population. These barangays collectively house the majority of adults and are critical focal points for local development initiatives, such as employment opportunities, healthcare access, and social services.

On the other end of the spectrum, Rosario has the smallest adult population share, comprising only 1.6% of the total. This may suggest a more rural or less densely populated area, which might require tailored strategies for service delivery and community support.

Sex distribution within each barangay generally reflects the overall pattern, with most areas having a slight male majority. Casinglot is a notable exception, having a marginally higher female population. Such differences should be considered when designing gender-sensitive programs to ensure inclusivity and equity.

7.3.6.4 Seniors (65 years and over)

Based on the recent data, the total number of senior citizens (aged 65 and over) across the ten barangays is 3,807, composed of 1,775 males (46.63%) and 2,032 females (53.37%). This reflects a common demographic trend where women tend to live longer than men, resulting in a higher proportion of female seniors. Poblacion accounts for the largest share of the senior population, with 846 individuals (22.21%), followed by Sta. Cruz (13.68%),

Casinglot (13.19%), Baluarte (12.84%), and Sta. Ana (10.77%). These top five barangays together comprise over 72% of the total senior population, indicating where age-targeted services such as healthcare, social welfare, and mobility support may be most needed. On the other hand, Gracia (2.97%) and Rosario (2.07%) have the smallest senior populations, suggesting a potentially more youthful demographic or smaller community size. Notably, most barangays have a higher number of female seniors, with Sta. Ana and Rosario showing particularly wide gender gaps in favor of women. Sugbongcogon stands out as the only barangay where male seniors (59.7%) outnumber females. These findings highlight the need for barangay-specific planning and interventions that consider both the size and gender composition of the elderly population.

7.3.7 Dependency Ratio

The Dependency Ratio in Tagoloan is approximately 51 dependents for every 100 working-age individuals. This indicates a moderate dependency burden, meaning that for every 2 working-age people, there is about 1 dependent relying on them either for care (children and elderly) or financial support. This ratio is relatively manageable but still requires adequate planning to ensure that the working-age population is supported in sustaining both the economy and the needs of non-working age groups.

7.3.7.1 Economically Active Population

The total Economically Active Population (EAP) in the municipality of Tagoloan is 58,124, consisting of 29,679 males (51.05%) and 28,445 females (48.95%). The barangay with the highest EAP is Sta. Cruz, contributing 10,862 individuals, or approximately 18.69% of the total EAP. This is followed by Poblacion with 8,217 (14.14%), and Baluarte with 8,026 (13.81%). These three barangays combined account for 46.63% of the municipality's total EAP, indicating their significant role in the local labor force. Other notable contributors are Casinglot with 7,244 (12.46%), Natumolan with 7,046 (12.12%), and Sta. Ana with 6,941 (11.94%). Meanwhile,
Sugbongcogon has 3,807 (6.55%), Mohon has 3,392 (5.84%), Gracia contributes 1,636 (2.81%), and Rosario has the smallest EAP with 953 (1.64%).

Table 7-31 Economically Active Population by Sex and Barangay, 2024

Economically Active Population (15-64yo)																					
	POBLACION	%	BALUARTE	%	CASINGLOT	%	NATUMOLAN	%	GRACIA	%	SUGBONGCOGON	%	MOHON	%	ROSARIO	%	STA. CRUZ	%	STA. ANA	%	TOTAL
Male	4238	4.83	4199	4.78	3489	3.97	3562	4.06	851	0.97	1900	2.16	1789	2.04	491	0.6	5660	6.45	3,500	3.99	29679
Female	3979	4.53	3827	4.36	3755	4.28	3484	3.97	785	0.89	1907	2.17	1603	1.83	462	0.5	5202	5.93	3441	3.92	28445
TOTAL	8217	14.14	8026	13.81	7244	12.46	7046	12.1	1636	2.81	3807	6.55	3392	5.84	953	1.6	10862	18.69	6941	11.94	58124

7.3.7.2 Economically Dependent Age Group (04-14 and 65 and above)

The dependent age group in the municipality of Tagoloan, which includes individuals aged 0–14 and 65 years and above, has a total population of 29,651, composed of 14,894 males (50.23%) and 14,757 females (49.77%). The barangays with the highest dependent populations are Sta. Cruz with 5,660 individuals (19.08%), Poblacion with 5,469 (18.44%), and Casinglot with 4,070 (13.73%). Together, these three barangays account for over half of the municipality's total dependent population, indicating a higher demand for education, childcare, and elderly services in these areas. In contrast, barangays such as Rosario (515), Gracia (740), and Sugbongcogon (1,301) have the lowest dependent populations.

Table 7-32 Economically Dependent Population by Sex and Barangay, 2024

DEPENDENT AGE GROUP (04-14 and 65 and above)																						
	POBLACION	%	BALUARTE	%	CASINGLOT	%	NATUMOLAN	%	GRACIA	%	SUGBONGCOGON	%	MOHON	%	ROSARIO	%	STA. CRUZ	%	STA. ANA	%	TOTAL
Male	2789	3.18	1548	1.76	2031	2.31	2005	2.28	356	0.41	688	0.78	736	0.84	251	0.3	2819	3.21	1671	1.9	14894
Female	2680	3.05	1748	1.99	2039	2.32	1854	2.11	384	0.44	613	0.7	733	0.84	264	0.3	2841	3.24	1601	1.82	14757
TOTAL	5469	18.44	3296	11.12	4070	13.73	3859	13	740	2.5	1301	4.39	1469	4.95	515	1.7	5660	19.09	3272	11.04	29651

7.3.8 Present Well Being Status

7.3.8.1 Health

Health Personnel and Facilities, Public and Private

The Municipality of Tagoloan, Misamis Oriental is supported by a network of public and private health facilities that provide essential healthcare services to its growing population. These facilities include two hospitals, a municipal health office, and ten Barangay Health Stations (BHS), strategically located to deliver both curative and preventive services.

Tagoloan is served by two hospitals. The Tagoloan Polymedic General Hospital, a private institution located in Barangay Sta. Cruz, has a bed capacity of 35 and employs 98 health personnel. This includes 17 doctors, 26 nurses, 5 midwives, 3 sanitary inspectors, 8 other medical staff, as well as 2 pharmacists and 2 radiologic technologists. It is fully operational and provides comprehensive inpatient and outpatient care. Meanwhile, St. Paul Hospital in Barangay Poblacion is a public Level I hospital with 28 beds. As a Level I facility, it offers general medical services, emergency care, and basic laboratory and diagnostic services. The hospital is staffed with 99 personnel, including 36 doctors, 40 nurses, 5 midwives, 5 medical technologists, 4 pharmacists, and 9 other medical staff, and it continues to play a crucial role in the delivery of accessible health services in the municipality.

The Municipal Health Office (MHO), also located in Poblacion, serves as the primary public health center of the municipality, focusing on preventive and promotive healthcare. Though it has a limited bed capacity of only 3, it is fully operational and employs 17 personnel, including 4 doctors, 2 nurses, 7 midwives, and 1 sanitary inspector. The MHO manages local health programs such as immunization drives, maternal and child health, nutrition campaigns, and disease prevention initiatives.

At the barangay level, Tagoloan has ten publicly owned Barangay Health Stations (BHS), which provide grassroots health services and support various community-based programs. While these facilities do not have inpatient capacity, they are essential in delivering basic health care and public health interventions. They are staffed by Barangay Health Workers (BHWs), Barangay Nutrition Scholars (BNS), Barangay Population Officers (BPO), and Barangay Sanitary Inspectors (BSI). Notably, Natumolan BHS has the highest number of personnel (25), followed by Sta. Cruz (24), Baluarte (23), and Sta. Ana (22). Most BHS are operational, except for those in Baluarte and Rosario, which are in need of repair and may face limitations in service delivery due to their physical condition.

Ten (10) Leading Causes of Morbidity (All Ages)

In 2024, the Municipality of Tagoloan recorded various health conditions affecting individuals across all age groups. Based on data as recorded by the Municipal Health Office, the ten leading causes of morbidity reflect a mix of infectious diseases, injuries, and lifestyle-related conditions, underscoring key health priorities for the local government and healthcare providers.

The leading cause of morbidity is animal bites, with a total of 5,386 reported cases, 2,368 among males and 3,018 among females. This high incidence highlights the need for strengthened animal control measures and sustained implementation of rabies prevention and post-exposure programs. Following this is acute upper respiratory infection (AURI), with 2,335 cases (1,084 males and 1,251 females), a condition that remains widespread due to environmental factors and seasonal changes.

Urinary tract infection (UTI) ranks third with 1,074 cases, notably affecting more females (739) than males (335), consistent with known anatomical and health behavior patterns. Viral infections are the fourth leading cause with 560 cases, showing relatively balanced distribution between males (296) and females (264), pointing to continuous viral circulation in the community.

Wounds of all types recorded 355 cases, with a higher incidence in males (203) compared to females (152), likely due to occupational exposure or outdoor activities. Acute tonsillitis had 290 cases (136 males and 154 females), often related to poor oral hygiene or environmental irritants.

Vector-borne disease remains a public health concern, with dengue registering 227 cases, 116 males and 111 females. This points to the continued need for effective vector control, environmental sanitation, and community engagement. Hypertension, a key noncommunicable disease, ranked eighth with 153 cases (57 males and 96 females), indicating an ongoing shift toward lifestyle-related health conditions.

Pneumonia, a serious lower respiratory infection, accounted for 123 cases, while gastroenteritis had 112 cases, more frequently affecting males (81) than females (31), often linked to food and water safety.

Ten (10) Leading Causes of Mortality (All Ages)

In 2024, the Municipality of Tagoloan recorded various causes of death across all age groups, as reported by the Municipal Health Office. The data highlights a significant prevalence of non-communicable diseases (NCDs) as the leading contributors to mortality in the locality, reflecting national and global health trends.

Hypertension emerged as the leading cause of mortality, accounting for a total of 44 deaths, 20 males and 24 females. This indicates the continued burden of uncontrolled high blood pressure and its complications, particularly in older populations. Following this is diabetes mellitus, with 19 total deaths (9 males and 10 females), underscoring the impact of poor lifestyle factors such as unhealthy diet, lack of physical activity, and late diagnosis or poor disease management.

Ranking third is ill-defined illnesses, with 18 recorded deaths (8 males and 10 females). These cases often point to gaps in health information, limited diagnostic capacity, or deaths occurring outside of health facilities. Myocardial infarction or heart attack, a leading cardiovascular emergency, accounted for 14 deaths, predominantly affecting males (8) compared to females (6), reflecting the critical need for early detection and emergency cardiac care.

Asphyxia, with 10 recorded deaths, may involve cases related to birth complications, respiratory obstruction, drowning or trauma. This is followed by cerebrovascular disease (likely referring to stroke) with 9 deaths (6 males and 3 females), another critical NCD that shares risk factors with hypertension and diabetes.

Community-acquired pneumonia ranked seventh, causing 7 deaths (3 males and 4 females), showing that infectious respiratory diseases remain a threat, especially among the elderly and immunocompromised. Liver cirrhosis, typically linked to alcohol abuse or chronic hepatitis, resulted in 6 deaths, followed by chronic kidney disease, which caused 5 deaths both highlighting the growing impact of chronic lifestyle-related conditions.

Finally, status asthmaticus, a severe and life-threatening asthma attack, was responsible for 4 deaths, indicating the need for improved asthma management and emergency response, particularly during respiratory illness surges or seasonal triggers.

Other Health Statistical Data

a. **Total number of births**

In 2024, the municipality of Tagoloan recorded a total of 124 births, composed of 64 males and 60 females, showing a nearly balanced gender distribution with a slight male predominance. Among the ten barangays, Sta. Cruz registered the highest number of births at 29, accounting for 23.4% of the total, followed by Mohon and Sta. Ana, each with 21 births. In contrast, the barangays of Gracia and Sugbongcogon had the lowest number of births, with only 3 each. Other barangays such as Baluarte (15 births), Casinglot (11), Natumolan (8), Poblacion (8), and Rosario (5) contributed moderately to the overall birth count. The distribution of births suggests a concentration in more populated or accessible barangays, possibly indicating better access to healthcare services or higher population density in these areas. Overall, the birth data reflects steady demographic activity in Tagoloan, with birth figures varying significantly across barangays.

b. Total number of deaths

The municipality of Tagoloan recorded a total of 61 deaths in 2024, consisting of 29 males and 32 females, showing a slightly higher number of female deaths. The barangay with the highest number of deaths was Sta. Cruz, with 12 total deaths, followed by Casinglot with 11, and Sta. Ana with 10. On the lower end, Gracia, Mohon, Poblacion, Sugbongcogon, and Rosario each recorded only 3 deaths, while Natumolan had 4. The data indicates that mortality was spread across all barangays, though certain areas like Sta. Cruz and Casinglot experienced relatively higher death counts, which may reflect differences in population size, age distribution, or health conditions. Overall, the death toll in 2024 was significantly lower than the number of births, suggesting a positive natural population growth for the municipality.

c. Total number of teenage-pregnancy

In 2024, the municipality of Tagoloan recorded a total of 29 teenage pregnancy cases. The barangay with the highest number was Rosario, with 7 cases, followed by Poblacion with 6, and Casinglot with 5. Meanwhile, Sugbongcogon reported zero cases, suggesting either a smaller teen population or successful awareness and prevention efforts in that area. Other barangays such as Baluarte (3), Gracia (2), Mohon (2), Sta. Ana (2), Sta. Cruz (1), and Natumolan (1) had relatively lower counts. The data shows that while teenage pregnancy is present in most barangays, it is more concentrated in a few areas. This highlights the need for targeted reproductive health education, access to services, and community support programs in higher-incidence areas like Rosario and Poblacion to help address and reduce teenage pregnancy rates.

d. Nutritional Status of Pre-School Children

Based on the 2024 Barangay Situational Analysis (BSA) data, a total of 9,269 pre-school children aged 0–59 months were measured across the ten barangays of Tagoloan. The results reveal that Tagoloan has a generally positive nutritional profile, with a majority (84.69%) of children falling within the normal weight range. This indicates effective nutrition programs and access to basic health services for most families.

Despite this encouraging majority, there are still cases of both undernutrition and overnutrition that merit attention. Underweight children account for 1.65%, while severely underweight cases are rare, at 0.20%. These figures suggest that although the incidence of acute malnutrition is low, certain children may still be experiencing food insecurity or illness affecting growth.

Indicators of acute malnutrition, such as wasting (0.64%) and severe wasting (0.18%), are present but remain below the national and global emergency thresholds. However, these children are vulnerable and require focused intervention to prevent further nutritional decline.

On the other hand, signs of overnutrition are also emerging, with 0.80% of children classified as overweight and 0.37% as obese. This may be linked to increased consumption of processed foods and sugary drinks, combined with limited physical activity trends seen in many transitioning rural communities. If left unaddressed, these patterns can lead to long-term health risks like diabetes and heart disease even in childhood.

Stunting, a sign of chronic malnutrition, affects 2.72% of the children, while severe stunting affects 0.26%. This makes stunting the most prevalent form of malnutrition in the municipality, more common than underweight or wasting. It highlights the need for long-term nutrition interventions starting in early childhood and even during pregnancy.

Among the barangays, Casinglot and Sta. Cruz stand out for having multiple indicators of both acute and chronic malnutrition, including higher numbers of underweight, stunted, and wasted children. These areas may face persistent issues such as poverty, food insecurity, or inadequate child care practices and require immediate and focused intervention.

On a more positive note, Sta. Cruz, Baluarte and Natumolan show relatively better nutritional outcomes, with very high proportions of children falling in the normal weight range and minimal cases of undernutrition.

7.3.9 Social Welfare

7.3.9.1 Social Welfare Programs and Services Available

In Fiscal Year 2024, the Municipality of Tagoloan continued to implement a broad range of social welfare services and programs designed to support vulnerable and marginalized sectors of the community. These services were delivered under the leadership of the Municipal Social Welfare and Development Office (MSWDO), in coordination with national agencies and local partners.

The Supplemental Feeding Program benefitted a total of 422 children, aimed at improving the nutritional status of preschoolers enrolled in Child Development Centers. This intervention helped address malnutrition and supported the physical and cognitive development of young children in the municipality.

The municipality also provided targeted services for children facing difficult circumstances. Services for Children in Conflict with the Law (CICL) were extended to 41 individuals, while Services for Children in Need of Special Protection (CNSP) reached 104 children, with 4 service interventions delivered to assist them. These programs reflect the municipality's commitment to child protection and rehabilitation through psychosocial support, case management, and family interventions.

A total of 2,674 youths, aged 18 to under 30 years, availed of 14 Youth Development Services, which include leadership training, capability building, and livelihood support. These initiatives aim to empower the youth and prepare them for meaningful participation in community and economic development.

In the area of gender-based protection, Services to Women Victims of Violence were provided to 79 women, with 2 key interventions offered to support recovery and reintegration, such as legal aid, counseling, and temporary shelter assistance.

The municipality also supported its growing elderly population through the Social Pension Program, serving 1,939 senior citizens under the DSWD national program and an additional 200 beneficiaries supported locally. This assistance plays a vital role in ensuring dignity and financial support for indigent senior citizens.

Persons with disabilities (PWDs) were not left behind. 253 individuals benefited from the Program for the Welfare of Disabled Persons, which delivered 7 services such as assistive devices, registration and ID issuance, and participation in community-based rehabilitation activities.

Through the Pantawid Pamilyang Pilipino Program (4Ps), the municipality supported 2,400 household beneficiaries, providing 3 major service interventions such as health and education grants, family development sessions, and conditional cash transfers to promote long-term poverty reduction.

Lastly, Emergency Assistance Programs were provided to 407 individuals through three service categories, including food packs, medical aid, financial assistance, and support services such as emergency shelter, housing assistance, and help during crisis situations like illness, fire incidents, natural disasters, or displacement. These interventions are designed to provide immediate relief and help families recover from unexpected emergencies.

Table 7-33 Social Welfare Services, Municipality of Tagoloan, 2024

Social Welfare Services, 2024		
Programs/Services	**Head Count**	**Service Count**
Supplemental Feeding	422	1

Services for Children in Conflict with the Law	41	
Services for Children in need of Special Protection	104	4
Youth Development Services (18 to less than 30 yo)	2,674	14
Services to Women Victims of Violence	79	2
Program for the welfare of the elderly / Social Pension	1,939 (DSWD) 200 (local)	
Propgram for the Welfare of Disabled Person	253	7
Pantawid Pamilyang Filipino Program	2,400	3
Emergency Assistance Program	407	3

7.3.9.2 Number of household beneficiaries of Pantawid Pamilya Pilipino Program

In 2024, the Pantawid Pamilyang Pilipino Program (4Ps) supported a total of 2,400 household beneficiaries across the Municipality of Tagoloan. The highest number of beneficiaries was recorded in Barangay Sta. Cruz, with 541 households or 22.5% of the total. This was followed by Casinglot with 361 households (15.0%), Sta. Ana with 348 households (14.5%), and Baluarte with 297 households (12.4%).

Natumolan accounted for 242 households (10.1%), while Poblacion had 180 households (7.5%). Smaller yet significant shares were reported in Sugbongcogon with 158 households (6.6%), Mohon with 155 households (6.5%), Rosario with 69 households (2.9%), and Gracia with 49 households (2.0%). These figures reflect the municipality's effort to equitably distribute poverty alleviation resources, targeting areas with the greatest need. The 4Ps program in Tagoloan continues to serve as a vital platform for improving the quality of life of vulnerable families through conditional cash grants, access to education and health services, and livelihood support.

7.3.10 Education

7.3.10.1 School-age population

Tagoloan's total school-age population is 24,216 children, with 12,280 males and 11,936 females, showing a fairly balanced gender distribution. The largest group is in Elementary (ages 6–11), with 9,834 children, representing 40.6% of the total population. This is followed by Junior High (ages 12–15), with 6,729 children (27.8%), and Senior High (ages 16–17), with 3,378 children (13.9%). Preschool (ages 3–4) and Kindergarten (age 5) groups have 2,551 (10.5%) and 1,724 (7.1%) children, respectively. This distribution reflects a strong base at the elementary level, with a noticeable drop in numbers as children progress to higher education levels.

7.3.10.2 Enrollment Profile by Educational Level: Private and Public Sectors

The municipality's education sector is primarily served by public institutions, with high enrollment across the basic education levels and limited but important vocational training options. However, data gaps remain in the senior high and tertiary levels.

For preschool/kindergarten, there are 2,503 enrolled learners, with 2,250 (90%) in public schools and 253 (10%) in private institutions. This reflects strong public provision of early childhood education.

Table 7-34 School Age Population, Municipality of Tagoloan

Age Group	School-Age Population		
	Male	Female	Total
Preschool (3–4)	1,304	1,247	2,551
Kindergarten (5)	867	857	1,724
Elementary (6– 11)	4,990	4,844	9,834
Junior High (12– 15)	3,411	3,318	6,729
Senior High (16– 17)	1,708	1,670	3,378
Total	**12,280**	**11,936**	**24,216**

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In junior high school (Grades 7–10), there are 6,484 learners, of which 5,734 (88%) are in public schools and 750 (12%) in private schools, still demonstrating strong dependence on public secondary education.

For senior high school (Grades 11–12), 1,680 students are enrolled in private institutions. No enrollment data has been received from public senior high schools, which may indicate either a lack of public SHS offerings or incomplete reporting.

At the tertiary level, no enrollment data has been provided by Tagoloan Community College, the municipality's main higher education institution. As a result, the status of local college attendance is unclear and should be validated in future assessments.

In vocational education, a total of 60 learners enrolled in TESDA-accredited programs, broken down as follows: Computer System Servicing NC II with 25 enrollees and Automotive Servicing NC II with 35 enrollees. These figures indicate a modest but active engagement in technical training, presenting an opportunity to further expand skills development programs.

Table 7-35 Enrollment by Education Level and Sector, Municipality of Tagoloan, 2024

Enrollment by Education Level and Sector (Private and Public)			
	PRI	PUB	Total
Preschool/kinder	253	2,250	2,503
Elementary Grade1-6	385	10,988	11,373
Junior High	750	5,734	6,484
Senior High	1,680	no data	1,680
Tertiary	no data	0	
Vocational	60		60

Source: Depd Ed East and West – Tagoloan, 2024

7.3.10.2 Participation Rate, by level (elementary, secondary, tertiary)

School-age population and enrollment data reveals varying levels of participation across educational stages. In preschool and kindergarten, out of a total population of 4,275 children aged 3 to 5, only 2,503 are enrolled, resulting in a participation rate of 58.55%. This suggests that early childhood education access remains limited and needs further attention. Elementary education, however, shows a participation rate of 115.65%, with 11,373 enrollees compared to a population of 9,834. This rate exceeding 100% may be attributed to in-migration, grade repetition, or enrollment of over- or under-aged students. Junior high school also reflects strong access with a participation rate of 96.36%, as 6,484 students are enrolled out of a total 6,729 in the age group. In contrast, senior high school shows a lower participation rate of 49.74%, based only on private school enrollment due to the unavailability of public school data. This likely underestimates the true rate but still points to potential challenges in retaining learners through the final years of basic education.

7.3.11 Housing

7.3.11.1 Households by Type of Dwelling

Table 7-36 Distribution of Households by Type of Dwelling, per Barangay, 2024

Barangay	Total HHs	Concrete	%	Semti-Concrete	%	Wood	%	Makeshift	%
Baluarte	2,630	823	31.3	1,032	39.2	741	28.2	598	22.74
Casinglot	3,365	860	25.6	1,322	39.3	237	7	—	0
Gracia	605	127	21	215	35.5	247	40.8	15	2.48
Mohon	1,088	115	10.6	230	21.1	955	87.8	1	0.09
Natumolan	2,440	809	33.2	684	28	906	37.1	21	0.86
Poblacion	2,895	794	27.4	822	28.4	758	26.2	—	0

Sta. Ana	2,355	686	29.1	839	35.6	819	34.8	18	0.76
Sta. Cruz	3,761	710	18.9	1,652	43.9	1,350	35.9	8	0.21
Sugbongcogon	884	16	1.8	50	5.7	818	92.5	—	0
Rosario	313	63	20.1	44	14.1	152	48.6	—	0

The distribution of households by type of dwelling across the barangays reveals significant variation in housing quality and durability within the municipality. Barangays such as Baluarte, Natumolan, Sta. Ana, and Poblacion show a relatively balanced mix of concrete, semi-concrete, and wooden houses, with concrete dwellings comprising around 26% to 37% of total households indicating moderate structural resilience. Casinglot also reflects a preference for semi-concrete structures (39.3%) and has very few wooden homes, suggesting improving housing standards. In contrast, barangays like Mohon and Sugbongcogon have a very high proportion of wooden houses, 87.8% and 92.5% respectively, pointing to fragile housing conditions and a lack of access to durable materials. Similarly, Gracia and Rosario also show a strong reliance on wooden dwellings, with nearly half of Rosario's households using wood. Sta. Cruz stands out with the highest percentage of semi-concrete homes (43.9%), although a large portion still lives in wooden structures. Makeshift houses are most prominent in Baluarte (22.74%) and present in small numbers in other barangays like Gracia and Sta. Ana, indicating pockets of housing insecurity. While some barangays such as Casinglot, Poblacion, and Sugbongcogon show no recorded data for makeshift dwellings, this absence may reflect either stable housing conditions or simply a lack of reported information.

7.3.11.2 Households by source of drinking water

The Barangay Situational Analysis data highlights notable differences in access to safe and reliable drinking water sources among the ten barangays. Several barangays, such as Natumolan and Poblacion, show a high reliance on mineral water from dispensing stores, with 90% and 65% of households respectively using this source. Gracia also exhibits a strong dependence on mineral water, with 74.3% of its households relying on it, likely due to limited access to piped and communal sources. In contrast, barangays like Sta. Ana, Casinglot, and Sta. Cruz has relatively better access to Level III piped water systems, indicating stronger infrastructure development. However, Mohon stands out for its overwhelming dependence on communal water sources, with 95.2% of households relying on shared systems and only 4.7% having household-level piped connections. Similarly, Rosario and Sugbongcogon also depend heavily on communal sources, reflecting potential infrastructure gaps or geographic isolation. While Sta. Ana and Casinglot benefit from both piped and mineral water sources, barangays like Gracia and Rosario have limited access across all categories, highlighting a need for focused water service improvements. The widespread use of mineral water in several barangays may also suggest issues of water quality or trust in public water systems. These findings point to the urgent need for targeted infrastructure investments, particularly in areas with low household-level access to piped water, alongside efforts to improve water quality, accessibility, and public confidence in local water systems.

Table 7-37. Distribution of Households by source of drinking water and Barangay, 2024

Barangay	Total HHs	Level III HHs	% Level III	Communal Source Piped Water System	% Communal	Mineral Water/water dispensing stores	% Mineral Water/water dispensing
Baluarte	2,468	712	28.8	333	13.5	611	24.8
Casinglot	2,453	1,162	47.4	201	8.2	1,056	43.0
Gracia	604	98	16.2	46	7.6	449	74.3
Mohon	1,301	61	4.7	1,238	95.2	1	0.1
Natumolan	2,420	212	8.8	30	1.2	2,178	90.0
Poblacion	2,374	656	27.6	176	7.4	1,542	65.0
Sta. Ana	2,358	1,317	55.9	1,008	42.7	35	1.5
Sta. Cruz	3,720	996	26.8	545	14.7	1,328	35.7
Sugbongcogon	884	55	6.2	285	32.2	544	61.5
Rosario	313	0	0.0	243	77.6	4	1.3

Source: BSA, 2024

7.3.11.3 Household Participation in Food Production Activities by Barangay

The household involvement in food production activities across the ten barangays highlights notable differences in participation levels in vegetable gardening, livestock or poultry raising, and combined practices with some figures possibly indicating missing or unreported data rather than zero participation. Out of a total of 18,895 households, 3,860 (20.4%) are engaged in vegetable gardening, 1,975 (10.5%) in livestock or poultry raising, and 4,140 (21.9%) in both activities. Sta. Cruz shows strong participation, with 47.4% of households involved in gardening and 23.4% in raising livestock. Sta. Ana stands out with an exceptionally high 84.5% of households practicing both activities, reflecting a deeply integrated approach to home-based food production. Similarly, Sugbongcogon reports that 92.5% of households are engaged in both gardening and livestock, despite low individual activity rates, suggesting that most residents prefer combined methods. Other barangays such as Poblacion and Rosario also show moderate to high participation across categories. In contrast, barangays like Baluarte, Mohon, and Natumolan show lower levels of reported involvement, particularly in livestock and combined practices though this may partly be due to incomplete data rather than lack of activity. These findings underscore the need to support and expand household food production, especially integrated approaches that enhance food security and resilience. High-performing barangays like Sta. Ana and Sugbongcogon can serve as models for encouraging similar practices in less-engaged communities.

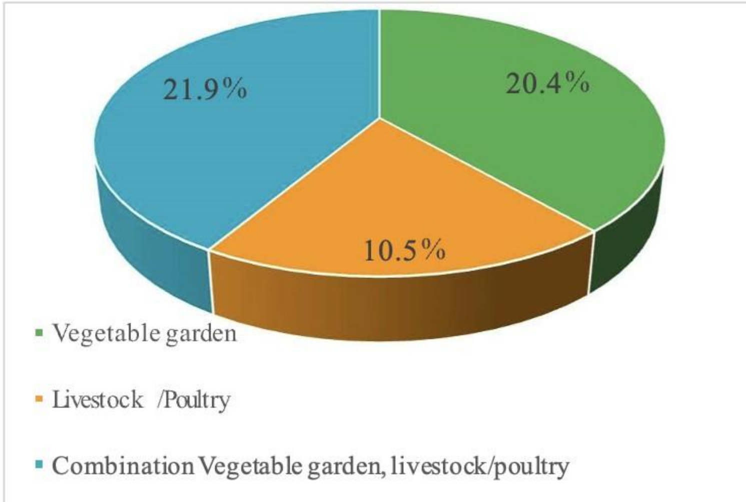

Figure 7-36 Distribution of Household Participation in Food Production Activities by Barangay, 2024

Table 7-38. Distribution of Households Food Production Practices by Barangay 2024

	Total HHs	Vegetable garden	%	Livestock/ Poultry	%	Combination Vegetable garden, livestock/poultry	%
Baluarte	2,468	78	3.2	74	3.0	8	0.3
Casinglot	2,453	676	27.6	439	17.9	145	5.9
Gracia	604	53	8.8	25	4.1	71	11.8
Mohon	1,301	250	19.2		0.0		0.0
Natumolan	2,420	150	6.2	75	3.1		0.0
Poblacion	2,374	346	14.6	334	14.1	680	28.6
Sta. Ana	2,358	366	15.5		0.0	1,992	84.5
Sta. Cruz	3,720	1,762	47.4	871	23.4	426	11.5
Sugbongcogon	884	16	1.8	50	5.7	818	92.5
Rosario	313	163	52.1	107	34.2		0.0
Total	**18,895**	**3,860**	**20.4**	**1,975**	**10.5**	**4,140**	**21.9**

Source: BSA, 2024

7.3.11.4 Household Waste Disposal Practices by Barangay

The household waste disposal methods across ten barangays reveals varied practices, reflecting differences in infrastructure access, sustainability efforts, and potential service gaps. Out of a total of 18,895 households, the majority 14,525 households or 76.9% rely on barangay or municipal garbage collection, indicating widespread but uneven access to formal waste management systems. A smaller portion, 1,769 households (9.4%), use their own compost pits, suggesting localized efforts toward sustainable waste disposal. Meanwhile, 1,292 households (6.8%) resort to other methods such as burning, burying, or informal dumping. Baluarte and Poblacion show the highest dependence on municipal garbage collection, serving over 98% of households, followed closely by Sta. Ana, Natumolan, and Casinglot, all with over 89% collection coverage. In contrast, Sta. Cruz, the most populous barangay, shows more diverse practices—only 55.6% rely on garbage collection, while 28.8% use compost pits and 15.6% utilize other methods. Gracia and Sugbongcogon also reflect limited access to formal services; in Gracia, only 54.5% use municipal collection, while the rest turn to composting (30.1%) or other means (15.4%). In Sugbongcogon, just 49.2% rely on garbage collection, with the remaining 50.8% using unspecified methods. Rosario shows a more balanced profile, with 70.6% of households using collection services, 20.1% using composting, and 5.4% relying on other options. Notably, Mohon lacks reported data, which may suggest either missing information or the absence of established disposal systems.

Table 7-39 Distribution of Households Waste Disposal Methods by Barangay 2024

	No. of HH	Barangay or municipal garbage collection	%	Own Compost Pit	%	Others, specify	%
Baluarte	2,468	2,423	98.2	41	1.7	4	0.2
Casinglot	2,453	2,141	87.3	312	12.7		0.0
Gracia	604	329	54.5	182	30.1	93	15.4
Mohon	1,301		0.0		0.0		0.0
Natumolan	2,420	2,287	94.5		0.0	133	5.5
Poblacion	2,374	2,358	99.3		0.0	16	0.7
Sta. Ana	2,358	2,262	95.9	100	4.2		0.0
Sta. Cruz	3,720	2,069	55.6	1,071	28.8	580	15.6
Sugbongcogon	884	435	49.2		0.0	449	50.8
Rosario	313	221	70.6	63	20.1	17	5.4
Total	**18,895**	**14,525**	**76.9**	**1,769**	**9.4**	**1,292**	**6.8**

Source: BSA, 2024

7.3.12 Family Income

7.3.12.1 Family Monthly Income Distribution per Barangay

Table 7-40 Family Monthly Income Distribution by Barangay, Municipality of Tagoloan, 2024

Number of Families with Monthly Income						
TOTAL FAMILIES		**Below 4,000**	**4,001-6,000**	**6,001-8000**	**8,001-10,000**	**10,000 above**
Baluarte	2,971	55	285	1,136	876	619
Casinglot	2,433	943	524	439	319	190
Gracia	714	89	125	152	172	176
Mohon	1,348	70	220	275	408	375
Natumolan	2,680	327	422	476	406	1,013
Poblacion	2,940	1,397	526	394	275	303
Sta. Ana	2,687	349	359	559	695	725
Sta. Cruz	4,225	1,110	934	863	725	593
Sugbongcogon	1,100	616	161	120	99	99
Rosario	483	294	138	27	3	21
Total	**21,581**	**5,250**	**3,694**	**4,441**	**3,978**	**4,114**

Source: MPO/BPO – Tagoloan, 2024

Based on the 2024 Barangay Population Data, the distribution of family income across the barangays reveals significant disparities in economic well-being. Rosario stands out with the highest poverty rate, where 89.44% of families (432 out of 483) earn less than ₱6,000 per month. This means that nearly 9 out of every 10 families in Rosario are struggling to afford essential needs such as food, shelter, and healthcare. Sugbongcogon follows closely, with 70.64% of its 1,100 families falling below the poverty line.

Poblacion also shows a critical situation, with 65.41% (1,923 out of 2,940 families) considered poor. Casinglot has a poverty rate of 60.30%, suggesting that more than half of its families live in financial hardship. In Sta. Cruz, nearly half of the population (48.38%) earns below ₱6,000, showing signs of economic struggle but with a notable portion also in higher income brackets. Barangays such as Gracia (29.97%), Natumolan (27.95%), Sta. Ana (26.35%), and Mohon (21.51%) have moderate poverty levels, with roughly one in four families earning less than the minimum required to meet basic needs. On the other hand, Baluarte reports the lowest poverty rate at 11.44%, with the majority of its families earning between ₱6,001 and ₱10,000 or higher, reflecting a more stable local economy. Notably, Natumolan also has the highest number of families earning above ₱10,000, which suggests a growing middle-income segment despite the presence of low-income households. These patterns highlight the need for targeted interventions, especially in barangays with the highest concentration of poor families. Programs focused on livelihood support, income generation, and access to essential services would be most beneficial in addressing the income gap and reducing poverty in the most affected communities.

7.3.13 Protective Services

7.3.13.1 Protective Services Infrastructure and Personnel

The Municipality of Tagoloan is supported by a coordinated protective services system aimed at ensuring public safety and order. The town has one police station, which is staffed by a total of 42 personnel composed of 31 male and 11 female uniformed officers alongside 4 non-uniformed personnel (1 male and 3 female). The station is equipped with 2 patrol cars and 1 motorcycle, allowing for effective mobility and rapid response to incidents. The municipality also has one detention facility for holding detainees in custody.

In addition to formal law enforcement, Tagoloan strengthens community-level peacekeeping through approximately 200 members of the Barangay Peacekeeping Action Team (BPAT) with each of the municipality's ten barangays assigning around 20 BPAT members, who help maintain order in their respective barangays. To support traffic management and road safety, 12 traffic enforcers are employed by the local government unit (LGU).

Fire protection services are covered by two fire stations—the Tagoloan Fire Station and the PIEMO Fire Station—while emergency medical and disaster response needs are served by one municipal emergency response unit. Altogether, this system reflects the municipality’s proactive approach to safety, blending institutional presence with community involvement and adequate logistical support.

7.3.13.2 Police – population ratio

Based on data from the Municipal Population Office, the Municipality of Tagoloan has a total population of 87,775 and is served by 42 uniformed police personnel. This results in a police-to-population ratio of 1:2,090, meaning that each police officer is responsible for the safety and security of over two thousand residents. This figure falls significantly short of the United Nations-recommended standard of 1:500, which highlights a considerable gap in manpower relative to the needs of the growing population. The current ratio suggests the need for additional recruitment, improved deployment strategies, and possibly greater investment in community-based policing and support systems such as the Barangay Peacekeeping Action Teams (BPATs) to maintain public safety and order effectively.

7.3.13.3 Types and volume of crime in the LGU

The crime incidence report for the Municipality of Tagoloan reveals an overall decline in criminal activities from 2023 to 2024, with total reported crimes decreasing by 20.3%, from 281 to 224 cases. Index crimes, which include serious offenses such as crimes against persons and property, dropped by 31%, from 71 to 49 cases. Within crimes against persons, there was a slight decrease of 8.3%, from 24 to 22 cases. However, certain offenses showed different trends: murders doubled from 3 to 6 cases, while physical injuries decreased sharply by 72.7%. Rape cases increased by 33.3%, highlighting an area of concern.

Table 7-41 Comparative Crime Incidence Report: 2023–2024

Index Crimes	**2023**	**2024**	**% Change**
Crimes Against Person	24	22	-8.3
a.Murder	3	6	100
b.Homicide	1	1	0
c. Physical Injury	11	3	-72.7
d. Rape	9	12	33.3
Crimes Against Property	47	27	-42.6
a.Robbery	6	1	-83.3
b.Theft	38	23	-39.5
c. Carnapping	3	2	-33.3
d.Cattle Rustling	0	1	-
Total Index Crime	71	49	-31
Non-Index Crimes	-	-	-
Reckless Imprudence Resulting to:	58	62	6.9
*Homicide	10	13	30
*Physical Injury	19	21	10.5
*Damage to property	29	28	-3.4
Violation of special Laws	94	78	-17
Other non-index crimes	58	35	-39.7
Total Non-Index Crime	210	175	-16.7
Grand Total (Index and Non-Index Crimes)	**281**	**224**	**-20.3**

Source: PNP – Tagoloan, 2024

Crimes against property saw a significant reduction of 42.6%, with robbery dropping dramatically by 83.3%, theft decreasing by nearly 40%, and carnapping also showing a decline. A new case of cattle rustling was reported in 2024.

Non-index crimes also declined by 16.7%, from 210 to 175 cases. Reckless imprudence-related incidents slightly increased by 6.9%, with homicide and physical injury under this category rising by 30% and 10.5%, respectively. Violations of special laws dropped by 17%, and other non-index crimes decreased by almost 40%.

These figures indicate that while the municipality has made progress in reducing many types of crimes, challenges remain in addressing gender-based violence and reckless behavior leading to injury or death. Continuous efforts in law enforcement, community awareness, and targeted interventions are needed to sustain and improve public safety.

7.3.13.4 Fire-fighting personnel and facilities

The Municipality of Tagoloan is served by two fire stations: the Tagoloan Fire Station and the PIEMO Fire Station. The Tagoloan Fire Station is equipped with two fire trucks and staffed by 16 personnel, ensuring readiness to respond to fire and emergency situations within its coverage area. The PIEMO Fire Station, on the other hand, operates with one fire truck and 8 personnel, contributing additional support to the municipality's fire protection and emergency response services. Together, these two stations play a vital role in safeguarding the community and maintaining public safety.

7.3.13.5 Fire Incidence Reported

In 2024, a total of 24 fire incidents were reported. The majority of these were attributed to human negligence such as leaving open flames unattended, burning waste improperly, and discarding cigarette butts carelessly. Electrical issues, including arcing and overheating, also played a major role, often due to poor maintenance and aging electrical systems. Additional contributing factors included vehicle overheating, excessive electrical load, and a general lack of public awareness and education on fire safety.

8. Evaluation/ Assessment of Environmental and Social Risk Impact

This section presents the identification, prediction, and evaluation of environmental and social risks and impacts associated with MICP across its pre-construction, construction, operation, and decommissioning phases. The assessment follows a structured and risk-based approach consistent with the AIIB Environmental and Social Framework and internationally recognized ESIA good practice.

The assessment considers direct, indirect, induced, and cumulative impacts on the physical environment, biodiversity, socio- economic conditions, labor and occupational health and safety, and community health and safety.

8.1 Impact Identification and Assessment Framework

Impact identification for the Mindanao International Container Port (MICP) Project was undertaken using a systematic and integrated approach, informed by:

- The Project's design, construction methods, and operational characteristics, including phased wharf development, marine works, yard development, internal circulation, and port operations;
- Established baseline environmental and social conditions within the PHIVIDEC Industrial Estate, adjacent coastal and marine areas of Macajalar Bay, and relevant land- and sea-based access corridors; and
- Applicable Philippine regulatory requirements and relevant international good practice for environmental and social assessment.

This framework ensured that potential environmental and social risks and impacts were identified across all project phases, including pre-construction, construction, operation, and, where relevant, decommissioning.

8.2 Impact Significance Evaluation

Impact significance was evaluated based on a structured impact rating matrix, adapted from established Asian Development Bank (ADB) and International Finance Corporation (IFC) environmental assessment practice and consistent with international good practice. The methodology assesses the interaction between Project activities and environmental and social receptors during the construction, operation, and decommissioning phases.

Impact significance was determined through a qualitative evaluation of

- Impact magnitude, taking into account the sacle and intensity of the impact, spatial extent, duration, reversibility, and likelihood of occurrence; and

- Receptor sensitivity, informed by baseline environmental and social conditions, conservation or protection status, legal or regulatory designation, and social value.

For each identified impact, a pre-mitigation significance rating was assigned by combining impact magnitude and receptor sensitivity using the impact rating matrix presented above. The resulting significance categories (negligible, minor, moderate, or major) provide an indication of the inherent level of project risk prior to the application of mitigation measures.

Elevated receptor sensitivity was applied to the following receptors due to their ecological, social, or regulatory importance:

- Marine ecosystems within Macajalar Bay;
- Natural habitats and biodiversity receptors assessed under the Critical Habitat Assessment (CHA); and
- Displaced informal settler families.

Table 1. Impact Significance Rating Matrix (Pre-Mitigation)

Receptor Sensitivity	Low Impact Magnitude	Medium Impact Magnitude	High Impact Magnitude
Low Sensitivity	Negligible	Minor	Moderate
Medium Sensitivity	Minor	Moderate	Major
High Sensitivity	Moderate	Major	Major

Table 2. Impact Magnitude Classification Matrix

Magnitude Level	Scale & Intensity	Spatial Extent	Duration	Reversibility	Likelihood
Low	Low-intensity change, barely distinguishable from baseline conditions	Highly localized, confined to the immediate work area	Short-term or intermittent	Fully reversible through natural recovery or routine management	Unlikely to occur or occurs infrequently
Medium	Measurable change of moderate intensity	Extends beyond the immediate site but remains within the Project Area of Influence	Medium-term or occurs repeatedly over the Project phase	Largely reversible with targeted mitigation measures	Likely to occur under normal Project conditions
High	Substantial change of high intensity	Widespread or extending beyond the Project Area of Influence	Long-term or permanent	Difficult to reverse or irreversible	Very likely or certain to occur

Table 3. Receptor Sensitivity Classification Matrix

Sensitivity Level	Environmental / Social Value	Legal / Regulatory Status	Vulnerability	Adaptive Capacity
Low	Low environmental or social value; highly modified or artificial systems	No specific legal or regulatory protection	Low vulnerability to disturbance	High capacity to absorb change without lasting effects
Medium	Recognized environmental or social value	Some regulatory protection or planning designation	Moderate vulnerability to disturbance	Moderate adaptive capacity
High	High ecological, social, cultural, or livelihood importance	Legally protected, conservation-designated, or socially safeguarded	Highly vulnerable to disturbance	Low capacity to absorb change

Elevated receptor sensitivity was applied to receptors of high ecological, social, or regulatory importance. Post-mitigation (residual) impact significance was determined by considering the effectiveness of mitigation and management measures defined in the Environmental and Social Management Plan (ESMP), consistent with the mitigation hierarchy.

8.3 Physical Environment

8.3.1 Intensification of Industrial Land Use within an Existing Project Footprint

Impact Discussion

During pre-construction and construction, the principal land-use impact pathway is the incremental conversion or intensification of industrial land use associated with new port structures, construction laydown areas, temporary haul routes, and utility relocations. As the Project is located within an existing industrial estate and expands an operating port facility, compatibility with designated land use is high and the potential for land-use conflict within the core Project footprint is limited.

Residual sensitivity is concentrated at the Project boundary and along public access corridors, where construction traffic, temporary access controls, dust, and noise may affect adjacent receptors. From a land planning and regulatory perspective, the wharf extension outside the prior ECC boundary represents a specific sensitivity, as it expands the Project's spatial influence and may interface with shoreline uses, navigational space, and coastal users, notwithstanding its consistency with port and industrial functions.

During operation, land-use impacts are primarily associated with increased throughput, higher intensity yard operations, and potential induced development pressure within the industrial estate and surrounding corridors. These effects may increase demand for land for ancillary logistics, transport-related activities, and worker services. Consequently, the significance of land-use impacts is closely linked to the effectiveness of estate planning controls, traffic management, and the Project's ability to prevent uncontrolled spillover of port-related activities into non-industrial zones.

Impact Evaluation and Significance

The magnitude of impact is assessed as Low, as the Project does not introduce incompatible land uses and is implemented within an established port and industrial setting. The sensitivity of receptors is assessed as Low, given the industrial baseline character of the site and surrounding areas.

Considering the Low magnitude and Low sensitivity, the overall impact significance is assessed as Minor, consistent with the impact classification presented in the Land Use impact matrix.

Impact Description	Intensification of Industrial Land Use within an Existing Project Footprint

Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability	✓	Low		Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Mitigation and Enhancement Measures

The following measures will be implemented to manage land-use impacts:

- Confirm and document consistency with PHIVIDEC development plans and host LGU land use policy instruments, including clear delineation of the Phase 3 footprint relative to ECC-covered areas.
- Establish a construction land-use control plan defining laydown areas, spoil and materials staging zones, haul routes, and no-go areas, with clear demarcation and access controls at Project boundaries.
- Implement a traffic and logistics management plan prioritizing scheduled deliveries, designated truck routes, and safe access management to reduce disruption to adjacent land uses.
- Apply progressive restoration of temporary construction areas and maintain good housekeeping standards to minimize secondary land degradation and visual

impacts at boundary interfaces.
- As an enhancement, incorporate boundary greening or buffer design where feasible to reduce dust transfer and improve visual screening, without compromising port safety or security requirements.

Residual Impact Significance

With the implementation of the above mitigation and enhancement measures, residual impacts on land use and land classification are expected to remain Minor.

8.3.2 Indirect Effects on Environmentally Critical Areas through Construction and Operational Activities

Impact Discussion

Screening against national ECA criteria indicates that the Project footprint does not physically overlap with protected areas or other designated Environmentally Critical Areas. However, indirect impact pathways remain relevant.

Beyond ECAs, sensitive receptors within the Project's Area of Influence include nearshore marine waters of Macajalar Bay, coastal ecological resources (e.g., soft-bottom benthic habitats and seagrass areas occurring outside the immediate footprint), downstream and adjacent fishing grounds used by small-scale fishers, ambient air and noise receptors at the industrial estate boundary, and nearby communities and road corridors affected by project-related traffic.

During construction, indirect effects may arise from increased demand for aggregates, construction materials, and disposal capacity, as well as higher transport activity along regional corridors. If sourcing and logistics are not adequately controlled, these demands could place pressure on natural areas beyond the Project boundary. These indirect pressures may also affect sensitive receptors through increased dust and noise levels, traffic-related safety risks, and temporary disturbance to coastal resource users.

For shoreline or marine-adjacent works associated with the wharf extension, indirect pathways also include increased sediment release and turbidity. These effects may influence coastal ecological receptors outside the immediate footprint, particularly where sediment plumes extend beyond the near-field area. Such effects may extend to sensitive marine receptors, including nearshore fishing areas and ecologically important coastal waters identified in the ESIA baseline.

During operation, increased cargo throughput and traffic can intensify air emissions, spill risk, and waste generation. While these effects occur within an existing industrial and port setting, their cumulative contribution may affect surrounding ecosystems over time, even in the absence of direct Project interaction with ECAs. This includes potential cumulative effects on nearby communities, marine water quality, and fisheries resources within the wider Area of Influence.

<u>Impact Evaluation and Significance</u>

The magnitude of impact is assessed as Low, as no direct physical interaction with ECAs occurs and indirect effects are limited in extent and largely controllable through standard port management measures. The sensitivity of receptors is assessed as Medium, reflecting the inherent vulnerability of protected or sensitive ecosystems that may be affected through indirect or cumulative pathways. This includes the ecological sensitivity of nearshore marine environments and the socio-environmental sensitivity of fisheries-dependent users and nearby communities.

Considering a Low magnitude and Medium sensitivity, the overall impact significance is assessed as Minor, consistent with the Project's indirect relationship to ECAs.

Impact Description	Indirect Effects on Environmentally Critical Areas through Construction and Operational Activities			
Impact Nature		Positive	✓	Negative
Impact Type		Direct	✓	Indirect

Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Mitigation and Enhancement Measures

To manage and minimize indirect impacts on ECAs, the following measures will be implemented:

- Apply an ECA-sensitive procurement and sourcing approach by requiring permitted and compliant sources for aggregates, quarry materials, and disposal facilities, and prohibiting sourcing from protected area cores or legally restricted zones.

- Strengthen shoreline and marine work controls, including turbidity management measures, deployment of silt curtains where applicable, appropriate timing of in-water works informed by the marine baseline, and spill prevention measures specific to marine construction activities.

- Establish and maintain operational spill prevention and emergency response preparedness commensurate with a container port setting, including personnel training, equipment placement, and routine drills.

- Implement dust, noise, and traffic management measures along access routes and at site boundaries to minimize indirect nuisance and safety risks to nearby communities and other receptors.

As an enhancement, align relevant biodiversity safeguards with coastal and watershed management initiatives led by local agencies where feasible, with emphasis on practical measures such as drainage outfall controls and waste minimization.

Residual Impact Significance

With the implementation of the above mitigation and enhancement measures, residual indirect impacts on Environmentally Critical Areas are expected to remain Minor.

8.3.3 Potential Land Tenure and Access Issues Associated with Expansion Beyond the Existing ECC Boundary

Impact Discussion

Within the ECC-covered Project footprint and long-established port operational areas, land tenure conditions are generally stable and characterized by institutional control within an industrial estate. However, the most significant tenure-related risk arises where Phase 3 development extends outside the existing ECC boundary and potentially into areas that have not historically been subject to continuous port operations.

In such areas, there is a possibility of third-party use, informal access, or unrecorded livelihood or transit activities along shoreline edges or peripheral zones. While no confirmed tenure conflicts have been identified at this stage, uncertainty regarding historic or informal use presents a potential risk of land access concerns, disputes, or grievances if not proactively managed.

Impact Evaluation and Significance

The magnitude of potential impact is assessed as Low, as any tenure-related issues are expected to be localized and limited in scope. The sensitivity of receptors is assessed as Medium, reflecting the importance of land access and tenure clarity to affected stakeholders, particularly where informal or customary use may exist.

Based on a Low magnitude and Medium sensitivity, the overall impact significance is assessed as Minor.

Impact Description	Potential Land Tenure and Access Issues Associated with Expansion Beyond the Existing ECC Boundary							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

<u>Mitigation and Enhancement Measures</u>

To manage land tenure risks associated with Phase 3 development, the following measures will be implemented:

- Undertake perimeter verification and stakeholder validation to confirm whether any third-party use, informal access, or customary activities exist at shoreline edges and around the proposed expansion area.
- Clearly demarcate Project boundaries and access restrictions prior to construction to prevent inadvertent encroachment or access conflicts.
- As an enhancement, implement a grievance mechanism specifically tailored to land tenure and access-related issues, with clear procedures, response timelines, and documentation requirements to ensure transparency and timely resolution.

<u>Residual Impact Significance</u>

With the implementation of the above measures, residual impacts related to land tenure and access are expected to remain Minor.

8.3.4 Temporary and Permanent Changes to Visual Character from Port Construction and Operations

<u>Impact Discussion</u>

During pre-construction and construction, visual impacts are expected to arise from the presence of heavy equipment, stockpiles, temporary structures, construction lighting, and increased vehicular traffic. These impacts are generally short- to medium-term and localized within the Project footprint and its immediate surroundings.

During operation, visual impacts will be associated with permanent changes to the skyline and night-time visual environment resulting from expanded port structures, yard activities, and increased lighting. Given that the baseline visual character is already dominated by industrial and port-related uses, the incremental change in visual character within the industrial estate is expected to be moderate.

However, visual effects may be more noticeable from nearby communities, public corridors, and coastal viewpoints, particularly where increased night-time lighting results in glare, light spill, or heightened visual activity beyond existing conditions.

<u>Impact Evaluation and Significance</u>

The magnitude of impact is assessed as Low, reflecting the already industrial visual baseline and the localized nature of changes within the port estate. The sensitivity of receptors is assessed as Medium, as nearby communities and coastal viewpoints may experience increased visibility of port activities, particularly at night.

Based on a Low magnitude and Medium sensitivity, the overall impact significance is assessed as Minor.

Impact Description	Temporary and Permanent Changes to Visual Character from Port Construction and Operations							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

<u>Mitigation and Enhancement Measures</u>

To minimize visual impacts during construction and operation, the following measures will be implemented:

- Adopt a construction visual management protocol requiring orderly staging of works, defined laydown areas, stockpile height limits where feasible, and prompt removal of waste and surplus materials.

- Implement lighting design controls, including the use of full cut-off fixtures where practicable, directional lighting to limit spill beyond operational requirements, and regular maintenance to prevent glare escalation over time.
- Use boundary screening and landscape buffers in feasible areas to reduce direct line-of-sight impacts from public corridors and adjacent communities.
- As an enhancement, integrate consistent architectural treatments, fencing design, and visual elements to reduce visual fragmentation along the industrial estate boundary.

Residual Impact Significance

With the implementation of the above measures, residual visual impacts are expected to remain Minor.

8.3.5 Localized Alteration of Surface Drainage and Ground Stability in a Deltaic Coastal Plain Setting

Impact Discussion

The Project Site is located on a deltaic coastal plain characterized by gentle slopes, low elevation, and the potential for shallow soil saturation. During construction, activities such as grading, fill placement, and the installation of temporary structures may affect surface drainage performance and localized ground stability if not properly managed.

Temporary obstruction of natural or engineered drainage flow paths may result in localized ponding, particularly during rainfall events. Inadequate control of earthworks may also induce erosion at drainage outlets and scouring around temporary conveyance structures. While overall slope gradients within the port platform are minimal, the geomorphological sensitivity of deltaic surfaces means that even minor disruptions to drainage patterns can lead to localized effects.

Given the existing engineered nature of the port platform, impacts are expected to be localized and manageable with appropriate construction planning and controls.

Impact Evaluation and Significance

The magnitude of impact is assessed as Low, as effects are expected to be temporary, localized, and confined to the construction phase. The sensitivity of receptors is assessed as Medium, reflecting the inherent geomorphological sensitivity of low-lying deltaic environments to drainage disruption and saturation.

Based on a Low magnitude and Medium sensitivity, the overall impact significance is assessed as Minor.

Impact Description	Localized Alteration of Surface Drainage and Ground Stability in a Deltaic Coastal Plain Setting							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

<u>Mitigation and Enhancement Measures</u>

The following measures will be implemented to minimize geomorphology- and slope-related impacts:

- Implement an earthworks and drainage sequencing plan that maintains continuous drainage pathways toward approved outfalls and prevents temporary blockage of natural or engineered flow routes.
- Provide temporary erosion and sediment control measures proportionate to exposed surface area and anticipated rainfall intensity, including stabilized access routes and protected discharge points.
- Maintain clear separation between clean runoff and sediment-laden runoff during construction, with appropriate treatment prior to discharge.
- As an enhancement, design permanent drainage upgrades to accommodate projected extreme rainfall intensities and ensure resilience under high-tide backwater conditions typical of coastal settings.

<u>Residual Impact Significance</u>

With effective implementation of the above measures, residual impacts on geomorphology and slope are expected to remain Minor.

8.3.6 Inducement of Geotechnical and Natural Hazard Risks

<u>Impact Discussion</u>

Seismic shaking, liquefaction, and associated lateral spreading represent low-probability but potentially high-consequence hazards for waterfront infrastructure, including wharf structures, crane rails, and paved operational areas. Flooding and drainage-related risks are more frequent but manageable hazards, particularly during construction phases when earthworks and temporary works are active.

Given the Project's location within an engineered port platform, risks are primarily associated with structural performance and operational continuity rather than direct threats to surrounding communities. With appropriate design, construction controls, and operational management, these risks are considered controllable.

Impact Evaluation and Significance

- Magnitude: Low
- Sensitivity / Vulnerability: Medium
- Duration: Long-term (for seismic and subsurface conditions); short-term to intermittent (for construction-phase flooding)
- Spatial Extent: Localized to the Project footprint and immediate access corridors
- Likelihood: Low to Moderate
- Overall Significance: Minor

The impact is not considered Moderate or Major because the hazards are well-characterized, the site is already developed for heavy port use, and effective engineering and management measures are available and standard for this type of infrastructure.

Impact Description	Inducement of Geotechnical and Natural Hazard Risks							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Mitigation and Management Measures Design and Engineering Controls

- Apply seismic design and detailing consistent with the site hazard context, explicitly accounting for soil amplification effects in structural design inputs.
- Quantify liquefaction potential using site-specific investigations (SPT/CPT, shear-wave velocity profiling, groundwater characterization) and implement appropriate ground improvement or deep foundation solutions for critical assets.
- Incorporate lateral spreading and waterfront stability checks in wharf and adjacent yard design, including suitable earth retention and scour protection measures.

Flooding and Drainage Management

- Set platform and critical system elevations using conservative assumptions for flood levels, storm surge, tide interaction, and freeboard.
- Design and maintain stormwater infrastructure to manage increased runoff from impervious surfaces.
- Install backflow prevention devices and tide gates where necessary, and protect outfalls against scour using energy dissipation and armoring.
- Design coastal protection works (revetments, seawalls, transitions) to account for overtopping, wave setup, and toe scour.

Construction Phase Controls

- Maintain clear drainage pathways throughout construction and prevent blockage of natural or engineered flow routes.
- Implement sediment control measures to prevent clogging of drainage inlets and outfalls.

Preparedness and Monitoring

- Establish emergency preparedness and business continuity procedures addressing earthquake scenarios, including rapid post-event inspection protocols for quay structures and yard pavements.
- As an enhancement, implement a risk-based monitoring program for settlement and deformation during the early operational period following Phase 3 commissioning.

<u>Residual Impact Significance</u>

With the implementation of the above engineering, drainage, preparedness, and monitoring measures, residual risks related to subsidence, liquefaction, seismic shaking, and flooding are expected to remain Minor and within acceptable limits for a coastal container port operating under good international industry practice.

8.3.7 Ground Stability, Settlement, and Sub-Surface Performance Risk

<u>Impact Discussion</u>

Settlement and sub-surface performance risks are typical for port developments on deltaic alluvium, particularly for load-sensitive infrastructure such as quay structures, crane rails, and heavy-duty pavements. While these risks do not generally present safety concerns when properly managed, they can affect operational tolerances, asset longevity, and maintenance requirements if not addressed through appropriate investigation, design, and construction quality control.

Groundwater conditions are an important factor influencing sub-surface behavior, settlement performance, and construction stability. Accordingly, groundwater quality testing will be conducted prior to or during the early stages of construction, in compliance with DENR-EMB requirements and good international practice, to establish baseline conditions and support the assessment of potential Project-related impacts.

Given that the Project extends into new development areas under Phase 3, additional characterization of subsurface conditions is required to ensure that ground behavior under new loads is adequately understood and managed.

Impact Evaluation and Significance

- Magnitude: Low
- Sensitivity / Vulnerability: Medium
- Duration: Long-term
- Spatial Extent: Localized to the Project footprint and new load-bearing structures
- Likelihood: Moderate without mitigation
- Overall Significance: Minor

The impact is not considered Moderate or Major because ground behavior risks are well understood in deltaic settings and can be effectively mitigated using standard geotechnical investigation, design, and construction practices.

Impact Description	Ground Stability, Settlement, and Sub-Surface Performance Risk							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Mitigation and Management Measures Investigation and Design

- Conduct targeted and site-specific geotechnical investigations in all Phase 3 development areas, with particular emphasis on the wharf extension footprint and any newly developed yard zones, to define stratigraphy, groundwater levels, compressibility, and shear strength parameters.
- Implement baseline groundwater quality testing prior to or during early construction in accordance with DENR-EMB requirements to confirm pre-project conditions and inform impact assessment.
- Apply foundation and ground improvement solutions appropriate to identified subsurface conditions, including settlement control measures for infrastructure with strict operational tolerances.

Construction Quality Control

- Implement rigorous quality assurance procedures for fill placement and compaction, including moisture control, density testing, and documentation of compliance with design specifications.
- Manage excavation stability through appropriate temporary works, dewatering controls where required, and sequencing of construction activities.
- Manage construction dewatering activities to minimize potential impacts on groundwater quality and surrounding receptors.

Monitoring and Asset Management (Enhancement)

- As an enhancement, incorporate long-term settlement monitoring and pavement performance inspection to support preventive maintenance and asset integrity management during the operational phase.
- Evaluate groundwater quality monitoring results, where applicable, against baseline conditions and implement corrective measures if Project-related changes are identified.

Residual Impact Significance

With the implementation of appropriate geotechnical investigation, design measures, and construction quality controls, residual impacts related to geology and sub-surface conditions are expected to remain Minor and manageable within standard port engineering practice.

8.3.8 Degradation of Air Quality due to Dust and Noise Emissions

Impact Discussion

During the construction phase, degradation of air quality and nuisance to people will occur due to earthworks, yard development, wharf extension, and installation of port infrastructure. Activities such as excavation, filling, piling, concrete works, and the movement of heavy equipment and trucks will generate fugitive dust (TSP, PM_{10}, $PM_{2.5}$) and exhaust emissions (NO_x, SO_x, CO, hydrocarbons). Simultaneously, noise from cranes, piling rigs, trucks, and other heavy machinery will contribute to nuisance and potential disturbance to workers and nearby receptors.

The Project is located within the PHIVIDEC Industrial Estate, an area already characterized by port and industrial activities. Baseline air quality and noise levels in the ESIA indicate that environmental conditions are generally compliant with Philippine standards and reflect an existing industrial setting. However, construction activities will temporarily elevate dust levels and noise, particularly along internal roads and access routes used by construction vehicles.

Nearby barangays such as Santa Ana, Baluarte, Mohon, Rosario, and Poblacion, which include mixed residential–industrial land uses, may experience intermittent nuisance from dust and noise, especially during peak construction periods

Impact Evaluation and Significance

The construction of the Project expansion will involve earthworks, wharf extension, yard development, piling, and intensive movement of heavy equipment and trucks. Dust will be generated from exposed surfaces, haul roads, stockpiles, and vehicle movement, while noise will be generated from cranes, piling rigs, generators, and transport vehicles. Baseline air quality and noise levels in the Project Area are currently compliant with Philippine standards and reflect an existing industrial port environment.

The villages and receptors potentially affected include workers within the port and communities located along access roads within Tagoloan municipality. As these areas are within an established industrial and logistics corridor, the sensitivity of receptors is considered Medium.

The spatial extent of the impact is Local, limited to the port area and its immediate access routes. The duration of the impact is Short-term to Medium-term, corresponding to the construction period. The impact is Reversible, as air quality and noise levels will return to baseline conditions after construction activities cease.

Taking into account that dust and noise generation will be noticeable but localized and temporary, the magnitude is assessed as Medium. With Medium magnitude and Medium sensitivity, the impact significance is assessed as Moderate.

Impact Description	Degradation of Air Quality due to Dust and Noise Emissions							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible		Low	✓	Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible		Minor	✓	Moderate		Major

<u>Mitigation and Management Measures</u>

- Implement a Construction Air Quality Management Plan.
- Regular watering of exposed surfaces, haul roads, and stockpiles.
- Cover trucks transporting fine materials.
- Provide wheel-washing facilities at site exits.
- Maintain and emission-test equipment and prohibit excessive idling.
- Provide dust masks and PPE for workers.
- Implement traffic and logistics management to prevent congestion.

<u>Residual Impact Significance</u>

If the mitigation measures are implemented effectively, including dust suppression, equipment maintenance, controlled scheduling of noisy activities, provision of PPE, and regular air and noise monitoring, the residual impact on people from dust and noise emissions during construction and operation is assessed to be of Minor significance.

8.3.9. Contribution to Greenhouse Gas (GHG) Emissions

<u>Impact Discussion</u>

GHG emissions will be generated during construction from the use of diesel-powered construction equipment, trucks, and generators. During operation, emissions will arise from vessel calls, cargo-handling equipment, internal transport vehicles, and electricity consumption for yard operations and reefer containers.

However, the expansion does not introduce new industrial processes; it expands capacity within an existing port that already operates on a 24/7 basis. Therefore, emissions are incremental rather than transformational

Impact Evaluation and Significance

GHG emissions will be generated during construction from fuel combustion in heavy equipment, trucks, and generators. During operation, emissions will mainly originate from vehicle traffic entering and exiting the terminal and from standby generators used only during power interruptions. No new industrial processes will be introduced, and the same container terminal processes and technologies will continue to be used.

The impact will extend beyond the Project Area in terms of contribution to climate change, and therefore the spatial extent is considered Regional to Global, while the duration is Long-term. However, the quantity of emissions from the Project is relatively small compared to national and regional emission sources, and the increase is incremental within an existing industrial port.

The magnitude of GHG emissions is therefore assessed as Low to Medium. The sensitivity of the receptor (the global climate system) is considered High. Taking into account the relatively low incremental contribution of the Project to total emissions, the overall impact significance is assessed as Minor to Moderate.

Impact Description	Community and Worker Exposure to Dust and Vehicle Emission							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Proposed Mitigation Measures

- Maintain fuel-efficient equipment and vehicles.
- Optimize logistics and traffic management to reduce idling.
- Use energy-efficient yard equipment and lighting.
- Implement preventive maintenance for all engines and electrical systems.
- Monitor fuel and electricity consumption.

Residual Impact Significance

If the proposed energy efficiency measures, equipment maintenance, traffic management, and fuel-use optimization measures are properly implemented, the residual greenhouse gas emissions from construction and operation of MICP expansion are considered to be of Minor significance.

8.3.10 Positive Impacts due to GHG Reduction Initiatives

Impact Discussion

The Philippines promotes the reduction of greenhouse gas (GHG) emissions and the transition to cleaner energy sources as part of its climate change mitigation and sustainable development objectives. In support of this policy direction, the Mindanao International Container Port (MICP), through the Mindanao Container Terminal (MCT), has adopted a renewable-energy-based emission-reduction strategy as part of its operational framework.

Overall GHG emissions from the Project are expected to remain minimal, with construction emissions primarily originating from heavy equipment and delivery vehicles, and operational emissions mainly associated with vehicular traffic and standby generators used only during power interruptions. These generators contribute only marginally to total emissions, and no significant air pollutants are anticipated from routine operations.

To further reduce the Project's carbon footprint, MCT has implemented a solar-powered energy sourcing strategy, which commenced on 14 February 2025. Under a retail supply contract with PrimeRES Energy Corporation within the Retail Competition and Open Access (RCOA) framework of the Philippine energy sector, MCT now operates exclusively on solar power during daylight hours. During nighttime, electricity is supplied through PrimeRES's diversified power portfolio, including the Wholesale Electricity Spot Market (WESM), ensuring continuous and reliable power while maximizing the share of renewable energy in terminal operations. This hybrid energy solution significantly reduces reliance on fossil-fuel-based electricity and supports long-term GHG emission reduction.

Impact Evaluation and Significance

The use of solar-generated electricity for daytime port operations represents a direct and sustained reduction in greenhouse gas emissions associated with grid electricity and diesel-based backup power. By displacing fossil-fuel-based power with renewable solar energy, the terminal avoids the emissions that would otherwise be produced from conventional electricity generation and generator use.

Port operations are long-term in nature, with infrastructure and electrical systems designed to operate for several decades. As such, the continued use of solar power as a primary daytime energy source will deliver long-term and cumulative GHG emission reductions throughout the operational life of the MICP. The hybrid solar-grid system also ensures energy security while maximizing the use of clean energy, making the emission-reduction benefit both technically and operationally sustainable.

Accordingly, the impact of the Project related to greenhouse gas mitigation and air quality improvement is assessed as Positive.

Impact Description	Positive Impacts due to GHG Reduction Initiatives			
Impact Nature	✓	Positive		Negative
Impact Type	✓	Direct		Indirect

8.4 Biological Environment

8.4.1 Potential Disturbance to Migratory and Wide-Ranging Marine Megafauna

Impact Discussion

Marine megafauna such as dolphins are known to be wide-ranging and migratory, and their occurrence in coastal waters may be episodic or seasonal rather than continuous. Baseline ecological surveys and key informant interviews undertaken for the Project recorded occasional sightings of dolphins in the wider Macajalar Bay area, although no regular use of the immediate Project frontage was documented.

A desk-based review of available secondary data sources—including regional ecological studies for Macajalar Bay, academic literature, fisheries and biodiversity assessments, and available citizen science and stranding records—indicates that the bay functions as a transit and foraging area for small cetaceans rather than as a critical breeding or resident habitat. The Project Area itself is located within a long-established, highly modified industrial port environment, characterized by engineered shorelines, routine vessel traffic, and elevated background underwater noise levels.

Potential impact pathways to marine megafauna during construction and early operation include:

- Temporary increases in underwater noise associated with piling, dredging, and construction vessel movements;
- Short-term disturbance from increased vessel activity and human presence; and
- Localized habitat disturbance in nearshore waters.

Given the absence of critical habitat, lack of documented resident populations, and the episodic nature of megafauna presence in the vicinity, the likelihood of significant adverse effects on marine megafauna is assessed as low, provided that construction activities are managed in accordance with international good practice.

Based on the above evidence, and applying a risk-based and proportionate approach, targeted primary marine megafauna surveys were not undertaken at this stage. However, a precautionary mitigation and monitoring framework is proposed to address residual uncertainty and ensure adaptive management should megafauna presence be higher than anticipated.

Impact Evaluation and Significance

The duration of potential disturbance is expected to be temporary, limited to periods of active marine construction and elevated vessel movement. The spatial extent of potential effects may extend beyond the immediate footprint but remains localized within the already industrialized section of Macajalar Bay.

The magnitude of impact is assessed as Low, as Project-related noise and activity will occur within an environment already subject to regular maritime traffic. The sensitivity of receptors is assessed as Medium, reflecting the mobile nature of marine megafauna and their capacity to avoid localized disturbances.

Taking into account a Low magnitude and Medium sensitivity, the overall impact significance is assessed as Minor.

Impact Description	Potential Disturbance to Migratory and Wide-Ranging Marine Megafauna							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Proposed Mitigation and Management Measures

As a precautionary approach, and consistent with international best practice for marine works in coastal environments, the following measures shall be implemented during marine construction activities where relevant:

- Conduct marine mammal observation by trained personnel during periods of active piling, dredging, or intensive vessel operations.
- Establish exclusion zones around piling or dredging activities, with temporary suspension of works if marine mammals are observed within the defined zone.
- Implement soft-start / ramp-up procedures for piling and other high-noise activities to allow marine fauna to move away from the area.
- Apply vessel speed controls and navigation protocols within the construction area to reduce collision risk and underwater noise.

- Where practicable, schedule high-noise marine activities outside periods of increased seasonal presence, should such patterns be identified during construction monitoring.

Monitoring and Adaptive Management

- Record all marine megafauna sightings during construction and early operational phases, including species (where identifiable), number of individuals, behavior, and location.
- Review sighting records periodically to determine whether presence is higher than baseline expectations.
- Apply adaptive management measures, including refinement of exclusion zones, enhanced observation effort, or additional operational controls, if monitoring indicates elevated risk.

Residual Impact Significance

With implementation of the above precautionary mitigation and monitoring measures, residual impacts on migratory and wide-ranging marine megafauna are expected to remain Minor.

8.4.2 Turbidity from Dredging and Seabed Disturbance

Impact Discussion

Capital and maintenance dredging, bed levelling, and vessel propeller wash associated with the wharf enhancement will resuspend fine sediments, resulting in temporary increases in turbidity and total suspended solids (TSS) in nearshore waters. Under slack current conditions, short-range sediment deposition may occur, potentially smothering micro-benthic communities and portions of the nearshore seagrass patch.

Baseline observations indicate that nearshore waters in front of the MCT already exhibit intermittent turbidity and surface discoloration, and that benthic habitats are dominated by sand and silt substrates. Plankton communities recorded during the baseline survey reflect conditions typical of turbid, nutrient-influenced nearshore waters.

Potential effects on seagrass are addressed separately under disturbance of soft-bottom habitats and seagrass.

Impact Evaluation and Significance

The duration of turbidity impacts is assessed as temporary, occurring during discrete periods of dredging and vessel activity. The spatial extent is expected to be localized, with turbidity plumes dissipating through natural dispersion processes.

The magnitude of impact is assessed as Low, as increases in turbidity are expected to be short-lived and within the range of observed background variability documented during baseline surveys. The sensitivity of receptors is assessed as Medium, due to the presence of nearshore seagrass and plankton communities.

Taking into account a Low magnitude and Medium sensitivity, the overall impact significance is assessed as Minor.

Impact Description	Turbidity from Dredging and Seabed Disturbance							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Proposed Mitigation and Management Measures

- Schedule dredging and bed-levelling works during slack tide or favorable current windows to limit sediment plume dispersion.
- Deploy silt curtains or localized barriers where feasible within the nearshore belt to protect the seagrass patch.
- Apply prop-wash controls for tugs and workboats operating in shallow areas.
- Monitor turbidity, TSS, dissolved oxygen, temperature, and chlorophyll-a at agreed up-and down-drift stations, with predefined action thresholds for work slow-down or temporary pause.

Note: Final dredging methodology, sediment characterization, and disposal arrangements will be confirmed through a detailed dredging study to be completed during detailed design (February–March 2026). Pending finalization, only approved disposal sites shall be used, subject to sediment suitability and applicable regulatory requirements.

Residual Impact Significance

Following implementation of the above measures, residual turbidity impacts are expected to remain Minor.

8.4.3 Disturbance of soft-bottom habitats and seagrass

Impact Discussion

Baseline marine surveys indicate that the coastal shelf fronting the Project area is dominated by sandy to muddy substrates, with no coral communities recorded during spot dive assessments. A narrow and patchy seagrass meadow composed of Cymodocea rotundata was documented within the shallow 0–15 m nearshore belt, exhibiting low overall mean cover and a small number of localized denser patches closer to the shoreline .

Seafloor disturbance associated with dredging, bed levelling, vessel propeller wash, anchor scouring, and shoreline-related works may disrupt soft-bottom habitats. Such disturbance may temporarily destabilize sediments, delay recolonization of infaunal organisms, and alter benthic surface structure. If construction activities extend toward the nearshore belt, localized burial or shading of seagrass may occur, potentially reducing cover or fragmenting the existing meadow.

Impact Evaluation and Significance

The duration of disturbance is expected to be temporary to short-term, limited to periods of active construction and maintenance. The spatial extent is localized, confined to the Project footprint and immediately adjacent areas.

The magnitude of impact is assessed as Low to Medium, given the predominance of unconsolidated substrates and the limited spatial extent of seagrass. The sensitivity of receptors is assessed as Medium, as seagrass habitats provide ecological functions despite their patchy distribution and low overall cover.

Based on a Medium magnitude and Medium sensitivity, the overall impact significance is assessed as Moderate.

Impact Description	Disturbance of soft-bottom habitats and seagrass			
Impact Nature		Positive	✓	Negative
Impact Type	✓	Direct		Indirect

Severity/ Magnitude		Negligible		Low	✓	Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible		Minor	✓	Moderate		Major

Proposed Mitigation and Management Measures

- Exclude construction traffic and anchoring from the 0–15 m nearshore belt where Cymodocea rotundata occurs; demarcate exclusion zones using buoys or temporary lines.
- Implement baseline and follow-up seagrass monitoring using McKenzie (Seagrass-Watch) field methods and Braun–Blanquet classes for reporting.
- Where measurable loss is detected within the footprint of works, apply site-appropriate measures such as prop-scour avoidance, micro-realignment of access routes, and progressive demobilization to minimize repeated disturbance.

Residual Impact Significance

With effective implementation of the above measures, residual impacts on soft-bottom habitats and seagrass are expected to remain Minor.

8.4.4 Risk of Spills and Degraded Runoff Affecting Marine Biological Resources

Impact Discussion

Construction and operational activities associated with the wharf enhancement involve the use and handling of fuels, lubricants, concrete, and other construction materials. Refueling operations, equipment maintenance, concrete works, and stormwater runoff from work areas may introduce limited quantities of hydrocarbons, nutrients, and fine particulates in the event of accidental releases into nearshore waters if not properly managed.

Acute spill events or uncontrolled runoff may temporarily degrade nearshore water quality, with potential effects on plankton communities, micro-benthic organisms, and the nearshore seagrass patch documented within the 0–15 m belt. Baseline surveys indicate that nearshore waters already experience variable turbidity and nutrient inputs; however, accidental releases could cause short-term localized degradation beyond background conditions.

Impact Evaluation and Significance

The duration of potential impacts from spills or degraded runoff is assessed as short-term, associated with discrete events rather than continuous discharges. The spatial extent is expected to be localized, confined to areas immediately adjacent to the source of release. While the likelihood of accidental releases is low under standard operating procedures, the consequence of an unmanaged release could be localized water-quality degradation.

The magnitude of impact is assessed as Low to Medium, depending on the volume and nature of any release. The sensitivity of receptors is assessed as Medium, due to the presence of plankton communities and patchy nearshore seagrass that may be affected by changes in water quality.

Taking into account a Low–Medium magnitude and Medium sensitivity, the overall impact significance is assessed as Minor.

Impact Description	Risk of Spills and Degraded Runoff Affecting Marine Biological Resources			
Impact Nature		Positive	✓	Negative
Impact Type	✓	Direct		Indirect

Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Proposed Mitigation and Management Measures

To minimize the risk of spills and degraded runoff, the following measures will be implemented:

- Implement a fuel and chemical handling plan, including bunded storage areas, drip trays, and spill response kits on all work platforms and vessels.
- Ensure concrete washout areas are properly managed and that sediment traps are installed to treat site runoff.
- Prohibit direct discharge of untreated construction runoff, wash water, or waste materials into Macajalar Bay.
- Train relevant personnel in spill prevention and response procedures.

Residual Impact Significance

With effective implementation of spill prevention and stormwater management measures, residual impacts on marine biological resources are expected to be Minor.

8.4.5 Coastal Turbidity Plume Reaching the Alae River Mouth

Impact Discussion

The downstream reach of the Alae River, from below the Alae Bridge to the estuarine interface, is located approximately 900 meters from the Mindanao Container Terminal (MCT) wharf enhancement area. No direct in-river works are proposed, and baseline surveys indicate that freshwater ecological conditions in this reach are already influenced by anthropogenic stressors, including engineered riverbanks, industrial and residential land use, and variable surface water discoloration.

A potential indirect pathway for project influence is the advection of fine sediments generated by capital and maintenance dredging and bed-levelling activities at the wharf toward the Alae River mouth. Under specific tidal and wind conditions, suspended sediments from nearshore works could reach the estuarine interface and temporarily increase turbidity and reduce water clarity at the river mouth. Receptors include near-mouth plankton communities and surface water quality conditions.

Impact Evaluation and Significance

The magnitude of impact is assessed as Negligible to Low, as any sediment plume reaching the river mouth would be diluted by coastal mixing processes and limited by the separation distance between the Project site and the estuary. The duration of the impact is short-term and event-based, dependent on tides and weather conditions, while the spatial extent is highly localized to the estuarine interface.

The sensitivity of receptors is assessed as Low, given the already turbid baseline conditions, absence of sensitive freshwater habitats, and dominance of tolerant plankton taxa. The impact is highly reversible and of low likelihood.

Considering the above, the overall impact significance is assessed as Minor.

Impact Description	Coastal Turbidity Plume Reaching the Alae River Mouth							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible	✓	Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

<u>Mitigation and Management Measures</u>

- Schedule dredging and bed-levelling during favorable tidal windows to minimize offshore plume dispersion.
- Apply sediment control measures at the wharf (e.g., silt curtains where practicable) to limit sediment release at source.
- Implement routine visual monitoring of coastal waters near the estuarine interface during active dredging.
- Apply adaptive management measures (work slow-down or temporary pause) if unexpected plume encroachment toward the river mouth is observed.

<u>Residual Impact Significance</u>

With implementation of standard sediment control and monitoring measures consistent with IFC General EHS Guidelines, residual impacts are expected to remain Minor.

8.4.6 Short-Term Shift in Phytoplankton Composition at the Alae River Mouth

<u>Impact Discussion</u>

Baseline freshwater surveys indicate that phytoplankton communities at the downstream Alae River stations are dominated by diatoms, reflecting turbid, nutrient-influenced conditions typical of modified lowland river systems. No freshwater megafauna were observed, and no active river fishery exists in the assessed reach.

Temporary increases in turbidity and suspended particulates at the estuarine interface, arising indirectly from nearshore dredging activities, could reduce light penetration and influence phytoplankton dynamics. Such conditions may transiently reinforce the dominance of chain-forming diatom taxa already present in the baseline community at the river mouth.

Impact Evaluation and Significance

The magnitude of impact is assessed as Negligible to Low, as any phytoplankton response would be limited to taxa already dominant under baseline conditions. The duration is short-term and episodic, constrained to brief exposure windows during plume events. The spatial extent is confined to the near-field estuarine interface, and the effect is highly reversible.

The sensitivity of receptors is assessed as Low, given the absence of sensitive freshwater species and the tolerance of diatom-dominated assemblages to fluctuating turbidity.

Overall, the impact significance is assessed as Minor.

Impact Description	Short-Term Shift in Phytoplankton Composition at the Alae River Mouth							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude	✓	Negligible		Low		Medium		Large
Severity/ Vulnerability	✓	Low		Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Mitigation and Management Measures

- Monitor turbidity and chlorophyll-a at agreed downstream and estuarine stations during dredging activities.
- Correlate surface discoloration observations with meteorological and tidal data to distinguish sediment-driven turbidity from algal responses.
- Apply adaptive controls to dredging intensity if sustained turbidity beyond baseline variability is observed.

Residual Impact Significance

Residual impacts on phytoplankton composition are expected to remain Minor.

8.4.7 Effects on Macro-Invertebrates and Fish Biota in the Downstream Alae River Reach

Impact Discussion

Baseline assessments recorded no live macro-invertebrates at surveyed stations, with only empty shells observed at one station (RvrMac1), and no active freshwater fishery in the assessed downstream reach. These findings indicate limited biological sensitivity and a highly modified freshwater habitat.

A potential indirect impact pathway is the short-term deposition of fine sediments at the river mouth, which could temporarily affect soft substrates and marginal habitats used by opportunistic fauna. However, given the absence of established macro-invertebrate or fish communities in the surveyed reach, measurable biological effects are unlikely.

Impact Evaluation and Significance

The magnitude of impact is assessed as Negligible, as no sensitive or established freshwater fauna were recorded in the affected reach. The duration would be short-term, and the spatial extent limited to the immediate estuarine margin. The impact is highly reversible and of low likelihood.

The sensitivity of receptors is assessed as Low.

Overall, the impact significance is assessed as Negligible.

Impact Description	Effects on Macro-Invertebrates and Fish Biota in the Downstream Alae River Reach							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude	✓	Negligible		Low		Medium		Large
Severity/ Vulnerability	✓	Low		Medium		High		
Significance	✓	Negligible		Minor		Moderate		Major

Management Measures

Given the negligible significance, no additional mitigation is required beyond implementation of standard sediment and runoff controls consistent with good international industry practice.

8.4.8 Accidental Hydrocarbon or Chemical Release Transported to the Alae River Mouth

<u>Impact Discussion</u>

Construction and operational activities at the wharf involve the handling of fuels, lubricants, and construction materials. Accidental small-scale hydrocarbon or chemical releases could, under specific coastal current conditions, be transported toward the Alae River mouth as a thin surface sheen.

Such releases could temporarily degrade water quality at the estuarine interface, potentially affecting plankton communities and surface water indicators. However, baseline conditions already reflect variable water quality, and the separation distance limits the extent of potential exposure.

<u>Impact Evaluation and Significance</u>

The magnitude of impact is assessed as Low, as potential releases are expected to be small in volume under standard operating conditions. The duration would be acute and short-term, while the spatial extent is linear and tide-limited. The effect is highly reversible with prompt response, and the likelihood is low.

The sensitivity of receptors is assessed as Medium, given the ecological role of plankton and estuarine interface processes.

Overall, the impact significance is assessed as Minor.

Impact Description	Accidental Hydrocarbon or Chemical Release Transported to the Alae River Mouth							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude	✓	Negligible		Low		Medium		Large
Severity/ Vulnerability		Low	✓	Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

<u>Mitigation and Management Measures</u>

- Implement a fuel and chemical handling plan, including bunded storage, drip trays, and controlled refueling procedures.
- Maintain spill response kits on work platforms and vessels.
- Train personnel in spill prevention and emergency response.
- Prohibit discharge of contaminated runoff or wash water to coastal or freshwater environments.

<u>Residual Impact Significance</u>

With effective spill prevention and response measures, residual impacts are expected to remain Minor.

8.4.9 Floating Debris Advection to the Alae River Mouth

Impact Discussion

Wind- and current-driven transport of light construction debris from the wharf area could result in temporary accumulation alongshore or near the Alae River mouth if materials are not adequately controlled. Floating debris may affect shoreline aesthetics and, in limited cases, estuarine interface conditions.

Impact Evaluation and Significance

The magnitude of impact is assessed as Negligible to Low, as events are expected to be infrequent and localized. The duration is event-based and short-term, and the impact is highly reversible. The sensitivity of receptors is Low.

Overall, the impact significance is assessed as Minor.

Impact Description	Effects on Macro-Invertebrates and Fish Biota in the Downstream Alae River Reach							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude	✓	Negligible		Low		Medium		Large
Severity/ Vulnerability	✓	Low		Medium		High		
Significance		Negligible	✓	Minor		Moderate		Major

Mitigation and Management Measures

- Apply good housekeeping practices at all construction and operational areas.
- Secure loose materials and waste to prevent wind or water dispersal.
- Conduct routine shoreline and worksite inspections and remove stray debris promptly.

Residual Impact Significance

Residual impacts related to floating debris are expected to remain Minor.

8.5. Socioeconomic and Cultural Impacts

8.5.1 Health and Safety Concerns

Impact Discussion

Construction and operation involve heavy machinery, vehicle movements, lifting operations, and marine activities, posing risks to workers and nearby communities. Dust, noise, traffic, and operational hazards may affect occupational and community health and safety if not properly managed.

However, the Project includes established safety management systems, PPE requirements, and emergency response measures

Impact Evaluation and Significance

Construction and operation of the port involve heavy equipment, lifting operations, traffic, marine activities, and exposure to dust and noise, which present potential risks to workers and nearby communities. Without proper management, these hazards could result in accidents, injuries, or occupational and community health effects.

The spatial extent of health and safety risks is Local, affecting the port workforce and nearby communities. The duration is Short-term during construction and Long-term during operation. The sensitivity of the receptors is High, as the impacts involve risks to human life and well-being.

With proper management systems in place, the likelihood and severity of accidents are reduced; however, the inherent hazards of port operations remain. Therefore, the magnitude is assessed as Medium and sensitivity as High, resulting in an overall impact significance of Moderate.

Impact Description	Health and Safety Concerns							
Impact Nature		Positive			✓	Negative		
Impact Type	✓	Direct				Indirect		
Severity/ Magnitude		Negligible		Low	✓	Medium		Large
Severity/ Vulnerability		Low		Medium	✓	High		
Significance		Negligible		Minor	✓	Moderate		Major

Proposed Mitigation Measures

- Enforce OHS management systems.
- Provide training and PPE.
- Implement traffic and marine safety controls.
- Maintain emergency response and medical services.

Residual Impact Significance

If occupational and community health and safety management systems, training, PPE provision, traffic controls, and emergency response measures are effectively implemented, the residual health and safety risks to workers and nearby communities are assessed to be of Minor significance.

8.5.2 Employment and Livelihood Opportunities

Impact Discussion

The Project will generate employment opportunities during both the construction and operational phases, contributing to local economic activity within Tagoloan, Misamis Oriental, and the wider Northern Mindanao region. During construction, temporary jobs will be created in civil works, engineering, logistics, administration, and ancillary services. Long-term employment will be sustained during the operational phase through port operations, terminal management, administration, maintenance, security, and support services.

Consistent with the Project's location within the PHIVIDEC Industrial Estate and its nature as an expansion of an existing port facility, employment generation will largely build on existing labor patterns. Technical, operational, and heavy-equipment roles are expected to remain predominantly male-dominated, reflecting prevailing conditions in the port and industrial sector. However, opportunities for women are expected in administrative, clerical, documentation, ICT-related, logistics coordination, and support service roles during both construction and operations.

The Project does not involve land acquisition, physical displacement, or disruption of existing livelihood activities. No adverse impacts on fisheries or coastal resource-based livelihoods are anticipated, as Project works are confined to a highly modified industrial shoreline with no reliance by local communities on the Project footprint for subsistence or income generation. As such, the Project is expected to have a net positive effect on livelihoods through employment creation and indirect economic opportunities for local entrepreneurs and service providers (e.g., transport, catering, equipment servicing, and supplies).

The Project commits to non-discriminatory employment practices and equal opportunity for women and men, supported by gender-sensitive occupational health and safety provisions and accessible grievance mechanisms.

Impact Evaluation and Significance

Port expansion projects are recognized as strong drivers of employment and economic activity, particularly in industrial and coastal municipalities such as Tagoloan. The Phase 3 development will create sustained employment opportunities over the long term, in line with the operational life of the terminal and its infrastructure.

The impact will be experienced at the local and regional level, benefiting workers, entrepreneurs, and service providers in Tagoloan, Misamis Oriental, and the wider Northern Mindanao area.

From a gender perspective, while employment benefits are expected to be broadly positive for both women and men, participation will reflect existing sectoral roles, with opportunities for incremental improvement in women's participation in administrative, supervisory, and support functions.

The magnitude of the impact is assessed as Medium to High, and the duration is Long-term, reflecting continued port operations. No significant gender-differentiated adverse livelihood impacts are anticipated. Accordingly, the impact on employment and livelihood opportunities is assessed as Positive.

Impact Description	Employment and Livelihood Opportunities			
Impact Nature	✓	Positive		Negative
Impact Type	✓	Direct		Indirect

9. Environmental and Social Management Plan

9.1 Environmental and Social Management Requirements

The ESIA process has identified the key environmental and social issues, impacts and risks associated with the Mindanao International Container Port Project (MICP) requiring the implementation of a wide range of mitigation measures. The necessary actions required to manage these issues, impacts and risks are presented in this Environmental and Social Management Plan (ESMP); these include identification of all Project commitments, mitigation measures that have been identified from the impact assessment, and other best practice measures designed to avoid, minimize, or reduce negative impacts and enhance positive impacts.

The objectives of an Environmental and Social Management Plan (ESMP) are to:

- Identify the set of responses to potentially adverse impacts.
- Define the responsibilities for implementation and monitoring.
- Determine requirements for ensuring that mitigation and management measures are implemented effectively and in a timely manner; and
- Describe the means for meeting those requirements.

The purpose of this Chapter is to demonstrate how the mitigation commitments made through the impact assessment process will be put into practice, monitored, and upheld. This ESMP Chapter provides information and instructions on how Environmental and Social commitments of MICP will be managed from pre-construction through the construction and operation phases.

9.2 Mitigation Strategy Framework

Mitigation measures for the MICP have been developed and applied in accordance with the mitigation hierarchy, ensuring that environmental and social risks are managed in a systematic, proportionate, and effective manner throughout the project lifecycle. The mitigation hierarchy comprises the following sequential steps:

- **Avoidance** – preventing impacts where feasible through project design and planning;
- **Minimization** – reducing the magnitude, spatial extent, duration, or likelihood of impacts;
- **Restoration / Rehabilitation** – restoring affected environmental or social conditions where impacts occur; and
- **Compensation / Offset** – addressing residual impacts where avoidance, minimization, or restoration measures are insufficient.

The approach is consistent with the Philippine Environmental Impact Statement (EIS) System under DENR DAO 2003-30 and aligned with internationally recognized environmental and social management good practice, including ISO 14001:2015 Environmental Management Systems and relevant international guidance. References to IFC Performance Standards and other international frameworks are used solely as sources of good practice and do not supersede the requirements of the AIIB Environmental and Social Framework.

9.3 Mitigation Measures for Identified and Cumulative Impacts

The mitigation measures for the MIPC are designed to address both project-specific impacts and potential cumulative effects arising from the interaction of the Project with existing industrial and port developments within the area. Given the multi-phase nature of the Project, mitigation measures are applied across the construction, operation, and decommissioning phases, with emphasis on preventing incremental environmental degradation.

The mitigation framework follows the mitigation hierarchy of avoidance, minimization, restoration, and compensation, as prescribed under the Philippine Environmental Impact Statement (EIS) System (DENR DAO 2003-30) and reinforced by international good practice, including the International Finance Corporation Performance Standards, International Organization for Standardization ISO 14001 Environmental Management Systems, and International Association for Impact Assessment principles on cumulative impact management.

All dredging-related mitigation measures—covering sediment containment, dewatering controls, waste classification, spill prevention, and navigational safety—are integrated into the Environmental and Social Management Plan (ESMP). Responsibilities are assigned to the Proponent and Contractors, with monitoring parameters and frequencies defined to ensure compliance throughout dredging and marine construction activities.

9.3.1 Effectiveness of Mitigation Measures in Managing Cumulative Impacts

When implemented collectively and consistently, the mitigation measures reduce both individual and cumulative impacts to low or acceptable residual levels. Continuous environmental monitoring, reporting, and periodic review of mitigation effectiveness ensure that emerging cumulative effects are identified early and addressed through adaptive management.

The mitigation framework demonstrates compliance with DENR regulatory requirements and alignment with international environmental and social safeguards, ensuring that the MICP contributes to sustainable development while preventing long-term environmental degradation and social inequity.

9.4 Environmental Management and Monitoring Plan

The mitigation and management measures take place throughout the Project lifetime, from pre-construction, construction, operation through decommissioning. In addition, there are common mitigation and monitoring requirements that apply to all phases of the Project.

The mitigation and monitoring measures specific to the environmental impact assessment conducted for the MICP ESIA are detailed in Table 9-1

Table 9-1 Environmental and Social Monitoring Plan

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
Physical Environment								
Pre-constructio n, Construction, and Operation	Wharf extension, construction laydown areas, temporary haul routes, utility relocations, and intensified yard and logistics operations within the port estate	Intensification of Industrial Land Use within an Existing Project Footprint	- Confirm and document consistency with PHIVIDEC development plans and host LGU land use policy instruments, including clear delineation of the Phase 3 footprint relative to ECC-covered areas. - Establish a construction land-use control plan defining laydown areas, spoil and materials staging zones, haul routes, and no-go areas,	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	During Detailed Engineering Design; Construction of Wharf Extension and Port Facilities; and Operation of Yard and Logistics Areas	▪ Compliance with approved land-use plans and ECC boundaries ▪ Location and management of laydown, haul routes, and no-go areas ▪ Condition and restoration status of temporary construction areas ▪ Traffic and logistics performance at site boundaries ▪ Land-use or boundary-related	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Once every three (3) months during Construction and once every six (6) months during Operation, or when changes to site layout, Phase 3 footprint, or logistics routes are introduced.

			with clear demarcation and access controls			complaints from stakeholders		

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			at Project boundaries. - Implement a traffic and logistics management plan prioritizing scheduled deliveries, designated truck routes, and safe access management to reduce disruption to adjacent land uses. - Apply progressive restoration of temporary construction areas and maintain good housekeeping standards to minimize secondary land					

			degradation and visual impacts at					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			boundary interfaces. - As an enhancement, incorporate boundary greening or buffer design where feasible to reduce dust transfer and improve visual screening, without compromising port safety or security requirements.					
Pre-constructio n, Construction, and Operation	Material sourcing and transport, shoreline and marine works, cargo handling, waste management, and spill-risk activities associated with port	Indirect Effects on Environmentally Critical Areas through Construction and Operational Activities	- Apply an ECA-sensitive procurement and sourcing approach requiring permitted and compliant sources for aggregates, quarry materials, and	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU),	During Detailed Engineering Design; Construction of Wharf Extension and Marine Works; and Operation of Port and Cargo-Handling Facilities	▪ Compliance of material sourcing with permits and ECA restrictions ▪ Turbidity levels and sediment plume extent during marine works ▪ Records	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if	Once every three (3) months during Construction and once every six (6) months during Operation, and after any marine incident, spill, or turbidity exceedance.

	construction		disposal	with implementation by		of spills, near-misses, and		

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
	and operation		facilities, and prohibiting sourcing from protected or legally restricted areas; - Implement strengthened shoreline and marine work controls, including turbidity management, use of silt curtains where applicable, appropriate timing of in-water works, and spill prevention measures for marine construction; - Establish and maintain operational spill	Construction Contractors and Port Operations Teams		emergency drills ▪ Waste generation and disposal compliance ▪ Evidence of coordination with local environmental agencies	required), in coordination with DENR-EMB, DOLE, and LGUs	

			prevention and emergency response - Imlemepnt dust, noise, and traffic management measures along access routes and at site boundaries to minimize indirect nuisance and safety risks to nearby communities and other receptors.					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			preparedness appropriate to a container port, including staff training, equipment placement, and regular drills; and - Where feasible, align biodiversity safeguards with coastal and watershed management initiatives of local agencies, including drainage outfall controls and waste minimization.					

Pre-constructio n and Construction	Wharf extension and site development beyond the existing ECC boundary, shoreline works, access control	Potential Land Tenure and Access Issues Associated with Expansion Beyond the Existing ECC Boundary	- Undertake perimeter verification and stakeholder validation to confirm whether any third-party use, informal	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental	Prior to and during Phase 3 site mobilization and shoreline works	▪ Boundary demarcation and access control status ▪ Records of stakeholder validation and consultatio ns	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant	Once every three (3) months during construction and whenever grievances or access issues are reported

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			access, or customary activities exist at shoreline edges and around the proposed expansion area. - Clearly demarcate Project boundaries and access restrictions prior to construction to prevent inadvertent encroachment or access conflicts. - As an enhancement, implement a grievance mechanism specifically tailored to land tenure and access-	and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams		▪ Number and type of land-access grievances	(ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	

			related issues, with clear procedures, response					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			timelines, and documentation requirements to ensure transparency and timely resolution.					

Pre-construction, Construction and Operation	Construction works, stockpiles, port structures, yard activities, and lighting systems	Temporary and Permanent Changes to Visual Character from Port Construction and Operations	- Adopt a construction visual management protocol requiring orderly staging of works, defined laydown areas, stockpile height limits where feasible, and prompt removal of waste and surplus materials. - Implement lighting design controls, including the use of full cut-off fixtures where practicable, directional	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	During construction activities and operation of port structures and lighting	▪ Compliance with lighting design controls ▪ Stockpile and laydown management ▪ Visual complaints from communities	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Once every three (3) months during construction and once every six (6) months during operation

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			lighting to limit spill beyond operational requirements, and regular maintenance to prevent glare escalation over time. - Use boundary screening and landscape buffers in feasible areas to reduce direct line-of-sight impacts from public corridors and adjacent communities. - As an enhancement, integrate consistent architectural treatments, fencing					

			design, and visual elements to reduce visual					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			fragmentation along the industrial estate boundary.					
Construction	Earthworks, grading, temporary structures, drainage modifications	Localized Alteration of Surface Drainage and Ground Stability in a Deltaic Coastal Plain Setting	- Implement an earthworks and drainage sequencing plan that maintains continuous drainage pathways toward approved outfalls and prevents temporary blockage of natural or engineered flow routes. - Provide temporary erosion and sediment control measures proportionate to exposed	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	During earthworks and drainage works	▪ Drainage flow continuity ▪ Ponding and erosion incidents ▪ Condition of sediment controls	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Once every two (2) weeks during earthworks and after heavy rainfall events

			surface area and anticipated rainfall intensity, including					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			stabilized access routes and protected discharge points. - Maintain clear separation between clean runoff and sediment-laden runoff during construction, with appropriate treatment prior to discharge. - As an enhancement, design permanent drainage upgrades to accommodate projected extreme rainfall intensities and ensure resilience					

			under high-tide backwater conditions typical of coastal settings.					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
Pre-construction, Construction and Operation	Wharf structures, yard pavements, stormwater systems, coastal protection works	Inducement of Geotechnical and Natural Hazard Risks	Design and Engineering Controls - Apply seismic design and detailing consistent with the site hazard context, explicitly accounting for soil amplification effects in structural design inputs. - Quantify liquefaction potential using site-specific investigations (SPT/CPT, shear-wave velocity profiling,	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	During design, construction, and early operation	▪ Ground movement and settlement ▪ Drainage and flood control performance ▪ Emergency response readiness	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Quarterly during construction and annually during operation, and after major events

			groundwater characterization) and implement - appropriate ground improvement or deep foundation solutions for					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			critical assets. - Incorporate lateral spreading and waterfront stability checks in wharf and adjacent yard design, including suitable earth retention and scour protection measures. Flooding and Drainage Management - Set platform and critical system elevations using conservative assumptions for flood levels, storm surge, tide interaction,					

			and freeboard. - Design and maintain stormwater infrastructure to					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			manage increased runoff from impervious surfaces. - Install backflow prevention devices and tide gates where necessary, and protect outfalls against scour using energy dissipation and armoring. - Design coastal protection works (revetments, seawalls, transitions) to account for overtopping, wave setup, and toe scour.					

			Construction Phase Controls - Maintain clear drainage pathways throughout					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			construction and prevent blockage of natural or engineered flow routes. - Implement sediment control measures to prevent clogging of drainage inlets and outfalls. Preparedness and Monitoring - Establish emergency preparedness and business continuity procedures addressing earthquake scenarios, including rapid post-event					

			inspection protocols for quay structures and yard pavements.					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			- As an enhancement, implement a risk-based monitoring program for settlement and deformation during the early operational period following Phase 3 commissioning.					

Pre-construction, Construction and Operation	Wharf extension, yard development, heavy pavement and crane rail installation	Ground Stability, Settlement, and Sub-Surface Performance Risk	Investigation and Design - Conduct targeted and site-specific geotechnical investigations in all Phase 3 development areas, with particular emphasis on the wharf extension footprint and any newly developed yard zones, to define stratigraphy, groundwater levels, compressibility, and shear strength parameters. - Undertake baseline groundwater quality testing prior to or during the early stages of construction, in accordance	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	During investigation, construction, and early operation	▪ ▪ Settlement and deformation readings ▪ Compaction and density test results ▪ Pavement and crane-rail condition ▪ Groundwater quality parameters (baseline and, if required, follow-up testing)	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Monthly during construction and semi-annually during operation

			with applicable DENR-EMB requirements and good international practice, to establish baseline conditions and inform assessment of potential Project-related impacts. - Apply foundation and ground improvement solutions appropriate to identified subsurface conditions, including settlement control measures for infrastructure with strict operational tolerances. <u>Construction Quality</u>					

			Control - Implement rigorous quality assurance procedures for fill placement and compaction, including moisture control, density testing, and documentation of compliance with design specifications. - Manage excavation stability through appropriate temporary works, dewatering controls where required, and sequencing of construction activities. - Ensure that					

			construction-related dewatering, if required, is managed to prevent adverse effects on groundwater quality, with appropriate handling and disposal of extracted groundwater. <u>Monitoring and Asset Management (Enhancement)</u> - As an enhancement, incorporate long-term settlement monitoring and pavement performance inspection to support preventive maintenance and asset integrity management					

			during the operational phase. - Review groundwater quality test results against baseline conditions to identify any construction-related changes requiring corrective action.					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			stratigraphy, groundwater levels, compressibility, and shear strength parameters. - Apply foundation and ground improvement solutions appropriate to identified subsurface conditions, including settlement control measures for infrastructure with strict operational tolerances. <u>Construction Quality Control</u> - Implement rigorous				LGUs	

			quality assurance					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			procedures for fill placement and compaction, including moisture control, density testing, and documentation of compliance with design specifications. - Manage excavation stability through appropriate temporary works, dewatering controls where required, and sequencing of construction activities.					

			Monitoring and Asset Management (Enhancement) - As an enhancement,					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			incorporate long-term settlement monitoring and pavement performance inspection to support preventive maintenance and asset integrity management during the operational phase.					
Construction	Earthworks, piling, yard development, wharf extension, heavy equipment and truck movements	Degradation of Air Quality due to Dust and Noise Emissions	- Implement a Construction Air Quality Management Plan. - Regular watering of exposed surfaces, haul roads, and stockpiles. - Cover trucks	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with	During earthworks, piling, yard construction, and equipment operation	▪ PM_{10}, $PM_{2.5}$, TSP concentrations ▪ Noise levels (dBA) at site boundary and work areas ▪ Equipment emission and maintenan	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in	Weekly during active earthworks and piling; monthly summary reporting

			transporting fine materials.	implementation by Construction Contractors and		ce records ▪ Worker PPE compliance ▪ Community	coordination	

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			- Provide wheel-washing facilities at site exits. - Maintain and emission-test equipment and prohibit excessive idling. - Provide dust masks and PPE for workers. - Implement traffic and logistics management to prevent congestion.	Port Operations Teams		complaints	with DENR-EMB, DOLE, and LGUs	

Construction and Operation	Use of diesel equipment, port vehicles, vessels, generators, and electricity consumption	Contribution to Greenhouse Gas (GHG) Emissions	- Maintain fuel-efficient equipment and vehicles. - Optimize logistics and traffic management to reduce idling. - Use energy-efficient yard equipment	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by	During construction and ongoing port operations	▪ Fuel consumption (diesel, gasoline) ▪ Electricity consumption ▪ Equipment utilization and idling time ▪ GHG intensity per TEU handled	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if	Monthly monitoring and annual reporting

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			and lighting. - Implement preventive maintenance for all engines and electrical systems. - Monitor fuel and electricity consumption.	Construction Contractors and Port Operations Teams			required), in coordination with DENR-EMB, DOLE, and LGUs	

Biodiversity Environment								
Project Phase	**Aspect or Project Activities**	**Potential Impact**	**Proposed Mitigation**	**Management Person-In-Charge**	**Timing**	**Monitoring Parameter**	**Monitoring Person-In-Charge**	**Monitoring Frequency**
Construction and Early Operation	Marine construction activities (piling, dredging, shoreline works), increased vessel traffic and human presence in nearshore waters	Potential Disturbance to Migratory and Wide-Ranging Marine Megafauna (e.g., dolphins)	- Conduct marine mammal observation by trained personnel during periods of active piling, dredging, or intensive vessel operations. - Establish exclusion zones around piling or dredging activities, with temporary suspension of works if marine mammals are observed within the defined zone. - Implement soft-start / ramp-up procedures for piling and other high-noise activities to allow marine fauna to move	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	Throughout marine construction works and during early operational phase	▪ Number, species (if identifiable), location, and behavior of marine megafauna sightings ▪ Compliance with exclusion zones and soft-start procedures ▪ Vessel speed and navigation compliance ▪ Records of work suspension or adaptive measures triggered by sighting	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Continuous observation during active marine works; summary reporting monthly during construction and quarterly during early operation

			away from the area. - Apply vessel speed controls and navigation protocols within the construction area to reduce collision risk and underwater noise. - Where practicable, schedule high-noise marine activities outside periods of increased seasonal presence, should such patterns be identified during construction monitoring. Monitoring and Adaptive Management - Record all marine megafauna sightings during construction and early operational					

			phases, including species (where identifiable), number of individuals, behavior, and location. - Review sighting records periodically to determine whether presence is higher than baseline expectations. - Apply adaptive management measures, including refinement of exclusion zones, enhanced observation effort, or additional operational controls, if monitoring indicates elevated risk.					

Construction	Dredging, bed-levelling, propeller wash	Turbidity from Dredging and Seabed Disturbance	- Schedule dredging and bed-levelling works during slack tide or favorable current windows to limit sediment plume dispersion. - Deploy silt curtains or localized barriers where feasible within the nearshore belt to protect the seagrass patch. - Apply prop-wash controls for tugs	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	During dredging; detailed dredging study and disposal planning to be completed February–March 2026 prior to full-scale works.	▪ Turbidity (NTU) ▪ TSS ▪ DO, temperature, chlorophyll-a	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Daily during dredging

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			and workboats operating in shallow areas. - Monitor turbidity, TSS, dissolved oxygen, temperature, and chlorophyll-a at agreed up- and down-drift stations, with predefined action thresholds for work slow-down or temporary pause. Note: Final dredging methodology, sediment characterization, and disposal					

			arrangements will be confirmed through a detailed dredging study to be completed during detailed design (February–March 2026). Pending finalization, only approved disposal sites shall be used, subject to sediment suitability and applicable regulatory requirements.					

Construction and Maintenance	Marine works, vessel movement, anchoring	Disturbance of soft-bottom habitats and seagrass	- Exclude construction traffic and anchoring from the 0–15 m nearshore belt where Cymodocea rotundata occurs; demarcate exclusion zones	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by	During marine works	▪ Seagrass cover and extent ▪ Prop-scour and sediment disturbance	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if	Before works, mid-construction, and post-construction

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			using buoys or temporary lines. - Implement baseline and follow-up seagrass monitoring using McKenzie (Seagrass-Watc h) field methods and Braun–Blanquet classes for reporting. - Where measurable loss is detected within the footprint of works, apply site-appropriate measures such as prop-scour avoidance, micro-	Construction Contractors and Port Operations Teams			required), in coordination with DENR-EMB, DOLE, and LGUs	

			realignme nt of access routes, and progressive demobilizatio n to minimize					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			repeated disturbance.					

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			construction. - Implement community-base d catch and effort tracking to monitor CPUE trends and inform adaptive management during the construction phase.					

Construction and Operation	Fuel handling, concrete works, runoff	Risk of Spills and Degraded Runoff Affecting Marine Biological Resources	- Implement a fuel and chemical handling plan, including bunded storage areas, drip trays, and spill response kits on all work platforms and vessels. - Ensure concrete washout areas are properly managed and that sediment traps are	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	Continuous	▪ Spill records ▪ Water-quality observations	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Continuous; monthly summary

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			installed to treat site runoff. - Prohibit direct discharge of untreated construction runoff, wash water, or waste materials into Macajalar Bay. - Train relevant personnel in spill prevention and response procedures.					

Construction	Dredging, bed-levelling	Coastal Turbidity Plume Reaching the Alae River Mouth	- Schedule dredging and bed-levelling during favorable tidal windows to minimize offshore plume dispersion. - Apply sediment control measures at the wharf (e.g., silt curtains where practicable) to limit sediment	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations	During dredging	▪ Visual plume extent ▪ Turbidity at estuary	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with	Daily during dredging

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			release at source. - Implement routine visual monitoring of coastal waters near the estuarine interface during active dredging. - Apply adaptive management measures (work slow-down or temporary pause) if unexpected plume encroachment toward the river mouth is observed.	Teams			DENR-EMB, DOLE, and LGUs	

Construction	Dredging-related turbidity	Short-Term Shift in Phytoplankton Composition	- Monitor turbidity and chlorophyll-a at agreed downstream and estuarine stations during dredging	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental	During dredging	▪ Turbidity ▪ Chlorophyll-a	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant	Weekly during dredging

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			activities. - Correlate surface discoloration observations with meteorological and tidal data to distinguish sediment-driven turbidity from algal responses. - Apply adaptive controls to dredging intensity if sustained turbidity beyond baseline variability is observed.	and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams			(ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	

Construction and Operation	Fuel and chemical handling	Accidental Hydrocarbon or Chemical Release	- Implement a fuel and chemical handling plan, including bunded storage, drip trays, and controlled refueling	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social	Continuous	▪ Spill incidents ▪ Water-quality sheen	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and	Continuous

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			procedures. - Maintain spill response kits on work platforms and vessels. - Train personnel in spill prevention and emergency response. - Prohibit discharge of contaminated runoff or wash water to coastal or freshwater environments.	Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams			Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	

Construction and Operation	Material storage, waste handling	Floating Debris Advection	- Apply good housekeeping practices at all construction and operational areas. - Secure loose materials and waste to prevent wind or water dispersal. - Conduct routine shoreline	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction	Continuous	▪ Debris presence	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in	Weekly

Project Phase	Aspect or Project Activities	Potential Impact	Proposed Mitigation	Management Person-In-Charge	Timing	Monitoring Parameter	Monitoring Person-In-Charge	Monitoring Frequency
			and worksite inspections and remove stray debris promptly.	Contractors and Port Operations Teams			coordination with DENR-EMB, DOLE, and LGUs	
Socio-Economic and Cultural Environment								
Pre-construction, Construction, and Operation	Heavy machinery and vehicle movement, lifting operations, marine works, cargo handling, exposure to dust and noise, increased traffic within an active port environment	Health and Safety Concerns (workers and nearby communities)	- - Enforce a comprehensive Occupational Health and Safety (OHS) Management System consistent with Philippine OSH standards and AIIB/IFC requirements. - Provide gender-appropriate PPE, sanitation	Mindanao International Container Port (MICP), through the Project Management Team (PMT) and Environmental and Social Safeguards Unit (ESSU), with implementation by Construction Contractors and Port Operations Teams	Prior to mobilization; Throughout construction works; and During port operation and maintenance activities	▪ ▪ Number and severity of accidents, injuries, and near-misses (disaggregated by gender where applicable) ▪ PPE availability and compliance rates ▪ Training and toolbox talk attendance records ▪ Traffic and marine safety	Environmental and Social Safeguards Unit (ESSU) with support from the Environmental and Social Consultant (ESC), and Independent Monitoring Agent (if required), in coordination with DENR-EMB, DOLE, and LGUs	Continuous monitoring, with monthly reporting during Construction and quarterly reporting during Operation, and immediate reporting of any serious incident.

			facilities, and workplace amenities suitable for both women and men. - Deliver regular health and safety training and toolbox talks that are inclusive and accessible to all workers. - Implement traffic management and marine safety controls to protect workers, port users, and nearby communities, with attention to			incidents ▪ Emergency response drills and response times ▪ Number and type of health, safety, or GBV-related grievances received and resolved		

			pedestrian safety. - Maintain emergency response and medical services capable of addressing gender-specific health needs. - Implement a Worker Code of Conduct addressing respectful behavior, anti-harassment, and GBV prevention. - Ensure that the Project's Grievance Redress Mechanism (GRM) is accessible, confidential, and					

			responsive to gender-related health and safety concerns.					

10. Institutional Mechanism for ESMP and Monitoring

10.1 Introduction and Objectives

An effective institutional mechanism is essential to ensure the successful implementation, monitoring, and reporting of the Environmental and Social Management Plan (ESMP) for the Mindanao International Container Port (MICP) Phase II and Phase III-A enhancements.

The Project involves the enhancement and expansion of an existing container terminal located within the PHIVIDEC Industrial Estate, Tagoloan, Misamis Oriental. Project activities include wharf extensions, yard development, and supporting infrastructure, largely within the footprint of an existing Environmental Compliance Certificate (ECC No. 9907-035-215), with additional works subject to regulatory review. The Project does not involve physical or economic displacement and does not require a Resettlement Plan.

Accordingly, this institutional mechanism is designed to ensure that environmental and social safeguard commitments are implemented in a coordinated, transparent, and accountable manner throughout construction and operation, and that compliance with national regulations and international safeguard standards is maintained.

Specifically, the objectives of this institutional framework are to:

- Clearly define roles, responsibilities, and reporting lines for ESMP implementation;
- Ensure effective coordination between environmental, social, engineering, and operational functions;
- Provide sufficient institutional capacity to manage environmental and social risks commensurate with Project scale and complexity; and
- Establish a structured capacity-building and adaptive management framework for the Client, contractors, and consultants.

This institutional arrangement is aligned with the following legal, regulatory, and policy frameworks:

- DENR DAO 2003-30 (Philippine Environmental Impact Statement System);
- Philippine Labor Code and Republic Act No. 11058 (Occupational Safety and Health Law);
- IFC Performance Standards (PS1, PS2, PS3);
- AIIB Environmental and Social Standards (ESS1, ESS2, ESS3); and
- ISO 14001 and ISO 45001 management system principles.

10.2 Institutional Capacity Assessment of the Client

10.2.1 Existing Institutional Capacity

Mindanao International Container Port (MICP), operating under the PHIVIDEC Industrial Authority and managed by ICTSI, has long-standing experience in port development, terminal operations, and regulatory compliance. Existing institutional strengths include:

- Implementation of environmental permitting, monitoring, and reporting requirements under the DENR-EIS System;
- Established port operational, safety, and security management systems;
- Corporate-level environmental, social, and governance (ESG) policies and procedures under ICTSI; and
- Engagement of qualified contractors with experience in marine works and port infrastructure development.

The absence of land acquisition, resettlement, or livelihood displacement further reduces institutional complexity compared to socially sensitive projects.

10.2.2 Proposed Institutional Arrangement

The institutional arrangement for MICP adopts an integrated and tiered structure that ensures accountability from strategic oversight to site-level implementation.

Key Institutional Actors include:

1. Project Owner / Client – Mindanao International Container Port (MICP)
2. Environmental and Social Safeguards Unit (ESSU)
3. Project Management Team (PMT)
4. Environmental and Social Consultant (ESC)
5. Construction Contractors and Subcontractors
6. Regulatory Agencies and Local Government Units (LGUs)
7. Independent Monitoring (if required by AIIB or DENR)

10.3 Roles and Responsibilities of Key Institutional Actors

10.3.1 Project Owner / Client – Mindanao International Container Port (MICP)

MICP holds overall responsibility for ESMP implementation and compliance. The Client shall:

- Ensure compliance with ECC conditions, applicable Philippine laws, and AIIB Environmental and Social Standards;
- Allocate adequate financial, technical, and human resources for ESMP implementation;
- Oversee contractor environmental, social, labor, and OSH performance;
- Establish and maintain a Project ESSU;
- Establish and maintain a project-level Grievance Redress Mechanism (GRM);
- Submit required environmental and social monitoring reports to DENR, LGUs, and AIIB; and

- Ensure timely implementation of corrective actions arising from monitoring, audits, or grievances.

10.3.2 Environmental and Social Safeguards Unit (ESSU)

A dedicated Environmental and Social Safeguards Unit shall function within MICP operations. The ESSU shall be responsible for:

- Day-to-day oversight of ESMP implementation;
- Monitoring compliance with environmental, occupational health and safety, and labor standards;
- Coordinating environmental and social monitoring programs;
- Maintaining safeguard documentation, records, and reporting systems;
- Liaising with DENR, LGUs, AIIB, and other relevant agencies; and
- Managing and documenting grievances in accordance with the GRM.

This arrangement is consistent with AIIB ESS1 requirements for institutional capacity and risk management.

10.3.3 Project Management Team (PMT)

The PMT shall:

- Integrate ESMP requirements into engineering design, construction scheduling, and procurement;
- Ensure environmental and social provisions are embedded in contractor contracts;
- Coordinate implementation of corrective actions; and
- Support the ESSU in managing contractor compliance.

10.3.4 Environmental and Social Consultant (ESC)

The ESC shall provide technical assistance to MICP, particularly the ESSU, by:

- Advising on ESMP implementation and regulatory compliance;
- Conducting periodic site inspections and safeguard audits;
- Supporting preparation of monitoring and compliance reports;
- Providing technical input on corrective and preventive measures; and
- Supporting safeguard-related training and capacity-building activities.

10.3.5 Construction Contractors and Subcontractors

Contractors shall be responsible for site-level implementation of safeguard measures and shall:

- Implement ESMP mitigation measures, OSH programs, and labor management procedures;
- Appoint qualified Environmental Officers and Safety Officers;
- Conduct worker inductions, toolbox meetings, and E&S awareness activities;
- Report incidents, non-compliances, and corrective actions promptly; and
- Cooperate in grievance handling and stakeholder engagement.

This is consistent with AIIB ESS2 and IFC PS2 requirements on labor and working conditions.

10.3.6 Regulatory Agencies and Local Government Units

- DENR–EMB: Regulatory oversight, ECC monitoring, and compliance verification;
- DOLE: Oversight of labor standards and OSH compliance;
- LGUs and Barangays: Community coordination, information dissemination, and local issue resolution.

10.3.7 Independent Monitoring (If Required)

If required by AIIB and/or DENR, an Independent Monitoring Agent (IMA) may be engaged to:

- Conduct independent verification of ESMP implementation;
- Assess compliance with AIIB ESS and ECC conditions; and
- Submit independent monitoring reports to the Client and regulators.

10.4 Institutional Capacity Building Strategy

10.4.1 Objectives

The capacity-building strategy aims to:

- Strengthen E&S governance within MICP;
- Ensure contractors fully understand safeguard obligations; and
- Maintain alignment with national regulations and AIIB standards.

10.4.2 Capacity Building Measures

For MICP / ESSU

- Training on AIIB ESF, IFC Performance Standards, and DENR requirements;
- Strengthening internal monitoring and reporting systems;
- Training on grievance handling and stakeholder engagement.

For Contractors

- Mandatory ESMP, OSH, and labor standards induction;
- Regular toolbox talks and refresher training;

- Training on incident reporting and emergency response.

For Consultants

- Updates on AIIB safeguard compliance and reporting;
- Advanced training on adaptive ESMP implementation.

10.5 Monitoring, Reporting, and Adaptive Management

Environmental and social monitoring shall be conducted throughout construction and operation. Monitoring results shall be documented in:

- Self-Monitoring Reports (SMRs);
- Compliance Monitoring Reports (CMRs); and
- AIIB environmental and social safeguard reports.

Corrective actions shall be tracked through a Corrective Action Plan (CAP), and the institutional mechanism shall be periodically reviewed and refined based on monitoring outcomes. This adaptive management approach is consistent with ISO management systems and AIIB ESS1.

10.6 Conclusion

The institutional mechanism for MICP provides a robust and proportionate governance framework for effective ESMP implementation. By clearly defining roles, strengthening institutional capacity, and aligning with national laws, ICTSI corporate systems, and AIIB Environmental and Social Standards, the framework ensures environmentally and socially responsible Project implementation within a long-established port and industrial setting.

11. Stakeholder Engagement Plan/ Public Consultation and Information Disclosure

Public Consultation and Information Disclosure

This Stakeholder Engagement Plan (SEP) has been prepared for the Mindanao International Container Port (MICP) Phase II and Phase III-A Enhancements within the PHIVIDEC Industrial Estate, Tagoloan, Misamis Oriental. The SEP forms an integral part of the Environmental and Social Impact Assessment (ESIA) and provides the framework for systematic stakeholder identification, consultation, information disclosure, and grievance management throughout the project lifecycle.

The SEP is consistent with the requirements of the Philippine Environmental Impact Statement (EIS) System and aligned with international standards, particularly the Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework, including Environmental and Social Standard 1 (ESS1).

The objectives of the SEP are to:

- Ensure timely, transparent, and culturally appropriate disclosure of project information;
- Identify and engage stakeholders proportionate to their influence, interest, and exposure to project-related risks;
- Integrate stakeholder feedback into environmental and social management measures; and
- Establish an accessible and effective grievance redress mechanism.

11.1 Stakeholder Identification, Analysis and Prioritization

Stakeholder identification for the MICP Enhancement Project was undertaken through a structured screening process considering:

(i) proximity to the project area and marine influence zone;
(ii) statutory and regulatory mandates;
(iii) livelihood or operational dependence on port and coastal resources; and
(iv) potential exposure to construction- and operation-related impacts.

Stakeholders include national government agencies, local government units (LGUs), host and adjacent communities, fisherfolk and coastal resource users, port users, business groups, civil society organizations, academe, and internal project stakeholders.

Stakeholder prioritization was based on an influence–interest assessment to determine the appropriate level and frequency of engagement. This approach ensures engagement efforts are proportionate to project risks and aligned with ESS1 good practice.

11.2 Consolidated Stakeholder Matrix and Engagement Strategy

Table 11-1 Consolidated Stakeholder Mapping, Influence, Interest, and Engagement Strategy

Stakeholder Group	Category	Influence	Interest	Key Issues / Concerns	Engagement Approach	Frequency

DENR–EMB	National Regulatory Agency	High	High	ECC compliance, environmental monitoring, pollution control	Formal technical meetings; compliance reporting; site inspections	Regular / per regulatory milestones
DENR–BMB	Biodiversity Authority	Medium	Medium	Marine habitat screening, biodiversity monitoring	Technical consultations; data sharing	As needed
PPA / MARINA	Maritime Agencies	High	Medium	Navigational safety, vessel traffic, port standards	Coordination meetings; technical briefings	Regular
PHIVIDEC Industrial Authority	Estate Administrator	High	Medium	Estate compliance, access control, construction coordination	Regular coordination meetings	Regular
LGU – Tagoloan	Local Government Unit	High	High	Traffic, public safety, DRRM alignment, local benefits	Public consultations; LGU coordination	Monthly during active phases
Barangays (Baluarte, Casinglot, adjacent)	Local Communities	Medium	High	Noise, dust, traffic, nearshore access, grievances	Barangay meetings; information disclosure; GRM	Monthly / as needed
Fisherfolk Associations	Resource Users	Low–Medium	High	Nearshore access, navigational safety, turbidity	FGDs; advance notices; participatory discussions	Every 2–3 months
Environmental NGOs / CSOs	Civil Society	Medium	Medium–High	Marine water quality, transparency of monitoring	Technical briefings; disclosure of results	Semi-annual
Port Users (Shipping lines, truckers)	Industry / Logistics	High	Medium	Operational efficiency, safety, scheduling	Coordination meetings; advisories	Regular
Local Businesses	Commercial	Medium	Medium	Economic opportunities, access	Information sessions; forums	Quarterly
Academe / Research Institutions such as Xavier University through the McKeough Marine Center	Technical / Research	Low-Medium	Medium	Access to baseline and monitoring data; scientific validation of marine and coastal assessments; opportunities for applied research and knowledge sharing	Technical workshops; data sharing (as appropriate); coordination on research collaboration and validation of monitoring methodologies	As needed, typically during baseline review and monitoring disclosure

MICP Management & Contractors	Internal	Medium	Medium	OHS, compliance, work conditions	Toolbox meetings; trainings	Regular
Macajalar Bay Development Alliance (MBDA)	Inter-LGU / Regional Coordination Body	Medium	Medium–High	Cumulative marine and coastal impacts within Macajalar Bay , Consistency with bay-wide coastal resource management objectives , Information sharing on marine monitoring results and mitigation measures , and Coordination among LGUs on environmental and navigational issues	Information sharing on project scope and marine impacts; coordination meetings on cumulative impact considerations and monitoring results.	Semi-annual or aligned with monitoring and reporting cycles

11.3 Engagement Methods and ScheduleStakeholder engagement

Stakeholder engagement will be implemented across pre-construction, construction, and operational phases using proportionate methods, including public consultations, FGDs, key informant interviews, technical meetings, IEC materials, digital channels, and a formal grievance redress mechanism. Engagement frequency and intensity will be adjusted based on project phase and stakeholder priority.

11.4 Engagement Principles

All engagement activities are guided by the principles of inclusiveness, transparency, cultural sensitivity, responsiveness, and accountability, consistent with national EIA requirements and AIIB ESS1.

11.5 Grievance Redress Mechanisms

A project-level grievance redress mechanism (GRM) will be maintained to receive, document, and resolve stakeholder concerns in a timely and transparent manner throughout construction and operation.

12. Grievance Redress Mechanism

The Grievance Redress Mechanism (GRM) for the Mindanao International Container Port (MICP) Project establishes a formal, transparent, and accountable process for receiving, assessing, and resolving concerns or complaints from a broad range of stakeholders. These include local communities, project-affected persons, employees, contractors, port users, business partners, and relevant regulatory authorities.

The GRM serves as a core instrument to uphold social responsibility, foster trust, and ensure compliance with applicable Philippine environmental and social regulations, as well as internationally recognized standards and good practice for environmental and social safeguards applicable to large-scale port and maritime infrastructure projects.

The mechanism provides accessible channels for stakeholders to raise grievances related to potential or actual impacts arising from Project activities, including environmental, social, occupational, health and safety, and operational matters. Emphasis is placed on timely, transparent, fair, and documented resolution, with grievance trends systematically monitored and analyzed to support adaptive management and continuous improvement of Project implementation.

The GRM is integrated within the Project's Environmental and Social Management Plan (ESMP) and is complementary to the Stakeholder Engagement Plan (SEP), and other governance instruments under the ESIA. By embedding grievance handling into the broader environmental and social management system, the Project ensures that stakeholder concerns inform decision-making, minimize conflict risks, and support responsible and sustainable port operations throughout all project phases.

12.1 Purpose and Objectives of the Grievance Redress Mechanism (GRM)

The Grievance Redress Mechanism (GRM) for the Mindanao International Container Port (MICP) is designed to establish a structured and transparent framework through which stakeholders—including local communities, government agencies, employees, contractors, port users, and other interested parties—can raise concerns or complaints related to the Project.

The GRM aims to:

- Provide an accessible, predictable, and rights-based process for grievance submission and resolution;
- Promote accountability, transparency, and trust between the Project Proponent and stakeholders;
- Enable early identification and resolution of environmental, social, health, safety, and operational issues; and

- Support compliance with national regulatory requirements and international good practice for environmental and social risk management.

12.2 Accessible and Transparent Channels for Stakeholder Concerns

The GRM ensures that all stakeholders have clearly defined avenues to submit grievances related to any aspect of the Project. These include concerns associated with environmental impacts, social or livelihood disruptions, occupational health and safety, security issues, or operational practices that may affect communities, port users, or workers.

Multiple submission channels—including in-person reporting, hotline services, email, written correspondence, and digital platforms—are provided to ensure inclusivity. Stakeholders may raise concerns without fear of discrimination, retaliation, or procedural barriers, and anonymous submissions are permitted.

12.2.1 Promotion of Accountability, Trust, and Open Communication

The GRM strengthens the relationship between the Project proponent and stakeholders by fostering transparency and mutual understanding. By systematically recording, tracking, and responding to grievances, the Project demonstrates accountability for its actions, reinforcing stakeholder trust and encouraging constructive dialogue. Open communication channels also help to align expectations, clarify project objectives, and prevent misunderstandings that could lead to disputes.

12.2.2 Facilitation of Timely Identification and Resolution of Potential Issues

By capturing grievances promptly, the GRM allows for early detection of social, environmental, or operational concerns. Rapid assessment and resolution of grievances prevent the escalation of conflicts and contribute to smoother project implementation. The mechanism is designed to ensure that all complaints are acknowledged, investigated, and resolved within a defined timeline, with documented follow-up and feedback provided to stakeholders. This proactive approach reduces risks associated with project delays, reputational impacts, and community dissatisfaction.

12.2.3 Support for Regulatory and International Compliance

The GRM reinforces compliance with Philippine laws, including the Environmental Impact Assessment (EIA) requirements under the Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB), as well as other relevant statutory and local regulations. Additionally, it aligns with international environmental and social standards, such as the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability, which emphasize stakeholder engagement, risk management, and grievance resolution as critical components of sustainable development projects. By integrating these standards, the GRM contributes to ethical, responsible, and sustainable port redevelopment practices.

12.3 Scope and Applicability of the Grievance Redress Mechanism (GRM)

12.3.1 Scope

The GRM for the MICP Project covers grievances arising from the Project's environmental, social, health, safety, and operational dimensions, including but not limited to:

- **Environmental Impacts**
  - Noise and vibration from construction activities, piling, vessel movements, and port operations;
  - Dust emissions and air quality concerns related to earthworks, material handling, and vehicle movements;
  - Water quality impacts associated with stormwater runoff, sedimentation, wastewater discharge, and accidental releases;
  - Disturbance to terrestrial and marine biodiversity, including concerns related to nearshore works, dredging, vessel traffic, and marine species interactions within Macajalar Bay and adjacent coastal waters.

- **Social and Livelihood Impacts**
  - Disruption to livelihoods, including impacts on small-scale fishers, transport operators, and local businesses;
  - Land access, shoreline use, and safety buffer restrictions;
  - Traffic congestion and access limitations affecting communities and port users.

- **Gender-Related Concerns (GBV / SEAH)**

  Grievances related to gender-based violence (GBV), sexual exploitation, abuse, and harassment (SEAH) associated with project activities or personnel are handled with heightened confidentiality and sensitivity, consistent with international good practice. Access to the GRM does not preclude complainants from pursuing judicial or administrative remedies.

- **Health and Safety**
  - Occupational health and safety risks affecting workers and contractors;
  - Public safety concerns related to construction activities, traffic, and port operations.

- **Project Operations**
  - Port access disruptions, cargo handling issues, and operational inefficiencies;
  - Compliance with project commitments, environmental standards, labor standards, and corporate policies.

Exclusions

The GRM does not address:

- Criminal acts, which are referred to law enforcement authorities;
- Formal labor disputes governed by labor laws or collective bargaining agreements;
- Grievances unrelated to Project activities.

12.3.2 Application

The GRM applies to all stakeholders who may be affected by, or have an interest in, the MICP Project, including:

- Local communities and households in Tagoloan and adjacent areas;
- Small businesses, suppliers, and service providers;
- Port users, shipping lines, logistics operators, and transport providers;
- Employees, contractors, and subcontractors;
- Government agencies, NGOs, and civil society organizations.

Special consideration is given to vulnerable or marginalized groups to ensure equitable access to the GRM.

12.4 Definitions and Guiding Principles

The Grievance Redress Mechanism (GRM) operates within a structured framework of terms and principles that ensure clarity, transparency, and equitable treatment of all stakeholders. These definitions and guiding principles establish a common understanding among project personnel, affected communities, regulatory agencies, and other stakeholders regarding how grievances are identified, processed, and resolved throughout the MICP.

12.4.1 Definitions

Grievance

A grievance refers to any concern, complaint, claim, or expression of dissatisfaction raised by an individual, group, organization, or community regarding actual or perceived adverse impacts resulting from the project's activities. These impacts may be environmental (e.g., noise, dust, water quality), social (e.g., community disturbance, livelihood interference), operational (e.g., traffic congestion, port access restrictions), or related to labor, safety, or community health and security.

Gender-Related Grievance

A grievance involving gender-specific or sensitive concerns, including allegations of gender-based violence (GBV) or sexual exploitation, abuse, and harassment (SEAH), arising in connection with project activities or personnel.

Complainant

A complainant is any stakeholder – individual, household, community representative, fisherfolk association, business operator, port user, or CSO – who submits a grievance to the project. A complainant may also choose to remain anonymous. In such cases, the grievance is still processed with the same level of diligence and confidentiality.

Project-Affected Person (PAP)

A PAP is any individual, household, business, or community that may experience direct or indirect impacts (positive or negative) from project activities during pre-construction, construction, or operational phases, including environmental, economic, and social impacts.

GRM Officer

The GRM Officer is the designated focal person under MICP's Environmental Unit responsible for receiving, recording, assessing, and managing grievances. This officer coordinates investigations, communicates with complainants, ensures proper documentation, and reports grievance-related activities to the EHS Manager and Senior Management.

Environmental, Health, and Safety (EHS) Manager

The EHS Manager provides technical oversight in addressing environmental, health, and safety-related grievances. This includes verifying compliance with the Environmental Management Plan (EMP) and Construction EMP (CEMP), supervising corrective actions, and ensuring adherence to regulatory and industry standards.

Community Relations Unit (CRU)

The CRU supports stakeholder engagement activities and acts as the bridge between the project and communities. The unit may assist in receiving grievances, validating local concerns, facilitating dialogues, and disseminating updates regarding grievance resolution.

Corrective Action

A corrective action is any remedial measure undertaken to address the root cause of a grievance. This may include operational adjustments, enhanced mitigation measures, additional monitoring, engineering interventions, or changes to project schedules or methods.

Resolution

Resolution refers to the outcome of a grievance case, including actions taken, timelines met, agreements reached, and documentation completed. A case is considered resolved when corrective actions have been implemented and the complainant (if identifiable) confirms satisfaction or when adequate technical justification is provided.

12.4.2 Guiding Principles

The design and operation of the GRM for MICP are anchored on the following guiding principles, which reflect both international good practice and locally appropriate approaches:

Accessibility

The mechanism must be easy to access for all stakeholders, regardless of socioeconomic status, literacy level, or familiarity with formal processes. Multiple reporting channels – verbal, written, electronic, and community-based – ensure that no stakeholder is disadvantaged. Materials are disseminated in Filipino and English, and assistance in completing forms is provided when needed.

Transparency and Accountability

Grievances are logged, tracked, and processed following clear procedures and defined timelines. Stakeholders are informed of their grievance status, investigation steps, and expected resolution periods. Regular reporting to management, communities, and regulatory agencies ensures accountability and reinforces trust.

Confidentiality and Non-Retaliation

Complainants may report anonymously. Personal information is protected and only accessible to authorized personnel. The project commits to ensuring that no complainant faces retaliation, intimidation, or adverse treatment for raising concerns – particularly crucial for workers, fisherfolk, and marginalized groups. This principle applies with heightened sensitivity to gender-related grievances, including GBV and SEAH.

Timeliness

The efficiency of the GRM hinges on prompt action. Acknowledgment of grievances is issued within defined timeframes, and investigations and resolutions follow established deadlines. Timely responses prevent escalation of issues and enhance stakeholder confidence.

Fairness and Impartiality

Grievances are reviewed objectively, without bias or preferential treatment. Decisions are based on verified information, established standards, and technical assessments. The GRM Officer, EHS Manager, and involved technical teams ensure that all complainants – regardless of social standing or influence – receive equitable consideration.

Cultural Appropriateness and Sensitivity

Community norms, cultural practices, and local dynamics within PHIVIDEC Industrial Estate and neighboring barangays are respected in handling grievances. This includes communication approaches, meeting practices, community protocols, and engagement with fisherfolk and coastal resource users who may have traditional rights or practices linked to Macalajar Bay.

Inclusiveness

The GRM ensures that vulnerable groups such as low-income households, women, elderly persons, informal workers, and small-scale fisherfolk have equal opportunity to access and utilize the mechanism. This includes targeted outreach and simplified explanations during consultations.

Proportionality

The level of investigation and response corresponds to the severity and potential impact of the grievance. Minor operational issues may require administrative action, whereas high-severity concerns – such as environmental contamination, health and safety risks, or alleged violations of regulations – trigger immediate and elevated responses.

Continuous Improvement

The GRM is not static. Data from grievances, trends observed, and lessons learned inform updates to project mitigation measures, construction practices, environmental safeguards, and community outreach strategies. Regular review ensures the mechanism remains effective and responsive to evolving project needs and stakeholder expectations.

12.5 GRM Structure and Institutional Arrangements

The GRM structure described in Sections 13.4 and 13.6 reflects a coordinated institutional system in which oversight, operational grievance handling, technical support, community engagement, and contractor responsibilities are clearly delineated and mutually reinforcing. To avoid duplication, roles described in this section focus on institutional functions, while Section
13.6 elaborates on operational responsibilities and resources supporting GRM implementation.

The effectiveness of the Grievance Redress Mechanism (GRM) relies on a clear, well-defined institutional structure that outlines the roles, responsibilities, reporting lines, and coordination pathways among project implementers. For MICP, the GRM structure is organized to ensure timely response, transparent decision-making, and efficient resolution of grievances that may arise during pre-construction, construction, and operational phases of the redevelopment works.

The institutional arrangement adopts a multi-tiered approach, ensuring that complaints are addressed at the lowest appropriate level, while allowing for escalation to higher authorities when needed.

Table 12-1. Grievance Redress Mechanism - Institutional Structure

GRM Component	Role and Function	Composition	Key Responsibilities
GRM Oversight Committee (GOC)	The GOC serves as the highest decision-making	• Mindanao International Container Port (MICP) Senior Management	• Policy direction and oversight of GRM

	authority for grievance resolution within the project and ensures alignment with MICP corporate policies, DENR requirements, and international good practices.	Representative • Project Manager / Construction Manager • Environmental Specialist • Social and Community Relations (ComRel) Lead • Health, Safety, and Security (HSS) Officer • Legal/Compliance Officer (as needed)	implementation • Review of quarterly and annual GRM performance reports • Resolution of complex, sensitive, or high-risk grievances escalated to management level • Endorsement of systemic corrective actions and resource allocation
Grievance Redress Unit (GRU)	A dedicated Grievance Redress Unit operates as the primary body responsible for day-to-day implementation of the GRM. The GRU functions as the operational hub of the GRM and ensures that all grievances move through the established workflow efficiently.	• GRM/Community Relations Officer (Lead) • Environmental and Social Safeguards Assistant • Administrative Support Staff • Data Management and Documentation Assistant	• Overall coordination of grievance management • Accountability for maintaining the grievance registry • Reporting to the GOC
MICP–Contractor Interface Team (Environmental, Social, and Engineering Support)	Since the redevelopment involves construction contractors, O&M teams, and technical consultants, inter-agency coordination is critical. This team ensures cross-	• Contractor's Environmental, Health, and Safety (EHS) Officer • Contractor's Community Liaison Officer • MICP Engineering & O&M Representatives • Third-Party Specialists	• Technical coordination for grievance verification • Oversight of corrective action implementation within contractor scope

	functional		
	collaboration, enabling rapid and technically sound resolution of issues.	(as needed, e.g., marine ecologists, structural engineers)	
Community Liaison Network (CLN)	To ensure that stakeholders have accessible channels, MICP designates trained focal persons who serve as community interfaces. The CLN strengthens accessibility and inclusivity, ensuring the GRM reaches marginalized and affected groups.	• Barangay Liaison Officers • Port Security Representatives • Local Government Unit (LGU) Social Development Office Contacts • Fisherfolk Representatives or Barangay Environmental Officers (for marine-related concerns)	• Community-level access points for grievance submission • Support for vulnerable and marginalized groups

External and Regulatory Interface	Certain grievances may require coordination with regulatory bodies or third-party institutions. This ensures that the GRM remains compliant with Government of the Philippines (GOP) regulatory processes.	• DENR-EMB for environmental violations or issues involving ECC conditions. • PCG and BFAR for marine-related concerns affecting fisheries or navigation safety. • LGU Tagoloan for community-level disputes, land-based impacts, or traffic management concerns. • DOTr/MARINA for port operations-related regulatory matters.	• Receive escalated grievances that cannot be resolved internally. • Provide technical or legal guidance on compliance issues. • Participate in joint resolution dialogues if mandated. •

12.5.1 Reporting and Accountability Arrangements

To maintain transparency and accountability:

The GRU submits:

- Monthly Grievance Status Report to MICP Management
- Quarterly Consolidated GRM Performance Report to the GOC
- Compliance Reports aligned with ECC conditions and required environmental monitoring
- Annual summary reports for stakeholder disclosure

The GOC reviews:

- Trends, recurring issues, and systemic risks
- Effectiveness of mitigation measures
- Stakeholder relations performance
- Recommendations for improving environmental, social, and operational management

All records are stored in a centralized GRM Management Information System (GRM-MIS) to ensure traceability and data integrity.

12.5.2 Resource Requirements for Effective GRM Implementation

The successful operation of the Grievance Redress Mechanism (GRM) relies not only on well-defined procedures and institutional arrangements but also on the allocation of adequate human, technical, and financial resources. For MICP, the following resources are critical to ensure the GRM functions efficiently, transparently, and inclusively throughout all phases of the project.

To ensure sustainability of the GRM throughout the project lifecycle, the following resources are allocated:

Dedicated staffing for GRU operations

A fully functional Grievance Redress Unit (GRU) requires dedicated personnel to manage all aspects of grievance handling. This includes:

1. **GRM Officer (Lead):** Responsible for receiving, assessing, and coordinating grievance resolution; maintaining records; and liaising with stakeholders and management.
2. **Assistant Officers / Data Clerks:** Support documentation, case tracking, and report preparation.
3. **Community Liaison Support:** Ensures that vulnerable or marginalized groups have access to the GRM and assists in community consultations.

Dedicated staffing ensures continuity and accountability in grievance management. Staff must be trained in communication, conflict resolution, documentation, and technical assessment of environmental and social issues. Adequate staffing prevents backlog, reduces resolution times, and allows for proactive engagement with stakeholders.

Office/desk space for grievance handling

The GRU requires a physical workspace within the MICP premises or nearby community-accessible office to receive in-person complaints, conduct consultations, and manage administrative tasks.

- Serves as a visible and accessible point of contact for complainants.
- Supports confidential discussions with stakeholders and documentation of sensitive cases.
- Provides a controlled environment for coordination with other project teams (EHS, engineering, community relations).

Proper office design, including private meeting spaces and secure storage for grievance records, enhances stakeholder confidence in the integrity of the mechanism.

Hotline, SMS, email, and social media platforms

Multiple communication channels ensure accessibility and convenience for all stakeholders:

- **Telephone Hotline / SMS:** Allows real-time reporting of grievances, including urgent issues such as safety hazards or environmental incidents.
- **Email:** Provides a documented trail for more formal or complex grievances.
- **Social Media Channels:** Engages tech-savvy stakeholders, informs the public, and facilitates rapid outreach for general queries or updates.

These channels must be monitored by trained personnel during working hours, with clear procedures for acknowledgment and initial assessment. Multi-channel accessibility ensures inclusivity, allowing even geographically dispersed or vulnerable populations to submit grievances easily.

Budget for field investigations and community meetings

Effective grievance resolution often requires on-site verification and stakeholder engagement. A dedicated budget allocation is necessary for:

- Travel to project sites or affected communities
- Logistics for meetings and consultations (venue, refreshments, translation services)
- Engagement of third-party experts when technical verification is needed (e.g., marine ecologists, structural engineers)

A well-funded GRM ensures that investigations are thorough, evidence-based, and participatory. Field presence builds trust among stakeholders, demonstrates commitment to addressing grievances, and supports accurate documentation for monitoring and reporting.

Data management software and secure storage

The GRU must implement a centralized and secure grievance management system, which includes:

- Digital logging of grievances, categorization, investigation status, and resolution actions
- Secure storage of sensitive documents, including complainant information and evidence
- Access controls to maintain confidentiality and integrity of data

A robust data management system allows for systematic tracking of grievances, trend analysis, and reporting to senior management and regulatory authorities. It also supports audits, annual reviews, and continuous improvement of the GRM by providing accurate, real-time data.

<u>Communication materials, brochures, and signage</u>
To ensure stakeholders are aware of the GRM and its procedures, MICP must produce and distribute information materials such as:

- Brochures and flyers explaining the GRM process and submission channels
- Posters and banners at port entrances, barangays, and public areas
- Community handouts during consultations and meetings
- Digital content for social media and the project website

These materials increase awareness, accessibility, and transparency of the GRM. Clear, culturally appropriate, and visually understandable materials help ensure that all stakeholders – including non-literate or marginalized groups – understand their rights and the steps to submit grievances. Signage and outreach reinforce the visibility and credibility of the GRM.
Allocating these resources – staffing, office space, multi-channel communication, budget for fieldwork, secure data management, and outreach materials – is essential for establishing a responsive, inclusive, and credible GRM. Together, they enable MICP to manage grievances effectively, ensure regulatory compliance, foster trust with communities, and enhance the environmental and social performance of the port redevelopment project.

12.6 Notification and Accessibility Measures

To ensure transparency, accessibility, and responsiveness in addressing concerns arising from MICP, the Project proponent will actively communicate the availability and procedures of the Grievance Redress Mechanism (GRM) to all relevant stakeholders, including local communities, port users, government agencies, and other affected parties. This multi-channel notification strategy is designed to maximize reach, ensure timely dissemination of information, and facilitate easy reporting of grievances.

12.6.1 Channels for GRM Disclosure:

Information Boards at Port Facilities and Public Offices:

Clear, prominently displayed information boards will be installed at strategic locations within the port premises and in local barangay halls or municipal offices. These boards will provide concise instructions on submitting grievances, contact details of GRM personnel, and visual guides to the grievance process, ensuring accessibility for stakeholders who may have limited digital access.

12.6.2 Project Website and Social Media Channels:

The GRM will be publicly accessible through the official MICP website and designated social media platforms. This approach leverages digital tools to reach a wider audience, including port users, suppliers, and civil society organizations. The online portals will feature downloadable forms, submission guidelines, frequently asked questions, and regular updates on grievance handling status.

12.6.3 Pamphlets, Newsletters, and Community Meetings:

Printed materials, such as pamphlets and newsletters, will be distributed to local communities and stakeholders to provide straightforward guidance on the GRM process. Additionally, periodic community consultations or meetings will be conducted to present the GRM framework in person, allowing stakeholders to ask questions and clarify procedures directly with Project representatives.

12.6.4 Dedicated GRM Hotlines and Email Addresses:

To ensure direct, real-time communication, dedicated telephone hotlines and email addresses will be established. These channels will enable stakeholders to submit grievances conveniently, seek clarification, or follow up on existing concerns. Hotline staff will be trained to record and categorize grievances accurately, providing initial responses within specified timelines.

12.6.5 Contents of GRM Notifications:

All notification materials will include:

- **Contact Information for Grievance Submission:** Clear, updated phone numbers, email addresses, and physical submission points where grievances can be lodged.

- **Step-by-Step Guidance on Grievance Handling:** A transparent outline of the grievance process, including acknowledgment of receipt, investigation procedures, timelines for response, and resolution measures. This ensures stakeholders understand how their concerns will be addressed at each stage.

- **Assurances of Confidentiality, Non-Retaliation, and Fair Treatment:** Explicit statements guaranteeing that all grievances will be treated confidentially, that no retaliation will occur against individuals raising concerns, and that all submissions will be considered fairly and objectively. These fosters trust in the GRM and encourages open communication from affected parties.

  The notification strategy integrates both traditional and digital communication methods to ensure inclusivity, considering the diverse demographic and literacy levels of stakeholders. By combining visual, print, and digital communication channels, the GRM becomes a proactive tool for stakeholder engagement, conflict prevention, and mitigation of social and environmental impacts during the redevelopment of MICP.

12.7 Roles, Responsibilities, and Resources

The effective functioning of the Grievance Redress Mechanism (GRM) for MICP relies on a well-defined institutional structure supported by clear mandates, coordinated responsibilities, and adequate resources. As the Project involves significant civil works, operational adjustments, and interactions with diverse stakeholder groups – including local communities, port users, fisherfolk, workers, regulatory agencies, and contractors – establishing a robust and transparent GRM governance structure is fundamental to maintaining social acceptability and regulatory compliance throughout the project lifecycle.

This section outlines the organizational arrangements required to operationalize the GRM and clarifies the specific duties of each participating entity. The delineation of roles ensures that grievances are managed in a systematic, timely, and accountable manner, consistent with national environmental regulations, industry best practices, and international safeguard standards. By assigning clear responsibilities – from grievance intake, logging, investigation, and resolution, to monitoring and reporting – the Project Proponent ensures that concerns are addressed at the appropriate level of authority and expertise.

Furthermore, the effectiveness of the GRM depends not only on organizational clarity but also on the availability of adequate human, technical, and financial resources. Each role within the GRM structure is supported by specific tools, knowledge, and logistical capabilities necessary for careful assessment of issues, meaningful stakeholder engagement, and the implementation of corrective actions. This structured approach enables the project to remain responsive to emerging concerns, mitigate potential social or environmental impacts, and strengthen trust and transparency between MICP and its stakeholders.

Overall, the clear articulation of roles, responsibilities, and resources creates a strong institutional foundation for the GRM, contributing to proactive risk management, continuous improvement, and long-term sustainability of the port redevelopment initiative.

1. **Project Proponent (MICP Management)**

   Role and Responsibilities

   MICP Management serves as the overall governing authority responsible for ensuring that the GRM is integrated into the project's environmental and social management systems. Their responsibilities include:

   - **Strategic Oversight:** Providing leadership and direction on grievance management, including the development, approval, and periodic review of GRM policies, protocols, and performance indicators.
   - **Accountability and Compliance:** Ensuring that the grievance process adheres to Philippine regulatory requirements such as DENR-EMB guidelines, the Environmental Compliance Certificate (ECC) conditions, and relevant international standards (e.g., IFC Performance Standards, ADB Social Safeguard Policies).

- **Resource Mobilization:** Allocating sufficient personnel, budget, and logistical support required for GRM operations including staffing, communication materials, monitoring activities, and implementation of corrective measures.
- **Decision-Making Authority:** Reviewing and approving recommended actions for complex, sensitive, or high-risk grievances such as those involving safety, land use, biodiversity concerns, or adverse impacts on vulnerable groups.
- **Performance Monitoring:** Assessing GRM effectiveness through periodic internal audits, stakeholder feedback, and regular progress reports submitted by the GRM Team.

<u>Resources</u>

- **Dedicated GRM Personnel:** A formally appointed GRM Team or unit with clear reporting lines to senior management.
- **Budget Allocation:** Funds earmarked for GRM operations including training, investigation activities, community consultations, and implementation of mitigation measures.
- **Management Systems:** Access to decision-support tools, policies, and procedural guidelines governing grievance handling, documentation, and evaluation.

2. GRM Officer / GRM Team

<u>Role and Responsibilities</u>

The GRM Officer or Team acts as the central coordinating body responsible for the day-to-day management of grievances. Their key functions include:

- **Intake and Documentation:** Receiving grievances through various channels (walk-ins, email, phone, online submissions, community meetings) and ensuring proper documentation in the grievance log or database.
- **Initial Screening and Categorization:** Classifying grievances based on type (environmental, social, labor, safety, operational), severity, and required response time.
- **Coordination of Investigations:** Engaging relevant technical experts, contractors, or field personnel to conduct site inspections or fact-finding activities.
- **Stakeholder Communication:** Ensuring timely acknowledgment of complaints and providing regular updates to complainants in accordance with the GRM timeline.
- **Monitoring and Closure:** Following up on corrective actions and documenting final resolutions, ensuring that complainants are satisfied with the outcome where possible.
- **Reporting:** Preparing monthly or quarterly summaries of grievances, trends, and resolution performance for submission to MICP Management and regulatory agencies if required.

<u>Resources</u>

- **Digital or Manual Logging System:** GRM software platform or structured logbook that allows for secure, traceable, and organized recordkeeping.

- **Standardized Templates:** Forms for grievance intake, investigation reports, action plans, and closure records.
- **Field Documentation Tools:** Mobile data collection devices, cameras, and GPS-enabled tools for field verification and monitoring.
- **Secure Database:** Protected system for storing sensitive personal and project-related information.

3. **Environmental and Social Safeguards Team**

Role and Responsibilities

This team provides technical expertise to ensure that grievances involving environmental or social concerns are properly evaluated and addressed. Their responsibilities include:

- **Technical Assessment:** Conducting environmental and social investigations related to air quality, noise, water quality, coastal and marine ecology, terrestrial habitats, community health and safety, or livelihood impacts.
- **Regulatory Compliance Review:** Checking alignment of proposed mitigation measures with ECC conditions, EPRMP commitments, EMP measures, and applicable Philippine environmental laws.
- **Mitigation Planning:** Developing scientifically sound, evidence-based corrective actions to resolve confirmed issues (e.g., enhanced sediment controls, noise mitigation measures, community safety enhancements).
- **Monitoring and Verification:** Assessing the effectiveness of implemented corrective measures through follow-up monitoring or field measurements.
- **Advisory Support:** Providing technical guidance to contractors, the GRM Team, and MICP Management on environmental and social risk reduction.

Resources

- **Monitoring and Sampling Equipment:** Instruments for air/noise monitoring, water sampling, sediment analysis, biodiversity observation, and other technical assessments.
- **Technical Manuals and Guidelines:** Access to environmental standards, DENR protocols, and international safeguard guidelines.
- **GIS and Mapping Tools:** For spatial analysis of grievance locations and related impacts.
- **Legal and Regulatory References:** Updated copies of relevant environmental and social legislation.

4. **Community Liaison / Stakeholder Engagement Officer**

Role and Responsibilities

The Community Liaison Officer (CLO) ensures active, culturally appropriate, and inclusive engagement with affected communities and stakeholders. Key functions include:

- **Outreach and Awareness:** Disseminating GRM procedures during community consultations, barangay meetings, port user orientations, and through printed or digital materials.
- **Accessible Grievance Submission:** Ensuring that stakeholders—including fisherfolk, transport operators, residents, and vulnerable groups—understand how to file grievances and can do so without barriers related to literacy, language, or social status.
- **Facilitation of Dialogue:** Coordinating meetings between complainants, technical teams, and contractors to clarify issues, gather additional information, and promote collaborative problem-solving.
- **Feedback Delivery:** Communicating investigation outcomes, timelines, or ongoing corrective actions to stakeholders.
- **Relationship Building:** Maintaining trust and transparency by serving as the primary point of contact for community concerns and emerging issues.

Resources

- **Communication Materials:** IEC materials, posters, brochures, and digital communication content to disseminate GRM information.
- **Engagement Logistics:** Access to community meeting venues, transportation, and facilitation supplies.
- **Language Support:** Local interpreters or multilingual staff to address diverse linguistic needs.
- **Public Engagement Tools:** Contact hotlines, suggestion boxes, feedback forms, and online submission portals.

5. Contractors / Subcontractors

Role and Responsibilities

Contractors and subcontractors play a frontline role in preventing and resolving grievances arising directly from construction and operational activities. Their responsibilities include:

- **Immediate Reporting:** Documenting and relaying complaints related to noise, dust, worker behavior, safety hazards, traffic disruptions, or material handling within their work areas.
- **Implementation of Mitigation Measures:** Executing corrective actions such as adjusting work schedules, installing noise barriers, applying dust suppression measures, enhancing safety controls, or improving housekeeping.
- **Compliance with Safeguards:** Ensuring adherence to the Environmental Management Plan (EMP), Construction Safety and Health Program (CSHP), and environmental and social standards.
- **Internal Monitoring:** Conducting daily or weekly inspections and reporting observations to the GRM and Environmental teams.
- **Worker Awareness:** Training site workers on appropriate behavior, environmental responsibilities, and the importance of grievance prevention.

Resources

- **On-site EHS Personnel:** Safety officers, environment officers, and monitoring staff with direct access to field conditions.
- **Operational Equipment:** Dust suppression systems, safety barriers, personal protective equipment (PPE), spill kits, and housekeeping materials.
- **Internal Reporting Systems:** Site-level logbooks, daily inspections tools, or contractor-level grievance response mechanisms.
- **Compliance Documentation:** Construction method statements, mitigation plans, and safety protocols.

Table 13-2 Summary of Role, Responsibilities, and Resources

Role	Responsibilities	Resources
Project Proponent (MICP Management)	Overall responsibility for GRM implementation, allocation of budget and human resources, approval of resolution measures.	Dedicated GRM team, budget allocation for grievance resolution.
GRM Officer / Team	Receive, log, and track grievances; conduct initial assessment; coordinate investigation and response; maintain records.	GRM management software/logbook, reporting templates.
Environmental & Social Safeguards Team	Provide technical support in investigating environmental or social issues raised; propose mitigation actions.	Technical expertise, field monitoring equipment, legal guidance.
Community Liaison / Stakeholder Engagement Officer	Communicate with stakeholders; facilitate meetings; ensure grievance submission is accessible and culturally appropriate.	Community meeting venues, communication materials, local interpreters if needed.
Contractors / Subcontractors	Implement mitigation measures; report grievances linked to their operations.	On-site monitoring staff, internal reporting mechanisms.

12.8 Grievance Process

The grievance process for MICP is designed as a structured, transparent, and rights-based mechanism that allows individuals, groups, and institutions to raise concerns regarding actual or potential environmental, social, safety, and operational impacts arising from project activities. The process supports early issue resolution, fosters constructive dialogue with affected communities, and ensures that concerns are addressed in accordance with Philippine regulatory frameworks, international environmental and social safeguards, and industry best practices for port redevelopment and maritime infrastructure projects.

The mechanism is intended to operate continuously throughout the pre-construction, construction, and operational phases, recognizing that port redevelopment activities often generate dynamic impacts related to construction noise, marine traffic, dredging, worker influx, traffic management, and livelihood interactions – especially for fisherfolk, shoreline users, adjacent industries, and transport operators.

Step 1: Submission of Grievance

Stakeholders may file grievances through a variety of accessible, culturally appropriate, and community-friendly channels. These mechanisms ensure that persons with limited literacy, limited internet access, or mobility challenges can still communicate their concerns effectively.

Available reporting channels include:

- Written submissions through formal letters, printed grievance forms, or electronic mail sent to the GRM Secretariat or designated project address.
- Walk-in submissions, where individuals may lodge concerns directly with the GRM Officer, Community Liaison Officer, or barangay focal persons who have been oriented on the GRM protocol.
- Dedicated hotline, SMS number, or social media platforms managed by the project, enabling real-time reporting of urgent or location-specific concerns such as traffic congestion, safety hazards, or accidental releases.
- Anonymous submissions via secure drop boxes located in barangays near the port or through digital forms where identity disclosure is optional. The project safeguards anonymity and will not attempt to identify anonymous complainants.

Information typically requested includes:

- Complainant's name, contact number, organizational affiliation (optional for anonymous reports).
- A precise description of the concern, indicating:
    - Date and time of incident or observation
    - Location (e.g., port gate, shoreline, barangay roads)
    - Nature of concern (environmental, social, livelihood, safety, nuisance, marine disturbance)
- Any supporting evidence, such as photographs, videos, medical reports, or witness statements.
- Expected or preferred resolution where applicable (e.g., restoration, compensation, clarification, removal of hazard).

This step ensures full documentation and proper routing of concerns to appropriate technical teams (environmental, construction management, engineering, community relations, and safety personnel).

Step 2: Acknowledgment

Within five (5) working days, the GRM Secretariat formally acknowledges receipt of the grievance. The acknowledgment includes:

- The reference or tracking number, allowing the complainant to follow up and track progress.
- A summary of the reported concern as understood by the team.

- Expected processing timelines, depending on complexity and type of grievance.
- Contact details of the assigned GRM Officer or case handler.
- This step establishes trust, demonstrates transparency, and ensures the complainant feels heard early in the process.

Step 3: Assessment and Categorization

To ensure systematic management and prioritization of complaints, all grievances received under the GRM are categorized into four levels based on their severity, scope, impact, and urgency. This categorization guides the investigation approach, resolution timeline, and escalation procedures.

Level 1 – Low / Minor Grievances

Definition: Grievances that are minor in scale, affect a limited number of stakeholders, and have low or negligible environmental, social, or operational impacts. Typically, these are localized complaints that can be resolved at the GRM Officer or Community Liaison level without extensive investigation.
Examples:

- Minor noise or dust complaints from nearby residents during construction.
- Temporary inconvenience due to a single-day road closure within port premises.
- Small delays in administrative processes or document requests.

Resolution Approach:

- Addressed by the GRM Officer within 5–10 working days.
- Simple corrective actions applied (e.g., dust suppression, signage, or minor schedule adjustments).
- Documented in GRM log; monitored for recurrence.

Level 2 – Moderate Grievances

Definition: Grievances with moderate impact, affecting multiple stakeholders or requiring intervention from project technical teams. These grievances may involve operational, environmental, or social issues that require verification, technical assessment, or corrective measures but are not immediately critical or legally sensitive. Examples:

- Recurring noise or vibration affecting multiple neighboring households.
- Minor traffic congestion affecting port access routes.
- Complaints from port workers regarding non-compliance with safety PPE requirements.

Resolution Approach:

- Investigated jointly by GRM Officers and relevant technical units (EHS, Engineering, or Contractors).
- Corrective measures implemented within 10–20 working days.
- Escalation to EHS Manager if unresolved or if recurring patterns are identified.

Level 3 – Significant / High Impact Grievances

Definition: Grievances that have significant environmental, social, or operational consequences, affect larger stakeholder groups, or pose substantial risk to health, safety, or project compliance. These require formal investigation, involvement of senior management, and potential engagement with local authorities.
Examples:

- Pollution of port waters or nearby coastal areas affecting multiple fisherfolk.
- Unsafe construction practices causing injury or risk to workers or visitors.
- Major disruption to barangay traffic, trade, or community services.
- Allegations of labor rights violations (e.g., unsafe working hours, lack of safety measures).

Resolution Approach:

- Investigated by GRM Officer with EHS Manager and Contractor teams.
- Resolution implemented within 15–30 working days depending on complexity.
- Escalation to Senior Management and, where necessary, LGU or DENR-EMB.
- Continuous communication with affected stakeholders to monitor resolution effectiveness.

Level 4 – Critical / Severe Grievances

Definition: Grievances with critical or potentially irreversible impacts, involve legal or regulatory violations, or pose serious threats to human health, safety, or the environment. Level 4 grievances are immediately escalated to senior management and, if required, regulatory authorities.
Examples:

- Breach of Philippine environmental laws or ECC conditions (e.g., unauthorized land reclamation or discharge into marine waters).
- Accidents causing serious injury or death of workers, port users, or community members.
- Significant destruction or degradation of sensitive habitats, such as coral reefs in the Macalajar Bay.
- Violations of international maritime safety, labor, or human rights standards.

Resolution Approach:

- Immediate notification to Senior Management and relevant regulatory bodies (DENR-EMB, MARINA, LGU, or third-party oversight).
- Formation of an investigation team, including technical specialists, to verify facts and recommend corrective measures.
- Rapid implementation of mitigation measures, emergency response, or suspension of activities if necessary.
- Full documentation and reporting in quarterly and annual GRM reports.
- Engagement with affected parties throughout the process to ensure transparency and trust.

Isolated / One-Off Grievances

A one-off grievance is defined as a complaint arising from a specific incident, typically affecting a single complainant or a very small group, and is localized in nature. Examples include minor inconvenience during a single day of construction or an isolated operational issue affecting one port user.
Note: Even one-off grievances may be escalated to Level 4 if they involve serious legal, environmental, or safety violations, such as breaches of ECC conditions, national environmental laws, or incidents causing potential harm to human life or biodiversity.
Resolution Approach:

- Documented, assessed, and addressed following the same GRM workflow.
- Escalated to Senior Management and/or regulatory authorities if Level 4 criteria are met.

Table 13-3 Summary Table - Grievance Levels

Level	Severity / Impact	Scope	Examples	Respons e Time	Escalation
1	Low / Minor	Single stakeholder	Minor noise, temporary inconvenience	5–10 days	GRM Officer
2	Moderate	Multiple stakeholders	Recurring noise, minor traffic issues, worker complaints	10–20 days	EHS Manager if unresolved
3	Signific a nt	Larger groups / project-wide	Water pollution, unsafe construction, labor rights concerns	15–30 days	Senior Management / LGU / DENR
4	Critical / Severe	Project-wide / regulatory	ECC violations, accidents, serious environmental damage	Immedia t e	Senior Management + Regulators

This categorization ensures that all grievances – whether minor, recurring, or critical – are appropriately assessed, documented, and addressed, and that high-risk issues are escalated without delay, maintaining compliance with regulations and safeguarding stakeholder trust
Type of Grievance:

- Environmental: Water quality concerns, dredging impacts, sedimentation, marine ecology disturbance, waste disposal.

- Social: Livelihood disruptions, fisherfolk navigation interference, land access, community safety, employment practices.
- Construction/Operational: Heavy vehicle movements, temporary road closures, noise/vibration, lighting, worker conduct.
- Health and Safety: Accidents, unsafe work practices, public safety risks.

Urgency

Issues affecting health, safety, or environmental integrity are prioritized for immediate investigation.
The assessment phase includes:

- Review of supporting documents and prior complaints.
- Site inspection and direct observation.
- Consultation with technical specialists (EHS, engineering, biodiversity experts, etc.).
- Verification against monitoring records (e.g., turbidity readings, noise monitoring logs).
- Coordination with barangay officials or community representatives when needed.

This step ensures objectivity in evaluating concerns and determining accountability.

Step 4: Resolution and Response

After assessment, the GRM Officer convenes the necessary technical teams to identify feasible, context-appropriate corrective actions. The resolution process must align with the Environmental Management Plan (EMP), Construction Environmental Management Plan (CEMP), and commitments under the project's ESIA.
Examples of possible corrective measures:

- Adjusting construction schedules to avoid nighttime noise.
- Deploying silt curtains or increasing turbidity monitoring during dredging.
- Improving traffic management plans to better control heavy equipment movement.
- Conducting community consultations to clarify project boundaries or timelines.
- Implementing additional safety barriers or signage near public access areas.
- Providing livelihood support or transitional assistance for affected fisherfolk if impacts are validated.

Timelines:

- Standard grievances: 15–30 working days to resolution.
- Complex grievances requiring third-party validation or regulatory coordination may exceed this timeframe, but the complainant is regularly updated.

A written response is issued to the complainant, outlining:

- Investigation findings
- Actions taken or planned
- Expected timelines for full resolution
- Contact person for follow-up inquiries

This step ensures transparency and demonstrates the project's commitment to responsible and ethical operations.

Step 5: Escalation

If the complainant is not satisfied with the initial resolution or if a grievance involves high-stake issues, it may be escalated.
Escalation pathways include:

- Project Management Team (PMT) for more complex technical or managerial decisions.
- Independent Review Panel, if impartiality is needed or requested by the complainant.
- Regulatory agencies such as DENR-EMB, MARINA, LGU Tagoloan, or the Philippine Ports Authority for grievances involving potential legal violations, environmental threats, or port safety risks.
- Judicial/administrative remedies, should stakeholders wish to pursue formal legal channels (which the project respects and does not impede).

Immediate escalation applies in cases involving:

- Community safety risks
- Environmental hazards near Macalajar Bay
- Pollution incidents with potential off-site impacts
- Accidents or fatalities
- Alleged misconduct by project personnel

Step 6: Closure

The grievance is closed once:

- Corrective actions have been implemented and verified.
- The complainant confirms that the resolution is satisfactory.
- For anonymous complaints, closure is based on the completion of corrective measures.

A closure report is prepared documenting:

- The resolution process
- Technical inputs and assessments
- Verification activities
- Preventive measures to avoid recurrence

Closure records contribute to continuous improvement of project practices and compliance reporting.

Step 7: Monitoring and Reporting

All grievances are recorded in a centralized GRM Database that tracks the life cycle of each case – from submission to final closure.
Routine reporting includes:

- Monthly internal updates to the Project Management Team
- Quarterly summaries shared with key stakeholders, regulatory agencies, or during multi-stakeholder meetings
- Annual consolidated reporting as part of the Environmental Monitoring and Compliance Report

Reports are analyzed using:

- Type of grievance
- Affected sectors/groups (e.g., fisherfolk, residents, transport operators)
- Geographic area
- Recurrence or frequency
- Resolution

timelines These analyses support:

- Adaptation of mitigation measures in the EMP
- Adjustment of construction or operational plans
- Enhanced stakeholder engagement strategies
- Identification of systemic issues requiring long-term corrective action

Ultimately, the monitoring and reporting process reinforces accountability and ensures that grievance trends inform ongoing environmental and social risk management throughout the lifecycle of MICP

12.9 Monitoring, Reporting, and Continuous Improvement

The Grievance Redress Mechanism (GRM) for the MICP

is designed not only as a reactive tool for addressing complaints but also as a proactive instrument for continuous learning and adaptive management. To ensure its long-term effectiveness and relevance, the GRM will be subject to periodic review and evaluation throughout the project lifecycle.

12.9.1 Objectives of Periodic GRM Review

1. **Improve Responsiveness**
   - Review timelines for acknowledgment, investigation, and resolution of grievances to ensure that stakeholders receive timely feedback.
   - Identify bottlenecks in the grievance process and implement procedural or technological enhancements (e.g., faster data entry, digital tracking, hotline efficiency).
   - Assess staff capacity and training needs to ensure that GRM officers and community liaison personnel can manage grievances promptly and professionally.

2. **Integrate Lessons Learned**
   - Analyze trends from grievance data, including the type, frequency, severity, and geographic distribution of complaints.
   - Identify recurring issues that indicate gaps in project planning, construction methodology, operational practices, or stakeholder communication.

- Use insights to update mitigation measures in the Environmental and Social Management Plan (ESMP) and Construction Environmental Management Plan (CEMP).
- Ensure that knowledge gained from previous grievances informs preventive measures to reduce future complaints.

3. **Enhance Communication Pathways**
    - Evaluate the effectiveness and accessibility of all grievance submission channels (hotline, email, in-person, social media, anonymous submissions).
    - Ensure that vulnerable and marginalized groups – including fisherfolk, informal workers, elderly residents, and women – can access the GRM without barriers.
    - Update outreach and awareness campaigns to improve stakeholder understanding of GRM procedures, rights, and reporting options.

4. **Strengthen Environmental and Social Safeguards**
    - Verify that grievance handling is aligned with national regulations (DENR-EMB, PPA, MARINA), international good practice, and ESIA commitments.
    - Assess whether grievances reveal gaps in safeguards such as erosion control, marine biodiversity protection, traffic management, dust suppression, or community safety measures.
    - Introduce corrective actions or additional mitigation measures where patterns of grievances indicate environmental or social risks are not fully controlled.
    -

5. **Address Emerging Risks Associated with Evolving Port Operations**
    - Adapt the GRM to account for new operational or technological changes, such as increased container throughput, changes in vessel schedules, automation of cargo-handling equipment, or modifications to access routes.
    - Anticipate and respond to potential environmental and social risks arising from these operational changes, ensuring the GRM remains relevant and capable of addressing new types of complaints.

12.9.2 Annual Stakeholder Review Meetings

At least once per year, the GRM will be evaluated in consultation with key stakeholders, including representatives from affected communities, barangay officials, fisherfolk associations, port users, and contractor representatives.

- The review meetings will:
    - Present consolidated grievance data, trends, and resolution outcomes.
    - Gather feedback on the effectiveness of grievance handling and stakeholder satisfaction.
    - Identify areas for procedural improvements, resource allocation, and training needs.
    - Facilitate adaptive management, ensuring the GRM evolves in line with stakeholder expectations, regulatory requirements, and project operational realities.

12.9.4 Expected Outcomes of Periodic Review

1. **Enhanced transparency, trust, and confidence among stakeholders**

A well-structured GRM promotes open, accessible, and responsive grievance handling, ensuring stakeholders see that their concerns are heard and addressed objectively. Clear procedures, timely communication, and proper documentation build stakeholder confidence in MICP's commitment to responsible port redevelopment and foster constructive relationships with communities, workers, and port users.

2. **Reduction in recurring complaints through targeted preventive measures**

By systematically analysing grievance trends and root causes, the GRM enables proactive mitigation of recurring issues. For example, repeated complaints about dust or noise can be addressed through engineering controls, scheduling adjustments, or operational improvements. This prevents repeat grievances, improves project efficiency, and reduces potential community tensions.

3. **Improved alignment between grievance management and environmental/social safeguards**

The GRM functions as a feedback loop to verify the effectiveness of mitigation measures in the ESMP and CEMP. Grievances provide real-time insight into environmental and social performance, allowing MICP to adjust safeguards, optimize monitoring, and ensure impacts on marine ecosystems, local communities, and port operations are minimized.

4. **Strengthened institutional capacity for adaptive management of project impacts**

Regular GRM reviews, trend analyses, and lessons learned contribute to adaptive management, enabling MICP to respond dynamically to emerging risks. This strengthens institutional capacity, supports decision-making, and ensures that project teams are prepared to address unexpected environmental or social challenges efficiently and effectively.

5. **Demonstrated compliance with national regulations, ECC conditions, and international best practice**

A robust GRM provides documented evidence that grievances are systematically tracked, investigated, and resolved in line with national laws, ECC requirements, and internationally recognized standards. This demonstrates regulatory compliance, corporate responsibility, and adherence to best practice, reducing legal risk and reinforcing the project's credibility with stakeholders and regulators.
Note: Detailed GRM operational tools and templates are included in the Appendices as implementation-ready forms to be used by the GRM team, contractors, and community liaison personnel.

13. Gender Analysis

13.1. Introduction and Objectives

This chapter presents the Gender Analysis for the Mindanao International Container Port (MICP) Project, an expansion of an existing container terminal within the PHIVIDEC Industrial Estate in Tagoloan, Misamis Oriental. The analysis is undertaken as an integral component of the Environmental and Social Impact Assessment (ESIA) and aims to identify gender-differentiated roles, risks, impacts, and opportunities associated with the Project's construction and operational phases. The objectives of the Gender Analysis are to:

- Assess baseline gender conditions within the Project's Area of Influence (AoI);
- Identify potential gender-differentiated risks and benefits arising from Project activities;
- Ensure compliance with applicable Philippine laws and international safeguard frameworks, including the Magna Carta of Women (RA 9710) and the Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework (ESF); and
- Recommend gender-responsive mitigation, enhancement, and monitoring measures that are integrated into the Environmental and Social Management Plan (ESMP).
  This analysis adopts a proportional, risk-based approach consistent with the Project's nature as an enhancement of an existing port facility, with no land acquisition, physical displacement, or introduction of new industrial processes beyond those already approved under the existing Environmental Compliance Certificate (ECC).

13.2. Policy, Legal, and Institutional Framework

The Gender Analysis is guided by the following key policy and legal instruments:

- Republic Act No. 9710 (Magna Carta of Women), which mandates the promotion of gender equality, non-discrimination, and women's participation in development processes;
- Labor Code of the Philippines and related Department of Labor and Employment (DOLE) issuances, which provide protections against workplace discrimination and ensure safe and fair working conditions for women and men;
- AIIB Environmental and Social Framework, particularly ESS1 (Environmental and Social Assessment and Management), which requires the identification and management of gender-differentiated risks and opportunities;
- IFC Performance Standards (PS1, PS2, and PS4), which emphasize inclusive stakeholder engagement, equitable labor practices, and community health and safety.

These frameworks collectively require that gender considerations be integrated across project planning, construction, and operation, with particular attention to vulnerable and disadvantaged groups.

13.3. Methodology

The Gender Analysis is based on:

- Review of ESIA baseline socioeconomic data;
- Review of the Project Description Report (PDR) to confirm scope, phasing, workforce requirements, and operational characteristics;
- Review of the Ecological Report to understand coastal and marine resource use relevant to gender-differentiated livelihoods;
- Stakeholder consultation records undertaken as part of the ESIA process; and
- Desktop review of national and local gender and labor statistics, applied selectively and proportionately to the Project AoI.

The analysis focuses on identifying practical, Project-relevant gender considerations rather than applying generalized national trends that are not supported by site-specific conditions.

13.4. Gender Baseline Conditions

- **Demographic Context**

The Project AoI includes communities within and adjacent to the PHIVIDEC Industrial Estate and the municipality of Tagoloan, Misamis Oriental. The area exhibits a mixed industrial–coastal socio-economic profile, with employment generated primarily through manufacturing, logistics, port operations, and supporting service sectors.

Women and men participate in both formal and informal economic activities. Formal employment within the industrial estate, including port-related work, is traditionally male-dominated, particularly in technical, operational, and heavy-equipment roles. Women are more commonly represented in administrative, clerical, service, and support functions.

- **Gender Roles in Livelihoods**

Within the coastal and nearshore context of Macajalar Bay, livelihoods associated with small-scale fisheries and coastal resource use persist at the municipal level. Consistent with the Ecological Report, no critical habitats, mangrove stands, or coral reefs are present within or immediately adjacent to the Project footprint.

Gender roles in fisheries-related livelihoods generally reflect a division of labor where men are more directly involved in fishing activities, while women are engaged in post-harvest handling, processing, vending, household-based enterprises, and supplementary income-generating activities. These activities occur outside the Project footprint and are not directly displaced by Project activities.

- **Access to Services and Decision-Making**

Women and men in the AoI have access to basic services, including education, health, and local governance mechanisms. Women's participation in formal decision-making structures varies but is supported by national and local gender and development (GAD) policies implemented by local government units (LGUs).

13.5. Gender-Differentiated Project Impacts

- **Construction Phase**

Employment and Economic Opportunities

The construction phase is expected to generate temporary employment opportunities, primarily in skilled and semi-skilled construction, engineering, and support roles. These roles are likely to be male-dominated due to the technical and physical nature of port construction works. However, opportunities for women may arise in administrative support, logistics, documentation, catering, and ancillary services.

Occupational Health and Safety (OHS)

Both women and men may be exposed to occupational risks during construction. While women are expected to comprise a smaller proportion of the construction workforce, gender-sensitive OHS measures are required to ensure appropriate facilities, personal protective equipment (PPE), and health provisions for all workers.

Community Health and Safety

Construction-related traffic, noise, and activity may affect nearby communities. Women, particularly those responsible for household management and caregiving, may experience differentiated perceptions of safety and nuisance. These impacts are expected to be temporary and manageable through standard ESMP measures.

Gender-Based Violence (GBV) Risk Screening

Given that the Project is located within an established industrial estate, relies largely on local labor, and does not involve large worker camps or in-migration, the risk of Project-induced GBV is assessed as low. Nevertheless, preventative measures and codes of conduct are required as part of good international practice.

- **Operational Phase**

Long-Term Employment

During operations, the expanded port is expected to sustain and potentially increase employment opportunities. While operational roles remain predominantly male in technical functions, there is potential to enhance women's participation in administrative, supervisory, ICT-related, and support roles.

Traffic and Safety

Increased operational throughput may contribute to higher internal traffic volumes. Gender-differentiated safety considerations, including pedestrian movement and access within the industrial estate, are addressed through existing port traffic management systems.

Livelihoods and Coastal Resource Use

No direct adverse impacts on fisheries or coastal resource-based livelihoods are anticipated, consistent with the Ecological Report and the Project's location within a heavily modified industrial shoreline.

13.6. Stakeholder Engagement and Gender Inclusion

Stakeholder engagement activities conducted as part of the ESIA included participation from local government representatives, community members, and other stakeholders. Efforts were made to ensure inclusive participation, including women's representation, consistent with national consultation requirements.

The Project's Grievance Redress Mechanism (GRM) is designed to be accessible to both women and men, with multiple entry points and clear procedures for lodging and resolving grievances related to labor, community impacts, or Project operations.

13.7. Mitigation and Enhancement Measures

Gender-responsive measures for the Project include:

- Equal Employment Opportunity: Commitment to non-discriminatory hiring and employment practices in accordance with Philippine labor laws.
- Gender-Sensitive OHS: Provision of appropriate PPE, sanitation facilities, and health services for women and men.
- Worker Code of Conduct: Implementation of codes addressing respectful behavior, anti-harassment, and GBV prevention.
- Capacity Building: Encouragement of skills development and training opportunities accessible to women, particularly in administrative and technical support roles.
- Accessible GRM: Maintenance of a grievance mechanism that is gender-sensitive and confidential.

These measures are integrated into the ESMP and contractor management plans.

13.8. Monitoring and Indicators

Gender-related monitoring indicators include:

- Proportion of women and men employed during construction and operation;
- Participation of women in training and capacity-building activities;
- Number and nature of gender-related grievances received and resolved;
- Compliance with gender-sensitive OHS requirements.

- Monitoring results will be reported as part of regular ESMP reporting.

13.9. Conclusion

The Gender Analysis concludes that the MICP Project presents manageable and generally low gender-related risks, given its location within an existing industrial port, absence of land acquisition or resettlement, and limited interaction with sensitive livelihoods. With the implementation of gender-responsive mitigation and enhancement measures, the Project is expected to support inclusive employment practices and avoid adverse gender-differentiated impacts, consistent with Philippine regulations and AIIB requirements.