



# **Environmental Impact Assessment (EIA) Report**

**for**

**Myint & Associates Offshore Supply Base Ltd.**



**1 February 2019**




# Provision of Environmental Impact Assessment (EIA), Social Impact Assessment (SIA) & Environmental Management Plan (EMP) and Social Management Plan (SMP) for Offshore Supply Base Nga Yoke Kaung

## EIA Report

### Environmental Resources Management

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## Acronyms and Abbreviations

Acronym	Definition
ASEAN	Association of South-East Asia Nations
BANCA	Biodiversity and Nature Conservation Association
BWM	Ballast Water Management
BOD	Biochemical oxygen demand
BS – EN	British Standard European Norm
CCTV	Closed-circuit television
CIA	Cumulative Impact Assessment
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
dB	Decibels
DoF	Department of Fisheries
ECC	Environmental Compliance Certificate
ECD	Environmental Conservation Department
EDC	Environmental Device Cooperation
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
ERM	Environmental Resources Management
EMP	Environmental Management Plan
FDG	Focus Group Discussion
FEED	Front-End Engineering Design
ft.	Feet
GAD	General Administrative Department
ha	Hectares
HSE	Health, Safety and Environment
Hz	Hertz
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ISGOTT	International Safety Guide for Oil Tankers and Terminals
ISGINTT	International Safety Guide for Inland Navigation Tank-barges and Terminals
ITCZ	Inter-Tropical Convergence Zone
IUCN	International Union for the Conservation of Nature
km	Kilometres
km <sup>2</sup>	Square kilometres
KBA	Key Biodiversity Area

Acronym	Definition
LMP	Liquid Mud Plant
m	Metres
m <sup>3</sup>	Cubic metres
mg/l	Milligrams per litre
ml	Millilitres
ms <sup>-1</sup>	Metres per second
M&AOSB	Myint & Associates Offshore Supply Base Ltd.
MARPOL	International Convention for the Prevention of Pollution from Ships
MIC	Myanmar Investment Commission
MODIS	Moderate Resolution Imaging Spectrometer
MOEE	Ministry of Electricity and Energy
MOGE	Myanma Oil and Gas Enterprise
MONREC	Ministry of Natural Resources and Environmental Conservation
MPA	Myanmar Port Authority
mPD	Metres Above Principle Datum
NEQEG	National Environmental Quality (Emissions) Guidelines
NFPA	National Fire Protection Association
NGO	Non-governmental Organisations
OCDI	Overseas Costal Area Development of Japan
OCIMF	Oil Companies International Marine Forum
OPEP	Oil Pollution Emergency Plan
OSB	Offshore Supply Base
OSV	Offshore Supply Vessel
O&G	Oil and Gas
Pa	Pascal
PAP	Project Affected People
PIANC WGs	Permanent International Association of Navigation Congresses Working Groups
Pre-FEED	Pre Front-End Engineering Design
REA	Rapid Environmental Assessment
SEP	Stakeholder Engagement Plan
SKC	SKC Ltd.
SOPEP	Shipboard Oil Pollution Emergency Plan
UNEP	United Nations Environment Programme
USEPA	United States Environmental Protection Agency
WCS	Wildlife Conservation Society

Acronym	Definition
WMP	Waste Management Plan
$\mu\text{g}/\text{m}^3$	Micrograms per cubic metre



## 1.1

## INTRODUCTION

**Myint & Associates Offshore Supply Base Ltd (M&AOSB)** is proposing to construct an Offshore Supply Base (OSB) near Nga Yoke Kaung Bay in Ayeyarwady Region, which is located approximately 40 km south of the town of Ngwe Saung. The facilities will initially include an access bridge and jetty of about 1.2 ha and a main onshore base of about 12.12 ha (29.955 acres). The nearest road lies ~ 25 km to the east. Details of the Project are shown in *Table 1.1* and the location is shown in *Figure 1.1*.

**Table 1.1**      **Project Details**

Component	Details
Name of the Project	Myint & Associates Offshore Supply Base.
Project Owner	Myint & Associates Offshore Supply Base Ltd. (M&AOSB).
Area of the Project	The Area of Phase 1 of the Project is 12.1 ha (onshore) and 1.2 ha (offshore). The Jetty length will be changed to 300m (60m more). This area includes all facilities mentioned in this EIA Report; including the access road. Overall this area could be expanded to up to 50 ha onshore in Phase 2. This EIA covers impacts from both Phase 1 and 2 (i.e., the extension).
Type of infrastructure	Jetty with a platform and a main onshore base.
Plans after commencement of the Project operation	To be used as an offshore supply base for current / future offshore operations.

As per the Myanmar Environmental Impact Assessment (EIA) Procedure, this Project requires an EIA to be conducted and submitted to the Environmental Conservation Department (ECD) of the Ministry of Natural Resources and Environmental Conservation (MONREC). An Environmental Management Plan (EMP) will also be submitted as part of the EIA.

This EIA Report has been prepared for the proposed Project activities related to the OSB (the “Project”) and has been prepared in accordance with the Myanmar EIA Procedure and other relevant legislation.

Figure 1.1 Location of Project



## 1.2 *POLICY AND REGULATORY FRAMEWORK*

The Project will be undertaken in line with a number of national and local standards and laws. Local laws relating to EIA include:

- Environmental Conservation Law (2012);
- Environmental Conservation Rules (2014);
- National Environmental Quality (Emission) Guidelines (2015); and
- Environmental Impact Assessment Procedure (2015).

## 1.3 *PROJECT DESCRIPTION AND ALTERNATIVES*

### 1.3.1 *Alternatives*

Consideration of options and alternatives is a fundamental requirement in the planning of any project as a means of avoiding or reducing adverse environmental and social impacts and maximising or enhancing project benefits. Alternatives that have been considered for the Project include:

- Location of the Project: The Project Area is Nga Yoke Kaung in Ayeyarwady Region. There were 8 locations identified as potential sites for the OSB. The selected location is in Palin Gyaing beach on Goyangyi Island.
- Access Bridge Design: An access bridge/trestle will connect the coast to the main jetty structure offshore. This could be a causeway or piled trestle structure. No piling will take place for the access bridge.
- Jetty Design: The jetty could either be a closed or open structure. A 'closed' reclaimed structure has been selected which is built of a sand core and rock layers on the outside to protect against erosion by waves and currents. Additional soil investigation will, however, be conducted which may lead to some changes in the design. The EIA is assessed based on the most conservative method being used (i.e., closed causeway).

### 1.3.2 *Proposed Project*

This EIA Report is based on a PRE-FEED report made available in December 2017. Where applicable, this EIA Report has been based on conservative information to ensure impacts are adequately assessed.

#### *Offshore Construction Activities*

The offshore activities include construction of a jetty and the dredging of an access channel and turning circle using a trailer suction hopper dredger or cutter suction dredger. The total area of the jetty will be 1.2 ha (0.012 km<sup>2</sup>). It is expected that during dredging of the navigation channel and turning

basin, most of the dredged / excavated materials will be used for land reclamation and fill material for the jetty construction. Only a small portion of non-suitable materials (silts) will be taken away by a ship to an authority approved Myanmar Port Authority (MPA) disposal area. A total volume of 410,000 m<sup>3</sup> of dredged materials is estimated. The dredging operation is expected to take between 1 and 3 months to complete, depending on the type of dredger used. Total offshore construction of the jetty will take 12 to 18 months.

The equipment used during the offshore construction activities includes piling barges, construction barges with small tugboats and landing craft.

#### *Onshore Construction Activities*

The onshore construction will include site preparations (such as site clearing, soil improvement and other earthworks), construction of temporary labour shelters, temporary fencing as well as temporary water supply and lighting. Open concrete yards for warehouse and container storage will be constructed. The equipment used during the construction includes rollers, dump trucks, bulldozers, mobile cranes, and batching plants.

During construction, there will be on-site power generation by a small diesel-powered generator located on the eastern side of the base, away from the village.

Given the topography of the OSB, levelling of rocky hills will be conducted and the fill material will be used for jetty/causeway construction.

There will be around 400 to 700 workers at its busiest period during construction, with around 70% of total workforce from local communities and the rest made up of migrant workers.

Waste types generated during construction include site clearance waste, excavated materials, waste concrete, wooden material, chemical waste, sewage and domestic waste. Waste management will be carried out by local authorised waste handling facilities.

The construction phase is scheduled for 1.5 to 2 years; estimated to be sometime between 2018 and 2023.

#### *Operational Activities*

The Project objective is to provide logistics services to the offshore O&G industry in Myanmar. During the first years of operation all goods will arrive by cargo ship, and will be stored at the base, loaded on an offshore supply vessel (OSV) to the rig/platform. Return cargoes will be shipped on an OSV back to the base and then taken by a cargo ship back to facility for repairs or treatment.

There will be around 100 staff in the 1st phase and an additional 100 staff in the 2nd phase during operation, with around 70% of total workforce from local communities and the rest made up of migrant workers.

Maintenance dredging of the navigation channel will occur around once every year during operation. The volumes of dredged materials generated will be around 20 to 30% of those generated during construction. Dredged materials will be taken away by a ship to an authority approved (MPA) disposal area.

The OSB will include firefighting facilities and oil spill response facilities. Domestic wastes will be treated on site and discharged. Hazardous waste will be sent to a licensed waste handling facility in Thilawa. Types of hazardous wastes include; oil, industrial chemicals, and chemical using for O&G industry (such as bentonite).

## **1.4 BASELINE CONDITIONS**

The Project's Area of Influence covers the Project Area, as well as its immediate surroundings. ERM has conservatively assumed that the potential impacts from air and noise emissions, waste discharges, and sedimentation will be felt up to 5 km from the Project Area.

### **1.4.1 Onshore Environment**

The onshore Project Area is located in cultivated land which is currently being used for agriculture and grazing by cattle. Photos of the land and flora are provided in *Figure 1.2*. Given the modified nature of this habitat, the presence of species or habitats of conservation concern is unlikely. As the Project contains an offshore aspect, there is an area of beach and coconut grove that is inside the footprint of the Project. This is shown in *Figure 1.3*.

**Figure 1.2 Terrestrial Modified Habitat in the Project Area**



**Figure 1.3**      ***Beach Front inside the Project Area***



#### **1.4.2**      ***Offshore Environment Baseline Conditions***

United Nations Environment Programme (UNEP) satellite analyses indicate the potential presence of coral communities (typically fringing or patch reefs) along the coast of the Ayeyarwady Region, including within the shallower waters near the Project Area. The prevalence of rocky substrate in shallow waters indicates possibly favourable conditions for the growth of corals and coral communities. During consultation in January 2017, locals mentioned that there could be potential coral reefs in the Project footprint. The presence of coral reefs was confirmed during environmental baseline surveys as part of the EIA Study. However, no corals were recorded in the Project Area.

Along the coastline of the Ayeyarwady Region, there are mangrove habitat areas occurring along the shoreline margins of river mouths and extending inland, fringing tidal creeks. In the Area of Influence, there are mangroves in the Nga Yoke Kaung River / estuary to the south-east of the Project Area.

Seagrass beds occur along the nearshore habitats of the Ayeyarwady Region and typically occur in less than 65 ft. (20 m) water depth in sheltered intertidal or subtidal areas (Short, *et al*, 2001). Seagrass habitat is confined to shallow waters with good light penetration a.

Recent fish trawl surveys to look at fisheries composition were conducted by the R.V. Dr. Fridtjof Nansen in 2013 and covered a number of stations in Ayeyarwady Region, as well as other parts of Myanmar waters. The findings showed that pelagic marine fishery resources had significantly decreased, by up to tenfold, between 1980 and 2013, which was attributed to exploitation by fisheries. The results of the analysis by region showed that the most common species (groups) in the Rakhine Coastal Zone (Project Area) were hairtails (*Trichiurus lepturus*), bigeye (*Priacanthus hamrur*), jellyfish, lizard fish (*Saurida tumbil*), toothpony fish (*Gazza minuta*), Japanese threadfin bream (*Nemipterus japonicas*), spinycheek lanternfish (*Benthosema fibulatum*), *Decapterus sp.*, and Indian anchovy (*Stolephorus indicus*).



A total of 21 cetaceans (whale and dolphin) and one sirenian (dugong) species have been reported in Myanmar waters (International Union for the Conservation of Nature (IUCN) Red List Website). Two species, the Irrawaddy dolphin (*Orcaella brevirostris*) and dugong (*Dugong dugon*), have been protected under the Myanmar Protection of Wildlife and Conservation of Natural Areas Law since 1994 under the category “completely protected”.

Five species of marine turtles, all of which are IUCN-listed threatened species are reported for Myanmar waters. These are the olive ridley turtle (*Lepidochely olivacea*) (Vulnerable), loggerhead turtle (*Caretta caretta*) (NE Indian Ocean subpopulation - Critically Endangered), green turtle (*Chelonia mydas*) (Endangered), hawksbill turtle (*Eretmochelys imbricata*) (Critically Endangered), and the leatherback turtle (*Dermochelys coriacea*) (Endangered).

#### *Environmental Baseline Survey Results*

In order to better understand the potential sensitivity of the baseline conditions of the marine environment around the project area, primary baseline surveys were conducted by ERM. These surveys were undertaken following standard international practice and provide an indication of the existing conditions as well as providing data for any future monitoring programmes.

An overview of the survey schedule is presented in *Table 1.2*. The survey was successfully concluded within the scheduled three day period from 16<sup>th</sup> September to 18<sup>th</sup> September 2017.

**Table 1.2** *Survey Schedule for Seawater Physio-chemical Sampling, Marine Sediment Sampling, Marcobenthos Survey and Subtidal Habitat Verification and Assessment Survey, September 2017)*

Date	Activity
16 to 18 September 2017	Seawater Sampling and Marine Sediment Sampling
	Drop Camera Survey and Marcrobenthos Survey
	Scientific Snorkel Survey
14 to 16 September 2017	Air Survey
14 to 16 September 2017	Noise Survey
14 to 16 September 2017	Soil and groundwater Survey
16 to 19 September 2017	Terrestrial Flora and Fauna Survey

For the marine environment, metal concentrations in sediment were considered to be indicative of naturally occurring background conditions with no metal at concentrations of environmental concern. The sediments were not contaminated. The sediment type was composed of sandy silt and clay fractions. The marine water quality parameters were compared against

ASEAN marine water quality guidelines and all results for pH fell within the permissible limits of 6 to 9. Dissolved Oxygen (DO) concentrations in seawater samples were found to be similar across the Survey Area and complied with the ASEAN water quality guidelines. Low Total Suspended Solid (TSS) concentrations and turbidity were recorded which complied with the ASEAN water quality guidelines and the results revealed high water clarity indicative of oceanic conditions.

The air quality of the Survey Area was considered to be generally un-degraded except for elevated levels of SO<sub>2</sub> which did not meet the WHO / NEQ Guidelines. High levels of SO<sub>2</sub> are usually from fuels burning SO<sub>2</sub> such as diesel and petrol. The source of this emission in the Project Area is not known. Noise at the sampling locations was within the NEQ guidelines during the day but slightly exceeded at night. This was due to vehicle (motorbike) noise and wave action. Soil samples showed no evidence of contamination and ground water tested from wells observed that all parameters were within the acceptable standards of the WHO Drinking Water standards and NEQ. In the Zin Yaw Chaung well, a slightly higher BOD was recorded that indicated potentially polluted water. This would occur from large amounts of organic matter from sewage or other discharges present in the water.

The terrestrial survey recorded two habitat types "Terrestrial" (wild and cultivated land) and Mangroves and Marine Vegetation in the Survey Area. Only a few degraded mangrove species were recorded in the southwest of the Project Site. These habitat types are common to the area and no species of conservation concern were encountered. No species recorded were listed as "completely protected" under Myanmar Law. The faunal survey recorded birds, amphibian and reptiles, aquatic fauna, and odonates. Of the species recorded, some of the amphibians (frogs), snakes, and fish were considered to be species of conservation concern (IUCN). The habitat in the Project Area was not considered to be unique for the Survey Area and likely to be more important than the surrounding environment for supporting these species.

#### **1.4.3 Social Baseline Conditions**

During the January and February, 2017 consultations a number of "wards" within Nan Thar Pu Village Tract were consulted and 50 household surveys were conducted. A summary of the demographics of the Village Tract is presented in *Table 1.3*.



**Table 1.3**      *Population of Villages Consulted in Project Area*

No	Sub-village (ward)	Numbers of Houses	Household	Total							
				Under 18 year		Above 18 year		Total		Total	
				M	F	M	F	M	F		
1	Seik Kann	131	137	245	241	215	227	460	468	928	
2	Zin Chaung										Yaw
3	Kyauk Phyar										
4	Ale Gone	87	93	129	132	135	120	264	252	516	
5	Nant Thar Pu	141	146	228	222	225	242	453	464	917	
6	Gyaing Galay										
Total		359	376	602	595	575	567	1177	1184	2361	

Source: Data by Village Tract Leader, GAD

The population data of Nan Thar Pu Village Tract for Seik Kann, Zin Yaw Chaung and Gyaing Galay villages are not yet officially recorded by the GAD. Therefore only combined data are available from some sub-wards as shown in *Table 1.3*.

Drinking water is provided from wells in the village. These are deep to ensure that the freshwater is not effected by the proximity to the coastline.

Within the Area of Influence, the main infrastructure and facilities are found in Nga Yoke Kaung town which is an hour drive from Nan Thar Pu. The nearest main hospital and secondary school are found here.

During the consultations; fishing focus group discussions (FGDs) were held with the Department of Fisheries (DoF) in Nga Yoke Kaung and Nan Thar Pu. Boats in the Nga Yoke Kaung area range from 12 ft. to 36 ft. in length but all operate within 10 miles from the coastline. Most of the voyages are day trips. In Nan Thar Pu, the boats in the “ward” are between 25 ft. and 50 ft. in length. There are 15 small and 15 large boats. These boats fish in the coastal waters (inshore fishing area) out to around 10 miles from the coast. Four different types of nets were mentioned as being used; gill netting, beach seine, trawling and purse seine. Some boats observed in the Study Area during the site visit in January, 2017 are shown in *Figure 1.4*.

**Figure 1.4**      *Fishing Boats in Study Area*



There is a guesthouse on the beach adjacent to the Project Area as well as another guesthouse on the north facing side of the peninsula (*Figure 5.15*).

## **1.5**      *KEY POTENTIAL IMPACTS AND PROPOSED MITIGATION*

### **1.5.1**      *Area of Influence*

The Project's Area of Influence covers the Project Area, as well as its immediate surroundings. Potential impacts from air and noise emissions, waste discharges, and sedimentation are conservatively assumed in this report to be felt up to 5 km from the Project Area.

### **1.5.2**      *Impact Assessment*

The summary of the Impact Assessment is provided in *Table 1.4*.

**Table 1.4**      *Summary of Impacts and Mitigation*

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
Dust and emissions and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>Site hoarding along the Project Area boundary.</li> <li>Control the height of unloading of fill materials.</li> <li>Regularly maintain all diesel-powered equipment to reduce emissions of NOx and SO<sub>2</sub>.</li> <li>Apply dust suppression methods.</li> <li>Use alternative fuels and fuel mixes where possible.</li> </ul>	Minor	Minor	Minor	Minor
Increase in ambient noise levels and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>Only well-maintained equipment should be operated on-site.</li> <li>Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components should be conducted.</li> </ul>	Minor	Minor	Minor	Minor
Visual impacts for local communities	<ul style="list-style-type: none"> <li>Erect fencing between Zin Yaw Chaung and the OSB to reduce visual impacts. The hoarding shall be of sufficient height to ensure that there is no direct line of sight between the OSB and Zin Yaw Chaung.</li> <li>A Traffic Management Plan will be developed.</li> </ul>	Moderate	Minor to Moderate	Moderate	Minor to Moderate
Physical presence of jetty altering coastal processes	<ul style="list-style-type: none"> <li>A coastal erosion study has been conducted separately to this EIA by Royal Haskoning. The findings of this study are that erosion would be expected to be minor.</li> </ul>	Not significant	Not Significant	Minor	Minor
Impact to water quality and resources	<ul style="list-style-type: none"> <li>Appropriate surface drainage will be designed and provided where necessary.</li> <li>Surface runoff from potential sources of contamination will be prevented.</li> <li>M&amp;AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimize impact to communities</li> <li>Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds).</li> </ul>	Minor	Minor	Minor	Minor

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
Smothering and marine habitat loss and reduction in water quality from dredging	<ul style="list-style-type: none"> <li>Minimise size of footprint on seabed.</li> <li>Avoid construction in sensitive habitats (e.g. coral reefs).</li> <li>Silt curtains and alternative methods will be deployed during dredging of the navigation channel during construction and operation to reduce the levels of suspended solids that could reach to nearby sensitive receivers.</li> </ul>	Minor (habitats)	Minor (habitats)	Minor (habitats)	Minor (habitats)
		Moderate (corals)	Moderate (corals)	Moderate (corals)	Moderate (corals)
		Minor (water quality)	Minor (water quality)	Minor (water quality)	Minor (water quality)
Entrainment / impingement from reverse osmosis system on marine organisms	<ul style="list-style-type: none"> <li>Use of modern surface water intake system / sub-surface intake system; and</li> <li>Locating the discharge in an area away from productive coastal habitats (such as coral, seagrass or mangrove habitat).</li> </ul>	N/A	N/A	Minor	Minor
Loss of beach habitat and disturbance to nesting behaviour	<ul style="list-style-type: none"> <li>The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.</li> <li>Minimising lighting to that which is absolutely necessary for the construction / operation area.</li> <li>No illegal gathering of eggs by contractors.</li> </ul>	Moderate	Minor	Moderate	Minor
Disturbance to marine fauna	<ul style="list-style-type: none"> <li>Pilling and associated machinery will be properly maintained for well-functioning and operating that will not severely impact;</li> <li>An exclusion zone of 500 m radius will be established around the construction site for marine mammals and turtles during piling.</li> </ul>	Minor (fish)	Minor (fish)	Not significant	Not Significant
		Moderate (sea turtles and marine mammals)	Moderate (sea turtles and marine mammals)		
Terrestrial habitat loss	<ul style="list-style-type: none"> <li>Footprint of the proposed OSB is minimised during the design stage and existing vegetation shall be retained as far as practicable.</li> <li>Landscape planting will be implemented by planting native tree species which are fast growing in nature.</li> <li>Construction activities will be restricted to works areas that will be clearly</li> </ul>	Minor	Minor	Minor	Minor

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
	demarcated.				
Community health and safety. Increased risk of accidents, security issues for	<ul style="list-style-type: none"> <li>There will be a perimeter wall around the premises to stop anyone trespassing onto the site.</li> <li>M&amp;AOSB will also provide navigation guidance to all vessels in line with Myanmar national requirements.</li> <li>As discussed in other sections on vessel movements, M&amp;AOSB will provide regular communications to fishermen on vessel movements as required.</li> <li>The Project will employ 70% Myanmar nationals to work on the construction phase.</li> <li>As part of the stakeholder engagement activities, communities in the vicinity of the OSB should be informed about the risks and consequences of trespassing. Such engagement should start prior to the start of construction activities.</li> <li>Once traffic routes to the site are known, a Traffic Management Plan should be developed by M&amp;AOSB. The Traffic Management Plan should be developed to indicate the traffic routes to be followed and speed limit to be complied with in order to reduce risk to the local communities.</li> <li>There should also be an enforcement of a speed limit for vehicles related to construction activities of the Project. During the construction phase, a speed limit of 40km/h shall be enforced.</li> </ul>	Moderate	Minor	Moderate	Minor
Livelihoods and economy. Job creation, fishing impacts	<ul style="list-style-type: none"> <li>Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk or marine accidents.</li> <li>Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area.</li> <li>At least four weeks prior to construction activities, relevant authorities and stakeholders (i.e. local fishing and tourism operators, fishery/tourism associations, and local villagers) will be alerted to the final works area design as well as the construction programme and any specific restrictions.</li> </ul>	Positive (job creation)	Positive (job creation)	Positive (job creation)	Positive (job creation)
		Moderate (fishing)	Moderate (fishing)	Moderate (fishing)	Moderate (fishing)
		Minor (livelihoods)	Minor (livelihoods)	Minor (livelihoods)	Minor (livelihoods)

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
Occupational health and safety. Risk of fatality or injury to workers	<ul style="list-style-type: none"> <li>The Project will design an occupational health and safety management plan which will be a subset of the overall EMP system, tailored to the needs of the project.</li> <li>The Project will create and implement a health and safety management system for the project.</li> </ul>	Minor	Minor	Minor	Minor
Impacts to tourism from air and noise nuisance and restriction of access to beach	<ul style="list-style-type: none"> <li>Mitigation measures provided in above sections.</li> </ul>	Moderate	Moderate	Moderate	Moderate
Impact to people and environment from waste discharge and disposal	<ul style="list-style-type: none"> <li>Impacts regarding wastes can be managed by good housekeeping practices for waste storage and handling supported by a comprehensive waste management plan (WMP) which will be prepared by M&amp;AOSB.</li> <li>Construction materials will be managed in a way to avoid over-ordering, poor storage and maintenance, mishandling as well as improper operation procedures.</li> <li>Segregated wastes will be temporarily stored at designated areas for reuse on site.</li> <li>Waste will be collected regularly.</li> </ul>	Minor	Minor	Minor	Minor
Impact from spill and leaks	<ul style="list-style-type: none"> <li>Standard Operating Procedures for handling / storage / transfer of hazardous materials;</li> <li>Bunding of fuel storage area;</li> <li>Shipboard Oil Spill Emergency Plans (MARPOL requirement) for larger vessels;</li> <li>M&amp;AOSB Supply Base Oil Spill Response Plan and associated response procedures / protection measures for oils spills.</li> <li>The Emergency Response Plan will be provided to ECD prior to construction.</li> <li>Secondary containment, constructed of impervious and chemically resistant material, shall be provided that is capable of containing the larger 110% of the largest tank or 25% of the combined tank volumes;</li> <li>Fuel shall not be stored in underground tanks; and</li> <li>Fuel shall be transferred between vehicles and storage tanks on an</li> </ul>	Minor	Minor	Minor	Minor

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
	impervious surface sloped to a collection structure.				



During the EIA, one meeting was undertaken at the General Administrative Department (GAD) office in Nga Pu Daw and one in Nan Thar Pu Village Tract. The Nga Pu Daw meeting was attended by over 200 government employees. In Nan Thar Pu, around 60 people from the six wards attended the meetings. Civil Society Organisations (CSOs) were also present at the meeting. The date, time, location, stakeholder and purpose of each meeting is provided in *Table 1.5*.

**Table 1.5** *Consultation Activities Undertaken*

Date, time, location	Stakeholder	Purpose of Engagement
28 February, 2017, Nga Pu Daw	Nga Pu Daw Township GAD	<ul style="list-style-type: none"> <li>Present information on Project impacts and EIA findings.</li> <li>Seek permissions and approvals required to conduct engagement in Ayeyarwady Region (Nga Yoke Kaung).</li> </ul>
3 March, 2017, Nan Thar Pu Village Tract	Nan Thar Pu villagers	<ul style="list-style-type: none"> <li>Undertake 50 household surveys.</li> </ul>
2 March, 2017, Nga Yoke Kaung and Gyangyi Island	Site visit to Project Area, Gyangyi Island and Nga Yoke Kaung bay	<ul style="list-style-type: none"> <li>Gather information from tourism operators.</li> <li>Gather information on terrestrial and marine environment.</li> </ul>
3 March, 2017, Nan Thar Pu Village Tract	Villagers and CSO in Nan Thar Pu	<ul style="list-style-type: none"> <li>Present information on Project impacts and EIA findings.</li> <li>Gather information on Potential Affected Communities and Peoples.</li> </ul>

Key questions during EIA public consultation included the impacts to fishing and the grievance procedure, job opportunities and discharges from the project impacting the local communities. These issues were considered and assessed where applicable in the EIA Report.

An EMP has been prepared for the proposed Project that aims to provide an environmental and social management framework by outlining the compliance requirements, mitigation measures, and monitoring programmes to be implemented throughout the Project activities.

The EMP is the means by which the findings of the environmental and social assessment are implemented during the execution of the offshore drilling activities. The scope of the EMP covers all of the activities as described in the EIA Report (summarised in *Section 1.3*), with the objective of demonstrating compliance with the relevant national and international legislation. The EMP lists the obligations and responsibilities of each party involved in the Project, stipulates methods and procedures that will be followed, and outlines the environmental and social management actions that will be implemented.



The EMP lists all Project commitments and describes the plans to be produced for the Project. M&AOSB will submit an Environmental Monitoring Report to the Ministry of Natural Resources and Environmental Conservation (MONREC) every **six months** as per the EIA Procedure requirements.

A summary of the environmental monitoring is provided in *Table 1.6*.

**Table 1.6** *Summary of the Reporting and Monitoring Requirements*

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Construction Phase			
Air	Air emissions will be measured at Zin Yaw Chaung. Measurements will be for SO <sub>x</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> and PM <sub>10</sub> (closest sensitive receptor).	Monthly during construction, during site clearance. If the levels are within the NEG Guidelines, no further monitoring is required.	M&AOSB / Third Party
Noise	Noise levels (dB) will be measured one daytime and one nighttime at Zin Yaw Chaung (closest sensitive receptor).	Monthly during construction, during day and nighttime and during noisy activities. If the levels are within the NEG Guidelines, no further monitoring is required.	M&AOSB / Third Party
Marine Sediment	Sediment monitoring will be conducted to confirm no pollutants from construction dredging. The following parameters will be measured in line with World Bank Group (WBG) Guidelines.	Monitoring will be conducted once after construction dredging is conducted. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring can cease.	M&AOSB / Third Party
Marine Flora & Fauna	During construction dredging, the amount of sediment accretion on the eastward side of the jetty should be studied given the presence of corals in the T2 transect (east of the jetty). This is measured to ensure no impacts on the coral species found during environmental surveys.	Monitoring will occur once during construction dredging.	M&AOSB / Third Party
Waste	The M&AOSB HSE team will review the Monthly Waste Reports (MWR) received by the contractor and report	Waste will be monitored monthly.	M&AOSB HSE Team

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
	waste generation and disposal to MONREC.		
Incident and accident reporting	M&AOSB will report all spills and leaks to MONREC and MOGE as per the EIA Procedure. All incidents and non-compliances will be reported to MONREC.	Reporting of large spills within 24 hours (as per the EIA Procedure). A large spill is any spill not able to be cleaned by M&A team but needing external measures.	M&AOSB HSE Team
<b>Operational Phase</b>			
Air	Air emissions will be measured at Zin Yaw Chaung. Measurements will be for SO <sub>x</sub> , NO <sub>x</sub> , PM2.5 and PM10 (closest sensitive receptor).	Six monthly during operation phase. If the noise is within NEQEG then monitoring can cease.	M&AOSB / Third Party
Noise	Noise levels (dB) will be measured one daytime and one nighttime at Zin Yaw Chaung (closest sensitive receptor).	Monthly during operation, during day and nighttime and during noisy activities. If the levels are within the NEG Guidelines, no further monitoring is required.	M&AOSB / Third Party
Effluent Discharges / Marine Water Quality	Treated wastewater will be measured for the following parameters (in line with NEQEG and considering the WBG EHS Guidelines).	Six monthly during operation phase. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring frequency can be reduced to annually.	M&AOSB / Third Party
Marine Sediment	Sediment monitoring will be conducted to confirm no pollutants from operation dredging. The following parameters will be measured in line with WBG EHS Guidelines.	Monitoring will be conducted once after operational dredging is conducted. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring can cease.	M&AOSB / Third Party

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Marine Flora & Fauna	<p>During operational dredging, the amount of sediment accretion on the eastward side of the jetty should be studied given the presence of corals in the T2 transect (east of the jetty).</p> <p>This is measured to ensure no impacts on the coral species found during environmental surveys.</p>	Monitoring during operation should be conducted for up to two years from operation. If no changes detected, then monitoring can cease.	M&AOSB /Third Party
Waste	The M&AOSB HSE team will review the Monthly Waste Reports (MWR) received by the contractor and report waste generation and disposal to MONREC.	Waste will be monitored monthly.	M&AOSB HSE Team
Incident and accident reporting	M&AOSB will report all spills and leaks to MONREC and MOGE as per the EIA Procedure. All incidents and non-compliances will be reported to MONREC.	Reporting of large spills within 24 hours (as per the EIA Procedure). A large spill is any spill not able to be cleaned by M&A team but needing external measures.	M&AOSB HSE Team

## 1.8

### CONCLUSIONS AND RECOMMENDATIONS

The EIA Study focused on the impacts associated with the Project in Nga Yoke Kaung. Impacts are likely to be localised to within the operational area. An Area of Influence of 5 km around the Project Area has been proposed to include potential impacts from noise, waste and water use, air emissions, and impacts to livelihoods (including fishing).

The EIA Report notes that communities in Nan Thar Pu village tract; specifically Zin Yaw Chaung “ward,” which is the nearest to the Project Area, could be potentially affected by the Project. The EIA consultation will therefore be focused on local communities within Nan Thar Pu village tract. Social baseline data was collected to support the current understanding of fishing and livelihoods in the region.

For onshore activities, there is potential for noise or dust from the Construction activities to impact local communities. The impact of the operational activities are expected to be limited because there will be no major source of emissions. The Project is likely to have a positive impact on local communities due to the job opportunities available during the construction phase.

There is potential for social and environmental impacts due to jetty construction activities. Marine habitats in the Project footprint will be directly impacted. Fishermen in the Area of Influence are likely to be directly or indirectly impacted by the jetty construction and operation.

The monitoring as listed above in *Section 1.7* will be conducted to ensure the impacts are properly mitigated.

If significant design changes are made once Project design is finalised during the Front End Engineering Design (FEED) Stage, the impacts should be re-evaluated and if necessary, the EIA Report and/or EMP may be revised.

Myint & Associates Offshore Supply Base Ltd. (M&AOSB) သည် ဧရာဝတီတိုင်းဒေသကြီးရှိ ငရုတ်ကောင်း ပင်လယ်အော်အနီးတွင် ကမ်းလွန်ပံ့ပိုးရေးစခန်း (OSB) တစ်ခု တည်ဆောက်ရန် အဆိုပြုပါသည်။ စီမံကိန်းသည် ငွေဆောင်မြို့မှတောင်ဘက်သို့ ၄၀ ကီလိုမီတာခန့် အကွာတွင် တည်ရှိပါသည်။ ထိုစခန်းတွင် ကနဦးအနေဖြင့် ၁.၂ ဟက်တာခန့် ကျယ်သော ပလက်ဖောင်းတစ်ခုပါသည့် ဆိပ်ခံ တံတားတစ်ခုနှင့် ၁၂.၁၂ ဟက်တာ(၂၉ .၉၅ ဧက) ခန့်ရှိသော အဓိကကုန်းတွင်းပိုင်း စခန်းတစ်ခု တို့ ပါဝင်သည်။ အနီးဆုံးလမ်းသည် အရှေ့ဘက်သို့ ၂၅ ကီလိုမီတာခန့် အကွာတွင် တည်ရှိပါသည်။ စီမံကိန်း၏ အသေးစိတ်အချက်အလက်များကို ဇယား ၁.၁ တွင် ဖော်ပြထားပြီး၊ တည်နေရာကို ပုံ ၁.၁ တွင် ဖော်ပြထားပါသည်။

ဇယား ၁.၁ စီမံကိန်းဆိုင်ရာ အသေးစိတ်အချက်အလက်များ

အကြောင်းအရာ	အသေးစိတ်အချက်အလက်
စီမံကိန်းအမည်	Myint & Associates ကမ်းလွန်ပံ့ပိုးရေးစခန်း။
စီမံကိန်းပိုင်ရှင်	Myint & Associates Offshore Supply Base Ltd. (M&AOSB)
စီမံကိန်းဧရိယာ	စီမံကိန်း လုပ်ငန်းစဉ်-၁ ၏ ဧရိယာမှာ ၁၂.၁ ဟက်တာ (ကုန်းတွင်းပိုင်း) နှင့် ၁.၂ ဟက်တာ (ကမ်းလွန်) ကျယ်ဝန်းပါသည်။ ဆိပ်ခံတံတားအရှည်ကို ၃၀၀ မီတာသို့ တိုးချဲ့ပါမည်။ ထိုဧရိယာမှာ ချဉ်းကပ်လမ်းအပါအဝင် EIA အစီရင်ခံစာ တွင် ဖော်ပြထားသော အဆောက်အဦး အားလုံးပါဝင်ပါမည်။ နောင်တွင် လုပ်ငန်းစဉ်- ၂ အတွက် ၅၀ ဟက်တာ ထိ တိုးချဲ့နိုင်ချေရှိပါသည်။ ယခု EIA အစီရင်ခံစာသည် လုပ်ငန်းစဉ်- ၁ နှင့် ၂ (ထပ်မံတိုးချဲ့ခြင်း) တို့ အထိလေ့လာသုံး သပ် ထားသည်။
အခြေခံအဆောက်အအုံအမျိုးအစား	ပလက်ဖောင်းတစ်ခုပါသည့်ဆိပ်ခံတံတားနှင့် အဓိကကုန်းတွင်း ပိုင်းစခန်းတစ်ခု။
စီမံကိန်းလုပ်ငန်းစတင်ပြီးနောက်လုပ်ကိုင် မည့်အစီအစဉ်များ	လက်ရှိ/အနာဂတ်ကမ်းလွန်လုပ်ငန်းများအတွက်ကမ်းလွန်ပံ့ပိုးရေး စခန်းအဖြစ်အသုံးပြုရန်။

မြန်မာ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) ဆိုင်ရာ လုပ်ထုံးလုပ်နည်းအရ၊ ဤစီမံကိန်းသည် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) ပြုလုပ်ဆောင်ရွက်ရန်လိုအပ်ပြီး၊ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဝန်ကြီးဌာန(MONREC)၏ သဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဌာန (ECD) သို့ တင်ပြရန် လိုအပ်ပါသည်။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) ၏အစိတ် အပိုင်းတစ်ရပ် အနေဖြင့် ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ကိုလည်းတင်သွင်းသွားမည် ဖြစ်ပါသည်။

ယခု ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာကို ကမ်းလွန် ပံ့ပိုးရေးစခန်း(OSB) ("စီမံကိန်း")  
နှင့် ပတ်သက်သည့် အဆိုပြုထားသောစီမံကိန်း လုပ်ငန်းများအတွက် ပြင်ဆင်ရေးသား ခဲ့ခြင်း ဖြစ်ပြီး၊  
မြန်မာ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း နှင့် အခြား သက်ဆိုင်ရာ  
ဥပဒေများနှင့် အညီ ရေးသားပြုစုခဲ့ပါသည်။



၁.၂

**မူဝါဒ နှင့် ကြီးကြပ်ကွပ်ကဲထိန်းသိမ်းရေးမူဘောင်**

ယခုစီမံကိန်းကို နိုင်ငံတော်အဆင့်နှင့် ဒေသအဆင့် စံနှုန်းများ ဥပဒေများနှင့်အညီ လုပ်ကိုင် ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) နှင့်ပတ်သက်သည့် ဒေသအဆင့်စံနှုန်းများတွင် အောက်ပါတို့ပါဝင်သည် -

- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)၊
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး နည်းဥပဒေများ (၂၀၁၄)၊
- အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာအရည်အသွေး(ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (၂၀၁၅) နှင့်
- ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅)။

၁.၃

**စီမံကိန်းအကြောင်းအရာ ဖော်ပြချက် နှင့် အခြားနည်းလမ်းရွေးချယ်ခြင်း**

၁.၃.၁

**အခြားနည်းလမ်းရွေးချယ်ခြင်း**

မည်သည့်စီမံကိန်းကိုမဆိုစဉ်ဆောင်ရွက်ရာတွင် သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးအပေါ် ဆိုးကျိုးသက်ရောက်မှုများ ရှောင်ရှားရန် သို့မဟုတ် လျှော့ချရန်နှင့် စီမံကိန်းအကျိုးအမြတ် အများဆုံးရရန် သို့မဟုတ် ပိုကောင်းစေရန် နည်းလမ်းအဖြစ် ရွေးချယ်စရာနှင့် အခြား နည်းလမ်းများ ကို ထည့်သွင်းစဉ်းစားရန်မှာ အဓိကလိုအပ်ချက်ဖြစ်ပါသည်။ စီမံကိန်း အတွက် ထည့်သွင်းစဉ်းစားထားသည့် အခြားနည်းလမ်းများရွေးချယ်ရာတွင် အောက်ပါတို့ပါဝင်ပါသည်။

- စီမံကိန်းတည်နေရာ - စီမံကိန်းဧရိယာသည် ဧရာဝတီတိုင်းဒေသကြီးရှိ ငရုတ်ကောင်းတွင် တည်ရှိပါသည်။ ကမ်းလွန်ပံ့ပိုးရေးစခန်း (OSB) အတွက် အလားအလာရှိသည့် နေရာများအဖြစ် နေရာ ၈ ခု သတ်မှတ်ထားပါသည်။ ရွေးချယ်ထားသောတည်နေရာမှာ ဂေါ်ရန်ဂျီကျွန်းရှိ ပလင်ဂျို ကမ်းခြေတွင် ဖြစ်ပါသည်။
- ချိတ်ဆက်ကူးတံတားဒီဇိုင်း - ချိတ်ဆက်ကူးတံတား/မြင်းခုံတစ်ခုကို ကမ်းလွန်ပင်မဆိပ်ခံ ဖွဲ့စည်းမှု နှင့် ချိတ်ဆက်သွားမည် ဖြစ်ပါသည်။ ၎င်းသည် တာလမ်း သို့မဟုတ် အောက်ခံတိုင် မြင်းခုံဖွဲ့စည်းမှု ဖြစ်နိုင်ပါသည်။ ချိတ်ဆက်ကူးတံတားအတွက် အောက်ခံတိုင်ဆောင်ရွက်မှု ပါဝင်မည်မဟုတ်ပါ။
- ဆိပ်ခံတံတားဒီဇိုင်း - ဆိပ်ခံတံတားသည် အပိတ်ဆိပ်ခံတံတား သို့မဟုတ် အပွင့်ဆိပ်ခံတံတား ဖွဲ့စည်းမှုဖြင့် ဆောင်ရွက်နိုင်ပါသည်။ လှိုင်းများ နှင့် ရေစီးကြောင်းများကြောင့် ရေတိုက်စားမှုကို ကာကွယ်နိုင်ရန် အပြင်ဘက်ရှိ သဲ နှင့် ကျောက်အလွှာများဖြင့် တည်ဆောက်ထားသည့် အပိတ်ဖွဲ့စည်းမှုကို ရွေးချယ်ခဲ့ပြီးဖြစ်ပါသည်။ အပိတ်ဖွဲ့စည်းမှု သည်ရွေးချယ်မှုတစ်ခုသာဖြစ် သည်။သို့သော် မြေသားစမ်းစစ်ခြင်း ထပ်မံဆောင်ရွက်ပြီးလိုအပ်ပါက၊ ဒီဇိုင်းအနည်း ငယ်ပြောင်းလဲမည် ဖြစ်သည်။ EIA ဆန်းစစ်ခြင်းကို ဆောင်ရွက်စဉ်ကတည်းက၊ အဖြစ်နိုင်ဆုံး



အခြေများကိုထည့်သွင်းစဉ်းစားခဲ့ပါသည်(ဥပမာ-တာလမ်းအပိတ်)။ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဦးစီးဌာနနှင့်၊ စီစစ်သုံးသပ်ရေးအဖွဲ့ဝင်များ၏ အကြံပြုချက်များအပေါ် ဂရုပြုကာ သဘာဝပတ် ဝန်းကျင်ထိခိုက်မှုလျော့နည်းစေရန် တာလမ်း တည်ဆောက်မှုပုံစံ(အပွင့်အပိုင်း)နှင့် ၎င်း၏အလျားနှင့် မြေပြင်ညီကို မွမ်းမံသွားမည်။

၁.၃.၂

**အဆိုပြုစီမံကိန်း**

ယခု ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာကို ၂၀၁၇ ဒီဇင်ဘာလ၌ ထွက်ရှိလာသော RRE-FEED အစီရင်ခံစာအပေါ် အခြေပြုထားပါသည်။ သက်ရောက်မှုများကိုပြည့်ပြည့်စုံစုံအသေအချာ ဆန်းစစ်နိုင်ရန် ဤပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာကို သတင်း အချက်အလက်များ အပေါ် သင့်လျော်သလို အခြေပြုထားပါသည်။

**ကမ်းလွန်တည်ဆောက်ရေးလုပ်ငန်းများ**

ကမ်းလွန်လုပ်ငန်းများတွင် ဆိပ်ခံတံတားတည်ဆောက်ရေး တစ်ခုပါဝင်မည် ဖြစ်ပြီး၊ ၎င်းအတွက် သဲစုပ်သည့် ကန်တော့ပုံ နောက်တွဲယာဉ် သို့မဟုတ်သောင်တူးနောက်တွဲယာဉ်ကို အသုံးပြု ကာ သောင်တူးယူရမည် ဖြစ်ပါသည်။ ဆိပ်ခံတံတားစုစုပေါင်းဧရိယာမှာ ၁.၂ ဟက်တာ (၀.၀၁၂ စတုရန်း ကီလိုမီတာ) ရှိမည် ဖြစ်ပါသည်။ ရေကြောင်းသွားလာရေးလမ်းကြောင်း နှင့် အကွေ့ နေရာများ တူးဖော်ရေးကာလအတွင်း ဆိပ်ခံတံတားတည်ဆောက်ရေးအတွက် မြေဖော်ယူခြင်း နှင့် မြေဖို့ခြင်း တို့ အတွက် သောင်တူး/မြေတူးရေး ကိရိယာများကို အသုံးပြုသွားရန် မျှော်လင့်ထားပါသည်။ မလိုလားအပ်သောအရာများ (နန်းများ) အနည်းအကျဉ်းကိုသာ သဘောတရားဖြင့် သယ်ယူပြီး စွန့်ပစ်ရေး ဧရိယာအဖြစ် အာဏာပိုင် (မြန်မာဆိပ်ကမ်းအာဏာပိုင် - MPA) က အတည်ပြုထားသောနေရာသို့ သယ်ယူသွားမည် ဖြစ်ပါသည်။ သောင်တူးရာမှ မြေစာစွန့်ပစ်ပစ္စည်း စုစုပေါင်း ပမာဏ ၄၁၀,၀၀၀ ကုဗမီတာ ထွက်လာမည်ဟု ခန့်မှန်းထားသည်။ အသုံးပြုသည့်သောင်တူးစက်အမျိုးအစားပေါ် မူတည် ကာ ကမ်းလွန်ဆိပ်ခံတံတားကို ၁ လ မှ ၃ လ အတွင်းအပြီးတည်ဆောက်သွားရန် တွက်ချက်ထား ပါသည်။ ဆိပ်ခံတံတား ကမ်းလွန်တည်ဆောက်ရေးလုပ်ငန်းသည် စုစုပေါင်း ၁၂ လ မှ ၁၈ လ အထိ ကြာမည် ဖြစ်ပါသည်။

တည်ဆောက်ရေးလုပ်ငန်း လုပ်ဆောင်နေစဉ် အတွင်း အသုံးပြုသည့်ကိရိယာများတွင် ပိုင်တူး ရေယာဉ်များ၊ ဆွဲသင်္ဘောများ နှင့်ဆင်းသက်ရာနေရာများဖြင့် ဆောက်လုပ်ရေးရေယာဉ်တို့ ပါဝင် ပါသည်။

**ကုန်းပေါ်တည်ဆောက်ရေးလုပ်ငန်းများ**

ကုန်းပေါ်တည်ဆောက်ရေး အဆင့်တွင် ဆောက်လုပ်ရေးလုပ်ငန်းခွင် ပြင်ဆင်ခြင်းများ (ဥပမာ - လုပ်ငန်းခွင်နေရာ ရှင်းလင်းခြင်း၊ မြေသား ပြင်ဆင်ခြင်းနှင့် မြေသားတံတိုင်းများလုပ်ဆောင်ခြင်း)၊ အလုပ်သမား များ ယာယီနားနေရာ နေရာ များ တည်ဆောက်ခြင်း၊ ယာယီခြံစည်းရိုးခတ်ခြင်းနှင့် ယာယီ ရေပေးဝေရေးနှင့် ယာယီမီးပေးဝေရေး တို့ ပါဝင်မည် ဖြစ်ပါသည်။ ကုန်လောင်ရုံများနှင့် ကွန်တိန်နာ များထားရန်အတွက် လေဟာပြင် ကွန်ကရစ်ဝင်းများ တည်ဆောက်မည် ဖြစ်ပါသည်။ တည်ဆောက်ရေး လုပ်ငန်း လုပ်ဆောင်နေစဉ် အတွင်း၊ အသုံးပြုသည့်ကိရိယာများတွင်

တလိမ့်တုံးများ၊ အမှိုက်ပစ် ထရပ်ကားများ၊ ဘူဒိုဇာများ၊ ရွှေ့ပြောင်းလွယ်သည့် ကရိန်းများနှင့် ကွန်ကရစ်ပုံလောင်းကိရိယာများ (batching plants) ပါဝင် ပါသည်။

တည်ဆောက်ရေးလုပ်ငန်းစဉ်အတွင်း စီမံကိန်းဝန်း၏ အရှေ့ဘက် (ရွာနှင့် ဝေးသောနေရာ) တွင် ထားရှိမည့် လုပ်ငန်းခွင်သုံး အသေးစားဒီဇယ်သုံးမီးစက် ရှိမည် ဖြစ်ပါသည်။

ကမ်းလွန်ပုံပိုးရေးစခန်း (OSB) ၏ မြေမျက်နှာသွင်ပြင်အရ ကျောက်တောင်ပေါ်များနေရာများကို မြေညှိခြင်းနှင့် တာလမ်း/ဆိပ်ဆံတည်ဆောက်ရာတွင် မြေဖို့ခြင်းများ ပြုလုပ်သွားမည်ဖြစ်ပါသည်။

တည်ဆောက်ရေးလုပ်ငန်းစဉ်အတွင်း လုပ်သားအင်အား ၄၀၀ မှ ၇၀၀ အထိရှိမည်ဖြစ်ပြီး စုစုပေါင်း လုပ်သားအင်အား၏ ၇၀% ခန့်မှာ ဒေသခံအသိုက်အဝန်းမှဖြစ်ကာ ကျန်လူများ မှာ ရွှေ့ပြောင်းလုပ်သားများ ပါဝင်မည် ဖြစ်ပါသည်။

တည်ဆောက်ရေးလုပ်ငန်းအတွင်း ထွက်ရှိလာမည့် စွန့်ပစ်အမှိုက်အမျိုးအစားမှာ လုပ်ငန်းခွင် ရှင်းလင်းရေးမှ ထွက်လာသည့်စွန့်ပစ်အမှိုက်၊တူးဖော်ရာမှ ထွက်လာသည့်ပစ္စည်းများ၊ စွန့်ပစ် ကွန်ကရစ်များ၊ သစ်သားစွန့်ပစ်ပစ္စည်းများ၊ ဓာတုစွန့်ပစ်ပစ္စည်းများ၊ မိလ္လာနှင့် မီးဖိုချောင်အမှိုက်များ ဖြစ်ပါသည်။ ဒေသဆိုင်ရာ လုပ်ပိုင်ခွင့်အာဏာပေးထားသော အမှိုက် ရှင်းလင်းရေးနေရာ အဆောက် အအုံများက စွန့်ပစ်အမှိုက်များကို စီမံခန့်ခွဲသွားမည် ဖြစ်ပါသည်။

တည်ဆောက်ရေးလုပ်ငန်းကို အချိန် ၁ နှစ်ခွဲ မှ ၂ နှစ်သတ်မှတ်ထားပြီး ၂၀၁၈ ခုနှစ်နှင့် ၂၀၂၃ ခုနှစ်ကြား ဖြစ်ပါမည်။

*လုပ်ငန်းလည်ပတ်ရေးလုပ်ငန်းများ*

စီမံကိန်းရည်မှန်းချက်မှာ မြန်မာနိုင်ငံရှိ ကမ်းလွန်ရေနှင့် သဘာဝဓာတ်ငွေ့ လုပ်ငန်း အတွက် ထောက်ပံ့ပို့ဆောင်ရေးဆိုင်ရာ ဝန်ဆောင်မှုများ ပံ့ပိုးပေးရန်ဖြစ်သည်။ လုပ်ငန်းလည်ပတ်ရေး စတင်သည့် ပထမနှစ်အတွင်း ကုန်ပစ္စည်းအားလုံးမှာ ကုန်တင်သင်္ဘောများဖြင့် ရောက်ရှိလာပြီး စခန်းတွင်သိမ်းဆည်းထားကာ ကမ်းလွန်ပုံပိုးရေးရေယာဉ် (OSV) ဖြင့် ရေနံတွင်း/တွင်းတူးစင်သို့ပို့ပေးခြင်း၊ ပြန်ပို့ထားသောအရာများကို ကမ်းလွန်ထောက်ပံ့ရေးရေယာဉ် (OSV) စခန်းဖြင့် သယ်ယူခြင်း၊ ထို့နောက်ပြင်ဆင်မှု များ ပြုလုပ်ရန်အတွက် ကုန်တင်သင်္ဘောများဖြင့် မူလနေရာသို့ ပြန်လည် သယ်ဆောင်ခြင်းများ ပြုလုပ်ပေးမည် ဖြစ်ပါသည်။

လုပ်ငန်းလည်ပတ်ဆောင်ရွက်နေစဉ်ကာလတွင် လုပ်ငန်းပထမအဆင့်အတွက် ဝန်ထမ်း ၁၀၀ ခန့် နှင့် လုပ်ငန်းဒုတိယ အဆင့်အတွက် နောက်ထပ်ဝန်ထမ်း ၁၀၀ ခန့်ရှိမည်ဖြစ် ပါသည်။ လုပ်သား အင်အား၏ ၇၀% ခန့်မှာ ဒေသခံအသိုက်အဝန်းမှဖြစ်ပြီး ကျန်လူများမှာ ရွှေ့ပြောင်းလုပ်သား များ ပါဝင်မည် ဖြစ်ပါသည်။

လုပ်ငန်းလည်ပတ်ဆောင်ရွက်နေစဉ်ကာလတွင် သောင်တူးပြုပြင်ထိန်းသိမ်းရေးလုပ်ငန်းကို တစ်နှစ် လျှင် ၁ ကြိမ် ဆောင်ရွက်မည် ဖြစ်ပါသည်။ သောင်တူး၍ထွက်လာသည့် မြေစာစွန့်ပစ်ပစ္စည်းပမာဏ မှာ ဆောက်လုပ်ရေး လုပ်ငန်းလုပ်နေစဉ် ထွက်လာသည့်ပမာဏ၏ ၂၀% မှ ၃၀% ခန့်လောက်သာ ရှိမည် ဖြစ်ပါသည်။ သောင်တူးရာမှထွက်လာသည့် မြေစာစွန့်ပစ်ပစ္စည်းများအား သက်ဆိုင်ရာ

အာဏာပိုင် များ ခွင့်ပြုထားသော (MPA) စွန့်ပစ်ဧရိယာသို့ သဘောတရားစစ်ဖြင့် ယူဆောင်သွားမည် ဖြစ်ပါသည်။

ကမ်းလွန်ထောက်ပံ့ရေးစခန်း (OSB) တွင် မီးငြိမ်းသတ်သည့် ပစ္စည်းများနှင့် ရေနံယိုဖိတ်မှုကို ကိုင်တွယ်ဖြေရှင်းပေးမည့် ပစ္စည်းများ ပါဝင်မည် ဖြစ်ပါသည်။ အန္တရာယ်ဖြစ်စေသော စွန့်ပစ်ပစ္စည်း ကို သီလဝါရှိ လိုင်စင်ရ စွန့်ပစ်ပစ္စည်းကိုင်တွယ်ဖြေရှင်းရေး အဆောက်အအုံသို့ ပေးပို့သွားမည် ဖြစ်ပါသည်။ အန္တရာယ်ဖြစ်စေ သည့် စွန့်ပစ်ပစ္စည်းအမျိုးအစားများတွင် ရေနံ၊ စက်မှုလုပ်ငန်းသုံး ဓာတုပစ္စည်းများနှင့် ရေနံနှင့်သဘာဝဓာတ်ငွေ့ လုပ်ငန်းအတွက် အသုံးပြုသည့် ဓာတုပစ္စည်း (ဥပမာ - ရေစုပ်ယူတတ်သောရွှံ့စေး (bentonite)) ပါဝင်သည်။

**၁.၄ အခြေခံအချက်အလက်အခြေအနေများ**

စီမံကိန်းလွှမ်းခြုံနယ်မြေတွင် စီမံကိန်းဧရိယာ နှင့် ၎င်း၏ အနီးပတ်ဝန်းကျင်တို့ ပါဝင်သည်။ ERM အနေဖြင့် အစိုး အငွေ နှင့် ဆူညံသံထုတ်လွှတ်မှုများ၊ စွန့်ပစ်ပစ္စည်းစွန့်ထုတ်ခြင်း နှင့် အနည် အနစ်များကြောင့် ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများကို စီမံကိန်းဧရိယာမှ ၅ ကီလိုမီတာထိ ကျရောက်နိုင်သည်ဟု မယုတ်မလွန် ယူဆတင်ပြထားပါသည်။

**၁.၄.၁ ကုန်းတွင်းသဘာဝပတ်ဝန်းကျင်**

ကုန်းတွင်းပိုင်းစီမံကိန်းဧရိယာသည် လက်ရှိတွင် စိုက်ပျိုးရေးနှင့် ကျွဲနွားတိရိစ္ဆာန်စားကျက်မြေ အတွက် အသုံးပြုနေသော စိုက်ပျိုးမြေအတွင်းတည်ရှိပါသည်။ ထိုမြေထုနှင့် သဘာဝအပင်များ၏ ဓာတ်ပုံကို ပုံ ၁.၂ တွင်ဖော်ပြထားပါသည်။ ထိုနေရာကို ပြုပြင်မွမ်းမံထားသည့် သဘော သဘာဝ ကြောင့် မျိုးစိတ်များ သို့မဟုတ် သက်ရှိများ ထိန်းသိမ်းစောင့်ရှောက်မှုနှင့် ပတ်သက်ပြီး စိုးရိမ်စရာ များရှိမည် မဟုတ်ပါ။ ထိုစီမံကိန်းတွင် ကမ်းလွန် မျက်နှာမူရာဘက်တစ်ခု ပါဝင်သည့် အတွက် စီမံကိန်းမြေပုံအတွင်းပိုင်း၌ ကမ်းခြေနှင့် အုန်းပင်အုပ်စုပါသော ဧရိယာတစ်ခု ပါရှိပါသည်။ ၎င်းကို ပုံ ၁.၃ တွင်ဖော်ပြထားပါသည်။

**ပုံ ၁.၂ စီမံကိန်းနယ်မြေရှိ ကုန်းပေါ်ပြုပြင်ထားသောနေရာများ**





**ကမ်းလွန်ပတ်ဝန်းကျင် အခြေခံအချက်အလက်အခြေအနေများ**

ကုလသမဂ္ဂပတ်ဝန်းကျင်အစီအစဉ် (UNEP) ဂြိုဟ်တုလေ့လာဆန်းစစ်မှုတွင် စီမံကိန်းဧရိယာအနီး ရေတိမ်ပိုင်းအပါအဝင် ဧရာဝတီတိုင်းဒေသကြီးကမ်းရိုးတန်းတစ်လျှောက် သန္တာကျောက်တန်းများ (ကျောက်တန်းအစွန်း အစ သို့မဟုတ် အကွက်များ) ရှိကြောင်းဖော်ပြနေပါသည်။ ရေတိမ်ပိုင်းတွင် ကျောက်တောင် ထူသည့်အောက်ခံအလွှာ ပျံ့နှံ့တည်ရှိမှုက သန္တာကျောက်များနှင့် သန္တာကျောက် အစု အဖွဲ့များ ကြီးထွားရန်အခြေအနေကောင်းကို ဖော်ပြနေပါသည်။ ၂၀၁၇ ခုနှစ် ဇန်နဝါရီလက ပြုလုပ်သည့်ဆွေးနွေးပွဲတွင် ဒေသခံများက စီမံကိန်းမြေပုံအတွင်း၌ သန္တာကျောက်များရှိနိုင် သည့်အလားအလာရှိကြောင်း ပြောကြားခဲ့ကြပါသည်။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) လေ့လာမှုတစ်စိတ်တစ်ပိုင်း အဖြစ်ပြုလုပ်သည့် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံလေ့လာ စစ်တမ်းကောက်မှုတွင် သန္တာကျောက်တန်းများ တည်ရှိမှုအား အတည်ပြုနိုင်ခဲ့ပါသည်။ သို့ဖြစ်ပါသော်လည်း စီမံကိန်းဧရိယာတွင်မူ သန္တာကျောက်တန်းများ မတည်ရှိပေ။

ဧရာဝတီတိုင်းဒေသကြီး ကမ်းရိုးတန်းတစ်လျှောက်ရှိ မြစ်နုတ်ခမ်းများ၏ ကမ်းရိုးတစ်လျှောက်၌ ဒီရေတောဧရိယာများ ရှိနေပြီး ကုန်းတွင်းပိုင်း ဒီရေတောသည့်ချောင်းစွယ်များ ပိုင်းရံနေ ပါသည်။ သက်ရောက်မှုရှိသည့် ဧရိယာမှာ စီမံကိန်းဧရိယာ၏ တောင်ဘက် ငရုတ်ကောင်းမြစ်/မြစ်ဝရှိ ဒီရေတော များဖြစ်ပါသည်။ စီမံကိန်းဧရိယာအတွင်း၌ ဒီရေတော များ ရှိမနေပါ။

ဧရာဝတီတိုင်းဒေသကြီး၏ ကမ်းရိုးတန်းအနီးနေရာများတစ်လျှောက် ပင်လယ်မြက်ခင်းပြင်များ ဖြစ်ပေါ်နေပြီး၊ ပုံမှန်အားဖြင့် ဒီရေငယ်များ (Short, *et al*, 2001) ဝင်ရောက်သည့် ရေအနက် ၆၅ပေ (မီတာ ၂၀) အောက်တွင် ဖြစ်ပေါ်ပါသည်။ ပင်လယ်မြက်ပင်များသည် အလင်းရောင်ကောင်းစွာ ဝင်ရောက်သည့် ရေတိမ်ပိုင်းတွင် ရောက်ရှိနေပါသည်။

ငါးလုပ်ငန်းအနေအထားကို သိရှိရန်အတွက် ၂၀၁၃ ခုနှစ်က ဧရာဝတီတိုင်းဒေသကြီးအတွင်းရှိ စခန်းအတော်များများနှင့် မြန်မာ့ရေပိုင်နက်၏ အခြားနေရာများတွင်ပါ လတ်တလော ဆွဲပိုက်ချ ငါးဖမ်းခြင်း စစ်တမ်းကောက်ယူမှုကို R.V. Dr. Fridtjof Nansen က ပြုလုပ်ခဲ့ပါသည်။ ငါးများ အပြည့်အဝဖမ်းဆီးမှုကြောင့် ၁၉၈၀ ပြည့် နှင့် ၂၀၁၃ ခုနှစ်ကြားတွင် ပင်လယ်ငါးဖမ်း လုပ်ငန်းအရင်း အမြစ်များ ၁၀ ဆ အထိသိသိသာသာ ကျဆင်းသွားကြောင်း တွေ့ရှိချက်တွင် အနှစ်ချုပ်ဖော်ပြထား ပါသည်။ ဒေသအလိုက် လေ့လာဆန်းစစ်မှုရလဒ်အရ ရခိုင် ကမ်းရိုးတန်းဇုန် (စီမံကိန်းဧရိယာ) အတွင်း အများဆုံးတွေ့ရလေ့ရှိသည့် မျိုးစိတ်များမှာ hairtails (*Trichiurus lepturus*) bigeye(*Priacanthus hamrur*)၊ ရေရူ (jellyfish), lizard fish(*Saurida tumbil*)၊ toothpony fish(*Gazza minuta*)၊ Japanese threadfin bream(*Nemipterus japonicas*)၊ spinycheek lanternfish(*Benthosema fibulatum*)၊ *Decapterus sp.* နှင့် ငါးနီတူများ (*Stolephorus indicus*) များဖြစ်သည်။

မြန်မာ့ရေပြင်များတွင် စုစုပေါင်း ရေနေနို့တိုက်သတ္တဝါများ (cetaceans) (ဝေလငါးနှင့် လင်းပိုင်) မျိုးရင်း ၂ မျိုးနှင့် sirenian (ရေဂက်) မျိုးစိတ် ၁ မျိုးရှိကြောင်း အစီရင်ခံထားသည် (IUCN Red List Website)။ မျိုးစိတ် ၂ မျိုးဖြစ်သော ဧရာဝတီလင်းပိုင် (*Orcaella brevirostris*) နှင့် ရေဂက် (*Dugong dugong*) တို့ကို ၁၉၉၄ ခုနှစ်ကတည်းက မြန်မာ့တောရိုင်းတိရစ္ဆာန် ကာကွယ် ရေးနှင့် သဘာဝတောများ ထိန်းသိမ်းရေးဥပဒေအရ လုံးဝကာကွယ်ရမည့် အမျိုးအစား အောက်တွင် ထိန်းသိမ်းစောင့်ရှောက်ထားပါသည်။

မြန်မာ့ရေပြင်တွင် ပင်လယ်လိပ်မျိုးစိတ် ၅ ခုရှိပြီး အားလုံးမှာ UICN ၏မျိုးသုဉ်းပျောက်ကွယ်မှု အန္တရာယ်ရှိစာရင်းတွင် ပါဝင်ပါသည်။ ၎င်းတို့မှာ olive ridley turtle (*Lepidochelys olivacea*) (ထိခိုက်လွယ်)၊ loggerhead turtle (*Caretta caretta*) (NE Indian Ocean subpopulation - မျိုးသုဉ်းရန်အလွန်အန္တရာယ်ရှိ)၊ green turtle (*Chelonia mydas*) (မျိုးသုဉ်းရန်အန္တရာယ်ရှိ)၊ hawksbill turtle (*Eretmochelys imbricata*) (မျိုးသုဉ်းရန်အလွန်အန္တရာယ်ရှိ)၊ နှင့် leatherback turtle (*Dermochelys coriacea*) (မျိုးသုဉ်းရန်အန္တရာယ်ရှိ) တို့ဖြစ်ကြပါသည်။

## ၁.၄.၃ ပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များစစ်တမ်းကောက်ယူမှုရလဒ်များ

စီမံကိန်း ဧရိယာအနီးပတ်လည်တွင် တည်ရှိသော ဖြစ်နိုင်ချေရှိသည့် ထိခိုက်လွယ်သော အဏ္ဏဝါပတ်ဝန်းကျင်ဆိုင်ရာ အခြေခံအချက်အလက်များ၏ အခြေအနေကို သိရှိနားလည်စေရန် မူရင်း အခြေခံအချက်အလက်များစစ်တမ်းကောက်ယူမှုများကို ERM မှ ဆောင်ရွက်ခဲ့ပါသည်။ ၎င်း စစ်တမ်းကောက်ယူမှုများကို နိုင်ငံတကာအဆင့် ဆောင်ရွက်ချက်များနှင့် အညီဆောင်ရွက်ခဲ့ပြီး လက်ရှိတည်ရှိမှု အခြေအနေအား ထောက်ပံ့နိုင်ရုံ သာမက ရှေ့ဆက် စောင့်ကြည့်လေ့လာ ကြည့်ရှုခြင်း အစီအစဉ်များအတွက်ပါ အချက်အလက်များ ထောက်ပံ့နိုင်ခဲ့ ပါသည်။

စစ်တမ်းကောက်ယူမှုအချိန်ဇယားအကျဉ်းကို ဇယား ၁.၂ တွင် တင်ပြထားပါသည်။ စစ်တမ်းကို ၂၀၁၇ စက်တင်ဘာလ ၁၆ ရက် မှ ၁၈ ရက် အချိန် ၃ ရက်အတွင်း အောင်မြင်စွာ အပြီးသတ် ဆောင် ရွက်နိုင် ခဲ့ပါသည်။

ဇယား ၁.၂

ပင်လယ်ရေ ရှုပ်-စာတုနမှုနာ၊ အဏ္ဏဝါအနည်အနှစ်မှုနာ၊ ရေအောက်နေ အကြီးစား သတ္တဝါများ စစ်တမ်းကောက်ယူခြင်း နှင့် ဒီရေအောက်အကျနေရာအတည်ပြုခြင်း နှင့် ဆန်းစစ်ခြင်း စစ်တမ်း ကောက်ယူမှု တို့အတွက် စစ်တမ်းကောက်မှု အချိန်ဇယား (၂၀၁၇ စက်တင်ဘာလ)

နေ့စွဲ	ဆောင်ရွက်မှု
၂၀၁၇ စက်တင်ဘာလ ၁၆ ရက် မှ ၁၈ ရက်	ပင်လယ်ရေမှုနာ နှင့် အဏ္ဏဝါ အနည်အနှစ် မှုနာကောက်ယူခြင်း ရေအောက်ကင်မရာဖြင့် စစ်တမ်းကောက်ယူခြင်း နှင့် ရေအောက်နေ အကြီးစားသတ္တဝါများ စစ်တမ်းကောက်ယူခြင်း  သိပ္ပံနည်းကျ ရေအောက်အသက်ရှူပိုက်သုံး၍ စစ်တမ်းကောက်ယူခြင်း
၂၀၁၇ စက်တင်ဘာလ ၁၄ ရက် မှ ၁၆ ရက်	လေထု စစ်တမ်းကောက်ယူခြင်း
၂၀၁၇ စက်တင်ဘာလ ၁၄ ရက် မှ ၁၆ ရက်	ဆူညံမှု စစ်တမ်းကောက်ယူခြင်း
၂၀၁၇ စက်တင်ဘာလ ၁၄ ရက် မှ ၁၆ ရက်	မြေဆီလွှာ နှင့် မြေအောက်ရေ စစ်တမ်းကောက်ယူခြင်း
၂၀၁၇ စက်တင်ဘာလ ၁၆ ရက် မှ ၁၉ ရက်	ကုန်းပေါ်ရှိ တောရိုင်းတိရစ္ဆာန်များ နှင့် သဘာဝ အပင်များ စစ်တမ်းကောက်ယူခြင်း

အဏ္ဏဝါပတ်ဝန်းကျင်နှင့် စပ်လျဉ်း၍ အနည်အနှစ်တွင် ပတ်ဝန်းကျင်ဆိုင်ရာ စိုးရိမ်ရလောက်သော သတ္တုပါဝင်မှုမရှိဘဲ သဘာဝအလျောက်သာ ဖြစ်ပွားနေကြောင်း ညွှန်ပြနေသည့် သတ္တုပါဝင်မှုများကို ထည့်သွင်းစဉ်းစားခဲ့ပါသည်။ အနည်အနှစ်များသည် ညစ်ညမ်းမှုမရှိပါ။ အနည်အနှစ်အမျိုးအစားမှာ သဲပါသောနုန်း နှင့် ရွှံ့အနည်းငယ်ဖြင့် ပေါင်းစပ်နေပါသည်။ အဏ္ဏဝါရေအရည်အသွေး ညွှန်းကိန်းများကို အာဆီယံအဏ္ဏဝါရေအရည်အသွေး လမ်းညွှန်ချက်များနှင့် နှိုင်းယှဉ်လေ့လာခဲ့ပြီး၊ pH ရလဒ် အားလုံးမှာ ၆ မှ ၉ ရှိ လက်ခံနိုင်လောက်သော ကန့်သတ်မှုများအတွင်း ကျရောက်နေ ပါသည်။ ပင်လယ်ရေမှုနာများရှိ အောက်ဆီဂျင်ပါဝင်မှု (DO) စစ်တမ်းကောက်ယူသည့် ဧရိယာ တစ်လျှောက် ဆင်တူနေပြီး အာဆီယံ ရေအရည်အသွေး လမ်းညွှန်ချက်များနှင့် ကိုက်ညီမှုရှိပါသည်။ အစိုင်အခဲ ပါဝင်မှု (TSS) နှင့် နောက်ကျိမှု နည်းပါးကြောင်း မှတ်တမ်းတင်ထားပြီး ၎င်းသည် အာဆီယံ ရေ အရည်အသွေး လမ်းညွှန်ချက်များ နှင့် ကိုက်ညီမှုရှိကာ၊ ပင်လယ်အခြေအနေကြောင့် ရေပိုမို ကြည်လင်ကြောင်း ဖော်ပြနေပါသည်။

စစ်တမ်းကောက်ယူသည့် ဧရိယာ၏ လေထု အရည်အသွေးကို WHO / NEG လမ်းညွှန်ချက်များ နှင့် ကိုက်ညီမှုမရှိသည့် SO<sub>2</sub> ၏ အတိုင်းအတာအဆင့်မြင့်မားမှုမှ လွဲ၍၊ ယေဘုယျအားဖြင့် နိမ့်ပါး ကြောင်း ထည့်သွင်းစဉ်းစားခဲ့ပါသည်။ SO<sub>2</sub> ပမာဏမြင့်မားမှုမှာ ယေဘုယျအားဖြင့် ဒီဇယ် နှင့် ရေနံဆီ SO<sub>2</sub> လောင်ကျွမ်းမှုတို့ကြောင့် ဖြစ်ပါသည်။ စီမံကိန်းဧရိယာရှိ ၎င်း၏ထုတ်လွှတ်မှုအရင်း အမြစ်ကို မသိရှိရပါ။ နမူနာကောက်ယူသောနေရာများရှိ ဆူညံသံများသည် နေ့ခင်းဘက်တွင် NEQ လမ်းညွှန်ချက်များအတွင်း ကျရောက်ပြီး၊ ညနေပိုင်းတွင် အနည်းငယ် မြင့်တက်ပါသည်။ ၎င်းမှာ ယာဉ် (မော်တော်ဆိုင်ကယ်) အသံ နှင့် လှိုင်းပမာဏကြောင့် ဖြစ်ပါသည်။ မြေဆီလွှာနမူနာများ သည်



ရေတွင်းမှ စစ်ဆေးခဲ့သော မြေအောက်ရေ နှင့် ညစ်ညမ်းမှု အထောက်အထားများမတွေ့ရဘဲ၊ ညွှန်းကိန်းများအားလုံးသည် WHO နှင့် NEQ လက်ခံနိုင်လောက်သော သောက်သုံးရေးစံနှုန်းများ အတွင်း ကျရောက်နေပါသည်။ ဇင်ဇော်ချောင်းရေတွင်း၌ BOD မှာ အနည်းငယ်မြင့်မားကြောင်း တွေ့ရပြီး၊ ရေညစ်ညမ်းနိုင်ဖွယ်ရှိကြောင်း ဖော်ပြနေပါသည်။ ၎င်းမှာ ရေတွင်းရှိနေသည့် အညစ် အကြေး သို့မဟုတ် အခြားစွန့်ထုတ်မှုများမှ များပြားသည့် ကြွင်းကျန်မြေဆီလွှာပါဝင်မှု ပမာဏ ကြောင့် ဖြစ်ပေါ်ခြင်းဖြစ်နိုင်ပါသည်။

ကုန်းတွင်းပိုင်းစစ်တမ်းကောက်ယူမှုတွင် စစ်တမ်းကောက်ယူမှုဧရိယာ၌ “ကုန်းတွင်းပိုင်း” (မြေရိုင်း၊ စိုက်ပျိုးနိုင်သောမြေ) နှင့် ဒီရေတောများ နှင့် အလှူဝါသဘာဝအပင်များ ဟူ၍ နေရာနှစ်မျိုး ကို မှတ်တမ်းယူခဲ့ပါသည်။ စီမံကိန်းလုပ်ငန်းနေရာ၏ အနောက်တောင်ဘက်၌ အရည်အသွေးနိမ့် နေသော ဒီရေတောမျိုးအနည်းငယ်ကိုသာ မှတ်တမ်းရယူခဲ့ ပါသည်။ ၎င်းနေရာအမျိုးအစားများမှာ ဧရိယာတွင် တွေ့နေကျနေရာများဖြစ်ပြီး၊ ထိန်းသိမ်းရေးဆိုင်ရာ စိုးရိမ်ရသည့် မျိုးစိတ်များကို မတွေ့ခဲ့ရပါ။ မှတ်တမ်းရယူခဲ့သော မျိုးစိတ်များတွင် မြန်မာဥပဒေအရ “လုံးဝကာကွယ်ထားသော” စာရင်းအဖြစ်သတ်မှတ်ထားသည့် မျိုးစိတ်များ မပါဝင်ပါ။ တောရိုင်းတိရစ္ဆာန်စစ်တမ်းကောက်ယူရေး တွင် ငှက်များ၊ ကုန်းနေရေနေသတ္တဝါများ နှင့် တွားသွားသတ္တဝါများ၊ ရေသတ္တဝါများ၊ နှင့် သားရဲ တိရစ္ဆာန်ပိုးကောင်တို့ကို မှတ်တမ်းရယူခဲ့ပါသည်။ မှတ်တမ်းရယူခဲ့သော မျိုးစိတ်များအနက်၊ အချို့သော ကုန်းနေရေနေသတ္တဝါများ (ဖားများ)၊ မြွေများ နှင့် ငါးများကို ထိန်းသိမ်းရေး အရစိုးရိမ် ရသောမျိုးစိတ်များ (IUCN) အဖြစ် ထည့်သွင်းစဉ်းစားခဲ့ပါသည်။ စီမံကိန်းဧရိယာရှိ နေရာကို စစ်တမ်းကောက်ယူရေးဧရိယာအတွက် တမူထူးခြားနေရာအဖြစ် ထည့်သွင်းမစဉ်းစားဘဲ၊ ၎င်း မျိုးစိတ်များကို အထောက်အကူပြုနိုင်ရန်အတွက် အနီးအနားပတ်ဝန်းကျင်ထက် အရေးကြီးနိုင် ပါသည်။

**၁.၄.၄ လူမှုရေး အခြေအချက်အလက်များ**

၂၀၁၇ ခုနှစ် ဇန်နဝါရီလက နံသာပူကျေးရွာအုပ်စုအတွင်းရှိ ရပ်ကွက်အများအပြားနှင့် တိုင်ပင်ဆွေး နွေးမှုများဆောင်ရွက်ခဲ့ပြီး၊ အိမ်ထောင်စု ၅၀ ကို စစ်တမ်းကောက်ယူခဲ့ပါသည်။ ကျေးရွာအုပ်စု လူဦးရေဆိုင်ရာ အချက်အလက်များအကျဉ်းကို ဇယား ၁.၃ တွင်ဖော်ပြထားသည်။

**ဇယား ၁.၃ စီမံကိန်းဧရိယာရှိ တိုင်ပင်ဆွေးနွေးခဲ့သည့် ကျေးရွာများ၏လူဦးရေ**

စဉ်	ကျေးရွာခွဲ (ရပ်ကွက်)	အိမ်ခြေအရေအတွက်	အိမ်ထောင်စု	စုစုပေါင်း					
				၁၈ နှစ်နှင့်အောက်		၁၈ နှစ်နှင့် အထက်		စုစုပေါင်း	
				ကျား	မ	ကျား	မ	ကျား	မ
၁	ဆိပ်ကမ်း								
၂	ဇင်ဇော်ချောင်း	၁၃၁	၁၃၇	၂၄၅	၂၄၁	၂၁၅	၂၂၇	၄၆၀	၄၆၈
၃	ကျောက်ဖျာ								

စဉ်	ကျေးရွာခွဲ (ရပ်ကွက်)	အိမ်ခြေအရေအတွက်	အိမ်ထောင်စု	စုစုပေါင်း						
				၁၈ နှစ်နှင့်အောက်		၁၈ နှစ်နှင့် အထက်		စုစုပေါင်း		စုစုပေါင်း
				ကျား	မ	ကျား	မ	ကျား	မ	
၄	အလယ်ကုန်း	၈၇	၉၃	၁၂၉	၁၃၂	၁၃၅	၁၂၀	၂၆၄	၂၅၂	၅၁၆
၅	နံသာပု	၁၄၁	၁၄၆	၂၂၈	၂၂၂	၂၂၅	၂၄၂	၄၅၃	၄၆၄	၉၁၇
၆	ဂျိုင်ကလေး									
စုစုပေါင်း		၃၅၉	၃၇၆	၆၀၂	၅၉၅	၅၇၅	၅၆၇	၁၁၇၇	၁၁၈၄	၂၃၆၁

အရင်းအမြစ်။ ။ ကျေးရွာအုပ်စုအုပ်ချုပ်ရေးမှူးမှရရှိသော အချက်အလက်များ၊ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန

နံ.သာပုကျေးရွာအုပ်စုရှိ ဆိပ်ကမ်း၊ ဇင်ဇော်ချောင်း၊ ဂျိုက်ကလေး ရွာတို့ရှိ လူဦးရေ စာရင်းများမှာ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာနမှ တရားဝင်ကောက်ယူထားခြင်းမရှိပါ။ ထို့ကြောင့် အချို့ ကျေးရွာများမှ ကောက်ယူရရှိသော အချက်အလက်များကို စုပေါင်းကာ ဇယား ၁.၃ တွင် ဖော်ပြ ထားခြင်းဖြစ်ပါသည်။

ကျေးရွာတွင် သောက်သုံးရေကို ရေတွင်းများမှ ရရှိကြပါသည်။ ဤသည်မှာ ကမ်းရိုးတန်းအနီးအပါးမှ ရေချိုအပေါ် သက်ရောက်မှုမရှိနိုင်ကြောင်း သေချာစေပါသည်။

လွှမ်းခြုံနယ်မြေအတွင်းရှိ အဓိက အခြေခံအဆောက်အအုံများကို နံသာပုမှ ကားဖြင့် ၁ နာရီခန့် မောင်းရသည့် အကွာရှိ ငရုတ်ကောင်းမြို့တွင် တွေ့ရှိရပါသည်။ ၎င်းနေရာတွင် အဓိကဆေးရုံ နှင့် အလယ်တန်းကျောင်းကို တွေ့ရှိရပါသည်။

ဆွေးနွေးမှုပြုလုပ်စဉ်အတွင်း ငါးလုပ်ငန်းအပေါ် အဖွဲ့လိုက်ဆွေးနွေးမှု (FGDs) ကို ငါးလုပ်ငန်းဦးစီးဌာန (DoF) က ငရုတ်ကောင်းမြို့နှင့် နံသာပုကျေးရွာတို့တွင် ပြုလုပ်ခဲ့ပါသည်။ ငရုတ်ကောင်းဧရိယာရှိ ရေယာဉ်များမှာ ၁၂ ပေမှ ၃၆ ပေအထိ အရှည်ရှိပါသည်။ သို့ရာတွင် ကမ်းခြေမှ ၁၀ မိုင်ခန့်အကွာ အဝေးအတွင်း သွားလာကြပါသည်။ ရေယာဉ်အများစုမှာ နေ့ချင်းပြန်သာထွက်ကြပါသည်။ နံသာပုတွင်၊ ရပ်ကွက်ရှိ ရေယာဉ်များမှာ အရှည် ၂၅ ပေ နှင့် ၅၀ ပေ အကြား ရှိကြပါသည်။ ရေယာဉ်အငယ်စား ၁၅ စင်း နှင့် အကြီးစား ၁၅ စင်းရှိပါသည်။ ဤရေယာဉ်များမှာ ကမ်းရိုးတန်းရေပြင် (ကမ်းနီးငါးဖမ်းဧရာ) ရှိ ကမ်းမှ ၁၀ မိုင်အကွာထွက်ဖမ်းကြပါသည်။ အသုံးပြုသည့် ငါးဖမ်းပိုက် အမျိုးအစား မှာ မျှောပိုက် (gill net)၊ မော်ရံပိုက် (beach seine)၊ ဆွဲပိုက် (trawl) နှင့် ပိုင်းပိုက် (purse seine) ဟု အမျိုးအစား ၄ မျိုးဖြင့် ဖော်ပြကြပါသည်။ ၂၀၁၇ခုနှစ် ဇန်နဝါရီလက စီမံကိန်းနေရာသို့ သွားရောက်လေ့လာစဉ် တွေ့ရှိခဲ့သည့် လေ့အချို့ကို ပုံ ၁.၄ တွင် ဖော်ပြထားပါသည်။





စီမံကိန်းဧရိယာနှင့် ထိစပ်လျက်ရှိသော ကမ်းခြေတွင် တည်းခိုခန်းတစ်ခုရှိပြီး၊ ကျွန်းဆွယ် မြောက်ဘက်တွင်လည်း နောက် တည်းခိုခန်းတစ်ခု ရှိပါသည် (ပုံ ၅.၁၅ တွင်ကြည့်ပါ)။

#### ၁.၅ အဓိကဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ နှင့် အဆိုပြုလျှော့ချရေးအစီအမံ

##### ၁.၅.၁ လွှမ်းမိုးမှုနယ်မြေ

စီမံကိန်းလွှမ်းမိုးမှုနယ်မြေတွင် စီမံကိန်းဧရိယာ နှင့် ၎င်း၏ အနီးပတ်ဝန်းကျင်တို့ ပါဝင်သည်။ အရိုးအငွေ့ နှင့် ဆူညံသံထုတ်လွှတ်မှုများ၊ စွန့်ပစ်ပစ္စည်းစွန့်ထုတ်ခြင်း နှင့် အနည်အနှစ်များကြောင့် ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများကို စီမံကိန်းဧရိယာမှ ၅ ကီလိုမီတာထိ ကျရောက်နိုင်သည်ဟု ဤအစီရင်ခံစာတွင် မယုတ်မလွန် ယူဆတင်ပြထားပါသည်။

##### ၁.၅.၂ သက်ရောက်မှုဆန်းစစ်ခြင်း

သက်ရောက်မှုဆန်းစစ်ခြင်း အကျဉ်းကို ဇယား ၁.၃ တွင် တင်ပြထားပါသည်။

ဇယား ၁.၄ သက်ရောက်မှုများ နှင့် လျှော့ချရေးအစီအမံများ အကျဉ်း

ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ	အဆိုပြုလျှော့ချရေး အစီအမံများ	တည်ဆောက်ရေးကာလ		လုပ်ငန်းလည်ပတ်ရေးကာလ	
		သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု	သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု
ဒေသခံရပ်ရွာများ အတွက် ဖုန်မှုန့်၊ ထုတ်လွှတ်မှုများ နှင့် အနောက် အပတ်ပတ် ဖြစ်ပေါ်စေ နိုင်သည့် သက်ရောက်မှုများ	<ul style="list-style-type: none"> <li>စီမံကိန်းဧရိယာနယ်နိမိတ်တစ်လျှောက် လုပ်ငန်းခွင်ယာယီ အကာအရံ ထားရှိခြင်း။</li> <li>မြေသားများထွက်ရှိမှုကို ထိန်းချုပ်ခြင်း။</li> <li>NOx နှင့် SO<sub>2</sub> ထုတ်လွှတ်မှုများကို လျှော့ချရန် ဒီဇယ်သုံး ကိရိယာများအားလုံးကို ပုံမှန် ထိန်းသိမ်းခြင်း။</li> <li>ဖုန်မှုန့်ထိန်းချုပ်ရေးနည်းလမ်းများကို အသုံးပြုခြင်း။</li> <li>အခြားလောင်စာများ နှင့် လောင်စာအရောအနှောများကို သင့်လျော်သလိုအသုံးပြုခြင်း။</li> </ul>	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော
ဒေသခံရပ်ရွာများအတွက် အနီးဝန်းကျင်ဆူညံသံ အဆင့်မြင့်တက်လာခြင်း နှင့် အနောက်အပတ်ပတ် ဖြစ်ပေါ် စေနိုင်သည့် သက်ရောက်မှုများ	<ul style="list-style-type: none"> <li>လုပ်ငန်းခွင်တွင် စနစ်တကျထိန်းသိမ်းထားသော ကိရိယာများကိုသာ အသုံးပြု လည်ပတ်ဆောင်ရွက်စေခြင်း။</li> <li>လည်ပတ်ရသောအစိတ်အပိုင်းများကို လျှော့မွေ့စေခြင်း၊ ချောင်နေသော အစိတ်အပိုင်းများကို တင်းကျပ်စေခြင်း နှင့် ဟောင်းနွမ်းနေသော အစိတ်အပိုင်းများကို အစိုးထိုးခြင်း ကဲ့သို့သော ပစ္စည်းကိရိယာများကို ပုံမှန်ထိန်းသိမ်းခြင်း။</li> </ul>	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော
ဒေသခံရပ်ရွာများအတွက် မြင်ကွင်းဆိုင်ရာ သက်ရောက်မှုများ	<ul style="list-style-type: none"> <li>မြင်ကွင်းဆိုင်ရာ သက်သက်ရောက်မှုများကို လျှော့ချရန် ဇင်ဇော်ချောင်း နှင့် OSB တို့အကြား ခြံတည်ဆောက်ခြင်း။ OSB နှင့် ဇင်ဇော်ချောင်း တို့အကြား တိုက်ရိုက်တွေ့မြင်နိုင်မှုမရှိစေရန် လုံလောက်သော အမြင့်ရှိသော အကာအရံကို ထားရှိမည် ဖြစ်ပါသည်။</li> <li>ယာဉ်အသွားအလာစီမံ ခန့်ခွဲမှုအစီအစဉ်ကို ပြုစုသွားမည်</li> </ul>	အတော်အသင့် ဖြစ်သော	အရေးမပါသော အဆင့်မှ အတောင်အသင့်ဖြစ်သော အဆင့်	အတော်အသင့် ဖြစ်သော	အရေးမပါသော အဆင့်မှ အတောင်အသင့်ဖြစ်သော အဆင့်

ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ	အဆိုပြုလျှော့ချရေး အစီအမံများ	တည်ဆောက်ရေးကာလ		လုပ်ငန်းလည်ပတ်ရေးကာလ	
		သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု	သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု
	ဖြစ်ပါသည်။				
ဆိပ်ခံတံတားရှိနေမှုကြောင့် ကမ်းရိုးတန်းသဘာဝဖြစ်စဉ်များကို ပြောင်းလဲစေခြင်း	<ul style="list-style-type: none"> <li>သီးခြား ကမ်းရိုးတန်းသဘာဝဖြစ်စဉ်များလေ့လာခြင်းကို Royal Haskoning ကို ဆောင်ရွက်ခဲ့ပြီး ဖြစ်ပါသည်။ လေ့လာတွေ့ရှိချက်များအရ တိုက်စားမှုဆိုင်ရာ သက်ရောက်မှု များမှာ နည်းပါးမည်ဖြစ်ကြောင်း ဖော်ပြထားပါသည်။</li> </ul>	အရာမရောက်သော	အရာမရောက်သော	အရေးမပါသော	အရေးမပါသော
ရေအရည်အသွေးနှင့် အရင်းအမြစ်များအပေါ် သက်ရောက်မှု	<ul style="list-style-type: none"> <li>သင့်လျော်သော မြေပေါ်ရေနုတ်မြောင်းစနစ်ကို ရေးဆွဲပြီး လိုအပ်သလို ထောက်ပံ့ဆောင်ရွက်ခြင်း။</li> <li>ညစ်ညမ်းမှုဖြစ်ပေါ်စေနိုင်သောအရာများမှ မြေပေါ်စီးကျခြင်းကို ကာကွယ်ဆောင်ရွက်ခြင်း။</li> <li>M&amp;A OSB အနေဖြင့် ဒေသမြေအောက်ရေ အရင်းအမြစ်နှင့် ရရှိနိုင်မှုအပေါ် ထိခိုက်နိုင် လျော့နည်းစေရန် သေချာအောင် ဆောင်ရွက်ခြင်း။</li> <li>ညစ်ညမ်းမှုဖြစ်ပေါ်စေနိုင်သော အရာများမရှိသည့် နေရာများမှ စီးကျမှုကို အနည်းဆုံးဖြစ်အောင်ဆောင်ရွက်ခြင်း (ဥပမာ - စိမ့်မဝနိုင်သောမျက်နှာပြင်များကို လျှော့ချခြင်း) နှင့် စွန့်ထုတ်မှုအမြင့်ဆုံးနှုန်းကို လျှော့ချခြင်း (ဥပမာ - ရေစီးကြောင်း နှင့် ထိန်းသိမ်းရေးတွင်းများ အသုံးပြုခြင်း)။</li> </ul>	မပြောပလောက်သော	မပြောပလောက်သော	မပြောပလောက်သော	မပြောပလောက်သော
ဖိအုပ်ခြင်း နှင့် ပင်လယ်မှီခိုရာနေရာ ဆုံးရှုံးခြင်းနှင့် သောင်တူးခြင်းကြောင့် ရေအရည် အသွေး ကျဆင်းခြင်း။	<ul style="list-style-type: none"> <li>ပင်လယ်ကြမ်းပြင်ရှိ ဆောင်ရွက်သည့်ခြေရာအရွယ်အစားကို လျှော့ချခြင်း။</li> <li>ထိုခိုက်လွယ်သောမှီခိုရာနေရာများ (ဥပမာ - သန္တာကျောက်တန်း နေရာများ) တွင် တည်ဆောက်ရေးကို ရှောင်ရှားခြင်း။</li> <li>တည်ဆောက်ရေးလုပ်ငန်းစဉ်နှင့်</li> </ul>	အရေးမပါသော	အရေးမပါသော	အတော်အသင့် ဖြစ်သော	အတော်အသင့် ဖြစ်သော
		အတော်အသင့် ဖြစ်သော (သန္တာကျောက်	အတော်အသင့် ဖြစ်သော (သန္တာကျောက်	အတော်အသင့် ဖြစ်သော (သန္တာကျောက်	အတော်အသင့် ဖြစ်သော (သန္တာကျောက်တန်းများ)

ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ	အဆိုပြုလျှော့ချရေး အစီအမံများ	တည်ဆောက်ရေးကာလ		လုပ်ငန်းလည်ပတ်ရေးကာလ	
		သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု	သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု
	စီမံကိန်းလည်ပတ်စဉ်အတွင်း သော်တူးဖော်ရေးလမ်းကြောင်းများဆောင်ရွက်စဉ် အနီးအနားရှိ ထိခိုက်လွယ်နေရာများမှ အစဉ်အဆက်မြင့်တက်လာမှုကို လျှော့ချနိုင်ရန် နှုန်းထိန်းချုပ်ရေးစနစ်ဆီးများကို အသုံးပြုခြင်း။	တန်းများ)	တန်းများ)	တန်းများ)	
တဘက်စီမံပင်ခြင်း (ပြင်းအားနည်း မှရေသည် ပြင်းအားများ သည် ဘက်သို့) ဖြစ်စဉ်၏ ပြောင်းပြန် ကြောင့်ပင်လယ် သတ္တဝါ များအပေါ် သက်ရောက်ခြင်း/ ထိခိုက်ခြင်း။	<ul style="list-style-type: none"> <li>ခေတ်မီအပေါ်ရေယူစနစ်/ အပေါ်ယံအောက်လွှာရေယူ စနစ် အသုံးပြုခြင်းနှင့်</li> <li>ကာကွယ်ထိန်းသိမ်းထားသောကမ်းရိုးတန်းစားကျက်(ပင်လယ် မြက်ခင်းနှင့် သန္တာကျောက်) နှင့်ပေးရာ ဒေသတွင် စွန့်ထုတ်ခြင်း</li> </ul>	မရှိ	မရှိ	အရေးမပါသော	အရေးမပါသော
ကမ်းခြေနေရာများ ဆုံးရှုံးခြင်း နှင့် အသိုက်ပြုလုပ်မှု အလေ့အထများအပေါ် အနှောင့်အယှက်ဖြစ်ပေါ်ခြင်း	<ul style="list-style-type: none"> <li>အသိုက်များပျက်စီးမှုကို ရှောင်နိုင်ရန် လုပ်ငန်းမစတင်မီ လုပ်ငန်းဧရိယာတွင် ပင်လယ်လိပ်အသိုက်များမရှိကြောင်းကို ကန်ထရိုက်တာသည် အတည်ပြုရမည် ဖြစ်ပါသည်။</li> <li>တည်ဆောက်ရေး / လုပ်ငန်းလည်ပတ်ရေး ဧရိယာ အတွက် လုံးဝလိုအပ်သော မီးအလင်းကို လျှော့ချထားခြင်း။</li> <li>ကန်ထရိုက်တာများမှ တရားမဝင် (လိပ်)ဥများကို ကောက်ယူခြင်း ကို ပြုလုပ်မည် မဟုတ်ပါ။</li> </ul>	အတော်အသင့် ဖြစ်သော	အရေးမပါသော	အတော်အသင့် ဖြစ်သော	အရေးမပါသော
ပင်လယ်သတ္တဝါများအပေါ် အနှောင့်အယှက်ဖြစ်ပေါ်မှု	<ul style="list-style-type: none"> <li>အောက်ခံတိုင်တစ်ခုချင်းစီနှင့် တူကို ကာကွယ်ထားသည့် မျက်နှာပြင်ဖြင့် ပတ်ကာထားမည် ဖြစ်ပါသည်။</li> <li>ပင်လယ်နေ နို့တိုက်သတ္တဝါများနှင့် လိပ်များအတွက် အောက်ခံတိုင် ဆောက်ရွက်စဉ် တည်ဆောက်ရေးဧရိယာအနီးပတ်လည်တွင် မီတာ ၅၀၀ ချန်လှပ်ရန် ထားရှိသွားမည် ဖြစ်သည် ။</li> </ul>	အရေးမပါသော (ငါး)	အရေးမပါသော (ငါး)	အရာမရောက်သော	အရာမရောက်သော
		အတော်အသင့် ဖြစ်သော (ပင်လယ်လိပ်များ နှင့် အဏ္ဏဝါ	အတော်အသင့် ဖြစ်သော (ပင်လယ်လိပ်များ နှင့် အဏ္ဏဝါ		

ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ	အဆိုပြုလျှော့ချရေး အစီအမံများ	တည်ဆောက်ရေးကာလ		လုပ်ငန်းလည်ပတ်ရေးကာလ	
		သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု	သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု
		နို့တိုက်သတ္တဝါများ)	နို့တိုက်သတ္တဝါများ)		
ကုန်းတွင်းပိုင်းနေရာများ ဆုံးရှုံးခြင်း	<ul style="list-style-type: none"> <li>အဆိုပြု OSB ၏ လုပ်ငန်းခြေရာအရွယ်အစားကို ဒီဇိုင်းအဆင့်ကာလ အတွင်း လျှော့ချပြီး၊ ရှိနေပြီးသောအပင်များကို တတ်နိုင်သမျှ ထိန်းသိမ်းထားရှိမည် ဖြစ်ပါသည်။</li> <li>အကြီးမြန်သော ဒေသရင်းမျိုးစိတ်သစ်ပင်များကို စိုက်ပျိုးခြင်းဖြင့် ရှုခင်းနေရာသစ်ပင်စိုက်ခြင်းကို အကောင်အထည်ဖော်ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။</li> <li>ရှင်းလင်းစွာဘောင်ခတ်ထားမည့် အလုပ်နေရာများသို့ တည်ဆောက်ရေးလုပ်ငန်းများကို ကန့်သတ်ထားမည် ဖြစ်ပါသည်။</li> </ul>	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော
အများပြည်သူကျန်းမာရေး နှင့် ဘေးကင်းရေး၊ မတော်တဆမှုများ၊ လုံခြုံရေးကိစ္စရပ်များကို တိုးပွားလာခြင်း။	<ul style="list-style-type: none"> <li>လုပ်ငန်းခွင်သို့ မည်သူမဆိုဝင်ရောက်မှုကို ရပ်တန့်ရန် မျက်နှာစာပတ်လည်နံရံကို ထားရှိမည် ဖြစ်ပါသည်။</li> <li>M&amp;AOSB သည် ရေကြောင်းသွားလာမှုလမ်းညွှန်ချက်ကို မြန်မာအမျိုးသား သတ်မှတ်ချက်များနှင့် အညီ ရေယာဉ်များအားလုံးသို့ ထောက်ပံ့ပေးသွားမည် ဖြစ်ပါသည်။</li> <li>ယာဉ်များရွေ့လျားမှုနှင့်ပတ်သက် အခြားအပိုင်းတွင် ဆွေးနွေး တင်ပြထားသကဲ့သို့ M&amp;AOSB သည် ရေယာဉ်သွားလာမှုများနှင့် ပတ်သက်၍ ရေလုပ်သားများသို့ပုံမှန်ဆက်သွယ်ရေးကို လိုအပ်သလို ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။</li> <li>ဆောက်လုပ်ရေးလုပ်ငန်းများ ဆောင်ရွက်စဉ်အတွင်း အလုပ်သမား ၇၀ ရာနှုန်းခန့် ကို မြန်မာနိုင်ငံသား များသာ အသုံးပြု မည်။</li> <li>သက်ဆိုင်သူများနှင့် ဆွေးနွေးညှိနှိုင်းမှုများအရ၊ စီမံကိန်းအနီး</li> </ul>	အတော်အသင့် ဖြစ်သော	အရေးမပါသော	အတော်အသင့် ဖြစ်သော	အရေးမပါသော

ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ	အဆိုပြုလျှော့ချရေး အစီအမံများ	တည်ဆောက်ရေးကာလ		လုပ်ငန်းလည်ပတ်ရေးကာလ	
		သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု	သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု
	<p>ဝန်းကျင်နေထိုင်သူများအား ဖြတ်သန်းသွားလာခြင်းကြောင့် ဖြစ်ပေါ်လာနိုင်သည့် အကျိုးဆက်များနှင့် အန္တရာယ်များကို အကြောင်းကြားမည်။ တည်ဆောက်ရေးမစတင်မီ ညှိနှိုင်းမှုများ ဆောင်ရွက်သွားမည်။</p> <ul style="list-style-type: none"> <li>စီမံကိန်းလုပ်ငန်းခွင် သို့မဟုတ်သွယ်မည့် လမ်း အတည်ပြုပြီးပါက၊ ယဉ်သွားလာမှု အစီမံကို M&amp;AOSB ကရေးဆွဲ သွားမည်။ ၎င်းတွင် ဖြတ်သန်းသွားလာရမည့်လမ်းကြောင်းနှင့် အရှိန်နှုန်း ကန်သတ်ချက်တို့ဒေသခံများ ဘေးအန္တရာယ်ကင်းရှင်းစေရန် သတ်မှတ်ဆောင်ရွက် သွားမည်။</li> <li>စီမံကိန်းဆောက်လုပ်ရေးလုပ်ငန်းနှင့်သက်ဆိုင်သော ယဉ်များအတွက် အရှိန်နှုန်းကန်သတ်ထားမည်။ အမြန်နှုန်းမှာ တစ်နာရီ ၄၀ ကီလိုမီတာနှုန်းဖြစ် သတ်မှတ်မည်။</li> </ul>				
အသက်မွေးဝမ်းကျောင်းလုပ်ငန်းများ နှင့် စီးပွားရေး၊ အလုပ်အကိုင် ဖန်တီးခြင်း၊ ငါးဖမ်းခြင်းအပေါ် သက်ရောက်မှုများ။	<ul style="list-style-type: none"> <li>ဆောင်ရွက်နေသော လည်ပတ်ရေးလုပ်ငန်းများအပေါ် အနှောင့်အယှက် အနည်းဆုံးဖြစ်စေရန် နှင့် အန္တရာယ် သို့မဟုတ် ပင်လယ်တွင်း မတော်တဆမှုများကို လျှော့ချနိုင်ရန် ရေယာဉ် အသွားအလာများနှင့် ပတ်သက်၍ ဆိပ်ကမ်းအာဏာပိုင်နှင့် သင့်လျော်သလို ဆွေးနွေးသင့်ပါသည်။</li> <li>ဧရိယာအတွင်း အခြားရေယာဉ်များကို လုံလောက်သော သတိပေး နိုင်ရန် ရေကြောင်းသွားလာရေး မီးအလင်းများ၊ ဧရိယာမီးအလင်း များ၊ ရေကြောင်းသွားလာမှု / ဆက်သွယ်မှု ကိရိယာ နှင့် ရေဒါရောင်းပြန်ပြားများအပါအဝင် ကောင်းမွန် သောရေကြောင်းပြ သတိပေးကိရိယာများဖြင့် သင့်လျော်သလို ဆိပ်ခံတံတားနှင့် ရေယာဉ်များကို မီးလင်းဆောင်ရွက်သွားမည်</li> </ul>	အပြုသဘော ဆောင်သော (အလုပ်အကိုင် များ ဖြစ်ပေါ် စေခြင်း)	အပြုသဘော ဆောင်သော (အလုပ်အကိုင် များ ဖြစ်ပေါ် စေခြင်း)	အပြုသဘော ဆောင်သော (အလုပ်အကိုင် များ ဖြစ်ပေါ်စေခြင်း)	အပြုသဘော ဆောင်သော (အလုပ်အကိုင် များ ဖြစ်ပေါ်စေခြင်း)
		အရေးမပါသော (ငါးဖမ်းလုပ်ငန်းနှင့် အသက်မွေးဝမ်းကျောင်း လုပ်ငန်းများ)	အရေးမပါသော (ငါးဖမ်းလုပ်ငန်းနှင့် အသက်မွေးဝမ်းကျောင်း လုပ်ငန်းများ)	အရေးမပါသော (ငါးဖမ်းလုပ်ငန်းနှင့် အသက်မွေးဝမ်းကျောင်း လုပ်ငန်းများ)	အရေးမပါသော (ငါးဖမ်းလုပ်ငန်းနှင့် အသက်မွေးဝမ်းကျောင်း လုပ်ငန်းများ)



ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ	အဆိုပြုလျှော့ချရေး အစီအမံများ	တည်ဆောက်ရေးကာလ		လုပ်ငန်းလည်ပတ်ရေးကာလ	
		သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု	သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု
	<p>ဖြစ်ပါသည်။</p> <ul style="list-style-type: none"> <li>တည်ဆောက်ရေးလုပ်ငန်းများ၊ အပြီးသတ်အလုပ်စီမံခန့်ခွဲမှု၊ အစီအစဉ်များ နှင့် အသေးစိတ်ကန့်သတ်ချက်များကို သက်ဆိုင်ရာ အာဏာပိုင်များ နှင့် သက်ဆိုင်သူများ (ဥပမာ - ဒေသခံငါးလုပ်ငန်း များ နှင့် ခရီးသွားလာရေးလုပ်ငန်းဆောင်ရွက်သူများ၊ ငါးလုပ်ငန်း/ ခရီးသွားလာရေးအသင်းအဖွဲ့များ၊ နှင့် ဒေသခံကျေးရွာသူ ကျေးရွာသားများ) သို့ အနည်းဆုံး လေးပတ် ကြိုတင်၍ အသိပေးသွားမည် ဖြစ်ပါသည်။</li> </ul>				
လုပ်ငန်းခွင်ဆိုင်ရာ ကျန်းမာရေး နှင့် ဘေးကင်းရေး၊ အလုပ်သမားများ သေဆုံးမှု သို့မဟုတ် ထိခိုက်ဒဏ်ရာရရှိမှု။	<ul style="list-style-type: none"> <li>စီမံကိန်း၏ လိုအပ်ချက်အရစီစဉ်ထားသော EMP စနစ်၏ အစိတ်အပိုင်းအနေဖြင့် လုပ်ငန်းခွင်ကျန်းမာရေး နှင့် ဘေးကင်းရေး စီမံခန့်ခွဲမှုအစီအစဉ်ကို စီမံကိန်းမှ ဒီဇိုင်းရေးဆွဲသွားမည် ဖြစ်ပါသည်။</li> <li>စီမံကိန်းသည် ကျန်းမာရေး နှင့် ဘေးကင်းရေးစီမံခန့်ခွဲမှုစနစ်ကို စီမံကိန်းအတွက် ဖန်တီးအကောင်အထည်ဖော် ဆောင်ရွက် သွားမည် ဖြစ်ပါသည်။</li> </ul>	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော
အစိုးအငွေ့ နှင့် ဆူညံမှု ဖြစ်ပေါ်ခြင်း နှင့် ကမ်းခြေသို့လာရောက်လည်ပတ်မှု ကို ကန့်သတ်ခြင်းကြောင့် ခရီးသွားလာရေးအပေါ် သက်ရောက်မှုများ	<ul style="list-style-type: none"> <li>အထက်ဖော်ပြပါ လျှော့ချရေးအစီအမံများကို ဆောင်ရွက်ခြင်း။</li> </ul>	အတော်အသင့် ဖြစ်သော	အတော်အသင့် ဖြစ်သော	အတော်အသင့် ဖြစ်သော	အတော်အသင့် ဖြစ်သော

ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ	အဆိုပြုလျှော့ချရေး အစီအမံများ	တည်ဆောက်ရေးကာလ		လုပ်ငန်းလည်ပတ်ရေးကာလ	
		သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု	သက်ရောက်မှု၏ အရေးပါမှု (လျှော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု
စွန့်ပစ်ပစ္စည်း စွန့် ထုတ်ခြင်း နှင့် စွန့်ပစ်ခြင်းတို့မှ လူများ နှင့် သဘာဝပတ်ဝန်းကျင် အပေါ် သက်ရောက်မှု	<ul style="list-style-type: none"> <li>စွန့်ပစ်ပစ္စည်း သိုလှောင်မှုအတွက် စနစ်ကျသော သန့်ရှင်းရေး အလေ့အကျင့်များ ဖြင့် စွန့်ပစ်ပစ္စည်းနှင့် ဆက်စပ်သည့် သက်ရောက်မှုများကို စီမံခန့်ခွဲခြင်း နှင့် M&amp;AOSB မှ ပြုစုထားသော စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု အစီအစဉ် (WMP) ဖြင့် ထောက်ပံ့ပေးသည့် ကိုင်တွယ်ဖြေရှင်းခြင်း။</li> <li>မှာကုန်များ၊ ညံ့ဖျင်းသော သိုလှောင်မှု နှင့် ထိန်းသိမ်းမှု၊ ညံ့ဖျင်းစွာစီမံခန့်ခွဲမှု နှင့် စနစ်မကျသော လည်ပတ်မှု အခြေအနေများကို ရှောင်ရန် တည်ဆောက်ရေး ပစ္စည်းများနှင့် ပတ်သက်၍ စီမံခန့်ခွဲသွားမည် ဖြစ်ပါသည်။</li> <li>သီးသန့်ခွဲထားသော စွန့်ပစ်ပစ္စည်းများကို လုပ်ငန်းခွင်တွင် ပြန်လည်အသုံးပြုနိုင်ရန် အတွက် သတ်မှတ်ထားသည့် ဧရိယာများတွင် ယာယီ သိုလှောင်းသွားမည် ဖြစ်ပါသည်။</li> <li>စွန့်ပစ်ပစ္စည်းများကို ပုံမှန် ကောက်ယူခြင်း။</li> </ul>	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော
ယိုဖိတ်မှု နှင့် ယိုစိမ့်မှုများမှ သက်ရောက်မှု	<ul style="list-style-type: none"> <li>အန္တရာယ်ရှိသော ပစ္စည်းများ ကိုင်တွယ်ခြင်း / သိုလှောင်ခြင်း / ပြောင်းရွှေ့ခြင်း တို့အတွက် စံပြုထားသောလည်ပတ်ရေး လုပ်ထုံးလုပ်နည်းများကို အသုံးပြုခြင်း။</li> <li>လောင်စာသိုလှောင်ရေးဧရိယာကို အထိန်းထားပေးခြင်း၊</li> <li>ပိုမိုကြီးမားသည့် ရေယာဉ်များအတွက် သင်္ဘောကုန်းပေါ် ဆီယိုဖိတ်မှု အရေးပေါ်အစီအစဉ်များ (MARPOL သတ်မှတ်ချက်များ) ထားရှိခြင်း။</li> <li>ဆီများ ယိုဖိတ်မှုတို့အတွက် M&amp;AOSB ပံ့ပိုးရေးစခန်း ဆီယိုဖိတ်မှု တုံ့ပြန်ရေး အစီအစဉ် နှင့် ၎င်းနှင့်ဆက်နွှယ်သော တုံ့ပြန်ရေး လုပ်ထုံးလုပ်နည်းများ / ကာကွယ်ရေးအစီအမံများ ထားရှိခြင်း။</li> <li>အရေးပေါ်အခြေအနေများတွက် တုံ့ပြန်ဆောင်ရွက်မှုအစီအ</li> </ul>	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော	အရေးမပါသော



ဖြစ်ပေါ်လာနိုင်သည့် သက်ရောက်မှုများ	အဆိုပြုလျော့ချရေး အစီအမံများ	တည်ဆောက်ရေးကာလ		လုပ်ငန်းလည်ပတ်ရေးကာလ	
		သက်ရောက်မှု၏ အရေးပါမှု (လျော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု	သက်ရောက်မှု၏ အရေးပါမှု (လျော့ချရေး မလုပ်မီ)	ကြွင်းကျန်သက် ရောက်မှု၏ အရေးပါမှု
	<p>စဉ် ကိုတည်ဆောက်ရေးလုပ်ငန်းများ မစတင်မီ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာနသို့ ပေးပို့သွားမည်။</p> <ul style="list-style-type: none"> <li>ဒုတိယဆင့်ထိန်းချုပ်ရေးအနေဖြင့် အန္တရာယ်ရှိအရည်စီးဆင်းခြင်း သောအဟန့်အတား နှင့် ဓာတုဓာတ်ပြုခြင်း ခံနိုင်သော ပစ္စည်းတည်ဆောက်ခြင်းတို့ဆောင်ရွက်သွားမည်ဖြစ်ပြီး အကြီးဆုံး လှောင်ကန်၏ ၁၁၀ ရာနှုန်း၊ စုပေါင်းလှောင်ကန်၏ ၂၅ ရာနှုန်းခန့်ကို ကိုင်တွယ်နိုင်မည်။</li> <li>လောင်စာဆီကို မြေအောက်လှောင်ကန်များတွင် မသိုလှောင်ရပါ။</li> <li>လောင်စာကန်မှ ယဉ်များသို့ဆီဖြည့်ရာတွင် လျော့စောက်ဖြင့် စုကန်အတွင်းစီးပြီး စိမ့်ဝင်ခြင်းမရှိသော အဟန့်အတားများ ထားရှိမည်။</li> </ul>				

**သက်ဆိုင်သူများနှင့် ဆက်ဆံတိုင်ပင်ခြင်း**

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ကာလအတွင်း၊ ငပုတောရှိ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန (GAD) ရုံး၌ အစည်းအဝေးတစ်ရပ် နှင့် နံ့သာပုကျေးရွာအုပ်စု၌ အစည်းအဝေးတစ်ရပ် ပြုလုပ် ဆောင်ရွက်ခဲ့ပါသည်။ ငပုတောအစည်းအဝေးကို အစိုးရဝန်ထမ်း ၂၀၀ ကျော်တက်ရောက်ခဲ့ပါသည်။ နံ့သာပုတွင်၊ ရပ်ကွက် ခြောက်ခုမှ လူ ၆၀ ဦးခန့် အစည်းဝေးသို့ တက်ရောက်ခဲ့ပါသည်။ အရပ်ဘက် လူ့အဖွဲ့အစည်းများ (CSOs) လည်း အစည်းအဝေးသို့တက်ရောက်ခဲ့ပါသည်။ နေ့စွဲ၊ အချိန်၊ နေရာ၊ သက်ဆိုင်သူများနှင့် အစည်းအဝေးတစ်ခုချင်းစီ၏ ရည်ရွယ်ချက်ကို **ဇယား ၁.၅** တွင် တင်ပြထား ပါသည်။

**ဇယား ၁.၅ ဆောင်ရွက်ခဲ့သည့် တိုင်ပင်ဆွေးနွေးမှုလုပ်ငန်းများ**

နေ့စွဲ၊ အချိန်၊ နေရာ	သက်ဆိုင်သူများ	တွေ့ဆုံမှု၏ ရည်ရွယ်ချက်
၂၀၁၇ ဖေဖော်ဝါရီလ ၂၈ ရက်၊ ငပုတော	ငပုတောမြို့နယ် GAD	<ul style="list-style-type: none"> <li>စီမံကိန်းသက်ရောက်မှုများ နှင့် EIA တွေ့ရှိချက်များဆိုင်ရာ သတင်းအချက်အလက်များကို တင်ပြခြင်း။</li> <li>ဧရာဝတီတိုင်းဒေသကြီး (ငရုတ်ကောင်း) တွင် ဆွေးနွေးမှုများ ဆောင်ရွက်ရန် လိုအပ်သော ခွင့်ပြုချက်များတောင်းခံခြင်း။</li> </ul>
၂၀၁၇ မတ်လ ၃ ရက်၊ နံ့သာပုကျေးရွာအုပ်စု	နံ့သာပု ကျေးရွာသူ ကျေးရွာသားများ	<ul style="list-style-type: none"> <li>အိမ်ထောင်စု ၅၀ စစ်တမ်းကောက်ခြင်း။</li> </ul>
၂၀၁၇ မတ်လ ၂ ရက်၊ ငရုတ်ကောင်း နှင့် ဂေါ်ရန်ဂျီကျွန်း	စီမံကိန်းဧရိယာလုပ်ငန်း ခွင်လေ့လာခြင်း၊ ဂေါ်ရန်ဂျီ ကျွန်း နှင့် ငရုတ်ကောင်း ပင်လယ်အော်	<ul style="list-style-type: none"> <li>ခရီးသွားလာရေးလုပ်ငန်းဆောင်ရွက်သူများထံမှ သတင်း အချက်အလက်များကောက်ယူစုဆောင်းခြင်း။</li> <li>ကျွန်းတွင်းပိုင်း နှင့် ပင်လယ် ပတ်ဝန်းကျင်ဆိုင်ရာ သတင်းအချက်အလက်များ ကောက်ယူစုဆောင်းခြင်း။</li> </ul>
၂၀၁၇ မတ်လ ၃ ရက်၊ နံ့သာပုကျေးရွာအုပ်စု	နံ့သာပုရှိ ကျေးရွာသူ ကျေးရွာသားများ နှင့် CSO	<ul style="list-style-type: none"> <li>စီမံကိန်းသက်ရောက်မှုများ နှင့် EIA တွေ့ရှိချက်များဆိုင်ရာ သတင်းအချက်အလက်များကို တင်ပြခြင်း။</li> <li>စီမံကိန်းကြောင့် ထိခိုက်ခံစားရနိုင်ဖွယ်ရှိသော ရပ်ရွာများ နှင့် လူများနှင့် ပတ်သက်သည့် သတင်းအချက်အလက်များ ကောက်ယူစုဆောင်းခြင်း။</li> </ul>

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအတွက် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးမှုအတွင်း မေးမြန်းခဲ့သည့် အဓိကမေးခွန်းများတွင် ရေလုပ်ငန်းအပေါ် သက်ရောက်မှုများ နှင့် နှစ်နာချက်များကို တိုင်ကြားနိုင်သည့် ယန္တရားစနစ်၊ အလုပ်အကိုင်အခွင့်အလမ်းများ နှင့် ဒေသရပ်ရွာများအပေါ် စီမံကိန်းမှ စွန့်ထုတ်မှုများအကြောင်းတို့ ပါဝင်ပါသည်။ ဤကိစ္စရပ်များကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ၌ သင့်လျော်သောနေရာများတွင် ထည့်သွင်းဆန်းစစ်ခဲ့ပါသည်။

**ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်**

အဆိုပြုစီမံကိန်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်တစ်ရပ်ကို ပြင်ဆင်ရေးသားခဲ့ပြီး၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီ အစဉ်သည် စီမံကိန်းသက် တမ်းကာလတစ်လျှောက် အကောင်အထည် ဖော်ဆောင်ရွက်မည့် လိုက်နာ ဆောင်ရွက်ရမည့်သတ်မှတ်ချက်

များ၊ လျော့ချရေးအစီအမံများ၊ နှင့် စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရေး အစီအစဉ်များကို ရေးဆွဲလျက် ပတ်ဝန်းကျင် နှင့် လူမှုစီမံခန့်ခွဲမှု မူဘောင်တစ်ရပ်ကို တင်ပြရန် ရည်ရွယ်ပါသည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) သည် ကမ်းလွန်တူးဖော်ရေးလုပ်ငန်းများကို ဆောင်ရွက်စဉ် ကာလအတွင်း ပတ်ဝန်းကျင် နှင့် လူမှုဆန်းစစ်ချက်များ၏ တွေ့ရှိချက်များအရ အကောင်အထည် ဖော်ဆောင်ရွက်ရမည့် နည်းစနစ် ဖြစ်ပါသည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်၏ နယ်ပယ်တွင် ယခု ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာ (အပိုင်း ၁.၃ တွင် အကျဉ်းချုပ်တင်ပြ ထားပါသည်) ပါ ပြဋ္ဌာန်းထားသည့် လုပ်ငန်း များအားလုံး ပါဝင်ပါသည်။ ရည်ရွယ်ချက်မှာ သက်ဆိုင်ရာ နိုင်ငံတော်အဆင့် နှင့် နိုင်ငံတကာအဆင့် ဥပဒေတို့ဖြင့် အညီဆောင်ရွက်နိုင်ရန် ဖြစ်ပါသည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်သည် စီမံကိန်း၏ ကတိကဝတ်များအားလုံးကို စာရင်းပြုစုထားပြီး၊ စီမံကိန်းအတွက် ဆောင်ရွက်မည့်အစီအစဉ်များကို ဖော်ပြထားပါသည်။ M&A OSB ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းနှင့်အညီ စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရေး အစီရင်ခံစာကို သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဝန်ကြီးဌာန (MONREC)သို့ ခြောက်လ တစ်ကြိမ်ကျစီ တင်သွင်းသွားမည် ဖြစ်ပါသည်။

ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမှုအကျဉ်းကိုကို ဇယား ၁.၆ တွင် တင်ပြထားပါသည်။

**ဇယား ၁.၆ အစီရင်ခံစာတင်ပြရေး နှင့် စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရေး သတ်မှတ်ချက်များ အကျဉ်းတင်ပြခြင်း**

စီမံကိန်းလုပ်ငန်း/ ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရေး အစီအမံများ	အကြိမ်အရေအတွက်	တာဝန်ရှိခြင်း
တည်ဆောက်ရေးကာလ			
ထုတ်လွှတ်အနီးအငွေ့ထုတ်လွှတ်မှုကို ဇင်ဇော်ချောင်း၌ တိုင်းတာမည် ဖြစ်ပါသည်။ SOx, NOx, PM2.5 နှင့် PM10 စသည့်တို့ကို တိုင်းတာမည်ဖြစ်ပါသည် (အနီးဆုံးလက်ခံရရှိမည်နေရာ)။	ထုတ်လွှတ်အနီးအငွေ့ထုတ်လွှတ်မှုကို ဇင်ဇော်ချောင်း၌ တိုင်းတာမည် ဖြစ်ပါသည်။ SOx, NOx, PM2.5 နှင့် PM10 စသည့်တို့ကို တိုင်းတာမည်ဖြစ်ပါသည် (အနီးဆုံးလက်ခံရရှိမည်နေရာ)။	တည်ဆောက်ရေးကာလနှင့် လုပ်ငန်းခွင် ရှင်းလင်းရေးကာလ အတွင်း တစ်လ တစ်ကြိမ်။ အဆင့်များသည် NEG လမ်းညွှန်ချက်များ အတွင်း ရောက်ရှိနေလျှင်နောက် ထပ်စောင့်ကြည့်မှုကို မလိုအပ်ပါ။	M&A OSB/ တတိယအဖွဲ့ အစည်း
ဆူညံသံထုတ်လွှတ်မှု နောက် တစ်ကြိမ်၊ ညဘက် တစ်ကြိမ် တိုင်းတာမည်ဖြစ်ပါသည် (အနီးဆုံးလက်ခံရရှိမည်နေရာ)။	ဆူညံသံအဆင့်ကို ဇင်ဇော်ချောင်း၌ နောက် တစ်ကြိမ်၊ ညဘက် တစ်ကြိမ် တိုင်းတာမည်ဖြစ်ပါသည် (အနီးဆုံးလက်ခံရရှိမည်နေရာ)။	တည်ဆောက်ရေးကာလနှင့် လုပ်ငန်းခွင် ရှင်းလင်းရေးကာလ အတွင်း တစ်လ တစ်ကြိမ်။ အဆင့်များသည် NEG လမ်းညွှန်ချက်များအတွင်း ရောက်ရှိနေလျှင်၊ နောက်ထပ်စောင့်ကြည့်မှုကို မလိုအပ်ပါ။	M&A OSB/ တတိယအဖွဲ့ အစည်း

စီမံကိန်းလုပ်ငန်း/ ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရေး အစီအမံများ	အကြိမ်အရေအတွက်	တာဝန်ရှိခြင်း
အက္ကဝါ အနည်အနှစ်	သောင်တူးခြင်းလုပ်ငန်းများမှ ညစ်ညမ်းမှုများမရှိစေရန် အက္ကဝါ အနည်အနှစ် တိုင်းတာခြင်းကို ဆောင် ရွက်မည်ဖြစ်ပါသည်။ WBG ၏ လမ်းညွှန်ချက်များနှင့်အညီ အောက်ပါ သတ်မှတ်ချက်များကို တိုင်းတာပါမည်။	သောင်းတူးခြင်းလုပ်ငန်းဆောင်ရွက်မှု ပြီးလျှင်၊ တိုင်းတာခြင်းကို ဆောင် ရွက်မည်ဖြစ်ပါသည်။ အဆင့်များသည် (NEQEG နှင့် WBG EHS ၏ လမ်းညွှန်ချက်များ) ခွင့်ပြု အတိုင်းအဆအတွင်း ရောက်ရှိနေ လျှင်၊ တိုင်းတာခြင်းကို ရပ်စဲမည်ဖြစ်ပါသည်။	M&A OSB/ တတိယအဖွဲ့ အစည်း
အက္ကဝါ သတ္တဝါ နှင့် အပင်များ	တည်ဆောက်ရေးကာလ သောင်တူး စဉ်အတွင်း၊ ဆိပ်ခံတံတား၏ အရှေ့ဘက်သို့ဦးတည်သော ဘက်တွင် အနည်အနှစ်များပို့တက်လာခြင်းကို T2 transect (ဆိပ်ခံတံတားအရှေ့ဘက်) ရှိ သန္တာကျောက်တန်းများရှိနေ မှုအပေါ်အခြေခံ၍ လေ့လာသင့်ပါသ ည်။ ပတ်ဝန်းကျင် အခြေခံအချက်အလက် များ ကောက်ယူစဉ်က တွေ့ရှိသော သန္တာကျောက်တန်းမျိုးစိတ်များကို သက်ရောက်မှုမရှိစေရန် ၎င်းကို တိုင်းတာခြင်းဖြစ်ပါသည်။	စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးခြင်းကို တည်ဆောက်ရေးကာလ သောင်တူး စဉ်အတွင်း ဆောင်ရွက်ပါမည်။	M&A OSB/ တတိယအဖွဲ့ အစည်း
စွန့်ပစ်ပစ္စည်း	M&A OSB HSE အဖွဲ့သည် ကန်ထရိုက်တာမှ လက်ခံရရှိသော လစဉ်စွန့်ပစ်ပစ္စည်းအစီရင်ခံစာ နှင့် MONREC စွန့်ပစ်ပစ္စည်း စွန့် ထုတ်ခြင်း အစီရင်ခံစာများကို သုံးသပ်မည်ဖြစ် ပါသည်။	စွန့်ပစ်ပစ္စည်းကို တစ်လတစ်ကြိမ် စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမည်ဖြစ် ပါသည်။	M&A OSB HSE အဖွဲ့
ထိခိုက်မှုနှင့် မတော်တဆထိခိုက်မှု များ အစီရင်ခံခြင်း	EIA လုပ်ထုံးလုပ်နည်းအရ M&A OSB သည် MONREC နှင့် MOGE ကို ယိုစိမ့်မှုနှင့် ယိုဖိတ်မှုများအား အစီရင်ခံပါမည်။ ထိခိုက်မှုများနှင့် ပျက်ကွက်မှုများကို MONREC ထံ အစီရင်ခံပါမည်။	EIA လုပ်ထုံးလုပ်နည်းအရ ပမာဏကြီးမားသောယိုဖိတ်မှုများကို ၂၄ နာရီအတွင်း အစီရင်ခံရပါမည်။ ပမာဏကြီးမားသည့် ယိုဖိတ်မှုဆိုသည်မှာ M&A အဖွဲ့မှ မသန်စင်နိုင်သည့်၊ ပြင်ပအစီအမံများ လိုအပ်သည့် ယိုဖိတ်မှု ကို ဆိုလို သည်။	M&A OSB HSE အဖွဲ့

စီမံကိန်းလုပ်ငန်း/ ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရေး အစီအမံများ	အကြိမ်အရေအတွက်	တာဝန်ရှိခြင်း
လုပ်ငန်းလည်ပတ်ရေးကာလ			
ထုတ်လွှတ်အနီးအငွေ့	ထုတ်လွှတ်အနီးအငွေ့ထုတ်လွှတ်မှုကို ဇင်ဇော်ချောင်း၌ တိုင်းတာမည် ဖြစ်ပါသည်။ SOx, NOx, PM2.5 နှင့် PM10 စသည်တို့ကို တိုင်းတာမည်ဖြစ်ပါသည် (အနီးဆုံးလက်ခံရရှိမည်နေရာ)။	လုပ်ငန်းလည်ပတ်ရေးကာလအတွင်း ခြောက်လ တစ်ကြိမ်။ အဆင့်များသည် NEQEG လမ်းညွှန်ချက်များ အတွင်း ရောက်ရှိနေလျှင်၊ စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးခြင်းကို ရပ်စဲမည်ဖြစ်ပါသည်။	M&A OSB/ တတိယအဖွဲ့ အစည်း
ဆူညံသံထုတ်လွှတ်မှု	ဆူညံသံအဆင့်ကို ဇင်ဇော်ချောင်း၌ နေ့ဘက် တစ်ကြိမ်၊ ညဘက် တစ်ကြိမ် တိုင်းတာမည်ဖြစ်ပါသည် (အနီးဆုံးလက်ခံရရှိမည်နေရာ)။	လုပ်ငန်းလည်ပတ်ရေးကာလနှင့် နေ့ဘက်၊ ညဘက် နှင့် ဆူညံသံထွက်သည့် လုပ်ငန်းများ ဆောင်ရွက်နေစဉ်အ တွင်း တစ်လ တစ်ကြိမ်။ အဆင့်များသည် NEQ လမ်းညွှန်ချက်များအတွင်း ရောက်ရှိနေလျှင်၊ နောက်ထပ်စောင့်ကြည့်မှုကို မလိုအပ်ပါ။	M&A OSB/ တတိယအဖွဲ့ အစည်း
အညစ်အကြေးများစွန့် ပစ်ခြင်းနှင့် ပင်လယ်ရေ အရည်အသွေး	သန့်စင်ပြီး ရေဆိုးများကို NEQEG နှင့် WBG EHS လမ်းညွှန်ချက်များနှင့်အညီ အောက်ပါသတ်မှတ်ချက်များအတွက် တိုင်းတာပါမည်။	လုပ်ငန်းလည်ပတ်ရေးကာလအတွင်း ခြောက်လ တစ်ကြိမ်။ အဆင့်များသည် NEQEG နှင့် WBG EHS လမ်းညွှန်ချက်များ၏ ခွင့်ပြု အတိုင်းအဆအတွင်း ရောက်ရှိနေ လျှင်၊ စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးခြင်း အကြိမ်အရေအတွက်ကို နှစ် အလိုက် လျော့ချမည် ဖြစ်ပါသည်။	M&A OSB/ တတိယအဖွဲ့ အစည်း
အကူအညီအနစ်	သောင်းတူးခြင်းလုပ်ငန်းများမှ ညစ်ညမ်းမှုများမရှိစေရန် အကူအညီ အနစ်အနစ် တိုင်းတာခြင်းကို ဆောင် ရွက်မည်ဖြစ်ပါသည်။ WBG ၏ လမ်းညွှန်ချက်များနှင့်အညီ အောက်ပါ သတ်မှတ်ချက်များကို တိုင်းတာပါမည်။	သောင်းတူးခြင်းလုပ်ငန်းဆောင်ရွက်မှု ပြီးလျှင်၊ တိုင်းတာခြင်းကို ဆောင် ရွက်မည်ဖြစ်ပါသည်။ အဆင့်များသည် (NEQEG နှင့် WBG EHS ၏ လမ်းညွှန်ချက်များ) ခွင့်ပြု အတိုင်းအဆအတွင်း ရောက်ရှိနေ လျှင်၊ တိုင်းတာခြင်းကို ရပ်စဲမည်ဖြစ်ပါသည်။	M&A OSB/ တတိယအဖွဲ့ အစည်း

စီမံကိန်းလုပ်ငန်း/ ပတ်ဝန်းကျင်ဆိုင်ရာ ကဏ္ဍ	စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရေး အစီအမံများ	အကြိမ်အရေအတွက်	တာဝန်ရှိခြင်း
အဏ္ဏဝါ သတ္တဝါ နှင့် အပင်များ	လုပ်ငန်းလည်ပတ်ရေးကာလ သောင်တူးစဉ်အတွင်း၊ ဆိပ်ခံတံတား၏ အရှေ့ဘက်သို့ဦးတည်သော ဘက်တွင် အနည်အနှစ်များ ပို့တက်လာခြင်းကို T2 transect (ဆိပ်ခံတံတားအရှေ့ဘက်) ရှိ သွန္တာကျောက်တန်းများရှိနေ မှုအပေါ်အခြေခံ၍ လေ့လာသင့်ပါသ ည်။ ပတ်ဝန်းကျင် အခြေခံအချက်အလက် များ ကောက်ယူစဉ်က တွေ့ရှိသော သွန္တာကျောက်တန်းမျိုးစိတ်များကို သက်ရောက်မှုမရှိစေရန် ၎င်းကို တိုင်းတာခြင်းဖြစ်ပါသည်။	လုပ်ငန်းလည်ပတ်ရေးကာလအတွင်း လုပ်ငန်းစတင်ချိန်မှ အနည်းဆုံး ၂ နှစ် ထိ စောင့်ကြပ်ကြည့် ရှုစစ်ဆေးခြင်းကို ဆောင်ရွက်သင့် ပါသည်။ ပြောင်းလဲမှု မရှိလျှင်၊ စောင့် ကြပ်ကြည့်ရှုစစ်ဆေးခြင်းကို ရပ်စဲပါမည်။	M&A OSB/ တတိယအဖွဲ့၊ အစည်း
စွန့်ပစ်ပစ္စည်း	M&A OSB HSE အဖွဲ့သည် ကန်ထရိုက်တာမှ လက်ခံရရှိသော လစဉ်စွန့်ပစ်ပစ္စည်းအစီရင်ခံစာ နှင့် MONREC စွန့်ပစ်ပစ္စည်း စွန့် ထုတ်ခြင်း အစီရင်ခံစာများကို သုံးသပ်မည်ဖြစ် ပါသည်။	စွန့်ပစ်ပစ္စည်းကို တစ်လတစ်ကြိမ် စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးမည်ဖြစ် ပါသည်။	M&A OSB HSE အဖွဲ့
ထိခိုက်မှုနှင့် မတော်တဆထိခိုက်မှု များ အစီရင်ခံခြင်း	EIA လုပ်ထုံးလုပ်နည်းအရ M&A OSB သည် MONREC နှင့် MOGE ကို ယိုစိမ့်မှုနှင့် ယိုဖိတ်မှုများအား အစီရင်ခံပါမည်။ ထိခိုက်မှုများနှင့် ပျက်ကွက်မှုများကို MONREC ထံ အစီရင်ခံပါမည်။	EIA လုပ်ထုံးလုပ်နည်းအရ ပမာဏကြီးမားသောယိုဖိတ်မှုများကို ၂၄ နာရီအတွင်း အစီရင်ခံရပါမည်။ ပမာဏကြီးမားသည့် ယိုဖိတ်မှုဆိုသည်မှာ M&A အဖွဲ့မှ မသန်စင်နိုင်သည့် ပြင်ပအစီအမံများ လိုအပ်သည့် ယိုဖိတ်မှု ကို ဆိုလို သည်။	M&A OSB HSE အဖွဲ့

၁.၈

### နိဂုံး နှင့် အကျဉ်းချုပ်ချက်များ

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလေ့လာမှုသည် ငရုတ်ကောင်းရှိ စီမံကိန်းနှင့် ဆက်နွယ်နေသော သက်ရောက်မှုများကို အလေးပေးခဲ့ပါသည်။ သက်ရောက်မှုများသည် လည်ပတ်ရေးဧရိယာအတွင်း ကွက်၍သာ ဖြစ်ပေါ်နိုင်ပါသည်။ စီမံကိန်းဧရိယာပတ်ပတ်လည် ၅ ကီလိုမီတာအကွာ လွှမ်းခြုံမှု နယ်မြေကို ဆူညံမှု၊ စွန့်ပစ်ပစ္စည်း နှင့် ရေအသုံးပြုမှု၊ ထုတ်လွှတ်အခိုးအငွေ့များမှ ဖြစ်ပေါ်လာနိုင် သည့် သက်ရောက်မှုများ နှင့် အသက်မွေးဝမ်းကျောင်းလုပ်ငန်းများ (ရေလုပ်ငန်းအပါအဝင်) အပေါ် သက်ရောက်မှုများကို ထည့်သွင်းပါဝင်ရန် အဆိုပြုပြီးဖြစ်ပါသည်။

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာသည် နံ့သာပု ကျေးရွာအုပ်စုရှိ ရပ်ရွာများ၊ အထူးသ ဖြင့် ဇင်ဇော်ချောင်း “ရပ်ကွက်” မှာ စီမံကိန်းဧရိယာနှင့် အနီးဆုံးဖြစ်ပြီး၊ စီမံကိန်းကြောင့် ထိခိုက်ခံရ

နိုင်ငံဖွယ်ရှိကြောင်း ဂရုပြုထားပါသည်။ ထို့ကြောင့်၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအတွက် တိုင်ပင်ဆွေးနွေးမှုကို နံ့သာပုကျေးရွာအုပ်စုအတွင်းရှိ ဒေသခံရပ်ရွာများတွင် အလေးပေးပြုလုပ်သွားမည် ဖြစ်ပါသည်။ ဒေသရှိ ငါးဖမ်းလုပ်ငန်းများ နှင့် အသက်မွေးဝမ်းကျောင်းလုပ်ငန်းများဆိုင်ရာ လက်ရှိနားလည်သဘောပေါက်ထားမှုကို အထောက်အကူပြုနိုင်ရန် လူမှုအခြေခံအချက်အလက်များကို ကောက်ယူစုဆောင်းခဲ့ပါသည်။

ကုန်းတွင်းပိုင်းလုပ်ငန်းများနှင့်ပတ်သက်၍၊ တည်ဆောက်ရေးလုပ်ငန်းများမှ ဖြစ်ပေါ်လာနိုင်သည့် ဆူညံသံ သို့မဟုတ် ဖုန်မှုန့်များသည် ဒေသခံရပ်ရွာများအပေါ် ထိခိုက်နိုင်ဖွယ် ရှိပါသည်။ အဓိက ထုတ်လွှတ်မှုအရင်းအမြစ်များမရှိသောကြောင့် လည်ပတ်ရေးလုပ်ငန်း၏ သက်ရောက်မှုသည် အကန့်အသတ်ဖြင့်သာ ရှိနိုင်ပါသည်။ တည်ဆောက်ရေးကာလအတွင်း၊ စီမံကိန်းမှ အလုပ်အကိုင် အခွင့်အလမ်းများဖြစ်ပေါ်စေနိုင်သောကြောင့် ဒေသခံရပ်ရွာများအပေါ် အပြုသဘောဆောင်သော သက်ရောက်မှုများရှိနိုင်ပါသည်။

ဆိပ်ခံတံတားတည်ဆောက်ရေးလုပ်ငန်းများကြောင့် လူမှုဘဝ နှင့် ပတ်ဝန်းကျင်တို့အပေါ် သက်ရောက်မှုများ ဖြစ်ပေါ်လာနိုင်ခြေရှိပါသည်။ စီမံကိန်းလုပ်ငန်းခြေရာရှိ ပင်လယ်နေရာများမှာ တိုက်ရိုက်သက်ရောက်မှုခံရနိုင်ဖွယ်ရှိပါသည်။ ဆိပ်ခံတံတား နှင့် လုပ်ငန်းလည်ပတ်ရေးတို့ကြောင့် လွှမ်းခြုံနယ်မြေရှိ ရေလုပ်သားများသည် တိုက်ရိုက် သို့မဟုတ် သွယ်ဝိုက်၍ သက်ရောက်မှုခံရ နိုင်ဖွယ်ရှိပါသည်။

သက်ရောက်မှုများကို စနစ်တကျ သေချာစွာ လျော့ချနိုင်ရန် အထက်ပါ အပိုင်း ၁.၇ တွင် စာရင်းချ ပြုစုထားသော စောင့်ကြပ်ကြည့်ရှုစစ်ဆေးရေးကို ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။

FEED (Front End Engineering Design) အဆင့်ကာလအတွင်း ကြီးမားသောဒီဇိုင်းဆိုင်ရာ အပြောင်းအလဲများကို စီမံကိန်းဒီဇိုင်း အပြီး သတ် ဆောင်ရွက်ပြီးသည်နှင့်တစ်ပြိုင်နက်၊ လိုအပ်လျှင် သက်ရောက်မှုများကို ပြန်လည်တွက်ချက် သင့်ပါသည်။ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ နှင့်/သို့မဟုတ် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်ကို ပြန်လည်ပြင်ဆင်ပြုစုနိုင်ပါသည်။

## 2.1

## PROJECT OVERVIEW

**Myint & Associates Offshore Supply Base Ltd (M&AOSB)** is proposing to construct an Offshore Supply Base (OSB) near Nga Yoke Kaung Bay in Ayeyarwady Region, which is located approximately 40 km south of the town of Ngwe Saung. The facilities will initially include a causeway and jetty of about 1.2 ha and a main onshore base of about 12.12 ha (29.95 acres). There is currently no infrastructure at the proposed Project. The nearest road lies ~ 25 km to the east. Details of the Project are shown in *Table 2.1*.

**Table 2.1**      *Project Details*

Component	Details
Name of the Project	Myint & Associates Offshore Supply Base.
Project Owner	Myint & Associates Offshore Supply Base Ltd. (M&AOSB).
Area of the Project	The Area of Phase 1 of the Project is 12.1 ha (onshore) and 1.2 ha (offshore). This area includes all facilities mentioned in this EIA Report; including the access road. Overall this area could be expanded to up to 50 ha onshore in Phase 2. This EIA covers impacts from both Phase 1 and 2 (i.e., the extension).
Type of infrastructure	Jetty with a platform and a main onshore base.
Plans after commencement of the Project operation	To be used as an offshore supply base for current / future offshore operations.

As per the Myanmar Environmental Impact Assessment (EIA) Procedure, this Project requires an Environmental Impact Assessment (EIA) to be conducted and submitted to the Environmental Conservation Department (ECD) of the Ministry of Natural Resources and Environmental Conservation (MONREC). An Environmental Management Plan (EMP) will also be submitted as part of the EIA.

This EIA Report has been prepared for the proposed Project activities related to the OSB (the "Project") and has been prepared in accordance with the Myanmar EIA Procedure and other relevant legislation.



## 2.2 *PROJECT PROPONENT*

Contact details for M&AOSB are provided below.

**Name:** U Myo Tin  
Group General Manager  
**Address:** M&AOSB  
Vantage Tower  
Pyay Road  
Yangon 11041  
**Telephone:** +95 1 230 7722  
**Fax:** +95 1 230 7720  
**Email:** [esiafeedback@myintassociatesosb.com](mailto:esiafeedback@myintassociatesosb.com)

## 2.3 *EIA OBJECTIVES*

The objective of the EIA Study is to complete a robust environmental and social assessment for the Project in compliance with the EIA Procedure (2015). Specifically, the objectives of the EIA are:

- To review the potential interactions between the proposed Project activities and the key environmental and social receptors and resources.
- To identify the potentially sensitive environmental and social components of the baseline.
- To identify and evaluate potential environmental and social Project impacts.
- To recommend mitigation or enhancement measures to remove, reduce or avoid potential adverse impacts.
- To provide a Project specific EMP that will also cover social impacts.
- To summarize public consultation and disclosure activities related to the Project.

## 2.4 *ENVIRONMENTAL AND SOCIAL EXPERTS*

The key environmental and social consultants that will conduct the EIA Study are presented in *Table 2.1*. The EIA was conducted by **Environmental Resources Management (ERM) Hong Kong Ltd.**, who has been certified under the Transitional Consultant Registration as an EIA Consulting Organization Type-A (Certificate No. 0016). ERM were supported by **Environmental Quality Management (EQM)** (Certificate No. 0009) and Dr. Nyo Nyo Lwin (Certificate No. 0143) who are also certified under the Transitional Consultant Registration.

**Table 2.2**      *Environmental and Social Consultants for the Project*

Name	Organisation	Academic Experience	Years' Experience	Area of Expertise	Registration Status
Craig A. Reid	ERM	BSc (honours)	20	Ecology and Biodiversity	Registered Under ERM Hong Kong (Certificate No. 0016) and Individually (Certificate No. 0053)
Rebecca Summons	ERM	MSc	8	Ecology and Biodiversity	Registered Under ERM Hong Kong (Certificate No. 0016) and Individually (Certificate No. 0053)
Myat Mon Swe	ERM	M.Eng.	>10	Socio-economic Facilitation of Meeting	Registered Individually (Certificate No. 0069). Registration Application to be submitted to ECD under ERM Hong Kong
Ohnmar May Tin Hlaing	EQM	PhD	>20	Air Quality.	Registered Under EQM (Certificate No. 0009)
Dr Nyo Nyo Lwin	Magway University	PhD	>20	Terrestrial Biodiversity (Fauna)	Registered Under Certificate No. 0079
Dr. Thet Thet Mar	Maubin University	Ph.D	>20	Terrestrial Biodiversity (Flora)	Registered Under Certificate No.0120
Tom Glenwright	ERM	PhD	16	Water Pollution Control, Ground water and Hydrology	Registered Under ERM Hong Kong (Certificate No. 0016)

Name	Organisation	Academic Experience	Years' Experience	Area of Expertise	Registration Status
Stuart Mackenzie	ERM	BSc	10	Waste Management	Registered Under ERM Hong Kong (Certificate No. 0016)
Piers Touzel	ERM	MBA	15	Facilitation of meeting, Socio-Economy, Land use	Registered Under ERM Hong Kong (Certificate No. 0016)
Man Ping To (Mandy To)	ERM	MSc	20	Noise and Vibration	Registered Under ERM Hong Kong (Certificate No. 0016)
Herve Bonnel	ERM	M.En	19	Risk Assessment and Hazard Management	Registered Under ERM Hong Kong (Certificate No. 0016)
Laurence Geene	ERM	MSc	20	Risk Assessment and Hazard Management, Legal Analysis	Registered Under ERM Hong Kong (Certificate No. 0016)
Wai Hang Ng (Nicci Ng)	ERM	M.A	10	Other (GIS)	Registered Under ERM Hong Kong (Certificate No. 0016)
Chi Hung Wan (Frank Wan)	ERM	MSc	30	Geology and Soil, Archaeology	Registered Under ERM Hong Kong (Certificate No. 0016)
Perry Cohn	ERM	MSc	29	Civil Engineer*	-

\* Primary engineering support provided by the Project Proponent

The remainder of this EIA Report is structured as follows:

- Section 3: the institutional framework for the Project.
- Section 4: the Project description and alternatives selection.
- Section 5: the environmental and social baseline.
- Section 6: the impact assessment including the adopted methodology and proposed mitigation measures.
- Section 7: the cumulative impact assessment.
- Section 8: the Project's public consultation and disclosure activities.
- Section 9: the Environmental Management Plan.
- Section 10: the conclusions of the EIA Report and recommendations of future actions.

The following section presents a summary of the regulatory requirements that will be applicable to the Project including an overview of the requirements for an EIA, as well as local and international regulations, conventions and guidelines that are of relevance to the proposed Project.

### 3.1 M&AOSB STANDARDS AND GUIDELINES

M&AOSB have an Environmental Policy which includes the company's commitments to health, safety and environment. This Policy is provided in *Appendix A*.

### 3.2 POLICY AND LEGAL FRAMEWORK

#### 3.2.1 Myanmar EIA Procedure

The EIA Procedure (dated 29 December 2015) set out the requirements for development, assessment and subsequent monitoring of an EIA. The requirements to conduct an EIA are outlined in the Environment Conservation Law (2012) and Environment Conservation Rules (2014). In addition; the EIA Procedures are supported by the draft Administrative Instruction which sets out a proposed format and content for reports.

The full EIA Process undertaken for the Project is shown in *Figure 3.1*. This Project is currently in the EIA Investigation and Reporting Phase which is discussed in detail below.

#### *EIA Study and Report Preparation*

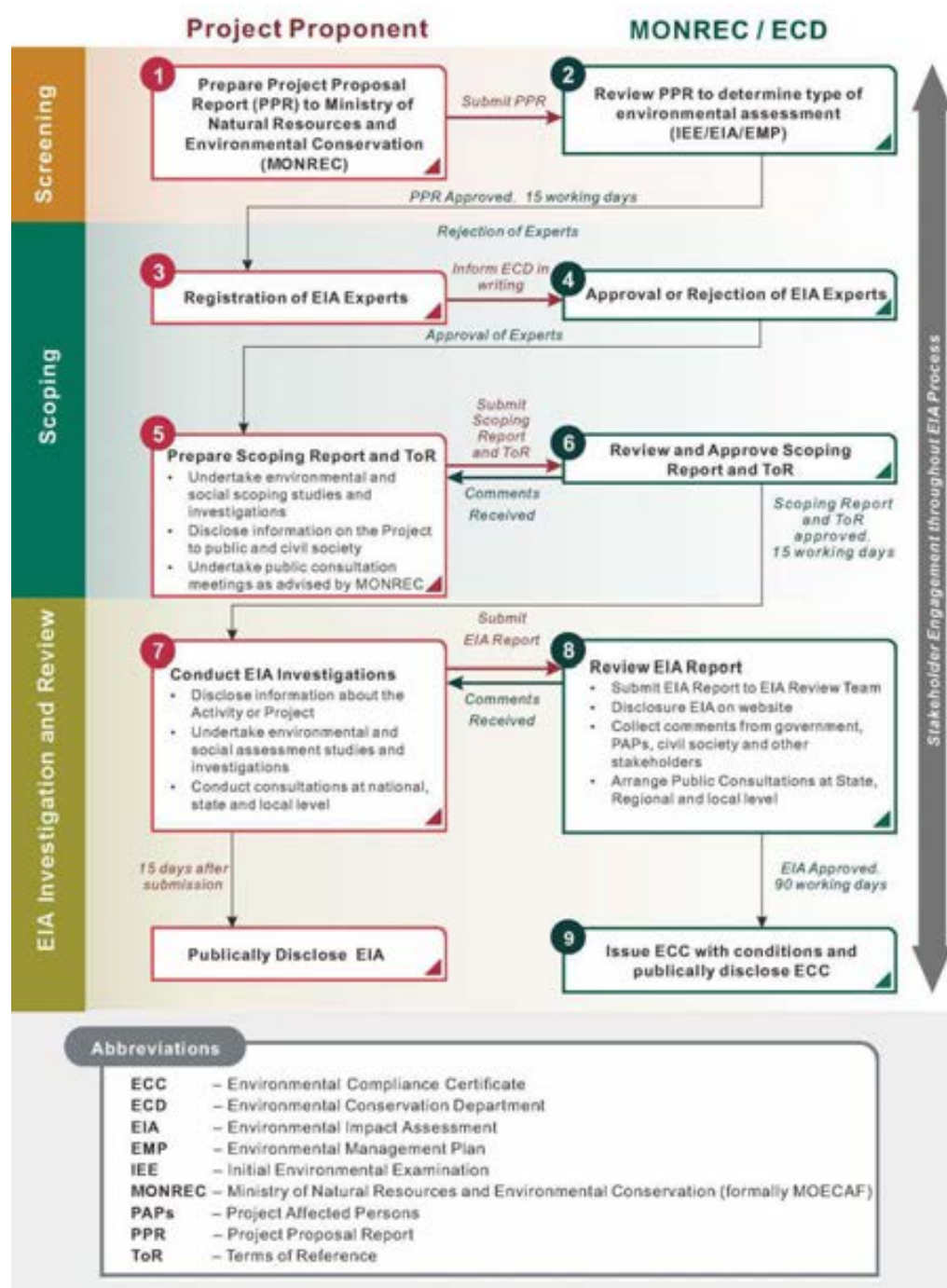
M&AOSB undertook a systematic assessment of the proposed activities. Screening was conducted as part of the assessment to identify all potential environmental risks.

After screening, a scoping phase was conducted to further identify the potential impacts of the Project, and likely Project Affected Peoples / Communities and to identify potential mitigation measures. Stakeholder engagement was undertaken during this process to collect baseline data and allow stakeholders to express views and concerns which would be considered during the EIA Phase. The Scoping Report outlined the scope and studies necessary as part of the EIA Phase and contained the Terms of Reference for the EIA Report.

The subsequent EIA Report (this Report) has been prepared to address all potential adverse environmental and social impacts and to propose appropriate mitigation measures. The report includes the results of public consultations and addresses public concerns when assessing impacts, designing mitigation measures and selecting monitoring parameters.

The EIA Procedure states that operators should disclose the EIA Report to civil society, Project Affected Peoples (PAPs), concerned government organisations and other interested stakeholders.

**Figure 3.1** *EIA Process in Myanmar*



### 3.2.2 Myanmar Regulatory Authorities

In Myanmar, matters pertaining to Health, Safety and Environment (HSE) requirements are generally under the jurisdiction of the ministries and state-owned enterprises. Key ministries, agencies and state-owned enterprises that have jurisdiction over HSE matters in oil and gas operations are included in Table 3.1.

**Table 3.1**      **Key Ministries, Agencies and State-Owned Enterprises Involved in HSE**

Ministry/Agency	Responsibility
Ministry of Natural Resources and Environmental Conservation (MONREC)	The Environmental Conservation Department (ECD) of MONREC has ultimate responsibility in the review and approval, or otherwise, of submissions under the IEE/EIA process.
Ministry of Electricity and Energy (MOEE)	MOEE jointly works with MOGE in managing HSE issues of oil and gas operators in Myanmar, in which MOEE encourages operators to establish a HSE Management System and prepare their own EIA/SIA for their project.
Myanmar Investment Commission (MIC)	MIC is a government agency responsible for coordinating with ministries (such as the MOEE) and other state entities to facilitate foreign investment in Myanmar. The MIC is also responsible for granting MIC permits which enable foreign investors to carry out business activities under the Myanmar Investment Law (2016).

### 3.2.3      **Myanmar Legislation Relevant to the Project**

Laws related to environmental and social issues and hence relevant to the EIA Study for the proposed Project are included in *Table 3.2*.

**Table 3.2**      *Commitments related to laws, rules and regulations to be complied by M&AOSB*

Sources of Related Laws, Rules and Regulations		Relevant Articles	Commitments
<b>The Constitution of the Union of Myanmar, 2008</b>		Article 37 (a)(b) , 42, 390	<p>M&amp;AOSB commits to comply as these three Articles in the Constitution provide a basis for legalizing and institutionalizing environmental health impact assessment and social impact assessment. There stipulated that</p> <ul style="list-style-type: none"> <li>• The Union is the ultimate owner of all lands and all natural resources above and below the ground, above and beneath the water and in the atmosphere in the Union; The Union shall enact necessary law to supervise extraction and utilization of State owned natural resources by economics forces;</li> <li>• The Union shall protect and conserve natural environment.</li> <li>• Every citizen has the duty to assist the Union in carrying out the following matters:               <ul style="list-style-type: none"> <li>(a)preservation and safeguarding of cultural heritage;</li> <li>(b)environmental conservation;</li> <li>(c)striving for development of human resources;</li> <li>(d)protection and preservation of public property.</li> </ul> </li> </ul>
<b>Environmental Conservation Law, 2012</b>		Clause 7(o), 14,15, 23, 24, 29	<p>M&amp;AOSB commits to comply as there prescribed</p> <ul style="list-style-type: none"> <li>• That the Ministry (MONREC) has the right to require a proponent to provide compensation for environmental impact and contribute funds and need for prior permission from the Ministry for the business that have been categorized for causing impact on the environmental quality and right to issuing permit with terms and conditions relating to environmental conservation after scrutinizing.</li> <li>• That the emissions to the environment to meet stipulated environmental quality standards.</li> <li>• To provide onsite controlling equipment to monitor, control, manage, reduce or eliminate pollutants, or if impracticable, arrange environmentally-sound disposal.</li> <li>• Not to violate any prohibition contained in the rules, notifications, orders, directives and procedures under the Environmental Conservation Law.</li> </ul>
<b>Environmental Rules, 2014</b>	<b>Conservation</b>	Rule 69	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• Not to emit, cause to emit, dispose, cause to dispose, pile and cause to pile, by any means, the pollutants and the hazardous waste or hazardous material stipulated by notification under the Law and any of these rules at any place which may affect the public directly or indirectly.</li> <li>• Not to carry out to damage the ecosystem and the natural environment which is changing due to such system, except for carrying out with the permission of the Ministry for the interest of the people.</li> </ul>
<b>Environmental Impact Assessment Procedure, 2015</b>		Clause 102,103, 104, 105, 106, 107, 108, 110, 113, 115, 117	<p>M&amp;AOSB commits to take the responsibilities for adverse impacts, and</p> <ul style="list-style-type: none"> <li>• To bear full legal and financial responsibility for actions and omissions and those of other related to the project proponents.</li> </ul>



Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
National Environmental Quality (Emissions) Guidelines (2015)		<ul style="list-style-type: none"> <li>To support programs for livelihood restoration and resettlement in consultation with all stakeholders.</li> </ul> <p><i>For EMP, M&amp;AOSB commits to comply to implement the EMP, the requirements set forth in ECC, Project commitments and conditions when providing services to the Project and inform the Ministry with detailed information as to the propose project's potential adverse impacts.</i></p> <p><i>For the monitoring, M&amp;AOSB commits to comply to implement;</i></p> <ul style="list-style-type: none"> <li>to undertake comprehensive self-monitoring</li> <li>to notify and identify in writing to the Ministry for any breaches of its obligations or other performance failures or violations of the ECC and EMP</li> <li>to submit monitoring reports to the Ministry</li> <li>to submit the monitoring report within ten (10) days of completing a monitoring report and the information to be included.</li> </ul> <p><i>For the purposes of monitoring and inspection, the event of emergency, M&amp;AOSB commits to</i></p> <ul style="list-style-type: none"> <li>grant the ministry and/or its representatives;</li> <li>grant the Ministry access to any places relating to project activities;</li> </ul> <p>M&amp;AOSB commits to comply the NEQ guidelines and its setting out for emission standards for air, noise and effluent discharges for oil and gas operations. M&amp;AOSB considers this emissions standards in its environment impact assessment and environmental management plan.</p>
		<p>Myanmar Investment Law, 2016</p> <p>Clause (50)(d), (51), (65),</p> <p>M&amp;AOSB commits to comply</p> <ul style="list-style-type: none"> <li>The stipulation that the investor has to register the land lease contract at the office of Registry of Deeds in accordance with the Registration Act.</li> <li>The mentioning for appointment, replacement, providing for the employment of staff and workers, ensuring to comply the entitlements and rights in the labor laws and rules, settling dispute regarding HR issues.</li> <li>Stipulation: <ul style="list-style-type: none"> <li>(a). To respect and comply with the customs, traditions and traditional culture of the ethnic groups in the Union;</li> <li>(e). To inform to the Commission if it is found that natural mineral resources or antique objects and treasure trove are not related to the investment permitted;</li> <li>(f). Not to make any significant alteration of topography or elevation of the land on which is entitled to lease or to use, without the approval of the Commission;</li> <li>(g). To abide by applicable laws, rules, procedures and best standards practiced internationally for this investment so as not to cause damage, pollution, and loss to the natural and social environment and not to cause damage to cultural heritage;</li> <li>(h). To list and keep proper records of books of account and financial statement and necessary financial matters relating to the investments performed by permit or</li> </ul> </li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>endorsement in accordance with internationally and locally recognized accounting standards;</p> <p>(j). To pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directive and so forth during the period of suspension of investment for a credible reason;</p> <p>(k). To pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease or death due to the work;</p> <p>(l). To supervise foreign experts, supervisors and their families, who employ in their investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar;</p> <p>(m). To respect and comply with the labor laws;</p> <p>(n). To have the right to sue and to be sued in accordance with the laws;</p> <p>(o). To pay effective compensation for loss incurred to the victim, if there are damage to the natural environment and socioeconomic losses caused by logging or extraction of natural resources which are not related to the scope of the permissible investment, except from carrying out the activities required to conduct investment in a permit or an endorsement;</p> <p>(p). To allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment;</p> <p>(q). To take in advance permit or endorsement of the Commission for the investments which need to obtain prior approval under the Environmental Conservation Law and the procedures of environmental impact assessment, before undertaking the assessment, and shall submit the situation of environmental and social impact assessment to the Commission along the period of activities of the investments which obtained permit or endorsement of the Commission.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• To comply with all terms and conditions in the permit and other applicable laws when the investment is carried out.</li> <li>• To fully assist while negotiating with the Authority for settling the grievances of the local community that have been effected due to Investments.</li> <li>• To appoint expert foreigner as senior manager, technical and operational expert or advisor according to subsection (a) of the section 51 of the Law, he shall submit the application attached with passport, expertise evidence or degree certificate and summary of biography of such foreigner to the Commission and obtain the approval.</li> <li>• To obtain the permit or tax exemption or relief to insure the relevant insurance out of the following types of the insurance at any insurance business entitled to carry out insurance business within the Union based on the nature of the business: Property and Business Interruption Insurance; Engineering Insurance; Professional Liability Insurance; Bodily Injury Insurance; Marine Insurance; or Workmen Compensation Insurance; Life Insurance; Fire Insurance.</li> </ul>
Myanmar Investment Rules, 2017	Clause 202, 203, 206, 212,	

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
<b>The Import and Export Law, 2012</b>	Clause 7	M&AOSB commits to comply stipulation for a person who obtained any license not to violate the conditions contained in the license.
<b>The Forest Law (2018)</b>	Clause12	<p>The Forest Law is enacted by Pyihtaungsu Hluttaw in September, 2018. It empowers, to declare for the reserved forest for the maintaining a sustained yield of the forest produce, to manage the forest land.</p> <p>M&amp;AOSB commits to comply the stipulation</p> <ul style="list-style-type: none"> <li>(a). For requiring prior approval from the Ministry if desirous to implement the development work or economic project within a forest land and forest covered land.</li> <li>(c). Whoever desirous to undertake as in sub-section (a), has to comply the Environmental Conservation Law and the stipulations from respective Laws.</li> </ul>
<b>Conservation of Water Resources and Rivers Law (2006)</b>	Clause (10), (11)(a), (19),	<p>M&amp;AOSB commits to comply prohibitions for the following activities:</p> <ul style="list-style-type: none"> <li>• “No person shall anchor the vessels where vessels are prohibited from anchoring in the rivers and creeks.</li> <li>• No person shall dispose of engine oil, chemical, poisonous material and other materials which may cause environmental damage, or dispose of explosives from the bank or from a vessel which is plying, vessel which has berthed, anchored, stranded or sunk.</li> <li>• No one shall dispose of any substance into the river creek that may cause damage to waterway or change of watercourse from the bank or vessel.”</li> </ul> <p>The empowerment of this Law is provided to the Ministry of Transport for controlling navigation of vessels in the rivers and creeks as well as communicating with local and foreign government and organizations for conservation of water resources, rivers and creeks. Also, to carry out conservation works for water resources, rivers and creeks, in accordance with the relevant international conventions, regional agreements and bilateral agreements for environmental conservation.</p>
<b>The Protection of Biodiversity and Conservation Areas Law 2018</b>	Clause 39 (d) (e),	<p>M&amp;AOSB commits to comply the stipulation that there may be charge with fine or imprisonment or both if finds guilty of</p> <ul style="list-style-type: none"> <li>• using dynamite or explosive chemicals, electrolyzing, destroying water flow or poisoning water, intentionally pollutes the soil, water, air in the conservation area;</li> <li>• Disposing or handling chemical waste and poisoning materials in the conservation area.</li> </ul>
<b>Law on Protecting New Species of Plants (2016)</b>		M&AOSB commits to comply the stipulation for the right and protect the right of the new species growers for causing any impact to environment and biodiversity.
<b>The Protection and Preservation of Cultural Heritage Regions Law, 1998</b>	Clause 13, 15, 22	<p>The State Peace and Development Council Law enacted this law by Law No. 9/ 98 on the date of 10 September, 1998. The Ministry of Culture may, with the approval of the Government issue notification for the protection of cultural heritage areas are categorized as following kinds of zones / region:</p> <ul style="list-style-type: none"> <li>a) Ancient monumental zone;</li> <li>b) Ancient site zone.</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That certain land-based construction works must apply for prior permission and must abide by provisions of existing laws.</li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
<b>The Protection and Preservation of Antique Objects Law (2015)</b>	Clause 12, 13	<ul style="list-style-type: none"> <li>For the person desirous of carrying out construction works to abide by the provisions of other existing laws and also apply in accordance with the stipulations to the Department to obtain prior permission under this law.</li> <li>For Buildings in cultural heritage region to conform to conditions prescribed by the Ministry of Culture.</li> </ul> <p>M&amp;AOSB commits to comply the stipulation:</p> <ul style="list-style-type: none"> <li>That person who finds any object which has no owner or custodian, needs to inform the relevant Ward or village-tract administrator if he knows or it seems reasonable to assume that the said object is an antique object.</li> <li>For a procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation</li> </ul>
<b>The Protection and Preservation of Ancient Monuments Law (2015)</b>	Clause 12, 13, 15, 20	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>That a person who finds an ancient monument over one hundred years old under the water or above ground shall promptly inform the relevant Ward or Village-Tract Administrative Office.</li> <li>For procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation.</li> <li>Requirement for prior permission to obtain from the Department before searching for and extracting oil and gas or constructing pipelines</li> <li>For prohibitions not to damage ancient monuments including using machinery which causes vibration and discharging chemical substance.</li> </ul>
<b>Myanmar Fire Force Law, 2015</b>	Clause 25	<p>M&amp;AOSB commits to comply for the stipulations:</p> <ul style="list-style-type: none"> <li>For the requirement to obtain the opinion of the Fire Services Department for the purpose of fire precaution and prevention, when laying down plans for construction for town, village and downtown or village development plans.</li> <li>For the requirements for the factory, workshop, highway bus, airport, jetty, hotel, motel, guest house, collective-owned building, market, work-site or business exposed to fire hazard of the owner or manager; <ul style="list-style-type: none"> <li>(a). Not fail to form the reserve fire brigade</li> <li>(b). Not fail to provide materials and apparatuses for fire safety; in conformity with the directive of the Fire Services Department.</li> </ul> </li> </ul>
<b>Prevention from Danger of Hazardous Chemical and Associated Material Law (Pyidaungsu Hluttaw Law No 28/2013)</b>	Clause 8, 13, 20, 22, 15, 16, 17, 23, 27	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For Any person, who wants to do the business of chemical and associated materials, to apply to the central body for the acquisition of the license, attached with the management plan for the environmental conservation in accord with the stipulations".</li> <li>For License holder to apply to the central supervising body in accord with the stipulation for the relevant chemicals and associated materials using for his chemicals and associated materials business" for a certificate.</li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> <li>For the registered certificate holder to abide by the regulations contained in the registered certificate and shall follow the order and directives issued from time to time by the central supervising body”.</li> <li>For the duties and powers of the central supervising board.</li> <li>For the requirements: <ul style="list-style-type: none"> <li>before works, license holder to be inspected by the relevant supervising and inspection team for safety and machinery/equipment check and</li> <li>The persons who are discharging the duty to be asked to attend foreign training or preventative trainings conducted by government departments and organizations.</li> </ul> </li> <li>For license holders to <ul style="list-style-type: none"> <li>follow the license regulations,</li> <li>follow directives on safe handling and shall ask workers to strictly follow</li> <li>shall provide necessary safety equipment and issue free personal protective equipment to workers,</li> <li>provide training in occupational safety</li> <li>determine the hazard to the environment, people and animals</li> <li>provide fit for work medical check-up and keep records</li> <li>send permission letter to Department of Township Administration if the chemicals and associated material are permitted to store</li> <li>acquire in advance guidance and agreement from fire service department if using inflammable materials or explosives</li> <li>transport only the permitted amount of chemicals in accordance with prescriptive stipulations</li> <li>obtain approval of central supervising body if transporting chemical and associated material from the permitted region to any other region</li> <li>abide and operate in accordance with related environmental laws to avoid impacts and damage to the environment.</li> </ul> </li> <li>For the license holder to have insurance in accordance with stipulations in case of compensation is required for losses related to people, animals and environment.</li> <li>For the registered certificate holder shall apply again for using chemical which are not in the registered list.</li> <li>For the license holder to <ul style="list-style-type: none"> <li>classify the hazard level of chemicals and related substances in advance</li> <li>show Material Safety Data Sheet and warning signage</li> <li>provide safety equipment, personal protective equipment and training on their use</li> <li>possess, transport, store, use and discharge chemicals and related materials in accordance with stipulations,</li> <li>not import or export chemicals and related materials banned by the central supervising board.</li> </ul> </li> </ul>
Ayeyarwady Region Development Committees Law (regional hluttaw)	Clause 14 (k) (l) (u)	M&AOSB commits to comply the stipulations:

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
law no.3/2012),amended in (16.052013) and (07.10.2016)		<ul style="list-style-type: none"> <li>For the Committee to supervise the jobs and establishments that are potential to hazardous</li> <li>For the Committee to undertake the supportive work for protection of natural disasters, fire, floods.</li> <li>That the Committee with the approval of Ministry can issue permit and supervise to the private building construction at the out bond of city in the rural area by notifying the territory.</li> </ul>
Ayeyarwady Region Development Committees Procedures Law related to Building Construction (notification no. 7/2016)	Clause 3, 15	<ul style="list-style-type: none"> <li>M&amp;AOSB commits to comply the stipulations:</li> <li>To apply the approval for building construction prior to the construction.</li> <li>To construct the building as per conditions with this procedures.</li> </ul>
Ayeyarwady Region Development Committees Procedures Law related to supervisions and revenues for Jobs and establishments causing potential hazardous to public. (notification no.6/2016)	Clause 22	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For prohibitions not to operate the jobs and establishments causing potential hazardous to public in the township area and city area without license.</li> </ul>
Underground Water Act, 1930		<p>The underground water act is enacted on the date of 21st June in 1930 whereas it is expedient to conserve and protect underground sources of water supply in the Union of Myanmar.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>for prohibition from sinking of a tube for the purpose of obtaining underground water except under and in accordance with the terms of a license granted by the water officer.</li> <li>For the powers of Township Officer or sub-divisional officer to close a license tube after exercising jurisdiction over the local area concerned and the expense of such closure shall be recoverable from the owner of the tube as if it were an arrear of land-revenue.</li> </ul>
Myanmar Insurance Law (1993)	Clause 15, 16	<p>Myanmar Insurance is established under this Law as a legal entity having perpetual succession, capable of suing and being sued in its own name.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For compulsory requirement for owners of motor vehicles to have Third Party Liability Insurance with Myanma Insurance</li> <li>For compulsory requirement for organizations operating as an enterprise which may cause damage to life and property of the public or may pollute the environment to have General Liability Insurance with the Myanma Insurance.</li> </ul>
The Law On Standardization (2014)		<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For the smoothness of technology transfer and invention, utilizes the standardization to reduce the technological barriers for the trade and supportive for the development international free trade zone and for the development of Myanmar economy and social,.</li> <li>For empowering to organize the council for setting up the policy, guideline and to implement to practice the national standard in respective production and service.</li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
<b>Myanmar Port Authority Law 2015</b>	Clause 19 (a)(b), 23 (a) to (c), 19, 59, 66 (f), 72 (a) to (c), 73, 80(a), 80 (b), 80 (d), The Law Amending the Ports Act promulgated (2008), Clause 11 (substituting for Sub-Clause 21 of the Ports Act), 53	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That the Myanmar Port Authority can claim damages from the relevant organization and person if the pollution arises and losses to environmental resources occur within the port limit and right to retain the relevant vessels, from above and under water natural resource exploration rigs and structures before obtaining the compensations.</li> <li>• That the Myanmar Port Authority, relating to environmental conservation, to carry out <ol style="list-style-type: none"> <li>1. protection and prevention for non-existence of wastes;</li> <li>2. Distribution of information and technology, taking precautionary measures not cause oil spills from oil pipelines or from collision and grounding of vessels.</li> <li>3. For clearing and sanitation, not causing water pollution if oil and chemical spill occurs, charging the cost occurred from the responsible person.</li> </ol> </li> <li>• That the Myanmar Port Authority may claim damages from the relevant organization if damage and losses to environmental resources occur within the port limit due to oil spill.</li> <li>• For functions and duties to be carried out by the Myanmar Port Authority relating to the prevention of the infectious diseases and health of the sick within a port limit where sea-going vessels berth by itself or by delegating to the health officer appointed and assigned duty.</li> <li>• That the port conservator can remove sewage of a vessel disposed or dumped not in conformity with the discipline so as not to affect the navigation channel and claim the expenses from the relevant master of a vessel and take action against the master of a vessel who disposed or dumped the sewage;</li> <li>• For the requirement to apply a license from the Myanmar Port Authority for the building any kinds of wharf, shipyard, dry dock, slip way and require to pay license pay.</li> <li>• That the Myanmar Port Authority can charge a fine to the person who has obtained an operation license and violates the prohibitions.</li> <li>• Prohibition from causing oil spill or discharging of sludge from tankers navigated in port limit or from oil test wells, oil wells and oil pipelines and grounding of vessels</li> <li>• Prohibition from discharging, disposing or causing to fall dangerous materials, toxic materials, garbage, sludge and waste from vessels and above or below water from exploration rigs and structures within a port limit.</li> <li>• Prohibition from disposing or dropping materials that may slide into the port because of tide, storm or flood on land.</li> <li>• Prohibition from removing or shifting rocks, stones, gravels, sand or materials protecting the bank from slide from the foreshore and shore area of any bank without permission of the port conservator.</li> <li>• To comply with any order or directive by the assigned person on duty of the Myanmar Port Authority.</li> <li>• For Any person who by himself or another so casts or throws any ballast or rubbish or any such other thing or so discharges any oil or water mixed with oil, or the master of any vessel from which the same is so cast, thrown or discharged, to be punishable with</li> </ul>



Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
<b>The Myanmar Coastal and Inland Water Transport Service License Law (Pyidaungsu Hluttaw Law No.10.2015)</b>	Clause 6, 23	<p>fine not exceeding fifty thousand kyats, and to pay any reasonable expenses which may be incurred in removing the same.</p> <ul style="list-style-type: none"> <li>For any pilot in charge of a vessel who disobeys, or abets disobedience to, any of the provisions of this Chapter, be punishable with fine not exceeding fifty thousand kyats for each instance of such disobedience or abetment, and, in addition, be liable to have his authority to act as a pilot withdrawn.</li> </ul> <p>This is enacted to implement the agreements which is relevant to water transport service concluded by regional countries or neighboring countries or regional organizations; enable to lay down the policies relating to water transport service; This empowers to organize and form Central Supervising Body.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For empowering the Central Supervising Body <ol style="list-style-type: none"> <li>to specify the terms and conditions of service license;</li> <li>to inspect whether or not it is in conformity with the stipulations after halting the vessels if there is necessity and coordinating with the relevant department for securing and seizure of such necessary documents.</li> </ol> </li> <li>For prohibition from operating or causing to operate the service of water transport service without service license.</li> </ul>
<b>Motor Vehicle Law (2015)</b>		<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>for reducing environmental pollution caused by motor vehicles</li> <li>for the right of the Department to issue directives, the standards, guidelines for the purposes of importing, manufacturing, assembling, maintaining to be safe in accident and environment conservation.</li> </ul>
<b>The Burma Aircraft Act (1934) Law Amending the Burma Aircraft Act(Pyidaungsu Hluttaw Law No.33 of 2013)</b>	Clause 5	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For the regulation of the air transport services, and the prohibition of the use of aircraft in such services except under the authority of and in accordance with a license authorizing the establishment of the services;</li> <li>For the registration and marking of aircraft;</li> <li>For the air-route by which and the conditions under which aircraft may enter or leave Myanmar or may fly over the Union of Myanmar and the places at which aircraft shall land;</li> <li>For the prohibition of flight by aircraft over any specified area, either absolutely or at specified times, or subject to specified conditions and exceptions;</li> </ul>
<b>The Farmland Act 2012</b>	Clause 30 (a) (b)	<p>M&amp;AOSB commits to comply the stipulations for empowering</p> <ul style="list-style-type: none"> <li>In respect of the application to utilize the farmland for other purposes in the interest of the public:- <ol style="list-style-type: none"> <li>The Central Farmland Management Body to give permission to utilize the paddy land for other purposes, with the recommendation of the Region or State Farmland Management Body;</li> </ol> </li> </ul>



Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
		<p>2. The respective Region or State Government shall give permission to utilize the farmland for other purposes except paddy land, with the recommendation of the Region or State Farmland Management Body;</p>
<b>Vacant, Fallow and Virgin Land Management Act 2012, (Pyidaungsu Hluttaw Law No.10 of 2012)</b>	Clause 16, 19	<p>M&amp;AOSB commits to comply the stipulation</p> <ul style="list-style-type: none"> <li>for Person who is granted the right to use the vacant, fallow and virgin lands has to comply the conditions:               <ol style="list-style-type: none"> <li>Land granted will use for the purpose granted and in relation to economic enterprise;</li> <li>To carry out to be completed within four years from the date of grant according to the purpose granted (can revise by the Central Committee for losing time due to natural disaster and unstable security conditions;</li> <li>Not to mortgaged, giving, sold, leasing or otherwise transferred or divided without the permission of the Cabinet of the Union Government;</li> <li>To fully pay the land revenue;</li> <li>To comply the conditions prescribed by the Central Committee</li> <li>Prohibit to explore other natural resources below and above ground except the purpose granted;</li> <li>To surrender the natural resources found in the authorized land and the Government being desirous of extracting the same on a commercial resumes the area required therefrom.                   <ul style="list-style-type: none"> <li>That the Central Committee can resume the area required in the authorized land, if one of the following situation arises:-                       <ol style="list-style-type: none"> <li>If ancient culture heritage are found in the authorized land;</li> <li>If infrastructure project or Special project are desired to be constructed on the authorized land, in the interest of the State;</li> <li>Except the permitted minerals , if other natural resources are found in the authorized land which are permitted for production of mining;</li> <li>If natural resources are found in the authorized land which are permitted for the purposes described in Section4, Sub-section (a),(b), and (d);</li> </ol> </li> </ul> </li> </ol> </li> </ul>
<b>Myanmar Territorial Sea and Maritime Zones Law (2017)</b>	Clause 10, 30, 31	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For the route and necessary documents;               <ol style="list-style-type: none"> <li>The ships that carried the petroleum that operated by nuclear power or by mean of nuclear in any way that carried the hazardous materials, shall pass the route being set aside by the State.</li> <li>As per passage as (a), the ship shall carry the necessary documents and comply the plans being assigned by the precautionary management by international agreements.</li> </ol> </li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> <li>For not to move antiques and historical items present on the sea bed without permission of the government.</li> <li>For anybody who cannot do the following without permission of the government in the exclusive economic zone;               <ul style="list-style-type: none"> <li>(a) Exploration</li> <li>(b) Drilling or Production of natural resources</li> <li>(c) Research</li> </ul> </li> </ul>
Union of Myanmar Marine Fisheries law (25 April 1990, amended 1993)	Clause 39	M&AOSB commits to comply the stipulations: <ul style="list-style-type: none"> <li>For prohibition from disposing of living aquatic creatures or any material into the Myanmar Marine Fisheries Waters to cause pollution of water or to harass fishes and other marine organisms.</li> </ul>
Freshwater Fisheries Law, 1991, Ayeyarwaddy Region Fresh Water Fisheries Law (2012),	Clause 40, 34, 39, 41	M&AOSB commits to comply the stipulations: <ul style="list-style-type: none"> <li>For restriction to anyone from causing harassment of fish and other aquatic organisms or pollution of the water in a freshwater fisheries waters.</li> <li>For prohibition from clearing, firing the woods/forest that is habitat for fish.</li> <li>For not polluting, deterring the fish, aquatic creatures in the fresh water area.</li> </ul>
The Law Relating to Aquaculture, 1989	Clause 29(b)	M&AOSB commits to comply the stipulation: <ul style="list-style-type: none"> <li>For deterring transport by water and flow or pollution or mean to happen that at the territory of fishing area.</li> </ul>
Public Health Law, 1972	Clause 3, 5	M&AOSB commits to cooperate with the authorized person or organization in line with the stipulations <ul style="list-style-type: none"> <li>To abide by any instruction or stipulation for public health.</li> <li>To accept any inspection, anytime, anywhere if it is needed.</li> </ul>
The Protection and Prevention of Communicable Disease Law, 1995	Clause 3(a), 9, 11	M&AOSB commits to comply the stipulations: <ul style="list-style-type: none"> <li>That the Department of Health will carry out immunizations and health education activities related to communicable diseases</li> <li>That all persons are responsible for reporting an outbreak of a communicable disease to the nearest Health Officer.</li> <li>That Health Officer may undertake investigations and medical examinations to prevent the control the spread of Principal Epidemic Disease.</li> </ul>
The Control of Smoking and Consumption of Tobacco Product Law, 2006	Clause 9(a-d),	M&AOSB commits to comply the stipulation: <ul style="list-style-type: none"> <li>For the person-in-charge               <ul style="list-style-type: none"> <li>(a) To keep the caption and mark referring that it is a non-smoking area,</li> <li>(b) To arrange the specific place</li> <li>(c) To supervise and carry out measures so that no one shall smoke at the non-smoking area</li> <li>(d) To accept the inspection when the supervisory body comes to the place for which he is responsible.</li> </ul> </li> </ul>
The Petroleum and Petroleum Product Law, 2017	Clause 7, 9, 10, 11	M&AOSB commits to comply the stipulations: <ul style="list-style-type: none"> <li>(a). That the Ministry of Commerce shall functions relating to:</li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
Employment and Development Law, 2013	Skill Clause 5, 14, 15	<ul style="list-style-type: none"> <li>(e) (a)issuing licenses relating to import and export (c) determining procedures and conditions related to import and export</li> <li>(f) prohibition not to import or export from the other places except from the places stipulated for import or export;</li> <li>(g) determining procedures, and conditions relating to import or export;</li> <li>(b). That the Ministry of Transport and Communications shall carry out the following functions relating to any petroleum and petroleum product               <ul style="list-style-type: none"> <li>(a) issuing licenses relating to refining, transit, transport by pipeline, sale and distribution, inspection, and testing; issuing joint license or compound license for carrying out more than a type of business activities;</li> <li>(d) taking action, as necessary, in accordance with the existing laws if it occurs spill or accident in carrying out import, export, transport, and sale and distribution of petroleum and petroleum product by water;</li> <li>(e) determining standard and quality of receptacles for transport, and procedures and conditions for the pipelines;</li> </ul> </li> <li>(c). That the Ministry of Transport and Communications shall carry out the following functions relating to any petroleum and petroleum product               <ul style="list-style-type: none"> <li>(a) issuing license for the right to store for the storage tanks and warehouses;</li> <li>(b) issuing transport permit for the vehicles, vessels and barges that shall carry any petroleum and petroleum product;</li> <li>(d) if it occurs environmental impacts in carrying out petroleum and petroleum product business activities, taking action, as necessary , in accordance with the existing laws of on-site inspection</li> </ul> </li> <li>(d). For stating warning sign of danger or if not possible writing shall be displayed on all receptacles containing any dangerous petroleum and petroleum product.</li> </ul>
		<p>M&amp;AOSB commits to comply the stipulation</p> <ul style="list-style-type: none"> <li>(a). For the agreement, training and probation period as in :               <ol style="list-style-type: none"> <li>1. If the employer has appointed the employee to work for an employment, the employment agreement shall be made within 30 days. But it shall not be related with government department and organization for a permanent employment.</li> <li>2. If pre training period and probation period are stipulated before the appointment the said trainee shall not be related with the stipulation of sub-section (1).</li> </ol> </li> <li>(b). For particulars to be included in the employment agreement:               <ol style="list-style-type: none"> <li>1. the type of employment;</li> <li>2. the probation period;</li> <li>3. wage, salary;</li> <li>4. location of the employment;</li> <li>5. the term of the agreement;</li> <li>6. working hour;</li> <li>7. day off, holiday and leave;</li> <li>8. overtime;</li> </ol> </li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> <li>9. meal arrangement during the work hour;</li> <li>10. accommodation;</li> <li>11. medical treatment;</li> <li>12. ferry arrangement to worksite and travelling;</li> <li>13. regulations to be followed by the employees;</li> <li>14. if the employee is sent to attend the training, the limited time agreed by the employee to continue to work after attending the training;</li> <li>15. resigning and termination of service;</li> <li>16. termination of agreement;</li> <li>17. the obligations in accord with the stipulation of the agreement;</li> <li>18. the cancellation of employment agreement mutually made between employer and employee;</li> <li>19. other matters;</li> <li>20. specifying the regulation of the agreement, amending and supplementing;</li> <li>21. Miscellaneous.</li> </ul> <p>(c). For the worksite regulations contained in the employment agreement to be in compliance with any existing law and the benefits of the employee not to be less than those of the any existing law.</p> <p>(d). For the employment agreement, the Ministry shall issue the notification for paying the stipulated compensation to the employee by the employer, if the work is completed earlier than the stipulated period or the whole work or any part of it have to be terminated due to unexpected condition or the work has to be terminated due to various conditions.</p> <p>(e). For the employment agreement made under sub-section (a) to be related with daily wage workers, piece rate workers who are appointed temporarily in the government department and organization.</p> <p>(f). For the worksite regulations and benefits contained in the employment agreement mutually made between the employer and employee or among the employees to be amended as necessary, in accord with the existing law.</p> <p>(g). For the employer to send a copy of the employment agreement made between the employer and employee, to the relevant employment and labor exchange office within the stipulated period and to get the approval of it.</p> <p>(h). For the employment agreement made before the enforcement of this law has be confirmed up to the end of the term of the original agreement.</p> <p>(i). 14. The employer shall carry out the training program in accord with the work requirement in line with the policy of the skill development team to develop the skill relating to the employment for the workers who are proposed to appoint and working at present.</p> <ul style="list-style-type: none"> <li>• For the Employer: <ul style="list-style-type: none"> <li>(a). to carry out the training for each work or compounding the work individually or group-wise by opening on-job training, training systematically at worksite, sending outside</li> </ul> </li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
<b>The Settlement of Labour Dispute Law, 2012</b>	Clause 38, 39, 40, 51	training and training by using information technology system, for arranging the training program to enhance the employment skill of the workers; (b). for appointing the youths of 16 years as apprentice, shall arrange the training for technology relating to the employment systematically in accord with the regulations prescribed by the skill development team.
		<ul style="list-style-type: none"> <li>(a) For the employer of the industry and service business to put in to the fund monthly as put in fees without fail for the total wages of the subordinates and the supervisors' salary for not less than 0.5%;</li> <li>(b) To put in money paid under sub-section (a) not to be deducted from the wage and salary of the employees.</li> </ul> <p>The Pyidaungsu Hluttaw hereby had enacted this Law for safeguarding the right of workers or having good relationship between employer and workers and making peaceful workplace or obtaining the rights fairly, rightfully and quickly by settling the dispute of employer and worker justly.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>Not to fail to negotiate and coordinate in respect of a complaint within the prescribed period without sufficient cause</li> <li>Not to alter the conditions of service of workers involved in disputes prior to investigation by tribunals</li> <li>That no party shall strike or lock-out without negotiation, conciliation and arbitration by Arbitration Body.</li> <li>For the employer if commits acts without sufficient cause, may be liable to pay full compensation to workers as determined by Arbitration Body or Tribunal.</li> </ul> <p>The Workmen's compensation act had been promulgated in 1923, amended in 2005, M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For the payment by certain classes of employers to their workmen of compensation for injury by accident.</li> <li>For the liability for compensation of employer's, amount of compensation, compensation to be paid when due and penalty for default, method of calculating wages, review, commutation of half-monthly payments, payment of a lump sum amount, distribution of compensation, compensation not to be assigned, attached or charged, notice and claim, power to require from employers statements regarding fatal accidents, reports of fatal accidents and serious bodily injuries, medical examination, contracting, remedies of employer against stranger, compensation to be first charge on assets transferred by employer, special provisions relating to masters and seamen.</li> <li>In the amendment law for revising the monetary amount to update.</li> </ul> <p>This Law was enacted, to protect the rights of the workers, to have good relations among the workers or between the employer and the worker, and to enable to form and carry out the labor organizations systematically and independently.</p> <p>M&amp;AOSB commits to comply the stipulations:</p>
<b>The Workmen Compensation Act, 1923 (amended 2005)</b>		
<b>Labor Organization Law, 2011</b>	Clause 17, 18, 19, 20, 21, 22	

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
<b>Minimum Wages Law, 2013</b>	Clause 12 (a-e), 13 (a-g)	<ul style="list-style-type: none"> <li>• That Labor Organizations are free to organise and negotiate workers rights if not meeting labour laws.</li> <li>• That Labour Organisations may demand re-appointment of worker if cause of dismissal is related to labour organisation membership or activities or not conform with labour laws.</li> <li>• That Labour Organisations have the right to send representatives to conciliation tribunals.</li> <li>• That Labour Organisations have the right to participate and discuss workers rights and interests with government and employers</li> <li>• That Labour Organisation have the right to participate in collective bargaining in accordance with labour laws.</li> <li>• That Labour Organisation may take collective actions in accordance with the relevant procedures, regulations and law.</li> </ul> <p>This Law was enacted to meet with the essential needs of the workers, and their families, who are working at the commercial, production and service, agricultural and livestock breeding businesses and with the purpose of increasing the capacity of the workers and for the development of competitiveness.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That the employer not to pay wage less than the minimum wage stipulated, not have the right to deduct any other wage;</li> <li>• That the employer to inform rates of minimum wage relating to the business, allow the entry and inspection of the inspection officer, give the sick worker holiday for medical treatment in accord with stipulation and give holiday for the matter of funeral of the family of worker without deducting from the minimum wage.</li> </ul>
<b>Payment of Wages Law, 2016</b>	Clause 3, 4, 5, 9, 10, 14	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That salaries are to be paid at the end of the month or, depending on the size of the employing enterprise, between 5-10 days before the end of the month. The employer is permitted and required to withhold income tax and social security payments. Other deductions, e.g. for absence, may only be withheld in accordance with the law.</li> <li>• For the employer (a) to pay for salary either Myanmar Kyats or Foreign Cash permitted by National Bank of Myanmar. When delivery the salary (b) If the employer needs to pay the other opportunities or advantages, he can pay cash together with other materials according employee's attitude.</li> <li>• For finishing the contract, employer need to pay the salary (not more than one month) to employees. For the permanent worker, need to pay per monthly. If more than 100 employees, need to pay within the 5 days from the end of month. If fire the employees, need to pay salary within two days after fire. When employee dies due to the accident, need to pay money as an insurance to employee's family within two days.</li> <li>• If the employer has difficulties to pay wages on time because of significant events (eg natural disaster), the employer must report to the Department with evidence of payment at later date agreed with the employee.</li> </ul>

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
Social Security Law, 2012	Clause 11 (a)(b), 15(a), 18(b), 48(a), 49(a)(b), 51(a)(b), 53(a), 54(a)(b), 75	<ul style="list-style-type: none"> <li>When cut the salary due to the employees' absence, total cut salary not more than 50 % of his salary.</li> <li>For the Employer need to approval form the department as a penalty and cannot more than actual ravage rate when cut salary. No cut salary from the employees under 16 age.</li> <li>If an Employee carries out overtime work, he/she must be allowed the presiding overtime rate as set by the Law.</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For compulsory registration for social security system and benefits, the following establishments can be applied if they employ minimum number of workers and above determined by the Ministry of Labor in co-ordination with the Social Security Board: <ul style="list-style-type: none"> <li>i. production industries doing business whether or not they utilize mechanical power or a certain kind of power, works of production, repairing or services, or engineering works, mills, warehouses, establishments;</li> <li>ii. Government departments, Government organizations and regional administrative organizations doing business;</li> <li>iii. development organizations;</li> <li>iv. financial organizations,</li> <li>v. companies, associations, organizations and their subordinate departments and branch offices doing business;</li> <li>vi. shops, commercial establishments, public entertaining establishments;</li> <li>vii. Government departments and Government organizations doing business or transport businesses owned by regional administrative body, and transport businesses carried out with the permission of such department, body or in joint venture with such department or body;</li> <li>viii. construction works carried out for a period of one year and above under employment agreement;</li> <li>ix. works carried out with foreign investment or citizen investment or joint ventured businesses;</li> <li>x. works relating to mining and gemstone contained in any existing law;</li> <li>xi. works relating to petroleum and natural gas contained in any existing law;</li> <li>xii. ports and out-ports contained in any existing law;</li> <li>xiii. works and organizations carried out with freight handling workers;</li> <li>xiv. Ministry of Labor and its subordinate departments and organizations;</li> <li>xv. Establishments determined by the Ministry of Labor from time to time, in co-ordination with the Social Security Board and with the approval of the Union Government; that they shall be applied with the provisions of compulsory registration for Social Security System and benefits contained in this Law.</li> </ul> </li> <li>For provisions of compulsory registration under sub-section (a) to continue to be applied by this Law even though any of the following situations occurs if it continues to carry out such work:</li> </ul>



Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> <li>i. carrying out work by employing under stipulated minimum number of workers but more than one worker;</li> <li>ii. Changing the employer or changing the type of business.</li> </ul> <ul style="list-style-type: none"> <li>• For the Social security fund, to include the funds for health and social care, family assistant, invalidity benefit, superannuation benefit and survivors' benefit, unemployment benefit, other social security fund for social security system of compulsory registration and contribution stipulated by the Ministry of labor, other social security fund and social security housing plan fund.</li> <li>• That the employer can deduct contributions to be paid by worker from his wages together with contribution to be paid by him and pay to the social security fund and in such case he can incur the expense.</li> <li>• For the employer to effect insurance by registering for employment injury benefit insurance system contained in section 45 at the relevant township social security office and pay contribution to employment injury benefit fund in accord with stipulations in order that workers applied to provisions of compulsory registration may obtain the employment injury benefits.</li> <li>• For the inapplicability to the Workmen's compensation act.</li> <li>• For the employer (a) to pay contribution monthly to Employment Injury Benefit Fund at the rates stipulated under section 50. Moreover he shall also bear the expenses for paying as such; (b) to pay defaulting fee stipulated under section 88, in addition to the contribution if fails to contribute after effecting insurance for employment injury benefit.</li> <li>• For the employers and workers (a) to co-ordinate with the Social Security Board or insurance agency in respect of keeping plans for safety and health in order to prevent employment injury, contracting disease and decease owing to occupation and in addition to safety and educational work of the workers and accident at the establishment;</li> <li>• For the employer (a) to report to the relevant township social security office immediately if a serious employment accident occurs to his insured worker. There shall not be any delay without sufficient cause to report as such. (b) A team of officers and other staff who inspect the establishments, if it is found out the employment injury, death, and contracting disease, shall report to the relevant township social security office in accord with the stipulations.</li> <li>• For keeping records of work and lists.</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• For the Equal right between the Ethnic living in Myanmar. It enacted that if an ethnic loose the right, he can complain to the Regional or State Government to get the equal chance and find the equal right.</li> <li>• That project matters shall be informed, coordinated and undertaken in consultation with ethnic groups if projects are in areas with ethnic groups.</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p>
<b>Law protecting Ethnic Right, 2015</b>	Clause 5	
<b>Leaves and Holidays Act, 1951</b>		



Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
		<ul style="list-style-type: none"> <li>For employee to be granted to pay public holidays as announced by the Government in the Myanmar Gazette. On average, Myanmar has 26 public holidays per year, depending on the date of the variable holidays.</li> <li>For additional rules to apply in accordance with other laws, such as the Social Security Law (2012) for employees contributing to the Social Security Fund.</li> </ul>

In addition to national legislation, a range of international standards, including IFC Performance Standards (IFC PS) and the World Bank Guidelines will be considered for the Project. These standards are set to complement national legislation and ensure the Project is conducted under best practices in a way that minimises risks, impacts and ensures compliance and fair practices.

The following international guidelines and standards have been considered for the EIA Study of the Project:

- IFC PS (2012): The IFC PS represent the 'policy framework' for the EIA and sustainable environmental management for the Project, whereas the World Bank Group's EHS Guidelines provide guidance on general and industry best practice as well as recommended numerical limits for emissions to the atmosphere, noise, liquid and solid wastes, hazardous wastes, health and safety, and other aspects of industrial facilities and other types of development projects;
- World Bank Group (WBG) Environmental Health and Safety (EHS) General Guidelines (2007): The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs;
- WBG EHS Guidelines for Onshore Oil and Gas Development (2007);
- WBG EHS Guidelines for Ports, Harbors, and Terminals (2017);
- Relevant international treaties to which Myanmar is a signatory, including those related to waste management and biodiversity conservation; and
- Design, engineering and firefighting standards include: International Safety Guide for Oil Tankers and Terminals (ISGOTT), International Safety Guide for Inland Navigation Tank-barges and Terminals (ISGINTT) and National Fire Protection Association (NFPA); British Standard European Norm (BS - EN) Eurocodes, Permanent International Association of Navigation Congresses Working Groups (PIANC WGs), Oil Companies International Marine Forum (OCIMF), Overseas Coastal Area Development of Japan (OCDI), Port Designers Handbook, Carl A. Thoresen, 2014, and Piers, Jetties, and Related Structures exposed to waves: Guidelines for Hydraulic Loadings, 2004.

The key international conventions of relevance to the Project are included in *Table 3.3*.

**Table 3.3** *International Conventions relevant to the Project*

Legislation	Description	Relevance to the Project	Ratification Status in Myanmar
Environmental			
The International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997(MARPOL)	Regulates waste, emission and discharges from vessels. Contains the following Annexes:		
	Annex I: Regulations for the Prevention of Pollution by Oil (October 1983)		
	Annex II: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (1986)	The Project vessels will comply with emissions and discharge standards.	Ratified Annexes I and II
	Annex III: Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (1992)		
	Annex IV: Regulations for the Prevention of Pollution by Sewage from Ships (September 2003)	Annex I, IV, V and VI are of relevance to the Project.	
	Annex V: Regulations for the Control of Pollution by Garbage from Ships (December 1998)		
International Convention for the Control and Management of Ships' Ballast Water and Sediments (the Ballast Water Management Convention)	Annex VI: Regulations for the Prevention of Air Pollution from Ships (1997)		
	Aims to address the transfer of harmful aquatic organisms and pathogens in ships' ballast water.	The Project vessels will have ballast water	Not yet in force
Vienna Convention for the Protection of the Ozone Layer 1988 and Montreal Protocol on Substances that Deplete the Ozone Layer 1989	Aims at the protection of the ozone layer, including requirements for limiting the production and use of ozone depleting substances.	The Project may use or generate ozone depleting substances.	Accession 16 Sep 1998 (Vienna) & Accession 24 Nov 1993 (Montreal)

Legislation	Description	Relevance to the Project	Ratification Status in Myanmar
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (CMS)	CMS provides a global platform for the conservation and sustainable use of migratory animals and their habitats. Myanmar is currently a non-party but is a MOU Signatory for two CMS instruments: IOSEA Marine Turtles and dugongs.	The Project will be undertaken offshore where marine turtle species have been recorded. Dugongs are coastal and unlikely to be impacted by Project activities.	Marine Turtle (2001) & dugong (2007)
Convention on Biological Diversity 1992	Aims to promote national policies for the conservation of wild flora, fauna and habitat that needs to be included in planning policies. The three main goals are: (1) the conservation of the biological diversity; (2) the sustainable use of its components; (3) fair and equitable sharing of the benefits.	The Project will be undertaken in terrestrial and aquatic habitats.	Ratified 25 Nov 1994
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1992)	The Convention regulates the transboundary movements of hazardous wastes and provides obligations to its Parties to ensure that such wastes are managed and disposed of in an environmentally sound manner.	The Project may generate hazardous wastes.	Entered into force 6 April 2015
United Nations Framework Convention on Climate Change 1992 (UNFCCC) and Kyoto Protocol 1997	Provide a framework for intergovernmental efforts to tackle climate change. Recognises that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other GHGs.	The Project will form part of Myanmar's total emissions output.	Entered in force 23 Feb 1995 (UNFCCC) and 16 Feb 2005 (Kyoto Protocol)
Asia Least Cost Greenhouse Gas (GHG) Abatement Strategy (ALGAS) 1998	Develop national and regional capacity for preparation of GHG inventories. Assist in identifying GHG abatement options and preparation of a portfolio of abatement projects for each country.	The project will produce air emissions from the vessels.	1998

Legislation	Description	Relevance to the Project	Ratification Status in Myanmar
United Nations Agenda 21	<p>Formed by the National Commission for Environmental Affairs in Myanmar. Provides a framework of programmes and actions for achieving sustainable development in the country.</p> <p>Building on the National Environment Policy of Myanmar, takes into account principles contained in the Global Agenda 21. Myanmar Agenda 21 also aims at strengthening and promoting systematic environmental management in the country.</p>	Not relevant to Project. Relevant to government.	Since 1997
Social			
The International Convention for the Safety of Life at Sea (SOLAS) 1974	Ensures that ships flagged by signatory States comply with minimum safety standards in construction, equipment and operation.	The Project vessels will comply with safety standards (as applicable or required by vessel class).	Entered into Force 11 Feb 1988
Convention on the International Regulations for Preventing Collisions at Sea (COLREG) 1972	Sets out the navigation rules to be followed by ships and other vessels at sea to prevent collisions between two or more vessels.	The Project vessels will comply with navigation rules (as applicable or required by vessel class).	Entered into Force 11 Nov 1987
International Convention on Standards of Training, Certification and Watch-keeping for Seafarers 1978	Sets out requirements for marine environment awareness training and training in leadership and teamwork including new training guidance for personnel operating Dynamic Positioning Systems.	The project vessels will comply with training requirements (as applicable or required by vessel class).	Entered into Force 1988

### 3.3

#### ENVIRONMENTAL AND SOCIAL STANDARDS

With the release of the Myanmar EIA Procedure in December 2015, the National Environmental Quality (Emissions) Guidelines (NEQEG) was also enacted. The NEQEG provide the basis for regulation and control of noise and air emissions and effluent discharges from projects in order to prevent pollution and protect the environment and public health. The NEQEG are noted to be the similar to that recommended by the International Finance Corporation (IFC) General Environmental Health and Safety (EHS) Guidelines (2007) (World Bank Group, 2007) and the IFC and World Bank Group EHS Guidelines (2017) for ports, harbours and terminals.

The air and noise emission parameters are taken from *Section 1.1* and *Section 1.3* of the NEQ and shown in *Table 3.4* and *3.5* respectively.

**Table 3.4** *Air Emissions Parameters*

Parameter	Averaging Period	Guideline Value (µg/m <sup>3</sup> )	IFC Guideline Value (µg/m <sup>3</sup> )	World Bank Guideline value(µg/m <sup>3</sup> )	WHO Guideline Value (µg/m <sup>3</sup> )
Nitrogen dioxide	1-year	40	40	40	40-50
	1-hour	200	200	200	200
Ozone	8-hours daily maximum	100	100	100	120
Particulate matter PM10a	1-year	20	20	20	-
	24-hours	50	50	50	70
Particulate matter PM2.5b	1-year	10	10	10	-
	24-hours	25	25	25	-
Sulphur dioxide	24-hours	20	20	20	125
	10-minutes	500	500	500	-
Carbon monoxide	1-hour	-	-	Not mention	30000
	8-hours	-	-		10000
Volatile Organic Compound (VOC)	-	-	-	Not mention	-

a PM 10 = Particulate matter 10 micrometres or less in diameter

b PM 2.5 = Particulate matter 2.5 micrometres or less in diameter

**Table 3.5** *Noise Level Parameters (NEQG, IFC and World Bank)*

Receptor	One hour LAeq (dBA) <sup>a</sup>	
	Daytime 07:00 – 22:00 (10:00 – 22:00 for Public holidays)	Night Time 22:00 – 07:00 (22:00 – 10:00 for Public holidays)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

<sup>a</sup> Equivalent continuous sound level in decibels

#### *NEQEG Effluent Discharge*

Effluent discharges from ports are provided in a sector specific section in the NEQEG. These are detailed in *Table 3.6*.

**Table 3.6**      ***Effluent Discharge Levels (NEQG, IFC and World Bank)***

Parameter	Unit	Maximum Concentration
Biological oxygen demand	mg/l	30
Chemical oxygen demand	mg/l	125
Oil and grease	mg/l	10
pH	S.U. <sup>a</sup>	6-9
Total coliform bacteria	100 ml	400
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50

<sup>a</sup> Standard unit

This section provides a brief overview of the alternatives considered and details of the proposed Project activities to be conducted as well as a summary of the Project alternatives considered.

**4.1****PROJECT DETAILS**

The Project is the construction and operation of an offshore supply base in the Nga Yoke Kaung area of Ayeyarwady Region. The Proposed construction consists of an island jetty head with small deck, a causeway and an onshore facility (the main supply base). The jetty is likely to include space for office, and a dry bulk storage facility as this needs to be as near as possible to Offshore Supply Vessels (OSVs) onto which this supply material is loaded in order to be taken to offshore rigs. The main base will consist of short and long term storage facilities, custom inspections area, main office area, accommodation area and utilities.

The OSB will be constructed in Phases; Phase 1 and the final Phase estimated layouts are shown in *Figure 4.1* and *Figure 4.2*, respectively. It is noted that small changes may still be made to these layouts before construction starts. M&AOSB will notify ECD of the final layout prior to construction as well as a statement on whether or not these changes affect the findings or commitments of the EIA / EMP.

As per Article 95 of the Myanmar EIA Procedure; M&AOSB will notify ECD (MONREC) in case of major changes in size, scope, location, layout, technology, risk associated with foreseeable Adverse Impacts, production methods or pollution prevention/ mitigation measures of the Project, or an expansion or second phase development is proposed. M&AOSB will provide supporting documentation of such changes within the timeframe as may be prescribed.



Figure 4.1 Phase 1 Layout

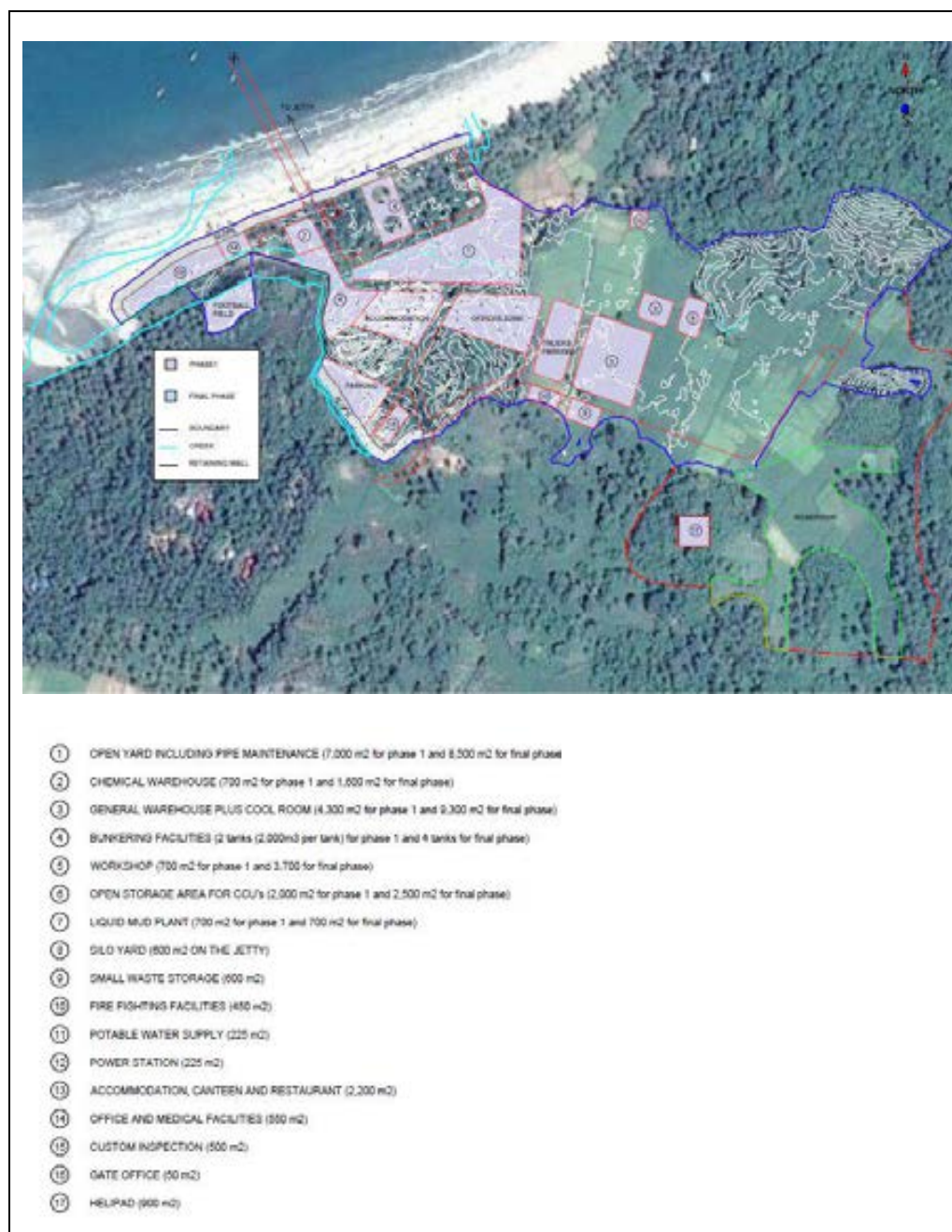
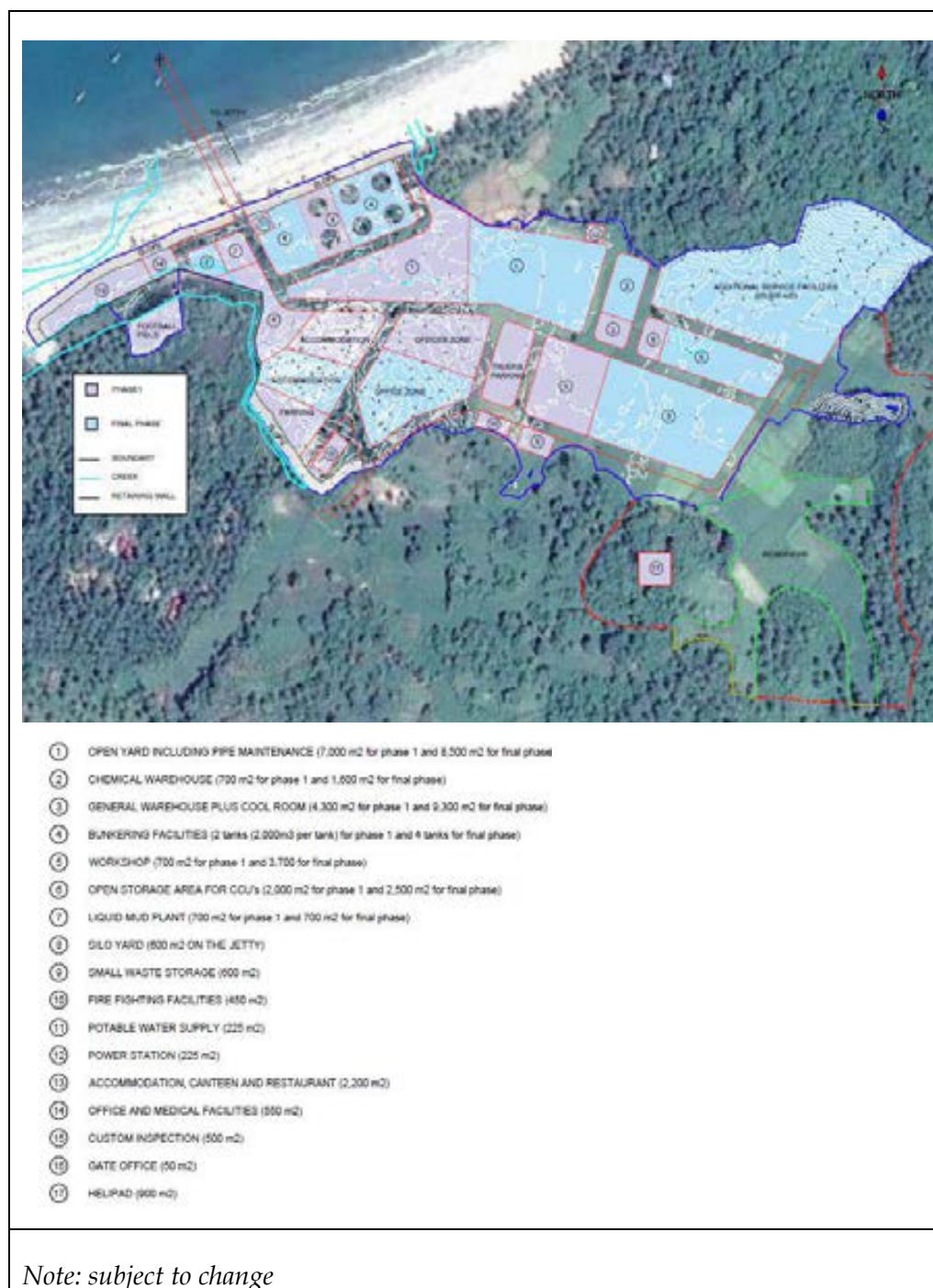


Figure 4.2 Phase 2 Layout



## 4.2 PROJECT LOCATION

The OSB is proposed to be located near Nga Yoke Kaung in Ayeyarwady Region, which is located approximately 40 km south of the town of Ngwe Saung and covers an area of 29.95 acres. This will be referred to as the "Project Area" throughout this report. The Project Area encompasses an area of sandy beach and onshore farm land. Photos of the Project Area are provided in Figure 4.3 and coordinates are provided in Table 4.1.

**Table 4.1**      **Project Area Coordinates**

Point	Coordinate
1	16°32'26.52"N 94°16'33.34"E
2	16°32'18.30"N 94°16'42.39"E
3	16°32' 7.84"N 94°17' 1.33"E
4	16°32'24.86"N 94°17'11.58"E
5	16°32'34.90"N 94°17'6.47"E
6	16°32'36.66"N 94°16'53.61"E
7	16°32'50.37"N, 94°16'52.30"E
8	16°33'12.72"N, 94°16'51.98"E
9	16°33'13.48"N, 94°16'38.94"E
10	16°32'46.38"N, 94°16'26.90"E

*Note: Subject to change*

**Figure 4.3**      **Photos of the Project Area, taken in January 2017**



**A. Beach front view of Project Area**





**B. Coconut Trees Facing Beach in Project Area**



**C. Farmland in Project Area**



**D. Temporary Farming Hut in Project Area**



**E. Panoramic View of Project Area**

### **4.3** *DESIGN CONSIDERATIONS*

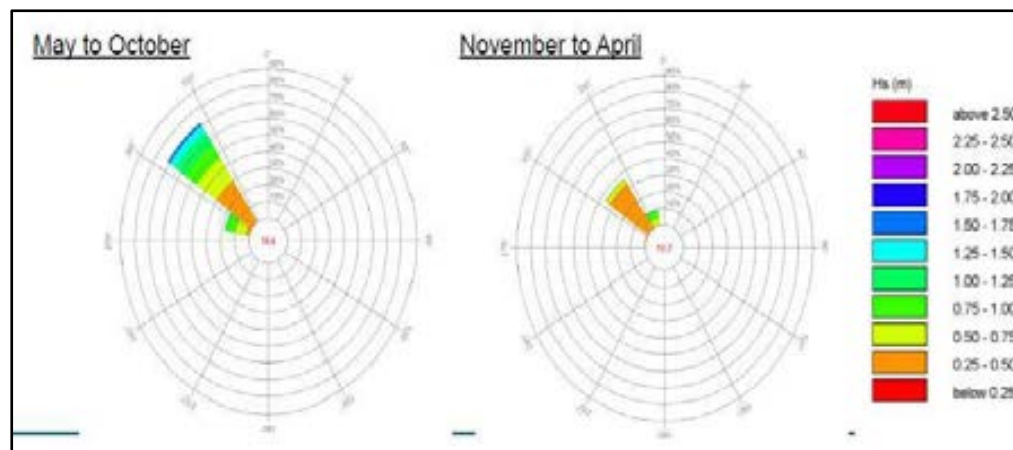
The following section lists all the design considerations within the EIA Report.

#### **4.3.1** *Wave Model Results for proposed Jetty location*

Swell waves from the south-west are dominant around the year at the Project location. They diffract around Goyangyi Island and arrive at the site, mainly from 300 to 330 degree from the north. Wind waves in the dry season also arrive from the same direction. A wind model is provided in *Figure 4.4*.



**Figure 4.4**      **Wind model at Goyangyi Island**



The result of the wave model is provided in *Table 4.2*. The design of the jetty considered the following characteristics;

- Operational wave: (1/10 yr return period): significant wave height (Hs) =2.43 m & peak period (Tp) =10.5 s; and
- Survival (cyclone event) Wave: (1/100yr return period): HS=2.77 m & 12s.

**Table 4.2**      **Wave Model Results**

Return Period	WL (mMSL)	H <sub>s</sub> (m)	T <sub>p</sub> (s)
1	2.99	2.03	9.76
1/10	2.99	2.43	10.5
1/25	2.99	2.64	11.65
1/50	2.99	2.70	11.8
1/100	2.99	2.77	12.11
1/250	2.99	2.84	12.68

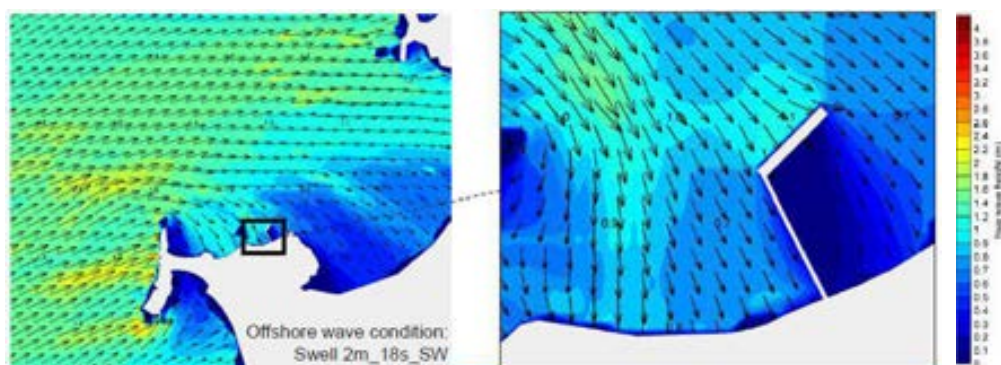
#### 4.3.2      *Downtime Assessment for Open Type Jetty*

The dominant swell waves at site are higher than the safe operation limit. The downtime (non-operational time) for an open jetty is within the range of 85-100% year round. Therefore the jetty would need to be protected from these waves to meet safe working conditions. This would result in an additional structure (such as a breakwater) being constructed with associated environmental and social impacts.

#### 4.3.3      *Downtime Assessment for Closed Type Jetty*

For a closed jetty, wave modelling was conducted. The wave modelling of a heavier operational swell (2m) shows a sheltered berth behind the jetty for vessels (*Figure 4.6*). A closed type jetty with an orientation of 30° provides a significant reduction in downtime (< 20%) all year round.

**Figure 4.5**      *Modelling of Wave Condition of Offshore*

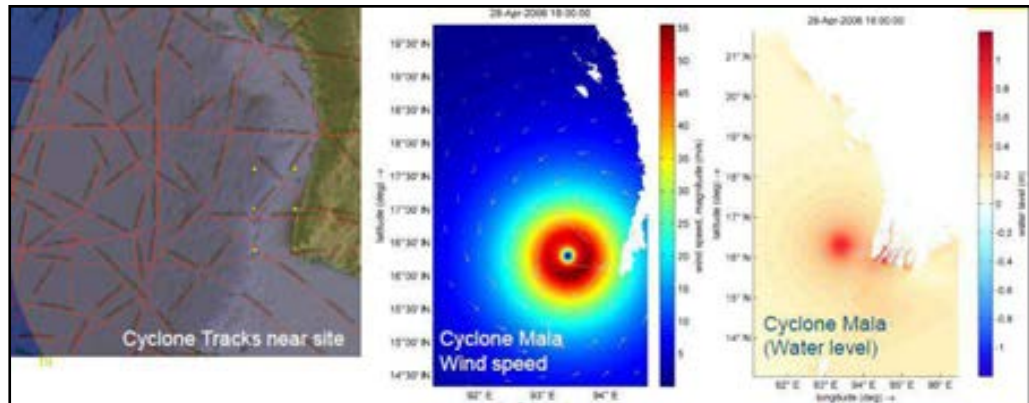


#### 4.3.4      *Cyclone- Storm Surge*

With the same model, 23 cyclones were modelled to assess the storm surge at the site, including from high wind velocities. The strongest recent cyclone was Cyclone Mala in 2006 and the storm surge was almost 1 m. For the basis of the Project, a storm surge of 1.5 m is selected as a conservative design

condition. The wind speed and water level of Cyclone Mala and Cyclone Tracks near site are provided in *Figure 4.6*.

**Figure 4.6** *Wind speed and Water level of Cyclone Mala and Cyclone Tracks near site*



#### 4.3.5 *Tsunamis*

Tsunamis have extremely long wavelengths and can travel long distances fast. Historic earthquakes closest to the site were identified through the USGS online database. Two critical events along the Sunda and Andaman faults were selected;

- 2004 Indian Ocean Earthquake (9.1 – 9.3Mw); and
- 1941 Andaman Island Earthquake (7.7-8.1 Mw).

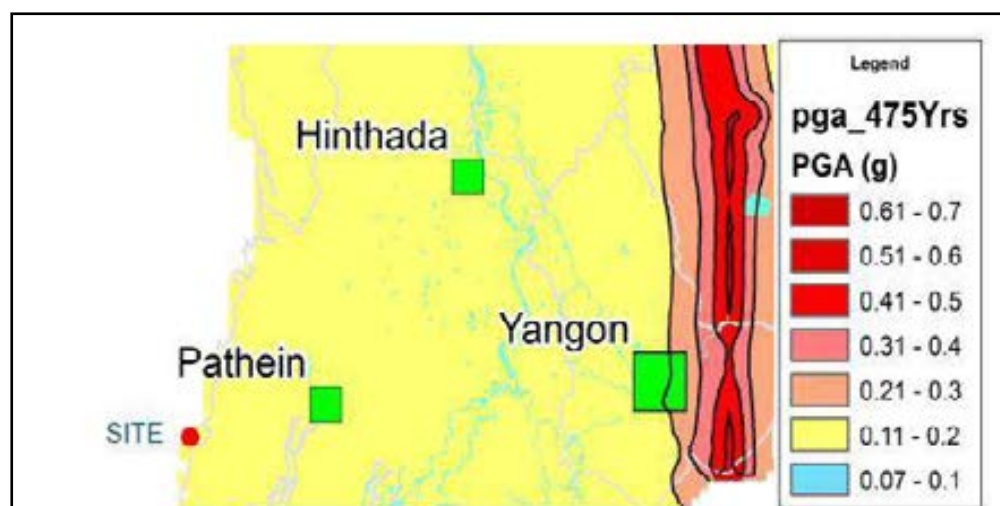
Water displacements were computed and the tsunami propagations were simulated. The run up from the 2004 Tsunami was the highest at approximately 2 m at the site. This was considered in the design of the Project.

#### 4.3.6 *Seismic*

Historic earthquakes (mentioned above) were also considered in terms of peak ground acceleration (pga) and the impacts on the Project. Within a period of 475 years at the site; the ranges was between 0.11 and 0.2g (*Figure 4.7*). The structural design will take into this pga range.



**Figure 4.7**      *Seismic Map of Myanmar*



#### 4.3.7      *Sea Level Rise*

Sea level rise considered for the Project and based on middle range projections of 2000- 2004 in Myanmar are provided in *Table 4.3*.

**Table 4.3**      *Middle Range of Sea Level Rise in the future in Myanmar*

Timeline	Middle range of future sea level rise
2020s	5 cm to 13 cm
2050s	20 cm to 21 cm
2080s	37 cm to 83 cm

#### 4.3.8      *Sediment Assessment – Estimate of Coastline Change over time*

The sediment Assessment was done by Royal Haskoning DHV. The envisaged closed jetty and causeway will create a change in the longshore transport along the beach. Longshore transport is a current driven by breaking waves within the breakers zone. An estimation was made for the annual longshore transport using the CREC formula (1984). The nearshore wave data from the SWAN model from 1979 to 2007 were used and it is anticipated that the down drift coast (west of the jetty) will experience small scale, localised erosion but will not be a significance impact.

### 4.4      *PROJECT ALTERNATIVES*

Consideration of options and alternatives is a fundamental requirement in the planning of any project as a means of avoiding or reducing adverse environmental and social impacts and maximising or enhancing project benefits. Alternatives that have been considered for the Project include:

#### 4.4.1

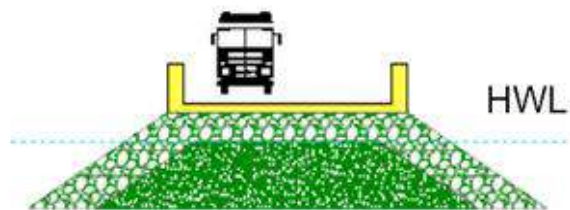
#### Jetty Design

A causeway is a marine civil structure with a road and/or pipelines on top usually across a broad body of water or wetland. There are three options for the causeway as listed below and shown in *Figure 4.8*:

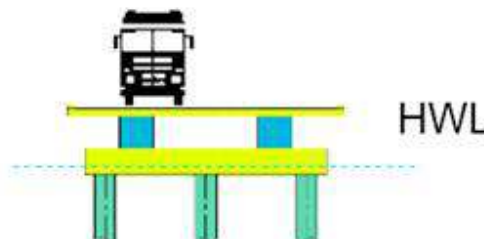
- A 'closed' reclaimed structure built of a sand core and rock layers on the outside to protect against erosion by waves and currents.
- An 'open' deck on piles structure consisting of piles driven into the seabed with a concrete deck structure on top.
- A combination of the two above. The first section closed structure and the second section an open deck on pile structures.

M&AOSB received approval for the jetty layout design for the MPA in a letter dated at 20<sup>th</sup> of June 2018 with reference letter no. aka/civil (M&A)/1401/2018 (attached in **Appendix B**). M&AOSB commissioned a sediment assessment for the jetty by Royal Haskoning. The changes to coastal processes from the design are considered in the EIA Report and are not likely to cause significant environmental impacts (*Section 6.4.4*). Monitoring will be conducted of nearby sensitive habitats (corals). A closed structure is the selected option as it provides safe berthing, manoeuvring, loading and unloading of cargoes (due to reduction of the big wave affect). However, additional soil investigation will be conducted which may lead to some changes in the design. The EIA is based on the most conservative method being used (i.e., closed structure).

**Figure 4.8** Options for Causeway



#### "Closed" Reclamation



#### "Open" Reclamation Access/Trestle Design

For access:

- If a causeway structure is adopted; the top of the seabed may be partially removed with a backhoe while good sediment will be dumped from shore outward by truck and shaped with the backhoe. After shaping the bund, this will be covered by geotextile after which the revetments will be covered with 2 or 3 layers of graded rock and the top surface is then covered in a reinforced concrete roadway. In this option limited to no marine equipment will be used for the works. This is the selected alternative.
- If a piled trestle structure is adopted; the piles will be driven into the seabed from a barge using a hydraulic hammer. After driving of the piles these will be cut to size from the barge with the debris collected on the deck. Following the cutting of the piles prefabricated beams will be placed across subsequent pile bents followed by placement of prefabricated longitudinal beams and deck slabs. Part of the structural elements will be connected with cast-*in-situ* joints with the concrete pumped in or dropped-in by bucket from a barge.

#### **4.4.2**      *Location of the Project*

The Project Area is Nga Yoke Kaung in Ayeyarwady Region. Myint & Associates Offshore Supply Base Co; Ltd. awarded a contract to Royal Haskonging DHV (RHDHV) to undertake comprehensive feasibility study and site selection for the development of Offshore Supply Base in Myanmar. Between February and May 2016, RHDHV conducted extensive surveys and identified eight potential sites along the coast. There were eight locations identified as potential sites for the OSB. The following selection criteria were taken into account to finalize the most suitable site location which was Location D and shown in *Figure 4.11*.


1. Water depth
2. Natural protection
3. Maintenance dredging required
4. Onshore land availability
5. Impact on local communities
6. Environmental impact
7. Hinterland transport
8. Relative cost



Figure 4.9 Site Selection Criteria

			CRITERIA								
Rank Locations			Water depth	Natural protection	Maintenance dredging required	Onshore land availability	Impact on locals	Environmental Impact	Hinterland transport	Relative cost	
Predefined @ Goyangyi	2	Location A	-	++	0	+	0	0	-	-	0
	4	Location B	-	+	-	0	-	0	-	-	-4
	2	Location C	0	+	0	0	-	0	-	+	0
	1	Location D	0	+	0	+	0	0	-	+	2
Alternative sites	2	Ngwe Saung	-	+	0	+	0	-	+	-	0
	3	Sinma	-	+	0	+	-	-	0	-	-2
	4	Kya Li	-	+	-	0	-	-	0	-	-4
	3	opp. Nga Yok	--	++	--	+	0	-	-	+	-2



These are discussed in more detail in Table 4.4.

Table 4.4 Site Location Alternatives Considered

Site	Location
<p><b>Location 1: Southern Ngwe Saung Beach</b></p> <p>This site is located at the southern end of Ngwe Saung Beach where a rocky headland is protruding from the coastline into the sea. The brownish grey beach indicates silty waters coming from the river mouths to the north. There is a fishing village on the east of the rocky head but the rocky head itself appears uninhabited. The water depths varied from -1.95 to -0.85 m which indicates some dredging would be needed.</p>	

Site	Location
<p><b>Location 2: Sinma</b></p> <p>The site is located 4 km south of Location 1. A half-protected natural bay is formed by rocky outcrops into the sea. Water depths are varying up to -8.5m which is sufficiently deep for a base; however there is a village close by. This location has a complex coastal environment.</p>	
<p><b>Location 3: Kya Li</b></p> <p>Site 3 is located at nearly 12 km south of Sinma village. This site also has a rocky headland protruding towards the sea and is situated at the mouth of a creek. There are several islands on the south-west of the rocky headland that could act as a natural protection for the OSB. A number of huts were observed on the rocky headland. Water depths ranged from -4.3 to -6.7 m.</p>	



Site	Location
<p><b>Location 4 to 8 – Nga Yoke Kaung</b></p> <p>These 4 locations in Nga Yoke Kaung are discussed in detail below.</p>	
<p><b>Location 4: Nga Yoke Bay – Goyangyi Island (Site A)</b></p> <p>The site is located about 14 km south of Site Location 3. Goyangyi Island is made up of a 3.3 km long rock orientated from north to south. The peninsula is a catch for coastal drift of suspended sediments. During the dry season the southern bay is utilised for storage of fishing boats by locals. The water depth at the middle of the north bay is less than 4 m but at the northern edge of the bay it reaches 8 m. There is potential connection of this area to the main roads.</p>	

Site	Location
------	----------

#### Location 5: Nga Yoke Kaung (Site B)

East of Site A is a 900 m wide bay between a rocky headland on the West and SaBatar Island on the East, identified as Site "B". Water depths measured in this bay are relatively shallow at only 2 m at approximately 350 metres from the beach and the water depth only reaches up to 4 m at approximately 1 km from the beach. There are villages at either end of the bay under the trees. A potential port facility would require a long access trestle and also would require dredging to allow for a safe navigation channel.





#### Location 6: Nga Yoke Kaung Site C

Site C is located near Sabahtar Island which is East of Site location B. The water depth between Sabahtar Island and main land is shallow (less than 1 m). This would mean the island may be permanently connected to the main land in the future. Locals confirm they can walk to the island at low spring tide. According to local fishermen there are rocks scattered on the seabed. There is a village on the main land, just South of Sabahtar Island.





Site	Location
<p><b>Location 7: Nga Yoke Kaung Site D - SELECTED ALTERNATIVE</b></p> <p>Site D is situated 1 km east of Site C. Water depth at Site D is more than -5m at 300 metres from the beach. This site has the shortest distance to reach sufficiently deep water of the site locations A to D. The land just inside of the beach consists of paddy fields only. The land is elevated several metres above the beach and is relatively flat. There is a village with over 300 households located 450 m south-west of the beach. A fresh water well was observed near the beach. The locals mentioned that the fresh water is available at around 8 m below the ground. From this, one could conclude that there could be an underground fresh water reservoir without sea water intrusion.</p>	
<p><b>Location 8: Nga Yoke Kaung Village Opposite</b></p> <p>A shallow patch was observed which dries up at low water, which is situated just North of the ferry point from Nga Yoke Kaung village. This may be suitable for a small base and 1 to 2 berths. The land behind it seems quite undulating and hilly and would require quite some cut and fill works. North of this site the coast consists of a steep rock of 10 to 20 m high. The water depth at this site is around 6 m deep. However from navigation charts it can be seen it gets shallower before it gets deeper towards the open sea. Thus a considerable amount of dredging would be needed for a proper access channel.</p>	

The selected location was location D. The selection considered environmental factors as follows:

- Location A to D are comparable to each other. The land that required to be occupied is farmland and therefore not natural habitat. This will reduce the potential for impacts to terrestrial ecology. Concerning the offshore environment, the footprint of the project is relatively small (i.e., no need for a breakwater or reclamation) and the impacts are similar across Location A to D. Location D was selected as it was in an area with lower / weaker current movements, which means fewer impacts to coastal morphology and lower sedimentation. This would mean that the potential for smothering of sensitive receptors would be reduced.

For the other sites, negative ratings were provided for environmental impacts as:

- For the Ngwe Saung and Sinma sites, large reclamation would likely be required which will increase the project footprint offshore and therefore could have a larger impact on marine habitats and species. Any organisms or habitats within the footprint of the Project would be lost and larger footprint would require more dredging / seabed disturbance, which could lead to smothering of sensitive receptors (corals).
- For the Kya Li site, in addition to the jetty, a breakwater would likely be required which will also increase the project footprint offshore and therefore could have a larger impact on marine habitats and species; as provided above.
- For the area opposite of Nga Yoke Kaung village, reclamation into the sea would be required due to very limited flat land area, as well as major leveling off the hill and a large amount of dredging for a long channel due to shallow water depth. This will have larger impacts on both terrestrial and marine habitats and species due to sedimentation impacts, land loss and larger project footprint.

## **4.5 PROPOSED PROJECT ACTIVITIES**

### **4.5.1 Construction Activities**

The Construction Phase will include both onshore and offshore construction.

#### *Offshore Activities*

The offshore activities include construction of an access bridge, jetty and an access channel. During construction, an area of 300\*700m will be utilised for construction. This area will include the area of the jetty.

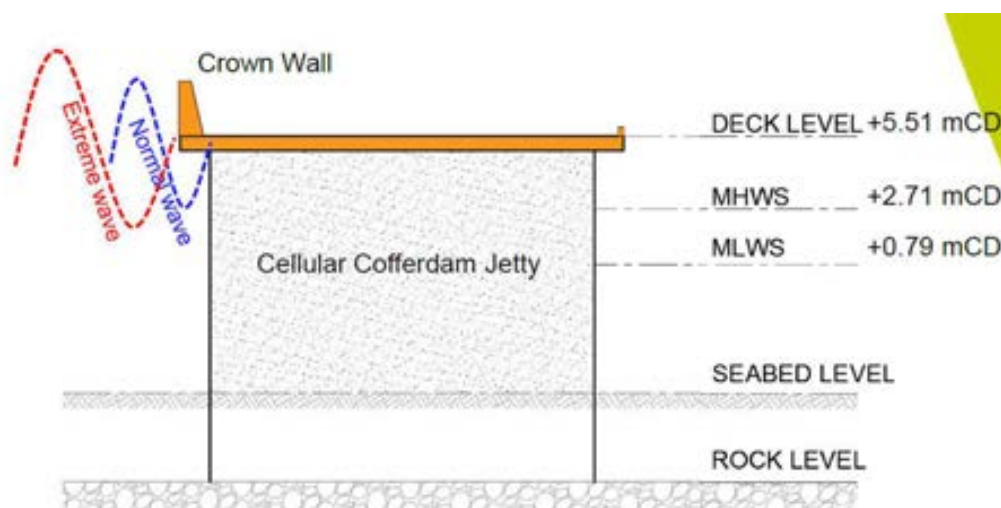
The total area of the jetty will be 1.2 ha (0.012 km<sup>2</sup>) with a length of 300m and width of 30m. The jetty will be a closed structure at 30° from the coast in order to provide shelter from waves (the dominant wave direction is from the northwest).

Dredging will be required to allow vessels access to the jetty and will likely be undertaken using a trailer suction hopper dredger, cutter suction dredger, or a clamshell dredger. The total dredged area will be 180,000 m<sup>2</sup> as per approved jetty layout design by MPA and an estimated volume of 410,000 m<sup>3</sup> of material will be dredged / excavated and this will be used for land reclamation and fill material for the jetty construction. No dynamite will be used to construct the jetty. Only a small portion of non-suitable materials (silts) will be taken away by a ship to a Myanmar Port Authority (MPA) approved disposal area. The disposal site has not yet been selected. This location will be selected in accordance with the requirements from MPA and details will be provided to ECD prior to construction.

The amount of material to be disposed of at the disposal area is not able to be calculated at the time of writing this report. M&AOSB will prepare a disposal plan that will be submitted to and approved by MPA prior to construction. This disposal plan will also be provided to ECD.

An access bridge/trestle will connect the coast to the main jetty structure offshore. For the design of the jetty, based on preliminary design information, a gravity type structure (cofferdam) has been selected as this will offer good wave protection. The design is provided in *Figure 4.6*.

**Figure 4.10** *Design of the Jetty (Cross Section)*



The design of the jetty and piling used is not yet confirmed. The appropriate piling method is subject to detailed design. Temporary steel supports will be placed on the seabed with piles vibrated into the seabed to provide restraint. Following this the main steel sheets for the cofferdam will be vibrated into the seabed to form 'cells'. Material from the top of the seabed will be removed if necessary after which the cells will be filled with clean sand to the top of the platform. If it is not possible to use sand from dredging and/or excavations

on site, sand will be imported from approved and licensed sites. The EPC contractor will use a sustainable source for sand used for the Project. An analysis of the soil and sediment types in the Project Area was conducted by RHDHV and is presented in *Figure 4.11*.

The platform will be topped with reinforced concrete copings and decking which will be a combination of precast and cast-*in-situ* elements.

The cross section of the Access Bridge and jetty is provided in *Figure 4.12* and *Figure 4.13*, respectively.

Figure 4.11 Analysis of Sediment/Soil in the Project Area

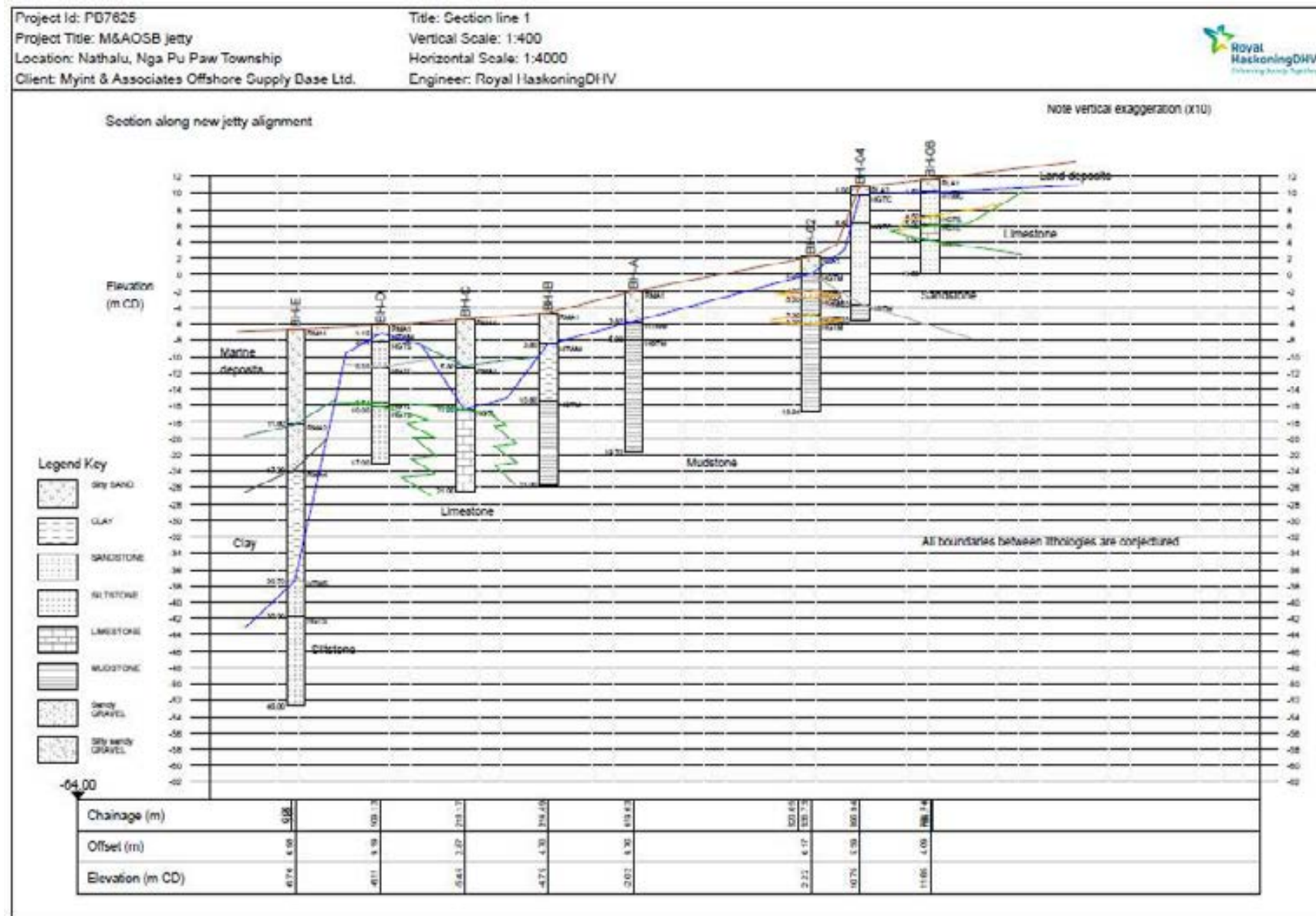


Figure 4.12 Cross Section of Access Bridge

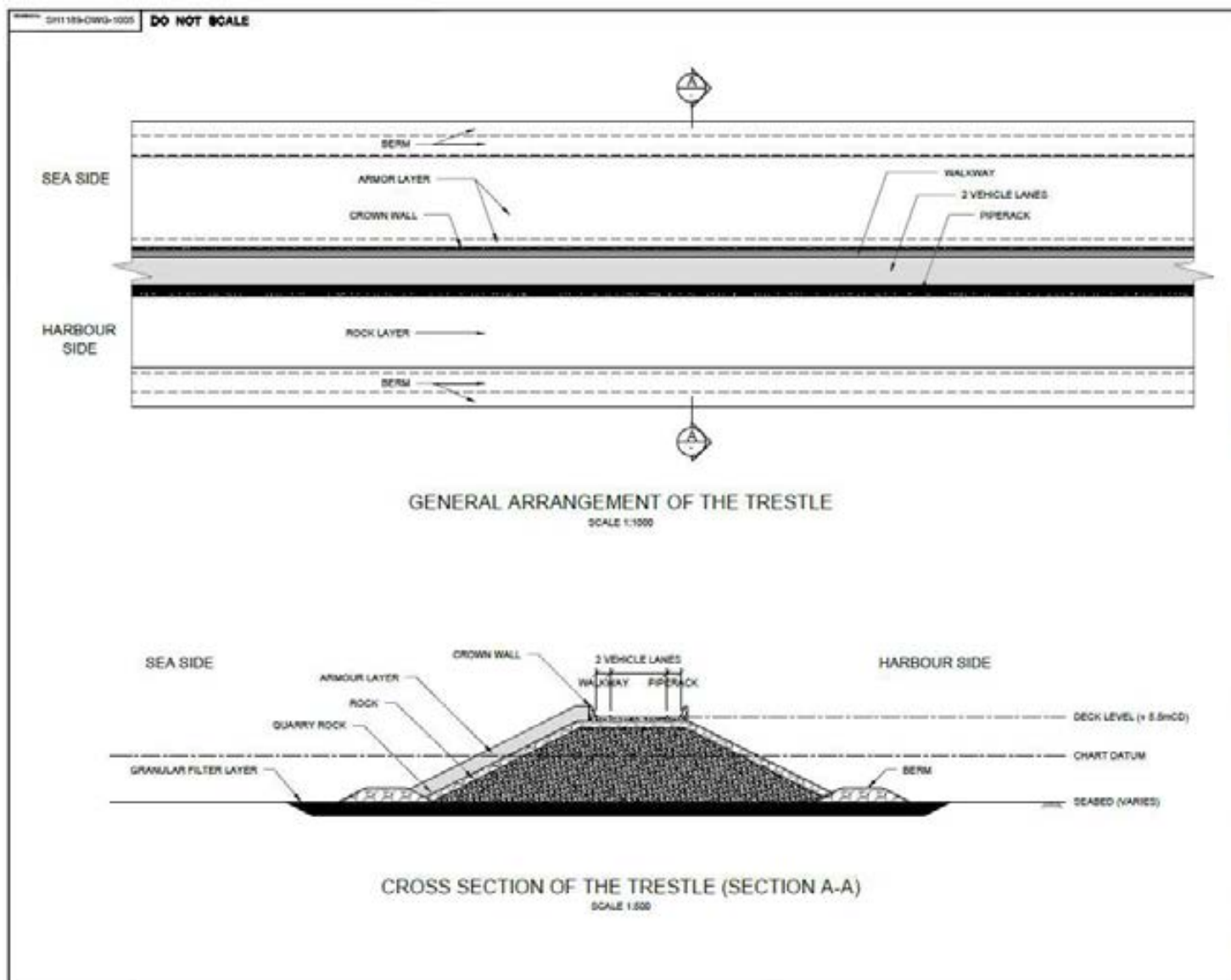
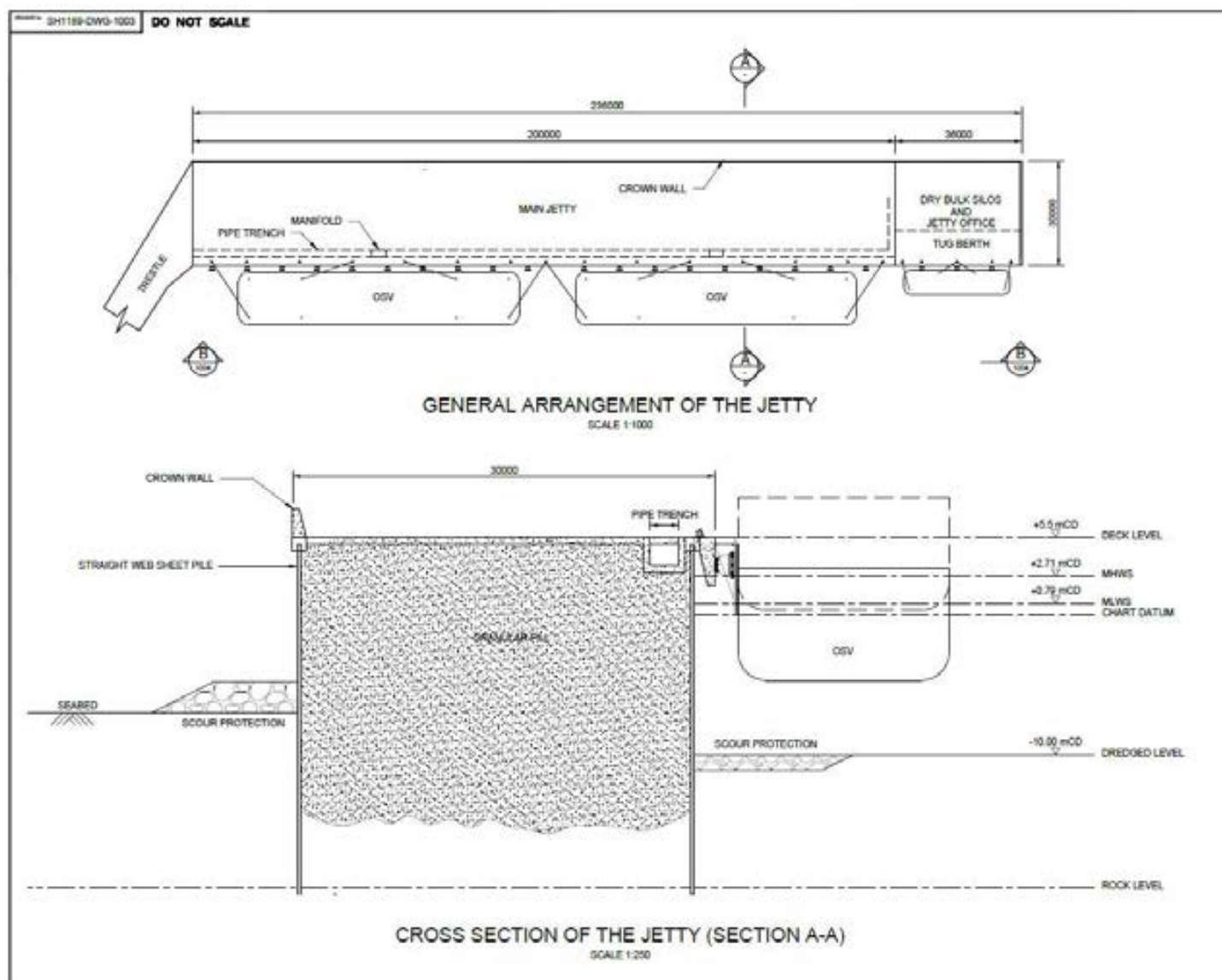




Figure 4.13 Cross Section of Jetty



### *Onshore Activities*

There will also be a supply base area onshore for storage of materials from oil and gas operations in the area. The construction phase will include site preparations (such as site clearing, soil improvement and other earthworks), construction of temporary labour shelters, temporary fencing as well as temporary water supply and lighting. Open concrete yards for warehouse and container stacking will be constructed.

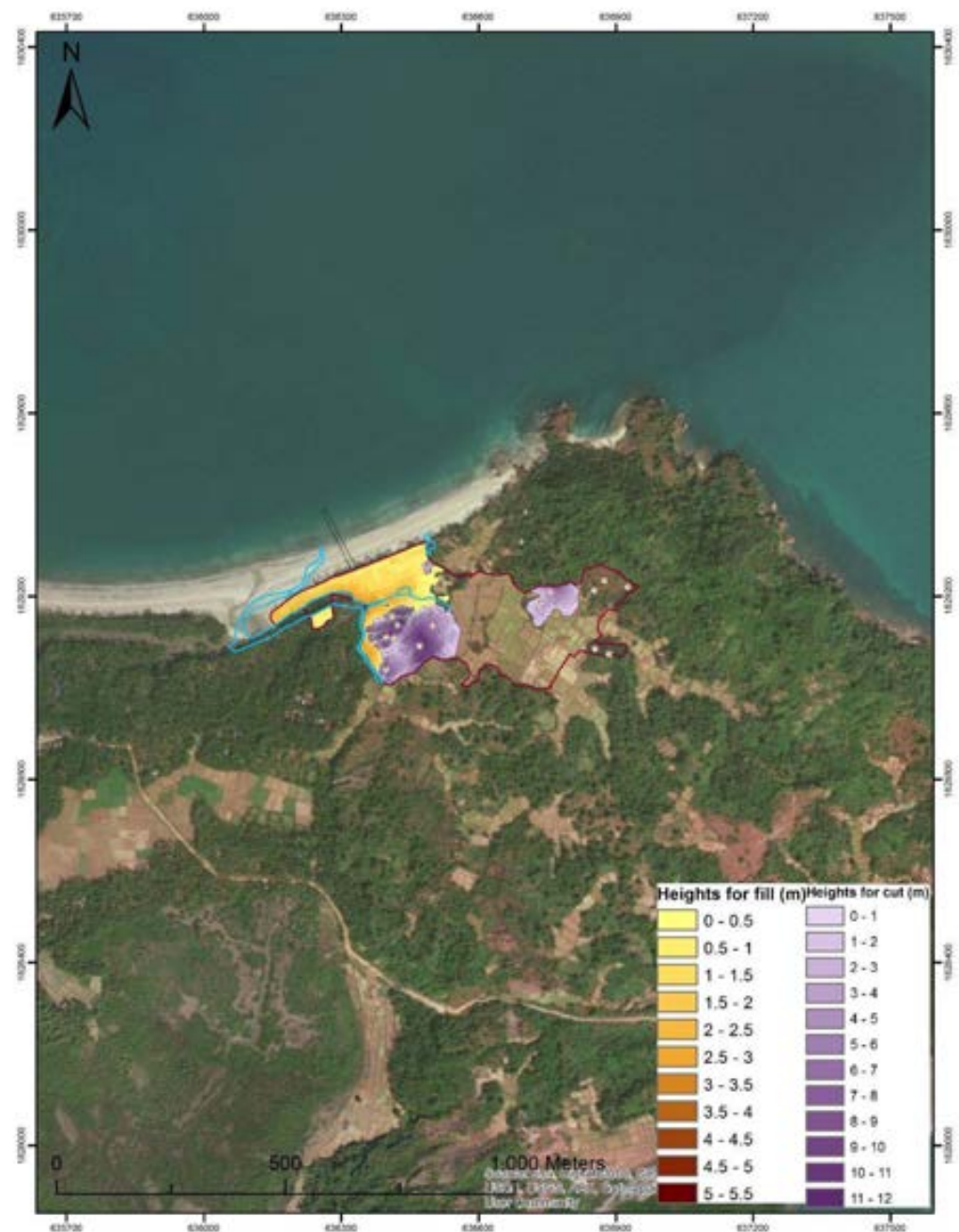
During construction, there will be on-site power generation by a small diesel-powered generator located on the Eastern side of the base, away from the village.

Given the topography of the OSB, levelling of rocky hills will be conducted and the fill material will be used for jetty/causeway construction. The topography of the OSB is shown in *Figure 4.14*.

Biomass decomposition form reservoir flooring is not relevant here as there will be no infilling of surface water. The Project Area is mostly agricultural land and some coconut grove forest.



Figure 4.14 Topography of the Project Area



The equipment used during the onshore construction activities will include rollers, dump trucks, bulldozers, mobile cranes, and batching plants.

Materials to be handled and stored at the base include the following:

- Drilling fluids
- Cement
- >1,500 ppm water
- Potable water
- Oilfield chemicals

- Various OCTG (Oil country tubular goods)
- Compressors
- Pumps
- Heating equipment
- Spare parts
- Diesel
- Valves
- Drill bits
- Wellhead and related parts
- IT and telecom

#### *Access Road*

There will be a new access road from the Project Site to the nearest road. This will be approximately 800 m in length and 10 m wide and pass through modified habitat (coconut farms/ groves) and paddy fields (shown as blue dotted line in *Figure 4.15*). The access road will be mainly used by local people that are employed by M&A OSB and expected traffic at this stage is the typical commuting traffic. Being a commuting lane, it will be a dirt road with 10m width and load shall be designed for 3t/m<sup>2</sup>. The land utilised for access road has been purchased by M&AOSB from local land owners. The purchasing contract list and copy of one contract is provided in **Appendix C**.

Construction materials will arrive from sea via landing crafts from Yangon port or another port in Myanmar. From Yangon everything will come by local Myanmar vessels so there no possibility of foreign invasive species being imported on vessels from outside Myanmar waters.

During the operation phase supplies via road start to increase and if materials obtained from excavation or dredging are not suitable, construction materials for the causeway will be imported from approved and licensed sources.

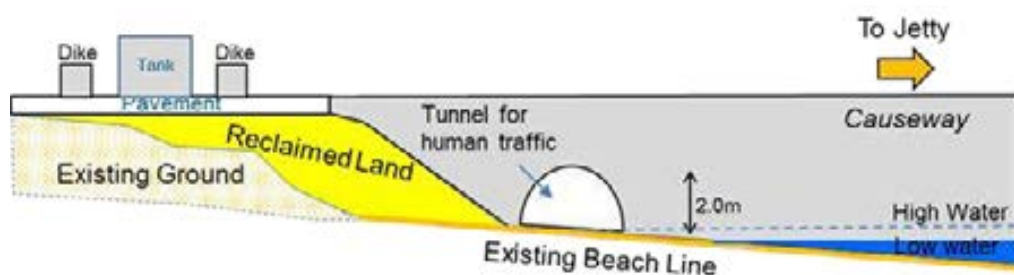
**Figure 4.15**    *Access Road to Project Site*



#### *Tunnel*

In order to mitigate the potential impacts from loss of beach access from the jetty structure, M&AOSB will construct a tunnel on the beach to allow the local beach users (local communities and fishermen) to have access to the beach. The tunnel is shown in *Figure 4.16*.

**Figure 4.16**    *Tunnel Access on Beach*



#### *Land Use*

Land acquisition was conducted for the Project with local communities and village leaders. The purchased areas are all paddy field and the land was purchased at market price through consultation with local communities. A map of the land owners who have sold out their land to M&A is provided in *Figure 4.17*.



Figure 4.17 Map of land area purchased by M&A from the community



Source: M&AOSB

### *Helipad*

There is also the potential for helicopters to be used during the operation of the Project but this will be limited to emergency events, such as medivac and urgent repairs, and will therefore not be regular. The potential location of the helipad as in Figure 4.18.

**Figure 4.18** *Potential location of the Helipad*



### *Workforce*

It is estimated that there will be around 400 to 700 workers employed during the construction phase, with around 70% of the total workforce coming from local communities and the rest made up of migrant workers.

### *Equipment Required*

The equipment used during the construction will include piling barges, construction barges with small tugs and landing craft. Vessels used during Construction include:

- A piling barge;
- At least 2 barges;
- 1 small tugboat;
- Several small support vessels;
- Dredger – likely to be grab dredger (i.e., clam shell dredger). These also produce less dredge plume; and



- Landing craft.

All the construction equipment and construction materials will come via Yangon port or another port in Myanmar. If any of this equipment or material is imported it will have to be trans-shipped in Yangon. From Yangon everything will come by local Myanmar vessels so there no possibility of foreign invasive species being imported on vessels from outside Myanmar waters.

#### *Waste Generation*

Waste generated during construction will include site clearance waste, excavated materials, waste concrete, wooden material, chemical waste, sewage and domestic waste. Waste disposal will be carried to a licensed waste handling facility (Dowa) in Thilawa.

#### *Traffic (onshore & offshore)*

The following assumptions are made:

- Contractor will set-up a batching plant on-site
- All materials will be delivered by barge/landing craft
- Most labour will stay on-site in temporary barracks
- Senior staff may stay at the resort and leave by vehicle;
- Occasional visits by road from surveyor(s) etc.

With these assumptions the following traffic is expected:

During the 3-5 months for the piling work, a piling barge will be towed or sailed to site and stay there. Landing craft and materials barges will be towed or sailed to site and, depending on size; there will be 1 barge/landing craft every 2-3 weeks with certain peak periods. During this period, two tugs will be on standby in the Project Area and occasionally sail around the Project Area while personnel boats will make approximately 4 trips to the piling barge a day.

For concreting works, both precast and *in-situ*, material will be brought to site by landing craft with 1-2 movements/week expected.

After approximately 6 weeks of piling, placement of concrete units will start with a separate crane barge and pontoon, the pontoon being shuttled between the beach and the barge with materials on a daily basis. After the crane barge is brought to site it will stay there till the end of construction to also install such things as fenders etc. The barge will move around the construction site with one or 2 moves made daily along the structure alignment. Personnel boats will make approximately 4 trips to the piling barge a day.

Once the access is starting to be constructed one or 2 pick-ups and a small mobile crane are expected to move along this several times on a daily basis to support construction with small materials and equipment.

To maintain the workforce at site and provide fuel and food etc. twice weekly deliveries by landing craft are expected while small trucks will come overland. The small truck movements are expected to be approximately 8-12 movements a day, varying throughout the week.

All construction traffic will arrive by sea and depart by sea and be restricted to the site area only. Operational transport on the base is expected to consist of three cranes (60-120t), three forklifts (up to 16t capacity), five tractor units with 12m trailers, and two 4WD vehicles. All those equipment will arrive by sea and be confined to the base with the exception of the 4WD vehicles. Traffic to and from the base will consist of commuter traffic of the local workforce. No heavy goods vehicles are envisaged.

The access road will be mainly used by local people that are employed by M&AOSB and expected traffic at this stage is the typical commuting traffic. Being a commuting lane, it will be a dirt road with 10m width and load shall be designed for 3t/m<sup>2</sup>.

A Traffic Management Plan will be prepared and submitted to ECD prior to operations commencing.

#### 4.5.2

#### *Operation Activities*

The Project objective is to provide logistics services to the offshore oil and gas industry in Myanmar. During the first years of operation all goods will arrive by cargo ship, and will be stored at the base, shipped on an offshore support vessel (OSV) to the rig/platform, shipped back to the base on an OSV for further storage or, if necessary, removed by cargo ship.

The proposed facilities that will be available during different phases of the development are provided in the following sections.

#### *Facilities*

##### Liquid Mud plant

A liquid mud plant is a bulk handling facility where dry powder and wet components are mixed to produce 'liquid mud' which is a critical component for the drilling operation (*Figure 4.19*). Products include water based mud, and oil based mud. A facility typically consists of a small covered mixing facility and a small group of tanks placed inside a banded area for spill containment. The liquid mud plant is connected to the manifold at the jetty with a pipe network.

**Figure 4.19**     *Liquid Mud Plant*



#### Open Storage Areas

The outside storage areas will be used to store goods such as cargo carrying units, steel pipes, steel plate, tubulars, tote tanks, pressurized tanks, drums of lubricants and other materials not requiring covered storage.

#### Workshops

There may be oil and gas industry service providers that will want to have workshops on the base where specialized equipment can be assembled, tested, repaired and overhauled.

#### Accommodation

In the first phase temporary accommodation units will be placed with following specifications:

- Air conditioned: able to maintain a temperature of 21C°.
- Apartment furniture: beds, lounge, desks and chairs (as applicable).
- Kitchen facility: gas / electric stove, microwave, utensils etc.
- Bathroom facilities: toilet, shower, sink with running water.
- Cleaning services: accommodation servicing.
- Electricity / water supply: included.
- Wireless internet: accommodation to have high speed internet service provider.
- Security: 24 HR CCTV, solid lockable external doors, security rated locks



with keys provided to Company Representatives, alarms and safe secured to floor.

- Fire sensors, fire alarm & fire-fighting equipment: appropriately installed at designated locations.
- Emergency exits: accommodation to have clear emergency exits and muster points as well as fire-exit layout plan.

### Office

For the first stage temporary office facilities are foreseen which meet the following specifications:

- Air conditioned: reverse cycle to maintain the entire office at approximately 21 degrees Celsius in all predictable weather extremes.
- Reliable 220 / 240- 50 / 60 hz power supply with generator backup.
- Utilities: electricity, water, diesel (for backup generator).
- Kitchenette for coffee and tea preparation.
- Wired telephone service: two phone lines and one fax line with international access and high speed wireless internet connection in each office.
- High speed reliable 4G wired internet.
- Security: all offices must be lockable (keys provided to Company).
- First aid stations / kits.
- Fire sensors, fire alarm and fire-fighting equipment, appropriately installed at designated locations.
- Emergency exits: designated doors as emergency exits inclusive displaying a fire-exit layout plan.
- Meeting Room to have ability to install Company IT equipment (i.e. projector, video conference device etc.).
- Security: All offices and Company Server Room must have lockable solid external doors with keys provided to company representatives.

### Drainage system

The OSB shall have drainage systems, which will be sufficient to ensure that there is no standing water in and around the supply base areas, i.e. open storage areas, pipe yards, warehouses, offices, etc. The drainage and sanitary systems shall include, but not be limited to channels, side & interception ditches, and inlet & outlet ditches in order to keep away water from the

embankment for permanent drainage. Mosquito control will be critical in drainage.

#### Waste Storage Facility

A small open but roofed storage facility will be required where various types of waste storage units containers, drum, etc. can be stored safely.

#### Fire Fighting and Safety Equipment for Fixed Facility

OSB should have sufficient amounts of firefighting and safety equipment to cover the entire facility area, including but not limited to fixed and portable fire extinguishers and fire hose(s).

A fire protection system will be installed with the capacity to cover the entire area of the facility which includes a hydrant system.

#### Power Generator

A generator will be required to supply sufficient power for the OSB facility. For the first phase an estimated 600 KVA is required.

#### Fuel

There will be up to 5 fuel tanks with a maximum capacity of 2,000 m<sup>3</sup> each. Fuel tanks will be installed within bunded concrete walls and will comply with applicable international standards.

#### Water Supply

In the first phase water will be produced from seawater using a Reverse Osmosis (RO) facility to avoid competition for local groundwater sources. Booster pumps may be required at certain points to ensure sufficient pressure remains on the lines at all times. M&AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimise impact to communities if there needs to use groundwater.

A sea water intake will be built along the jetty, on the unprotected side. The end of the intake will be equipped with a mesh protection to avoid suction of marine life. The location of the intake is as in *Figure 4.20*.

Figure 4.20 Sea Water Intake



RO is very effective in treating brackish, surface, and ground water for both large and small flows applications. The sea water will have a natural degree of filtration that will reduce pretreatment requirements and will increase lifespan of the RO system membranes. Two additional solutions could be as follows;

- Discharge to beach and offshore galleries and trenches; and
- Dilution by forward osmosis using domestic wastewater.

Discharge to the beach and offshore galleries and trenches will be a small RO plant that will produce no more than 60 m<sup>3</sup> of brine per day. The reject feed water will be discharged to the sea at controlled intervals. The fresh water aquifer will not be affected.

M&AOSB are currently studying the option of a reservoir probably in a later phase. A reservoir may be created at the back of the OSB between 2 hills and flooding a current paddy area. The water from the reservoir will be distributed to various locations at the OSB including but limited to: the office, accommodation, and warehouses, jetty. The local community can get benefits by sharing water from the reservoir.

No details of the storage capacity and size of the reservoir are available at this stage. It will be an open reservoir, within the land acquired by M&AOSB. The reservoir will be built within the area where was purchased from the farmers at the existing market price.

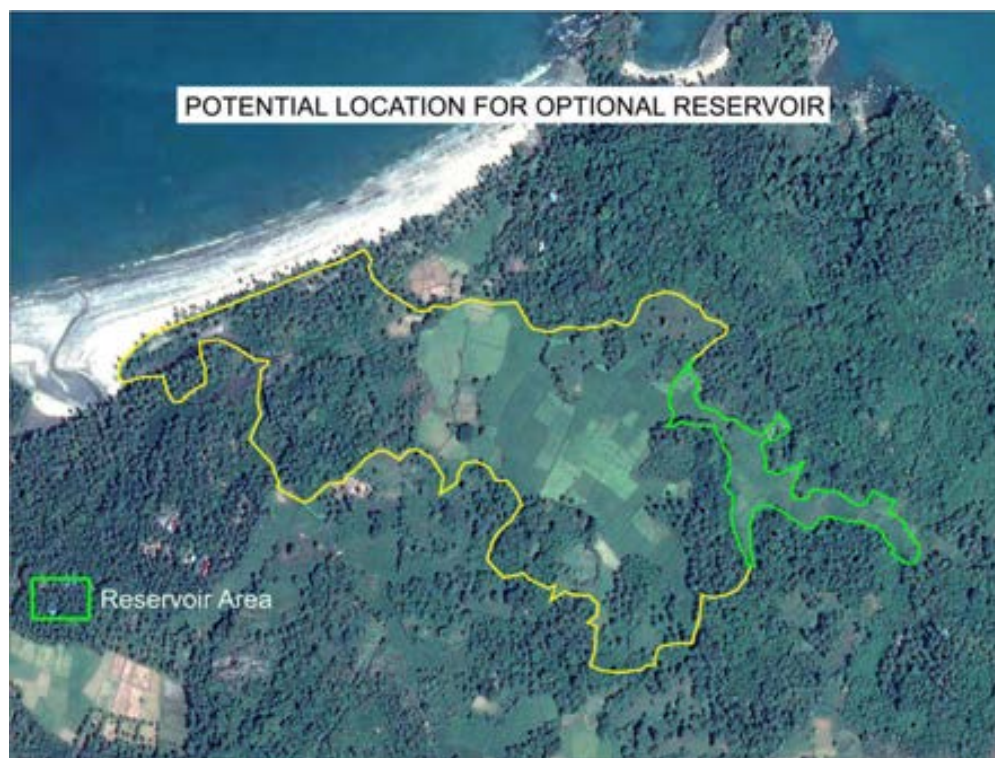
A reservoir will meet initial requirements of 35 m<sup>3</sup> per day. The ultimate water requirement for the project is 3000 tons/month (or) 3055 m<sup>3</sup>/month and the net water requirement for the whole year is 36,600 m<sup>3</sup> (or) 8.00 ml gallons.

To secure such quantity of water from rainfall, an approximate catchment area of six (6) acres is required. Another important need is to reserve adequate storage area as follows:

- Based on the reliable rainfall period of 150 days in a year; and
- Volume of water required to store for 215 dry days = 21,900 m<sup>3</sup>.

There will be an installed desalination plant in the project to meet the initial requirement. The reservoir is optional and it will be required to prepare prefeasibility study covering all project scenarios with relevant costs and implementation program if it is decided to build a reservoir. The intended location of the reservoir is shown in *Figure 4.21*.

**Figure 4.21** *Potential Reservoir Location*



#### *Jetty*

Maintenance dredging of the navigation channel will occur around once a year during operation. The volumes of dredged materials generated will be around 20 to 30% of those generated during construction. Dredged materials will be taken away by a ship to a Myanmar Port Authority (MPA) approved disposal area. The topsides will most likely include:

- Three silos for dry bulk storage;
- Pipe-connections to fuels tank-farm;
- Pipe-connections to Liquid Mud Plant ;
- Pipe-connection for water;

- Manifold for all liquid products;
- Operator office; and
- Lighting.

#### *Workforce*

There will be around 100 staff required for the first phase of operations and an additional 100 staff will be required for the second phase, with around 70% of the total workforce being from local communities and the rest made up of migrant workers.

#### *Equipment Required*

Equipment at the supply base will include:

- Yard crane;
- Forklift trucks;
- Rough terrain forklift;
- Wharf crane;
- Reach stacker;
- Forklift trucks; and
- Semi-trailer trucks.

#### *Storage Plan*

All chemicals received into the warehouse will be added to the stock list. Chemicals will either be in bags or in drums on pallets or one ton bulk bags or in one ton intermediate bulk containers. All differing types of chemicals will be stored separately in specifically marked zones. Any chemicals received in a damaged condition will be placed in a bunded quarantine area and the damage rectified. Chemical spill kits will be positioned throughout the warehouse as a precaution in accordance with best industry practice.

The likely chemicals to be stored are listed below. These chemicals are selected by the offshore oil and gas operators and the use of which would be subject to a separate review under the respective offshore EIAs:

- Potassium chloride – KCl;
- Calcium carbonate -  $\text{CaCO}_3$  – fine, medium & coarse;
- Bentonite;
- Barite;

- Lime;
- Biocide;
- Caustic soda;
- Emulsifiers;
- Class G cement; and
- Gas migration blocker.

#### *Security*

The OSB will most likely have a dedicated security team including advanced security systems (sensors, alarms, watchmen, CCTVs, barbed wired fence, finger print, etc.).

#### *Traffic (onshore & offshore)*

Vehicles will be utilised during operation. Currently, estimated numbers are not known but over the five year period, vehicle usage could be up to 20 trucks per day. However, for the first few years of operation, this amount is likely to be a lot less. Vessels during Operation include:

- Supply vessels. Largest will have drafts of up to 8 m and will be up to 150m length
- General Cargo vessels up to 200 m length
- Small Tankers with up to 200 m length

It is estimated that during operations there will be an average of one vessel per two days.

There is also the potential for helicopters to be used during the operation of the Project but this will be limited to emergency events, such as medivac and urgent repairs, and will therefore not be regular.

### **4.5.3**

#### ***Waste Management***

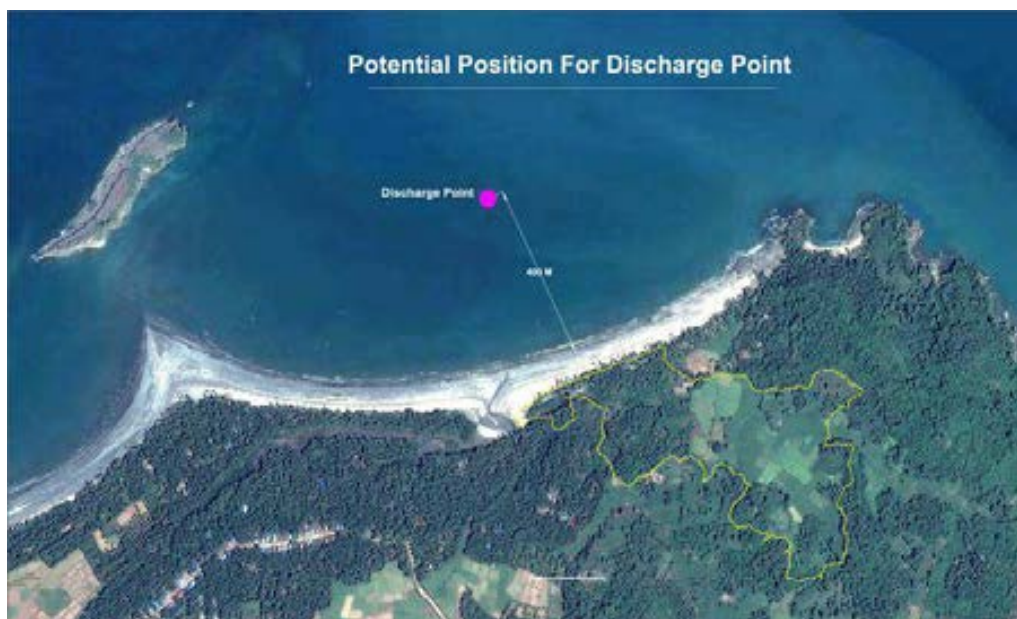
Construction vessels used for the Project will adopt the applicable MARPOL (international) requirements for waste discharges. No waste will be discharged within three nm of the coast.

Liquid effluents associated with land-based activities in ports and terminals (such as construction activities, vehicle maintenance and washing, fuel and material storage and transfer, etc.) include storm water, wash water and sewage. A sanitary system for the OSB will be installed to ensure that all waste grey and or black water / fluids are collected, stored and treated. After treatment the effluent shall be discharged in accordance with NEQ Guidelines. The discharge location will be along the Palin Gyaing Beach to



the North of the Project Area, 400m from the shore. The discharge location is as in *Figure 4.22*.

**Figure 4.22** *Discharge Point Location*



Hazardous waste will be sent to a licensed waste handling facility in Thilawa. Typical hazardous wastes include; oil, general industrial chemicals, and specialised chemicals used by the offshore oil and gas industry (such as bentonite, etc.). The hazardous area will be banded and serves as temporary storage to categorize and separate the different hazardous wastes, which will then be transported and processed by a certified waste management operator.

The details of the solid waste volumes from offshore oil and gas operations are provided in *Table 4.5*.

**Table 4.5** *Waste Sources and estimated amount*

Type	From Rig to OSB Volume by waste (m <sup>3</sup> ) (m <sup>3</sup> per well)	From Platform to OSB Volume by waste (m <sup>3</sup> per platform)
Cuttings	80.50	-
Grey and toilet water	80.50	-
Miscellaneous chemicals	80.50	736.00
Miscellaneous Solid Waste - hazardous	80.50	736.00
Miscellaneous Solid Waste - non hazardous	35.00	368.00

The only waste to be treated on site will be grey water and oily water. All residues from the waste water treatment plant (WWTP) will go to the waste reception centre. The remaining waste will be shipped to Yangon for treatment or disposal. The waste flow chart is as in *Figure 4.23*.



All cut/dredged and fill balance shall be disposed of at MPA authorized disposal areas.

#### 4.6

##### *SCHEDULE*

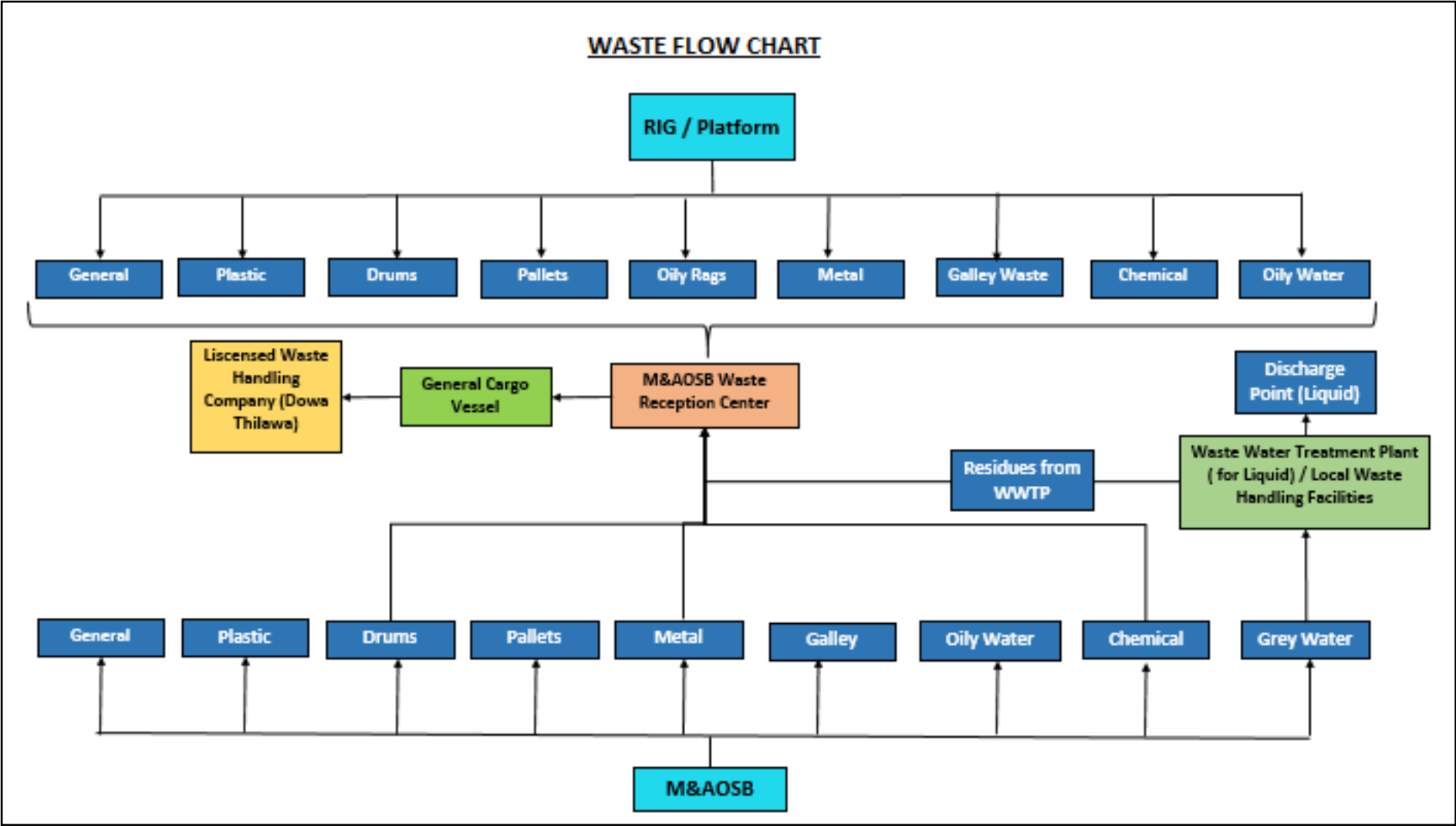
The construction phase is scheduled for 1.5 to 2 years; estimated to be sometime between 2018 and 2023. On-site construction activity for the marine works will be 9 to 12 months.

It is expected that the initial phase of construction of the OSB will be completed by around 2019. This initial phase will consist of only fundamental OSB infrastructure and basic facilities, handling approximately 30 to 40% of the phase 1 cargo requirements.

The full phase 1 operations will start approximately two years or later (>2021) depending on market demand.

This schedule is dependent on the selection of the contractors. M&AOSB will provide detailed schedule updates to local communities prior to construction of the Project.

Figure 4.23 Waste Flow Route



## 5.1 INTRODUCTION & SETTING THE STUDY LIMITS

The following section describes the physical, biological and social environment within the Project's potential Area of Influence. The Area of Influence is defined in the International Finance Corporation Performance Standard 1 (IFC PS1) as: *"The area likely to be affected by: (i) the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent."*

The Project's Area of Influence covers the Project Area, as well as its immediate surroundings. ERM has conservatively assumed that the potential impacts from air and noise emissions, waste discharges, and sedimentation have the potential to occur up to 5 km from the Project Area (Figure 5.1).

A more expansive area, known as the Study Area, was defined as 10 km from the Project Area in order to give a broader picture of the overall physical, biological and social characteristics. The Study Area covers the Area of Influence and also encompasses the coastal habitats of the bay area of Nga Yoke Kaung as well as Goyangyi Island. This wider review is used to identify and scope potential impacts associated with the project.

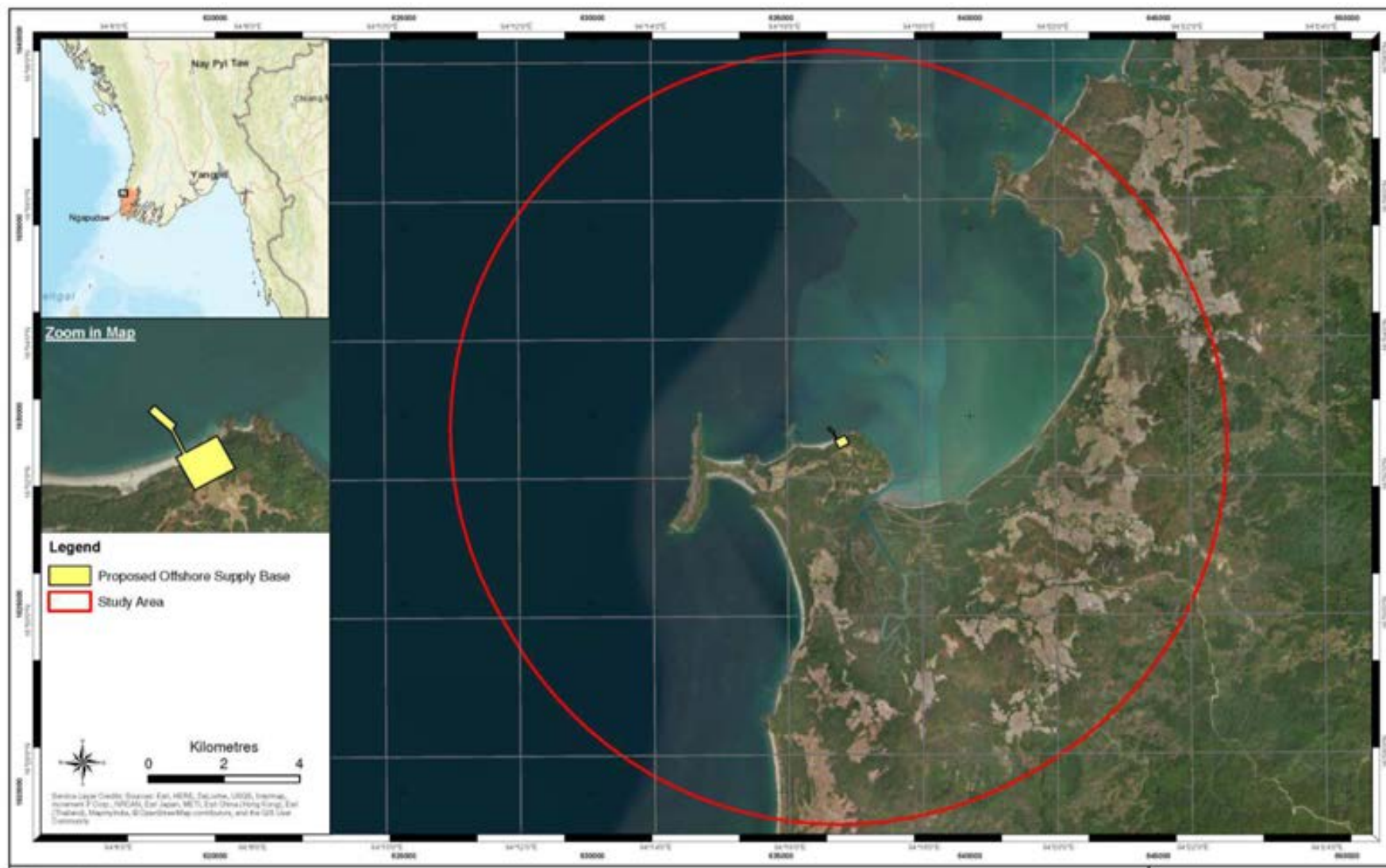
## 5.2 METHODOLOGY

The information provided in this section is based on data collected from primary and secondary sources.

Primary data was collected during the scoping visit and site survey of the Project Area in January 2017. Secondary sources include a desktop review of published information, supplemented with information provided by M&AOSB and through review of available ERM in-house literature. These data sources have been supplemented by data provided from a variety of stakeholders, including government bodies (e.g. Ministry of Education's Department of Marine Science), scientific organisations (e.g. Marine Science Association Myanmar), non-governmental organisations (NGOs) (Wildlife Conservation Society), Civil Society Organisations (CSOs) and local communities.

The objective of this section is to ensure there is a robust environmental and social baseline for the Study Area against which the potential Project impacts can be assessed.

Figure 5.1 Project Location and Study Area



### 5.2.1 *Baseline Surveys*

An overview of the survey schedule is presented in *Table 5.1*. The survey was successfully concluded within the scheduled 3 day period from 16<sup>th</sup> September to 18<sup>th</sup> December 2017.

Given that discharges and water intake will occur along Palin Gyaing beach, there is no impact expected to occur to the estuary. As such, the survey locations were selected to be representative of areas near Palin Gyaing beach and offshore.

**Table 5.1** *Survey Schedule for Seawater Physio-chemical Sampling, Marine Sediment Sampling, Marcobenthos Survey and Subtidal Habitat Verification and Assessment Survey September 2017)*

Date	Activity
16 to 18 September 2017	Seawater Sampling and Marine Sediment Sampling
	Drop Camera Survey and Macro-benthos Survey
	Scientific Snorkel Survey
14 to 16 September 2017	Air Survey
14 to 16 September 2017	Noise Survey
14 to 16 September 2017	Soil and groundwater Survey
16 to 19 September 2017	Terrestrial Flora and Fauna Survey

## 5.3 *PHYSICAL CHARACTERISTICS*

### 5.3.1 *Climate and Meteorology*

The weather and climate of Myanmar is primarily influenced by the Northeast and the Southwest Monsoons and the short transitional periods between them. The southwest monsoon (June to September) is characterized by extensive cloud cover, light rain almost daily, interspersed with rain squalls or thunderstorms. The northeast monsoon (December to April) brings less cloud, scant rainfall, mild temperatures and lower humidity during winter (Suwannathatsa, *et al*, 2012).

The spring and autumn transition periods between the monsoons (April and May, October and November) are generally hot with very variable weather and heavy squalls. The transition periods are governed by the Inter-Tropical Convergence Zone (ITCZ) which separates the main wind streams of the northern and southern hemispheres. The ITCZ moves seasonally over the area (northwards in spring and southwards in autumn); with no well-defined weather pattern (Suwannathatsa, *et al*, 2012).

Satellite images from 1974 to 2015 show that the shoreline near the site has been modified by accretion of sand in between Goyangyi Island and the mainland. This is a well-known process called the Tombola-effect. It is a one-way process which means the land form linking Goyangyi Island and main land can be considered permanent and stable, but does remain low-lying and could be flooded during a storm surge (Royal Haskoning internal report).

### 5.3.2 *Coastline*

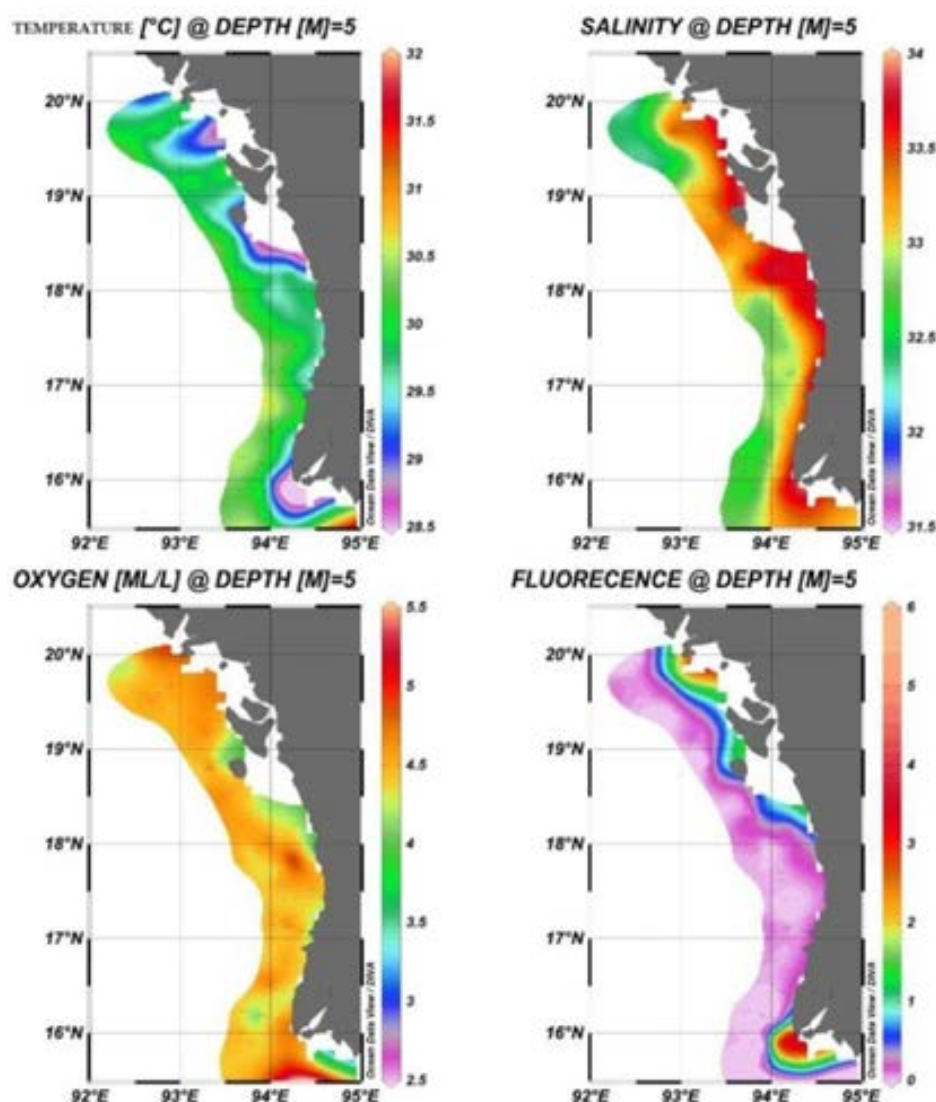
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### 5.3.3 *Oceanography and Hydrology*

The surface circulation of the Bay of Bengal moves generally clockwise from January to July and counter-clockwise from August to December, in accordance with the reversible monsoon wind systems (Somayajulu *et al*, 2003). The flow is not constant and depends on the strength and duration of the winds. The effects of a strong wind blowing for a few consecutive days are reflected in the rate of flow. Currents to the northeast generally persist longer and flow at greater speed because of the stronger southwest monsoons.

Information of temperature, salinity, oxygen levels and florescence in the Rakhine Coastal Region is provided in *Figure 5.2*. An analysis of the wave height, and changes in coastal morphology was conducted by RHDHV and are shown in *Figure 5.3* and *Figure 5.4*.

*Horizontal near-surface (5m depth) distributions of temperature, salinity, oxygen and fluorescence along the Rakhine Coastal Region (including Ayeyarwady)*



Source: Myanmar Ecosystem Survey (2015). FAO-NORAD PROJECTNO: GCP/INT/003/NOR. CRUISE REPORT "DR. FRIDTJOF NANSEN".  
EAF - N/2015/

## Wave Modelling Nga Yoke Kaung

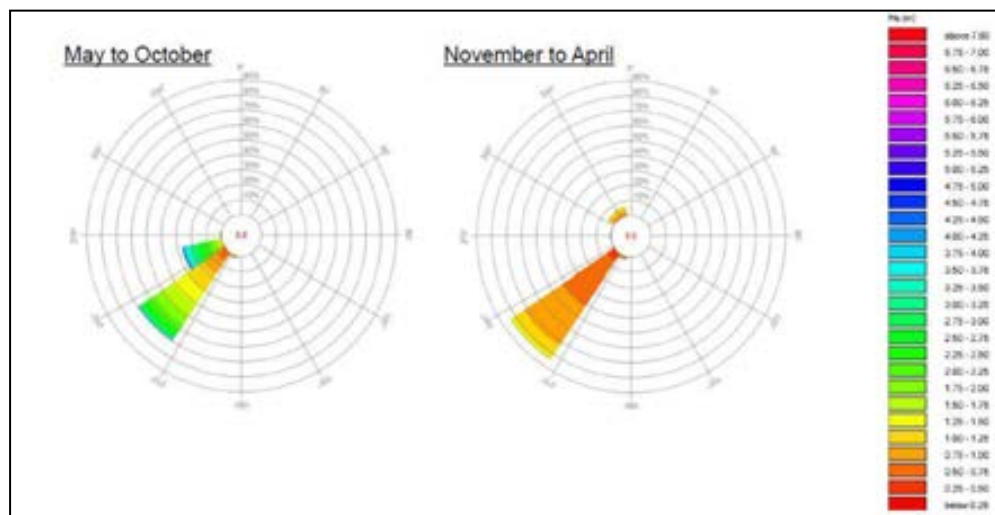
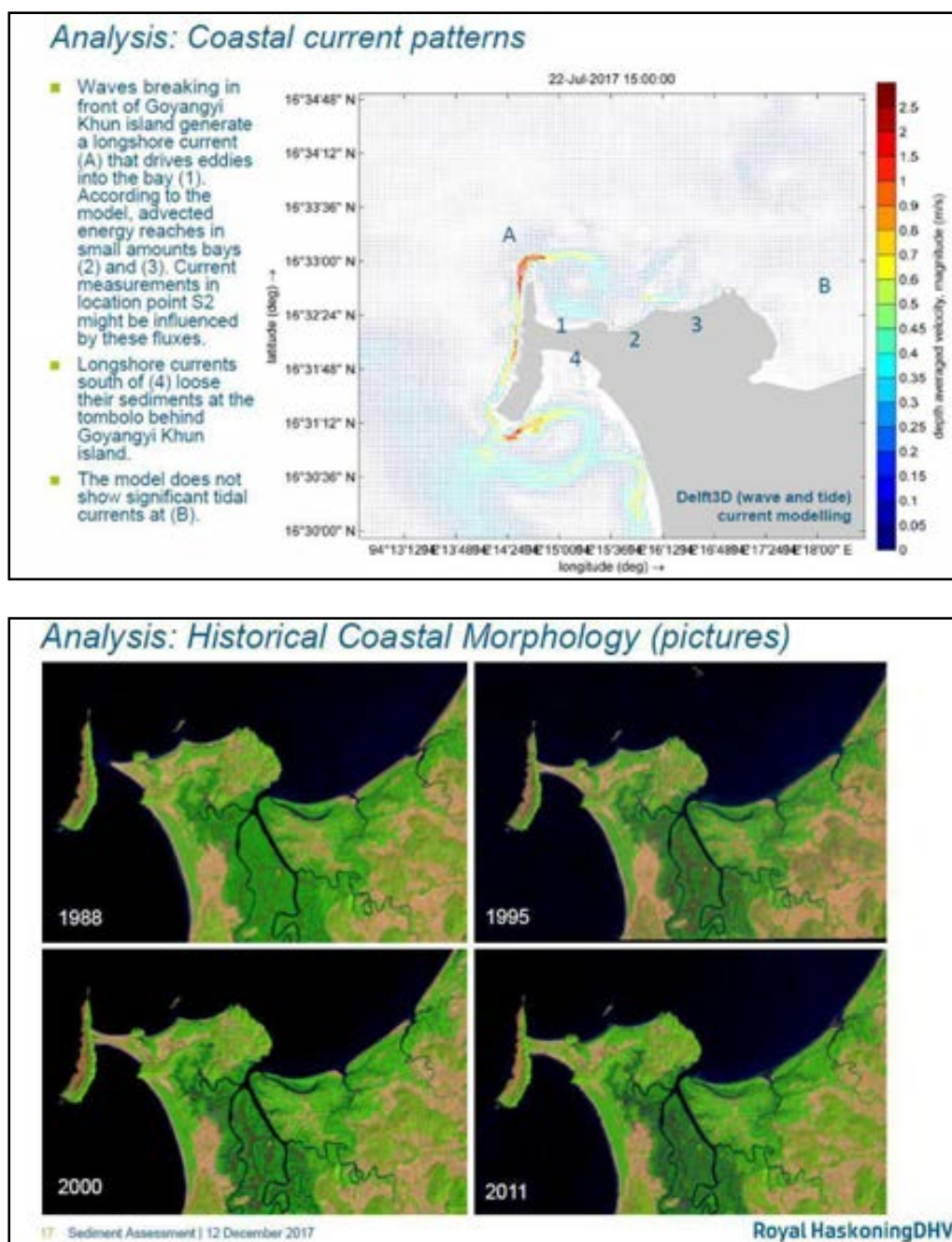




Figure 5.4 Coastal Current Patterns and Historical Coastal Morphology



### 5.3.4 Marine Sediment Sampling

#### Survey Methodology

A total of six stations were surveyed for marine sediment. The sampling locations are presented in Figure 5.5 and the number of stations at each location is described in Table 5.2. The locations were selected to include four (4) sites within the footprint of the Project and two (2) control areas outside the Project footprint for comparison. At each station, two (2) sediment samples were collected for laboratory analysis.

**Table 5.2**      *Sampling Locations and Number of Samples Collected*

Name	Location	Latitude (WGS)	Longitude (WGS)
S1	Jetty Footprint	16° 32' 43.277" N	94° 16' 37.419" E
S2	Jetty Footprint	16° 32' 39.473" N	94° 16' 39.300" E
S3	Dredged Area	16° 32' 55.423" N	94° 16' 43.058" E
S4	Dredged Area	16° 32' 45.566" N	94° 16' 42.993" E
C1	Control	16° 32' 43.430" N	94° 16' 19.962" E
C2	Control	16° 32' 55.965" N	94° 17' 1.466" E

\* It should be noted that these areas were selected based on preliminary design locations

Sediment samples were collected using a 0.1m<sup>2</sup> "Day" grab sampler. After retrieval, each grab sample was inspected for quality. A sample is deemed acceptable when:

- The depth of sediment penetration was adequate for subsampling, but not to the extent where the surface layer of sediment touched the hinged lid of the grab; and
- The surface layer of fine sediments was either undisturbed or still intact, with no significant sediment sample slumping, 'folding,' or wash out of the sample through the jaws of the grab.

Once accepted, the sample were labelled and photographed for reference. Subsequently, they were collected using a seawater rinsed metal spoon while samples for metals analysis were collected using seawater rinsed plastic spoon from the same sediment replicate. The sample were labelled and stored at a temperature of 4°C before chemical analysis.

Figure 5.5 Location of Sediment and Seawater Sampling Stations



The sediment sampler and all other utensils were rinsed with seawater after each sample had been collected to avoid cross contamination between samples. On completion of the survey, all samples shall be promptly transported, in chilled containers, to the testing laboratory for further analysis. The storage and preservation of the sediment samples is shown in *Table 5.3*.

**Table 5.3** *Storage and Preservation for Marine Sediment Samples*

Type of Analysis	Storage Container	Quantity	Preservation
Particle Size Distribution	Double Layered Polyethylene Bag	1 kg	Cool < 4 °C
Total Petroleum Hydrocarbon, Oil & Grease and Total	Glass Jar	0.5 kg	Cool < 4 °C
Metals	Glass Jar	0.5 kg	Cool < 4 °C

The parameters to be measures for marine sediment are shown in *Table 5.4*.

**Table 5.4** *Marine Sediments Parameters and Test Methods*

Parameter	Test Method	Number of Samples
Particle Size Distribution	BS EN 1377: Part 3	12
Munsell colour	Munsell Colour Charts	12
Colour	In-house	12
Total Petroleum Hydrocarbon (C10 – C36)	APHA 5520 E & F	12
Total Organic Carbon (TOC)	USEPA 9060	12
Oil & Grease	APHA 5520E	12
Metals		
• Arsenic		
• Barium		
• Cadmium		
• Chromium		
• Copper		
• Iron	APHA 3125	12
• Lead		
• Manganese		
• Nickel		
• Selenium		
• Zinc		
• Mercury		

Field logs were maintained for all survey work, noting the date of the survey, equipment used, and a record of all activities and observations. Field logs were retained for the duration of the survey.

All samples transferred from the survey vessel to the laboratory were accompanied by Chain of Custody (COC) forms. The number of samples, the parameters to be tested and the time of delivery were clearly stated on the COC forms to ensure that samples are analysed for the correct parameters.

## *Survey Result*

Table 5.5 presents the marine sediment survey results. There are no national sediment quality guidelines in Myanmar. For context, metal concentrations were therefore compared against Australian and New Zealand interim sediment quality guidelines (ANZECC/ARMANZ 2000) <sup>(1)</sup> ('ISQG') as well as Australia's National Assessment Guidelines for Dredging 2009 ('NAGD') <sup>(2)</sup>.

(1) ANZECC/ARMCANZ 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.  
<http://www.agriculture.gov.au/SiteCollectionDocuments/water/nwqms-guidelines-4-vol1.pdf>

(2) Australian Government 2009. National Assessment Guidelines for Dredging.  
<http://www.environment.gov.au/marine/publications/national-assessment-guidelines-dredging-2009>

**Table 5.5 Marine Sediments Survey Results**

Parameter	S1	S2	S3	S4	C1	C2	ISQG Trigger Level	
							Low	High
Particle Size Distribution	Sandy Silt, Clayey Silt	Sandy Clay, Sandy Silt	Silty Sand	Sandy Silt	Silty Sand	Silty Sand	-	-
Gravel (%) (>2.00mm)	0.2	1.8	0.6	1.9	1.4	0.3		
Sand (%) (0.063 – 2.00mm)	27.5	31.6	75.6	34.0	50.4	60.7		
Silt (%) (0.002 - 0.063mm)	50.6	38.5	23.9	47.3	35.0	26.8		
Clay (%)(<0.002mm)	21.7	27.3	0.0	16.9	13.3	12.2		
Munsell colour	Dark Greenish Grey	Very Dark Greenish grey	Very Dark Greenish grey	Dark Greyish Brown	Dark Greenish grey	Dark Greenish to Greenish Black	-	-
Colour	grey	grey	grey	Brown	grey	grey, Black	-	-
TOC (mg/kg)	6559.0	7647.5	16346.0	20790.0	12115.0	8959.5	-	-
TPH (C10-C36) (mg/kg)	ND (<1.00)	ND (<1.00)	ND (<1.00)	ND (<1.00)	ND (<1.00)	ND (<1.00)	550	-
Oil and Grease (mg/l)	43.0	78.0	71.0	71.0	43.0	21.5	-	-
Arsenic (mg/kg)	2.86	2.43	2.39	2.63	2.82	3.11	20	70
Barium (mg/kg)	3.96	2.92	2.95	0.50	1.39	1.68	-	-
Cadmium (mg/kg)	2.06	1.91	1.77	0.55	1.57	1.30	1.5	10
Chromium (mg/kg)	64.10	54.00	59.90	17.15	40.70	35.30	80	370
Copper (mg/kg)	9.96	6.45	7.52	1.80	4.99	5.65	65	270

Parameter	S1	S2	S3	S4	C1	C2	ISQG Trigger Level	
							Low	High
Iron (mg/kg)	31029.0	27394.5	29304.0	8378.0	22188.5	21583.0	-	-
Lead (mg/kg)	14.10	10.95	11.78	6.36	11.25	9.37	50	220
Manganese (mg/kg)	614.50	554.50	549.00	304.00	521.50	779.50	-	-
Mercury (mg/kg)	0.64	0.10	0.20	0.17	ND (<0.100)	ND (<0.100)	0.15	1
Nickel (mg/kg)	57.15	47.85	50.15	19.60	43.55	41.95	21	52
Selenium (mg/kg)	ND (<0.100)	ND (<0.100)	ND (<0.100)	ND (<0.100)	ND (<0.100)	ND (<0.100)	-	-
Zinc (mg/kg)	57.65	50.90	54.00	23.10	45.45	48.05	200	410

Note: NAGD Screening Levels are the same as ISQG-Low Trigger Levels

ND- Not Detected



## Particle Size Distribution and Colour

Sampled seabed were predominantly dark greenish grey sediments composed almost entirely of sandy silt and clay fractions. In station S1, S2 and S4, the sediment consists mostly silt and clay, ranging from 38.5% to 50.6% and from 16.9% to 27.3%, respectively. In station S3, C1 and C2, they were mostly sand, ranging from 50.4% to 75.6%, with 23.9% to 35.0% silt.

## Total Organic Carbon

The organic content of marine sediments collected at the control stations was found to be 10,537.3 mg/kg in average. Since all sampling location in the jetty footprint and the dredged area were all below a factor of two of the average total organic carbon concentration of the control stations (i.e. 24,230 mg/kg) <sup>(1)</sup>, it indicated that the survey locations are typical of undisturbed marine environments <sup>(2)</sup>.

Sampled seabed were predominantly dark greenish grey sediments composed almost entirely of sandy silt and clay fractions.

## Metals

Of the marine sediment samples collected, it was found that metal concentration at both Control stations and dredged area/jetty footprint were similar. Spatial differences were discernible in terms of the higher concentrations of some metal (i.e. Copper, Iron, Lead, Zinc, Chromium, Nickel, Mercury and Barium) found to occur in marine sediment samples collected at the S1 monitoring station compared to the other monitoring stations. With the exception of exceedances in Nickel in most samples and Mercury in S1, S3 and S4 monitoring stations, metal concentrations (Cadmium, Chromium, Copper, Lead, Zinc and Arsenic) in the collected sediment samples were below guideline trigger and screening levels. The exceedances of Nickel and Mercury, which had concentrations in excess of the ISQG-High value (52 mg/kg for Nickel) and NAGD screening level (21 mg/kg for Nickel and 0.15 mg/kg for Mercury), were however present across the seabed at similar concentrations with no increasing trend among the monitoring stations. This was interpreted as indicating concentrations of these metals are naturally-occurring. The NAGD also note that high Nickel concentrations are a natural occurrence in some seabed sediments. Based on the survey results, metal concentrations were considered to be indicative of naturally occurring background conditions with no metal at concentrations of environmental concern.

(1) ANZECC/ARMCANZ 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. <http://www.agriculture.gov.au/SiteCollectionDocuments/water/nwqms-guidelines-4-vol1.pdf>

(2) ANZECC/ARMCANZ 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. <http://www.agriculture.gov.au/SiteCollectionDocuments/water/nwqms-guidelines-4-vol1.pdf>

*Survey Methodology*

During the baseline surveys, a total of six stations will be surveyed for marine water quality. The locations were selected to include four (4) sites within the footprint of the Project and two (2) control areas outside the Project footprint for comparison. The sampling locations and number of samples to be collected at each location were the same as marine sediment sampling and presented in *Table 5.2* and *Figure 5.5*.

For *in situ* measurement, seawater was measured using digital meter with its probe extended to the mid-depth of the water column. All *in situ* monitoring instruments were checked, calibrated and certified and subsequently re-calibrated throughout all stages of the monitoring, or as required by the manufacture's specification.

For chemical analysis, seawater samples were collected using Niskin Water Samplers. Once the water sampler reached the mid-depth of the water column, a messenger was released from the surface down the cable to trigger the sampler. The water sampler was then retrieved on board. Once the sampler was on board the vessel, the water sample was stored in appropriate sample bottles at 4 °C for later laboratory analysis. At each station, two (2) water samples were be taken at the mid-depth.

The parameters measured for marine water quality are shown in *Table 5.6*. The parameters measured are in line with those required to be monitored under the ASEAN Marine Water Quality Criteria.

**Table 5.6** *Marine Water Quality Parameters and Test Method*

Parameter	Test Method	Number of Samples
Temperature	<i>In-situ</i> measurement	12
pH	<i>In-situ</i> measurement	12
Transparency (Secchi depth)	Secchi dish	12
Total Suspended Solid (TSS)	APHA 2540 D	12
Salinity	<i>In-situ</i> measurement	12
Turbidity	<i>In-situ</i> measurement	12
Conductivity	<i>In-situ</i> measurement	12

Field logs were maintained for all survey work, noting the date of the survey, equipment used, and a record of all activities and observations. Field logs were retained for the duration of the survey.

Measured data were digitally recorded from the instruments and converted into Microsoft Excel format, or manually noted. Both disc copy and hard copy were retained for the file records. Any deviation from the standard procedure was noted in the log and the reason for the deviation recorded. In addition, field logs contained notes of events or activities in the vicinity of the monitoring location which might give rise to anomalous data being recorded.

All samples transferred from the survey vessel to the laboratory were accompanied by Chain of Custody (COC) forms. The number of samples, the parameters to be tested and the time of delivery were clearly stated on the COC forms to ensure that samples are analysed for the correct parameters.

#### *Survey Results*

Water sampling survey has been conducted to characterise the existing marine water quality condition in the surroundings of the Project Site. The water quality measurements are provided in *Table 5.7*.

**Table 5.7**      *Marine Water Quality Parameters and Test Method*

Parameter	S1	S2	S3	S4	C1	C2	ASEAN Marine Water Quality Criteria
Transparency (Secchi depth) (m)	3.8	3.6	3.1	3.7	2	3.3	-
Water depth (m)	12	10	13	14.5	7	12.5	-
Depth (of sample taken) (m)	6	5	6	7	4	6	-
Temperature (°C)	30.79	30.75	30.525	30.49	30.4	30.61	Increase not more than 2°C above the maximum ambient temperature
pH	8.26	8.16	8.225	8.065	8.53	8.115	-
DO (mg/l)	6.465	6.205	5.755	5.62	6.285	5.89	4
EC (µs)	41644.0	41919.5	48577.5	48613.5	42746.0	47407.5	-
Turbidity (FNU)	4.4	3.85	2	2.1	3.95	3.05	-
Salinity (psu)	24.3	24.8	28.9	29.05	24.75	28.9	-
Total Suspended Solid (mg/l)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	5.4	ND (<5.0)	Permissible 10% maximum increase over seasonal average concentration

Note; ND = Non Detected

The water quality parameters were compared against ASEAN marine water quality guidelines <sup>(1)</sup>.

#### Temperature and Salinity

Seawater temperature was largely similar among all the monitoring locations. The levels of salinity were higher at monitoring locations S3, S4 and C2.

#### pH

All results for pH fell within the permissible limits of 6 to 9. Seawater pH was similar among sampling locations and no marked differences were discernible comparing seawater samples collected from all monitoring stations.

#### Dissolved Oxygen (DO)

DO concentrations in seawater samples were found to be similar across the field areas, ranging from 5.62 to 6.47 mg/l. Concentrations of DO at all monitoring stations complied with the ASEAN water quality guidelines.

#### Total Suspended Solids (TSS) and Turbidity

Low TSS concentrations and turbidity were recorded in collected seawater samples. In terms of spatial differences, no notable trends in TSS concentrations or turbidity were observed between the monitoring stations. Overall, the TSS and turbidity results revealed high water clarity indicative of oceanic conditions. Concentrations of TSS at all monitoring stations complied with the ASEAN water quality guidelines.

### 5.3.6

#### ***Ground Water Quality***

##### *Survey Methodology*

Baseline ground water sampling was conducted at two (2) locations within (2) km of the Project Area. The locations of monitoring sites are presented in *Table 5.8*.

**Table 5.8**      ***Water Sampling Locations for the Baseline Survey***

ID	Date	Coordinates	
		Northern	Eastern
1. Ale Gone	14.9.2017	16 ° 32' 15.53"	94 ° 16' 13.46"
2. Zin Yaw Chaung	15.9.2017	16 ° 32' 18.89"	94 ° 16' 35.76"

(1) Australian Government 2008. ASEAN Marine Water Quality Management Guidelines and Monitoring Manual. <http://environment.asean.org/wp-content/uploads/2015/07/ASEAN-MarineWaterQualityManagementGuidelinesandMonitoringManual.pdf>

Sample bottles and sampling dipper were washed and cleaned with purified water as well as deionized water three times, filled with preservatives if needed, and capped securely. Water samples were collected using clean sampling dippers in order to avoid sample contamination from other sources according to standard operation procedures.

Water was collected at the outflow of a pressure and flushed (hand pump and compressor pump for shallow well and deep well respectively) for few minutes prior to sampling in order to remove any stagnant water in the well casing and to ensure that at least 95 percent of the water sample originates from the aquifer formation being sampled.

For bacteriological analysis, the preconditioned sterile glass bottles directly from the analytical laboratory were used.

After sample collection, sample bottles were kept in a cool box with ice.

### *Survey Results*

The results of the groundwater sampling are provided in *Table 5.9* and *Table 5.10*. All parameters in Point 1 (Ale Gone Village well) were within the acceptable standards of the WHO Drinking Water standards and NEQ. However, in Zin Yaw Chaung village well, a higher Biological Oxygen Demand was recorded. This indicates potentially polluted water where Dissolved Oxygen (DO) is consumed by bacteria and that this well potentially has large amounts of organic matter from sewage or other discharges present in the water.

**Table 5.9**      **Result of Water Testing of Point 1**

Quality Parameter	Results	Method	Drinking Standard	Effluent Standard	Remarks
pH	8.2	pH meter	6.5 - 8.5	6.0 - 9.0	Normal
TSS	0      mg/L	Lovibond Spectro Direct Method No.383	NG	≤ 50 mg/L	Normal
BOD <sub>5</sub>	3      Mg/L	Estimated by Eco-Lab with Jenway Dissolved Oxygen meter (Modal 970)	≤ 3 mg/L	≤ 50 mg/L	Normal
COD	<30      mg/L	Lovibond Spectro Direct Method No.130,131, 132	NG	≤ 250 mg/L	Normal
Ammonia	0.15      mg/L	Lovibond Spectro Direct Method No.60	< 0.5 mg/L	< 10 mg/L	Normal
Free Cyanide	<0.02      mg/L	Lovibond Spectro Direct	≤ 0.07 mg/L	≤ 0.1 mg/L	Normal

Quality Parameter	Results	Method	Drinking Standard	Effluent Standard	Remarks
Nitrate Nitrogen	<0.5 mg/L	Method No.157 Lovibond Spectro Direct Method No. 265,267	≤ 10 mg/L	NG	Normal
Nitrite	<0.01 mg/L	Lovibond Spectro Direct Method No.270	≤ 0.5 mg/L	NG	Normal
Arsenic	0 mg/L	Lovibond Arsenic test kit code.no-400700	≤ 0.01 mg/L	< 0.1 mg/L	Normal
Copper	ND mg/L	AAS, Shimadzu AA-6200 Cu(324.8nm)	≤ 0.05 mg/L	≤ 0.5 mg/L	Lower limit of detection=0.01 mg/L
Cadmium	ND mg/L	AAS, Shimadzu AA-6200 Cu(228.8nm)	≤ 0.005 mg/L	≤ 0.1 mg/L	Lower limit of detection=0.02 mg/L

ND – Not Detected, NG- No Guideline

**Table 5.10 Result of Water Testing of Point 2**

Quality Parameter	Results	Method	Drinking Standard	Effluent Standard	Remarks
pH	8.1	pH meter	6.5 – 8.5	6.0 – 9.0	Normal
TSS	10 mg/L	Lovibond Spectro Direct Method No.383	NG	≤ 50 mg/L	Normal
BOD <sub>5</sub>	5 Mg/L	Estimated by Eco-Lab with Jenway Dissolved Oxygen meter (Modal 970)	≤ 3 mg/L	≤ 50 mg/L	Above Limit DW
COD	<30 mg/L	Lovibond Spectro Direct Method No.130,131, 132	NG	≤ 250 mg/L	Normal
Ammonia	0.23 mg/L	Lovibond Spectro Direct Method No.60	< 0.5 mg/L	< 10 mg/L	Normal
Free Cyanide	<0.01 mg/L	Lovibond Spectro Direct Method No.157	≤ 0.07 mg/L	≤ 0.1 mg/L	Normal
Nitrate Nitrogen	0.6 mg/L	Lovibond Spectro Direct Method No. 265,267	≤ 10 mg/L	NG	Normal
Nitrite	<0.01 mg/L	Lovibond Spectro Direct	≤ 0.5 mg/L	NG	Normal



Quality Parameter	Results	Method	Drinking Standard	Effluent Standard	Remarks
Arsenic	0 mg/L	Method No.270 Lovibond Arsenic test kit code.no-400700	≤ 0.01 mg/L	< 0.1 mg/L	Normal
Copper	ND mg/L	AAS, Shimadzu AA-6200 Cu(324.8nm)	≤ 0.05 mg/L	≤ 0.5 mg/L	Lower limit of detection=0.01 mg/L
Cadmium	ND mg/L	AAS, Shimadzu AA-6200 Cu(228.8nm)	≤ 0.005 mg/L	≤ 0.1 mg/L	Lower limit of detection=0.02 mg/L

ND – Not Detected, NG- No Guideline

### 5.3.7

#### *Air Quality*

##### *Survey Methodology*

The ambient air parameters were monitored for 24 hours and compared with World Health Organisation (WHO) air quality standards (which are the same as the National Environmental Quality (Emissions) (NEQ) Guidelines).

The air monitoring survey used the HAZ-SCANNER EPAS Wireless Environmental Perimeter Air Monitoring System (EPAS). The EPAS, manufactured by EDC/SKC (USA), is a light scattering photometer equipped with a filter sampling system. This dual capability allows for simultaneous real-time and filter measurement. Single-jet impactors are used for particulate size selection and the TSPM, PM<sub>10</sub> impactor would be used for this air quality survey.

The highly sensitive EPAS provides real-time determinations and data recordings of airborne particle concentration in µg/m<sup>3</sup>. It provides the minimum, maximum and time-weighted average (TWA) monitoring of gases as well.

Prior to the survey, calibration span and system checks (system flow rate, sensor baseline levels for all parameters, etc.) performed on the EPAS to ensure it is operational and ready for monitoring.

This instrument is factory calibrated with the appropriate USEPA certified target gas and correlated with USEPA methods. (Ref: Code of Federal Regulation 40CFR part 53). The EPAS does not require laboratory analysis to determine concentrations. It operates maximum automation of data collection, uses the optional data logger including Dust Comm Pro Software for PC that provides statistical analysis, graphs, and detailed reports that can be printed for record keeping.

The survey complied with the following guidelines as follows;

- Particulates and gas sensor intakes located between 2-3 m above the ground level;
- Keep unrestricted airflow located away from obstacles so that the distance from the sensor intake is at least twice the height that the obstacle protrudes above the probe;
- Keep unrestricted airflow in an arc of at least 270 degrees around the inlet probe, or 180 degrees if the probe is on the side of a building;
- Would be clear of optical obstructions, including potential obstructions that may move due to wind, human activity, growth of vegetation, etc.;
  - Spacing from trees (10-20 m)
  - Spacing from roadways (10-250 m) depending on the traffic
- Observed temporary optical obstructions, such as rain, particles, fog, or snow

The monitoring sites were selected based on their being broadly distributed within the project area and in proximity to the most sensitive receptors i.e. local communities. Operating activities of the project would impact local air quality. Air pollution both on site and in the surrounding locality may result from release of dust to the atmosphere from handling or processing of its by-products. This survey monitored 24 hr continuously.

Locations of air sampling stations are listed in *Table 5.11*.

- Point 1 at the Ale Gone ward; and
- Point 2 at the Zin Yaw Chaung ward.

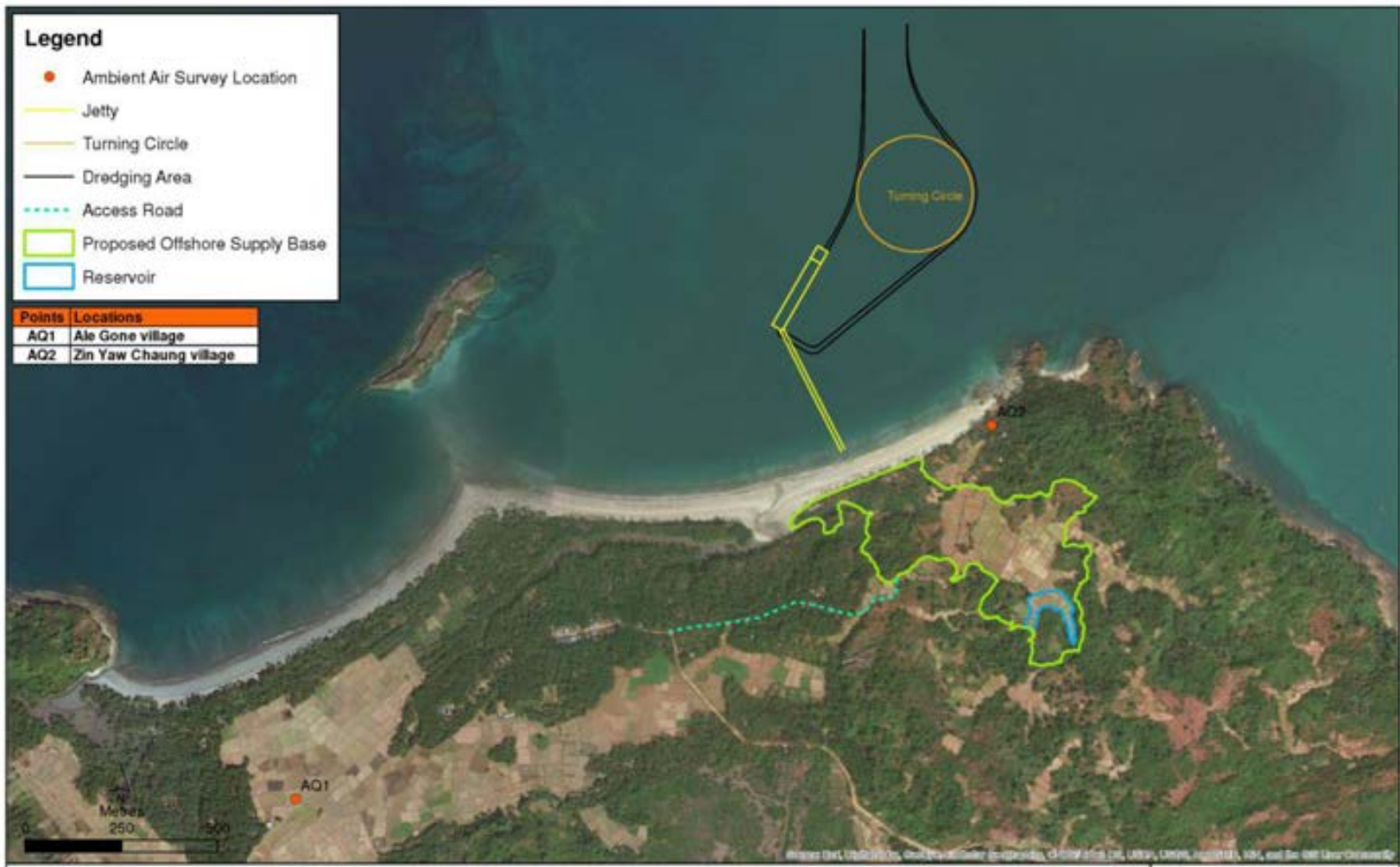
**Table 5.11** *Air Sampling Locations for Baseline Survey, September, 2017*

Points	Locations	Coordinates		Start Date	End Date
		N	E		
1	Air monitoring station Location (1) at Ale Gone village	16°32'2.79"	95°15'49.82"	14.9.2017	15.9.2017
2	Air monitoring station Location (2) at Zin Yaw Chaung village	16°32'33.88"	95°16'50.95"	15.9.2017	16.9.2017

### *Survey Results*

Point 1 is located approximately 2 km from the proposed Project (see in *Figure 5.6* and *Figure 5.7*).

Figure 5.6      *Ambient Air Survey Locations*



**Figure 5.7** *Ambient Air Monitoring at Point (1), Ale Gone*



The meteorology findings (temperature, relative humidity, wind speed, wind direction) during the monitoring are presented in *Table 5.12* which shows both the levels of PM<sub>10</sub> (21 µg/m<sup>3</sup>) and PM<sub>2.5</sub> (11 µg/m<sup>3</sup>) which met the NEQ and WHO Guideline (24hr average). NO<sub>x</sub> levels also met the WHO and NEQ guidelines but SO<sub>2</sub> exceeded the guidelines.

**Table 5.12** *Ambient Air Monitoring at Point (1), Ale Gone*

Parameters	Average Concentration (24hr average) except some Gases (NO <sub>2</sub> , CO and O <sub>3</sub> )*	WHO Quality Standard (Human Health) / Annual Mean Air Quality Standard (same as NEQ)
PM <sub>10</sub>	21µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
PM 2.5(µg/m <sup>3</sup> )	11µg/m <sup>3</sup>	25 µg/m <sup>3</sup>
NO <sub>2</sub> *	37 <sup>a</sup> (10 <sup>b</sup> -58 <sup>c</sup> )ppb/70µg/m <sup>3</sup> (24 hr) 37 ppb/70 µg/m <sup>3</sup> (one hr)	40 µg/m <sup>3</sup> (annual) /200 µg/m <sup>3</sup> (one hour)
SO <sub>2</sub>	15 <sup>a</sup> (1 <sup>b</sup> -70 <sup>c</sup> )ppb/39 µg/m <sup>3</sup>	20 µg/m <sup>3</sup>
CO *	17a(1 <sup>b</sup> -282 <sup>c</sup> ) ppb/ 19µg/m <sup>3</sup> (24hr) 17 ppb/19 µg/m <sup>3</sup> (one hr)	30,000 µg/m <sup>3</sup> (one hr) 10,000 µg/m <sup>3</sup> (8 hr)
O <sub>3</sub> *	5 <sup>a</sup> (1 <sup>b</sup> -17 <sup>c</sup> )ppb / 10 µg/m <sup>3</sup> (24hr) 5 ppb/ 10 µg/m <sup>3</sup> (8 hr)	100 µg/m <sup>3</sup> (8hr)
VOC	76 <sup>a</sup> (1 <sup>b</sup> -1540 <sup>c</sup> ) ppb	NA
NH <sub>3</sub>	0 <sup>a</sup> (0 <sup>b</sup> -0 <sup>c</sup> )ppm	NA
CH <sub>4</sub>	16 <sup>a</sup> (1 <sup>b</sup> -54 <sup>c</sup> )ppm	NA
Atomic Radiation	10.4	25-75 CPM (USEPA)
<b>Meteorology</b>		
Temperature (Degree C)		34 <sup>a</sup> (2 <sup>b</sup> -52 <sup>c</sup> )



Parameters	Average Concentration (24hr average) except some Gases (NO <sub>2</sub> , CO and O <sub>3</sub> )*	WHO Quality Standard / (Human Health)	Annual Standard	Mean (Human Health)	Air
Relative Humidity		53 <sup>a</sup> (2 <sup>b</sup> -81 <sup>c</sup> )			
Wind Speed (kph)		0.03 <sup>a</sup> (0 <sup>b</sup> -6.1 <sup>c</sup> )			
Wind Direction (Degree from North)		180 (S)			
<b>Note: There were 20 small cars and 200 motorcycles around the monitoring site</b>					

<sup>a</sup> Average <sup>b</sup> Min <sup>c</sup>Max

Referring to NEQ and WHO Guidelines, the color codes are categorised in order to reveal the general air quality status around the of the project area.

Green (meets the standards)

Yellow (slightly exceeds)

Orange (exceeding)

Point 2 is located approximately 1 km from the proposed Project Site (see Figure 5.8).

**Figure 5.8** *Air Monitoring at Point (2), Zin Yaw Chaung*



The meteorology findings (temperature, relative humidity, wind speed, and wind direction) during the monitoring are presented in Table 5.13.

**Table 5.13**      *Ambient Air Monitoring at Point (2), Zin Yaw Chaung*

Parameters	Concentration (24hr average) except some Gases (NO <sub>2</sub> , CO and O <sub>3</sub> )*	WHO Annual Mean Air Quality Standard (Human Health)
PM <sub>10</sub>	16 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	7 µg/m <sup>3</sup>	25 µg/m <sup>3</sup>
NO <sub>2</sub> *	39 <sup>a</sup> (18 <sup>b</sup> -61 <sup>c</sup> )ppb/73 µg/m <sup>3</sup> (24 hr) 39 ppb/73 µg/m <sup>3</sup> (one hr)	40 µg/m <sup>3</sup> (annual) / 200 µg/m <sup>3</sup> (one hour)
SO <sub>2</sub>	16 <sup>a</sup> (1 <sup>b</sup> -77 <sup>c</sup> )ppb/42µg/m <sup>3</sup>	20 µg/m <sup>3</sup>
CO *	18 <sup>a</sup> (2 <sup>b</sup> -51 <sup>c</sup> ) ppb/ 21µg/m <sup>3</sup> (24hr) 18 ppb/21 µg/m <sup>3</sup> (one hr)	30,000 µg/m <sup>3</sup> (one hr) 10,000 µg/m <sup>3</sup> (8 hr)
O <sub>3</sub> *	6 <sup>a</sup> (0 <sup>b</sup> -17 <sup>c</sup> )ppb / 12 µg/m <sup>3</sup> (24hr) 6 ppb/ 12 µg/m <sup>3</sup> (8 hr)	100 µg/m <sup>3</sup> (8hr)
VOC	28 <sup>a</sup> (1 <sup>b</sup> -1174 <sup>c</sup> ) ppb	NA
NH <sub>3</sub>	0 <sup>a</sup> (0 <sup>b</sup> -0 <sup>c</sup> )ppm	NA
CH <sub>4</sub>	17 <sup>a</sup> (10 <sup>b</sup> -37 <sup>c</sup> )ppm	NA
Atomic Radiation	11	25-75 CPM (USEPA)
<b>Meteorology</b>		
Temperature (Degree C)		35 <sup>a</sup> (30 <sup>b</sup> -38 <sup>c</sup> )
Relative Humidity		66 <sup>a</sup> (3 <sup>b</sup> -82 <sup>c</sup> )
Wind Speed (kph)		6.4 <sup>a</sup> (0 <sup>b</sup> -14.4 <sup>c</sup> )
Wind Direction (Degree from North)		360 (N)
<b>Note: Sea waves and wind</b>		

<sup>a</sup> Average <sup>b</sup> Min <sup>c</sup>Max

Referring to NEQ and WHO Guidelines, the color codes are categorized in order to reveal the general air quality status around the of the project area.

Green (meets the standards)

Yellow (slightly exceeds)

Orange (exceeding)

Table 5.13 presents both the levels of PM<sub>10</sub> (16 µg/m<sup>3</sup>) and PM<sub>2.5</sub> (7 µg/m<sup>3</sup>) which met the NEQ and WHO Guideline (24hr average). In terms of gases levels, all parameters met the guideline except SO<sub>2</sub> which was 42 µg/m<sup>3</sup>.

The increased SO<sub>2</sub> may be due to the use of vehicles (motorbikes) around the sampling locations.

### 5.3.8

#### Noise Level

##### Survey Methodology

24hr average ambient noise levels were monitored as well as compared with the NEQ Guidelines.

The ambient noise level monitoring was carried out for 24hr continuously along with air monitoring in the vicinity within 2 km around the proposed Project Area.

Locations of noise sampling stations are listed in Table 5.14.

- Point 1 at the Ale Gone; and
- Point 2 at the Zin Yaw Chaung.

**Table 5.14 Noise Sampling Locations for Baseline Survey, September, 2017**

Points	Locations	Coordinates		Start Date	End Date
		N	E		
1	Ale Gone village	16°32'2.79"	95°15'49.82"	14.9.2017	15.9.2017
2	Zin Yaw Chaung village	16°32'33.88"	95°16'50.95"	15.9.2017	16.9.2017

### Survey Results

Tables 5.15 and Table 5.16 show the noise level measured around the proposed project area. Being situated around the residential area, the findings were compared with the applicable noise level guideline for residential area by Myanmar NEQ Guidelines.

**Table 5.15 24hr Average Noise Level at the Point 1 at the Ale Gone**

Area	Whole Average Level (dB)	Day Noise	Day Time Noise Level (dB)	NEQ Residential (Day Time)
Ale Gone village	46 <sup>a</sup> ±0.1 <sup>b</sup> 48 <sup>c</sup> (27 <sup>d</sup> -118 <sup>e</sup> )		45 <sup>a</sup> ±0.05 <sup>b</sup>	55
			45 <sup>c</sup> (27 <sup>d</sup> -118 <sup>e</sup> )	
			Night Time Noise Level (dB)	NEQ Residential (Night Time)
			48 <sup>a</sup> ±0.02 <sup>b</sup>	45
			49 <sup>c</sup> (40 <sup>d</sup> -67 <sup>e</sup> )	

<sup>a</sup> Average <sup>b</sup> Standard Error <sup>c</sup> Median <sup>d</sup> Min <sup>e</sup> Max

The average day time noise levels at Ale Gone Village did not exceed the NEQ Guidelines but the average night time level did exceed the NEQ by a few dB. This was noted to be mainly due to vehicle (motorbike) noise.

**Table 5.16 24hr Average Noise Level at Zin Yaw Chaung**

Area	Whole Average Level (dB)	Day Noise	Day Time Noise Level (dB)	NEQ Residential (Day Time)
Zin Yaw Chaung village	55 <sup>a</sup> ±0.01 <sup>b</sup> 55 <sup>c</sup> (48 <sup>d</sup> -77 <sup>e</sup> )		55 <sup>a</sup> ±0.01 <sup>b</sup>	55
			55 <sup>c</sup> (48 <sup>d</sup> -77 <sup>e</sup> )	
			Night Time Noise Level (dB)	NEQ Residential (Night Time)
			55 <sup>a</sup> ±0.01 <sup>b</sup>	45



Area	Whole Average Level (dB)	Day Noise Day Time Noise Level (dB)	NEQ Residential (Day Time)
		55 <sup>c</sup> (49 <sup>d</sup> -94 <sup>e</sup> )	

<sup>a</sup> Average <sup>b</sup> Standard Error <sup>c</sup> Median <sup>d</sup> Min <sup>e</sup> Max

At Point 2, the average noise levels of night time exceeded the NEQ standard. These increased levels were mainly due to wind and waves action.

The locations of noise sampling station are in Ale Gone and Zin Yaw Chaung are shown in *Figure 5.9* and *Figure 5.10*.

**Figure 5.9**      **Noise Monitoring Station at Ale Gone**



**Figure 5.10** Noise Monitoring Station at Zin Yaw Chaung



### 5.3.9 Soil

#### *Survey Methodology*

Baseline soil sampling was conducted at two (2) locations within the proposed Project Area. One (1) soil sample was collected in the north and one in the south. The locations of monitoring sites are presented in *Table 5.17*:

- Point (1) Wooded Area; and
- Point (2) Farmland.

**Table 5.17** Soil Sample Locations for the Baseline Survey

ID	Date	Coordinates	
		Northern	Eastern
1	3.7.2017	16° 32' 28.90"	94° 16' 43.96"
2	3.7.2017	16° 32' 25.88"	94° 16' 50.77"

Soil samples were collected from drill -holes dug approximately 1m depth by soil auger (hand auger drill). During sample collection, gloves were worn and equipment was rinsed with clean water. Samples were transferred into wide-mouth glass bottles and sent to an accredited laboratory. Parameters tested included basic soil chemistry as well as metals. Soil samples were

collected according to the standard procedure and kept in a cooling box at 4°C till the respective laboratory.

#### *Survey Results*

The results of the soil sampling are provided in *Table 5.18* and show no evidence of contamination.

**Table 5.18 Soil Results from Sample Site**

Sample	pH						Interpretation of Results	
	Soil : Water	Cadmium-%	Copper-ppm	Lead-ppm	Zinc-ppm	Iron-ppm	pH	
	1:2.5						Soil : Water	Iron-ppm
							1:2.5	
Point (1)								
Wooded area	5.44	1.55	ND	3.15	ND	108.56	Moderately acid	Low
Point (2)								
Farmland	6.13	1.21	ND	2.50	ND	84.11	Slightly acid	Low
Dutch Standards and FAO Soil Bulleting 65	-	-	20-300	85	15-150	-		

ND- Not detected

*Earthquakes*

A review of available literature has shown that Myanmar is seismologically unstable and vulnerable to earthquakes due to its location in the active Alpine seismotectonic belt and the young Alpine-Himalayan-Sumatran orogenic belt (Theilen and Pararas-Carayannis, 2009). Historic records show that at least 15 major earthquakes with magnitudes  $M \geq 7.0$  Richter Scale have occurred in Myanmar in the last hundred years. These earthquakes occurred within Myanmar in the last century, at Bago (5 May 1930), at Yangon (27 March, 16 May and 21 May 1931), at Sagaing (16 July 1956) and at Bagan (8 July 1976) (Union of Myanmar, 2009). More recently, a M6.8 RS occurred with an epicentre west of Chauk, adjacent to Rakhine State (24 August 2016).

*Tsunami*

Myanmar is an earthquake-prone country and at moderate risk for tsunamis. Tsunamis have been recorded in the Myanmar coastal areas. The recent 2004 tsunami generated by the Sumatra earthquake caused moderate damage to the Rakhine Coast, Ayeyarwady Delta and the Tanintharyi Coast with more than 60 lives and hundreds of boats lost (Union of Myanmar, 2009). The Project Area is generally rocky and sandy without mangrove protection. As such, it is considered that this area is comparatively more vulnerable to a potential tsunami.

*Cyclones*

Gale force winds ( $17.2 \text{ ms}^{-1}$  or over) are mainly associated with local rain squalls and with severe tropical storms or cyclones. The central region of the Bay of Bengal receives the worst buffeting during the summer monsoon. Myanmar is a cyclone-prone country and Cyclone Nargis of 2008 was the worst natural disaster in the country's recorded history. Coastal habitat destruction, in particular, the clearance of mangrove habitat is likely to have exacerbated the destructive impacts of the cyclone. The threat of cyclones with winds above 107 ft. ( $32.7 \text{ ms}^{-1}$ ) affects different areas at different times of the year, affecting all areas though the major tracks do not pass over the Andaman Sea. They are most frequent from mid-May to early December.

During stakeholder engagement, the communities consulted mentioned two recent natural flooding / cyclone events; 2006 (Malar), and 2008 (Narigs). This area is susceptible to cyclones.

## 5.4 ENVIRONMENTAL CHARACTERISTICS

### 5.4.1 Terrestrial Habitats

#### *Secondary Data*

The Project Area is located in cultivated land which is currently being used for agriculture and grazing. Photos of the land and flora are provided in *Figure 5.11*. This land is currently also used for grazing by cows. Given the modified nature of this habitat, the presence of species or habitats of conservation concern is unlikely.

The land in the Ayeyarwady Region is fertile and low lying which is characterised by a soil type of thick alluvium brought down by the Ayeyarwady River. Three main types of soil are reported to be found in the area, meadow clay soils, meadow swampy soils and saline gleyey soils.

**Figure 5.11** *Terrestrial Modified Habitat in the Project Area, taken in January 2017*







As the Project contains an offshore aspect, there is an area of beach and coconut grove that is inside the footprint of the Project. This is shown in *Figure 5.12*.



*Figure 5.12 Beach Front inside the Project Area, taken in January 2017*



#### *Survey Methodology*

A flora survey was conducted between the 16 and 19 September 2017 in the proposed Project Area.

Walkover surveys were conducted around the site and all terrestrial and aquatic plant species observed were recorded within randomly selected transects. Photographs were taken of all species for identification. Flora species identification was carried out by using keys and appropriate literature and confirmed by matching with herbarium specimens of the Department of Botany, University of Yangon. Collected specimens were checked with the

IUCN Red List and CITE appendices and Myanmar Law (Protection of Wildlife, Wild Plants and Conservation of Natural Areas Act 15(A)), and Myanmar Biodiversity Conservation Investment Vision 2013.

#### *Survey Results*

There were a total of 47 species recorded during the study period, of which 11 species were herbs, 12 shrubs, 6 climbers, and 18 trees. These are provided in **Appendix D**.

Two mangroves species, *Calophyllum inophyllum* L. (Pon-nyet) and *Nypa fruticans* Wurmb. (Dani), were recorded and are listed as Least Concern (LC) (according to IUCN Red List 2017). These species are found in the shoreward area of the Proposed Project Site as well as along the shoreline to the west of the Project Site.

No species recorded were listed as “completely protected” under Myanmar Law (Protection of Wildlife, Wild Plants and Conservation of Natural Areas Act 15(A)).

Figure 5.13 present the vegetation (Habitat) type with locations recorded in Study Area. There are two vegetation (habitat) recorded; terrestrial (wild and cultivated land), and mangroves / marine types.

Figure 5.13 Vegetation (Habitat) Type in Study Area





Figure 5.14 presents terrestrial vegetation plantation of *Cocos nucifera* (Ohm), paddy field and natural bushes along the access road of the Study Area.

**Figure 5.14** *Terrestrial Vegetation (Plantation of Cocos nucifera (Ohm), Paddy Field and Natural Bushes)*



Figure 5.15 presents mangrove and marine species such as *Scaevola taccada*, *Ipomoea pes-caprae*, *Canavalia rosea*, and *Pandanus odoratissimus* within the Study Area.

**Figure 5.15** *Mangroves and Marine Vegetation along the Seashore and Creek Area*





In total, two vegetation (Habitat) types “Terrestrial” (wild and cultivated land) and Mangroves and Marine Vegetation in the Survey Area. Only a few degraded mangrove species were recorded. These habitat types are common to the area and no species of conservation concern were encountered. The area of the Jetty is small in comparison to the habitat areas in the Survey Area and the majority of land in the proposed Project Area is cultivated farming land i.e., modified habitat.

#### 5.4.2 *Terrestrial Fauna*

The baseline ecological survey sought to determine the status, diversity and distribution of the fauna including aquatic species and the extent to which that may be impacted due to the proposed project activities. Fauna survey was conducted in Wet season from 16th to 19th September 2017.

The base line study and specimen collection of terrestrial fauna, especially as major groups are vertebrate (birds, reptiles, lizards and amphibians as well as fish and aquatic species especially visual observation for the birds) and invertebrate (butterflies, dragonflies, damselflies and many kinds of insects visually during survey). They are carried out in and around Project Area. Habitat preferences, relative abundances and diversity assessment were examined. Diversity of fauna species were presented in tabulated forms. Possible impacts (negative and positive impacts) were investigated and mitigation measures were proposed. Collected specimens were checked with the IUCN Red List and CITE appendices.

#### *Overview of Survey Method*

Fauna surveys were conducted in the wet season from 16 to 19 September, 2017. The biodiversity survey was conducted within 500 – 1000 m of the Project Area. The study was conducted primarily in the day time, and once during the night. The ornithological (bird) survey was conducted via aural and visual searching. Information on fisheries was collected through interviewing fishermen as well as survey of the local fish market. A rapid visual field survey and discussions with local people were used for the floral survey. All collected data has been cross-checked through literature review.

The study involved photos of and specimen collection of terrestrial fauna, including vertebrate (birds, reptiles, lizards and amphibians, as well as, fish and aquatic species) and invertebrate (butterflies, dragonflies, and damselflies). Habitat preferences, relative abundances, and diversity assessments were examined.

### *Birds*

24 species of birds were observed belonging to 6 order and 15 families (**Appendix D**). Nests with eggs were also recorded in the Survey Area. None of the species recorded are listed as Species of Conservation Concern on the IUCN Red list. In addition, none of the species are included as “completely protected” under Myanmar Law (Protection of Wildlife, Wild Plants and Conservation of Natural Areas Act 15(A)).

The bird species recorded are common to the area and Myanmar and the Project Area does not contain any habitat for birds that is unique when compared to the wider Survey Area.

### *Herpetofauna (Amphibians and Reptiles)*

7 species of reptile belonging to one order and 3 families were recorded at the study site (**Appendix D**). Three lizard species; Collared Forest Lizard *Calotes chincollium*, Htunwin's Forest Lizard *Calotes htunwini*, and Chanthabun Forest Lizard *Bronchocela smaragdina* were identified. Four snake; Yellow-Lipped Sea Krait *Laticauda colubrine*, Banded Krait *Bungarus fasciatus*, Golden Tree Snake *Chrysopelen ornate*, and Asiatic water snake *Xenochrophis piscator*, are occasional visitors to the area. Yellow-lipped sea kraits come ashore roughly once a day, they are oviparous, and deposit their eggs on land. According to interview records, locals accidentally catch both poisonous and non-poisonous snakes in this area.

One Species, *Bronchocela smaragdina*, Chanthabun Forest Lizard is listed as Vulnerable on the species of conservation concern on IUCN Red List 2017. No species recorded were listed as “completely protected” under Myanmar Law (Protection of Wildlife, Wild Plants and Conservation of Natural Areas Act 15(A)).

5 species of amphibians belonging to one order and two families were recorded (**Appendix D**). Other amphibians such as true toad *Dutlaphrynus melanostictus*, paddy frog *Fejervarya limnocharisi*, Montane frog *Fejervarya greenii*, and skittering frog *Euphlyctis cyanophlyctis*, and the common puddle frog *Occidozyga laevis* were also observed. The Montane frog is listed as Endangered on the IUCN Red List.

Four amphibian species, all frogs, have been identified as near threatened status and their populations are decreasing (IUCN 2011). These species are *Limnonectes blythii* (Giant Asian River Frog), *Bufo pageoti*, *Glyphoglossus molossus* and *Nanorana arnoldi*.

### *Butterfly*

27 species of Butterfly including males and females belonging to 7 families were recorded in the Study Area. Species are provided in **Appendix D**.

### *Dragonfly*

9 species of Dragonfly and Damselfly belonging to two families (Libellulidae and Coenagrionidae) were recorded in the Study Area (**Appendix D**).

None of the species recorded are listed as Species of Conservation Concern on the IUCN Red list. It is not included completely protected species in Myanmar Law (Protection of Wildlife, Wild Plants and Conservation of Natural Areas Act 15(A)) and Myanmar Biodiversity Conservation Investment Vision 2013.

## **5.4.3 Coastal Habitats - Secondary Data**

From an initial review of the Project Area and surrounding areas, the following habitats are thought to occur (*Figure 5.16*).

### *Coral Habitats*

UNEP satellite analyses indicate the possible presence of coral communities (typically fringing or patch reefs) along the coast of the Ayeyarwady Region, including within the shallower waters near the Project Area (*Figure 5.16*). The prevalence of rocky substrate in shallow waters is indicative of favourable conditions for the growth of corals and coral communities. During consultation in January 2017, locals mentioned that there could be potential coral reefs in the Project footprint.

The presence or otherwise of coral reefs was confirmed during environmental baseline surveys as part of the EIA Study; refer to *Section 5.4.4 and 5.4.5* for more details on the surveys.



Figure 5.16 Coastal Habitats in Study Area



## *Mangroves*

Along coastline of the Ayeyarwady Region, there are mangrove habitat areas occurring along shoreline margins of river mouths and extending inland fringing tidal creeks. In the Area of Influence, there are mangroves in the Nga Yoke Kaung River / estuary to the south of the Project Area (*Figure 5.17*). There are no mangroves within the Project Area itself. Mangroves recorded from Ayeyarwady Region include *Rhizophora*, *Xylocarpus*, *Avicennia*, *Bruguiera*, *Sonneratia*, and *Ceriops* species. The known distribution of mangrove habitat within the Study Area is illustrated in *Figure 5.15* (Ocean Data Viewer website).

Reduction in mangrove areas is known in the Study Area along the Ayeyarwady Region coast. The main pressures are firewood collection by local communities and reclamation of mangrove habitat for agriculture and aquaculture.

**Figure 5.17** *Mangroves Near Nga Yoke Kaung Town, taken in January 2017*



## *Seagrass*

Seagrass beds occur along the nearshore habitats of the Ayeyarwady Region and typically occur in less than 65 ft. (20 m) water depth in sheltered intertidal or subtidal areas (Short, *et al*, 2001). The locations of seagrass habitat along the western coast of Ayeyarwady Region are shown in *Figure 5.5* (Ocean Data Viewer website).

In waters around Ayeyarwady Region, seagrass beds are expected to serve as nurseries and habitats for fish and invertebrates, and may also provide a food source for species of international and national conservation interest including marine turtles and dugongs (*Dugong dugon*). Dugongs feed almost exclusively on seagrass (Lanyon, *et al.*, 1989). Seagrass habitat is confined to shallow waters with good light penetration and the nearest potential habitats thought to be located to the north of Nga Yoke Kaung town; around 1 km south of the Project.

*Survey Methodology*

The drop camera includes a digital wide-angle compact camera in an underwater housing and attached to a weighted camera frame to obtain high resolution still images of the seabed and associated sessile benthos. The camera system was lowered to the seabed with the camera set in an auto-shoot mode (at intervals of every five seconds). The frame was raised and lowered as the vessel drifts over the target survey location and a minimum of 25-30 clear images recorded. Once a sufficient time and spatial coverage of the survey area has been reached the camera system was retrieved and images reviewed on the vessel.

A number of survey sites were selected according to bathymetry data and they are shown in *Figure 5.18*. The sampling stations were prioritized to the dredged area and footprint of the jetty. A hierarchical survey approach was adopted whereby at each site the following was conducted:

- Step 1 – Conduct Spot Check: As a first step, the camera system was lowered to a suitable height above the seabed and to gain an impression of the seabed habitat. The camera remained deployed for a period of around five (5) minutes with the vessel allowed to either drift or follow a controlled speed. If corals were identified from still images taken with the camera system, Step 2 was initiated. Should no corals be identified within this short period, the camera system was retrieved and the process repeated at the next location.
- Step 2 –Photo Quadrat Assessment: For Sites where corals had been identified, still camera images of the benthos within identified drop camera stations were recorded. A minimum of five replicate drop camera stations was surveyed within each coral site and the location of the drop camera stations determined from the Spot Checks (Step 1). A minimum of 15-25 images were recorded per station for further analysis as described below.

Photo Quadrats data were assessed post-survey to record two tiers of semi-quantitative data on the coastal habitats. Each drop camera station was assessed for benthic cover (Tier I) and taxon abundance (Tier II), which are described below. The photo-quadrat images obtained from the offshore drop camera survey were recorded using internationally-accepted standard Rapid Ecological Assessment (REA) methodology<sup>1</sup>.

(<sup>1</sup>) DeVantier, L.M., G. De'Ath, T.J. Done and E. Turak (1998) Ecological assessment of a complex natural system: A case study from the Great Barrier Reef. *Ecological Applications* 8: 480-496.





### Tier I - Categorisation of Benthic Cover

Upon the completion of each survey transect, ecological and substratum attributes (*Table 5.19*) were assigned to standard categories (*Table 5.20*).

**Table 5.19** *Tier I Benthic Attribute Categories*

Ecological Attributes	Substratum Attributes
Hard coral	Bedrock
Dead coral	Continuous pavement
Octocoral (Soft corals and Gorgonians)	Rocks (<26 cm)
Black coral	Large boulders (>50 cm)
Dead standing coral	Small boulders (<50 cm)
Macroalgae	Rubble
Other Benthos (including sponges, zoanthids, ascidians and bryozoans)	Sand
	Mud/ Silt
	Other

**Table 5.20** *Tier I Categories of Percentage Cover of Benthic Attributes*

Rank	Percentage Cover (%)
0	None recorded
1	1-5
2	6-10
3	11-30
4	31-50
5	51-75
6	76-100

### Tier II - Taxonomic Inventories to Define Types of Benthic Communities

An inventory of benthic taxa was compiled for each transect. Taxa were identified *in situ* to the following levels:

- Scleractinian (hard) corals to species, where possible;
- Soft corals, anemones and conspicuous macroalgae to genus level where possible;
- Other benthos (including sponges, zoanthids, ascidians and bryozoans) recorded to genus level, where possible, or phylum plus growth form.

Following the completion of the survey of each transect, each taxon in the inventory were ranked in terms of abundance in the community (*Table 5.21*). These broad categories rank taxa in terms of relative abundance of individuals, rather than the contribution to benthic cover along each transect. The ranks are visual assessments of abundance, rather than quantitative counts of each taxon. Representative photos of organisms were taken.

**Table 5.21**      *Ordinal Ranks of Taxon Abundance*

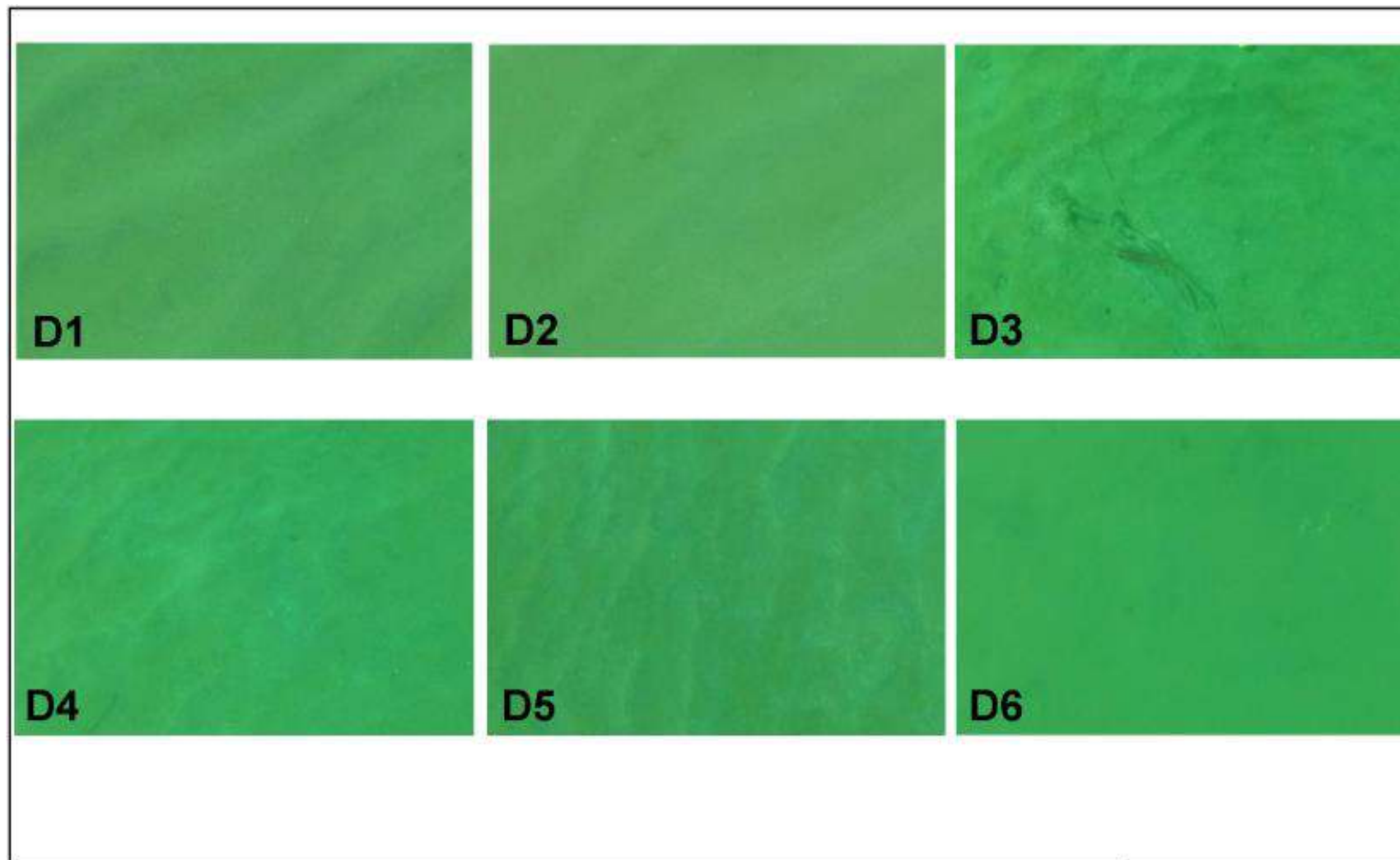
Rank	Abundance
0	Absent
1	Sparse
2	Uncommon
3	Common
4	Abundant
5	Dominant

*Survey Result*

A total of six (6) spot checks were conducted within the dredged area and footprint of the jetty (*Figure 5.18*). Overall, seabed substrate of all station (D1 – D6) was observed to be comprised entirely of mud and/or sand. The seabed of station D1, D2 and D6 were recorded to be relatively muddy while substratum of D3, D4 and D5 were shown to be relatively sandy. No sessile benthic taxa and coral reef development were encountered at the survey site based on a review of the drop camera survey results.

Representative photos of each of the spot check stations are presented in *Figure 5.19*.

*Figure 5.19 Photos of Spot Check Stations*





*Survey Methodology*

Nearshore rocky habitats were identified as part of a preliminary survey in January 2017 as likely to support coral habitats. A series of snorkel surveys were conducted to record semi-quantitative data of the shallow subtidal communities. The snorkel surveys were conducted as free-swims parallel to the shore at defined locations as shown in *Figure 5.20* and examination of the coastal features of the Project Area. Where possible, these were recorded as 200m transects. Representative underwater video footage and photographs were recorded.

Nearshore survey data were assessed 'real-time' and post-survey using REA to record two tiers of semi-quantitative data on the coastal habitats as mentioned in *Section 5.4.4*.

Figure 5.20 Snorkelling Survey Locations



## *Survey Result*

The results on the scientific snorkel survey, conducted along the subtidal rocky habitat in the vicinity of the Project Area are presented below. A description of these three survey sites, namely T1, T2 and T3 (*Figure 5.20*), and key ecological characteristics is presented based on semi-quantitative data recorded during the survey.

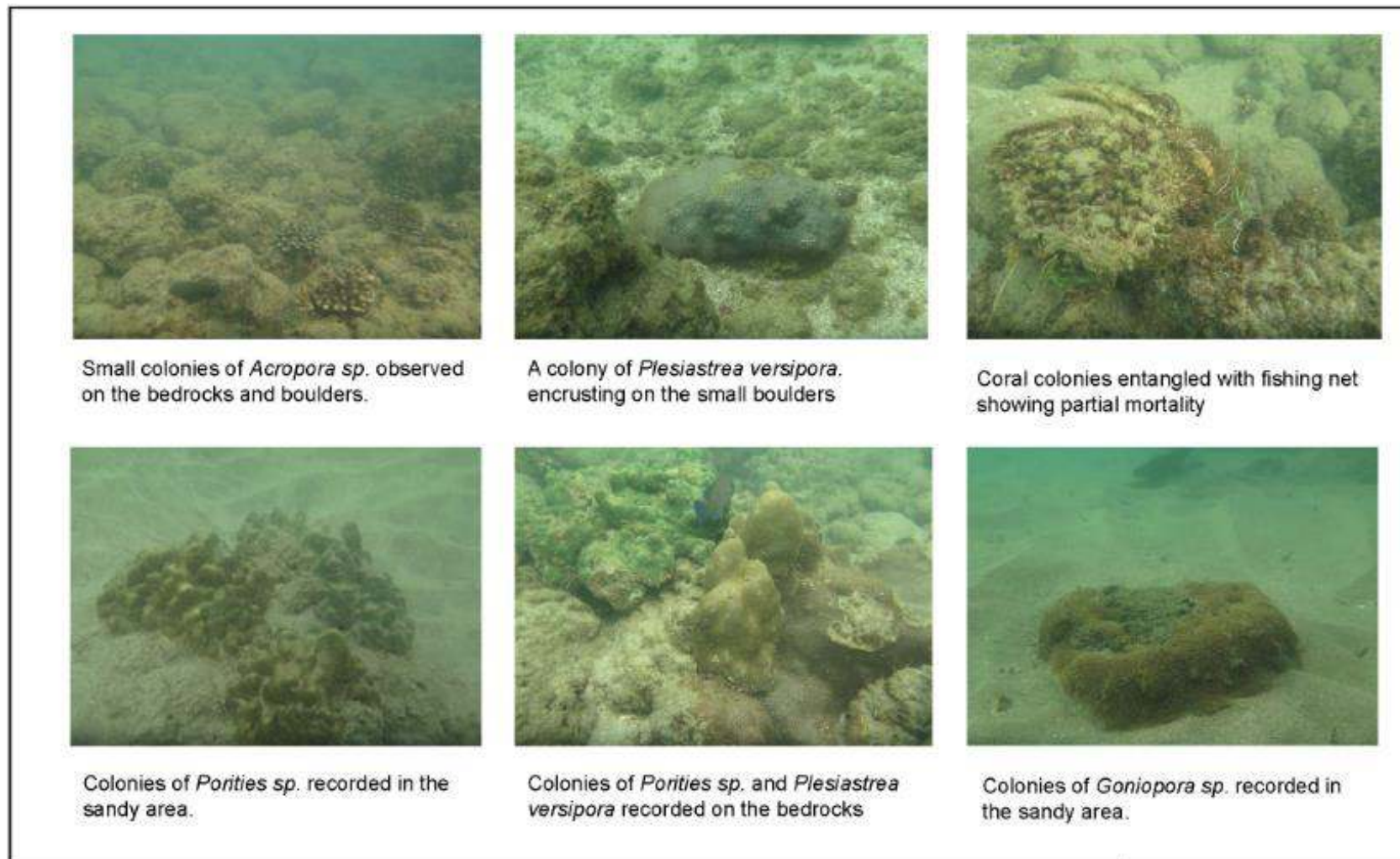
### Transect 1 (T1)

This transect is located at the natural island to the west of the Project Area and a total distance of approximately 0.5 km was surveyed during the REA. Tier 1 and Tier 2 survey findings are presented in *Table 2.11* and *Table 5.23* and representative photos in *Figure 5.21*.

The sites mainly comprised of large boulders at depth of -1 to -2 mPD and of sand and small boulders at depth >-3mPD. Sparse colonies of hard coral with 6 – 10 % coverage were present mainly on the hard substratum at the shallow region and a total of 10 genera of hard coral were identified. Hard coral colonies were relatively small (i.e. < 20 – 30 cm in diameter) and mainly composed of *Acropora* spp. and *Porities* spp. (*Table 5.23*). All the coral colonies observed to be in a healthy condition, except for some dead colonies due to damage, potentially from fishing gear. Other sessile benthic taxa included hydroids and barnacles were observed.

In terms of reef development, no evidence of reef accretion was observed at this site. Corals present occur as isolated colonies attached or encrusted onto boulders and bedrock. The area does not constitute a fringing coral reef.

Figure 5.21 Representative Photographs Records taken during the Snorkelling Survey at Transect 1



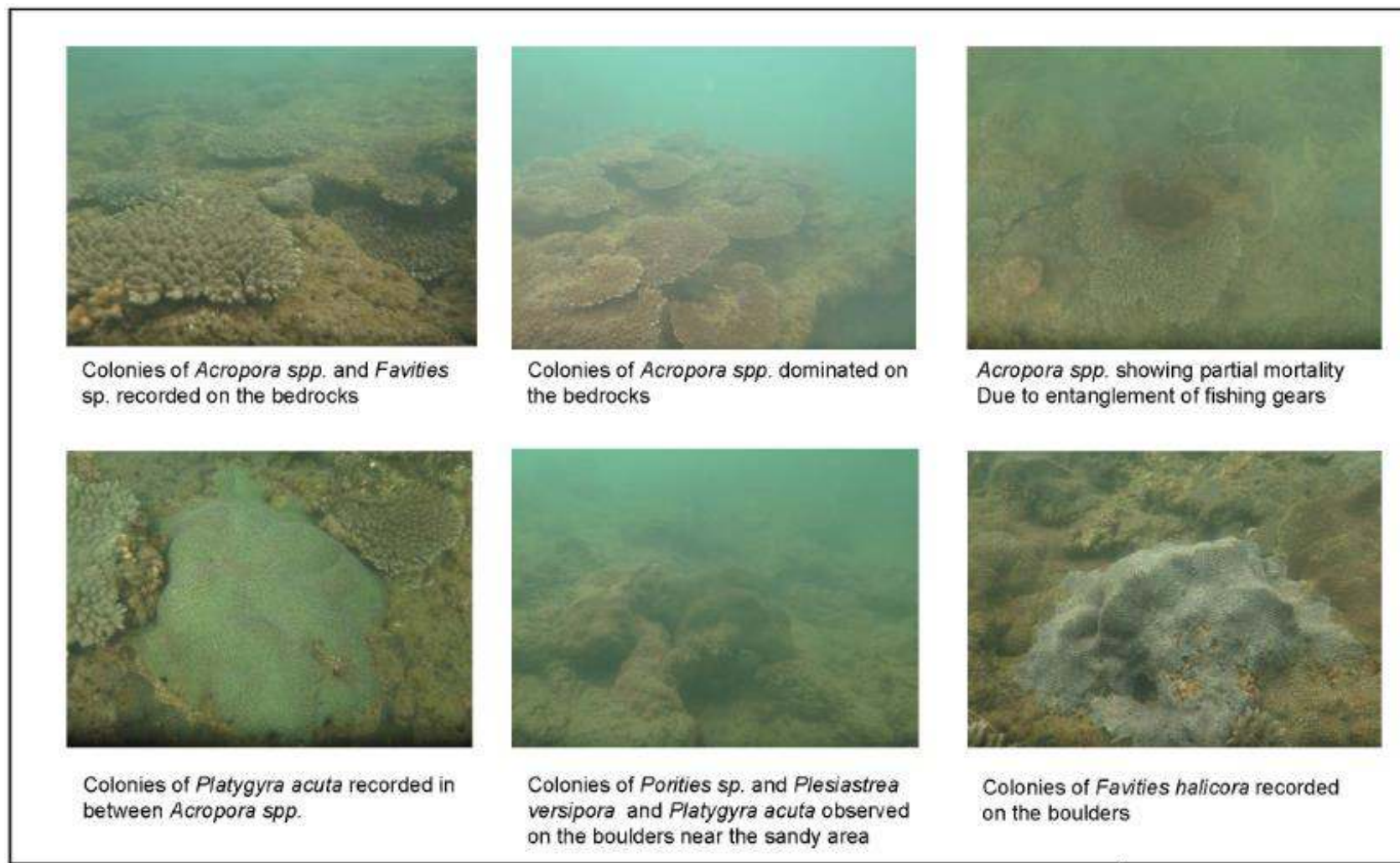
## Transect 2 (T2)

Transect 2 situated along the rocky headland to the east of the Project Area. A total distance of approximately 0.5 km was surveyed and the survey findings are presented in *Table 5.22* and *Table 5.23*. Representative photos were shown in *Figure 5.22*.

The sites mainly comprised of bedrocks with sandy area in between. High coverage of hard coral (i.e. 50 – 75%) was recorded, but most coral colonies were found on the bedrocks with isolated colonies on the sandy region. A total of eight Genera of hard coral were identified and majority of them are *Acropora* spp (*Table 5.23*) with around 30 – 50 cm diameter. Except for the colonies damaged, likely by fishing gear, all the coral colonies recorded to be healthy and no bleaching condition was observed. Other sessile benthic taxa included barnacles were observed.

In terms of reef development, although there is high coverage of hard corals, no evidence of reef accretion was observed at this site. Corals appeared to be only occurred only attached or encrusted at the bedrock limited at the subtidal region of the headland and do not constitute a fringing coral reef.

Figure 5.22 Representative Photographic Records of Corals taken during the Snorkelling Survey at Transect 2





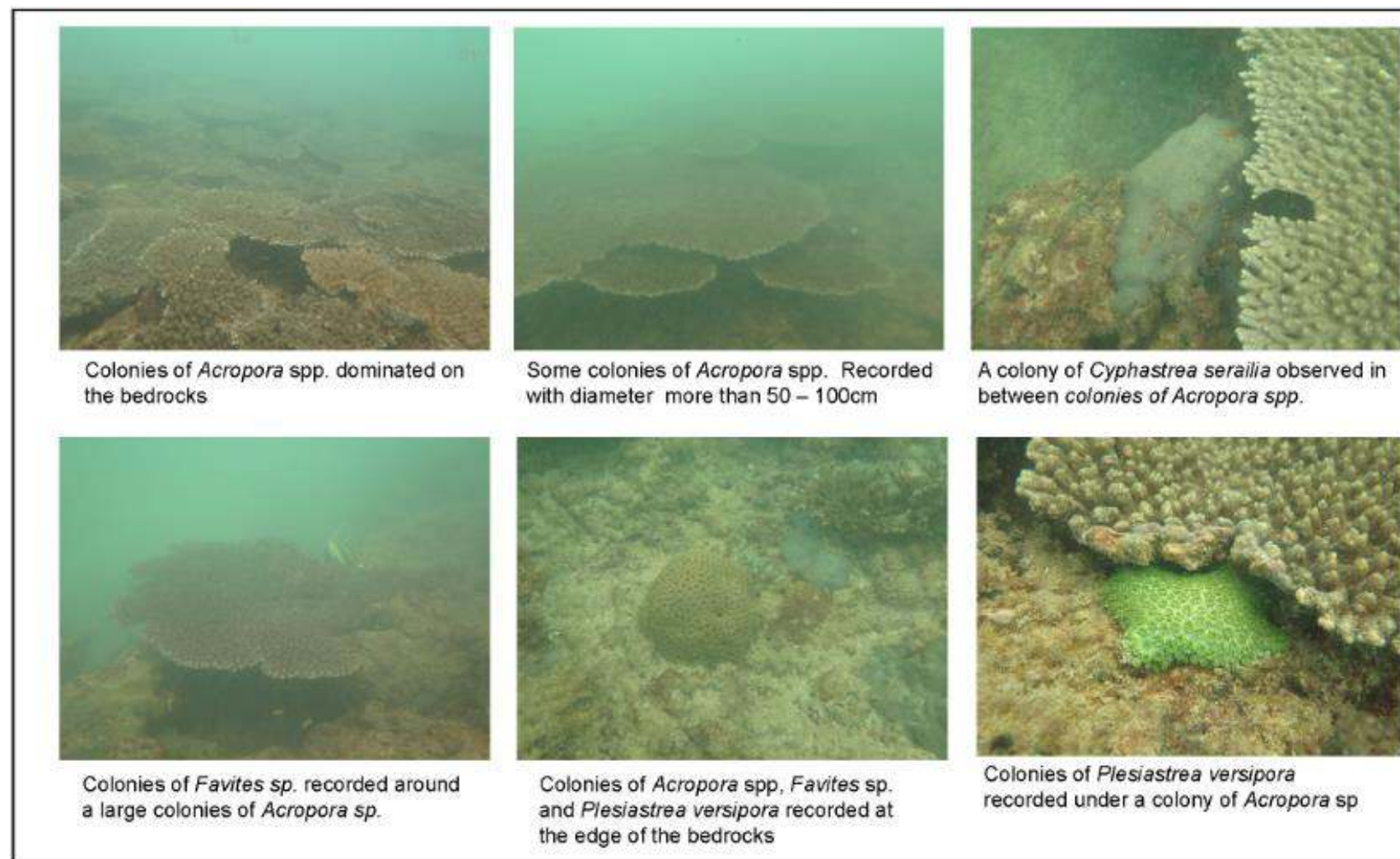
### Transect 3 (T3)

This transect are located at an offshore island to the north of the Project Area. A total distance of approximately 0.5 km was surveyed and the survey findings are presented in *Table 5.22* and *Table 5.23*. Representative photos are shown in *Figure 5.23*.

This site is only composed of bedrock with 76 – 100% coverage of hard coral. The hard colonies were relative large in size and some reached more than 50 – 100 cm in diameter. Similar to T2, the dominant species in this site was also *Acropora* spp and only a total of five hard coral Genera was recorded (*Table 5.23*). All the coral colonies recorded to be healthy and no dead coral cover was observed. Other sessile benthic taxa included barnacles were observed.

In terms of reef development, there is no evidence of reef accretion was observed at this site. Although coral coverage is high at this site, the growth of coral colonies appeared to be limited by current and sedimentation. All colonies are attached or encrusted on the bedrock and do not constitute a fringing coral reef.

Figure 5.23 Representative Photographic Records of Corals taken during the Snorkelling Survey at Transect 3



**Table 5.22**      *Seabed Attributes along the Survey Transects at T1, T2 and T3*

	T1	T2	T3
<b>Seabed attributes</b>			
Bedrock	1	5	6
Continuous pavement	0	0	0
Large Boulder (diam.>50cm)	3	0	0
Small Boulder (diam.<50cm)	2	0	0
Rock (<26cm)	2	0	0
Rubble	0	0	0
Mud/Silt	0	0	0
Sand	3	2	0
Other	0	0	0
<b>Ecological attributes</b>			
Hard coral	2	5	6
Octocoral (Soft corals and gorgonians)	0	0	0
Dead Coral	1	1	0
Other Benthos (sponges, zoanthids, ascidians and bryozoans)	1	1	1
Macroalgae	0	0	0

Notes: 0 = 0%, 1 = <5%, 2= 6 -10%, 3 = 11 - 30%, 4 = 31- 50%, 5 = 51 - 75%, 6 = 76 - 100%

**Table 5.23 Coral Species Recorded Along the Survey Transects**

	T1	T2	T3
<b>Hard Coral</b>			
<i>Acropora</i> spp	3	5	5
<i>Alveopora</i> spp	1	0	0
<i>Cyphastrea serailia</i>	2	2	1
<i>Dipsastraea speciosa</i>	0	1	0
<i>Favites abdita</i>	0	1	0
<i>Favites flexuosa</i>	2	1	1
<i>Favites micropentagona</i>	1	0	0
<i>Favites pentagona</i>	2	1	1
<i>Favities acuticollis</i>	1	0	0
<i>Favities chinensis</i>	1	0	1
<i>Favities halicora</i>	1	3	1
<i>Goniopora</i> sp	2	1	1
<i>Leptastrea</i> sp	1	0	0
<i>Platygyra acuta</i>	2	3	0
<i>Plesiastrea versipora</i>	2	2	2
<i>Porites</i> spp	3	1	0
<i>Stylocoeniella</i> sp	1	0	0

Notes:

- (1) 0=absent, 1=rare, 2=uncommon, 3=common, 4=abundant, 5=dominant
- (2) The ranks shown in the Table above indicate the relative abundance of each coral in relation to other corals in the community. In other words, these broad categories rank taxa in terms of relative abundance of individuals, rather than the contribution to benthic cover along each transect. The ranks are subjective assessments of abundance, rather than quantitative counts of each taxon. For instance, if a coral is ranked as 'common', it means it was more frequent than other coral species along the transect. It should be borne in mind that coral cover along all of the transects where corals occurred was very low (<5% cover).

#### 5.4.6

#### *Plankton*

Moderate Resolution Imaging Spectrometer (MODIS) Aqua satellite datasets (NOAA, 2015) from the Bay of Bengal show that chlorophyll a concentrations and inferred phytoplankton standing crop levels in the surface layer are higher in the Northeast season (November to March) than in Southwest (June to September). As is typical, highest chlorophyll levels ranging up to 10 mg/m<sup>3</sup> occur closest to the coast likely due to nutrient inputs from the land such as from rivers.

There are limited other data on the species composition, abundance and distribution of plankton within the Study Area. Some studies have been undertaken in the wider Bay of Bengal with, for instance, phytoplankton communities found to be dominated by diatoms (Bacillariophyceae) followed by dinoflagellates (Dinoflagellata) in terms of abundance in different survey areas (north, west and east).

Due to the high salinity, highest temperature, lowest nutrients and suspended sediments prevalent in the offshore waters of the Bay of Bengal including the Andaman Sea, plankton is mostly in the declining phase (Jyothibabu et al, 2014).

Given the high mortality rate naturally occurring in plankton, and the nature of the proposed works, plankton is not considered particularly sensitive to the proposed Project activities.

#### 5.4.7

#### *Macrobenthos Survey*

##### *Survey Methodology*

Marine sediments for biological analysis were sampled using the same method and at the same location as the marine sediment sampling (Table 5.2 and Figure 5.5). Samples were collected using a 0.1m<sup>2</sup> "Day" grab sampler and two (2) sediment samples were collected at each station for further analysis.

Once the samples are accepted and photographed after the inspection procedure as mentioned in Section 5.2.1, sediment for benthos analysis were then be sieved by 0.5 mm mesh sieve. The sediment was washed onto a sieve stack and gently rinse with seawater to remove all fine material. The remaining fauna were collected and kept in ziplock plastic bag. A 10% solution of buffered formalin containing rose Bengal in seawater was then added to the bag to ensure tissue preservation prior to delivery to the laboratory for taxonomic sorting and identification.

Upon arrival at the laboratory, all macrobenthos samples were re-inventorised and checked against chain-of-custody forms. Sample rescreening was performed after the samples have been held in formalin for a minimum of 24 hours to ensure adequate fixation of the organisms. Samples were gently rinsed with fresh water into a 500 µm sieve to remove the formalin from the sediments. Sieves were partially filled while rinsing a specific sample to

maximize washing efficiency and prevent loss of material. All material retained on the 500 µm sieve were placed in small fractions into a labelled petri dish and preserved with 70% ethanol. The material was lightly agitated to ensure complete mixing of the alcohol with the sediments. The sediment was then sorted to remove all animals and fragments. Standard and accepted techniques were used for sorting organisms from the sediments. Small fractions of a sample will be placed in a petri dish under a 10-power magnification dissecting microscope. The petri dish was scanned systematically and all animals and fragments removed using forceps. Organisms representing major taxonomic groups including Polychaeta, Arthropoda, Mollusca, and miscellaneous taxa were sorted into separate, labelled vials containing 70 percent ethanol. All sorted samples will be systematically checked to ensure compliance with QA/QC program requirements before proceeding to the taxonomic identification, enumeration, and biomass determination phases of the analysis.

Taxonomic identifications were performed using stereo dissecting and high-power compound microscopes, to the family level except for dominants, which were identified, where possible, to species. Careful sampling procedure was used to minimise fragmentation of organisms, however if breakage of soft-bodied organisms occurred only anterior portions of organism fragments were counted. All fragments were retained and weighed during biomass determinations. Rare or questionable taxa were compared against reference collection specimens for confirmation and consistency of identification. Biomass determinations were made by taking the blotted wet mass of each taxonomic fraction.

### *Survey Result*

A total of 199 individual organisms were collected from the 10 grab sampling stations at the 6 survey sites during the wet season survey in September 2017. The specimens belong to six (6) Phyla with a total of 9 classes, 45 families and 53 species identified. *Table 5.24* provides a summary on the abundance, biomass and taxonomic richness of infauna collected at the control stations (i.e. C1 and C2) and impact stations (i.e. S1 – S4).

Results of the wet season benthic survey showed that mean infaunal abundance, biomass, mean taxonomic richness, Pielou's Evenness and Shannon Diversity were similar among all sampling sites, except higher abundance and taxonomic richness at S2 and higher biomass at C1, C2 and S1 (*Table 5.24*). In addition, the benthic assemblage between stations is similar. The Shannon Diversity ranged from 2.56 – 3.15 and the Pielou's Evenness was recorded to be 0.91 – 0.97 (*Table 5.24*). This indicates that the composition and distribution of species are similar among control and impact stations.

In terms of infaunal abundance, the majority (62.3%) of organisms recorded in the wet season were from the Phylum Annelida, followed by Arthropoda (21.6%), Mollusca (8.0%) and Echinodermata (5.5%). Each of the other recorded phyla, including Nemertinea and Sipuncula, contributed to < 3 % of the number of individuals recorded. High abundance of Annelida was



contributed by high number of different polychaete species. The polychaete worm *Glycera chirori* was the most abundant species from the wet season survey (total abundance = 20 individuals). No rare or uncommon species were recorded in the wet season survey.

In terms of infaunal biomass, organisms from the Phylum Mollusca contributed 84.5% of the total biomass recorded, while organisms from Arthropoda, Annelida and Echinodermata also contributed significant biomasses (8.3%, 4.4%, and, 2.6% respectively). Each of the other recorded phyla contributed to < 5 % of the total infaunal biomass recorded. High biomass of Mollusca was contributed by few numbers of bivalve *Elpidollina* sp. and *Macoma candida*.

In summary, results from the wet season surveys suggest that infaunal assemblages of the surveyed sites consist of common species typical of disturbed environment, i.e. numerical dominance of low biomass, stress-tolerant and short-lived polychaete species. Infaunal assemblage structure was largely similar between control and impact stations.

The full list of species is provided in **Appendix E**.

**Table 5.24 Composition of Infaunal Assemblages, Density and Indices of richness, evenness and diversity of Infaunal Assemblages at the Sampling Sites for the Soft Bottom Habitat Surveys at the Assessment Area during the Wet Season (September 2017)**

Site	Total Number of Infaunal Individuals	Mean Number of Individuals per Station	Mean Number of Individuals per m <sup>2</sup>	Mean Taxonomic Richness (No. Families) per Station	Mean Taxonomic Richness (No. Species) per Station	Pielou's Evenness (J)	Shannon Diversity (H')	Total Biomass (g wet weight)	Mean Biomass per Individual (g wet weight)
C1	37	18.5	185	15	19	0.9180	3.152	5.7987	0.1567
C2	22	11.0	110	11	11	0.9365	2.536	2.9161	0.1326
S1	21	10.5	105	11	11	0.9691	2.558	2.9056	0.1384
S2	61	30.5	305	29	31	0.9275	2.986	0.8934	0.0146
S3	26	13.0	130	12	13	0.9664	2.738	0.1020	0.0039
S4	32	16.0	160	15	16	0.9373	2.808	0.5841	0.0183

Within the Area of Influence, fish species will be made up of coastal, shallow water species. Coastal or reef species are range restricted species and generally inhabit rocky, coral or coastal areas for the majority of the life; using these areas as both feeding and spawning grounds.

Recent trawl surveys to look at fisheries composition were conducted by the R.V. Dr. Fridtjof Nansen in 2013 and covered a number of stations in Ayeyarwady Region, as well as other parts of Myanmar waters. The findings were summarised as showing that pelagic marine fishery resources have significantly decreased, tenfold for this sample, between 1980 and 2013, which was attributed to exploitation by fisheries. An “Ecosystem Survey” as an extension to this survey was carried out between April and June 2015 by the Institute of Marine Research, Norway and Myanmar’s Department of Fisheries (Myanmar Ecosystem Survey, 2015). This survey assessed the number of fish species in Myanmar waters.

A total of 372 different species were caught in the Ayeyarwady coast stations. The greatest number of species was recorded between 65 ft. (20 m) and 164 ft. (50 m) water depth (200 species). The results of the analysis by region showed that the most common species (groups) in the Rakhine Coastal Zone (including the Ayeyarwady coast) hairtails (*Trichiurus lepturus*), bigeye (*Priacanthus hamrur*), jellyfish, lizard fish (*Saurida tumbil*), toothpony fish (*Gazza minuta*), Japanese threadfin bream (*Nemipterus japonicas*), spinycheek lanternfish (*Benthosema fibulatum*), *Decapterus sp.*, and Indian anchovy (*Stolephorus indicus*). Some of the fish species caught in Nan Thar Pu near the Project Area are shown in Figure 5.24.

**Figure 5.24** *Representative Sample of Fish Species Caught in Nan Thar Pu, taken in February, 2017*



Whale sharks (*Rhincodon typus*) are listed as endangered on the IUCN 2016 Red List. This species is highly migratory occurring in both tropical and temperate waters. The species normally has an oceanic distribution but can occur in coastal waters. In the Bay of Bengal, whale sharks have been recorded in the northern area of Bengal (off the Bangladesh coast) from December to March.

Data on other sharks found within the Bay of Bengal are limited, scalloped hammerhead (*Sphyrna lewini*) and great hammerhead (*Sphyrna mokarran*); both listed as Endangered on the IUCN 2016 Red List are found within Myanmar's domestic waters, predominantly as by-catch. Other sharks reported in the Bay of Bengal include the vulnerable smooth hammerhead (*Sphyrna zygaena*); and various other shark species. Myanmar also has a number of ray species.

During the site visit in January, 2017 fishermen were observed on Goyangyi Island to have caught some ray species (Figure 5.25).

**Figure 5.25** *Mobula Ray Caught by Fishermen on Goyangyi Island, taken in January 2017*



#### *Survey of Fishermen and Markets near Project Area*

42 species of aquatic fauna belonging to 10 order and 36 families were recorded (**Appendix D**).

*Polynemus indicus*, *Panulirus polyphagus* and *Panulirus versicolor* are listed as Endangered, and *Tenualosa ilisha* is listed as Critically Endangered on the Myanmar Biodiversity Conservation Investment Version 2013 although those are only Least Concern status on IUCN Red List 2017. *Dasyatis zugei* and *Mobula japanica* are listed Nearly Threaten status on IUCN Red List 2017.

*Lepturacanthus savala*, *Lethrinus lentjan*, *Otolithes ruber*, *Upeneus sulphureus*, *Lates calcarifer*, *Scomberomorus guttatus*, *Rastrelliger kanagurta*, *Lactarius lactarius*, *Saurida undosquamis*, *Penaeus indicus*, *Portunus sanguinolentus* and *Charybdis feriata* are listed as Vulnerable on the species of conservation concern on Myanmar Biodiversity Conservation Investment Version 2013 while *Thunnus obesus* is listed as Vulnerable on the species of conservation concern on IUCN Red List 2017.

#### **5.4.9** *Marine Mammals*

A total of 21 cetaceans (whale and dolphin) and one sirenian (dugong) species have been reported in Myanmar waters (IUCN Red List Website). Two species, the Irrawaddy dolphin (*Orcaella brevirostris*) and dugong (*Dugong dugon*), have been protected under the Myanmar Protection of Wildlife and Conservation of Natural Areas Law since 1994 under the category “completely protected”.

## Cetaceans

Of the whale and dolphin species potentially present in Myanmar waters, most are far-ranging, migratory species though there are several coastal species with closer affinities to shallow water habitat areas and estuarine areas.

Such coastal species include Irrawaddy dolphin (*Orcaella brevirostris*), Indo-Pacific humpback dolphin (*Sousa chinensis*) and Indo-Pacific bottlenose dolphin (*Tursiops aduncus*). IUCN-listed threatened cetacean species in Myanmar waters are oceanic species that typically inhabit deep offshore open waters, namely the blue whale (*Balaenoptera musculus*) (Endangered), fin whale (*Balaenoptera physalus*) (Endangered) and sperm whale (*Physeter macrocephalus*) (Vulnerable). The blue whale and the fin whale are also listed as endangered species recognized as of prime importance to the Region and deserving special attention under the ASEAN Agreement on the Conservation of Nature and Natural Resources. Other common deeper water species such as humpback whale (*Megaptera novaeangliae*) and Bryde's whale (*Balaenoptera edeni*) are known to occur in offshore waters in Myanmar; however these are listed as Least Concern and Data Deficient on IUCN Red List, respectively.

One coastal species of dolphin; the Irrawaddy dolphin (*Orcaella brevirostris*) is protected under the Myanmar Protection of Wildlife and Conservation of Natural Areas Law since 1994 under the category "completely protected".

## Sirenians (Dugongs)

Dugongs (*Dugong dugon*) are migratory species with factors governing movements including food availability. Dugongs rely on seagrass for nutrition and therefore typically inhabit shallow and sheltered coastal waters, though individuals occasionally may occur many kilometres from the coast. In Myanmar, these herbivorous mammals are rare and their distribution mainly extends in areas to the west of the Ayeyarwady Delta and northwards along the Rakhine State coast as far north as Bangladesh (Tint Tun and Ilangakoon, 2007). Dugongs (*Dugong dugon*) inhabit shallow and sheltered coastal waters. Along with the Irrawaddy dolphin; dugong are also protected under the Myanmar Protection of Wildlife and Conservation of Natural Areas Law since 1994 under the category "completely protected". Given their preference to nearshore/coastal areas, dugongs could potentially inhabit the Project Area.

### 5.4.10

## Marine Turtles

Five species of marine turtles, all of which are IUCN-listed threatened species are reported for Myanmar waters (Figure 5.26). These are the olive ridley turtle (*Lepidochelys olivacea*) (Vulnerable), loggerhead turtle (*Caretta caretta*) (NE Indian Ocean subpopulation - Critically Endangered), green turtle (*Chelonia mydas*) (Endangered), hawksbill turtle (*Eretmochelys imbricata*) (Critically Endangered), and the leatherback turtle (*Dermochelys coriacea*) (Endangered).



A review of available data on the numbers of turtles nesting annually was undertaken for Ayeyarwady Region. There is also information available from the Ministry of Livestock and Fisheries on turtle nesting from Diamond Island (Thameehla) in the Ayeyarwady Region around 42 miles (70 km) to the south of the Project Area. These data was collected from 1986 to 2004 and demonstrates a positive relationship between number of eggs laid and number of hatchlings released (Maung Maung Lwin, undated). The number of nests, eggs laid and the total number of unhatched, damaged and hatched eggs is presented in *Table 5.25*. Diamond Island is the largest recorded concentration of nesting in Myanmar where approximately 20,000-30,000 green turtle eggs and 7,000-15,000 loggerhead turtle eggs are laid annually according to the DoF (Thorbjarnarson, *et al.*, 2000). Green turtle nesting numbers at Thameehla Island is estimated at a few tens of nesting females per year (Limpus, C. 2012).

Figure 5.26 Potential Turtle Nesting Beaches in the Study Area



**Table 5.25 Turtle Nesting Data from Ayeyarwady Region (1986 to 2004)**

Year	No of Nests	Eggs Laid	Unhatched Eggs	Damaged Eggs	Hatchlings Released	Hatching Rate (%)
1986	106	5,200	-	4,230	970	18.65
1987	528	16,073	5,890	2,114	8,069	50.2
1988	297	27,900	2,650	15,161	10,089	36.16
1989	549	66,908	27,294	4,583	35,031	52.36
1990	537	52,300	7,321	-	44,979	86
1991	359	34,334	7,395	-	26,939	78.46
1992	369	36,900	7,558	7,413	21,929	59.43
1993	540	47,902	3,143	10,036	34,723	72.49
1994	387	34,461	3,987	-	30,474	88.43
1995	419	39,613	4,516	3,533	31,564	79.68
1996	463	45,928	3,767	5,317	36,844	80.22
1997	456	47,312	5,138	1,689	40,485	85.57
1998	306	30,679	3,664	2,065	24,950	81.33
1999	136	13,651	1,888	-	11,763	86.17
2000	231	45,673	2,201	-	43,472	95.18
2001	402	46,680	3,090	-	43,590	93.38
2002	122	11,549	1,821	595	9,133	79.09
2003	251	21,016	4,711	5,221	11,084	52.74
2004	165	14,347	3,162	7,764	3,421	23.84
<b>Total</b>	<b>6,623</b>	<b>638,426</b>	<b>99,196</b>	<b>69,721</b>	<b>469,509</b>	<b>-</b>
<b>Average</b>	<b>349</b>	<b>33,601</b>	<b>5,511</b>	<b>5,363</b>	<b>24,711</b>	<b>68</b>

Turtle nesting is well known on the Islands around the Bogale River in the Ayeyarwady Region (over 97 miles / 155 km from the Project Area). In 2003, the Department of Fisheries suggested that the annual number of nests is 300. Most nesting in the Ayeyarwady Region is performed by olive ridley (70%), loggerhead (20%) and green turtle (10%). Closer to the Project Area, UNEP data suggest sandy shore habitat along the Goyangyi Island and facing the Project Area is potential are potential nesting sites for green and olive ridley turtles (*Figure 5.24*).

Annual turtle nesting activity for coastal locations in Myanmar waters is reported to occur between September and March with the peak period of activity occurring from December to January. During the baseline surveys in September 2017, no signs of turtles nesting were observed (although this is outside the peak nesting period). In addition, local villagers consulted have not observed any turtles nesting on this stretch of beach.

#### 5.4.1 *Seabirds*

Terns are the most abundant group of seabirds in offshore Myanmar waters, of which 13 species regularly occur. Other seabirds which may use these waters include gulls, storm petrels, jaegers (also known as Skuas), tropic birds, boobies, noddies and frigatebirds. Seabird species tend to be highly migratory, far ranging and widely distributed away from breeding areas. Offshore Myanmar waters are used by seabirds for foraging and resting. Islands and islets can also be used for roosting, resting and moulting. Only two species, the little tern (*Sterna albifrons*) and the brown booby (*Sula leucogaster*), are reported to have breeding colonies in Myanmar. No Important Bird and Biodiversity Areas <sup>(1)</sup> are reported for the Area of Influence.

The distribution range of one IUCN-listed threatened seabird species, the Christmas Island frigatebird (*Fregata andrewsi*) (Critically Endangered) extends as far as southern Myanmar waters. However, Myanmar waters are at the outer limit of its range. Given the scope of the Project, impacts to birds are not expected to be significant.

#### 5.4.2 *Protected and Environmentally Sensitive Areas*

Information from Instituto Oikos and Biodiversity and Nature Conservation Association (2011) and Wildlife Conservation Society (WCS 2013) reported a total of 43 designated or proposed protected areas with IUCN categories exist for Myanmar <sup>(2)</sup>; however none of these lie within the Project Area and the closest is over 42 miles (70 km away).

There are also a number of Key Biodiversity Areas (KBAs) within the Study Area. KBAs have been identified based on stakeholder consultation undertaken by WC Myanmar in 2011 (WCS, 2013) however they are not classified as legally protected areas in Myanmar.

Information on the size of the protected area and KBAs and key species identified as potentially present is presented in Table 5.26. Ngwe Saung KBA is the closest to the Project Area at 18 miles (30 km). This area has been identified due to the presence of two marine turtle species listed as species of conservation concern on the IUCN Red List; green turtle and hawksbill turtle; which are listed as endangered and critically endangered respectively by the IUCN. It is also identified for presence of mangrove species.

(1) An Important Bird and Biodiversity Area (IBA) is an area recognized by Birdlife International as being globally important habitat for the conservation of birds populations.

(2) It should be noted that some of the locations are proposed as protected area without authorized designation (i.e. "soft" designation).

**Table 5.26 Protected Areas and Key Biodiversity Areas in the Study Area**

Name	Area (km <sup>2</sup> )	Key species and IUCN Status	Distance from Project Area
<b>Protected Areas</b>			
Thamihla Kyun (Marine)	0.88	Hawksbill turtle (CR), green turtle (EN), loggerhead turtle (EN), olive ridley turtle (VU)	42 miles (70 km)
Khaing Thaung Island	14	Olive ridley turtle (VU), spotted greenshank (EN), congregatory waterbirds, mangrove species	74 miles
Kadonkani	647	Burmese Eyed Turtle (VU), lesser adjutant (VU), congregatory waterbirds, mangrove species	75 miles
Kadongalay Island	10	Green turtle (EN), loggerhead turtle (EN), olive ridley turtle (VU) salt water crocodiles, mangrove species, <i>sonneratia griffithii</i> (CR), <i>heritiera fomes</i> (EN) Moluccan Ironwood <i>Intsia bijuga</i> (VU)	83 miles
Gayetgyi Island	13	Green turtle (EN), loggerhead turtle (EN), olive ridley turtle (VU) salt water crocodiles, mangrove species, <i>sonneratia griffithii</i> (CR), <i>heritiera fomes</i> (EN) Moluccan Ironwood <i>Intsia bijuga</i> (VU)	88 miles
<b>Key Biodiversity Areas</b>			
Ngwe Saung	382	Hawksbill turtle (CR), green turtle (EN), mangrove species	18 miles (30 km)
Pyindaye	1,229	Olive ridley turtle (VU), salt water crocodiles, greater spotted eagle (VU), congregatory waterbirds, mangrove species, <i>sonneratia griffithii</i> (CR), <i>heritiera fomes</i> (EN) Moluccan Ironwood <i>Intsia bijuga</i> (VU)	83 miles
Pyin-ah-lan	273	Olive ridley turtle (VU), spotted greenshank (EN), lesser adjutant (VU), congregatory waterbirds	63 miles

IUCN Status: CR = Critically Endangered, E = Endangered, VU= Vulnerable.

Source: Key Biodiversity Areas in Myanmar from Wildlife Conservation Society, 2013. Available from <https://myanmarbiodiversity.org/key-biodiversity-areas/> and GIS data provided by WCS Myanmar

## 5.5 SOCIO-ECONOMIC CHARACTERISTICS

### 5.5.1 *Data Collection Methodology*

Data were collected during site visits in January and March 2017 in Nga Pu Daw town, Nga Yoke Kaung town and Nan Thar Pu village Tract. This data covered demographics and population, livelihoods, income, infrastructure and utilities, and tourism.

The data were collected using a number of questionnaires for farming, fishing and village level data as well as 50 household surveys within Nan Thar Pu Village tract including 6 villages such as Seik Kann, Zin Yaw Chaung, Kyauk Phyar, Ale Gone, Gyaing Galay and Nan Thar Pu villages by ERM Social Survey Team. The survey was conducted 13 % respondent of total 376 household in the whole village tract. The socio-economic survey questionnaire is included about village profile, land demographic information, Livelihood, income and financing, and health.

Secondary data sources were also used including the Union of Myanmar Population and Housing Census (2015).

### 5.5.2 *Administration and Demographics*

#### *Ayeyarwady Region*

Myanmar is divided administratively into seven Regions and seven States and six self-administered zones. Ayeyarwady Region, with its capital situated at Patheingyi, is one of the seven regions in Myanmar, which is further divided into six (6) districts and 26 townships. The Study Area from a social perspective covers Nga Yoke Kaung Township in Nga U Daw District.

The Ayeyarwady Region is located in south western Myanmar. It is bordered by the Bago and Yangon Region in the northeast and east, the Rakhine State in the northwest, and the Bay of Bengal and Andaman Sea to the west and south. The total population of Ayeyarwady as recorded by the Myanmar Census, 2015 is 6,184,829 persons (as of 29 March 2014) consisting of 3,009,808 males and 3,175,021 females. This represents 12 % of the total population of Myanmar. Since the last census in 1983, the population of Ayeyarwady Region has increased by 24%. The population density in 2014 was ~176 persons per square kilometre which is more than double the Union Level population density (76 persons per square kilometre). The majority of people live in areas classified by the GAD as "rural"; 86 out of 100 people. The population of females in Ayeyarwady Region exceeds the population of males with a sex ratio (number of males for every 100 females) of 95.

Table 5.27 and Table 5.28 provide an understanding of the demographic profile of the region and the townships consulted; respectively (Myanmar Census, 2015).



**Table 5.27** *Administrative and Demographic Profile of the Ayeyarwady Region (Myanmar Census, 2015)*

Attribute	Ayeyarwady
Districts	6
Townships	26
Wards	219
Village Groups	1912
Villages	11651
Total Population	6,184,829
Area (sq. km)	35,032
Population Density (persons per sq. km)	176.5
Rural Population %	86
Urban Population %	14
Districts	6

Source: The 2014 Myanmar Population and Housing Census (2015)

**Table 5.28** *Overview of the Demographics of the Study Area*

District/Township	Population			Sex ration
	Total	Urban	Rural	Number of men per 100 women
Pathein Township	287,071	169,773	117,298	92.1
Nga Pu Daw Township	168,776	10,682	158,094	99.5

Source: The 2014 Myanmar Population and Housing Census (2015)

Ayeyarwady Region is reported to be comprised of the social groups such as Bamar, Kayan, Kayin and Rakhine. Of these, the Bamar are reported to be the majority while the Rakhine are reported as the minority group, primarily found in the western coastal regions (Delta Alliance, 2013). In terms of religion, it is characterized by a majority of Buddhist, followed by Christians and Muslims.

#### *Nan Thar Pu Village Tract*

Nan Thar Pu Village Tract is located in near Nga Yoke Kaung Town, Nga Pu Daw Township, Pathein District, Ayeyarwady Region. It is approximately 4-hour drive from Pathein (Pathein-Mawtin highway). It is accessible from

Nga Yoke Kaung Town by road, however during the rainy season it is necessary to take a ferry then motor bike into town. There are six wards (parts) in Nan Thar Pu Village Tract – Zin Yaw Chaung, Kyauk Phyar, Ale Gone, Nan Thar Pu, Gyaing Galay and Seikkann.

In Nan Thar Pu Village Tract, there are 359 houses and 376 households with Ale Gone and Gyaing Galay wards being the most populous. Kayan, Kayin, Bamar and Rakhine people all live in Nan Thar Pu Village Tract. The majority of people are Kayin followed by Bamar and Rakhine. Most people are Buddhist.

Demographic information for Nan Thar Pu is shown in *Table 5.29* and the locations of the wards within Nan Thar Pu are shown in *Figure 5.28*. This data was collected from the GAD office in Nga Yoke Kaung Town.

**Table 5.29      Population Demographics of Nan Thar Pu (collected during social surveys in March 2017)**

No	Sub-village (ward)	Numbers of Houses	Household	Below 18 Years Old			Above 18Years Old			Total Population		
				Male (M)	Female (F)	Total	M	F	Total	M	F	Total
1	Seik Kann											
2	Zin Yaw Chaung	131	137	245	241	486	215	227	442	460	468	928
3	Kyauk Phyar											
4	Ale Gone	87	93	129	132	261	135	120	255	264	252	516
5	Nan Thar Pu											
6	Gyaing Galay	141	146	228	222	450	225	242	467	453	464	917
Total		359	376	602	595	1197	575	567	1164	1177	1184	2361

Source: Data by Village Tract Leader of Nan Thar Pu Village

Figure 5.27 Wards in Nan Thar Pu



### 5.5.3

### Livelihood

Table 5.30 shows land use of the Ayeyarwady Region.

**Table 5.30** *Land Use in the Ayeyarwady Region (Delta Alliance, 2013)*

Type	Area (Hectares)	Percentage
Districts	6	-
Cultivable Land	1,818,467	52
Forest and Reserved Forest	720,088	21
Cultivable Waste Land	149,168	4
Virgin Land	23,020	1
Other Area	792,447	23
<b>Total area</b>	<b>3,503,190</b>	<b>100</b>

### Livelihood Profile

Rice cultivation and fishing are the main economic activities of the Ayeyarwady Delta and play a critical role in the economy and livelihood of the region, especially in rural areas (Delta Alliance, 2013). Industry, infrastructure and services sectors are smaller in scale.

The majority of the 50 households surveyed for the Project get their income from either farming or business; refer to Table 5.31. None of the 50 households' surveyed made income from fishing however, it was reported by the Village Tract Leader in Gyaing Galay ward at up to 30% of households in that village received some income from fishing.

**Table 5.31** *Annual income of the people living in Nan Thar Pu, March 2017 (in Kyat)*

Name of Village	Services	Agriculture and Livestock	Casual labour	Business (Fishery)	Rent	Allowance
Ale Gone	0	750,000	510,000	2,450,000	50,000	0
Gyaing Galay	0	0	300,000	1,250,000	0	0
Kyauk Phyar	600,000	1,200,000	400,000	1,200,000	0	0
Nan Thar Pu	200,000	230,000	100,000	1,800,000	0	0
Seik Kann	0	160,000	0	1,200,000	0	450,000
Zin Yaw Chaung	0	800,000	450,000	0	0	60,000
<b>Average</b>	<b>133,333</b>	<b>523,333</b>	<b>293,333</b>	<b>1,316,667</b>	<b>8,333</b>	<b>85,000</b>

## *Agriculture*

The region has historically been a major agricultural producer in the country, being known as the country's rice bowl, accounting for 30% of the country's rice production. Crop production was reported to be comprised of 31% of the region's gross domestic product in 2013, which was followed by the fisheries sector contributing 16%. The annual rice production of the region is reported to be 6 million tonnes.

Apart from rice, black gram is the most important crop in the area and is the winter crop of the area. The community also plants vegetable which are mostly for home consumption with the excess production being sold for income. However, vegetable production plays a critical role in the income generation for those households with small land holdings. The most common vegetables are cauliflower, cucumber, water melon, pumpkin and leaf vegetables.

In Nga Yoke Kaung Town, betel harvesting was also observed (*Figure 5.28*) and farming is important for local communities in Nan Thar Pu (*Figure 5.29*).

**Figure 5.28** *Betel Nut drying in Nan Thar Pu*



**Figure 5.29** *Agriculture in Zaw Yin Gang Ward*







Livestock is an important asset and workforce for farmers, with most of the farmers owning water buffaloes, pigs and/or poultry. Small numbers of livestock were observed in Nan Thar Pu during the site visit in January 2017 and mostly chickens, pigs and cows.

The estimated monthly expenditure is shown in *Table 5.32*. This data was compiled from the 50 households surveys conducted in Nan Thar Pu village tract. The education and transportation expenditure are high as all high school students study in Nga Yoke Kaung. According to the income and expenditure ratio, only businessmen within the fishery business can support education for their children. Most of other business, such as agriculture, livelihood and labour, noted that they have debt from money lenders for their children's education.



**Table 5.32**      *Average of Surveyed Household Expenditure in Nan Thar Pu (Kyat per month)*

Village/Wards	Food	Cooking fuel	Fire Wood	Education	Diesel/petrol	Transport	Cultural/ religious	Annual maintenance of house	Loan	Telephone	Agriculture	Entertainment	Healthcare	Total Expenditure
Ale Goon	120,000	117,000	67,000	728,000	486,000	85,000	80,000	80,000	174,000	119,000	50,000	10,000	50,000	2,166,000
Gyaing Galay	125,000	111,000	5,000	210,000	165,000	50,000	20,000	30,000	0	80,000	0	3,000	0	799,000
Kyauk Phyar	117,000	226,500	40,000	526,000	460,000	238,000	38,000	120,000	50,000	180,000	170,000	70,000	143,000	2,378,500
Nan Thar Pu	110,000	90,000	47,000	483,000	409,000	85,000	80,000	2,000	20,000	105,000	34,000	0	380,000	1,845,000
Seik Kann	116,000	59,000	9,000	15,000	195,000	0	40,000	0	0	57,000	5,000	0	10,000	506,000
Zin Yaw Chaung	102,000	67,000	85,000	80,000	212,000	16,000	290,000	27,000	100,000	185,000	26,000	48,000	78,000	1,316,000
Average	115,000	20,460	42,167	340,333	321,167	79,000	91,333	43,167	57,333	121,000	47,500	21,833	110,167	1,410,460

## Fishing

The DoF at the national level controls offshore fishing activities and licenses, while inshore licenses are granted at the state level. The DoF has instituted two fishing zones which provide a restriction on fishing activities and a degree of protection to fisheries resources. Fishing Zone 1, for traditional coastal fisheries, extends from the shoreline to 10 nautical miles from the shore. Fishing Zone 2 extends from the outer limit of Fishing Zone 1 to the 200 nautical mile Exclusive Economic Zone limit. The Project is located in Fishing Zone 1.

Consultations in Nga Yoke Kaung Town and Nan Thar Pu Village Tract were conducted in January and February 2017. Information collected from fishermen is presented below.

During the consultations; fishing focus group discussions (FGDs) were held in Nga Yoke Kaung with the DoF and in Nan Thar Pu with 6 fishermen from 6 villages including Seik Kann, Zin Yaw Chaung, Kyauk Phyar, Ale Gone, Gyaing Galay and Nan Thar Pu villages. Boats in the range from 12 ft. to 50 ft. in length but all operate within 10 miles from the coastline. Most of the boats make day trips. Information collected on boats is presented in *Table 5.33* and *Table 5.34*.

**Table 5.33** *Fishing Data collected from Nga Yoke Kaung*

Type of Boats	Size	Amount of catch per vessel	Distance covered (units)	Average fishing trip (time spent)
Small	12 ft. length	10 viss	>10 miles	Early morning to 1 PM
Medium	30 ft. length	20 viss	>10 miles	Early morning to 3PM (Hilsa shad netting)
Large	36 ft. length	35 viss	>10 miles	Early morning to 3PM

*Note: 1 viss = 1.64 kg*

**Table 5.34**     *Fishing Data collected from Nan Thar Pu*

Type of Boats	Size	Carrying Capacity	Distance covered	Depth	Number of HHs	Average fishing trip (time spent)	Number of boats in village
Small	25ft. length	1,000 viss	>10 miles	100 m	100%	4AM to 1PM	15
Large	50 ft. length	5,000 viss	>10 miles	100 m	100%	4PM to 6AM	15

*Note: 1 viss = 1.64 kg*

Boats observed in the Study Area during the site visit in January, 2017 are shown in *Figure 5.30*.

**Figure 5.30**     *Boats in Study Area*



**A. Large offshore fishing boat (overserved offshore Nan Thar Pu)**



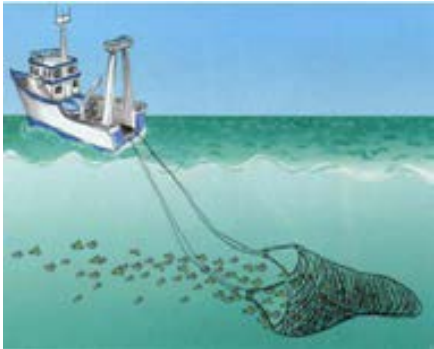

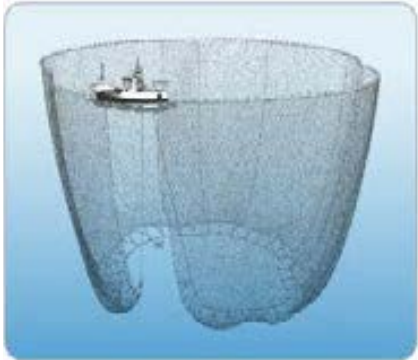
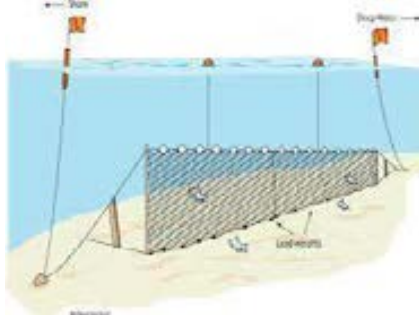
**B. Medium Fishing Boat (observed in Nga Yoke Kaung Bay)**



C. Small fishing boats in Nga Yoke Kaung Estuary (showing nets)

The communities in Nga Yoke Kaung and Nan Thar Pu use four different types of fishing gear; gill netting, beach seine, trawling and purse seine (refer to Figure 5.31).

Figure 5.31 Fishing Methods used in Area of Influence

Type	Photo
<b>Trawling</b> 	<b>Beach Seine</b> 
<b>Ocean purse seine</b> 	<b>Gill Netting</b> 

Images courtesy of Shutterstock

Primary data collected shows that the maximum fish catch is between June and August (Table 5.35 and Table 5.36). Gillnetting is undertaken year round

whereas trawling mostly only conducted in the rainy season (around June to August).

**Table 5.35 Fishing Calendar for Nga Yoke Kaung**

		Jan	Feb	Mar	Apr	Ma	Jun	July	Aug	Sep	Oct	Nov	Dec
Maximum Fish Catch													
Type of Fish catch	Prawn												
	Hilsa shad												
	Goldstripe sardinella												
	Herring/ Anchovy												
Type of nets used	Gill netting												
	Beach seine												
	Trawling												
	Purse Seine												

**Table 5.36 Fishing Calendar for Nan Thar Pu Village Tract**

		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Maximum Fish Catch													
Lowest fish catch													
Type of nets used	Purse Seine												
	Grilling netting												
	Beach Seine												
Fish Breeding Season	Mostly Prawn												
Influx from other villages													

The species caught, season, location and net size of each of the fishing net types used in the Area of Influence are provided in *Table 5.37* and *Table 5.38*.

**Table 5.37 Fishing Methods from Nga Yoke Kaung**

Fishing method	Location	Type of fish	Season	Size of boat	Dimensions of net (length, width, height)
Gill netting	Within 10 miles of coast	Hilsa shad	Whole year	Small & Big	No data
Beach seine	Within 10 miles of coast		November to April	Small & Big	No data
Trawling	Within 10 miles of coast	Largehead hairtail	July to September	Small & Big	No data
Purse Seine	Within 10 miles of coast	None targeted, catch anything	November to April	Small & Big	No data

**Table 5.38 Fishing Method in Nan Thar Pu Village Tract**

Fishing method	Location	Type of fish	Season	Size of boat	Dimensions of net (length)	Location in water column
Purse Seine	Within 10 miles of coast	None targeted, catch anything	October to March	Small & Big	750 ft (150 * 5 ft)	Bottom
Gill netting	Within 10 miles of coast	Hilsa shad	July to September	Small & Big	750 ft	Bottom
Netting	Within 10 miles of coast	None targeted, catch anything	October to February	Small & Big	750 ft	Bottom
Beach Seine	Within 10 miles of coast	None targeted, catch anything	June to August	Small & Big	750 ft	Surface



The communities in Nan Thar Pu rely on fishery business, farming, small/medium scale businesses, government positions, and motor bike taxi for their income.

- **Fishing** - Most of the fishermen in Nan Thar Pu fish in the “inshore” water i.e., within 10 miles from the coast. They use gill nets, trawls, and some dive for lobster. Line fishing from the beach is also undertaken. Fish traders earn an average of one lakh per month.
- **Agriculture** - Paddy farming is carried out in the rainy season (June to September), and groundnut farming is conducted in dry seasons (winter and summer). Approximately 50/60 bushels are produced from one acre, and “kauk gyi” rice paddy is the most commonly cultivated. The current price for 100 bushels is six to seven lakhs. Most of the paddy is harvested for local or domestic consumption and some is sold in Pathein. Groundnuts are cultivated to sell and produced approximately 35 bushels in one acre. Last year, one bushel was worth around 18,000 Kyats.
- **Small and Medium Grocery Shops** - Small and medium shops (grocery, restaurant, tea shop) are mostly located in Gyaing Galay. The goods are bought from Pathein and are transported to the area by truck in the summer and by boat and then motor trishaw during the rainy season. This means that items can be quite expensive.
- **Gardening** -Coconut trees are common in family compounds. The coconuts are picked every two to three months. There are also betel nuts tree and betel in some households. Nipa palm are also cultivated and sold for construction, primarily used for roofing of houses.
- **Motor Bike Taxi** - Some teenagers and young people earn an income from motor bikes taxiing. The cost of one motor bike is six to seven lakhs and they earn approximately 5,000 to 10,000 kyats per day.

#### **5.5.4**

#### ***Infrastructure and Utilities***

Within the Area of Influence, the main infrastructure and facilities are found in Nga Yoke Kaung Town which is around an hour drive from Nan Thar Pu Village Tract (*Table 5.39*). The nearest main hospital and high school is in Nga Yoke Kaung Town (*Figure 5.32*).

**Table 5.39**      *Distance of Village (Ward) from Nearest Facilities*

Facility	Distance from facilities)
Nursery	15 minutes (Ah Lel Kone)
High School	1 hr (Nga Yoke Kaung)
Middle School	15 mins (Ah Lel Kone)
Middle School	1 hr (Nga Yoke Kaung)
Market	1 hr (Nga Yoke Kaung)
General Hospital (16 beds)	1 hr (Nga Yoke Kaung)

**Figure 5.32**      *Facilities in Study Area, taken in January 2017*



**A.**    Hospital in Nga Yoke Kaung Town



**B.**    Basic Education High School (BEHS) in Nga Yoke Kaung Town

The majority of households in Nan Thar Pu are not connected to the national grid and get electricity from solar. Most families use firewood and charcoal in cooking.

Drinking water is provided from wells in the village. These are deep to ensure that the freshwater is not effected by the proximity to the coastline. A photo of a typical well is provided in Figure 5.33. People from Gyaing Galay need to fetch water from other parts (of the village) in summer.

**Figure 5.33**     *Well in Village*



### **5.5.5**     *Education, Health and Transportation*

There is a middle school in Nan Thar Pu Village Tract for students from kindergarten to 8<sup>th</sup> grade (*Figure 5.34*). There are seven official teachers and about 300 students of which 4 teachers are assigned to primary school classes and 3 teachers to high school classes. After finishing middle school, students go to the high school in Nga Yoke Kaung Town. The education rates of Nga Yoke Kaung from Myanmar Census data are provided in *Table 5.40*.

**Figure 5.34**     *Middle School of Nan Thar Pu Village Tract*



**Table 5.40 Education Rates for Over 25 Year Old – Census Data**

	Total	None	Primary school (grade 1 - 5)	Middle school (grade 6 - 9)	High school (grade 10 - 11)	Diploma	University/ College	Post-graduate and above	Vocational training	Other
<b>Ayeyawady</b>										
Total	3,287,665	404,442	1,796,797	549,334	243,101	3,895	158,048	5,989	2,792	123,267
Male	1,542,623	159,486	792,699	322,011	136,035	2,225	64,116	1,575	1,851	62,625
Female	1,745,042	244,956	1,004,098	227,323	107,066	1,670	93,932	4,414	941	60,642
<b>Pathein</b>										
Total	872,002	77,555	487,173	158,646	72,648	1,039	49,400	2,276	1,315	21,950
Male	410,611	27,578	217,319	91,789	40,191	583	20,366	606	869	11,310
Female	461,391	49,977	269,854	66,857	32,457	456	29,034	1,670	446	10,640
<b>Nga Yoke Kaung (Sub-Tsp)</b>										
Total	23,675	2,496	10,441	5,677	1,917	9	890	41	32	2,172
Male	11,934	958	4,891	3,258	1,132	7	442	8	20	1,218
Female	11,741	1,538	5,550	2,419	785	2	448	33	12	954



There is a small clinic in Nan Thar Pu village which has one nurse to look after all the surrounding villages (*Figure 5.35*). A government medical team also visits all villages twice per year for medical check-ups. Patients with serious disease and / or injury who need emergency care go to hospital in Nga Yoke Kaung (16 beds) or Pathein General Hospital. Travelling time to Nga Yoke Kaung is about one hour or about half a day to Pathein by car.

The diseases/illnesses that cause the most death are malaria, tuberculosis, diarrhoea and hepatitis. The birth rate is 2.5 and the early childhood death is not found in this area. Health data were collected from the Nga Yoke Kaung GAD regarding the health statistics from the local Nga Yoke Kaung Hospital. The most common diseases are as follows:

- Acute Viral Infection (23persons)
- Gastritis (17persons)
- Hypertension (3persons)
- Acute Respiratory Tract Infection (3 Persons)
- Sexually Transmitted Disease (1 Person)

The main road of Nan That Pu village is unpaved and soil based road (*Figure 5.36*). It is commonly damaged in the rainy season.

**Figure 5.35** *Rural Clinic of Nan Thar Pu Village Tract*



**Figure 5.36**     *Main Entrance Road of Nan Thar Pu Village Tract*



#### **5.5.6**     *Social Organizations and Their Activities*

Within the administration of the Village Tract, there are administrators, general administration clerks, elders, and around 100 household leaders. The social groups in Nan Thar Pu are shown in *Table 5.41*.

**Table 5.41**     *Social Groups in Nan Thar Pu*

Organization Name		Numbers of Member	Activities
The Elder		5	Organising social occasions and coordinating with the village tract administrators
Agriculture Land and Other Land Reuse and Committee		9	Managing the cases/disputes related to the agriculture and other land
Mother and Child, Women Affair Group		60	Social, health and women affairs
Fishermen (Kanchay Arman)	Network	50	Activities for fishermen
Save the Children			Raising health awareness

#### **5.5.7**     *Tourism*

The two main areas are Ngwe Saung Beach, located approximately 140 km north and Goyangyi Island around 5-10 km west and southwest of the Project. Ngwe Saung contains a mix of high end luxury resort accommodation, mid-range hotels and budget hostels. The peak tourism period is between October and May due to the monsoon period (Pers comm, U Soe Win, Staff



Officer, Dept. of Tourism). There are smaller guesthouses neighbouring the Project Area.

Information on tourism was collected from social surveys conducted in Nga Yoke Kaung in January and February 2017. The following presents a summary of the tourism data collected. There are about 27 guesthouses (most of them are unregistered) in Nga Yoke Kaung.

The Project Area is located on the beach facing seawards from the peninsula which is made up of three parts; Kywe Gyaing, Gyaing Lay and Palin Gyaing. The Project Area is located in Palin Gyaing. There are two guesthouses in Palin Gyaing (see example in *Figure 5.37*). Two of these (The Lodge and Htee Htar) are within 1 km of the Project Site. There are 2-3 bungalows in each guesthouse – one bungalow takes two people. There are also 1-2 home stays which can take 5 to 7 people.

**Figure 5.37**     *Guesthouse near Project Area*



Most of the tourists are local people and some guesthouses do not let foreigners stay for security reasons.

The owner of Htee Htar guesthouse (closest to the Project Area and within 1 km) said that he knew about the Project and he thinks that there will no impacts to his guesthouse. His guesthouse allows foreigners to stay although they rarely do. Last year there were only 6 foreigners (in one group) who stayed at this guesthouse. However, foreigners do take day trips to the beach to swim at Palin Gyaing beach.

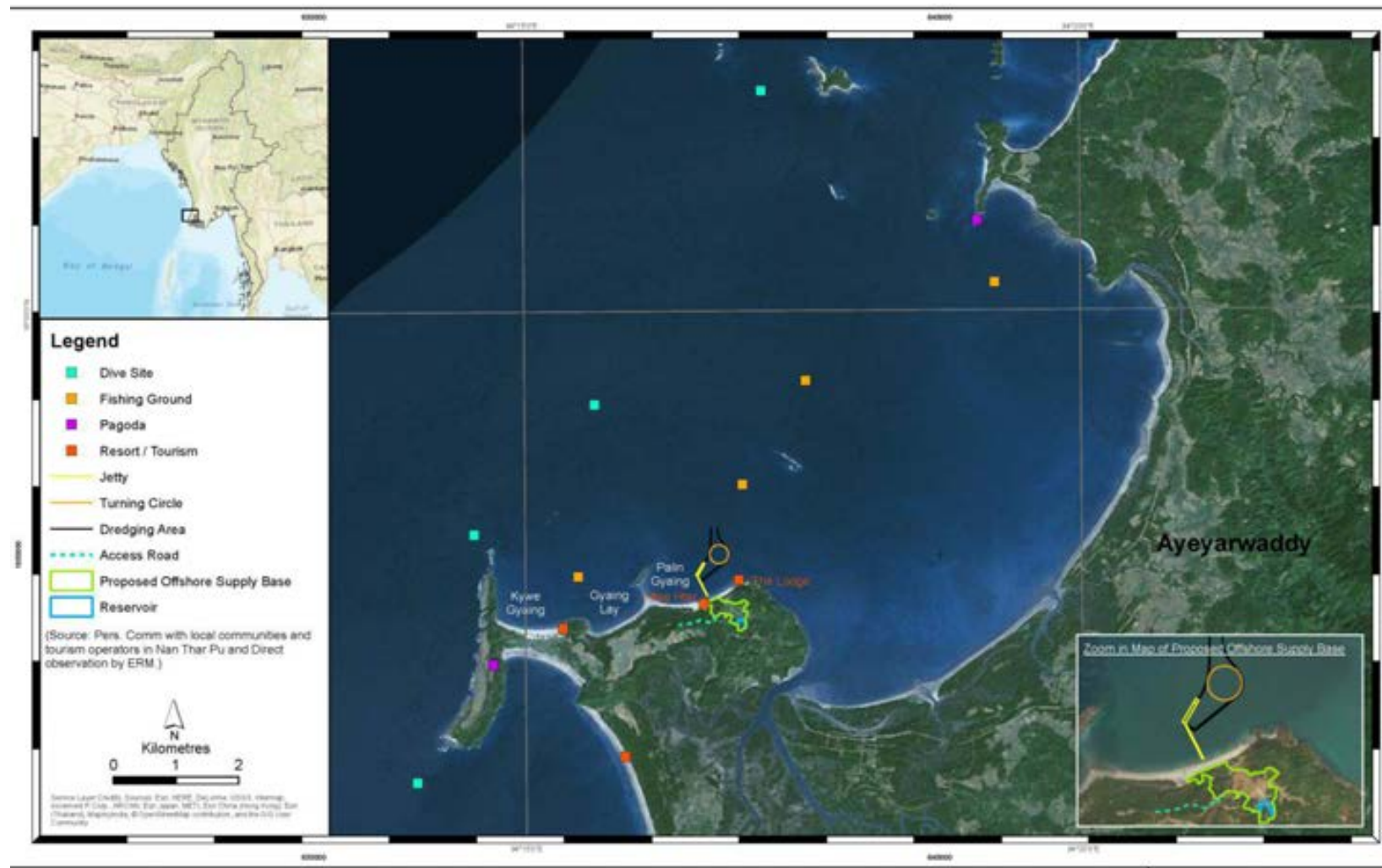
The busiest time is the water festival period in April. People set up the stalls on the beach during the water festival. The high season is from November to January and March to May. The area is more popular with tourists at weekends and on public holidays.

There are over 200 people per day at high season in the area; some stay at the guesthouses and some return home.

Other tourist activities include diving and snorkelling near Late (Turtle) Gyaing, Goyangyi Island and Zaba Htar Island which is close to Zaba Htar guesthouse on Goyangyi Island is one of the most popular excursions for tourists.

Recreational fishing trips also run out of Ngwe Saung and Goyangyi Island. The locations of the dive sites and fishing grounds observed during the site visit and provided by some tourism operators consulted are shown in *Figure 5.38*.

Figure 5.38 Dive Sites and Fishing Areas in Study Area



### 5.5.8 *Shipping Lanes*

From available ship frequency tracking data, the Bay of Bengal has relatively limited shipping activity with lightly used shipping lanes from ports in the north (Kolkata, Chittagong etc.) heading to the southern tip of India and the Straits of Malacca in the south (Marine Traffic Website). This shipping route is offshore and not located in the Area of Influence for the Project activities.

## 5.6 *CULTURAL CHARACTERISTICS*

There is one known culture heritage site within the Project Area; a pagoda in Goyangi Island located 3.5 km from the Project Area. This pagoda is located on the top of a steep hill and is shown in *Figure 5.39*. The pagoda is around 15 minutes' drive from the Project Area.

*Figure 5.39 Pagoda on Goyangyi Island*



## 5.7 *VISUAL CHARACTERISTICS*

The Project Area is located on the peninsula to the south of Nga Yoke Kaung bay area. This area is a sandy beach with small coconut grove and on land is modified farm habitat. The Project could be visible from the surrounding local communities and visual impacts are considered in this EIA Study.

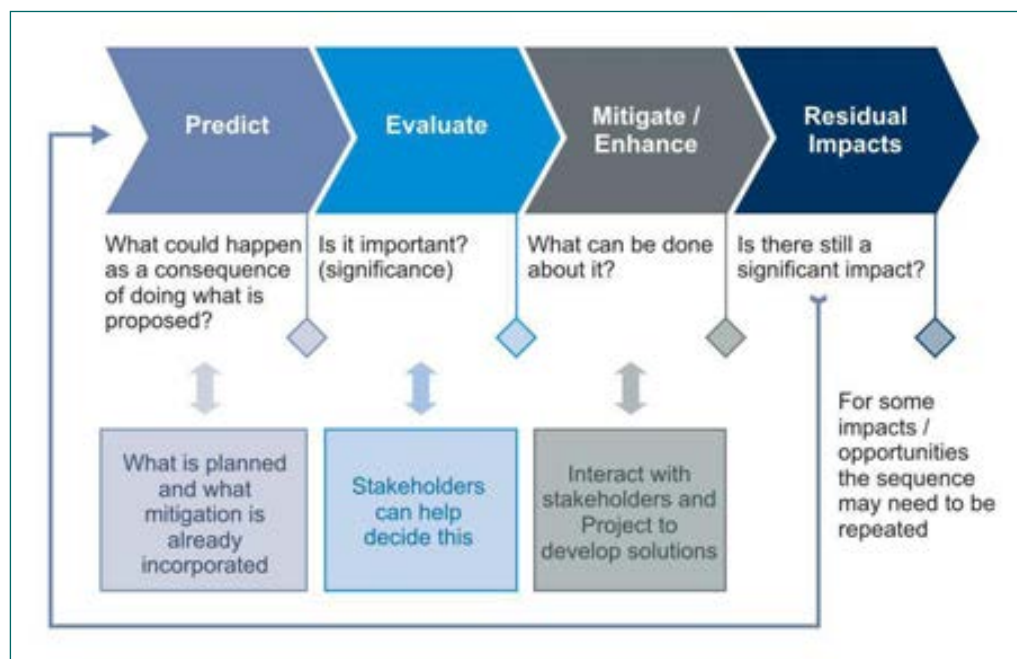
## 6.1

## IMPACT ASSESSMENT METHODOLOGY AND APPROACH

The principal impact assessment steps are summarized in *Figure 6.1* and comprise:

- Impact prediction: to determine what could potentially happen to resources/receptors as a consequence of the Project and its associated activities.
- Impact evaluation: to evaluate the significance of the predicted impacts by considering their magnitude or likelihood of occurrence (for unplanned events), and the sensitivity, value and/or importance of the affected resource/receptor.
- Mitigation and enhancement: to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts.
- Residual impact evaluation: to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.

*Figure 6.1* Impact Assessment Process



## 6.1.1

*Prediction of Impacts*

Prediction of impacts is an objective exercise to determine what could potentially happen to the sensitive receptors/resources as a consequence of the Project activities. From these potential interactions, the potential impacts to the various resources/receptors are identified and are elaborated to the extent possible. The assessment process typically utilises a wide range of



prediction methods including quantitative, semi-quantitative and qualitative techniques.

### 6.1.2 *Evaluation of Impacts*

Once the prediction of impacts is complete, each impact is described in terms of its relevant characteristics (e.g., type, scale, duration, frequency, extent). The terminology used to describe impact characteristics is shown in *Table 6.1*.

**Table 6.1** *Impact Characteristic Terminology*

Characteristic	Definition	Designations
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect).	Direct, Indirect, Induced
Extent	The “reach” of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc.).	Local, Regional, International
Duration	The time period over which a resource / receptor is affected.	Temporary, Short-term, Long-term, Permanent
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.).	[no fixed designations; intended to be a numerical value]
Frequency	A measure of the constancy or periodicity of the impact.	[no fixed designations; intended to be a numerical value]

The definitions for the *type* designations are shown in *Table 6.2* and definitions for the other designations are resource/receptor-specific and are discussed in *Section 6.4*.

**Table 6.2** *Impact Type Definitions*

Designations (Type, Extent, Duration)	Definition
<b>Type</b>	
Direct	Impacts that result from a direct interaction between the Project and a resource/receptor (e.g. sound from a seismic source such as a VSP leading to behavioural changes in marine fauna).
Indirect	Impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g. reduction in water quality from waste discharges potentially leading to effects in marine fauna).
Induced	Impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).
<b>Extent</b>	
Local	Impacts are experienced at a localised extent and limited to the vicinity of the Project. These impacts will not be felt outside of the Project Area.



Designations (Type, Extent, Duration)	Definition
Regional	Impacts are likely to be experienced within the wider region i.e. Ayeyarwady Region.
International	Impacts are may potentially extend across International boundaries.
<b>Duration</b>	
Temporary	Impacts that have effects that will occur for less than 1 month.
Short-term	Impacts that have effects that will occur for 1-12 months.
Long-term	Impacts that have effects that will occur for over a year 5 years.
Permanent	Permanent, irreversible impact.

The above characteristics and definitions apply to planned and unplanned events. An additional characteristic that pertains only to unplanned events is *likelihood* which is designated using a qualitative scale, as described in *Table 6.3*.

**Table 6.3** *Definitions for Likelihood Designations*

Likelihood	Definition
Unlikely	The event is unlikely but may occur at some time during normal operating conditions.
Possible	The event is likely to occur at some time during normal operating conditions.
Likely	The event will occur during normal operating conditions (i.e., it is essentially inevitable).

### 6.1.3 *Impact Magnitude, Receptor/Resource Sensitivity and Impact Significance*

The next step is to assign each impact a 'magnitude' which is a function of a combination (depending on the resource/receptor in question) of the following impact characteristics: Extent; Duration; Scale; and Frequency.

Magnitude essentially describes the intensity of the change that is predicted to occur in the resource/receptor as a result of the impact. The magnitude designations are: Positive; Negligible; Small; Medium; and Large.

In the case of a *positive* impact, no magnitude designation (aside from 'positive') is assigned.

The definitions for these designations vary on a resource/ receptor basis. The impact magnitude for species, habitats and water quality impacts is provided in *Table 6.4*, *Table 6.5*, and *Table 6.6* respectively. The impact magnitude criteria for the social impact assessment are provided in *Table 6.7*.

**Table 6.4**      ***Impact Magnitude for Marine and Terrestrial Species***

Extent / Duration / Scale / Frequency	
Large	May affect an entire population or species in sufficient magnitude to cause a decline in abundance and/ or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) would not return that population or species, or any population or species dependent upon it, to its former level within several generations.
Medium	May affect a portion of a population and may bring about a change in abundance and/ or distribution over one or more generations, but does not threaten the integrity of that population or any population dependent on it.
Small	May affect specific group of localised individuals within a population over a short time period (one generation or less), but does not affect other trophic levels or the population itself.
Negligible	Immeasurable, undetectable or within the range of normal natural variation.

**Table 6.5**      ***Impact Magnitude for Marine and Terrestrial Habitats***

Extent / Duration / Scale / Frequency	
Large	May affect the integrity of an area or region, by substantially changing, in the long term, its ecological features, structures and functions, across its whole area, that enable it to sustain the habitat, complex of habitats and/or population levels of species that makes it important.
Medium	May affect some, if not all, of the area's ecological features, structures and functions in the short or medium term. The area or region may be able to recover through natural regeneration and restoration.
Small	May cause some minor impacts of limited extent, or to some elements of the area, are evident but easy to recover through natural regeneration.
Negligible	Immeasurable, undetectable or within the range of normal natural variation.

**Table 6.6**      ***Impact Magnitude for Water Quality***

Extent / Duration / Scale / Frequency	
Large	Change in water quality over a large area that lasts over the course of several months with quality likely to cause secondary impacts on marine ecology; and/or Routine exceedance of benchmark effluent discharge limits.
Medium	Temporary or localised change in water quality with water quality returning to background levels thereafter and/or occasional exceedance of benchmark effluent discharge limits.
Small	Slight change in water quality expected over a limited area with water quality returning to background levels within a few metres and/or discharges are well within benchmark effluent discharge limits.
Negligible	Immeasurable, undetectable or within the range of normal natural variation.

**Table 6.7**      ***Impact Magnitude for Local Communities and Livelihoods***

Extent / Duration / Scale / Frequency	
Large	Change dominates over baseline conditions. Affects the majority of the area or population in the area of influence and/or persists over many years. The impact may be experienced over a regional or national area.

Extent / Duration / Scale / Frequency	
Medium	Clearly evident difference from baseline conditions. Tendency is that impact affects a substantial area or number of people and/or is of medium duration. Frequency may be occasional and impact may potentially be regional in scale.
Small	Perceptible difference from baseline conditions. Tendency is that impact is local, rare and affects a small proportion of receptors and is of a short duration.
Negligible	Change remains within the range commonly experienced within the household or community.

The other principal impact evaluation step is definition of the sensitivity (including vulnerability and importance) of the impacted resource/receptor. Other factors may also be considered, such as legal protection, government policy, stakeholder views and economic value.

As in the case of magnitude, the sensitivity designations themselves are universally consistent, however, the definitions for these designations vary on a resource/receptor basis. The universal sensitivity/ vulnerability/ importance designations are: Low; Medium; and High.

The receptor sensitivities for species, habitats and water quality are provided in *Table 6.8*, *Table 6.9*, and *Table 6.10*, respectively. The receptor sensitivity criteria for the social assessment are provided in *Table 6.11*.

**Table 6.8** *Receptor Sensitivity for Marine and Terrestrial Habitat*

Category	Designation / Importance / Vulnerability
High	A habitat that has designated conservation status at an international scale (e.g. IUCN). Areas of particular biodiversity importance that may support populations of restricted range, endemic or endangered species, or is in itself unique or threatened.
Medium	A habitat that has designated conservation status at a national or regional scale. Areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.
Low	A habitat not protected by law. Areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition.

**Table 6.9** *Receptor Sensitivity for Marine and Terrestrial Species*

Category	Designation / Importance / Vulnerability
High	A species population that has designated conservation status at an international scale (e.g. IUCN). A species that is globally rare. A keystone species fundamental to the functioning of the ecosystem.
Medium	A species population that has designated conservation status at a national or regional scale. A species common globally but rare locally. Important to ecosystem functions or under threat or population in decline.
Low	A species not protected by law. Not critical to other ecosystem functions (e.g. as prey to other species or as predator to potential pest species) or common / abundant locally.

**Table 6.10 Receptor Sensitivity for Water Quality**

Category	Designation / Importance / Vulnerability
High	Existing water quality is already under stress and/ or the ecological resources it supports are very sensitive to change (secondary ecological or health impacts are likely).
Medium	Existing water quality already shows some signs of stress and/ or supports ecological resources that could be sensitive to change in water quality.
Low	Existing water quality is good and the ecological resources that it supports are not sensitive to a change in water quality.

**Table 6.11 Receptor Sensitivity for Local Communities and Livelihoods**

Category	
High	Profound or multiple levels of vulnerability that undermine the ability to adapt to changes brought by the Project.
Medium	Some but few areas of vulnerability; but still retaining an ability to at least in part adapt to change brought by the Project.
Low	Minimal vulnerability; consequently with a high ability to adapt to changes brought by the Project and opportunities associated with it.

Once impact magnitude and resource/receptor sensitivity have been characterised, the significance can be assigned for each impact. Impact significance is designated using the matrix shown in Table 6.12.

**Table 6.12 Impact Significances**

		Resource/Receptor Sensitivity		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The matrix applies universally to all resources/receptors as well as all impacts, as the resource/receptor-specific considerations are factored into the assignment of magnitude and sensitivity designations that enter into the matrix. Box 6.1 provides context for what the impact significance ratings signify.

**Box 6.1 Context of Impact Significances**

An impact of **negligible** significance is one where a resource/receptor will essentially not be affected or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.

An impact of **minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity. In either case, the magnitude should be well within applicable standards.

An impact of **moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. These impacts are a priority for mitigation in order to avoid or reduce the significance of the impact. This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly sensitive resource/receptors. An aim of impact assessment is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted. An example might be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

It is important to note that impact prediction and evaluation take into account any embedded controls (i.e., physical or procedural controls that are already planned as part of the Project design, regardless of the results of the impact assessment process). An example of an embedded control is a standard acoustic enclosure that is designed to be installed around a piece of major equipment. This avoids the situation where an impact is assigned a magnitude based on a hypothetical version of the Project that would not happen in a real world situation.

#### 6.1.4 *Identification of Mitigation and Enhancement Measures*

Once the significance of an impact has been characterised, the next step is to evaluate what control measures can be applied to eliminate, control or mitigate the risk and to determine if the risk level is acceptable.

The assessment process is intended to identify impacts and benefits associated with project activities and ways of dealing with them during the planning and design stage of the project. Planned mitigation measures will be described, and additional measures or controls will be recommended where impacts are still considered to be unacceptable. These mitigation measures have been utilised to develop the EMP.

Many mitigation or control measures will require a degree of management to ensure their success in reducing potential impacts to the residual level that is expected through the EIA process. Most of these residual outcomes are likely to require a degree of monitoring through project implementation to ensure that the mitigation management process is effective. It is these management and monitoring efforts that report to the EMP as part of the EIA process.

#### 6.1.5 *Residual Impact Evaluation*

Once mitigation and enhancement measures are declared, the residual impact significance is identified (i.e. a repeat of the impact assessment steps discussed above). In some cases, it may only be possible to reduce the impact to a

certain degree such as where an impact could not be completely avoided. All residual significant impacts are described in this report with commentary on why further mitigation is not feasible.

The degree of significance attributed to residual impacts is related to the weight that should be given to them in reaching a decision on the Project:

- Residual impacts of **Major** significance are considered to warrant substantial weight in the Project decision making process. Conditions should be imposed to ensure adverse impacts are strictly controlled and monitored;
- Residual impacts of **Moderate** significance are considered to be of reducing importance to decision-making, however, still warrant careful attention to ensure best available techniques are used to keep adverse impacts to as low as is technically and financially feasible;
- Residual impacts of **Minor** significance should be brought to the attention of the decision-maker but are identified as warranting little if any weight in the decision; and
- Not significant residual impacts are those that, after assessment, are found not to be significant to the decision making about the Project.

#### 6.1.6 *Management and Monitoring*

The final stage in the impact assessment process is defining the management and monitoring measures that are needed to identify whether: a) impacts or their associated Project components remain in conformance with applicable standards; and b) mitigation measures are effectively addressing.

A summary of all actions which the Project Proponent has committed to are included in the separate EMP. The EMP includes mitigation measures, management and monitoring activities. Based on the monitoring results, the EMP will review and revise with the approval and acknowledgement of ECD.

### 6.2 *IMPACT IDENTIFICATION*

The proposed Project activities are well practiced and understood, having been used widely in Myanmar and internationally. Risks were identified for both planned (routine and non-routine) and unplanned (accidents/incidents) activities. Potential impacts were then determined based on the physical activity or hazard type e.g. light, noise etc.

Table 6.13 provides a summary matrix of the scoping exercise. The potential impact sources are listed down the first vertical column of the 'matrix' and the receptors listed across the horizontal axis. The matrix identifies the key aspects of the Project that have the potential to interact with the surrounding environmental and social receptors and cause potential impacts, with no mitigation in place.



Entries in the matrix cells are then coloured to indicate whether:

- An interaction is not reasonably expected (white);
- An interaction is reasonably possible but none of the resulting impacts are likely to lead to significant effects (grey); or
- The interaction is reasonably possible and at least one of the resulting impacts is likely to lead to an effect that is significant (black).

All potential interactions, regardless of probability of occurrence, are considered at this stage.

**Table 6.13**      *Potential Interactions and Significance of Impacts to Receptors/Receivers from the Project*

		Physical Environment									Biological Environment					Human Environment								
Project Activities	Ambient Air Quality and Climate Change	Ambient Noise & Vibration	Groundwater and Surface Water Quality	Hydrology & Hydrogeology	Soil and Topography	Landscape and Visual Character	Use of Natural Resources	Underwater Noise	Aquatic Water Quality	Aquatic Sediments and coastal process	Terrestrial Flora	Terrestrial Fauna	Aquatic Habitat	Aquatic Flora & Fauna	Protected Areas	Community Health and Safety	Indigenous People	Demographic Pattern (including livelihood)	Economy and Livelihoods	Infrastructure and Services (Inc.	Occupational Health and Safety	Fisheries	Tourism	Cultural Heritage
Construction Phase																								
Labour, equipment and services supply																								
Site preparation																								
Jetty construction																								
Transportation of equipment, supplies and workforce																								
Mobile power generation/ use of equipment																								
Waste disposal																								
Sewage and wastewater discharge																								
Accidental Events																								

Physical Environment		Biological Environment					Human Environment																	
Project Activities	Ambient Air Quality and Climate Change	Ambient Noise & Vibration	Groundwater and Surface Water Quality	Hydrology & Hydrogeology	Soil and Topography	Landscape and Visual Character	Use of Natural Resources	Underwater Noise	Aquatic Water Quality	Aquatic Sediments and coastal process	Terrestrial Flora	Terrestrial Fauna	Aquatic Habitat	Aquatic Flora & Fauna	Protected Areas	Community Health and Safety	Indigenous People	Demographic Pattern (including livelihood)	Economy and Livelihoods	Infrastructure and Services (Inc.	Occupational Health and Safety	Fisheries	Tourism	Cultural Heritage
Operational Phase																								
Maintenance of the facilities																								
Labour, equipment and services supply																								
Transportation of equipment, materials, waste and workforce																								
Mobile power generation / use of equipment																								
Waste disposal																								
Sewage and wastewater discharge																								
Water intake																								
Accidental Events																								

Potential interactions that were deemed not to result in a potentially significant impact (grey in the matrix) have been scoped out with justification and will not be considered in more detail in the EIA Study. The rationale for scoping out impacts associated with the construction and operation of the Project is provided in Table 6.14.

**Table 6.14**      *Scoped Out Impacts and Rationale*

Impact	Rationale for scoping out of assessment
<b>Environmental Impacts</b>	
	<b>Operation Phase</b>
Air Quality and Fugitive Emissions on Local Communities and Ambient Air Quality	- During operation, there will be limited emissions given that there will be limited emission sources on site such as some vehicles and plant (e.g. cranes, ship propulsion and auxiliary engines and boilers) associated with the operations of the OSB.
Noise impacts to Local Communities and Marine Fauna	<b>Operation Phase</b> - There will be no piling during operation so impacts from underwater noise have been scoped out of the assessment.
Impacts to Water Quality	<b>Construction and Operation Phase</b> - Soil may be lost from the site to the surrounding environment during site clearance and topsoil removal as well as sand filling works. However the scope for impacts to ground or surface water in the region is low as the groundwater is provided from wells located away from the site.
Impacts from helicopter use	<b>Operation Phase</b> - A helipad will be constructed for emergency use only. Given that this will not be in regular use and will only be used for emergency MEDEVAC requirements, the impacts are not expected to be significant.
<b>Social Impacts</b>	
Impacts on cultural heritage due to accidental events	<b>Construction and Operation Phase</b> - Within the proposed site for the Project, no cultural heritage sites were identified. The closest cultural heritage site is a Pagoda located at least 3.5 km from the Project Area. Due to the separation from the Project Area, impact to the monastery is unlikely to be potentially significant.

### 6.3 KEY POTENTIAL IMPACTS

This EIA Report is based on a conceptual design provided by M&AOSB at the time of writing from the PRE-FEED documentation. This EIA Report has been prepared conservatively to ensure the impacts assessment covers all potential scenarios. During operation and construction, the actual impact could be less significant than that presented and assessed in this EIA Report. M&AOSB will notify ECD of the final layout prior to construction as well as a statement on whether or not these changes affect the findings or commitments of the EIA / EMP.

There have been interactions between the resources/receptors and Project activities that have been identified as likely to lead to significant impacts which should be further investigated during the EIA. Those interactions

which have been identified as unlikely to result in significant impacts have been scoped out and do not require further assessment in the EIA. The scoping has identified the following potentially significant impacts (scoped in):

- Potential Impact on Ambient Air Quality and Associated Impacts to Local Communities;
- Potential Impacts on Ambient Noise Levels and Associated Impacts to Local Communities;
- Potential Impacts on Landscape and Visual;
- Potential Impacts on Marine Water Quality;
- Potential Impacts on Marine Coastal Processes;
- Potential Impacts on Marine Habitats from Sedimentation and Habitat Loss;
- Potential Impacts on Marine Turtles;
- Potential Impacts on Marine Fauna from Underwater Noise Generation;
- Potential Impacts on Terrestrial Flora and Fauna (including Use of Natural Resources)
- Potential Impacts on Community Health and Safety;
- Potential Impacts on Livelihoods and Economy (including Fisheries and Farming);
- Potential Impacts on Occupational Health and Safety
- Potential Impacts to Local Tourism;
- Potential Impacts from Waste Discharge and Disposal; and
- Potential Impacts from Accidental Events.

The impact assessment for these key impacts is provided in the following sections.

*Potential Impact on Ambient Air Quality and Local Communities**Construction Phase*Source of Impacts

Construction activities can result in emissions of dust and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) to air. Any dust generated will remain airborne and can travel considerable distances from the source (Desert Research Institute, 2010). If not managed accordingly, fugitive dust has the potential to cause significant impacts on any nearby sensitive receptors (such as Zin Yaw Chaung ward which is located within 500 m of the Project). In terms of the effect of local meteorology, the following considerations are important:

- Precipitation at greater than 0.2 mm/hour will effectively attenuate dust (UK Office of the Deputy Prime Minister, 2005); and
- The Project Site may experience prolonged periods of drought during the dry season, which can considerably increase the potential for dust and particulate emissions.

Within the Area of Influence, there are a number of receptors including the six wards in Nan Thar Pu. The closest of which, Zin Yaw Chaung, is within 500 m of the Project Site.

The construction activities could have potential direct and negative impact on human health as well as cause significant nuisance issues. It is likely that potential impacts will arise continuously during the construction phase of the Project. Health impacts from fugitive dust, PM<sub>10</sub> and PM<sub>2.5</sub> include:

- Effects on breathing and respiratory systems; and
- Decreased lung function and symptomatic effects, including acute bronchitis, particularly in children and asthmatics.

Nuisance issues from fugitive dust are typically related to soiling of surfaces and obscuration of visibility. These can be damaging to ones quality of life if not managed at the source of the emission.

Existing / In Place Controls

The controls that will be in place for the Project will include the following actions:

- Site hoarding along the Project Area boundary will be higher than the Project activities which may generate dust and fugitive emissions.
- Control of the height of unloading of fill materials during filling as far as possible. Where possible, this will be below the height of the hoarding around the Project Area boundary.



- Total enclosure of any skip hoist for material transport with impervious sheeting.
- Provision of material handling sources such as conveyors and bins with similar measures that also have control equipment such as covers or water sprays.
- Implementation of a regular and rigorous watering and sprinkling regime in particular during the dry season, for example, in the morning and in the afternoon, watering in area which has a lot of dust.
- Provision of a wheel washing facility at the exit of the Project Area to reduce the likelihood of dusty materials being deposited beyond the Project Area boundary.
- Regular maintenance of all diesel-powered equipment to reduce emissions of NO<sub>x</sub> and SO<sub>2</sub>.
- Switching off of machinery and equipment when it is not in operation.
- Application of dust suppression methods.
- Use of low sulphur fuels in heavy good vehicles and diesel powered equipment in collaboration with good management practices for construction phase.
- Use of alternative fuels and fuel mixes where possible.

#### Significance of Impact

With the implementation of the abovementioned industry practice mitigation measures, the magnitude of the impact is considered to be small and short-term and of **minor** magnitude.

The sensitivity for human health within the general population is considered as **medium** as there are households living within 500 m of the Project Area. The overall impact significance during the construction is considered **minor** (refer to *Table 6.15*).

**Table 6.15** *Impacts on Ambient Air Quality and Local Communities from Air Emissions – Construction Phase*

Impact	Dust and particulate matter (PM <sub>10</sub> and PM <sub>2.5</sub> ) to air from construction activities.				
Impact Nature	Negative		Positive		Neutral
	The impact will have a <b>negative</b> impact on human health and cause nuisance.				
Impact Type	Direct		Indirect		Induced
	The project will cause a direct impact to air quality.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Impacts would arise throughout the construction period only and are therefore considered to be <b>short-term</b> .				
Impact Extent	Local		Regional		International
	Impacts on human health within the general population are expected to be local.				
Impact Scale	The fugitive dust impacts are expected to be limited, localized (within 500m from the worksite boundary) and short-term (i.e., throughout the construction period).				
Frequency	The impact is expected to occur on a <b>daily</b> basis during the construction phases and be <b>continuous</b> during working day.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Health and nuisance issues associated with emissions of PM <sub>10</sub> , PM <sub>2.5</sub> and dust from vehicle movements on unpaved roads are <b>small</b> .				
Resource/ Receptor Sensitivity	Low		Medium		High
	When considering impacts to human health due to inhalation of airborne pollutants, all sensitive human receivers are defined as <b>medium</b> sensitivity. This represents general populations and areas of habitation.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Minor impacts at worst from emissions of PM <sub>10</sub> , PM <sub>2.5</sub> and dust from vehicle movements on unpaved roads and from construction activities with the implementation of appropriate mitigation and management techniques.				

#### Additional Mitigation Measures

As the significance of impacts is considered minor with the exiting control measures, additional measures are not considered necessary. However, in order to confirm that dust suppression measures are working, it is recommended to undertaken monitoring near the access road during construction and operation. Monitoring is discussed in more detail in *Section 8.5*.

#### Residual Impact Significance

With the implementation of existing control measures, it is expected that the impact significance would be **minor**.

### *Operational Phase*

Air quality impacts during the operation of the Project are expected to be limited to cranes and vehicles using the OSB. As such, emissions will not be significant and have been scoped out of the impact assessment (see *Table 6.15*).

#### **6.4.2 Potential Impact on Ambient Noise**

##### *Construction Phase*

##### Source of Impact

Noise will be generated by the plant and machinery used on site to construct the Project. This will include generator, and cranes, etc. Noise will also be generated by vehicles transporting the materials and workforce to and from the Project Area. Noise generated during the construction phase may lead to nuisance to nearby local communities such as Zin Yaw Chaung which is located within 500 m of the Project Area.

A helipad will be constructed for emergency use only. Given that this will not be in regular use and will only be used for emergency Medivac requirements, the impacts are not expected to be significant.

##### Existing / In Place Controls

Existing or in-place controls for noise impacts will include the following:

- Only well-maintained equipment will be operated on-site.
- Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components will be conducted.
- Machines and construction plant items (e.g. trucks) that may be in intermittent use will be shut down or throttled down between work periods.
- The number of equipment operating simultaneously will be reduced as far as practicable.
- Equipment known to emit noise strongly in one direction will be orientated so that the noise is directed away from nearby sensitive receptors as far as practicable.
- Noise impacts from activities will be properly reduced by shielded by implementing control measures (e.g. erecting temporary noise barriers and deflectors) whenever applicable.
- Material stockpiles and other structures will be utilised, where practicable, to screen noise from on-site construction activities.

## Significance of Impact

Construction noise impact is considered to be of **minor** significance at the nearest sensitive noise receptor. A construction noise impact assessment summary is given in *Table 6.16*.

**Table 6.16** *Ambient Noise Impact Assessment – Construction Phase*

Impact	Noise impact from the construction works during construction phase.				
Impact Nature	Negative		Positive		Neutral
	Noise impact from the construction activities is <b>negative</b> .				
Impact Type	Direct		Indirect		Induced
	Noise impact from the construction activities is <b>direct</b> .				
Impact Duration	Temporary	Short-term	Long-term		Permanent
	Noise impact from the construction activities is <b>temporary</b> .				
Impact Extent	Local		Regional		International
	Noise impact from the construction equipment and activities is <b>local</b> .				
Impact Scale	Impacts are expected to occur within 500 m of the Project.				
Frequency	Throughout the construction period.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the noise impact is <b>small</b> as it will be localised to the vicinity of the Project Site.				
Receptor Sensitivity	Low		Medium		High
	The sensitivity of the nearby receptors (residents in Zin Yaw Chaung) is considered as <b>medium</b> .				
Impact Significance	Negligible	Minor	Moderate		Major
	As the impact magnitude is small and the receptor sensitivity is medium, the impact significance is considered as <b>minor</b> .				

## Additional Mitigation /Measures

As the significance of impacts is considered minor with existing control measures, additional measures are not considered necessary. However, in order to confirm that noise is within the NEQ guidelines limits, it is recommended to undertake monitoring in Zin Yaw Chaung village (the closest to the Project Area) during construction. Monitoring is discussed in more detail in *Section 8.5*.

## Residual Impact Significance

The residual construction noise impact is considered to be of **minor** significance at the nearest receptor.

## *Operational Phase*

## Source of Impact

Noise impacts during the operation of the Project are expected to be limited to cranes and other equipment using the OSB.

Vehicles will be utilised during operation. Currently, estimated numbers are not known but over the 5 year period, vehicle usage could be up to 20 trucks per day. However, for the first few years of operation, this amount is likely to be a lot less. Noise from vehicle use of the roads would impact nearby communities.

#### Existing / In Place Controls

Existing or in-place controls for noise impacts will be the same as those during the construction phase.

#### Significance of Impact

Operational noise impact is considered to be of **minor** significance at the nearest sensitive noise receptor. A construction noise impact assessment summary is given in Table 6.17.

**Table 6.17** *Ambient Noise Impact Assessment – Operational Phase*

Impact	Noise impact from the construction works during operational phase.				
Impact Nature	Negative		Positive		Neutral
	Noise impact from the construction activities is <b>negative</b> .				
Impact Type	Direct		Indirect		Induced
	Noise impact from the construction activities is <b>direct</b> .				
Impact Duration	Temporary	Short-term		Long-term	Permanent
	Noise impact from the construction activities is <b>temporary</b> .				
Impact Extent	Local		Regional		International
	Noise impact from the construction equipment and activities is <b>local</b> .				
Impact Scale	Impacts are expected to occur within 500 m of the Project.				
Frequency	Throughout the construction period.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the noise impact is <b>small</b> as it will be localised to the vicinity of the Project Site.				
Receptor Sensitivity	Low		Medium		High
	The sensitivity of the nearby receptors (residents in Zin Yaw Chaung) is considered as <b>medium</b> .				
Impact Significance	Negligible	Minor		Moderate	Major
	As the impact magnitude is small and the receptor sensitivity is medium, the impact significance is considered as <b>minor</b> .				

#### Additional Mitigation / Measures

As the significance of impacts is considered minor with existing control measures, additional measures are not considered necessary.

## Residual Impact Significance

The residual construction noise impact is considered to be of **minor** significance at the nearest receptor.

### 6.4.3 *Potential Impacts on Landscape and Visual*

#### *Construction Phase*

During construction, the impacts on visual and landscape will be from the use of vessels and vehicles to construct the site. The impacts will be similar to but less than those during the Operational Phase which is discussed in detail below.

#### *Operational Phase*

#### Source of Impact

The Project Area will be located on the peninsula to the south of Nga Yoke Kaung bay area. This area is a sandy beach with small coconut grove immediately behind the beach and onshore the Project is constructed on modified farm habitat. The OSB could lead to negative impacts on the landscape for local communities.

#### Existing / In Place Controls

There are no existing controls planned to be in place.

#### Significance of Impact

The Project Site is surrounded by forested land and farmland. The jetty and onshore base will not be visible from the other side of the peninsula (i.e. it will not be visible from Nga Yoke Kaung Town) given the elevation of land in between. The OSB itself is flat and only slightly raised off of the ground. As such, the impact on the landscape will be of **small** magnitude. The receptors, such as human receptors, are of **high** sensitivity as they live within 500 m of the Project and as such, the OSB will be visible to them without any mitigation measures. As such, the impact will be of **moderate** significance (Table 6.18).

**Table 6.18** *Impacts on Landscape and Visual – Operational Phase*

Impact	Visual impact of the OSB on neighbouring communities and landscape features.		
Impact Nature	Negative	Positive	Neutral
	The impact will have a <b>negative</b> impact on the local landscape		
Impact Type	Direct	Indirect	Induced
	The project will cause a direct impact to the landscape		
Impact Duration	Temporary	Short-term	Long-term
	Impacts would be permanent		
Impact Extent	Local	Regional	International



	Impacts on the landscape are localised to a few kilometres from the Project Site.				
Impact Scale	The impacts are expected to be permanent but localized.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The impacts will be blocked by the elevated land and forest surrounding the Project. As such, the impact magnitude will be small.				
Resource/ Receptor Sensitivity	Low		Medium		High
	When considering impacts to landscape, local communities are defined as <b>high</b> sensitivity as they are within 500 m of the Project Area.				
Impact Significance	Negligible	Minor	Moderate		Major
	<b>Minor</b> impacts at worst may occur from presence of the OSB on the landscape.				

### Additional Mitigation Measures

As the significance of the impacts is **moderate**, the following additional mitigation measures are considered necessary:

- Erect fencing and potential landscaping (i.e., trees) between Zin Yaw Chaung and the OSB to reduce visual impacts. The hoarding shall be of sufficient height to ensure that there is no direct line of sight between the OSB and Zin Yaw Chaung.

### Residual Impact Significance

Although an additional mitigation measure is proposed, the residual impact is still of **minor to moderate** significance as the barrier will be visible to local communities and will have a negative impact.

#### 6.4.4

### ***Potential Impacts on Coastal Processes***

#### *Construction Phase*

The assessment applied to the operation phase (below) is also applicable to construction.

#### *Operational Phase*

### Sources of Impacts

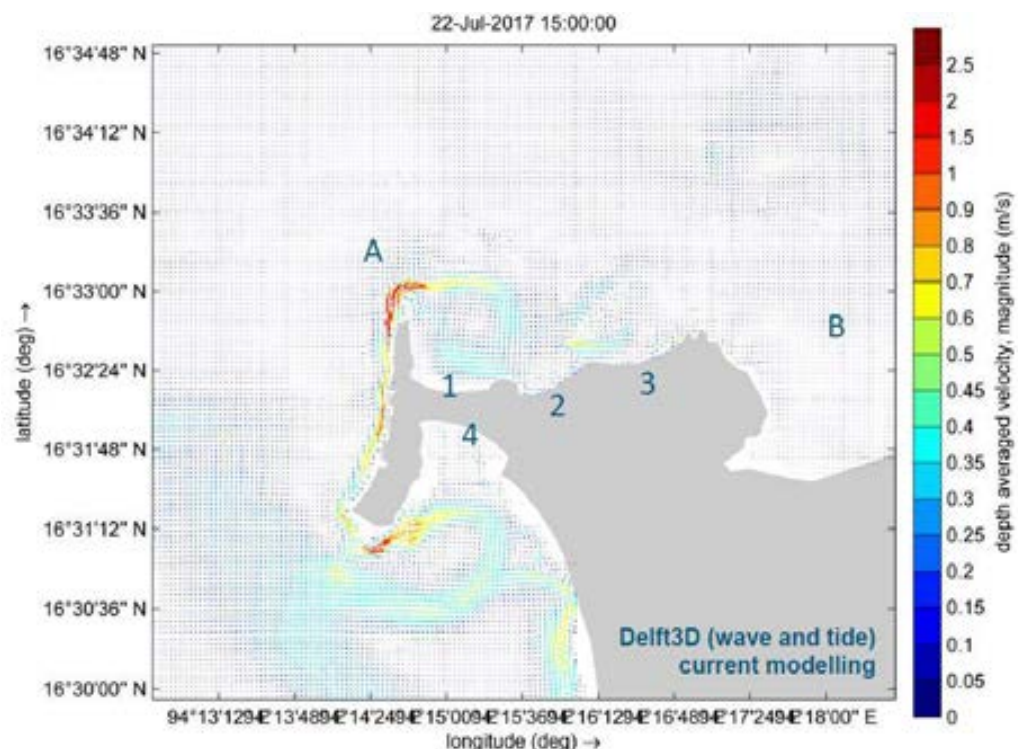
The construction of the jetty and piling works will result in localised alterations in water flows (both in terms of velocity and direction). Altered water flows have the potential to result in secondary effects on the sedimentary regime in the vicinity of the site; increased or changed water flow patterns have the potential to result in localised scour (i.e. resuspension) of seabed sediments. Conversely, the creation of calmer or lower velocity water flows have the potential to result in increased sedimentation effects, or sediment build up.

In terms of the present study, it is noted that the site for the proposed jetty lies within an area of high energy with high levels of sediment transport during tidal changes.

M&AOSB commissioned a sediment assessment for the jetty by Royal Haskoning. It was concluded that the jetty would over time have a local and small impact on the shape and position of the coastline. On the up-drift (west) of the jetty accretion will occur and at the down-drift (east) small coastal retreat might occur, however, the latter is expected to be limited due to the presence of harder (rocky) material at this location. The changes are not expected to create significant changes outside of the bay. As such, no adverse severe impacts to coastal processes as a result of the jetty would be expected to occur except a moderate impact to tourism.

A sediment assessment was conducted by RHDHV. The output of which is presented in Figure 6.2. The study found that waves breaking in front of Goyangyi island generate a longshore current (A on map) that drives eddies into the bay (1 on map). According to the model, advected energy reaches in small amounts bays (2) and (3). The Project is located in Bay (3). Longshore currents south of (4) lose their sediments at the tombolo (mound) behind Goyangyi Island. The model does not show significant tidal currents in the bay area (B on map) therefore low levels of sedimentation from the presence of the jetty.

**Figure 6.2**      *Sediment Assessment*



### Existing/ In-place Controls

No controls are in place to reduce impacts to coastal processes however, M&AOSB have commissioned coastal studies from engineering company Royal Haskoning that concluded erosional impacts would be minimal.

### Significance of Impacts

The impact magnitude is **small** and the receptor sensitivity is **medium**, therefore the impact significance will be **minor** significance (Table 6.19).

**Table 6.19** *Potential Impacts to Coastal Processes – Operational Phase*

Impact	Installation of the jetty may result in changes to coastal processes through alterations to hydrodynamics				
Impact Nature	Negative	Positive		Neutral	
	Impacts to hydrodynamics and coastal processes would be considered to be adverse.				
Impact Type	Direct	Indirect		Induced	
	Impacts to hydrodynamics would be direct effect whereas impacts to coastal process would be a secondary effect.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Impacts to coastal processes, if not controlled, would persist during the operation of this facility.				
Impact Extent	Local	Regional		International	
	Impacts would affect local coastal process.				
Impact Scale	Impacts are localised to a few kilometres around the jetty.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Impacts may occur in the surrounding waters and to the nearby jetties and will be <b>small</b> magnitude.				
Resource/ Receptor Sensitivity	Low		Medium		High
	The surrounding water body is a high energy regime with mobile sediment patterns and small changes to sedimentation / scour would likely be similar to natural events.				
Impact Significance	Negligible	Minor	Moderate		Major
	The combination of a medium receptor sensitivity and small impact magnitude will result in an overall Minor impact.				

### Additional Mitigation Measures

Assuming the design of the jetty takes into consideration the hydrodynamics of the area and environmental design criteria, the assessment has indicated that impacts to coastal processes through the presence of the jetty are expected

to be negligible; hence no additional mitigation or monitoring activities are considered necessary over and above the existing or in-place controls.

#### Residual Impact Significance

Residual impacts would be expected to be of **minor** significance.

#### 6.4.5

#### *Potential Impacts on Water Quality, Terrestrial and Marine habitats from Wastewater and Run-Off during Construction*

##### *Construction Phase*

##### Source of impact

Wastewater and run-off can impact water quality and can have secondary impacts to terrestrial flora and fauna and local communities. However, Domestic-type wastewater and sewage will arise from the construction workforce. Black and grey water will arise from the construction workforce and from drainage from cooking and laundry facilities serving site workers. It is estimated up to 400-700 workers will be working on-site during the construction phase of the Project however, 70% of these will be from local communities. Mis-management of sewage and wastewaters would have the potential to result in contamination of surface waters, which may result in localized land/ecological contamination, impacts to health, odour nuisance and attraction of vermin.

Surface run-off from the Project, particularly following heavy rains, could have potential impacts on water quality of aquatic water bodies. Surface run-off from the Project Site could contain high levels of suspended sediments. It may also contain contaminants washed out during rainstorms such as from accidentally spilled fuels (e.g. petroleum, gasoline and waste oil) or leaks from machinery (e.g. lubricants).

Sanitary effluent, which will be generated at the staff housing and main office, will generally be characterized as having a high concentration of solids (suspended and dissolved), biological oxygen demand and chemical oxygen demand, nutrients (ammonia) and faecal coliform counts. Run-off water that could have suspended sediment and may be contaminated with oil will be released from the Site. Mis-management of sewage wastewaters and site drainage that contain fuel, oil and lubricant could potentially reduce the water quality in the area.

Usage of water for domestic purposes for up to 100 workers for the Project could also strain local resources as during consultation, local communities mentioned that groundwater was scarce in the area during the dry season.

##### Existing and / or In-place Controls

Sewage and sanitary wastewater will be treated prior to disposal. The discharge location will be along the Palin Gyaing Beach to the North of the Project Area.

Direct disposal into surface or aquatic waters is not allowed. The treated wastewater will meet the National Environmental Quality (Emissions) Guidelines on Effluent Discharges which will be monitored regularly. Other in-place controls shall also be applied to reduce the potential for contamination of storm water, as follows:

- Earthworks to form the final surfaces will be followed up with surface protection and drainage works to prevent erosion caused by rainstorms;
- Appropriate surface drainage will be designed and provided where necessary;
- Surface runoff from potential sources of contamination will be prevented;
- All drainage facilities and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms;
- M&AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimise impact to communities;
- Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds);
- Oil water separators and grease traps will be installed and maintained as appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas, if any;
- The discharge point of treated sewage effluent to aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters;
- During the early stages of work, portable chemical toilets will be used prior to the construction of septic tanks or a temporary sewage treatment plant. During operation, septic tanks will be provided.
- Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean.

### Significance of Impact

With the proper implementation of the existing control measures, it is expected that the impact magnitude would be **small**. Sensitivity of the water is considered as **medium** as this is an area with potential sensitive habitats.

The significance of impacts associated with wastewater and run-off during construction is considered **minor** (Table 6.20).

**Table 6.20** *Significance of Impacts on Water Quality from Wastewater and Run-Off during Construction*

Impact	Impacts on water quality from sanitary wastewater and runoff				
Impact Nature	Negative		Positive		Neutral
	Impacts on water quality are considered to be negative.				
Impact Type	Direct		Indirect		Induced
	Impacts on water quality would be direct through the discharge of treated sanitary wastewater in septic tank and storm water.				
	Impacts on water resources from domestic water usage during the project.				
Impact Duration	Temporary	Short-term	Long-term		Permanent
	Potential for water quality and resource impacts would be short term over the length of construction.				
Impact Extent	Local		Regional		International
	Impacts on water quality and resources are expected to be localised to the Project Area and the immediate vicinity.				
Impact Scale	Impact scale is considered small given the localized discharge and short term impact duration.				
Frequency	Potential impacts would be limited to the construction period.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Impact magnitude is considered negligible given under good practice of in-place controls.				
Resource/ Receptor Sensitivity	Low		Medium		High
	The receptor sensitivity is considered medium with sensitive uses.				
Impact Significance	Negligible	Minor	Moderate		Major
	The combination of a high receptor sensitivity and small impact magnitude will result in an overall Minor impact.				

#### Additional Mitigation and / or Management Measures

No additional mitigation measures are recommended given the negligible impact significance. However, in order to confirm that discharged domestic water complies with the NEQ Guidelines, monitoring should be conducted every 6 months during construction. Monitoring is discussed in more detail in Section 8.5.4.



## Residual Impact Significance

The residual impacts are expected to be **minor** significance.

### *Operational Phase*

#### Source of impact

Wastewater and run-off can impact water quality and can have secondary impacts to terrestrial flora and fauna and local communities. However, Domestic-type wastewater and sewage will arise from the OSB. Black and grey water will arise from drainage from cooking and laundry facilities serving site workers. As workers will be working on-site during the operation phase of the Project, mis-management of sewage and wastewaters would have the potential to result in contamination of surface waters, which may result in localized land/ecological contamination, impacts to health, odour nuisance and attraction of vermin.

Surface run-off from the Project, particularly following heavy rains, could have potential impacts on water quality of aquatic water bodies. It may also contain contaminants washed out during rainstorms such as from accidentally spilled fuels (e.g. petroleum, gasoline and waste oil) or leaks from machinery (e.g. lubricants).

Sanitary effluent, which will be generated at the staff housing and main office, will generally be characterized as having a high concentration of solids (suspended and dissolved), biological oxygen demand and chemical oxygen demand, nutrients (ammonia) and faecal coliform counts. Run-off water that could have suspended sediment and may be contaminated with oil will be released from the Site. Mis-management of sewage wastewaters and site drainage that contain fuel, oil and lubricant could potentially reduce the water quality in the area.

Usage of water for domestic purposes for up to 100 workers for the Project could also strain local resources as during consultation, local communities mentioned that groundwater was scarce in the area during the dry season.

#### Existing and / or In-place Controls

Sewage and sanitary wastewater should be treated prior to disposal. The discharge location will be along the Palin Gyaing Beach to the North of the Project Area.

Direct disposal into surface or aquatic waters is not allowed. It is assumed that the treated wastewater will meet the National Environmental Quality (Emissions) Guidelines on Effluent Discharges which will be monitored regularly. Other in-place controls shall also be applied to reduce the potential for contamination of storm water in accordance with IFC EHS General Guidelines, as follows:

- Appropriate surface drainage will be designed and provided where necessary;
- Surface runoff from potential sources of contamination will be prevented;
- All drainage facilities and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms;
- M&AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimize impact to communities;
- Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds);
- Oil water separators and grease traps will be installed and maintained as appropriate at refueling facilities, workshops, parking areas, fuel storage and containment areas, if any;
- The discharge point of treated sewage effluent to aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters;
- During operation, septic tanks or a permanent sewage treatment plant will be provided;
- Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean.

#### Significance of Impact

With the proper implementation of the existing control measures, it is expected that the impact magnitude would be **small**. Sensitivity of the water is considered as **medium** as this is an area with potential sensitive habitats. The significance of impacts associated with wastewater and run-off during operation is considered **minor** (Table 6.21).

**Table 6.21** *Significance of Impacts on Water Quality from Wastewater and Run-Off during Operation*

Impact	Impacts on water quality from sanitary wastewater and runoff				
Impact Nature	Negative	Positive		Neutral	
	Impacts on water quality are considered to be negative.				
Impact Type	Direct	Indirect		Induced	
	Impacts on water quality would be direct through the discharge of treated sanitary wastewater in septic tank and storm water.				
	Impacts on water resources from domestic water usage during the project.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Potential for water quality and resource impacts would be short term over the length of construction.				
Impact Extent	Local	Regional		International	
	Impacts on water quality and resources are expected to be localised to the Project Area and the immediate vicinity.				
Impact Scale	Impact scale is considered small given the localized discharge and short term impact duration.				
Frequency	Potential impacts would be limited to the construction period.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Impact magnitude is considered negligible given under good practice of in-place controls.				
Resource/ Receptor Sensitivity	Low	Medium		High	
	The receptor sensitivity is considered medium with sensitive uses.				
Impact Significance	Negligible	Minor	Moderate	Major	
	The combination of a high receptor sensitivity and small impact magnitude will result in an overall negligible impact.				

#### Additional Mitigation and / or Management Measures

No additional mitigation measures are recommended given the negligible impact significance. However, in order to confirm that discharged domestic water complies with the NEQ Guidelines, monitoring should be conducted every 6 months during operation. Monitoring is discussed in more detail in *Section 8.5.4*.

#### Residual Impact Significance

The residual impacts are expected to be **minor** significance.

*Construction Phase*Source of Impact

The jetty footprint does not traverse coral reefs and seagrass beds. Therefore direct loss of corals and seagrass caused by dredging activity is not expected.

Dredging activities for the navigation channel have the potential to indirectly impact corals. Soft corals and hard corals can be injured by high suspended sediment concentrations. Damage (sub-lethal effects) or mortality (lethal effects) can result from a reduction in light penetration which cause mortality to the photosynthesising symbiotic algae associated with the hard corals, and also from the deposition of sediment onto the coral's surface which physically blocks the respiratory and feeding apparatus. Hard corals possess mechanisms for rejecting sediment from their surfaces, but employment of these mechanisms expend energy and may cause stress ultimately leading to bleaching (expulsion of zooxanthellae) or tissue necrosis. The vulnerability of different corals to sedimentation effects is not the same. Hard corals with horizontal plate-like or massive growth forms are more vulnerable than hard corals that grow with plates arranged vertically or with upright branches. Hard corals with convex surfaces or possessing tall polyps are also less sensitive.

Within the jetty footprint, impacts will be due to the removal of organisms during dredging. In addition to this direct loss, impacts to macro-benthic organisms may occur in the immediate vicinity of the dredging due to burial by sediment. Sediment may be deposited on the seabed outside the footprint during dredging (following the dispersion of sediment) and postplacement (through erosion and wave-induced re-suspension). Impacts to benthic assemblages immediately outside of the trench are expected to occur temporarily while works are underway. The effects of sedimentation on organisms will depend on other factors, such as an organism's tolerance, growth orientation of sessile organisms and water movement. Owing to the localised extent and low severity of sedimentation associated with the suction dredging, indirect impacts on benthic communities in the vicinity of works are anticipated to be of low severity and localised.

Water quality can also be impacted from dredging as any contamination in the sediment can enter the water column. As shown in *Section 5.3.4*, there is no contamination of sediment and metal concentrations were considered to be indicative of naturally occurring background conditions with no metal at concentrations of environmental concern. No contamination of water quality from dredging is therefore expected to occur.

Noise emissions from piling will not have an impact on marine habitats but the species that inhabit these habitats may be impacted. This is assessed in *Section 6.4.8*.

During the construction and operation stage, the passage of ship (vessel movement) will cause collision with the mammals and turtles but this is not much significant.

Sediment dispersion modelling offshore the Project was conducted by Woodside for their A6 well. Woodside was able to demonstrate that seabed and surface discharge of cuttings and fluids did not reach the Myanmar mainland coast, the footprint of the sediment deposition was highly localised, and a zone of predicted ecological impact was limited to within 328 ft. (100 m) of the well site. Deposition and elevated Total Suspended Solids (TSS) return to a minimum level that defines the area of influence (1 mm, and 0.3 mg/L, respectively) within 820 ft. (250 m) of the well site. It is assumed the disposal site would be in a similar location to the A6 well and the disposal for sediment offshore will not impact any sensitive habitats.

#### Existing / In Place Controls

The existing controls include:

- Minimise size of footprint on seabed.
- Avoid construction in sensitive habitats (e.g. coral reefs).
- Silt curtains and alternative methods will be deployed during dredging of the navigation channel of the navigation channel to reduce the levels of suspended solids that could impact nearby sensitive receivers.
- Closed grab dredgers or suction dredgers with silt curtains and alternative methods should be used to reduce the potential for leakage of sediments;
- Disposal barges will be fitted with tight bottom seals in order to prevent leakage of material during transport;
- When the dredged material has been unloaded at the disposal areas, remove any material that has accumulated on the deck or other exposed parts of the vessel and place in the hold or a hopper. Do not wash decks clean in a way that permits material to be released overboard;
- The contractor(s) will ensure that the works cause no visible foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the area of marine works; and
- Control and monitoring systems will be used to alert the crew to leaks or any other potential risks.

#### Significance of Impacts

The assessment has indicated that impacts to marine ecological resources (i.e. corals) during dredging works are expected to be **Moderate** and **Minor** for water quality (*Table 6.22, Table 6.23 and Table 6.24*).

**Table 6.22** *Impacts to Marine Habitats & Fauna in the Project Footprint – Construction Phase*

Impact	Removal of macrobenthos within the footprint of the jetty and smothering of marine habitats from sedimentation from dredging of the navigation channel.				
Impact Nature	Negative	Positive		Neutral	
	The impact will have a <b>negative</b> impact on marine habitats.				
Impact Type	Direct	Indirect		Induced	
	Removal of marine fauna in the footprint is a direct impact and sedimentation is an indirect impact.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Impacts would be permanent				
Impact Extent	Local	Regional		International	
	Impacts on the marine fauna are localised to a few kilometres from the Project Site.				
Impact Scale	Majority of sediment is expected to settle quickly within relatively close proximity to the works areas.				
Impact Frequency	The indirect impact is expected to occur only during the dredging works. Removal of habitat will occur once but is permanent.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the impacts would be considered to be Medium.				
Resource/ Receptor Sensitivity	Low	Medium		High	
	Marine fauna and habitats in the Project footprint are defined as <b>low</b> sensitivity.				
Impact Significance	Negligible	Minor	Moderate	Major	
	<b>Minor</b> impacts may occur to benthic communities within the footprint of the jetty as it is assumed that the 0.6 ha of footprint is coral reef area.				

**Table 6.23** *Impacts to Corals – Construction Phase*

Impact	Smothering of corals from sedimentation from dredging of the navigation channel.				
Impact Nature	Negative	Positive		Neutral	
	The impact will have a <b>negative</b> impact on corals.				
Impact Type	Direct	Indirect		Induced	
	Sedimentation is an indirect impact.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Impacts would be short-term				
Impact Extent	Local	Regional		International	
	Impacts on the marine fauna are localised to a few kilometres from the Project Site.				
Impact Scale	Majority of sediment is expected to settle quickly within relatively close proximity to the works areas.				
Impact Frequency	The impact is expected to occur only during the dredging works.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the impacts would be considered to be Medium.				



Resource/ Receptor Sensitivity	Low	Medium	High	
	Impacts to coral are defined as <b>medium</b> sensitivity.			
Impact Significance	Negligible	Minor	Moderate	Major
	<b>Moderate</b> impacts may occur to coral reefs from the Project.			

**Table 6.24**      *Impacts to Water Quality – Construction Phase*

Impact	Contamination of water quality from dredged sediments				
Impact Nature	Negative	Positive		Neutral	
	The impact will have a <b>negative</b> impact on water quality.				
Impact Type	Direct	Indirect		Induced	
	Direct impact.				
Impact Duration	Temporary	Short-term	Long-term		Permanent
	Impacts would be short-term				
Impact Extent	Local	Regional		International	
	Impacts on water quality are localised to a few kilometres from the Project Site.				
Impact Scale	Majority of sediment is expected to settle quickly within relatively close proximity to the works areas.				
Impact Frequency	The impact is expected to occur only during the dredging works.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the impacts would be considered to be Small.				
Resource/ Receptor Sensitivity	Low	Medium		High	
	Water quality is defined as <b>Low</b> sensitivity.				
Impact Significance	Negligible	Minor	Moderate		Major
	<b>Minor</b> impacts may occur to water quality from the Project.				

#### Additional Mitigation and Monitoring Measures

It is recommended that a monitoring programme be implemented to monitor any potential changes to these communities during dredging activities. Information on coral habitats in Myanmar is limited, even more so on their resilience to withstand impacts or changes in their environments. Through the implementation of this monitoring programme, detailed scientific data will be made publically available to contribute to the better understanding of corals in Myanmar and add to the overall net benefit of the development of the proposed Project.

#### Residual Impact Significance

As no additional mitigation is proposed, the residual impact significance remains at **Moderate** to coral and habitats and **Minor** to water quality.

#### *Operational Phase*

#### Source of Impacts

During operation of the OSB, there will be regular maintenance dredging of the navigation channel. This may have an indirect impact on marine habitats as with the construction phase. Sediments are transported along the coast (longshore transport) however, sediment transported volumes are expected to be low. The direction of the longshore transport alternates with an eastward

net flow. The Project will not involve the direct loss of these habitats as none were recorded within the jetty footprint. However, some corals were recorded to the east of the jetty location and could be impacted by secondary sedimentation from erosion and temporary disturbance of benthic faunal communities.

#### Existing/ In place Controls

The existing controls used during construction would also be used during maintenance dredging.

#### Impacts Significance

The impact significance is **moderate** given the presence of corals in T2 transect 500 m to the east of the jetty. A summary of the operational phase impacts is provided in *Table 6.25* and *Table 6.26*.

**Table 6.25** *Impacts to Marine Habitats & Fauna in the Project Footprint – Operation Phase*

Impact	Removal of macrobenthos within the footprint of the jetty and smothering of marine habitats from sedimentation from dredging of the navigation channel.				
Impact Nature	Negative	Positive		Neutral	
	The impact will have a <b>negative</b> impact on marine habitats.				
Impact Type	Direct	Indirect		Induced	
	Removal of marine fauna in the footprint is a direct impact and sedimentation is an indirect impact.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Impacts would be permanent				
Impact Extent	Local	Regional		International	
	Impacts on the marine fauna are localised to a few kilometres from the Project Site.				
Impact Scale	Majority of sediment is expected to settle quickly within relatively close proximity to the works areas.				
Impact Frequency	The indirect impact is expected to occur only during the dredging works. Removal of habitat will occur once but is permanent.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the impacts would be considered to be Medium.				
Resource/ Receptor Sensitivity	Low	Medium		High	
	Marine fauna and habitats in the Project footprint are defined as <b>low</b> sensitivity.				
Impact Significance	Negligible	Minor	Moderate	Major	

**Table 6.26** *Impacts to Corals –Operation Phase*

Impact	Smothering of corals from sedimentation from dredging of the navigation channel.				
Impact Nature	Negative	Positive		Neutral	
	The impact will have a <b>negative</b> impact on corals.				
Impact Type	Direct	Indirect	Induced		
	Sedimentation is an indirect impact.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Impacts would be short-term				
Impact Extent	Local	Regional		International	
	Impacts on the marine fauna are localised to a few kilometres from the Project Site.				
Impact Scale	Majority of sediment is expected to settle quickly within relatively close proximity to the works areas.				
Impact Frequency	The impact is expected to occur only during the dredging works.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the impacts would be considered to be Medium.				
Resource/ Receptor Sensitivity	Low	Medium		High	
	Coral reefs are defined as <b>medium</b> sensitivity.				
Impact Significance	Negligible	Minor		Moderate	Major
	<b>Moderate</b> impacts may occur to coral reefs from the Project.				

#### Additional Mitigation Measures

The impact significance is **moderate**. It is recommended that additional monitoring be undertaken for the first two years during operation to monitor the sedimentation levels on the corals in T2 500 m to the east of the jetty. If no impacts are detected monitoring can stop. Monitoring is discussed in more detail in *Section 8.5*. This will be in conformity with the World Bank Group Guidelines for Environmental, Health, and Safety for ports, harbours, and terminals (2017) and other related international and national good practices that have been mentioned previously and practice in Myanmar.

#### Residual Impact Significance

As no additional mitigation is proposed, the residual impact significance remains at **moderate**.

### **6.4.7** *Potential Impacts to Marine Turtles*

#### *Construction Phase*

#### Source of Impact

Key issues to marine turtles arising during the Project are associated with:

- Direct habitat loss of sandy shore potentially used by nesting marine

turtles.

- Artificial lights could discourage females from nesting. In addition, lighting near the shore also can cause hatchlings to become disoriented and wander inland, where they often die of dehydration or predation.
- Destruction of existing turtle nests on commencement of installation activities at pipeline landing.
- Interference of nesting marine turtles due to entanglement or stranding in construction equipment and materials on the back shore during landings.
- Indirect disturbance impacts on marine turtles due to Project activities.
- Increased potential for egg collection due to increased human presence (work force).

No primary surveys were conducted for marine turtles or marine mammals as the review of literature indicated that the area was not important for such animals and the EIA is based on the conservative assumption that the sensitive species are present here (Section 5.4.3 and 5.4.4). In order to have a robust EIA, the impact assessment automatically assumes the presence of these species in the area (for example the impact assessment is based on the assumption that the species of conservation concern are present and the Receptor Sensitivity is therefore high). Fishermen and local communities were also consulted on the presence of marine mammals and turtles; the local community stated they do not see any turtles nesting on the beach near the Project.

The jetty construction would be expected to lead to small scale short-term loss of sandy shore. The shore is identified as potentially important habitat as it is considered suitable for turtle nesting. However villagers did not observe any turtles nesting on this stretch of beach. The peak nesting season is between December and January and as the Project will take 1.5 years to construct, there is some overlap. The scale of loss is however considered minor in the context of the size of sandy beaches available in the wider context of Nga Yoke Kaung bay. With the exception of rocky headlands, the coast is generally contiguous with sandy shores which span up to 5 km along the surrounding coast. The other side of the peninsula and Goyangyi Island is more suitable nesting beach habitat. The affected shore therefore represents a small area of shoreline that is available to marine turtles.

Sea turtle eggs typically require 50 – 60 days of incubation before hatching. If turtles have laid eggs within the boundary of the jetty work site prior to commencement of works, there is a possibility that these buried nests would be destroyed when construction equipment moves onto the site. Destruction of turtle nests should be avoided.

Gravid female marine turtles are cumbersome on shore. When nesting, turtles face the risk of stranding and injury if they are caught on obstacles

either natural or artificial on the shore. If turtles remain stranded on obstacles, they are likely to rapidly succumb to heat and desiccation stress due to exposure to the sun. During the shore works there is a possibility of marine turtles becoming stranded on works equipment or materials left on the beach at night. The likelihood of this happening however is very low owing to the expected low frequency of nesting turtles and the small size of the construction site and the large size of available sandy shore along the adjacent coastline.

Shore works could coincide with the expected peak nesting season (October to December). Nesting turtles may therefore be present and/or engaged in breeding activity in near shore waters. Any works in the shore conducted during the turtle nesting season has the potential to cause disturbance impacts to marine turtles. The affected area is however confined to the vicinity of works corridor and disturbances would be localised. Impacts to marine turtles would be limited to temporary behavioural change (e.g. moving away from the source of disturbance) and would not be expected to have biologically significant consequences for affected individuals. In addition, the frequency and duration of the presence of marine turtles in proximity to the works area can reasonably be expected to be low.

#### Existing In Place Controls

The existing controls include:

- The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.
- Minimising lighting to that which is absolutely necessary for the construction / operation area.
- No illegal gathering of eggs by contractors.

#### Significance of Impact

Sea turtles are of **high** sensitivity as they are species of international conservation concern. The impacts are localised to a small area of beach and are considered of **small** magnitude. Therefore, the impact is ranked as of **moderate** significance (*Table 6.27*).



**Table 6.27**      *Impacts to Marine Turtles – Construction*

Impact	Direct impacts from loss of nesting habitat on the beach as well as disturbance to nesting behaviour from construction.				
Impact Nature	Negative		Positive		Neutral
	The impact will have a <b>negative</b> impact on marine turtles.				
Impact Type	Direct		Indirect		Induced
	Direct impact from loss of nesting beaches.				
Impact Duration	Temporary	Short-term	Long-term		Permanent
	Impacts would be short-term to permanent depending on the turtle nesting behaviour.				
Impact Extent	Local		Regional		International
	Impacts on marine turtles will be localised to the Project Site.				
Impact Scale	The impact will be small scale (Project Site) and only impacting a small portion of potential nesting beaches.				
Impact Frequency	Impacts will be permanent for the duration of the Project.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the impacts would be considered to be small.				
Resource/ Receptor Sensitivity	Low		Medium		High
	Marine turtles and of high sensitivity as all species present in Ayeyarwady Region are of international conservation concern.				
Impact Significance	Negligible	Minor	Moderate		Major
	Moderate impacts may occur to marine turtles due to exclusion from nesting beaches and disturbance to nesting females.				

#### Additional Mitigation Measures

The assessment has indicated that impacts to marine turtles are expected to be **moderate**, and hence, the following measures to reduce impacts are recommended:

- Where night-time work is needed, or for night-time facilities, lighting mitigations measures should be employed including:
  - Minimizing lighting to that which is absolutely necessary for the construction area
  - Light dispersion should be limited/ mitigated by the design of the lighting equipment with the aim to minimize disturbance by avoiding intense illumination and night time lighting glare
  - Use directional lighting rather than diffuse lighting as far as practicable
- During the installation and construction phase, to minimize the potential for entanglement and stranding of turtles in the work site through good site practices:
  - Place equipment or stockpiles in designated works areas and

minimise the placement of stock piles on the beach and backshore.

- Restrict construction activities to works areas that should be clearly demarcated. Where practicable, reinstate the works areas after completion of the works.
- During the construction (and operation) phase, maintain a company policy to outlaw egg collection by employees of all parties/contractors involved.
- Include the provision that no company/contractor employees are to collect or have involvement in the collection of turtle eggs in contractual documents;
- The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.
- Liaison with the responsible Ministry or Government body is recommended to define procedures in the event of discovery of a nest on the works site.

#### Residual Impact Significance

Should the above measures be successfully implemented it is considered that residual impacts may be reduced to **minor**.

#### *Operation Phase*

#### Source of Impact

Key issues to marine turtles arising during the Project are associated with:

Direct habitat loss of sandy shore potentially used by nesting marine turtles.

Artificial lights could discourage females from nesting. In addition, lighting near the shore also can cause hatchlings to become disoriented and wander inland, where they often die of dehydration or predation.

Destruction of existing turtle nests on commencement of installation activities at pipeline landing.

Indirect disturbance impacts on marine turtles due to Project activities.

Increased potential for egg collection due to increased human presence at the OSB.

The jetty operation would be expected to lead to small scale long-term loss of sandy shore. The shore is identified as potentially important habitat as it is considered suitable for turtle nesting. However villagers did not observe any turtles nesting on this stretch of beach. The peak nesting season is between December and January and as the Project will take 1.5 years to construct, there is some overlap. The scale of loss is however considered minor in the context

of the size of sandy beaches available in the wider context of Nga Yoke Kaung bay. With the exception of rocky headlands, the coast is generally contiguous with sandy shores which span up to 5 km along the surrounding coast. The other side of the peninsula and Goyangyi Island is more suitable nesting beach habitat. The affected shore therefore represents a small area of shoreline that is available to marine turtles.

Destruction of turtle nests should be avoided since construction.

The affected area is however confined to the vicinity of works corridor and disturbances would be localised. Impacts to marine turtles would be limited to temporary behavioural change (e.g. moving away from the source of disturbance) and would not be expected to have biologically significant consequences for affected individuals. In addition, the frequency and duration of the presence of marine turtles in proximity to the works area can reasonably be expected to be low.

#### Existing In Place Controls

The existing controls include:

- The operator of OSB should verify that the works area for the present of sea turtle nests prior to avoid destruction of any buried nests.
- Minimising lighting to that which is absolutely necessary for operation area.
- No illegal gathering of eggs by all workers from OSB.

#### Significance of Impact

Sea turtles are of **high** sensitivity as they are species of international conservation concern. The impacts are localised to a small area of beach and are considered of **small** magnitude. Therefore, the impact is ranked as of **moderate** significance (Table 6.28).

**Table 6.28** *Impacts to Marine Turtles – Operation*

Impact	Direct impacts from loss of nesting habitat on the beach as well as disturbance to nesting behaviour from operation.			
Impact Nature	Negative	Positive	Neutral	
	The impact will have a <b>negative</b> impact on marine turtles.			
Impact Type	Direct	Indirect	Induced	
	Direct impact from loss of nesting beaches.			
	Temporary	Short-term	Long-term	Permanent

Impact Duration	Impacts would be short-term to permanent depending on the turtle nesting behaviour.				
Impact Extent	Local	Regional		International	
	Impacts on marine turtles will be localised to the Project Site.				
Impact Scale	The impact will be small scale (Project Site) and only impacting a small portion of potential nesting beaches.				
Impact Frequency	Impacts will be permanent for the duration of the Project.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the impacts would be considered to be small.				
Resource/ Receptor Sensitivity	Low	Medium		High	
	Marine turtles and of high sensitivity as all species present in Ayeyarwady Region are of international conservation concern.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Moderate impacts may occur to marine turtles due to exclusion from nesting beaches and disturbance to nesting females.				

### Additional Mitigation Measures

The assessment has indicated that impacts to marine turtles are expected to be **moderate**, and hence, the following measures to reduce impacts are recommended:

Where night-time work is needed, or for night-time facilities, lighting mitigations measures should be employed including:

- Minimizing lighting to that which is absolutely necessary for OSB area
- Light dispersion should be limited/ mitigated by the design of the lighting equipment with the aim to minimize disturbance by avoiding intense illumination and night time lighting glare
- Use directional lighting rather than diffuse lighting as far as practicable

During the operation) phase, maintain a company policy to outlaw egg collection by employees of all parties/contractors involved.

Include the provision that no company/contractor employees are to collect or have involvement in the collection of turtle eggs in contractual documents;

The operator should verify that the works area is clear of sea turtle nests to avoid destruction of any buried nests.

Liaison with the responsible Ministry or Government body is recommended to define procedures in the event of discovery of a nest on the works site.

#### Residual Impact Significance

Should the above measures be successfully implemented it is considered that residual impacts may be reduced to **minor**.

### 6.4.8 *Potential Impacts on Marine Fauna from Underwater Noise*

#### *Construction Phase*

#### Source of Impact

During jetty construction, the installation of the piles during jetty construction will generate underwater noise. The use of marine vessels and equipment for dredging can also generate noise to a lesser extent. Underwater noise can cause disturbance to certain sensitive species, such as marine mammal, turtle and fish species.

Marine piling works will be required to construct the jetty for the OSB. Certain piling activities are known to generate high intensity underwater sounds, which due to the potential presence of turtles and marine mammals in the vicinity of works require assessment.

Piles for the jetty are assumed to be installed by the percussive method using piling barge with hydraulic hammer. Although, percussive piling will produce high- intensity underwater sound, the progress of piling works is quicker than bored piling. Sound from percussive piling activities will be transmitted to the water via both structure-borne and air-borne sound pathways. Structure- borne vibrations from the percussive hammer will be re-radiated as sound into the water via the piles, the rock substrata and the piling rig to the barge. The air-borne sound pathway consists of sound propagation from the percussive hammer and the piles through the air and into the water. The sound transmitted to the water via the air-borne sound path is not expected to be significant as a large proportion of this sound will be reflected at the water and air interface and therefore not penetrate the water.

Activities such as percussive piling have their highest energy at lower frequencies from about 20 Hz to 1 kHz, and whilst smaller cetaceans (~ 3 - 4 m in length) are not known to be highly sensitive to sounds below 1 kHz they can hear in some of this range (peak range of 8 - 90 kHz reported for dolphins). Cetaceans are animals that rely on acoustic information to communicate and to explore their environment. Therefore, sound that disrupts communication or echolocation channels could have a potential impact. The reactions from impacted cetaceans can range from brief

interruption of normal activities to short- or long-term displacement from noisy areas.

Percussive piling will produce some high-intensity underwater sound, particularly through the structure-borne noise pathway. Experience of percussive piling indicates that this type of piling may result in temporary avoidance of the affected area by individual animals, with animals returning to the area upon cessation of construction activities (Wursig, *et al*, 2000). No underwater blasting is expected to be required.

The size of the disturbed area will be small in the context of the size of the range of habitats that marine mammals frequent. Furthermore, it would be expected that any disturbance impacts would affect individual animals representing a very small portion of the overall cetacean population. Any effect of underwater sound caused by piling works would thus be expected to be limited to behavioural disturbance impacts on affected dolphins, and there may be some avoidance of the waters in close proximity to the works. These impacts are not likely to cause biologically significant impacts on affected animals. Nevertheless, mitigation should be applied to ensure impacts are reduced to as low as reasonably practicable.

### **Impacts to Sea Turtles**

As discussed previously, based on the auditory anatomy of sea turtles they are believed to have lower sensitivity to underwater noise than cetaceans.

### **Impacts to Fishes**

Potential effects of increased underwater noise to fishes include physiological stress, avoidance and injury (at high pressure levels). It is anticipated that fish species that are most sensitive to the generation of noise are likely to instinctively avoid the area once works commence. If avoidance of the area by fish were to occur during works, it is likely that fish would be temporarily displaced to other local areas where similar habitat conditions are present.

### Existing / In Place Controls

Measures to control/ minimise adverse disturbance impacts to marine mammals from piling activities may be expected to include the following:

- Pilling and associated machinery will be properly maintained for well-functioning and operating that will not severely impact; and
- Piles will be carefully aligned with hammer for correct contact.

### Significance of Impacts

Marine mammals and sea turtles are species of international conservation concern. Marine mammals are also sensitive to underwater noise generation. As such, marine mammals and turtles are considered to be **high** sensitivity. Fish species are considered **medium** sensitivity. The activity is short-term



during construction and will be in a localised area, as such, the impact magnitude is considered to be **small** (Table 6.29). The significance of the impacts is considered to be **minor-moderate**.

**Table 6.29 Impacts to Marine Fauna from Underwater Noise – Construction Phase**

Impact	Behavioural disturbance and / or injury to marine fauna from underwater noise emissions from piling					
Impact Nature	Negative		Positive		Neutral	
	The impact will have a <b>negative</b> impact on marine fauna.					
Impact Type	Direct		Indirect		Induced	
	Sedimentation is an indirect impact.					
Impact Duration	Temporary	Short-term		Long-term	Permanent	
	Impacts would be short-term for the duration of piling activities.					
Impact Extent	Local		Regional		International	
	Impacts will occur on the local scale and are localised to a few kilometres from the Project Site.					
Impact Scale	Impacts from noise will only occur a few kilometres from the activity.					
Impact Frequency	The indirect impact is expected to occur only during the piling works.					
Impact Magnitude	Positive	Negligible	Small		Medium	Large
	The magnitude of the impacts would be considered to be small as impacts from noise can only occur a few kilometres from the activity and only short-term during piling activities.					
Resource/ Receptor Sensitivity	Low		Medium		High	
	Marine mammals and turtles will be high sensitivity and fish are medium sensitivity.					
Impact Significance	Negligible	Minor (fish)		Moderate (mammals and turtles)		Major
	Minor impacts may occur to fish species and moderate impacts to marine mammals and turtles.					

### Additional Mitigation

Measures to control/ minimise adverse disturbance impacts to marine mammals and sea turtles from marine construction activities include the following:

- An exclusion zone of 500 m radius will be established around the construction site. If a marine mammal or a sea turtle is observed in the exclusion zone during piling, construction will be delayed until they have left the area. This measure will ensure the vicinity is clear of marine mammals and sea turtles prior to the commencement of works and will serve to reduce any disturbance to marine mammals and sea turtles as well as physical harm from placement of quarry rock, etc.; and
- When a marine mammal or a sea turtle is spotted within the exclusion zone during piling, construction works will cease and will not resume until the observer confirms that the zone has been continuously clear of

the marine mammal or sea turtle for a period of 30 minutes. This measure will ensure the area in the vicinity of the piling is clear of the marine mammal or sea turtle during works and will serve to reduce any disturbance to marine mammals or sea turtles.

#### Residual Impact Significance

Assuming the additional mitigation measures above are adopted, the assessment has indicated that impacts are expected to be **moderate** for marine mammals and sea turtles and **minor** for fishes.

#### *Operational Phase*

There will be no piling during the Operational Phase and as such, noise impacts to marine fauna have been scoped out of the impact assessment.

### 6.4.9 *Potential Impacts on Marine Fauna from Reverse Osmosis System – Entrainment and Impingement*

#### *Operational Phase*

#### Source of Impact

Impingement and entrainment are collectively defined as the removal of marine organisms during operation of an intake system. The United States Environmental Protection Agency defines imping-able organisms to be “large enough to be retained by a mesh with a maximum opening of 14.2 mm, including 9.5-mm mesh and 6.35 by 12.7 mm mesh. The group includes larger, actively moving juvenile and adult organisms. “Entrainable” organisms are small enough to pass through the above specified mesh size. Entrainable organisms include small organisms with limited to no swimming ability. The water intake system on the Reverse Osmosis facility of the Project has the possibility to entrain / impinge organisms.

#### Existing in-place Controls

The following design considerations will be adopted for the water intake system:

- Use of modern surface water intake system / sub-surface intake system; and
- Locating the discharge in an area away from productive coastal habitats (such as coral, seagrass or mangroves).

#### Significance of Impact

The discharge of brine solution from the Reverse Osmosis is around 60 m<sup>3</sup> per day. This is small compared to other RO systems and will not require any additional studies. The assessment has indicated that impacts associated are expected to be **minor**. Given the in place controls, the receptor is **low** sensitivity and the magnitude is **small** (*Table 6.30*).

**Table 6.30** *Impacts on Marine Organisms Habitats – Construction Phase*

Impact	Water intake for Seawater Reverse Osmosis System				
Impact Nature	Negative	Positive		Neutral	
	The impact on marine organisms is negative.				
Impact Type	Direct	Indirect		Induced	
	Direct fatality of organisms.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	The loss of habitats will be permanent.				
Impact Extent	Local	Regional		International	
	The impact is expected to be localised to the water intake pipeline.				
Impact Scale	The impact will occur near the water intake.				
Impact Frequency	During operation				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Considering the size of the Project, the magnitude of impact <b>Small</b> .				
Receptor Sensitivity	Low	Medium		High	
	Sensitivity is considered low for marine organisms as the discharge will not be located in sensitive habitats.				
Impact Significance	Negligible	Minor	Moderate	Major	Critical
	The significance is of this impact is <b>Minor</b> .				

#### Additional Mitigation Measures

No additional mitigation measures are recommended given the **minor** impact significance.

#### Residual Impact Significance

The residual impacts from construction of the Project are anticipated to be of **minor** significance.

### **6.4.10** *Potential Impacts on Terrestrial Flora and Fauna (including Use of Natural Resources)*

#### *Construction Phase*

#### Source of Impact

The construction of the onshore facilities will cause land of habitat in the footprint of the Project. The habitat in the Project Area is currently modified farmland and therefore not considered contain species or habitats of conservation concern. The use of materials from local environment could impact natural resources and lead to decreased availability of resources for local species.

The proposed OSB site encompasses an area of 11.5 ha. Construction is expected to take 12 to 18 months to complete. Initial stages of the construction will involve site clearance and levelling for formation of the site

platform. Direct impacts to terrestrial ecology associated with the installation and construction of the OSB:

- Habitat and vegetation loss within the footprint of the project sites resulting from land take for the facilities; and,
- Potential loss of inactive or less mobile wildlife that are nesting in or inhabiting the affected area.

Indirect impacts to terrestrial ecology will include:

- Potential impacts to the surrounding habitat and associated wildlife due to disturbance of this habitat including noise, increased human activity, or hill fires;
- Increased sedimentation due construction site run-off could impact aquatic communities in watercourses within and downstream of the proposed works areas; and,
- Impacts to aquatic communities close to works areas could occur through potential spills of oils and other pollutants during the construction phase.

#### Existing In Place Controls

Measures to control/ minimise adverse impacts of habitat loss will include:

- Footprint of the proposed OSB is minimised during the design stage and existing vegetation shall be retained as far as practicable.
- Landscape planting will be implemented by planting native tree species which are fast growing in nature.
- Construction activities will be restricted to works areas that will be clearly demarcated.
- Work site boundaries will be regularly checked to ensure that they are not breached and that damage does not occur to surrounding areas.
- Works areas in temporarily affected areas would be reinstated with tree/shrub planting after completion of the works, as far as practicable.

#### Significance of Impact

The assessment has indicated that impacts associated with habitat loss are expected to be **minor**. And the receptor is **low** sensitivity and the magnitude is **small** (*Table 6.31*).

**Table 6.31** *Impacts on Terrestrial Habitats – Construction Phase*

Impact	Onshore construction of the Offshore Supply Base				
Impact Nature	Negative	Positive		Neutral	
	The impact on the terrestrial biodiversity is negative.				
Impact Type	Direct	Indirect		Induced	
	Direct terrestrial habitat loss in the Project Footprint in areas to be developed. Indirect effects on remnant/ isolated habitats.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	The loss of habitats will be permanent.				
Impact Extent	Local	Regional		International	
	The impact is expected to be local for habitats.				
Impact Scale	The Project (onshore) will cover an area of 11.5 ha.				
Impact Frequency	Construction occurs only once.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Considering the size of the Project, the magnitude of impact <b>Small</b> .				
Receptor Sensitivity	Low	Medium		High	
	Sensitivity is considered low for habitats and species as the project area is mostly modified farmland and not natural. There is a small area of coconuts groves facing the beach but this is only a small area of the total coconut grove area on Goyangyi Island and the Nan Thar Pu peninsula.				
Impact Significance	Negligible	Minor	Moderate	Major	Critical
	The significance is of this impact is <b>Minor</b> .				

#### Additional Mitigation Measures

No additional mitigation measures are recommended given the **minor** impact significance.

#### Residual Impact Significance

The residual impacts from construction of the Project are anticipated to be of **minor** significance.

#### *Operational Phase*

Any impacts during operation will be similar to those discussed under the Construction Phase.

### **6.4.11** *Potential Impacts on Community Health and Safety*

#### *Construction Phase*

The impacts during construction as similar to those discussed, in detail, during operation.

### *Operational Phase*

During construction, noise generation may cause nuisance to nearby residential settlements. Potentially significant impacts to community health and safety could also arise from traffic to and from the Project Area.

The influx of construction workers and in-migration could change the disease profile in the community resulting in declining community health and well-being.

Accidental events, including flooding, could lead to leakage from storage facilities which could have knock on effects on human health if hazardous materials are involved.

One of the concerns listed by Affected Communities in relation to the Project was noise and air emissions. These concerns are addressed in the air, noise and waste sections of this impact assessment (*Section 6.4.1 and 6.4.2*).

Community safety is likely to be impacted by the following:

- Presence of the port site through construction and operations;
- Sea vessels and proximity of local fishing boats in the sea;
- Traffic using the access road;
- In-migration to the area associated with the port development; and
- The use of security.

Receptors include the six wards in Nan Thar Pu and specifically Zin Yaw Chaung.

### **Site trespass resulting in accidents and injuries**

During the construction phase there is the potential for accidents to occur as a result of land clearing, construction, movement of heavy machinery and dredging of the navigation channel. When the port is operational, there is the potential for accidents associated with port infrastructure and machinery. As such there is the potential for accidents and injuries involving members of the public.

### **Increased traffic and vessel movements**

The area is only lightly used by fishing vessels which are usually small <30ft in length and therefore, any increasing in vessel movements will be noticeable. Smaller community boats are vulnerable to: the generation of bow waves which could capsize or swamp local boats; accidents amongst the sea traffic; and of not being seen. Faster moving tugs may generate bow waves which could capsize or swamp local boats. Poorly marked fishing gear may be overrun, potentially causing damage to Project vessels and presenting a

hazard to local vessels including the risk of boats capsizing and the loss of crew overboard.

The communities are small and predominantly rural therefore any increases in traffic shore will be noticeable. The predicted movement of traffic is not currently known. Increased traffic could result in a higher incidence of road traffic accidents. There is also heightened danger of pedestrian accidents and injuries to individuals walking and on motorcycles.

### Worker Influx

There will be up to 700 workers during construction and ~200 during operation. The construction estimate is at the high end and is likely to be around 200 to 400 employees during construction. An influx of workers can cause a strain on local resources and bring new diseases into the population through worker interaction with locals.

The impact of waste generation (solid and liquid) from the workforce is presented in *Section 6.4.15*.

### Existing / In-Place Controls

There will be a perimeter wall around the premises to stop anyone trespassing onto the site. M&AOSB will also provide navigation guidance to all vessels in line with Myanmar national requirements. As discussed in other sections on vessel movements, M&AOSB will provide regular communications to fishermen on vessel movements as required.

The Project will utilise Reverse osmosis for water in order to avoid utilising the local groundwater resources. Supplies will be brought from Yangon for domestic use of workers.

### *Significance of Impacts – Construction and Operations*

Receptors in the area are of **medium** significance as this is a rural area. The impact magnitude is assumed to be **medium**. Therefore, the impact significance is **moderate** (*Table 6.32*).

**Table 6.32** *Impacts to Community Health and Safety*

Impact	Impact on community health and safety during construction			
Impact Nature	Negative	Positive	Neutral	
	Potential injury or death to humans or livestock would be a negative occurrence			
Impact Type	Direct	Indirect	Induced	
	The impact could directly affect local residents and/or livestock.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact is expected to be most significant during the construction phase. During operations, the PLR will be a sealed road.			



Impact Extent	Local		Regional		Global	
	Impact is limited to communities near the Project Area.					
Impact Frequency	Construction equipment, vessels and vehicles will be operational at the Port almost continuously over the construction period.					
Impact Magnitude	Positive	Negligible	Small	Medium	Large	
	The impact magnitude is potentially Medium.					
Receptor Sensitivity	Low		Medium		High	
	The receptor sensitivity is considered Medium. Humans and livestock should spontaneously avoid construction equipment and vehicles where possible.					
Significance	Negligible	Minor		Moderate	Major	
	The significance is likely to be moderate.					

### Additional Mitigation Measures

Based on the impact significance, the following additional mitigation and management measures are considered necessary for the project.

- Community grievances in relation to the conduct of security personnel and safety issues or activities should be addressed in accordance with the Project's established Grievance Procedure.
- The Project should employ at least 70% Myanmar nationals to work on the construction phase.
- As part of the stakeholder engagement activities, communities in the vicinity of the OSB should be informed about the risks and consequences of trespassing. Such engagement should start prior to the start of construction activities.
- Once traffic routes to the site are known, a Traffic Management Plan should be developed by M&AOSB. The Traffic Management Plan should be developed to indicate the traffic routes to be followed and speed limit to be complied with in order to reduce risk to the local communities.
- The workers contracts will include provisions to protect the local communities from worker influx risks (such as sexually transmitted diseases). Workers will also have regular health checkups.
- Enforcement of a speed limit for vehicles related to construction activities of the Project. During the construction phase, a speed limit of 40km/h shall be enforced.
- Establishment of a security team to monitor entrance to the construction site.

### Residual Impact Assessment

Given that there will be low level vessel usage during operation, the impact significance is minor.

#### 6.4.12 *Potential Impacts on Livelihoods and Economy*

Impacts on the economy and livelihoods of local residents may arise from Project land acquisition as well as the possible influx of workers. The Project will employ between 400 and 700 people during construction, of which around 70 % (around 280 to 490 people) will be employed from local communities. Therefore, the Project will have a potential positive impact on economy and livelihoods of the local communities in the vicinity of the Project.

For farming impacts, all farmland has been acquired by the Project and land compensation has been paid and agreed with M&AOSB. There are no impacts expected to surrounding farmland from the Project.

The physical presence of the jetty and offshore supply base would cause restriction of visitors to and from Kyauk Chay Htauk. This could have impacts on their livelihoods. A preliminary assessment by M&AOSB has stated that on average ~50 fishermen per day utilise the beach area to the north of Goyaing Island (including Palin Gyaing beach where the project is located). The jetty would exclude some of this fishing ground and access to and from Nan Thar Pu for three families that use the beach for access to Nan Thar Pu located to the east of the OSB.

##### *Construction Phase*

##### Potential Impact

The waters surrounding the proposed jetty are used by both shore and vessel based fishermen. Vessels associated with the construction and operation of the jetty and the OSB, as well as the physical presence of the jetty itself may therefore have the potential to cause the following impacts:

- Restriction of access to fishing grounds due to the establishment of an exclusion zone;
- Restriction of access to beach from the jetty construction;
- Displacement, damage or loss of fishing equipment by construction / operation vessel movements; and,
- Blockage / change of vessel transportation routes through jetty and potential exclusion zone.

Artisanal fishing craft are generally not illuminated, are small and hence poorly visible, have limited ability to manoeuvre, and may deploy poorly-marked fishing gear (e.g. nets, lines, fixed gear) in the area.

Damage to fishing equipment is a concern from both a safety perspective (i.e. potential risk to personnel on the fishing vessel and the survey vessel) and in terms of adverse reactions/ complaints from fishermen whose equipment has been damaged (i.e. loss of equipment and temporary loss of earnings/ livelihood). Stationary fishing equipment (e.g. static nets and associated fastenings, stakes and fish traps) and fish aggregating devices would be considered to be at risk of being damaged from marine traffic associated with construction and operation activities. Other effects of survey activities in areas of concentrated fishing may include temporary effects such as a perception of interference with fishermen's right to fish in these waters.

The jetty (during operation) and construction equipment (during construction) will exclude fishermen from an area of the beach of 0.012 km<sup>2</sup>. There are ~50 fishermen utilising the beach area however, these fishermen use lines from the beach and can continue to fish on the beach outside the Project footprint. The presence of the jetty will also create a habitat for encrusting organisms which may in turn attract fish. Small boat fishermen fish further offshore and will not be impacted by the presence of the jetty.

#### Existing and / or In-place Controls

Potential impacts to fishing activities and navigation will be kept to as low as reasonably practicable through mitigation and control measures that will be incorporated into the project design and implementation to safeguard operations. These include:

- A tunnel will be included in the design of the Project on the beach to ensure that local communities and other beach users can have full access to the beach;
- Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk of marine accidents;
- Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area;
- Any restricted areas will be appropriately marked on Notice to Mariners to ensure mariners are aware of any potential restrictions;
- The works area within construction supply vessels will operate will be limited to ensure there is safe and efficient operation. M&AOSB will ensure that all construction vessels operate and are moored such that vessel traffic to and from Nga Yoke Kaung is not blocked and in areas agreed with the Port Authority as relevant;
- At least four weeks prior to construction activities, relevant authorities and stakeholders (i.e. local fishing and tourism operators, fishery/ tourism

associations, and local villagers) will be alerted to the final works area design as well as the construction programme and any specific restrictions;

- At least four weeks prior to commencement of construction activities a preliminary survey of obstructions e.g. fishing nets / traps, etc. in the survey area will be conducted; and
- Remove all obstructions in the project area at least one week prior to commencement of construction activities.

#### Significance of Impacts

With the existing controls in place, the sensitivity of fishermen is medium and impact magnitude is expected small. Therefore, the impact significance is **moderate** (Table 6.33).

**Table 6.33** *Assessment of Impact on Livelihoods – Construction Phase*

Impact	Impacts on livelihoods				
Impact Nature	Negative		Positive		Neutral
	Potential decrease in fish catch, decrease in fishermen’s livelihoods and reduction of fish supply to the local communities. The jetty area would be inaccessible for local communities.				
Impact Type	Direct		Indirect		Induced
	Direct impact to fishing. A secondary impact that may result from deterioration in water quality having knock on effects on water quality.				
Impact Duration	Temporary	Short-term		Long-term	Permanent
	Long-term because it will be extended throughout the construction and operation of the OSB and jetty.				
Impact Extent	Local		Regional		Global
	Impacts are within the Fishing Zone 1 for offshore fishermen.				
Impact Scale	Though fishing is major source of income in the local communities, at worst, Project activities may result in a slightly reduced catch. The exclusion is limited to the footprint of the OSB.				
Impact Frequency	Ongoing.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The impact magnitude is small.				
Receptor Sensitivity	Low		Medium		High
	The receptor sensitivity is medium as the majority of people in Nan Thar Pu rely on farming & fishing for their livelihoods.				
Impact Significance	Negligible	Minor	Moderate	Major	
	The significance is <b>Moderate</b>				

#### Additional Mitigation Measures

The impact is expected to be of **moderate** significance, continual communication with fishermen will be required to ensure no impacts. A Grievance Procedure will be in place. There are other potential mitigation measures to reduce the impacts:

- Navigation buoys and equipment along the approach channel to the jetty will be installed as per guidance by Myanmar Port Authority to prevent interaction with fishing boats.
- Local community leaders and head of fishermen group will be informed six hours in advance before entering the supply vessels.
- The fishing vessels along the approach channel in advance will be informed by using work boat.

#### Residual Impact Significance

Residual impacts would be expected to be of **moderate** significance provided that recommended existing controls are implemented.

#### Operational Phase

The impacts during the operational phase will be similar to those discussed during construction of the Project. As such, the residual impact significance is expected to be **moderate**.

### **6.4.13 *Potential Impacts on Occupational Health and Safety***

#### *Construction Phase*

#### Source of Impacts

During construction, temporary labour shelter will be constructed for the workforce. Potential health and safety issues at the temporary labour shelter include the availability of clean drinking water as well as sewage and waste disposal issues.

Other potentially significant occupational health and safety issues relevant to port construction primarily include the following:

- Physical hazards associated with use of heavy equipment;
- Chemical hazards, for example associated with handling of hazardous wastes and accidental spills;
- Exposure to organic and inorganic dust; and
- Exposure to noise.

The following Project activities are likely to result in potential impacts associated with labour and working conditions:

- Project development throughout the life of the OSB will result in the employment of workers both directly and through the use of contractors and subcontractors;
- Workers will be accommodated in construction camps during the Construction Phase;
- Procurement of goods and services (supply chain) in line with the local procurement policy; and
- Retrenchment of workers between Project phases.

Construction work as well as OSB operations and the associated industrial estate all involve high risk activities with the potential for accidents that may result in injuries and potential fatalities as well as lost man-hours.

Employees of local contractors and those in the supply chain may not have international standard training in occupational health and safety, covering issues such as use of personal protective equipment, and in general there is poor enforcement of occupational health and safety regulations so the vulnerability of contractors and workers in the M&AOSB supply chain workforce is expected to be medium.

Retrenchment of workers is likely to be required across the lifespan of the Project, particularly during the transition from construction to operation. Retrenchment of workers should be undertaken in line with national law and international best practices, and should include providing skills to enable individuals to secure alternative employment.

#### Existing In Place Controls

The following mitigation will need to be implemented to avoid impacts to receptors related to workers' rights, health and safety, as well as child and forced labour.

- The Project will design an occupational health and safety management plan which will be a subset of the overall EMP system, tailored to the needs of the project. This plan will set standards that will be met by all contractors and subcontractors.
- All staff will have medical check-ups prior to commencing work.
- The Project will create and implement a health and safety management system for the project. It will include mandatory health and safety training courses for M&AOSB workers and contractors, including handling of hazardous material. This training will take place prior to work starting on construction and operation. Training course attendance will be recorded and monitored by the Project.

#### Significance of Impacts

The receptors are the workforce at the site who are expected to be of medium sensitivity. There is assumed to be no confined space work and limited working at heights or handling of hazardous materials. As such, the impact magnitude is expected to be small. Therefore, the overall impact significance, with the existing controls in place, is considered to be of **minor** significance (Table 6.34).

**Table 6.34** *Impacts to Occupational Health and Safety*

Impact	Impacts on occupational health and safety (H&S)				
Impact Nature	Negative		Positive		Neutral
	Negative impacts from risk of injury or fatality.				
Impact Type	Direct		Indirect		Induced
	Direct impact to workforce.				
Impact Duration	Temporary	Short-term		Long-term	
	Long-term for length of Project.				
Impact Extent	Local		Regional		Global
	Impacts occur within the Project Area				
Impact Scale	Localised to 11.5 ha of Project Area (onshore) and the vessels / dredging equipment offshore.				
Impact Frequency	For the duration of the Project (up to 2years).				
Impact Magnitude	Positive	Negligible	Small		Medium
	The impact magnitude is small.				
Receptor Sensitivity	Low		Medium		High
	The receptors are the workforce and are of medium.				
Impact Significance	Negligible		Minor		Moderate
	The significance is minor				

#### Additional Mitigation Measures

The impact is expected to be of **minor** significance; no additional mitigation measures are proposed.

#### Residual Impact Significance

Residual impacts would be expected to be of **minor** significance provided that recommended existing controls are implemented.

#### *Operational Phase*

The impacts during the operational phase will be similar to those discussed during construction of the Project. As such, the residual impact significance is expected to be **minor**.



*Construction Phase*Source of Impact

The Project Area is located in Palin Gyaing where there are two guesthouses. There are around 2 to 3 bungalows in each guesthouse and each bungalow can sleep two people. Of these guesthouses, there is one within 500 m of the Project Area which has 3 bungalows. The busiest time is during the Water Festival in April and the high season is from November to January and March to May.

The OSB and jetty could cause impacts to tourism from generation of air and noise emissions, exclusion from beach access and visual impacts. There is also the exclusion from the beach access from the physical presence of the jetty structure.

The guesthouse situated to the east for the jetty would have their access to Nan Thar Pu village restricted by the presence of the jetty and OSB.

The tourists also undertake boat trips, snorkelling, diving and beach visits around Goyangyi Island including the beach where the OSB will be located. Therefore, the presence of increased marine traffic could cause disturbance to tourism boat trips, snorkelling and diving.

Existing / In Place Control Measures

The Project will have a number of existing controls in place for air, noise and visual impacts provided in the sections below which will in turn also reduce the impact on tourism:

- Site hoarding along the Project Area boundary will be higher than the Project activities which may generate dust and fugitive emissions;
- Control of the height of unloading of fill materials during filling as far as possible. Where possible, this will be below the height of the hoarding around the Project Area boundary;
- Implementation of a regular and rigorous watering and sprinkling regime in particular during the dry season, for example, in the morning and in the afternoon, watering in area which has a lot of dust;
- Provision of a wheel washing facility at the exit of the Project Area to reduce the likelihood of dusty materials being deposited beyond the Project Area boundary;
- Regular maintenance of all diesel-powered equipment to reduce emissions of NO<sub>x</sub> and SO<sub>2</sub>;
- Switching off of machinery and equipment when it is not in operation;

- Application of dust suppression methods;
- Use of low sulphur fuels in heavy good vehicles and diesel powered equipment in collaboration with good management practices for construction phase;
- Use of alternative fuels and fuel mixes where possible;
- Only well-maintained equipment will be operated on-site;
- Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components will be conducted.
- Machines and construction plant items (e.g. trucks) that may be in intermittent use will be shut down or throttled down between work periods;
- The number of equipment operating simultaneously will be reduced as far as practicable;
- Equipment known to emit noise strongly in one direction will be orientated so that the noise is directed away from nearby sensitive receptors as far as practicable;
- Noise impacts from activities will be properly reduced by shielded by implementing control measures (e.g. erecting temporary noise barriers and deflectors) whenever applicable;
- Earthworks to form the final surfaces will be followed up with surface protection and drainage works to prevent erosion caused by rainstorms;
- Appropriate surface drainage will be designed and provided where necessary;
- Surface runoff from potential sources of contamination will be prevented;
- All drainage facilities and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms;
- M&AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimise impact to communities;
- Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds);
- Oil water separators and grease traps will be installed and maintained as

appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas, if any;

- The discharge point of treated sewage effluent to aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters;
- During the early stages of work, portable chemical toilets will be used prior to the construction of septic tanks or a temporary sewage treatment plant. During operation, septic tanks or a permanent sewage treatment plant will be provided;
- Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean;
- Footprint of the proposed OSB is minimised during the design stage and existing vegetation shall be retained as far as practicable;
- Landscape planting will be implemented by planting native tree species which are fast growing in nature;
- Construction activities will be restricted to works areas that will be clearly demarcated;
- Work site boundaries will be regularly checked to ensure that they are not breached and that damage does not occur to surrounding areas;
- Works areas in temporarily affected areas would be reinstated with tree/shrub planting after completion of the works, as far as practicable;
- A tunnel will be included in the design of the Project on the beach to ensure that local communities and other beach users can have full access to the beach;
- Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk of marine accidents;
- Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area;
- Any restricted areas will be appropriately marked on Notice to Mariners to ensure mariners are aware of any potential restrictions;
- The works area within construction supply vessels will operate will be

limited to ensure there is safe and efficient operation. M&AOSB will ensure that all construction vessels operate and are moored such that vessel traffic to and from Nga Yoke Kaung is not blocked and in areas agreed with the Port Authority as relevant;

- At least four weeks prior to construction activities, relevant authorities and stakeholders (i.e. local fishing and tourism operators, fishery/tourism associations, and local villagers) will be alerted to the final works area design as well as the construction programme and any specific restrictions;
- At least four weeks prior to commencement of construction activities a preliminary survey of obstructions e.g. fishing nets / traps, etc. in the survey area will be conducted; and
- All obstructions in the Project Area will be removed at least one week prior to commencement of construction activities.

#### Significance of Impacts

The impact magnitude is considered to be **moderate** with the existing controls in place. Receptor sensitivity is **medium** given that there is at least one guesthouse within 500 m of the Project Site. Therefore, the overall impact significance, with the existing controls in place, is considered to be of **moderate** significance (Table 6.35).

**Table 6.35** *Impacts to Tourism – Construction Phase*

Impact	Impacts on local tourism				
Impact Nature	Negative		Positive		Neutral
	Negative impacts from emissions and visual impacts				
Impact Type	Direct		Indirect		Induced
	Direct impact to tourism operators				
Impact Duration	Temporary	Short-term		Long-term	Permanent
	Long-term for length of Project.				
Impact Extent	Local		Regional		Global
	Impacts occur within the Project Area				
Impact Scale	Localised to 11.5 ha of Project Area (onshore) and the vessels / dredging equipment offshore and the immediate vicinity of the Project.				
Impact Frequency	For duration of Project.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The impact magnitude is medium.				
Receptor Sensitivity	Low		Medium		High
	The receptors are the tourism operators and are of mediums sensitivity.				
	Negligible	Minor		Moderate	Major

### Additional Mitigation Measures

The **moderate** impact significance for tourism is due to the physical presence of the jetty both offshore and on the beach. The following additional mitigation measures are proposed:

- M&AOSB should liaise with tourism operators to confirm the level of impact and whether there are any negative impacts on the guesthouses.
- Continual engagement will be undertaken with stakeholders to assess the impacts of restricted beach access.
- Community grievance mechanism will record the number of person raising grievances with regards to physical access to the beach. Should the number of persons requiring access to the beach be regular and significant, M&AOSB will consider options for allowing access for persons across the jetty.

### Residual Impact Significance

The residual impact significance from impacts to tourism is considered to be **moderate** significance.

### *Operational Phase*

### Source of Impact

The Project Area is located in Palin Gyaing where there are two guesthouses. There are around two to three bungalows in each guesthouse and each bungalow can sleep two people. Of these guesthouses, there is one within 500 m of the Project Area which has three bungalows. The busiest time is during the Water Festival in April and the high season is from November to January and March to May.

The OSB and jetty could cause impacts to tourism from generation of air and noise emissions, exclusion from beach access and visual impacts. There is also the exclusion from the beach access from the physical presence of the jetty structure.

The guesthouse situated to the east for the jetty would have their access to Nan Thar Pu village restricted by the presence of the jetty and OSB. Tourists also undertake boat trips, snorkelling, diving and beach visits around Goyangyi Island including the beach where the OSB will be located. Therefore, the presence of increased marine traffic could cause disturbance to tourism boat trips, snorkelling and diving.

### Existing / In Place Control Measures

The Project will have a number of existing controls in place:

- Site hoarding along the Project Area boundary will be higher than the Project activities which may generate dust and fugitive emissions;
- Implementation of a regular and rigorous watering and sprinkling regime in particular during the dry season, for example, in the morning and in the afternoon, watering in area which has a lot of dust;
- Provision of a wheel washing facility at the exit of the Project Area to reduce the likelihood of dusty materials being deposited beyond the Project Area boundary;
- Regular maintenance of all diesel-powered equipment to reduce emissions of NO<sub>x</sub> and SO<sub>2</sub>;
- Use of low sulphur fuels in heavy good vehicles and diesel powered equipment in collaboration with good management practices for construction phase;
- Use of alternative fuels and fuel mixes where possible;
- Only well-maintained equipment will be operated on-site;
- Appropriate surface drainage will be designed and provided where necessary;
- Surface runoff from potential sources of contamination will be prevented;
- All drainage facilities and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms;
- M&AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimise impact to communities;
- Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds);
- Oil water separators and grease traps will be installed and maintained as appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas, if any;
- The discharge point of treated sewage effluent to aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters;
- Septic tanks or a permanent sewage treatment plant will be provided;

- Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean;
- Landscape planting will be implemented by planting native tree species which are fast growing in nature;
- A tunnel will be included in the design of the Project on the beach to ensure that local communities and other beach users can have full access to the beach;
- Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk of marine accidents;
- Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area; and
- Any restricted areas will be appropriately marked on Notice to Mariners to ensure mariners are aware of any potential restrictions.

#### Significance of Impacts

Coastal changes from the presence of the jetty (sedimentation) could affect tourism. However, currently the beach on which the Project is located has limited tourism. There is only one guesthouse within 1 km of the Project location. Sedimentation would be on the other side of the jetty from the guesthouses. The coastal morphology would therefore not be impacted near the existing guesthouses. With all the existing controls and mitigation measures in place for coastal processes, the impact from the presence of the jetty is considered to be of small magnitude and would therefore be minor significance to tourism. Overall, the cumulative impact to tourism is considered to be **moderate** with the existing controls in place. Receptor sensitivity is **medium** given that there is at least one guesthouse within 500 m of the Project Site. Therefore, the overall impact significance, with the existing controls in place, is considered to be of **moderate** significance (Table 6.36).

**Table 6.36**      *Impacts to Tourism – Operational Phase*

Impact	Impacts on local tourism		
Impact Nature	Negative	Positive	Neutral
	Negative impacts from emissions and visual impacts		
Impact Type	Direct	Indirect	Induced



	Direct impact to tourism operators				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Long-term for length of Project.				
Impact Extent	Local		Regional	Global	
	Impacts occur within the Project Area				
Impact Scale	Localised to 11.5 ha of Project Area (onshore) and the vessels / dredging equipment offshore and the immediate vicinity of the Project.				
Impact Frequency	For duration of Project.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The impact magnitude is medium.				
Receptor Sensitivity	Low		Medium		High
	The receptors are the tourism operators and are of mediums sensitivity.				
Impact Significance	Negligible	Minor	Moderate		Major
	The significance is moderate.				

#### Additional Mitigation Measures

The **moderate** impact significance for tourism is due to the physical presence of the jetty both offshore and on the beach. The following additional mitigation measures are proposed:

- M&AOSB should liaise with tourism operators to confirm the level of impact and whether there are any negative impacts on the guesthouses.
- Continual engagement will be undertaken with stakeholders to assess the impacts of restricted beach access.
- Community grievance mechanism will record the number of person raising grievances with regards to physical access to the beach. Should the number of persons requiring access to the beach be regular and significant, M&AOSB will consider options for allowing access for persons across the jetty.

#### Residual Impact Significance

The residual impact significance from impacts to tourism is considered to be **moderate** significance.

### **6.4.15 Impacts from Waste Generation and Disposal on the Terrestrial and Marine Environment**

#### *Construction Phase*

#### Source of Impact

Activities during the construction of the Project will generate a variety of waste which can be categorized based on their nature and the options for

disposal, such as inert waste (inert wastes, scrap metals/metal off-cuts, wood, cardboard, paper and some plastics) and refusal (food residues, paper, used bottles and cans, packaging and broken furniture). The handling, storage, transport and disposal of these wastes has the potential to result in visual, water, dust, noise and general environmental fouling impacts in the event of inappropriate management procedures.

### **Inert Wastes**

It is unlikely that the disposal of inert wastes will pose any long-term negative impacts to the environment. Nevertheless, good management practice should be applied in terms of segregation of these wastes in similar nature and recycling whenever applicable.

### **General Refuse**

General refuse generated by construction and operation activities has the potential to lead to variety of foul impacts without proper housekeeping practices. These impacts involve malodour, littering, water quality impacts, visual nuisance, pests and scavenging animals along with diseases to the Project Site as well as local communities. The disposal of these types of waste at the site other than accredited landfills or subcontractor can lead to similar impacts at disposal locations.

Inappropriate disposal of non-hazardous wastes could lead to contamination of air, soil and water resources. Water quality impacts can be associated with poor storage of materials, poor handling and direct impacts of waste on water quality by littering on a nearby watercourse. Soil and ecological impacts are related with inappropriate dumping in sensitive areas and inadequate storage/coverage during transport resulting in windblown litter. In addition, secondary impacts on local community health are expected including usage of the water obtained from impacted water courses. The use of local waste management infrastructures could deteriorate the environmental service qualities due to malodour, vermin and pathogens. In addition, there are nuisance impacts related to the dust creation and impacts from the transport of wastes to disposal sites.

### Existing / In-place Controls

Impacts regarding wastes can be managed by good housekeeping practices for waste storage and handling supported by a comprehensive Waste Management Plan (WMP) which will be prepared by M&AOSB.

Construction materials will be managed in a way to avoid over-ordering, poor storage and maintenance, mishandling as well as improper operation procedures. Construction wastes will be separated into reusable items and materials to be disposed of or recycled whenever applicable. It will be conducted at the immediate working area to avoid loss/leakage and cross contamination during handling.

Segregated wastes will be temporarily stored at designated areas for reuse on site. In case of temporary piling is required, weather protection such as tarpaulin and earth bunds or sand bag barriers will be provided to prevent leachate from entering the drain and surround water bodies. Enclosed waste containers will be provided for general refuse and enclosed designated waste collection bin will be provided for all construction to prevent spillage and vermin.

Waste will be collected regularly by reputable waste collectors. Recyclables such as scrap steel and metal items will be collected by recycling companies where possible to maximized reuse of these items wherever possible.

#### Significance of Impact

The impact magnitude is considered **small** with proper implementation of mitigation measures. The resource/receptor sensitivity is considered **medium**. The impact significance is considered **minor** (Table 6.37).

**Table 6.37** *Impact Assessment for Waste – Construction Phase*

Impact	Waste management impacts.				
Impact Nature	Negative	Positive		Neutral	
	Environmental impact of waste generated from the Project is negative.				
Impact Type	Direct	Indirect		Induced	
	Environmental impact of waste is direct.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	Waste impacts would be temporary if wastes are disposed of at suitable facilities.				
Impact Extent	Local	Regional		International	
	Impacts will be localized if wastes are disposed of at suitable facilities.				
Impact Scale	Estimation of the size of the impact is small based on temporary and localized impact.				
Frequency	Throughout the construction period.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The magnitude of the impact is small based on the localized extent of impact and temporary impact duration.				
Resource/ Receptor Sensitivity	Low	Medium		High	
	The sensitivity of the communities near the Project Site is considered as low.				
Impact Significance	Negligible	Minor	Moderate	Major	
	With small impact magnitude and the low sensitivity of resource/receptor sensitivity, the impact significance is considered as negligible.				

#### Additional Mitigation Measures

No additional mitigation measures are recommended given the minor impact significance.

#### Residual Impacts

The residual impacts from waste storage and segregation are anticipated to be of **minor** significance.

#### *Operational Phase*

The expected impacts during operation are the same as construction and therefore the residual impact significance is expected to be **minor**.

### **6.4.16 Potential Impacts from Accidental Events**

#### *Construction & Operational Phase*

##### Sources of Impact

Accidental events/spills and dropped objects during construction and operation of the supply base and jetty have the potential to result in adverse impacts on the marine environment and survey personnel. These adverse impacts may occur from the following:

- Oil spill
- Vessel grounding/ collisions;
- Small releases of harmful substances (e.g., minor chemical spills or oil leaks from engines and oily materials);
- Large releases of harmful substances (e.g., spills from fuel tanks or hoses connected to vessels); and
- Loss of equipment.

#### **Oil Spill**

A well installation and arrangement of the hardware will practice and plan for adequate control to minimise the risk of oil spill will prepare, including:

- Standard Operating Procedures for handling / storage / transfer of oil tanks and related materials;
- Shipboard Oil Spill Emergency Plans (MARPOL requirement) for larger vessels;
- Bunding of fuel storage area;
- M&AOSB Supply Base Oil Spill Response Plan and associated response procedures / protection measures for oils spills;
- Fuel shall not be stored in underground tanks; and
- Fuel shall be transferred between vehicles and storage tanks on an impervious surface sloped to a collection structure.

#### **Vessel Grounding/ Collisions**

Marine casualties (collision/ grounding on shallow seabed/ reefs etc.) may potentially result in significant physical damage.

Physical impacts by vessels grounding on coral formations have the potential to cause damage to both the corals and the vessel. In the event that the corals damaged as a result of such events, associated damage may be severe in a localised area. Damaged corals may have the ability to repair themselves under certain conditions and corals sustaining physical damage often re-grow.

It is assumed for the purpose of this assessment that coral reefs are likely to be found in the Project Area. Whilst impacts to such organisms through vessel grounding / collision may be considered to be severe, such an event is considered extremely unlikely to occur as the survey vessel will not be operating or manoeuvring within close proximity to these sites.

### **Small Releases of Harmful Substances**

Discharge of oily wastes into the environment due to minor accidents (e.g. failure of spill containment systems, separation of fuel hoses during bunkering operations) or discharge of bilge water prior to treatment may have an impact on marine / fresh water quality and marine / terrestrial ecology.

The impact would depend on the type of oil released, the volume of oil, the location of the spill and the prevailing weather and tidal conditions.

Marine gas oil / diesel used by vessels would be expected to form a thin surface sheen on the surface of the sea upon release, and would evaporate rapidly in the warm waters surrounding the jetty.

Lubricating oils would be expected to form a visible sheen on surface waters, and would persist for longer periods of time than the more volatile hydrocarbons.

Heavier oils accidentally released would be predicted to be more persistent and may eventually wash-up on coastlines as weathered tar balls which can have localised impacts on coastal habitats and species.

A proper maintenance and inspection plan for pipelines will be implemented with hydrostatic testing and integrity testing of pipelines. The only leakages that may occur are during disconnection of hoses. This will be conducted in a confined bunded area which would be a very limited spill. Spill kits (absorbers) will be available to recover any spillages.

Although dependent on the extent and location of the release, a small hydrocarbon spill would generally be predicted to have minor impacts. Such impacts are also considered to be unlikely to occur.

### **Offshore Spills**

The effects of a large release of marine gas oil/ diesel as a result of vessel grounding, collision or other major accident will depend on the quantity of

hydrocarbons released, the location of the release and the prevailing weather/oceanographic conditions. In sensitive areas the impact could be moderate with injury to marine mammals and injury and mortality to marine invertebrates and fish predicted to result. However, upon release, marine gas oil and diesel would quickly disperse and evaporate rapidly. Impact to coastlines is thus unlikely to occur.

In the event of an oil or chemical spill from one of those vessels, an Oil Spill Response Plan (to be prepared by M&AOSB) will be initiated immediately to contain and clean up the spill and prevent its spread. Residual impacts are considered to be minor.

### **Loss of Equipment**

Any equipment lost overboard may foul or create obstructions on the seabed, may damage associated marine organisms and may act as a future source of pollution. Any materials or equipment lost overboard will be recovered wherever practicable. In general, however, losses of this nature are predicted to have a minor impact.

### **Existing / In-place Controls**

A range of management and hardware controls will be in place to minimise the risk of collisions and spillages, including:

- Standard Operating Procedures for handling / storage / transfer of hazardous materials;
- Shipboard Oil Spill Emergency Plans (MARPOL requirement) for larger vessels;
- Bunding of fuel storage area;
- M&AOSB Supply Base Oil Spill Response Plan and associated response procedures / protection measures for oils spills;
- Secondary containment, constructed of impervious and chemically resistant material, shall be provided that is capable of containing the larger 110% of the largest tank or 25% of the combined tank volumes;
- Fuel shall not be stored in underground tanks; and
- Fuel shall be transferred between vehicles and storage tanks on an impervious surface sloped to a collection structure.

### **Significance of Impacts**

Provided that the above measures are followed, the impact is ranked as of **minor** significance (*Table 6.38*).

**Table 6.38 Impacts from Accidental Events – Construction & Operational Phase**

Impact	Accidental events/spills and dropped objects during construction and operation of the supply base and jetty				
Impact Nature	Negative	Positive		Neutral	
	Accidental events such as spills, leaks and dropped objects would be considered to be a negative impact. Accidental events/spills and dropped objects may impact ecological resources, and / or water quality or create a physical hazard to other land / marine users.				
Impact Type	Direct	Indirect		Induced	
	Impacts would be considered to be direct due to originating from either the supply base or vessels using the jetty				
Impact Duration	Temporary	Short-term	Long-term		Permanent
	With the correct mitigation measures in place, i.e. clean up, impacts would be considered to be short term.				
Impact Extent	Local	Regional		International	
	Impacts would be limited to the area of the spill				
Impact Scale	Estimation of the size of the impact is small based on temporary and localized impact with the existing control measures in place to reduce extent of the spill.				
Frequency	Throughout the construction period.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Impact severity is considered to be low as receptors are located at sufficient distance from the survey area to be unlikely to be directly affected by operations. However, noting the sensitivity of receptors, severity is considered to be low rather than slight.				
Likelihood	Unlikely (The event is unlikely but may occur at some time during normal operating conditions, i.e. the event has occurred within industry)				
Resource/ Receptor Sensitivity	Low	Medium		High	
	Depending on the limited nature of the potential spills and low likelihood, the extent of the damage may be wide and as it is known marine mammals, coral reefs, turtle nesting beaches a, the receptor sensitivity is considered to be <b>medium</b> .				
Impact Significance	Negligible	Minor	Moderate		Major
	With small impact magnitude, low likelihood and the medium sensitivity of resource/receptor sensitivity, the impact significance is considered as negligible.				

#### Additional Mitigation Measures, Management and Monitoring

The assessment has indicated that impacts due to accidental events / spills are expected to be **minor**; hence no additional mitigation or monitoring activities are considered necessary over and above the existing or in-place controls.

#### Residual Impact Significance

Residual impacts would be expected to be of **minor** significance.

#### **6.4.17 Summary of Impacts**

A summary of the potential impacts, the impact significance and the proposed mitigation is provided in *Table 6.39*. It should be noted that not all mitigation



measures are shown in this table. A full list of commitments is provided in the EMP.

**Table 6.39 Impact Summary Table – for both Construction and Operational Phases**

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
Dust and emissions and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>Site hoarding along the Project Area boundary.</li> <li>Control the height of unloading of fill materials.</li> <li>Regularly maintain all diesel-powered equipment to reduce emissions of NO<sub>x</sub> and SO<sub>2</sub>.</li> <li>Apply dust suppression methods.</li> <li>Use alternative fuels and fuel mixes where possible.</li> </ul>	Minor	Minor	Minor	Minor
Increase in ambient noise levels and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>Only well-maintained equipment should be operated on-site.</li> <li>Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components should be conducted.</li> </ul>	Minor	Minor	Minor	Minor
Visual impacts for local communities	<ul style="list-style-type: none"> <li>Erect fencing between Zin Yaw Chaung and the OSB to reduce visual impacts. The hoarding shall be of sufficient height to ensure that there is no direct line of sight between the OSB and Zin Yaw Chaung.</li> <li>A Traffic Management Plan will be developed.</li> </ul>	Moderate	Minor to Moderate	Moderate	Minor to Moderate
Physical presence of jetty altering coastal processes	<ul style="list-style-type: none"> <li>A coastal erosion study has been conducted separately to this EIA by Royal Haskoning. The findings of this study are that erosion would be expected to be minor.</li> </ul>	Not significant	Not Significant	Minor	Minor
Impact to water quality & resources	<ul style="list-style-type: none"> <li>Appropriate surface drainage will be designed and provided where necessary.</li> <li>Surface runoff from potential sources of contamination will be prevented.</li> <li>M&amp;AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimise impact to communities</li> <li>Runoff from areas without potential sources of contamination will be</li> </ul>	Minor	Minor	Minor	Minor

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
	minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds).				
Smothering and marine habitat loss and reduction in water quality from dredging	<ul style="list-style-type: none"> <li>Minimise size of footprint on seabed.</li> <li>Avoid construction in sensitive habitats (e.g. coral reefs).</li> <li>Silt curtains and alternative methods will be deployed during dredging of the navigation channel to reduce the levels of suspended solids that could reach to nearby sensitive receivers.</li> </ul>	Minor (habitats)	Minor (habitats)	Minor (habitats)	Minor (habitats)
		Moderate (corals)	Moderate (corals)	Moderate (corals)	Moderate (corals)
		Minor (water quality)	Minor (water quality)	Minor (water quality)	Minor (water quality)
Entrainment / impingement from reverse osmosis system on marine organisms	<ul style="list-style-type: none"> <li>Use of modern surface water intake system / sub-surface intake system; and</li> <li>Locating the discharge in an area away from productive coastal habitats (such as coral or seagrass).</li> </ul>	N/A	N/A	Minor	Minor
Loss of beach habitat and disturbance to nesting behaviour	<ul style="list-style-type: none"> <li>The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.</li> <li>Minimising lighting to that which is absolutely necessary for the construction / operation area.</li> <li>No illegal gathering of eggs by contractors.</li> </ul>	Moderate	Minor	Moderate	Minor
Disturbance to marine fauna	<ul style="list-style-type: none"> <li>Pilling and associated machinery will be properly maintained for well-functioning and operating that will not severely impact.</li> <li>An exclusion zone of 500 m radius will be established around the construction site for marine mammals and turtles during piling.</li> </ul>	Minor (fish)	Minor (fish)	Not significant	Not Significant
		Moderate (sea turtles and marine)	Moderate (sea turtles and marine)		

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
		mammals)	mammals)		
Terrestrial habitat loss	<ul style="list-style-type: none"> <li>Footprint of the proposed OSB is minimised during the design stage and existing vegetation shall be retained as far as practicable.</li> <li>Landscape planting will be implemented by planting native tree species which are fast growing in nature.</li> <li>Construction activities will be restricted to works areas that will be clearly demarcated.</li> </ul>	Minor	Minor	Minor	Minor
Community health and safety. Increased risk of accidents, security issues	<ul style="list-style-type: none"> <li>There will be a perimeter wall around the premises to stop anyone trespassing onto the site.</li> <li>M&amp;AOSB will also provide navigation guidance to all vessels in line with Myanmar national requirements.</li> <li>As discussed in other sections on vessel movements, M&amp;AOSB will provide regular communications to fishermen on vessel movements as required.</li> <li>Community grievances in relation to the conduct of security personnel and safety issues or activities should be addressed in accordance with the Project's established Grievance Procedure.</li> <li>The Project will employ 70% Myanmar national sot work on the construction phase.</li> <li>As part of the stakeholder engagement activities, communities in the vicinity of the OSB should be informed about the risks and consequences of trespassing. Such engagement should start prior to the start of construction activities.</li> <li>Once traffic routes to the site are known, a Traffic Management Plan should be developed by M&amp;AOSB. The Traffic Management Plan should be developed to indicate the traffic routes to be followed and speed limit to be complied with in order to reduce risk to the local communities.</li> <li>There should also be an enforcement of a speed limit for vehicles related to construction activities of the Project. During the construction phase, a speed limit of 40km/h shall be enforced.</li> </ul>	Moderate	Minor	Moderate	Minor

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
Livelihoods and economy. Job creation, fishing impacts	<ul style="list-style-type: none"> <li>A tunnel will be created on the beach to allow access to local communities.</li> <li>Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk or marine accidents.</li> <li>Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area.</li> <li>At least four weeks prior to construction activities, relevant authorities and stakeholders (i.e. local fishing and tourism operators, fishery/tourism associations, and local villagers) will be alerted to the final works area design as well as the construction programme and any specific restrictions.</li> </ul>	Positive (job creation)	Positive (job creation)	Positive (job creation)	Positive (job creation)
		Moderate (fishing)	Moderate (fishing)	Moderate (fishing)	Moderate (fishing)
		Minor (livelihoods)	Minor (livelihoods)	Minor (livelihoods)	Minor (livelihoods)
Occupational health and safety. Risk of fatality or injury to workers	<ul style="list-style-type: none"> <li>The Project will design an occupational health and safety management plan which will be a subset of the overall EMP system, tailored to the needs of the project.</li> <li>The Project will create and implement a health and safety management system for the project.</li> </ul>	Minor	Minor	Minor	Minor
Impacts to tourism from air and noise nuisance and restriction of access to beach	<ul style="list-style-type: none"> <li>Mitigation measures provided in above sections.</li> </ul>	Moderate	Moderate	Moderate	Moderate
Impact to people and environment from waste discharge and disposal	<ul style="list-style-type: none"> <li>Impacts regarding wastes can be managed by good housekeeping practices for waste storage and handling supported by a comprehensive waste management plan (WMP) which will be prepared by M&amp;AOSB.</li> <li>Construction materials will be managed in a way to avoid over-ordering, poor storage and maintenance, mishandling as well as improper operation procedures.</li> </ul>	Minor	Minor	Minor	Minor

Potential Impacts	Proposed Mitigation Measures	Construction Phase		Operational Phase	
		Impact Significance (pre-mitigation)	Residual Impact significance	Impact Significance (pre-mitigation)	Residual Impact significance
	<ul style="list-style-type: none"> <li>Segregated wastes will be temporarily stored at designated areas for reuse on site.</li> <li>Waste will be collected regularly.</li> </ul>				
Impact from spill and leaks	<ul style="list-style-type: none"> <li>Standard Operating Procedures for handling / storage / transfer of hazardous materials;</li> <li>Bunding of fuel storage area;</li> <li>Shipboard Oil Spill Emergency Plans (MARPOL requirement) for larger vessels;</li> <li>M&amp;AOSB Supply Base Oil Spill Response Plan and associated response procedures / protection measures for oils spills.</li> <li>The Emergency Response Plan will be provided to ECD prior to construction.</li> <li>Secondary containment, constructed of impervious and chemically resistant material, shall be provided that is capable of containing the larger 110% of the largest tank or 25% of the combined tank volumes.</li> <li>Fuel shall not be stored in underground tanks.</li> <li>Fuel shall be transferred between vehicles and storage tanks on an impervious surface sloped to a collection structure.</li> </ul>	Minor	Minor	Minor	Minor

This section presents the Cumulative Impact Assessment (CIA) which includes identification of existing and/or potential Projects or activities which could cause cumulative impacts, the impact assessment methodology, and, recommendations for the mitigation measures, if required.

Cumulative impacts refer to the additional impacts that may be generated by other developments or activities in the vicinity of the OSB that when added to the impacts of the proposed Project combine to cause a greater impact. Such impacts may arise due to spatial overlap (e.g. overlap in spatial extent of water quality changes) or temporal overlap (e.g. underwater sound impacts caused by piling activities at the same time from different sources).

### **7.1 IMPACT ASSESSMENT METHODOLOGY**

The methodology adopted for the CIA is the same as the methodology presented in *Section 6*. Receptors are given the same sensitivity; however, impact magnitude will consider the cumulative effect from the Project and the other projects / activities under consideration. The methodology adopted is presented in *Section 6.1*.

A CIA considers the residual impacts reported for the Project and evaluates these alongside potential impacts from other projects/activities that may affect common resources and receptors. The ultimate goal of this analysis is to capture the total effects of many actions over time that would be missed by evaluating each action individually.

The CIA will also define the geographic and temporal boundaries to identify other relevant projects or activities, which could interact with the Project. The cumulative assessment will be the same as the impact assessment process and once the initial impact assessment is performed, mitigation and management measures will be developed for all significant impacts and the residual impact will be calculated for each relevant receptor.

### **7.2 EXISTING OR PROPOSED PROJECTS AND ACTIVITIES IN THE AREA OF INFLUENCE**

Currently there are no existing Projects within the Area of Influence (5 km from the Project). However there are offshore Oil and Gas Projects (seismic surveys and exploration drilling) planned for the Oil and Gas Blocks offshore Nga Yoke Kaung and for another Offshore Supply Base to be built in this area. These projects will include the following impacts:

- Increases in ambient underwater noise;
- Discharges to sea of wastes and cuttings;
- Increased vessel movements.



The OSB is to be developed to support these future drilling operations and therefore it is highly likely that these activities will occur at the same time.

It is unlikely that the two OSBs will go ahead; one will likely be selected by MOGE over the other. However, for the purposes of this assessment it has been assumed that both OSBs will be built.

### 7.3 *POTENTIAL IMPACTS AND MITIGATION*

Each of the factors identified in the development specific impact assessment has been considered:

- Physical presence.
- Underwater noise.
- Emissions.
- Unplanned spills.

#### 7.3.1 *Physical Presence*

Vessel movements are anticipated to occur during the proposed Project, as well as for the offshore oil and gas operations and the neighbouring OSB. Movements could occur in coastal waters where there are a number of local fishing vessels. Therefore, any increases in vessels movements will be noticeable. It is expected that the potential cumulative impacts on fishing or shipping, if properly mitigated, will be localised and the impact will be of **moderate** significance overall.

#### 7.3.2 *Underwater Noise*

Underwater noise generated by piling will be of limited to the duration of the jetty construction only. From oil and gas operations, noise will be temporary from seismic operations as well as permanent, to a lesser extent, from drilling. Secondary data indicates that underwater noise emissions, similar to those experienced by the proposed Project, will only lead to disturbance a few kilometres from the noise source. However, it is highly likely that the OSB or oil and gas operations will not occur within 5 km of the Project. Therefore, given that the area of impact for the proposed Project activities is small, and the short and non-continuous duration, the resulting cumulative impacts is considered to be of **minor** significance. M&AOSB will liaise with the offshore operators and the operators of the OSB to aim to reduce any cumulative impacts.

#### 7.3.3 *Emissions*

Air emissions from offshore oil and gas projects would be limited in extent and unlikely to impact the coastline and the sensitive receptors. OSB developments would be similar to this Project. Therefore, as the extent of emission impacts is limited to a few kilometres around the Project Site, there is

unlikely to be any overlap and cumulative effects are not anticipated to local communities.

#### **7.3.4**      ***Unplanned Spills***

The risk of cumulative impact of spills from proposed Project activities is low as large scale events are extremely rare. Each developer and operator is required to have in place Emergency Response Plans. Given the highly unlikely nature of simultaneous spills, and the implementation of standard mitigation measures, impacts would be expected to be of **minor** significance.

### 8.1 DESCRIPTION OF THE PROJECT

Myint & Associates Offshore Supply Base Ltd. (M&AOSB) is proposing to construct an Offshore Supply Base near Nga Yoke Kaung Bay in Ayeyarwady Region, which is located approximately 40 km south of the town of Ngwe Saung. The facilities will initially include a jetty with a platform of about 0.6 ha and a main onshore base of about 11.5 ha (28.5 acres). There is currently no infrastructure at the proposed Project. The nearest road lies ~ 25 km to the east. Detailed information on the Project is provided in *Section 4*.

### 8.2 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

Under *Section 7* of the *Environmental Conservation Law* and *Articles 52 and 53* of the *Environmental Conservation Rules* of the Republic of the Union of Myanmar, M&AOSB is required to undertake an EIA to obtain an Environmental Compliance Certificate (ECC) for the proposed Project.

The Project will be undertaken in line with a number of national and local standards and laws. Local laws relating to EIA include: Environmental Conservation Law (2012); Environmental Conservation Rules (2014); National Environmental Quality (Emission) Guidelines (2015); and Environmental Impact Assessment Procedure (2015). A full list of laws and their relevance to the Project is provided in *Section 3*.

With the release of the final Myanmar EIA Procedure in December 2015, the National Environmental Quality (Emissions) Guidelines were also released. These Guidelines provide the basis for regulation and control of noise and air emissions and effluent discharges from projects in order to prevent pollution and protect the environment and public health. These standards are noted to be based on the standards as recommended by the IFC General EHS Guidelines and recently released sector specific guidelines for Ports(2007 & 2015) (IFC, 2007 & IFC, 2017) and World Bank Group EHS Guidelines for Ports, Harbours, and Terminals (2017).

### 8.3 SUMMARY OF IMPACTS AND MITIGATION MEASURES

The EIA has assessed the potential impacts and proposed mitigation to reduce the level of the impact. The EIA concluded that potential impacts are typically short term and are well understood, with moderate to negligible impacts.

Through the Project development and the EIA process, M&AOSB has made commitments to ensure appropriate environmental and social performance. A summary of the Project impacts and the committed measures designed to manage and mitigate those impacts is presented in *Table 6.39*. The schedule

and responsibility for implementation of these mitigation measures are identified as necessary.

#### **8.4 OVERALL BUDGET FOR EMP**

The budget for undertaking the commitments of the EIA is estimated to be around 300,000 to 2,000,000 USD.

#### **8.5 MANAGEMENT PLANS**

The detailed list of commitments from the Project is provided in *Table 8.1*. The monitoring measures are provided in *Table 8.2*.

**Table 8.1**      *Environmental Management Plan*

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
<b>Construction Phase</b>								
C.1.1	Ambient Air Quality	<p>Earthworks associated with the preparing and establishing the proposed Project Site for construction.</p> <p>Transportation of materials to the construction sites by truck.</p> <p>Stockpiling of construction materials.</p>	Dust and emissions and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>• Site hoarding along the Project Area boundary higher than the Project activities, which may generate dust and fugitive emissions.</li> <li>• Control the height of unloading of fill materials during filling as far as possible. Where possible, this should be below the height of the hoarding around the Project Area boundary.</li> <li>• Totally enclose any skip hoist for material transport with impervious sheeting.</li> <li>• Provide material handling sources such as conveyors and bins with similar measures that also have control equipment such as covers or water sprays.</li> <li>• Implement a regular and rigorous watering and sprinkling regime in particular during the dry season, for example, in the morning and in the afternoon, watering in area, which has a lot of dust.</li> </ul>	Construction Phase	<p>M&amp;AOSB</p> <p>3<sup>rd</sup> Party Environmental Consultant for monitoring &amp; audit</p>	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
		Material transfer.		<ul style="list-style-type: none"> <li>• Provide a wheel washing facility at the exit of the Project Area to reduce the likelihood of dusty materials being deposited beyond the Project Area boundary.</li> <li>• Regularly maintain all diesel-powered equipment to reduce emissions of NOx and SO2.</li> <li>• Switch off machinery and equipment when it is not in operation.</li> <li>• Apply dust suppression methods.</li> <li>• Use low sulphur fuels in heavy good vehicles and diesel powered equipment in collaboration with best management practices for construction phase.</li> <li>• Use alternative fuels and fuel mixes where possible</li> </ul>				
C.2.1	Ambient Noise	Overall construction activities including heavy machinery operations for construction works.	Increase in ambient noise levels and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>• Only well-maintained equipment should be operated on-site.</li> <li>• Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components should be conducted.</li> <li>• Machines and construction plant items (e.g. trucks) that may be in intermittent use should be shut down or throttled down between</li> </ul>	Construction Phase	M&AOSB  3rd Party Environmental Consultant for monitoring & audit	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>work periods.</p> <ul style="list-style-type: none"> <li>The number of equipment operating simultaneously should be reduced as far as practicable.</li> <li>Equipment known to emit noise strongly in one direction should be orientated so that the noise is directed away from nearby sensitive receptors as far as practicable.</li> <li>Noise impacts from activities should be properly reduced by shielded by implementing control measures (e.g. erecting temporary noise barriers and deflectors) whenever applicable.</li> <li>Material stockpiles and other structures should be utilised, where practicable, to screen noise from on-site construction activities.</li> </ul>				
C.3.1	Landscape and Visual	OSB and permanent structures	Visual impacts for local communities	<ul style="list-style-type: none"> <li>Erect fencing between Zin Yaw Chaung and the OSB to reduce visual impacts. The hoarding shall be of sufficient height to ensure that there is no direct line of sight between the OSB and Zin Yaw Chaung.</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Report



No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
C.4.1	Water Quality & Resources	Discharge of wastewater and runoff from Project Site near the coast	Impact to surface and ground water quality	<ul style="list-style-type: none"> <li>• Earthworks to form the final surfaces will be followed up with surface protection and drainage works to prevent erosion caused by rainstorms;</li> <li>• Appropriate surface drainage will be designed and provided where necessary;</li> <li>• Surface runoff from potential sources of contamination will be prevented;</li> <li>• During the early stages of work, portable chemical toilets will be used prior to the construction of septic tanks or a temporary sewage treatment plant;</li> <li>• Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to the either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean.</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
C4.2	Water Quality & Resources	Discharge of wastewater and runoff from Project Site near the coast	Impact to marine water quality	<ul style="list-style-type: none"> <li>Earthworks to form the final surfaces will be followed up with surface protection and drainage works to prevent erosion caused by rainstorms;</li> <li>Appropriate surface drainage will be designed and provided where necessary;</li> <li>Surface runoff from potential sources of contamination will be prevented;</li> <li>During the early stages of work, portable chemical toilets will be used prior to the construction of septic tanks or a temporary sewage treatment plant.</li> <li>Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to the either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean.</li> <li>The Ballast water discharge will</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>be managed by International Convention for the Control and Management of Ships' Ballast Water (BWM) and lead to prevent the spread of harmful aquatic organisms from one region to another and to implement the BWM requirements and supplemental BWM practices. However, everything will come by local Myanmar vessels from Yangon so no possibility of foreign invasive species.</p> <ul style="list-style-type: none"> <li>Only a small portion of non-suitable materials (silts) will be taken away by a ship to a Myanmar Port Authority (MPA) approved disposal area. The disposal site has not yet been selected. This location will be selected in accordance with the requirements from MPA and details will be provided to ECD prior to construction.</li> </ul>				
C.5.1	Marine Habitats	Construction of jetty	Smothering and habitat loss	<ul style="list-style-type: none"> <li>Minimise size of footprint on seabed.</li> <li>Avoid construction in sensitive habitats (e.g. coral reefs).</li> <li>Silt curtains and alternative methods will be deployed during</li> </ul>	Construction Phase	M&AO SB  3 <sup>rd</sup> Party Environmental Consultant for	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>dredging of the navigation channel to reduce the levels of suspended solids that could affect nearby sensitive receivers.</p> <ul style="list-style-type: none"> <li>• Closed grab dredgers or suction dredgers with silt curtains and alternative methods should be used to reduce the potential for leakage of sediments;</li> <li>• Disposal barges will be fitted with tight bottom seals in order to prevent leakage of material during transport;</li> <li>• When the dredged material has been unloaded at the disposal areas, remove any material that has accumulated on the deck or other exposed parts of the vessel and place in the hold or a hopper. Do not wash decks clean in a way that permits material to be released overboard; and</li> <li>• The contractor(s) will ensure that the works cause no visible foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the area of marine works.</li> <li>• M&amp;AOSB will prepare a disposal plan that will be submitted to and</li> </ul>		monitoring & audit		

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				approved by MPA prior to construction. This disposal plan will also be provided to ECD.				
C.6.1	Marine Turtles	Physical presence of jetty and OSB	Loss of beach habitat and disturbance to nesting behaviour	<ul style="list-style-type: none"> <li>The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.</li> <li>Minimising lighting to that which is necessary for the construction area.</li> <li>Where night-time work is needed, or for night-time facilities, lighting mitigations measures should be employed including:</li> <li>Minimizing lighting to that which is absolutely necessary for the construction area</li> <li>Light dispersion should be limited/ mitigated by the design of the lighting equipment with the aim to minimize disturbance by avoiding intense illumination and night time lighting glare</li> <li>Use directional lighting rather than diffuse lighting as far as practicable</li> <li>During the installation and construction phase, to minimize the potential for entanglement</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>and stranding of turtles in the work site through good site practices:</p> <ul style="list-style-type: none"> <li>• Place equipment or stockpiles in designated works areas and minimize the placement of stockpiles on the beach and backshore.</li> <li>• Restrict construction activities to works areas that should be clearly demarcated. Where practicable, reinstate the works areas after completion of the works.</li> <li>• Include the provision that no company/contractor employees are to collect or have involvement in the collection of turtle eggs in contractual documents;</li> <li>• The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.</li> <li>• Liaison with the responsible Ministry or Government body is recommended to define procedures in the event of discovery of a nest on the works site.</li> </ul>				

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
C.7.1	Underwater Noise	Generation of noise from piling	Disturbance to marine fauna	<ul style="list-style-type: none"> <li>Piling and associated machinery will be properly maintained for well-functioning and operating that will not severely impact;</li> <li>Piles will be carefully aligned with hammer for correct contact;</li> <li>An exclusion zone of 500 m radius will be established around the construction site. If a marine mammal or a sea turtle is observed in the exclusion zone during piling, the activity will be delayed until they have left the area. This measure will ensure the vicinity is clear of marine mammals and sea turtles prior to the commencement of works and will serve to reduce any disturbance to marine mammals and sea turtles as well as physical harm from placement of quarry rock, etc.; and</li> <li>A marine mammal observer will be utilised during piling.</li> <li>When a marine mammal or a sea turtle is spotted within the exclusion zone during piling, piling works will cease and will not resume until the observer confirms that the zone has been</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	N/A



No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				continuously clear of the marine mammal or sea turtle for a period of 30 minutes. This measure will ensure the area near the piling is clear of the marine mammal or sea turtle during works and will serve to reduce any disturbance to marine mammals or sea turtles.				
C.8.1	Terrestrial Flora and Fauna	Construction of OSB	Habitat loss	<ul style="list-style-type: none"> <li>• Footprint of the proposed OSB is minimised during the design stage and existing vegetation shall be retained as far as practicable.</li> <li>• Landscape planting will be implemented by planting native tree species, which are fast growing in nature.</li> <li>• Construction activities will be restricted to works areas that will be clearly demarcated.</li> <li>• Work site boundaries will be regularly checked to ensure that they are not breached and that damage does not occur to surrounding areas.</li> <li>• Works areas in temporarily affected areas would be reinstated with tree/shrub planting after completion of the works, as far as practicable.</li> <li>• The amount of trees to be</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	N/A

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				removed is not yet currently know. This information will be provided to ECD in the Environmental Monitoring Report.				
C.9.1	Community H&S	Construction activities and traffic	Increased risk of accidents, security issues.	<ul style="list-style-type: none"> <li>There will be a perimeter wall around the premises to stop anyone trespassing onto the site.</li> <li>M&amp;AOSB will also provide navigation guidance to all vessels in line with Myanmar national requirements.</li> <li>As discussed in other sections on vessel movements, M&amp;AOSB will provide regular communications to fishermen on vessel movements as required.</li> <li>M&amp;A will undertake local engagement prior to construction to analyse the local education level and potential job opportunities.</li> <li>The Project will employ 70% Myanmar national sot work on the construction phase.</li> <li>Once traffic routes to the site are known, a Traffic Management Plan should be developed by M&amp;AOSB. The Traffic Management Plan should be</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Plan

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>developed to indicate the traffic routes to be followed and speed limit to be complied with in order to reduce risk to the local communities.</p> <ul style="list-style-type: none"> <li>Enforcement of a speed limit for vehicles related to construction activities of the Project. During the construction phase, a speed limit of 40km/h shall be enforced.</li> </ul>				
C.10.1	Livelihoods and Economy	Construction activities	Job creation, fishing impacts	<ul style="list-style-type: none"> <li>Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk of marine accidents;</li> <li>Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area;</li> <li>Any restricted areas will be appropriately marked on Notice to Mariners to ensure mariners are aware of any potential restrictions;</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	N/A

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<ul style="list-style-type: none"> <li>The ship route and number of vessels will be included in Notice to Mariners which will be issued to local fishermen prior to construction;</li> <li>The works area within which construction supply vessels will operate will be limited to ensure there is safe and efficient operation. M&amp;AOSB will ensure that all construction vessels operate and are moored such that vessel traffic to and from Nga Yoke Kaung is not blocked and in areas agreed with the Port Authority as relevant;</li> <li>At least four weeks prior to construction activities, relevant authorities and stakeholders (i.e. local fishing and tourism operators, fishery/tourism associations, and local villagers) will be alerted to the final works area design as well as the construction programme and any specific restrictions;</li> <li>At least four weeks prior to commencement of construction activities a preliminary survey of obstructions e.g. fishing nets /</li> </ul>				

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>traps, etc. in the survey area will be conducted; and</p> <ul style="list-style-type: none"> <li>Remove all obstructions in the project area at least one week prior to commencement of construction activities.</li> <li>Navigation buoys and equipment along the approach channel to the jetty will be installed as per guidance by Myanmar Port Authority to prevent interaction with fishing boats.</li> <li>Local community leaders and head of fishermen group will be informed six hours in advance before entering the supply vessels.</li> <li>The fishing vessels along the approach channel in advance will be informed by using work boat.</li> </ul>				
C.11.1	Occupational H&S	Activities during construction	Risk of fatality or injury to workers	<ul style="list-style-type: none"> <li>The Project will design an occupational health and safety management plan, which will be a subset of the overall EMP system, tailored to the needs of the project. This plan will set standards that will be met by all contractors and subcontractors.</li> <li>The Project will create and implement a health and safety</li> </ul>	Construction and Operational Phase	M&AOSB	On site Project Management team and designated EHS team	Safety Records

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>management system for the project. It will include mandatory health and safety training courses for M&amp;AOSB workers and contractors, including handling of hazardous material. This training will take place prior to work starting on construction and operation. Training course attendance will be recorded and monitored by the Project.</p> <ul style="list-style-type: none"> <li>• All staff will have medical check-ups prior to commencing work.</li> <li>• The full OH&amp;S Plan that will be prepared prior to construction, will be updated to include procedures for evacuation in emergencies, checkups for workers and how to minimise diseases brought in by workers in compliance with relevant national legislation.</li> </ul>				
C.12.1	Tourism	Construction and presence of OSB and jetty	Impacts from air and noise nuisance and restriction of access to beach	<ul style="list-style-type: none"> <li>• Mitigation measures provided in above sections.</li> <li>• M&amp;AOSB should continually liaise with tourism operators.</li> </ul>	Construction Phase	M&AOSB	On site Project Management	-

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
C.13.1	Waste (Solid) (liquid waste is discussed under water quality)	Construction and operation of OSB and jetty & accommodation	Impact to people and environment from waste discharge and disposal	<ul style="list-style-type: none"> <li>Impacts regarding wastes can be managed by good housekeeping practices for waste storage and handling supported by a comprehensive waste management plan (WMP) which will be prepared by M&amp;AOB.</li> <li>Construction materials will be managed in a way to avoid over-ordering, poor storage and maintenance, mishandling as well as improper operation procedures. Construction wastes will be separated into reusable items and materials to be disposed of or recycled whenever applicable. It will be conducted at the immediate working area to avoid loss/leakage and cross contamination during handling.</li> <li>Segregated wastes will be temporarily stored at designated areas for reuse on site. In case of temporary piling is required, weather protection such as tarpaulin and earth bunds or sand bag barriers will be provided to prevent leachate from entering the drain and surround water bodies. Enclosed waste containers will be</li> </ul>	Construction Phase	M&AOB	On site Project Management team and designated EHS team	Environmental Monitoring Report



No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>provided for general refuse and enclosed designated waste collection bin will be provided for all construction to prevent spillage and vermin.</p> <ul style="list-style-type: none"> <li>Waste will be collected regularly. Recyclables such as scrap steel and metal items will be collected by recycling companies where possible to maximized reuse of these items wherever possible.</li> </ul>				
C.14.1	Accidental events	Construction activities and vessels	Impact from spill and leaks	<ul style="list-style-type: none"> <li>Standard Operating Procedures for handling / storage / transfer of hazardous materials;</li> <li>Shipboard Oil Spill Emergency Plans (MARPOL requirement) for larger vessels;</li> <li>M&amp;AOSB Supply Base Emergency Response Plan and associated response procedures / protection measures for oils spills.</li> <li>The Emergency Response Plan will be provided to ECD prior to construction.</li> <li>Secondary containment, constructed of impervious and chemically resistant material, shall be provided that is capable of containing the larger 110% of the largest tank or 25% of the</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	N/A

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<ul style="list-style-type: none"> <li>combined tank volumes.</li> <li>Fuel shall not be stored in underground tanks.</li> <li>Fuel shall be transferred between vehicles and storage tanks on an impervious surface sloped to a collection structure.</li> <li>M&amp;AOSB will follow the guidance of the MPA in cases of vessel collision with marine mammals/turtles or fishing boats.</li> <li>M&amp;AOSB will install the required signage within the supply base facilities. The vessels, which are managed by others, will be in accordance with the local and international rules and regulations, and Classification requirements. M&amp;AOSB will ensure vessels calling our port have valid certifications.</li> </ul>				
C.15.1	Cultural Heritage	Onshore construction	Impact on cultural heritage	<ul style="list-style-type: none"> <li>During the construction stage, if there finds unexpected ancient monuments, M&amp;A will inform the Ayeyarwady divisional office of Archaeology and National Museum through the village head.</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	N/A

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
C.16.1	Natural Resources	Use of sand for construction	Impact on natural resources	<ul style="list-style-type: none"> <li>The contractor will use sustainable source for sand used for the Project. This commitment will be included in the contractors' agreements.</li> </ul>	Construction Phase	M&AOSB	On site Project Management team and designated EHS team	Contractor agreements
<b>Operational Phase</b>								
O.1.1	Ambient Air Quality	Material transfer.	Dust and emissions and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>Provide a wheel washing facility at the exit of the Project Area to reduce the likelihood of dusty materials being deposited beyond the Project Area boundary.</li> <li>Regularly maintain all diesel-powered equipment to reduce emissions of NOx and SO2.</li> <li>Switch off machinery and equipment when it is not in operation.</li> <li>Apply dust suppression methods.</li> </ul>	Operational Phase	M&AOSB  3rd Party Environmental Consultant for monitoring & audit	On site Project Management team and designated EHS team	Environmental Monitoring Report
O.2.1	Ambient Noise	Overall operation activities including heavy machinery operations.	Increase in ambient noise levels and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>Only well-maintained equipment should be operated on-site.</li> <li>Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components should be conducted.</li> <li>Equipment known to emit noise strongly in one direction should</li> </ul>	Operational Phase	M&AOSB  3rd Party Environmental Consultant for monitoring & audit	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>be orientated so that the noise is directed away from nearby sensitive receptors as far as practicable.</p> <ul style="list-style-type: none"> <li>Noise impacts from activities should be properly reduced by shielded by implementing control measures (e.g. erecting temporary noise barriers and deflectors) whenever applicable.</li> </ul>				
O.3.1	Landscape and Visual	OSB and permanent structures	Visual impacts for local communities	<ul style="list-style-type: none"> <li>Erect fencing between Zin Yaw Chaung and the OSB to reduce visual impacts. The hoarding shall be of sufficient height to ensure that there is no direct line of sight between the OSB and Zin Yaw Chaung.</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Report
O.4.1	Coastal Processes	Operation of the jetty	Physical presence of jetty altering coastal processes	<ul style="list-style-type: none"> <li>A coastal erosion study has been conducted separately to this EIA by Royal Haskoning. The findings of this study are that erosion would be expected to be minor.</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	N/A
O.5.1	Water Quality & Resources	Discharge of wastewater and runoff from Project Site near the coast	Impact to surface and ground water quality	<ul style="list-style-type: none"> <li>Appropriate surface drainage will be designed and provided where necessary;</li> <li>Surface runoff from potential sources of contamination will be prevented;</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<ul style="list-style-type: none"> <li>All drainage facilities and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms;</li> <li>Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds);</li> <li>Oil water separators and grease traps will be installed and maintained as appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas, if any; and</li> <li>The discharge point of treated sewage effluent to aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters.</li> <li>Sewage from toilets, kitchens and</li> </ul>				

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to the either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean.				
O.5.2	Water Quality & Resources	Discharge of wastewater and runoff from Project Site near the coast	Impact to marine water quality	<ul style="list-style-type: none"> <li>• Appropriate surface drainage will be designed and provided where necessary;</li> <li>• Surface runoff from potential sources of contamination will be prevented;</li> <li>• All drainage facilities and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms;</li> <li>• Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds);</p> <ul style="list-style-type: none"> <li>• Oil water separators and grease traps will be installed and maintained as appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas, if any; and</li> <li>• The discharge point of treated sewage effluent to aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters.</li> <li>• Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to the either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean.</li> </ul>				



No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<ul style="list-style-type: none"> <li>The Ballast water discharge will be managed by International Convention for the Control and Management of Ships' Ballast Water (BWM) and lead to prevent the spread of harmful aquatic organisms from one region to another and to implement the BWM requirements and supplemental BWM practices. However, everything will come by local Myanmar vessels from Yangon so no possibility of foreign invasive species.</li> <li>Only a small portion of non-suitable materials (silts) will be taken away by a ship to a Myanmar Port Authority (MPA) approved disposal area. The disposal site has not yet been selected. This location will be selected in accordance with the requirements from MPA and details will be provided to ECD prior to construction.</li> <li>The discharges from the sanitary treatment system, the reverse osmosis plant and the wastewater treatment plant will be in line with the parameters mentioned</li> </ul>				

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				for effluent discharges is the EQEG.				
O.5.3	Water Quality & Resources	Use of groundwater	Impact to water resources	<ul style="list-style-type: none"> <li>M&amp;AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimise impact to communities</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	Water Resources Assessment
O.6.1	Marine Habitats	Construction of jetty	Smothering and habitat loss	<ul style="list-style-type: none"> <li>Closed grab dredgers or suction dredgers with silt curtains and alternative methods should be used to reduce the potential for leakage of sediments;</li> <li>Disposal barges will be fitted with tight bottom seals in order to prevent leakage of material during transport;</li> <li>When the dredged material has been unloaded at the disposal areas, remove any material that has accumulated on the deck or other exposed parts of the vessel and place in the hold or a hopper. Do not wash decks clean in a way that permits material to be released overboard;</li> <li>Control and monitoring systems will be used to alert the crew to leaks or any other potential risks;</li> </ul>	Operational Phase	M&AOSB  3 <sup>rd</sup> Party Environmental Consultant for monitoring & audit	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<ul style="list-style-type: none"> <li>Monitoring of corals will be undertaken during dredging works in the construction and operational phases.</li> </ul>				
O.7.1	Marine Turtles	Physical presence of jetty and OSB	Loss of beach habitat and disturbance to nesting behaviour	<ul style="list-style-type: none"> <li>Minimising lighting to that which is necessary for the operation area.</li> <li>Where night-time work is needed, or for night-time facilities, lighting mitigations measures should be employed including: <ul style="list-style-type: none"> <li>Minimizing lighting to that which is absolutely necessary for the construction area</li> <li>Light dispersion should be limited/ mitigated by the design of the lighting equipment with the aim to minimize disturbance by avoiding intense illumination and night time lighting glare</li> <li>Use directional lighting rather than diffuse lighting as far as practicable</li> </ul> </li> <li>Include the provision that no company/contractor employees are to collect or are involved in the collection of turtle eggs in</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Report

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				contractual documents.				
O.8.1	Marine Fauna	Water Intake	Entrainment or impingement	<ul style="list-style-type: none"> <li>Use of modern surface water intake system / sub-surface intake system; and</li> <li>Locating the discharge in an area away from productive coastal habitats (such as coral or seagrass).</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	N/A
O.9.1	Community H&S	Operational activities and traffic	Increased risk of accidents, security issues.	<ul style="list-style-type: none"> <li>There will be a perimeter wall around the premises to stop anyone trespassing onto the site.</li> <li>M&amp;AOSB will also provide navigation guidance to all vessels in line with Myanmar national requirements.</li> <li>As discussed in other sections on vessel movements, M&amp;AOSB will provide regular communications to fishermen on vessel movements as required.</li> <li>Once traffic routes to the site are known, a Traffic Management Plan should be developed by M&amp;AOSB. The Traffic Management Plan should be developed to indicate the traffic routes to be followed and speed limit to be complied with in order to reduce risk to the local communities.</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	Environmental Monitoring Plan

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<ul style="list-style-type: none"> <li>The workers contracts will include provisions to protect the local communities from worker influx risks (such as sexually transmitted diseases). Workers will also have regular health check-ups.</li> </ul>				
O.10.1	Livelihoods and Economy	Operational activities	Job creation, fishing impacts	<ul style="list-style-type: none"> <li>Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk of marine accidents;</li> <li>Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area; and</li> <li>Any restricted areas will be appropriately marked on Notice to Mariners to ensure mariners are aware of any potential restrictions.</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	N/A
O.11.1	Occupational H&S	Activities during operation	Risk of fatality or	<ul style="list-style-type: none"> <li>The Project will design an occupational health and safety management plan, which will be a subset of the overall EMP system,</li> </ul>	Construction and	M&AOSB	On site Project Management team and	Safety Records

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
			injury to workers	<p>tailored to the needs of the project. This plan will set standards that will be met by all contractors and subcontractors.</p> <ul style="list-style-type: none"> <li>The Project will create and implement a health and safety management system for the project. It will include mandatory health and safety training courses for M&amp;AOSB workers and contractors, including handling of hazardous material. This training will take place prior to work starting on construction and operation. Training course attendance will be recorded and monitored by the Project.</li> <li>All staff will have medical check-ups prior to commencing work.</li> </ul>	Operational Phase		designated EHS team	
O.12.1	Tourism	Presence of OSB and jetty	Impacts from air and noise nuisance and restriction of access to beach	<ul style="list-style-type: none"> <li>Site hoarding along the Project Area boundary will be higher than the Project activities which may generate dust and fugitive emissions;</li> <li>Implementation of a regular and rigorous watering and sprinkling regime in particular during the dry season, for example, in the morning and in the afternoon, watering in area which has a lot of</li> </ul>	Operational Phase	M&AOSB	On site Project Management	-

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<ul style="list-style-type: none"> <li>dust;</li> <li>Provision of a wheel washing facility at the exit of the Project Area to reduce the likelihood of dusty materials being deposited beyond the Project Area boundary;</li> <li>Regular maintenance of all diesel-powered equipment to reduce emissions of NO<sub>x</sub> and SO<sub>2</sub>;</li> <li>Use of low sulphur fuels in heavy good vehicles and diesel powered equipment in collaboration with good management practices for construction phase;</li> <li>Use of alternative fuels and fuel mixes where possible;</li> <li>Only well-maintained equipment will be operated on-site;</li> <li>Appropriate surface drainage will be designed and provided where necessary;</li> <li>Surface runoff from potential sources of contamination will be prevented;</li> <li>All drainage facilities and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times</li> </ul>				



No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>and particularly during rainstorms;</p> <ul style="list-style-type: none"> <li>• M&amp;AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimise impact to communities;</li> <li>• Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds);</li> <li>• Oil water separators and grease traps will be installed and maintained as appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas, if any;</li> <li>• The discharge point of treated sewage effluent to aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters;</li> <li>• Septic tanks or a permanent</li> </ul>				

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>sewage treatment plant will be provided;</p> <ul style="list-style-type: none"> <li>• Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, will be discharged into foul sewers via grease traps. The foul sewer will then lead to the either the septic tank or temporary / permanent treatment plant prior to effluent discharge to the ocean;</li> <li>• Landscape planting will be implemented by planting native tree species which are fast growing in nature;</li> <li>• A tunnel will be included in the design of the Project on the beach to ensure that local communities and other beach users can have full access to the beach;</li> <li>• Vessel movements should be discussed with Port Authority as appropriate to ensure minimal disturbance to ongoing operations and reduce the risk of marine accidents;</li> </ul>				

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<ul style="list-style-type: none"> <li>Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, area lighting, navigation/communications equipment and radar reflectors to provide sufficient warning to other vessels in the area; and</li> <li>Any restricted areas will be appropriately marked on Notice to Mariners to ensure mariners are aware of any potential restrictions.</li> </ul>				
O.13.1	Waste	Operation of OSB and jetty & accommodation	Impact to people and environment from waste discharge and disposal	<ul style="list-style-type: none"> <li>Impacts regarding wastes can be managed by good housekeeping practices for waste storage and handling supported by a comprehensive waste management plan (WMP) which will be prepared by M&amp;AOSB.</li> <li>Segregated wastes will be temporarily stored at designated areas for reuse on site. In case of temporary piling is required, weather protection such as tarpaulin and earth bunds or sand bag barriers will be provided to prevent leachate from entering the drain and surround water bodies.</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	Safety Records

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>Enclosed waste containers will be provided for general refuse and enclosed designated waste collection bin will be provided for all construction to prevent spillage and vermin.</p> <ul style="list-style-type: none"> <li>Waste will be collected regularly. Recyclables such as scrap steel and metal items will be collected by recycling companies where possible to maximized reuse of these items wherever possible.</li> <li>The wastewater discharge location will be along the Palin Gyaing Beach to the North of the Project Area. The exact discharge location is not yet know. M&amp;A will provide this information to ECD as part of the Environmental Monitoring Report.</li> <li>M&amp;AOSB provide ECD with details of the Waste Storage during operation.</li> </ul>				
O.14.1	Accidental events	Operation activities and vessels	Impact from spill and leaks	<ul style="list-style-type: none"> <li>Standard Operating Procedures for handling / storage / transfer of hazardous materials;</li> <li>Shipboard Oil Spill Emergency Plans (MARPOL requirement) for larger vessels;</li> <li>M&amp;AOSB Supply Base Emergency</li> </ul>	Operational Phase	M&AOSB	On site Project Management team and designated EHS team	N/A

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>Response Plan and associated response procedures / protection measures for oils spills.</p> <ul style="list-style-type: none"> <li>• The Emergency Response Plan will be provided to ECD prior to construction.</li> <li>• Secondary containment, constructed of impervious and chemically resistant material, shall be provided that is capable of containing the larger 110% of the largest tank or 25% of the combined tank volumes.</li> <li>• Fuel shall not be stored in underground tanks.</li> <li>• Fuel shall be transferred between vehicles and storage tanks on an impervious surface sloped to a collection structure.</li> <li>• M&amp;AOSB will install the required signage within the supply base facilities. The vessels, which are managed by others, will be in accordance with the local and international rules and regulations, and Classification requirements. M&amp;AOSB will ensure vessels calling our port have valid certifications.</li> </ul>				
General								

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
G.1.1	Legislation	All	All	<ul style="list-style-type: none"> <li>M&amp;AOSB will comply with all Myanmar laws, rules and regulations as listed in Table 3.2.</li> <li>M&amp;AOSB will operate the process follow by Myanmar National Environmental Quality (Emission) Guideline and consider the international standards and guidelines.</li> <li>No compensation is required as part of the outcomes of this EIA. However, M&amp;AOSB commit to paying any relevant compensation (as required)</li> </ul>	All phases	M&AOSB	On site Project Management team and designated EHS team	N/A
G.2.1	Vessel Use	All	All	<ul style="list-style-type: none"> <li>M&amp;AOSB commit to ensuring all vessels have required certificates as required per vessel class under MARPOL.</li> </ul>	All phases	M&AOSB	On site Project Management team and designated EHS team	N/A
G.3.1	Approvals	All	All	<ul style="list-style-type: none"> <li>M&amp;AOSB will receive suggestions from Department of Marine Administration (DMA).</li> <li>M&amp;AOSB will receive approval from Myanmar Port Authority (MPA) for the jetty design.</li> <li>M&amp;AOSB will follow the Myanmar Port Authority's guidance related to the disposal area and disposal plan,</li> </ul>	Prior to construction / operation	M&AOSB	On site Project Management team and designated EHS team	N/A

No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				<p>and to report back to ECD for guidance.</p> <ul style="list-style-type: none"> <li>M&amp;AOSB will produce a Disposal Plan and submit to the ECD prior to construction.</li> </ul>				
G.4.1	Design Changes	All	All	<ul style="list-style-type: none"> <li>As per Article 95 of the Myanmar EIA Procedure; M&amp;AOSB will notify ECD (MONREC) in case of major changes in size, scope, location, layout, technology, risk associated with foreseeable Adverse Impacts, production methods or pollution prevention/ mitigation measures of the Project, or an expansion or second phase development is proposed. M&amp;AOSB will provide supporting documentation of such changes within the timeframe as may be prescribed.</li> </ul>	Prior to construction / operation	M&AOSB	M&AOSB	N/A
G.5.1	CSR	All	All	<ul style="list-style-type: none"> <li>The M&amp;AOSB CSR program for FY 19-20 will be implemented as a training centre approach. Required skill sets for construction and operation of OSB had been mapped out and training resources had been locally identified. From these trainings, alternative livelihoods</li> </ul>	Prior to construction / operation	M&AOSB	M&AOSB	N/A



No.	Project Stage/Affected Aspect	Project Activity and affected area	Potential Impacts	Proposed Mitigation Measures	Timing	Responsible Party	Responsibility for supervision of mitigation implementation	Reporting Requirements
				can be considered for the community.				

**Table 8.2**      *Environmental Monitoring for the Project*

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
<b>Construction Phase</b>			
Air	Air emissions will be measured at Zin Yaw Chaung. Measurements will be for SO <sub>x</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> and PM <sub>10</sub> (closest sensitive receptor).	Monthly during construction, during site clearance. If the levels are within the NEG Guidelines, no further monitoring is required.	M&AOSB / Third Party
Noise	Noise levels (dB) will be measured one daytime and one nighttime at Zin Yaw Chaung (closest sensitive receptor).	Monthly during construction, during day and nighttime and during noisy activities. If the levels are within the NEG Guidelines, no further monitoring is required.	M&AOSB / Third Party
Marine Sediment	Sediment monitoring will be conducted to confirm no pollutants from construction dredging. The following parameters will be measured in line with WBG EHS Guidelines; <ul style="list-style-type: none"> <li>metals and metalloids</li> <li>organometallics</li> <li>organics.</li> </ul>	Monitoring will be conducted once after construction dredging is conducted. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring can cease.	M&AOSB / Third Party
Marine Flora & Fauna	During construction dredging, the amount of sediment accretion on the eastward side of the jetty should be studied given the presence of corals in the T2 transect (east of the jetty). This is measured to ensure no impacts on the coral species found during environmental surveys.	Monitoring will occur once during construction dredging.	M&AOSB / Third Party
Waste	The M&AOSB HSE team will review the Monthly Waste Reports (MWR) received by the contractor and report waste generation and disposal to MONREC.	Waste will be monitored monthly.	M&AOSB HSE Team
Incident and accident reporting	M&AOSB will report all spills and leaks to MONREC and MOGE as per the EIA Procedure. All incidents and non-compliances will be reported to MONREC.	Reporting of large spills within 24 hours (as per the EIA Procedure). A large spill is any spill not	M&AOSB HSE Team

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
		able to be cleaned by M&A team but needing external measures.	
<b>Operational Phase</b>			
Air	Air emissions will be measured at Zin Yaw Chaung. Measurements will be for SO <sub>x</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> and PM <sub>10</sub> (closest sensitive receptor).	Six monthly during operation phase. If the noise is within NEQEG then monitoring can cease.	M&AOSB / Third Party
Noise	Noise levels (dB) will be measured one daytime and one nighttime at Zin Yaw Chaung (closest sensitive receptor).	Monthly during operation, during day and nighttime and during noisy activities. If the levels are within the NEG Guidelines, no further monitoring is required.	M&AOSB / Third Party
Effluent Discharges / Marine Water Quality	<p>Treated wastewater will be measured for the following parameters (in line with NEQEG and considering the WBG EHS Guidelines):</p> <ul style="list-style-type: none"> <li>• Dissolved oxygen</li> <li>• Temperature</li> <li>• pH</li> <li>• Turbidity</li> <li>• Secchi disk transparency</li> <li>• Conductivity/Salinity</li> <li>• Biological oxygen demand</li> <li>• Chemical oxygen demand</li> <li>• Oil and grease</li> <li>• Total coliform bacteria</li> <li>• Total nitrogen</li> <li>• Total phosphorus</li> <li>• Total suspended solids</li> <li>• Chlorophyll</li> <li>• Filterable reactive phosphate</li> <li>• Total nitrogen</li> <li>• Oxides of nitrogen</li> <li>• Ammonia</li> <li>• Metals and metalloids.</li> </ul>	<p>Six monthly during operation phase. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring frequency can be reduced to annually.</p>	M&AOSB / Third Party
Marine Sediment	<p>Sediment monitoring will be conducted to confirm no pollutants from operation dredging. The following parameters will be measured in line with WBG EHS Guidelines;</p> <ul style="list-style-type: none"> <li>• metals and metalloids</li> <li>• organometallics</li> <li>• organics.</li> </ul>	Monitoring will be conducted once after operational dredging is conducted. If levels are within permissible limits (as specified by the NEQEG and WBG	M&AOSB / Third Party

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
		EHS Guidelines), then monitoring can cease.	
Marine Flora & Fauna	During maintenance dredging, the amount of sediment accretion on the eastward side of the jetty should be studied given the presence of corals in the T2 transect (east of the jetty).  This is measured to ensure no impacts on the coral species found during environmental surveys.	Monitoring during operation should be conducted for up to two years from operation. If no changes detected, then monitoring can cease.	M&AOSB /Third Party
Waste	The M&AOSB HSE team will review the Monthly Waste Reports (MWR) received by the contractor and report waste generation and disposal to MONREC.	Waste will be monitored monthly.	M&AOSB HSE Team
Incident and accident reporting	M&AOSB will report all spills and leaks to MONREC as per the EIA Procedure. All incidents and non-compliances will be reported to MONREC.	Reporting of large spills within 24 hours (as per the EIA Procedure). A large spill is any spill not able to be cleaned by M&A team but needing external measures.	M&AOSB HSE Team

### 8.5.1

#### *Emergency Response Plan*

##### *Objectives*

M&AOSB have developed an Emergency Response Plan to identify the potential for and response to environmental accidents and health and safety emergency situations and for preventing and mitigating any potentially adverse environmental and social impacts that may arise. The plans include but are not limited to: notification procedures; an emergency response organization with personnel properly trained on their roles and responsibilities; having adequate and appropriate emergency response equipment readily available to respond to minor incidents; and having the capability to quickly request additional assistance. The plan covers:

- Chemical spills;
- Forces of nature (earthquakes);
- Fire

- Medical Emergencies; and
- Traffic accidents.

#### *Management Actions*

The management actions are provided in *Table 8.1* and are listed below:

- The Project will design an occupational health and safety management plan which will be a subset of the overall EMP system, tailored to the needs of the project. This plan will set standards that will be met by all contractors and subcontractors.
- The Project will create and implement a health and safety management system for the project. It will include mandatory health and safety training courses for M&AOSB workers and contractors, including handling of hazardous material. This training will take place prior to work starting on construction and operation. Training course attendance will be recorded and monitored by the Project.
- All staff will have medical check-ups prior to commencing work.
- Standard Operating Procedures for handling / storage / transfer of hazardous materials;
- Shipboard Oil Spill Emergency Plans (MARPOL requirement) for larger vessels;
- M&AOSB Supply Base Emergency Response Plan and associated response procedures / protection measures for oils spills.
- The Emergency Response Plan will be provided to ECD prior to construction.
- Secondary containment, constructed of impervious and chemically resistant material, shall be provided that is capable of containing the larger 110% of the largest tank or 25% of the combined tank volumes.
- Fuel shall not be stored in underground tanks.
- Fuel shall be transferred between vehicles and storage tanks on an impervious surface sloped to a collection structure.

The Emergency Response Plan for the Project is provided in **Appendix F**. There is also an Oil Spill Contingency Plan in **Appendix G**.

#### *Monitoring Requirements*

Monitoring will be required in order to demonstrate compliance with both regulatory and M&AOSB's Project requirements (compliance monitoring), and will also provide verification of the overall design and effectiveness of the implemented control measures. Compliance will be monitored to ensure that

subcontractors meet contractual obligations with respect to work practices and design specifications (e.g. Project emission standards). This monitoring will be carried out by M&AOSB and/or by an appointed third party.

M&AOSB will submit an Environmental Monitoring Report to the Ministry of Natural Resources and Environmental Conservation (MONREC) every **six months** as per the EIA Procedure requirements.

A summary of the monitoring is provided in *Table 8.3*.

**Table 8.3** *Summary of the Reporting and Monitoring Requirements including Frequency and Responsibility*

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Incident reporting	Details of any environment or social Incidents	Incident report forms	Contractor, M&AOSB
Accidental Releases and Leaks	Safety record	Safety record	Contractor, M&AOSB
Non-Compliance Reporting	Non-Compliance with EMP	Inspection check sheets	M&AOSB, Third Party

#### *Responsibilities and Budgets*

The budget for the Emergency Response Plan and management actions is included in the overall budget of the EMP (*Section 8.4*).

M&AOSB is committed to providing resources essential to the implementation and control of the EMP. Resources include the appropriate human resources and specialised skills. The structure for the organisation responsible for environmental and social management and implementation of the EMP is depicted in *Table 8.4*.

**Table 8.4** *Environmental & Social Management Organisation Roles and Responsibilities*

Position	Responsibility
M&AOSB Operations Manager	<ul style="list-style-type: none"> <li>Ensure operations are undertaken as per this EMP.</li> <li>Provide sufficient resources to implement the management measures in this EMP.</li> <li>Ensure the sub-contractors are provided with an Environmental Induction at the start of the project activities. Ensure mitigation measures as detailed in this EMP are actioned.</li> </ul>

Position	Responsibility
M&AOSB HSE Advisor	<ul style="list-style-type: none"> <li>• Prepare environmental component of relevant Induction Package.</li> <li>• Assist with the review, investigation and reporting of environmental incidents. Ensure environmental monitoring and inspections/audits are undertaken as per the requirements of this EMP. Liaise with relevant regulatory authorities as required.</li> <li>• Assist in preparation of external regulatory reports required, in line with environmental approval requirements and M&amp;AOSB incident reporting procedures. Monitor and close out corrective actions identified during environmental monitoring or inspections.</li> </ul>

Supervision of subcontractor activities will be conducted by M&AOSB who will establish management controls over aspects of the Project and will interact with subcontractor staff where Project activities take place. M&AOSB will work with and influence the contractors to ensure that all contractors are aware of and competent with respect to:

- Environmental and social impacts that could potentially arise from their activities.
- Necessity of conforming to the requirements of the EIA and EMP (i.e. implementing the control and mitigation measures) in order to avoid or reduce those impacts.
- Roles and responsibilities to achieve that conformity, including with regard to change management and emergency response.
- Documentation and reporting requirements and other EMP compliance requirements.

The Project will require that contractors have implemented training programmes for their personnel and each contractor is responsible for HSE awareness training for personnel working on the Project. The contractors are also responsible for identification of any additional training requirements to maintain required competency levels.

## 8.5.2 *Traffic Management Plan*

### *Objectives*

A traffic management plan will be prepared and submitted to ECD prior to operations commencing. The plan will detail the way activities on the road will be carried out so they minimise inconvenience and help ensure road users and workers remain as safe as possible. The plan will consider the number and type of vehicles that the Project will utilise during construction.



## Management Actions

The management actions are provided in *Table 8.1* (No. 11.1) and listed below:

- M&AOSB will also provide navigation guidance to all vessels in line with Myanmar national requirements.
- As discussed in other sections on vessel movements, M&AOSB will provide regular communications to fishermen on vessel movements as required.
- Once traffic routes to the site are known, a Traffic Management Plan should be developed by M&AOSB. The Traffic Management Plan should be developed to indicate the traffic routes to be followed and speed limit to be complied with in order to reduce risk to the local communities.
- Enforcement of a speed limit for vehicles related to construction activities of the Project. During the construction phase, a speed limit of 40km/h shall be enforced.

## Monitoring Requirements

Monitoring will be required in order to demonstrate compliance with both regulatory and M&AOSB's Project requirements (compliance monitoring), and will also provide verification of the overall design and effectiveness of the implemented control measures. Compliance will be monitored to ensure that subcontractors meet contractual obligations with respect to work practices and design specifications (e.g. Project emission standards). This monitoring will be carried out by M&AOSB and/or by an appointed third party.

M&AOSB will submit an Environmental Monitoring Report to the Ministry of Natural Resources and Environmental Conservation (MONREC) every **six months** as per the EIA Procedure requirements.

A summary of the monitoring required for traffic (including air and noise impacts) is provided in *Table 8.5*.

**Table 8.5** *Summary of the Reporting and Monitoring Requirements including Frequency and Responsibility*

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Air Emissions	Air emissions will be measured at Zin Yaw Chaung once during construction and operation.	Monthly during construction, during site clearance.	M&AOSB / Third Party
	Measurements for SO <sub>x</sub> , NO <sub>x</sub> , PM2.5 and PM10.	Six monthly during operation phase.	

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Noise Generation	Noise levels (dB) will be measured one daytime and one night time during the construction phase.	Monthly during construction, during day and night time and during noisy activities.	M&AOSB /Third Party

### *Responsibilities and Budgets*

The budget for the Emergency Response Plan and management actions is included in the overall budget of the EMP (*Section 8.4*).

M&AOSB is committed to providing resources essential to the implementation and control of the EMP. Resources include the appropriate human resources and specialised skills. The structure for the organisation responsible for environmental and social management and implementation of the EMP is depicted in *Table 8.4*.

## **8.5.3**

### ***Waste Management Plan***

#### *Objectives*

A waste management plan will be prepared and submitted to ECD prior to operations commencing. The plan will outline the methods and practices to meet the requirements of this EIA and applicable regulations.

The objectives of the plan are to:

- ensure waste is managed in a controlled and appropriate manner in compliance with statutory requirements concerning the management of waste;
- ensure resources are recovered where possible and safe to do so, for re-use and recycling;
- detail responsibilities, both offshore and onshore (supply bases) for waste management; and
- outline the appropriate handling, storage, transportation and disposal of waste.

#### *Management Actions*

The Management Actions for waste are listed in *Table 8.1* (No 15.1) and listed below:

- Impacts regarding wastes can be managed by good housekeeping practices for waste storage and handling supported by a comprehensive waste management plan (WMP) which will be prepared by M&AOSB.
- Construction materials will be managed in a way to avoid over-ordering,

poor storage and maintenance, mishandling as well as improper operation procedures. Construction wastes will be separated into reusable items and materials to be disposed of or recycled whenever applicable. It will be conducted at the immediate working area to avoid loss/leakage and cross contamination during handling.

- Segregated wastes will be temporarily stored at designated areas for reuse on site. In case of temporary piling is required, weather protection such as tarpaulin and earth bunds or sand bag barriers will be provided to prevent leachate from entering the drain and surround water bodies. Enclosed waste containers will be provided for general refuse and enclosed designated waste collection bin will be provided for all construction to prevent spillage and vermin.
- Waste will be collected regularly. Recyclables such as scrap steel and metal items will be collected by recycling companies where possible to maximized reuse of these items wherever possible.
- The wastewater discharge location will be along the Palin Gyaing Beach to the North of the Project Area. The exact discharge location is not yet know. M&A will provide this information to ECD as part of the Environmental Monitoring Report.

All wastes will be managed to ensure protection of the environment and human health. Waste management activities will be performed in accordance with the following waste hierarchy principles.

- Reduce- the quantity of waste generated by prevention of arising by process or design change. Eliminate wastes by improved management of products.
- Re-use- materials where possible in engineering structures or return to suppliers where surplus to requirements.
- Recycle- material streams where practicable (eg oils, metal, wood, paper, plastics) to reduce the quantity of wastes landfilled.
- Recover- as much as possible, such as oils from contaminated cuttings or energy within materials.
- Responsible disposal- to landfill or alternative following appropriate treatments to reduce hazards and long term impacts on the environment.

Waste minimization and the application of these principles shall be addressed in the Contracts and Procurement Execution Strategies for the project and taken into consideration when reviewing shipping, storage and disposal method throughout the project life span.

Storage areas will be provided for waste containers at each facility. Hazardous and non-hazardous wastes will be segregated in separate storage units in

designated areas. These areas are to be indicated on the facility site plan. Wastes will be stored in a manner to prevent:

- accidental spillage or leakage;
- contamination of soils and groundwater;
- corrosion or wear of containers;
- loss of integrity from accidental collisions or weathering;
- theft by people; and
- scavenging by animals.

Waste storage containers will be appropriate in terms of volume, composition, and shape and access for the material that is being stored. Only containers in good condition will be utilised. Bungs and lids will be securely fastened or other forms of covering shall be provided. Storage of waste will be carried out in accordance with the MSDS, in a designated area, with a suitable surface and a method to contain any leakage or contaminated runoff water. Containers used shall be inert in relation to their content, clearly labelled, indicating the characteristics of the content, date of containerizing or packing, and data on toxicity and/or potential contaminant.

Prior to allowing the consignment of waste to leave an operational site, the facility specific Designated Personnel shall ensure that the waste containers are:

- clearly labelled - to describe the contents using the appropriate waste labels which should be completed in full (old labels should be removed to avoid confusion)
- in good condition and are not leaking
- appropriate to the waste they contain
- appropriately sealed (eg with a lid or bung)
- not emitting any harmful gases or generating heat

If any of these have not been done or have been done to a poor standard, the waste consignment should not be allowed to leave the facility. The HSE Advisor or designated personnel should be contacted who will take all necessary corrective action(s) to rectify the situation before allowing the waste to leave the facility.

Any unidentified waste should be quarantined at site in the designated area. The wastes should be reviewed following M&AOSB procedures, adhering to additional Personal Protective Equipment (PPE) requirements. Classification of the waste may require sampling and testing to confirm presence or otherwise of hazardous components.

Water Transfer Notes (WTNs) are fundamental to ensuring that wastes are transferred from the producer, through transportation chain to the disposer and provide a record of due diligence and duty of care. The WTN tracks the waste stream from the point of origin to the deposit location. WTNs will accompany all waste consignments (along with cargo manifest) originating from relevant operational sites, and will be duly completed with the details required within the WTNs and the appropriate signatories.

**Waste Monitoring Inspection and reporting:** All facilities producing wastes will keep a Waste Register and an inspection and reporting plan. The frequency and type of inspection will be agreed by all parties with the inspection covering all waste generating activities through segregation, handling, storage and final disposal.

The designated personnel will maintain the Waste Register and copies of all WTNs that have been produced from the site. The Waste Register will be available at all sites filed in printed form. The Waste Register shall contain a record of all waste arisings and serve as an index for all WTN consignments.

The Waste Register will include, as a minimum, the following information:

- waste inventory;
- source of waste (eg rig, vessel, base);
- description (eg oily rags);
- classification of waste streams (ie hazardous or non-hazardous);
- quantity (weight in kg/tonnes or volume in litres/m3);
- treatment or disposal method;
- numbered WTNs, duly signed and dated; and
- copies of completed WTNs returned to the M&AOSB HSE Advisor.

All reports should be fed back from the Waste Contractor to the EHS Advisor who will review the information and provide feedback to M&AOSB Management.

#### Waste Contractor: Waste Collection and Transfer

**Waste Collection:** The Waste Contractor will collect the wastes from the M&AOSB using appropriate vehicles. M&AOSB will advise the Contractor at least 48 hours in advance of the expected time that the wastes need to be collected from the base and the Contractor shall collect the wastes within the specified date.

All skips used to transfer the wastes will be supplied and regularly compliance checked by Waste Contractor.

**Collection Vehicles:** The Waste Contractor will collect the wastes using waste collection vehicles that, as a minimum, comply with M&AOSB's vehicle policy. All vehicles in the Contractor's fleet will:

- have regular maintenance checks and servicing, fully documented and logged;
- have road legal tyres exceeding minimum tread requirements; and
- comply with all Myanmar vehicle laws and M&AOSB minimum vehicle standards.

All staff operating the vehicles will wear appropriate PPE as a minimum:

- when loading materials, including coveralls, high visibility vests, steel toe-capped boots and hard hats;
- when loading / transferring liquid wastes goggles or face visor should be worn; and
- when loading / transferring hazardous liquids a chemical splash suit should be worn.

All collected loads will be properly labelled. Any hazardous wastes will be appropriately labelled and accompanied by relevant MSDS. The waste originator shall ensure that the wastes remain appropriately labelled during transportation and that any relevant MSDS sheets are carried with the load during transportation. It is the responsibility of the waste originator to appropriately package and dispose of such items offsite.

The Waste Contractor will ensure that vehicle drivers/operators are adequately trained in vehicle operation and the handling of wastes. Training records shall be maintained to demonstrate that all drivers are suitably qualified and trained.

**Waste Transfer:** All collected wastes will be delivered to the respective Waste Contractor's treatment facility without undue delay. No vehicles containing waste may be parked and left unattended other than at the facilities within an appropriately constructed and designated area capable of ensuring the security of the load and capable of preventing any leakage or spillage. No waste will be transported in the same vehicle as incompatible wastes or materials unless the wastes and/or materials are packaged in such a way as to prevent the wastes / materials coming into contact with each other.

**Waste Reception:** On arrival at the facility all wastes will be weighed or quantified by other means. The Contractor will provide M&AOSB with copies of the WTN to confirm the receipt of the consignments.

### *Monitoring Requirements*

Monitoring and Documentation: The M&AOSB HSE team will review the Monthly Waste Reports (MWR) received. The purpose of this assessment is:

- to confirm the accuracy of reporting;
- to ensure the WMP is being implemented correctly and that standards are being met;
- to monitor waste arisings and specific streams to identify trends and priority areas of improvement; and
- to report to M&AOSB Management.

Records are required to be kept by each installation or facility (eg Waste Register including WTN copies). The offshore MWR sheets will be transmitted to HSE Advisor who shall verify the quantities, retain records and will produce key statistics for annual reporting.

Waste Management Auditing: Audits and evaluations will be performed according to the audit programme and include both in-house and external auditing.

External audits will be commissioned on an annual basis by the HSE Department. Key outcomes from review and audit activities are tracked to ensure that waste minimisation opportunities are identified, to help establish goals and objectives, and to improve the management of all generated wastes.

Where weaknesses or non-conformance are identified, remedial action will undertake by M&AOSB.

### *Responsibilities and Budgets*

The budget for the Waste Management Plan and management actions is included in the overall budget of the EMP (*Section 8.4*).

The responsibilities are listed above under the Management Actions section.

#### **8.5.4 *Livelihood Restoration and Compensation Plan***

As mentioned, in *Section 6.4.11*, there is only a minor impact on livelihoods with the mitigation measures in place. As such, no further livelihood plans are provided. Compensation was provided to land owners at market price for the paddy field acquired. All land was acquired in conjunction with and in agreement with the farmers.

The management actions for livelihoods are provided in *Table 8.1* (No. 12.1). M&AOSB commits to employing around 70% of the workforce from Myanmar with the rest made up of migrant workers.



M&AOSB is also committed to social development and their Corporate Social Responsibility (CSR) activities are provided in *Section 9.4*.

#### 8.5.5 ***Biodiversity Management Plan***

##### *Objectives*

The Biodiversity Management Plan (BMP) is developed to maintain or improve biodiversity values during the Project, and to determine risks and impacts prior to the commencement of activities. The BMP should focus on identifying, evaluating, and conserving the relevant aspects of biodiversity, and should serve to avoid and mitigate impacts to biodiversity.

##### *Management Actions*

There are a number of management actions in *Table 8.1* to mitigate impacts to marine biodiversity. The main impact is from dredging, therefore the following actions will be undertaken:

- Minimise size of footprint on seabed.
- Avoid construction in sensitive habitats (e.g. coral reefs).
- Silt curtains and alternative methods will be deployed during dredging of the navigation channel to reduce the levels of suspended solids that could impact nearby sensitive receivers.
- Closed grab dredgers or suction dredgers with silt curtains and alternative methods should be used to reduce the potential for leakage of sediments;
- Disposal barges will be fitted with tight bottom seals in order to prevent leakage of material during transport;
- When the dredged material has been unloaded at the disposal areas, remove any material that has accumulated on the deck or other exposed parts of the vessel and place in the hold or a hopper. Do not wash decks clean in a way that permits material to be released overboard;
- The contractor(s) will ensure that the works cause no visible foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the area of marine works; and
- Control and monitoring systems will be used to alert the crew to leaks or any other potential risks.

For impacts to turtles, the following management actions will be undertaken:

- The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.

- Minimising lighting to that which is absolutely necessary for the construction / operation area.
- No illegal gathering of eggs by contractors.
- Where night-time work is needed, or for night-time facilities, lighting mitigations measures should be employed;
- During the installation and construction phase, to minimize the potential for entanglement and stranding of turtles in the work site through good site practices:
- During the construction (and operation) phase, maintain a company policy to outlaw egg collection by employees of all parties/contractors involved.
- Include the provision that no company/contractor employees are to collect or have involvement in the collection of turtle eggs in contractual documents;
- The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.
- Liaison with the responsible Ministry or Government body is recommended to define procedures in the event of discovery of a nest on the works site.

To mitigate disturbance to marine fauna from noise impacts during piling, the following management actions are required:

- Piling and associated machinery will be properly maintained for well-functioning and operating that will not severely impact;
- Piles will be carefully aligned with hammer for correct contact;
- An exclusion zone of 500 m radius will be established around the construction site. If a marine mammal or a sea turtle is observed in the exclusion zone during piling, construction will be delayed until they have left the area. This measure will ensure the vicinity is clear of marine mammals and sea turtles prior to the commencement of works and will serve to reduce any disturbance to marine mammals and sea turtles as well as physical harm from placement of quarry rock, etc.; and
- When a marine mammal or a sea turtle is spotted within the exclusion zone during piling, construction works will cease and will not resume until the observer confirms that the zone has been continuously clear of the marine mammal or sea turtle for a period of 30 minutes. This measure will ensure the area in the vicinity of the piling is clear of the marine mammal or sea turtle during works and will serve to reduce any disturbance to marine mammals or sea turtles.

The Project is located on modified habitat onshore (coconut groves and paddy field). To reduce impacts to terrestrial habitats and species, the following management actions are required:

- Footprint of the proposed OSB is minimised during the design stage and existing vegetation shall be retained as far as practicable.
- Landscape planting will be implemented by planting native tree species which are fast growing in nature.
- Construction activities will be restricted to works areas that will be clearly demarcated.
- Work site boundaries will be regularly checked to ensure that they are not breached and that damage does not occur to surrounding areas.
- Works areas in temporarily affected areas would be reinstated with tree/shrub planting after completion of the works, as far as practicable.
- The amount of trees to be removed is not yet currently know. This information will be provided to ECD in the Environmental Monitoring Report.

#### *Monitoring Requirements*

Monitoring will be required in order to demonstrate compliance with both regulatory and M&AOSB's Project requirements (compliance monitoring), and will also provide verification of the overall design and effectiveness of the implemented control measures. Compliance will be monitored to ensure that subcontractors meet contractual obligations with respect to work practices and design specifications (e.g. Project emission standards). This monitoring will be carried out by M&AOSB and/or by an appointed third party.

M&AOSB will submit an Environmental Monitoring Report to the Ministry of Natural Resources and Environmental Conservation (MONREC) every **six months** as per the EIA Procedure requirements.

A summary of the monitoring is provided in *Table 8.6*.

**Table 8.6** *Summary of the Reporting and Monitoring Requirements including Frequency and Responsibility*

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Terrestrial Flora & Fauna	As there are no significant impacts anticipated on terrestrial flora and fauna, no monitoring is required.	-	-

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Marine Flora & Fauna	During construction dredging and operational dredging, the amount of sediment accretion on the eastward side of the jetty should be studied given the presence of corals in the T2 transect (east of the jetty).	During Dredging activities. Measurements of TSS levels at sensitive receptors (T2 Transect).	M&AOSB /Third Party
	Monitoring during operation should be conducted for up to two years from operation. If no changes detected, then monitoring can evaluate, analyse, review and revise.		
Solid Waste	Good housekeeping practices for waste storage and handling supported by a comprehensive waste management plan (WMP) in construction and operation phases.		
	Construction materials will be managed in a way to avoid over-ordering, poor storage and maintenance, mishandling as well as improper operation procedures. Construction wastes will be separated into reusable items and materials to be disposed of or recycled whenever applicable. It will be conducted at the immediate working area to avoid loss/leakage and cross contamination during handling.	Regularly collect, evaluated in every six month during construction and operation phase.	M&AOSB /Third Party
	Segregated wastes will be temporarily stored at designated areas for reuse on site. In case of temporary piling is required, weather protection such as tarpaulin and earth bunds or sand bag barriers will be provided to prevent leachate from entering the drain and surround water bodies. Enclosed waste containers will be provided for general refuse and enclosed designated waste collection bin will be provided for all construction to prevent spillage and vermin.		
	Recyclables such as scrap steel and metal items will be collected by recycling companies where possible to maximized reuse of these items wherever possible.		

### *Responsibilities and Budgets*

The budget for the Biodiversity Management Plan and management actions is included in the overall budget of the EMP (*Section 8.4*). The responsibilities are listed in *Table 8.2*.

*Objectives*

The objectives of this plan are to:

- Ensure dredging is managed in a controlled and appropriate manner consistent with M&AOSB's policies and international and national standards;
- Comply with all statutory and contractual requirements concerning dredging; and
- Ensure appropriate monitoring occurs during dredging.

*Management Actions*

There are a number of management actions in *Table 8.1* to mitigate impacts from dredging:

- Minimise size of footprint on seabed.
- Avoid construction in sensitive habitats (e.g. coral reefs).
- Silt curtains and alternative methods will be deployed during dredging of the navigation channel to reduce the levels of suspended solids that could impact nearby sensitive receivers.
- Closed grab dredgers or suction dredgers with silt curtains and alternative methods should be used to reduce the potential for leakage of sediments;
- Disposal barges will be fitted with tight bottom seals in order to prevent leakage of material during transport;
- When the dredged material has been unloaded at the disposal areas, remove any material that has accumulated on the deck or other exposed parts of the vessel and place in the hold or a hopper. Do not wash decks clean in a way that permits material to be released overboard;
- The contractor(s) will ensure that the works cause no visible foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the area of marine works; and
- Control and monitoring systems will be used to alert the crew to leaks or any other potential risks.

*Monitoring Requirements*

Monitoring will be required in order to demonstrate compliance with both regulatory and M&AOSB's Project requirements (compliance monitoring), and will also provide verification of the overall design and effectiveness of the implemented control measures. Compliance will be monitored to ensure that

subcontractors meet contractual obligations with respect to work practices and design specifications (e.g. Project emission standards). This monitoring will be carried out by M&AOSB and/or by an appointed third party.

M&AOSB will submit an Environmental Monitoring Report to the Ministry of Natural Resources and Environmental Conservation (MONREC) every **six months** as per the EIA Procedure requirements.

A summary of the monitoring is provided in *Table 8.7*.

**Table 8.7** *Summary of the Reporting and Monitoring Requirements including Frequency and Responsibility for Water Quality and Sediment Quality*

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
<b>Construction Phase</b>			
Marine Sediment	<p>Sediment monitoring will be conducted to confirm no pollutants from construction dredging. The following parameters will be measured in line with WBG EHS Guidelines;</p> <ul style="list-style-type: none"> <li>metals and metalloids</li> <li>organometallics</li> <li>organics.</li> </ul>	<p>Monitoring will be conducted once after construction dredging is conducted. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring can cease.</p>	M&AOSB / Third Party
<b>Operational Phase</b>			
Effluent Discharges / Marine Water Quality	<p>Treated wastewater will be measured for the following parameters (in line with NEQEG and considering the WBG EHS Guidelines):</p> <ul style="list-style-type: none"> <li>Dissolved oxygen</li> <li>Temperature</li> <li>pH</li> <li>Turbidity</li> <li>Secchi disk transparency</li> <li>Conductivity/Salinity</li> <li>Biological oxygen demand</li> <li>Chemical oxygen demand</li> <li>Oil and grease</li> <li>Total coliform bacteria</li> <li>Total nitrogen</li> <li>Total phosphorus</li> <li>Total suspended solids</li> <li>Chlorophyll</li> <li>Filterable reactive phosphate</li> <li>Total nitrogen</li> <li>Oxides of nitrogen</li> <li>Ammonia</li> <li>Metals and metalloids.</li> </ul>	<p>Six monthly during operation phase. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring frequency can be reduced to annually.</p>	M&AOSB / Third Party

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Marine Sediment	<p>Sediment monitoring will be conducted to confirm no pollutants from operation dredging. The following parameters will be measured in line with WBG EHS Guidelines;</p> <ul style="list-style-type: none"> <li>metals and metalloids</li> <li>organometallics</li> <li>organics.</li> </ul>	<p>Monitoring will be conducted once after operational dredging is conducted. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring can cease.</p>	M&AOSB / Third Party

### *Responsibilities and Budgets*

The budget for the Sediment Management Plan and management actions is included in the overall budget of the EMP (*Section 8.4*). The responsibilities are listed in *Table 8.2*.

## **8.5.7 Occupational Health and Safety Plan**

### *Objectives*

The Occupational Safety and Health (OSH) Management Plan documents the responsibilities of M&AOSB in meeting relevant statutory requirements, specifications and standards. It defines the OSH objectives for Project operations. The scope includes matters of OSH, the prevention, management and rehabilitation of injuries and illnesses, and specific hazards and risks associated with the workplace.

### *Management Actions*

The management actions for OSH are provided in *Table 8.1* and listed below:

- The Project will design an occupational health and safety management plan which will be a subset of the overall EMP system, tailored to the needs of the project. This plan will set standards that will be met by all contractors and subcontractors.
- The Project will create and implement a health and safety management system for the project. It will include mandatory health and safety training courses for M&AOSB workers and contractors, including handling of hazardous material. This training will take place prior to work starting on construction and operation. Training course attendance will be recorded and monitored by the Project.
- All staff will have medical check-ups prior to commencing work.



## Monitoring Requirements

Monitoring will be required in order to demonstrate compliance with both regulatory and M&AOSB's Project requirements (compliance monitoring), and will also provide verification of the overall design and effectiveness of the implemented control measures. Compliance will be monitored to ensure that subcontractors meet contractual obligations with respect to work practices and design specifications (e.g. Project emission standards). This monitoring will be carried out by M&AOSB and/or by an appointed third party.

M&AOSB will submit an Environmental Monitoring Report to the Ministry of Natural Resources and Environmental Conservation (MONREC) every **six months** as per the EIA Procedure requirements.

A summary of the monitoring is provided in *Table 8.8*.

**Table 8.8** *Summary of the Reporting and Monitoring Requirements including Frequency and Responsibility*

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Incident reporting	Details of any environment or social incidents	Incident report forms	Contractor, M&AOSB
Non-Compliance Reporting	Non-Compliance with EMP	Inspection check sheets	Contractor, M&AOSB, Third Party

## Responsibilities and Budgets

The budget for the Occupational H&S Management Plan and management actions is included in the overall budget of the EMP (*Section 8.4*). The responsibilities are listed in *Table 8.2*.

## 9.1 PURPOSE OF THE CONSULTATION

The specific objectives for stakeholder engagement were to:

- Inform relevant stakeholders about M&AOSB and its planned Project activities;
- Identify stakeholders and communities potentially affected by Project activities;
- Gather baseline information on the social and biological environment; and,
- Engage with potentially affected groups to understand the scope of fishing activities, potential Project impacts, perceptions and concerns and discuss appropriate mitigation measures.

## 9.2 METHODOLOGY AND APPROACH

### 9.2.1 Identification of Relevant Stakeholders and Potential Issues

The process of identifying potentially affected stakeholders started with scoping. The purpose of scoping was to identify relevant issues and the townships and villages potentially impacted. The scoping exercise involved both desk-based and preliminary consultation with a number of stakeholders including government authorities.

The scoping process concluded that those fishers active in and around the Project Site as well as the Potentially Affected Communities in Nan Thar Pu.

ERM's previous experience of stakeholder engagement in the region was utilised to inform the stakeholder selection. This information is based on discussions with GAD and DoF representatives as well as previous Project experience.

Figure 5.27 shows the location of the village tract visited for the public consultation. Stakeholder engagement is an ongoing process and as such new stakeholders may emerge as the Project progresses. This will be captured and inform ongoing stakeholder engagement activity that will be undertaken for the Project.

### 9.2.2 Overall Approach and Scope of Engagement for the Impact Assessment

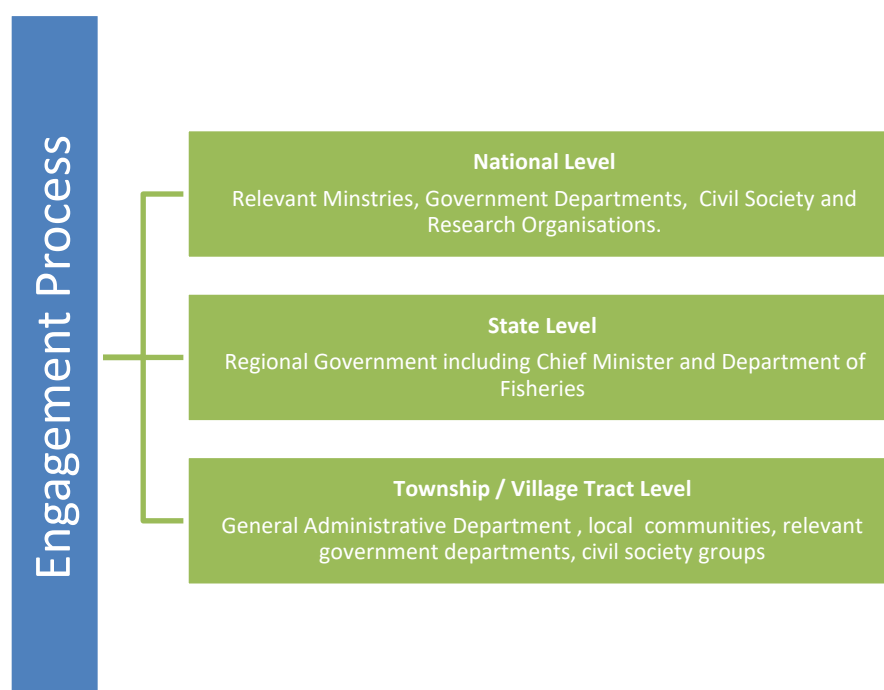
Stakeholder engagement was conducted across administrative levels, subject to permissions of responsible authorities. Figure 9.1 provides an overview of the levels engaged including: National Government, Ayeyarwady Region,

district and township levels, supported by representative discussion with the village tract leader in the town hall meeting.

Engagement, as specified in the Myanmar EIA Procedure, was undertaken in two phases in January and February 2017. A consultation team consisting of ERM and M&AOSB representatives conducted meetings and consultations at the three administrative levels.

M&AOSB understands the need for continual engagement and has also undertaken engagement in addition to that required under the Myanmar EIA Procedure. Information on this is presented in *Section 9.3.3*.

**Figure 9.1**     *Engagement at Three levels with Key Stakeholders*



#### *National Level*

Stakeholder engagement at the national level was focused on government agencies with regulatory and policy making responsibility. The purpose of early engagement was to introduce the Project and M&AOSB, to seek clarity on the EIA process and expectations on stakeholder engagement and disclosure. The opportunity was also used to obtain required permissions for engagement with agencies at state and township level and get access to data and information for the EIA Study.

#### *State Level*

Stakeholder engagement at the state level focused on obtaining required permission for engagement activities at the township level and get access to information on local communities and fishing activities in the Area of Influence. At the State level the Project met with the Chief Minister of Ayeyarwady Region and delegates.

Engagement for the EIA was focused on Nga Pu Daw District in which the Project is located. A meeting was conducted with Township and District levels in both Nga Pu Daw and Nga Yoke Kaung and held at the GAD offices. The necessity for this meeting and the participation was also discussed during the Chief Minister's meeting in Patheingyi undertaken during the Scoping Phase. The purpose of engagement was to make the township and district levels aware of the Project, seek an understanding of specific issues and stakeholder concerns, discuss potential impacts and mitigation measures and obtain district and township level social and environmental data.

Meetings were also conducted at Nan Thar Pu village tract (where the Project is located), two meetings were conducted during scoping and two during the EIA investigation phase.

The key stakeholders engaged with included;

- GAD (District and Township);
- Department of Fisheries;
- Offshore fishermen / boat owners;
- Village Tract Leaders and Elders;
- Local Community in Nan Thar Pu;
- Civil Society Organizations;
- NGOs.

### **9.2.3 *Format and Content of Consultation Meetings***

#### *Key Principles*

The consultation process was guided by the following key principles:

- **Inclusive:** The consultations were organised to ensure representation of potentially affected and interested stakeholders. Separate focus group discussions (FGDs) were undertaken with fishermen and boat owners.
- **Sharing of information:** At the township and village level consultations, special emphasis was given to build community level understanding of the Project and all the information was provided in Myanmar language.
- **Participatory:** Stakeholders were encouraged to actively participate in the consultations and were always given the opportunity to ask questions.

The approach to consultation, informed by these principles, is described below.

The stakeholder consultation meetings were structured as followed:

- **Introductions and information disclosure:** Introduce M&AOSB, the Project, the EIA, the proposed stakeholder engagement process, the potential environmental and social impacts and mitigation to help the stakeholders understand the Project and M&AOSB's intentions for engagement.
- **Question and answer session** for all stakeholders in the town hall meeting to raise concerns, comments or ask questions to which M&AOSB can directly respond.
- **Data collection:** Collection of more in-depth information through FGDs with key stakeholder groups in the town hall meeting.

In order to inform stakeholders about the Project and share information on the activities, a two page flyer was produced which contained Project information and details on how to feedback into the Project. The flyer is shown in **Appendix G**. All information was communicated through use of visual media (including posters and power point presentations) and was provided in local Myanmar language.

To gather more environmental and social baseline data and to identify potentially affected communities, FGDs were undertaken with village leaders, and were guided by questionnaires covering information relating to:

- **Generic village profile:** Collected information on demographic patterns, communities, occupations, and communication and grievance systems.
- **Household Questionnaires:** Collected information at the household level. In total 50 household surveys were conducted in Nan Thar Pu.
- **Fishing Methods:** Collected information on number / type of boats, fishing season, fishing locations, fishing camps, trip duration and fishing gear used.
- **Environment:** Collected information on type of fish caught, sighting of marine mammals and turtles, locations of sensitive habitats (coral reefs, seagrass beds, and mangroves), locations of turtle nesting beaches, timing of turtle nesting, fish / invertebrate spawning areas, and protected areas.

Visual tools, such as pictures of fishing gear, maps and pictures of marine species, and hands-on activities, such as drawing fishing areas on hard copies of maps, were utilised in order to increase the involvement of the communities in the stakeholder consultation process. All information collected was summarised and confirmed with stakeholders at the end of the discussion. Stakeholders were also given time to share their concerns and views and any further clarifications they required at the end of the meetings.

Any queries raised by the stakeholders were responded to, and also noted to feed into the impact assessment process for the EIA.

### 9.3 SUMMARY OF CONSULTATION ACTIVITIES UNDERTAKEN FOR THE EIA PROCESS

#### 9.3.1 Scoping Phase

For the Scoping Phase, consultation meetings were held with various relevant stakeholders at the regional level in Nga Yoke Kaung. The consultation helped the Project to gather information on potentially affected people, and on potential data gaps and how these can be closed out in the EIA Report. Scoping consultation involved face-to-face meetings with a range of stakeholders including local fishermen and villagers, the Department of Fisheries (DoF), the Ayeyarwady Chief Minister, the Regional Environmental Conservation Department (ECD), and the General Administrative Department (GAD), ward administrators, planning department as well as local community representatives. The date, time, location, stakeholder and purpose of each meeting is provided in *Table 9.1*.

**Table 9.1 Consultation Activities Undertaken during Scoping**

Date, time, location	Stakeholder	Purpose of Engagement
16 January, 2017, Pathein and Nga Pu Daw	Meeting with Minister of Electricity and Transport in Pathein Chief Minister office & Meeting with Nga Pu Daw Township GAD	<ul style="list-style-type: none"> <li>Present information on Project.</li> <li>Seek permissions and approvals required to conduct engagement in Ayeyarwady Region (Nga Yoke Kaung).</li> </ul>
17 January, 2017, Nga Yoke Kaung	Meeting with Nga Yoke Kaung Township GAD	<ul style="list-style-type: none"> <li>Present information on Project.</li> <li>Seek an understanding of the requirements and plan for government presence/participation in the consultation process.</li> <li>Seek permissions and approvals required to conduct engagement in Nan Thar Pu Village Tract.</li> </ul>
18 January, 2017, Nan Thar Pu village Tract	Meeting with Zin Yaw Chaung Meeting with Gu Chaung	<ul style="list-style-type: none"> <li>Present information on Project.</li> <li>Seek an understanding of the requirements and plan for government presence/participation in the consultation process.</li> <li>Gather information on Potential Affected Communities and Peoples.</li> </ul>
18 January, 2017, Nga Yoke Kaung and Project Area	Site visit to Project Area, Goyangyi Island and Nga Yoke Kaung bay	<ul style="list-style-type: none"> <li>Gather information from tourism operators.</li> <li>Gather information on terrestrial and marine environment.</li> </ul>

A summary of the outcomes of the meetings is presented below:

- Villagers from the nearest Villagers Tract (Nan Thar Pu) were consulted on the Project. Within this village tract, meetings were held in two “wards”; including Zin Yaw Chaung.







The meetings included a variety of stakeholder such as local government, fishermen, and villagers. One CSO representative was also consulted but for the EIA Consultation, more CSO in the local area will be consulted.

- Fishing is conducted in the area offshore of the Project. Fishing is mostly, small (<30 ft.) boats or by hand nets from the shore.
- Questions asked related to impacts on the environment (e.g. to coral reefs), impacts to local communities from air or noise generation, and impacts on fishing. Some questions were also raised on social benefits and job opportunities.
- People seemed pleased with the disclosure of information. It was suggested that engagement should be conducted in the other wards in Nan Thar Pu and with local CSOs. This will be done as part of the EIA consultations.

The minutes of the meetings are provided in **Appendix H** and photos from the consultation are provided in *Figure 9.2*.



**Figure 9.2**      *Photos from the Scoping Consultation Meetings*

		
<p>Meeting in Ayeyarwady Chief Minister Office</p>	<p>Attendees in Zin Yaw Chaung</p>	<p>Discussions with local tourism operators in Nga Yoke Kaung</p>
		
<p>Fishing Focus Group Discussion</p>	<p>Public Consultation in Zin Yaw Chaung</p>	<p>Discussions in Zin Yaw Chaung Ward</p>

## *Key Questions Raised During Scoping Consultation Meetings*

### Social Benefits

One of the common questions raised at the village levels meetings related to Corporate Social Responsibility (CSR) and Social Investment from the Project. M&AOSB responded that they do undertake CSR programs for Projects that are in the development stage. For this Project they are currently in the early stages of design and feasibility, as such, there is not information yet on potential CSR programs. Should the Project develop, M&AOSB will consider CSR in more detail.

A strategic community investment project is underway to construct a new school building for the Nan Thar Pu Sub-Middle School. In addition, renovations projects in the Nga Yoke Kaung High School are also underway.

### Impacts to Fishermen

Some attendees were mostly involved in fisheries and raised concerns about the Projects impacts on fishing grounds. The Project construction will mean that an area of the sea is excluded from fishing when the jetty is being built. Also, fishermen will have to be made aware of increased traffic in the region when vessels use the OSB. Fishermen will not be excluded from fishing along the entire beach however; an area around the jetty will be excluded for health and safety reasons. This will be communicated to the local communities prior to commencement of activities.

### Job Opportunities

It was asked whether there will be any job opportunities for local communities. M&AOSB responded that there will be opportunities for jobs during the construction and the majority of the workforce will come from local communities.

### Impacts to the Environment

Stakeholders were also concerned about the potential impact to sensitive offshore habitats such as coral reefs which they mentioned could be present in the proposed area of the jetty. ERM responded that the potential impact to marine ecology would be assessed in the EIA Report. For coral reef, it was stated that the Project may be required to undertake baseline surveys (such as using drop down cameras) to see what habitats are in the Project Area.

### Impacts to Community

One stakeholder in Zin Yaw Chaung asked about the anticipated air and noise impacts as the village is located close to the Project Area. ERM mentioned that air and noise impacts would be assessed in the EIA Study and all the

mitigation measures proposed will be included in EIA report which will be disclosed to the public. The EIA and EMP will be prepared by ERM. M&AOSB must follow the commitments in the EIA and EMP and submit a monitoring report to the ECD. These Reports will also be undertaken in compliance with Myanmar Emissions Quality Guidelines which specify the air and noise emission limits for a Project.

#### Disclosure of Information

A few stakeholders mentioned that information will need to be provided to local CSO groups. M&AOSB stated that during the next round of consultation for the EIA Phase, CSOs were invited to the public engagement meetings in Nan Thar Pu.

### 9.3.2

#### *EIA Phase*

During the EIA, one meeting was undertaken at the GAD office in Nga Pu Daw and one in Nan Thar Pu Village Tract. The Nga Pu Daw meeting was attended by over 200 government employees. The Nan Thar Pu, around 60 people attended the meetings from the six wards. CSO were also present at the meeting. A summary of the outcomes of the meetings is presented below:

- In Nga Pu Daw, only one comment was raised stating that in general, people were positive about the Project.
- 50 household surveys were conducted as well as women's group, fishing and farmers questionnaires to collect social data on the Area of Influence (*Table 9.2*).
- The main questions related to (1) social investment, (2) effluent discharges and (3) grievance procedure and management of activities. These are discussed in detail below.

**Table 9.2**      **Household Surveys**

No	Sub-village (ward)	Household	Number of question surveyed households	Respondent %
1	Seik Kann		5	
2	Zin Yaw Chaung	137	10	18.24
3	Kyauk Phyar		10	
4	Ale Gone	87	10	
5	Nant Thar Pu		10	10.4
6	Gyaing Galay	141	5	
Total		376	50	13.29

The minutes of the meetings and photos from the consultation are provided in **Appendix H**; some photos of the meeting are also provided in *Figure 9.3*. The date, time, location, stakeholder and purpose of each meeting is provided in *Table 9.3*.

**Table 9.3**      **Consultation Activities Undertaken**

Date, time, location	Stakeholder	Purpose of Engagement
28 February, 2017, Nga Pu Daw	Nga Pu Daw Township GAD	<ul style="list-style-type: none"> <li>Present information on Project impacts and EIA findings.</li> <li>Seek permissions and approvals required to conduct engagement in Ayeyarwady Region (Nga Yoke Kaung).</li> </ul>
3 March, 2017, Nan Thar Pu Village Tract	Nan Thar Pu villagers	<ul style="list-style-type: none"> <li>Undertake 50 household surveys.</li> </ul>
2 March, 2017, Nga Yoke Kaung and Goyangyi Island	Site visit to Project Area, Goyangyi Island and Nga Yoke Kaung bay	<ul style="list-style-type: none"> <li>Gather information from tourism operators.</li> <li>Gather information on terrestrial and marine environment.</li> </ul>
3 March, 2017, Nan Thar Pu Village Tract	villagers and CSO in Nan Thar Pu	<ul style="list-style-type: none"> <li>Present information on Project impacts and EIA findings.</li> <li>Gather information on Potential Affected Communities and Peoples.</li> </ul>



**Figure 9.3**      *Photos from the Consultation Meetings Undertaken for the EIA Process*

		
Household surveys in Nan Thar Pu	Women's surveys in Nan Thar Pu	Meeting in Nga Pu Daw
		
Fisheries surveys in Nan Thar Pu	Project information disclosure in Nan Thar Pu	Presentations in Nga Pu Daw

### Grievance Procedure and Fishing Impacts

One fishermen asked what the procedure was if the Project caused damage to his fishing gear. The fishermen stated that locals can't fish over ten miles from the coast due to DoF restrictions. M&AOSB responded that a grievance procedure would be put in place to investigate any complaints and losses noted by anyone affected by the project.

### Job Opportunities and Community Development

Job Opportunities and Community Development - Another villager wanted to know about job opportunities. He stated that local people do not have high education, diploma and certificates and asked if locals will still be able to work for the Project? M&AOSB responded that on-the-job-training would be provided.

### Effluent Discharges

A local from Zin Yaw Chaung mentioned that his village lands were close to the proposed project lands. He was concerned about the possibility of the drainage or discharges from the project affecting his village land. He also wanted to know whether he could trust the EIA process to ensure that this is checked and monitored. M&AOSB responded that there is an EMP in the EIA which includes detailed information about how environmental impacts would be minimised and a monitoring report has to be submitted to the related Ministries every six months. In addition, there will be no discharge of effluent to the land so no impact on farmlands.

## **9.3.3 *Continual Stakeholder Engagement During Project***

As part of M&AOSB's commitment to continual engagement with local communities, a number of additional meetings have been conducted in Nga Yoke Kaung. These meetings were conducted to; provide progress update to key project stakeholders, discuss other projects (Offshore Block A-6, A-7 and M&AOSB) in the area, inform project stakeholders about M&AOSB Ltd., inform stakeholders of the baseline surveys, collect the concerns of local community on the project, educate about CSR and its programs, and provide regular progress updates on the surveys, ESIA, CSR programs, and FEED design. The engagement locations, dates and stakeholder consulted are summarised in *Table 9.4*.

**Table 9.4**      *Continual Engagement Led by M&AOSB*

Date and Location	Location	Stakeholder	Number of Participants	Purpose
2016 - M&AOSB-led Project Introduction				
04-Oct-16	GAD office (Nga Yoke Kaung)	GAD (Nga Yoke Kaung)	5 participants from GAD and 5 participants from company	Share information about the project and about the company
04-Oct-16	Nga Yoke Kaung	Kan Chae Ar Man Fisherman's Association	Approximately 10 participants from Kan Chae Ar Man	
05-Oct-16	Nan Thar Pu Monastery	Local Communities	92 community members	
2017 - M&AOSB-led Project Disclosure (Post-MIC Permit)				
19-Jun-17	Pathein	General Administrative Departments (Pathein and Ngaputaw) and Member of Ayeyarwaddy Region Parliament	Approximately 20 Participants	<ul style="list-style-type: none"><li>- Provide progress update to key project stakeholders about the recently awarded MIC permit to build and operate the Myint &amp; Associates Offshore Supply Base (M&amp;AOSB) in Nan Thar Pu Village.</li><li>- Clarify to project stakeholders about multiple projects (Offshore Block A-6, A-7 and M&amp;AOSB) in the project area.</li><li>- Educate project stakeholders about M&amp;AOSB Ltd.</li></ul>
19-Jun-2017	Pathein	Civil Society Orgnaizationsand Speical Interest Groups (MATA, Another Development (AD) and 88 Generation)	15 Participants	
20-Jun-2017	Pathein	General Administrative Department and other government departments and Township Development Committees	25 Participants	
20-Jun-2017	Nga Yoke Kaung	Local communities from Nga Yoke Kaung including CSO (Kan Chae Ar Man Fisherman's Association)	64 Participants	
21-Jun-2017	Nan Thar Pu	Local communities from Nan Thar Pu Village	132 Participants	
10-Jul-17	Pathein	General Administrative Departments (Pathein and Ngaputaw) and Member of Ayeyarwaddy Region Parliament	24Participants	<ul style="list-style-type: none"><li>- Continue to introduce M&amp;AOSB Ltd. and the project to project stakeholders.</li><li>- Inform Project stakeholders about what to expect during the upcoming soil, bathymetry, and metocean surveys.</li></ul>
11-Jul-17	Nga Yoke Kaung	General Administrative Department and other government departments and Township Development Committees	21 Participants	
11-Jul-17	Nga Yoke Kaung	Fishermen from Nga Yoke Kaung Town and Kan Chae Ar Man Fisherman's Association	38 Participants	
12-Jul-17	Nan Thar Pu	Fishermen from Nan Thar Pu Village	9 Participants	



Date and Location	Location	Stakeholder	Number of Participants	Purpose
29-Aug-17	Nga Yoke Kaung	Kan Chae Ar Man Fisherman's Association	6 Participants	- Provide progress update of M&AOSB
18-Nov-17	Nga Yoke Kaung	Kan Chae Ar Man Fisherman's Association	7 Participants	- Consult the concerns of local community on the project
18-Nov-17	Nan Thar Pu	Community Based Volunteers (Nan Thar Pu)	2 Participants	- Educate about CSR and its programs
20-Nov-17	Nan Thar Pu	Daw Nant Cho Pyone	5 Participants	- Provide progress update of M&AOSB - Consult the concerns of local community on the project
4-Dec-17	Pathein	General Administrative Department Officer (Pathein), General Administrative Department Officer (Nga Pu Taw)	4 Participants	- Provide progress update about recent baseline surveys, ESIA, CSR programs and FEED design
4-Dec-17	Pathein	Chairman of Region Parliament (Ayeyarwady)	1 Participant	
4-Dec-17	Pathein	Member of Ayeyarwady Region Parliament, U Phyo Zaw Shwe	1 Participant	
4-Dec-17	Pathein	MATA (Ayeyarwady)	6 Participants	- Share information about the project and about the company
29-Dec-17	Nan Thar Pu	Regional Minister of MOPF (Ayeyarwady) and Regional Minister of Municipal Affairs (Ayeyarwady) and (3) members of parliament, Ayeyarwaddy Region, Amyothar Hluttaw, and Pyidaungsu Hluttaw	15 Participants	- Provide progress update about recent baseline surveys, ESIA, CSR programs and FEED design
<b>2018 - Engagement</b>				
2-Nov-18	Nanttharpu	Chaung Wa Base Major	2 Participants	
3-Nov-18	Nga Yoke Kaung	Nga Yoke Kaung Chaung Wa base Captain	2 Participants	To give official information letter of OSB project update
3-Nov-18	Nga Yoke Kaung	Nga Yoke Kaung Minicipal Officer	2 Participants	To give update information of jack up platform mobilization of Blue Delta Survey
4-Nov-18	Nga Yoke Kaung	U Kyaw Zin Lin (Nga Yoke Kaung Town Admnistrator)	2 Participants	To give update information of jack up platform mobilization of Blue Delta Survey
5-Nov-18	Nanttharpu	U Zaw Wan (Nanttharpu Village Tract Administrator)	2 Participants	To give update information of jack up platform mobilization of Blue Delta Survey

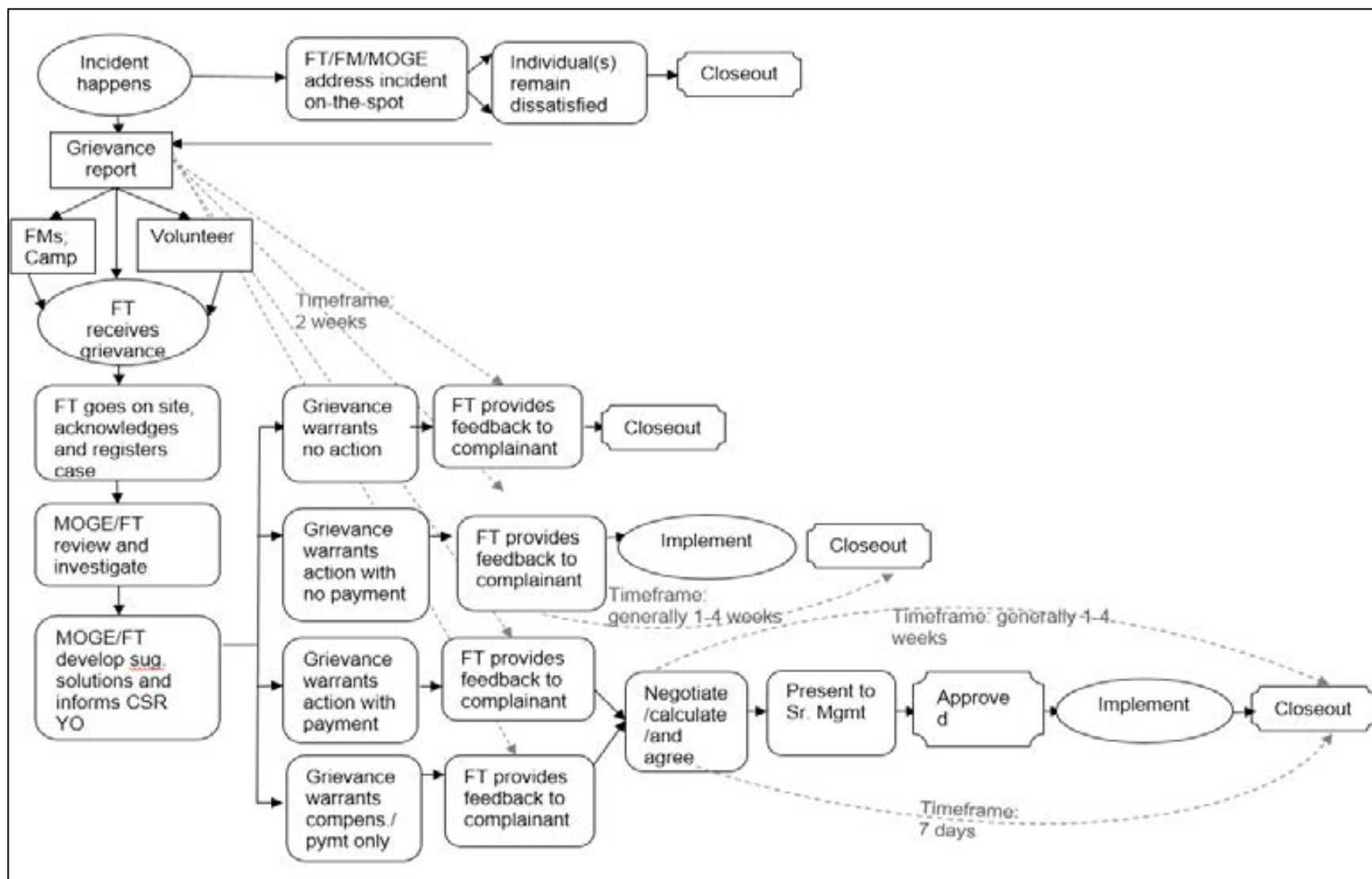
Date and Location	Location	Stakeholder	Number of Participants	Purpose
12-Nov-18	Nga Yoke Kaung	Members of Kan Chay Arr Mann CSO (Nga Yoke Kaung)	4 Participants	To give update information of M&AOSB Project and EIA Process
18-Nov-18	Nanttharpu	U Zaw Wan (Nanttharpu Village Tract Administrator)	12 Participants	Site Visit By ECD and MSDES
18-Nov-18	Nanttharpu	Village elders and Land Owners	42 Participants	Site Visit By ECD and MSDES
18-Nov-18	Nga Yoke Kaung	U Kyaw Zin Lin (Nga Yoke Kaung Town Administrator)	13 Participants	Site Visit By ECD and MSDES
18-Nov-18	Nga Yoke Kaung	Members of Kan Chay Arr Mann CSO (Nga Yoke Kaung)	20 Participants	Site Visit By ECD and MSDES
18-Nov-18	Nga Yoke Kaung	U Myo Thura Zaw (Department of fishery, Nga Yoke Kaung)	13 Participants	Site Visit By ECD and MSDES

The grievance mechanism of M&AOSB for the Project that aims to:

- Implement a safe and secure system that effectively received complaints/concerns associated with our operations;
- Provide stakeholders with an opportunity to develop a partnership with M&AOSB by working together to minimize risks and concerns;
- Resolve concerns received in a timely manner with all primary stakeholders involved in a confidential space; and
- Ensure the views of each complainant are respected and not discriminated against.

The proposed community grievance mechanism is provided in *Figure 9.4*.

Figure 9.4 M&AOSB Proposed Community Grievance Mechanism



Note: taken from Mann Field Grievance Mechanism

MPRL E&P has developed a multi-stakeholder approach to designing an Operational Grievance Mechanism (OGM), reflecting IFC standards, in Mann Field. This is the very first mechanism that has been facilitated and managed by both the host community and Myanmar Oil and Gas Enterprise (MOGE). Best practices from the Mann Field Grievance Mechanism (MFGM) is leveraged and used across assets operated by MPRL E&P.

MPRL E&P works closely with the operator of Mann Field, Myanmar Oil and Gas Enterprise (MOGE), providing advice, support and guidance. The objective of the MFGM is to enable local communities to have a voice and to ensure impact associated with operations affecting the environment and surrounding communities are solicited, monitored, and effectively addressed.

The MFGM enables stakeholders to voice their concerns directly to the company first, instead of turning to third parties, and enables the company to respond to their concerns early before they escalate.

The MFGM began in pilot phase with 3 out of the 14 communities in Mann field in April 2014, with a full roll out to the remaining communities in August 2014. During this time training was provided to local community volunteers, community meetings were held, information boards erected, and informational cartoon distributed to improve awareness. Grievance collection boxes were placed in strategic locations such as village intersections with high foot traffic. The Mann Field Grievance Progress Update report is published quarterly and concerns and complaints have been recorded and disclosed on the company website.

Designing a mechanism facilitated by community volunteers has proven to be successful as trust is immediately captured. In addition, strengthening the capacity of volunteers has led to improved decision making and empowerment.

As M&AOSB is now in the pre-construction phase and there is limited activity on the ground (hence limited complaints), the grievance procedures is kept simple. As M&AOSB enters into construction and operational phases, the steps taken to resolve complaints will be adjusted as per requirements at that stage (for example, involvement of M&AOSB's contractors to resolve grievances). The Community Grievance Mechanism management framework will include clear standard operating procedure. A Community Liaison Officer will be appointed and their job description, detailed grievance management procedure and complaint tracker system will be initially informed and sent to concerned persons and potentially affected persons. OGM Posters were set up across Nan Thar Pu and Nga Yoke Kaung and OGM awareness sharing sessions had been conducted by M&AOSB. The Grievance received and action taken in 2017 is shown in *Table 9.5*.

**Table 9.5**      *Grievance Received and Action Taken*

Date	Grievance	Action Taken
22 Aug 17	Tha Pyay road that the most of community member use was destroy due to overloaded trucks.	Contractor supported 120,000 Kyats to buy 200 bags of cobble-stone to repair the road.
17 Sept 17	Drainage wall in front of Nga Yoke Kaung monastery was damaged because of contractor's activity while they are transporting material.	Contractor supported 100,000 Kyats for the repairing cost of drainage wall.
20 Dec 17	Road between Nanttharpu village and Kway Chai village was destroy because of overloaded trucks.	After discussion with contractor, contractor supported 100,000 MMKs as a labors cost to repair the road and renovation of road will be take responsible by road renovation Committee.
15 Feb 18	Road between Nga Yoke Kaung and Kway Chai village was constructed by community and also it was destroyed due to local truck and tours car using in the past. But now road was destroy more because of overload trucks using for M&AOSB site access road and Community members also suffer from dust and noise due to over speed driving.	M&AOSB replied that M&AOSB will reinforces with contractor to drive no more than 40km/hr in the village. Also they will inform regional government for upgrading road between Nga Yoke Kaung and Nanttharpu Village. Assessment for CSR program and Community investment program will be implement in 2018.
15 Feb 18	Road between Nga Yoke Kaung and Nanttharpu Village will be destroy if overload trucks from M&AOSB using for project and Community members also will be suffer from dust.	M&AOSB replied that M&AOSB will reinforces with contractor to drive no more than 40km/hr in the village. Also they will inform regional government for upgrading road between Nga Yoke Kaung and Nanttharpu Village. Assessment for CSR program and Community investment program will be implement in 2018.
7 Mar 18	Small Bridge Kyauk Phya Village and Ah Lae Gone Village has been destroyed due to overload trucks use during transporting stone for site access road.	Materials (rocks, labor, etc.) provided in kind for repairs.
4 Nov 2018	Requested to provide gravel (5) sub to be used in Tha Pyay Road Renovation.	Contractor supported 75,000 Kyats and agreed to support another 75,000 Kyats during demobilization process.

### 9.3.5

#### *Future Stakeholder Engagement and Disclosure*

Stakeholder consultation is a continual process over the life of a Project. M&AOSB will continue to engage with and disclose information to stakeholders during the Construction and Operation of the Project.

M&AOSB will hold regular (at least quarterly) meetings prior to and during construction with land owners, local communities, and tourism operators to ensure they are aware of the Project activities. The grievance mechanism will also be in place for stakeholders to provide comments and suggestions as well as concerns and grievances.

M&AOSB disclosed the Scoping Report and EIA Report in local newspapers, on social media, and on their website and copies will be distributed to public meeting places and at the M&AOSB office in Yangon. The adverts published during the scoping phase of the Project are provided in *Figure 9.5* (The Global New Light of Myanmar) and *Figure 9.6* (The Mirror). This was published on 27 September 2017. The communication materials are shown in *Figure 9.7*.

These EIA disclosure meetings include the EIA findings as well as an explanation of the associated Corporate Social Responsibility (CSR) and Operational Grievance Mechanism (OGM) of M&A OSB were held as a public forum at Vantage Tower in Yangon on March 8, 2018 with the different levels of related Government organisations, Non-Government Organisations (NGOs), Civil society organizations (CSOs) and interest groups. Nine disclosure meetings were held in Patheingyi, Ngaputaw, Nga Yoke Kaung, and Nantharpu of Ayeyarwady Region from March 12 to 16, 2018. Stakeholders included NGOs, government officials, Parliament members, CSOs, and potentially affected communities within the Project's Area of Influence (AOI). The disclosure report is shown in **Appendix I**.



Figure 9.5 The Global New Light of Myanmar Newspaper Advert

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT  
FOR MYINT & ASSOCIATES OFFSHORE SUPPLY BASE,  
AYEYARWADDY REGION**

Myint & Associates Offshore Supply Base Ltd. (M&AOSB) is proposing to construct an Offshore Supply Base (OSB) near Nga Yoke Kaung Bay in Ayeyarwaddy Region, which is located approximately 40 km south of the town of Ngwe Saung. The facilities will initially include a jetty with a platform of about 0.6 ha and 30.4 acre for the onshore base plus 1.1 acre of access road. There is currently no infrastructure at the proposed Project. An access road will be include in the Project to connect to the nearest road within the village. The construction phase is estimated to take from 1.5 to 2 years to complete; commencing around 2018.

Under the Environmental Conservation Law and Environmental Conservation Rules of the Republic of the Union of Myanmar, M&AOSB are required to undertake an Environmental Impact Assessment (EIA) in order to obtain an Environmental Compliance Certificate (ECC) for the proposed activity. Environmental Resources Management (ERM), on behalf of M&AOSB, is currently undertaking an EIA Study, which includes stakeholder engagement in Nga Yoke Kaung. The EIA will be conducted in accordance with the Myanmar EIA Procedure (2015).

Any Information requests, or queries, comments and suggestions on the Project can be provided to [esiafeedback@myintassociatesosb.com](mailto:esiafeedback@myintassociatesosb.com) or 09-7949-31009. Information on the proponents of the project and this announcement are also available on the Myint & Associates Offshore Supply Base Ltd. website at [www.myintassociatesosb.com](http://www.myintassociatesosb.com).

Figure 9.6 The Mirror Newspaper Advert

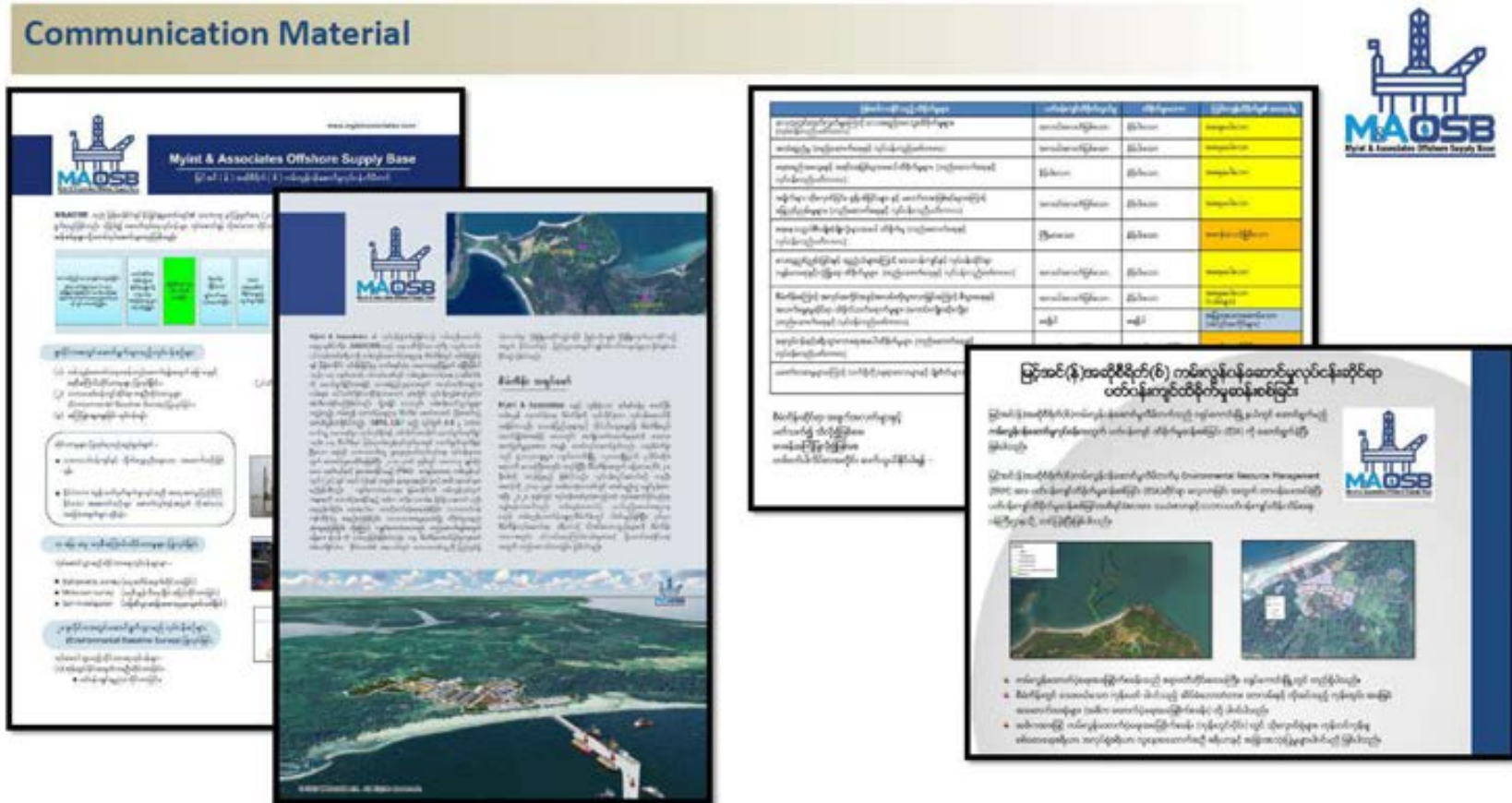
**ဧရာဝတီတိုင်းဒေသကြီးရှိ MYINT & ASSOCIATES ကမ်းလွန်ထောက်ပံ့ရေး အခြေစိုက်စခန်းအတွက် ပတ်ဝန်းကျင်နှင့် လူမှုသက်တိရိစ္ဆာန် ဆန်းစစ်ခြင်း (ESIA)**

Myint & Associates Offshore Supply Base Ltd. (M&AOSB) သည် ဧရာဝတီတိုင်းဒေသကြီး၊ ငရုတ်ကောင်း ပင်လယ်အော်အနီး၊ ငွေဆောင်မြို့မှ တောင်ဘက် (၄၀) ကီလိုမီတာခန့်အကွာတွင် ကမ်းလွန်ထောက်ပံ့ရေးဆိုင်ရာ အခြေစိုက်စခန်းတစ်ခု တည်ဆောက်ရန် အဆိုပြုချက်ရှိပါသည်။ ကနဦးအဆောက်အဦး လိုအပ်ချက်များ အနေဖြင့် (၁)၊ (၂) ပတ်တာ ခန့်ရှိ ပလက်ဖောင်း တစ်ခုပါရှိသည့် ဆိပ်ခံတံတားနှင့် (၃၀၀) ဧကရှိ ကုန်းတွင်းစခန်းအပြင် (၁၀) ဧကရှိ မြွေကပ်လမ်းတို့ ပါဝင်မည် ဖြစ်ပါသည်။ လက်ရှိကာလ၌ အဆိုပြုစီမံကိန်းဧရိယာတွင် မည်သည့် အခြေခံအဆောက် အအုံမျှ မရှိပါ။ စီမံကိန်းအတွင်း ချဉ်းကပ်လမ်းတစ်လမ်း ပါဝင်မည် ဖြစ်ပြီး ရွာအတွင်းရှိ အနီးဆုံးလမ်းနှင့် ရျှော်ဆက်သွားမည် ဖြစ်ပါသည်။ တည်ဆောက်ရေးကာလသည် ခန့်မှန်းချအားဖြင့် ၁၈၀၀ နှစ်အထိ ကြာမြင့်နိုင်မည်ဖြစ်ပြီး ၂၀၁၈ ခုနှစ် အစောပိုင်းတွင် စတင်ဆောင်ရွက်မည် ဖြစ်ပါသည်။

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံ၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာဥပဒေနှင့် နည်းဥပဒေများ အရ M&AOSB သည် အဆိုပြုလုပ်ငန်းစဉ်အတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လိုက်နာ ဆောင်ရွက်မှု သက်သေခံလက်မှတ် (ECC) ချရှိရန် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) အား အောင်မြင်ရန် လိုအပ်ပါသည်။ အဆိုပါ စီမံကိန်းနှင့်ပတ်သက်သည့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ် လေ့လာခြင်းအား Environmental Resources Management (ERM) မှ M&AOSB ၏ ကိုယ်စား ဆောင်ရွက်သွားမည် ဖြစ်ပြီး အဆိုပါလုပ်ငန်းစဉ်များတွင် ငရုတ်ကောင်းဒေသရှိ စီမံကိန်းနှင့် ပတ်သက် ဆက်သွယ်သူများနှင့် တွေ့ဆုံဆွေးနွေးခြင်းများလည်းပါဝင်မည် ဖြစ်ပါသည်။ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းကို မြန်မာနိုင်ငံ၏ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅) နှင့်အညီ လေ့လာပြုစုသွားမည် ဖြစ်ပါသည်။

အဆိုပါ လုပ်ငန်းစဉ်နှင့်ပတ်သက်၍ တောင်းခံချက်များ (သို့) မေးမြန်းလိုသည်များ၊ သုံးသပ်ချက်များနှင့် အကြံပြုချက်များ အား [esiafeedback@myintassociatesosb.com](mailto:esiafeedback@myintassociatesosb.com) (သို့) ၀၉-၇၉၄၉၃၁၀၀၉ သို့ ဆက်သွယ်မေးမြန်းနိုင်ပါသည်။ စီမံကိန်းဖော်ဆောင် မည့်သူများ၏ သတင်းအချက်အလက်များနှင့် သတင်းထုတ်ပြန်ချက်များကို Myint & Associates Offshore Supply Base Ltd. ၏ ဝက်ဘ်ဆိုက် ဖြစ်သော [www.myintassociatesosb.com](http://www.myintassociatesosb.com) တွင် ရရှိနိုင်ပါသည်။

## Communication Material



Although not part of the EIA Process, M&AOSB have started looking into potential CSR in the area of the Project. The purpose of CSR is to initiate relationship building with primary project stakeholders in order to receive a social license to operate.

## 9.4.1

*Approach*

M&AOSB's approach is to work together to uncover basic needs through repeated engagements and needs assessments. Contrary to other companies who typically hire external contractors to implement community investment projects, M&AOSB encourages community stakeholders to lead the planning, design, and implementation and management of projects. In support of this, in-house experts deliver high-impact trainings in project management skills, financial management, contracts, etc.

## 9.4.2

*CSR Activities for the Project*

Through a combination of observation, key informant interviews, and focus group discussions, the following sectors were assessed in Nan Thar Pu:

- Health
- Education
- Livelihoods
- Road infrastructure

A summary of the timelines for the CSR activities is provided in *Table 9.6*. CSR activities will be ongoing over the life of the Project.

*Table 9.6**CSR Activities Timeline*

No.	Village	Activities	Timeline
1		Water trestle	Completed on 4 Nov. 2017
2		Replacement of doors and windows	Completed on 10 Dec. 2017
3	Nga Yoke Kaung	Partitions	Completed on 6 Jan. 2018
4		10-Unit Toilets	Completed on 29 May 2018
5		Fencing Renovation	Completed on 29 May 2018
6		New school building construction	Ground breaking ceremony was on 27 January. It was handed over to Ministry of Education on 29 May 2018.
7	Nan Thar Pu	Home Gardening Training	Conducted from 7 July to 11 July 2018 with 30 participants completed the training

No.	Village	Activities	Timeline
8	Nan Thar Pu and Kyway Khaing	Coconut based handicraft training (2 sessions)	Conducted from 25 Aug to 23 Sept 2018 with 39 participants completed the training.
9	Nan Thar Pu	Drinking Water Treatment Techniques Training	Conducted from 17 to 18 January 2019 with total 50 participants from Nga Yoke Kaung, Nanttharpu and Kyway Khaing.

The M&AOSB CSR program for FY 19-20 will be implemented as a training center approach. Required skill sets for construction and operation of OSB had been mapped out and training resources had been locally identified. From these trainings, alternative livelihoods can be considered for the community.

The CSR activities conducted and planned for the Project are summarised in *Figure 9.8* and *Figure 9.9*. The CSR Activities conducted by M&AOSB is shown in **Appendix J**.

Figure 9.8 CSR Program FY 2017-2018

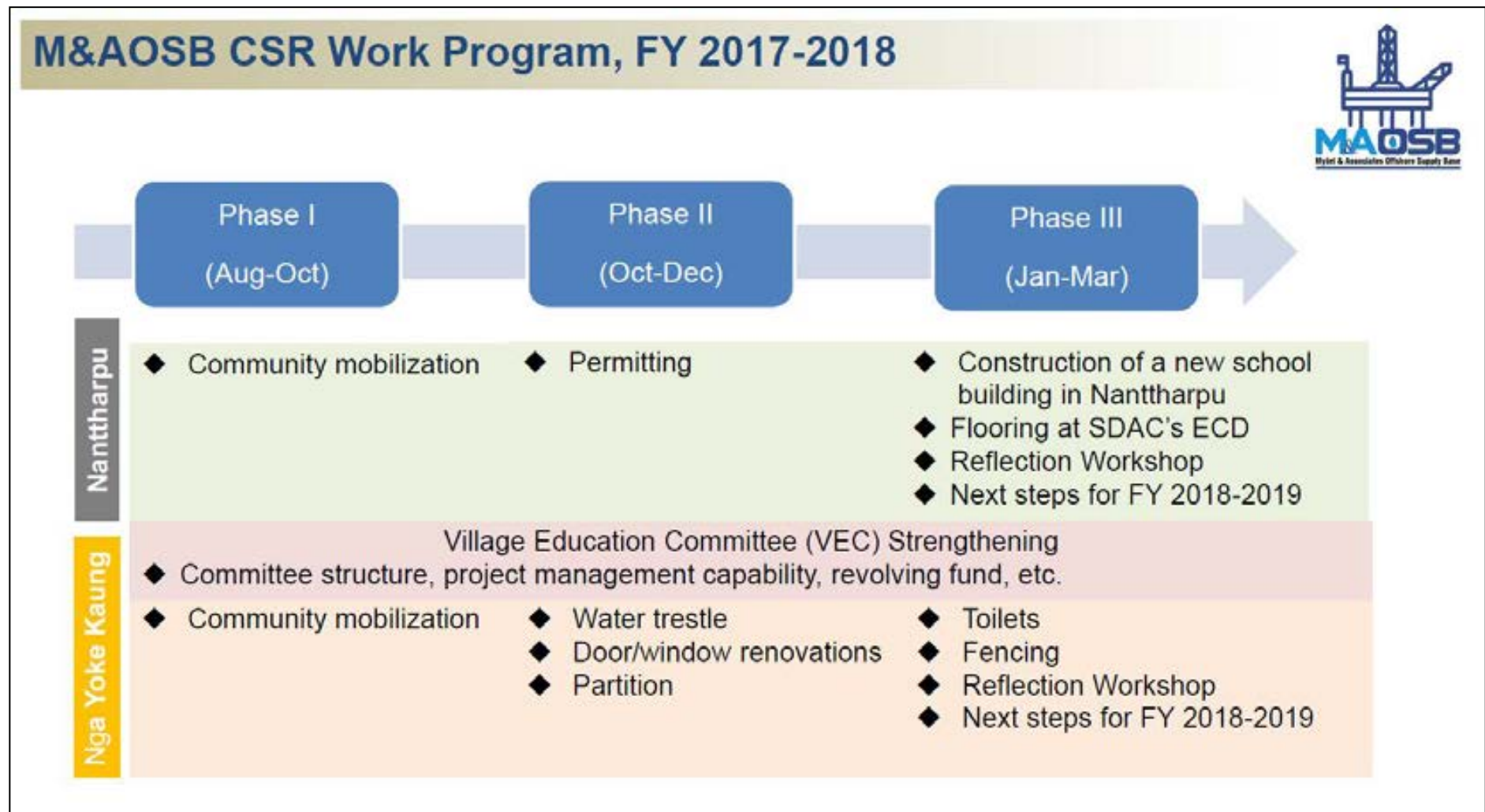
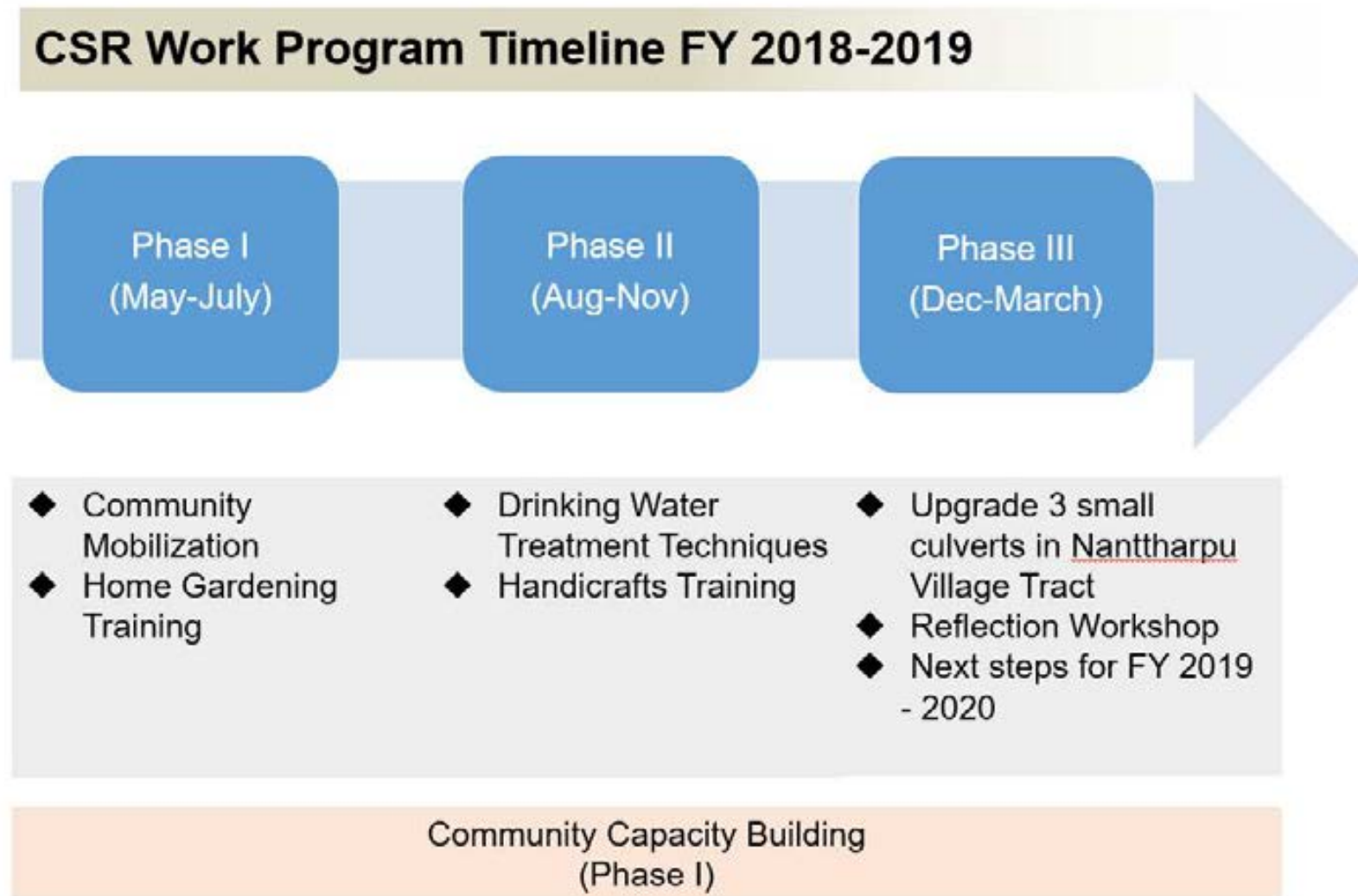




Figure 9.9 CSR Program FY 2018-2019





The EIA Study focused on the impacts associated with the Project in Nga Yoke Kaung. Impacts are likely to be localised to within the operational area. An Area of Influence of 5 km around the Project Area has been proposed to include potential impacts from noise, waste and water use, air emissions, and impacts to livelihoods (including fishing).

The EIA Report notes that communities in Nan Thar Pu village tract; specifically Zin Yaw Chaung “ward,” which is the nearest to the Project Area, could be potentially affected by the Project. The EIA consultation will therefore be focused on local communities within Nan Thar Pu village tract. Social baseline data was collected to support the current understanding of fishing and livelihoods in the region.

For onshore activities, there is potential for noise or dust from the Construction activities to impact local communities. The impact of the operational activities are expected to be limited because there will be no major source of emissions. The Project is likely to have a positive impact on local communities due to the job opportunities available during the construction phase.

There is potential for social and environmental impacts due to jetty construction activities. Marine habitats in the Project footprint will be directly impacted. Fishermen in the Area of Influence are likely to be directly or indirectly impacted by the jetty construction and operation.

Limited information on the Project was available at the time of writing this EIA because detailed design had not yet taken place and the Project was still in its conceptual phase. As such, it is recommended that should significant design changes be made once Project data becomes available, the impacts are re-evaluated and if necessary, the EIA Report and/or EMP are revised.

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# **Appendix A – M&AOSB Policies**



## COMMUNITY INVESTMENT

DOCUMENT NO. : M&AOSB-CPL-05012018-CMI  
DOCUMENT TITLE : COMMUNITY INVESTMENT POLICY  
AUTHOR : CORPORATE AFFAIRS MANAGER  
DATE : 05 JANUARY 2018  
APPROVED BY : GENERAL MANAGER

## OBJECTIVES

M&AOSB is committed to addressing its business risks and balancing community needs through long-term investment activities that provide value and meaningful impact to the business and community.

Our investment focuses on projects that address the impacts of our activities as well as development issues within surrounding communities delivering lasting social, economic, and environmental returns for both host communities and governments.

Breach of the M&AOSB Community Investment Policy may result in disciplinary action, up to and including dismissal. Contracted personnel who fail to comply with this policy may have their contract terminated, not renewed, or be subject to other appropriate actions.

## APPLICABILITY

M&AOSB expects active participation in achieving its goals and commitments by all employees and managers regardless of corporate hierarchy, contractor, and/or suppliers who individually and collectively are responsible for performance across the business value chain.

Breach of the M&AOSB Community Investment Policy may result in disciplinary action, up to and including dismissal. Contracted personnel who fail to comply with this policy may have their contract terminated, not renewed, or be subject to other appropriate actions. M&AOSB reserves the right to amend or update this policy as required from time to time.





## COMMUNITY INVESTMENT

CONTINUED

### COMMITMENT

To achieve this objective, M&AOSB will:

- Support community investment projects that meet the needs of the host community and address primary business risks and impact.
- Engage with all stakeholders to ensure sufficient data is collected and potential investment options are identified and confirmed with the community and business partners involved.
- Comply with all applicable laws, regulations, standards, or where internal policies require a higher standard, will comply with such higher standards.
- Apply monitoring and evaluation frameworks to track progress and report performance, and in particular, impact of investments.
- Use standardized tools and guidelines to measure performance and communicate progress and challenges associated with investment projects.

### RESPONSIBILITIES

The CSR Department has general oversight for M&AOSB's community investment, sponsorship, and donation activities, such as reviewing the policy on a regular basis; reviewing the direction of M&AOSB's community investment goals and objectives; and, conducting an annual review of the company's social performance against this policy, stated goals, and objectives of community investment activities.

In addition, the CSR Department ensures this policy is implemented across the company. Devising local strategy, managing community investment, sponsorship and donation activities, and coordinating community engagement activities across various functions are the primary responsibilities of the CSR Department.

The CSR Department is responsible for the reporting of the company's social performance in an annual progress report based on the UN Global Compact formats. In addition, the CSR Department is also responsible to respond to social related questions addressing sustainability, environment, and governance.





## COMMUNITY INVESTMENT

CONTINUED

### REVIEW, MONITORING AND REPORTING

The Community Investment Policy will be reviewed every two years to ensure that it is aligned with the changes in our business and external environment including changes to national context and legal requirements. We seek to apply internationally accepted standards, such as the London Benchmarking Group methodology, to review the effectiveness of major projects/programs in creating value for the community and the business. M&AOSB is committed to communicating openly and transparently to our stakeholders on the economic, social, and environmental impact of our business.

( U Myo Tin )

General Manager

Myint & Associates Offshore Supply Base Ltd.



## CORPORATE SOCIAL RESPONSIBILITY POLICY

DOCUMENT NO. : M&AOSB-CPL-05012018-CSR  
DOCUMENT TITLE : CORPORATE SOCIAL RESPONSIBILITY POLICY  
AUTHOR : CORPORATE AFFAIRS MANAGER  
DATE : 05 JANUARY 2018  
APPROVED BY : GENERAL MANAGER

### OBJECTIVES

M&AOSB is committed to being a responsible investor in the long-term development of the host nation by conducting business operations to the highest standards.

Our goal is to be honest and conduct business with integrity with the people we work with, which can include, but is not limited to, local communities, business partners, and governments, and to maintain respect for cultural, national, and religious diversity.

### APPLICABILITY

M&AOSB expects active participation in achieving its goals and commitments by all employees and managers regardless of corporate hierarchy, contractor, and/or suppliers who individually and collectively are responsible for performance across the business value chain.

Breach of the M&AOSB Corporate Social Responsibility Policy may result in disciplinary action, up to and including dismissal. Contracted personnel who fail to comply with this policy may have their contract terminated, not renewed, or be subject to other appropriate actions. M&AOSB reserves the right to amend or update this policy as required from time to time.



## CORPORATE SOCIAL RESPONSIBILITY POLICY

CONTINUED

### COMMITMENT

Company directors, personnel, and contractors are responsible for ensuring strict compliance with this policy, and specifically to:

- Respect individuality and diversity of all employees, treating them fairly and without discrimination.
- Commit to equal opportunity in all aspects of employment and encouragement in diversity.
- Stimulate personal growth of all employees through promotion of creativity and teamwork.
- Provide a safe, secure, and worker friendly environment that promotes career opportunities for self-development.
- Ensure compliance with the M&AOSB Health & Safety Policy and Environmental Policy by all personnel involved in our activities.
- Contribute to the sustainable development of communities through active engagement and dialogue.
- Maintain high ethical standards and support transparency in all of our activities.
- Encourage our partners and stakeholders to observe and uphold similar standards wherever possible.

### RESPONSIBILITIES

M&AOSB executive management is accountable for the implementation of this policy. Implementation is achieved by adhering to our management systems, and where appropriate, the management systems used by those who work with us.

The Corporate Social Responsibility Policy will be reviewed every two years to ensure that it is aligned with the changes in our business and external environment, including changes to national context and legal requirements.



## **CORPORATE SOCIAL RESPONSIBILITY POLICY**

CONTINUED

### **REVIEW, MONITORING AND REPORTING**

M&AOSB executive management is accountable for the implementation of this policy. Implementation is achieved by adhering to our management systems, and where appropriate, the management systems used by those who work with us.

The Corporate Social Responsibility Policy will be reviewed every two years to ensure that it is aligned with the changes in our business and external environment, including changes to national context and legal requirements.

A handwritten signature in blue ink, appearing to read 'U Myo Tin', is positioned above the printed name.

**( U Myo Tin )**

General Manager

Myint & Associates Offshore Supply Base Ltd.





## ENVIRONMENTAL POLICY

DOCUMENT NO. : M&AOSB-CPL-05012018-EP  
DOCUMENT TITLE : ENVIRONMENTAL POLICY  
AUTHOR : HEALTH, SAFETY & ENVIRONMENT MANAGER  
DATE : 05 JANUARY 2018  
APPROVED BY : GENERAL MANAGER

### OBJECTIVES

M&AOSB is committed to demonstrating appropriate and sincere respect for the environment, particularly for the prevention of any accidental loss of resources or assets likely to have an impact on the environment, company employees and communities located in the areas where we operate. In addition, we focus on enabling business operations to be improved in an environmentally responsible manner and aim to:

- minimal environmental impact

### APPLICABILITY

M&AOSB expects active participation in achieving its goals and commitments by all employees and managers regardless of corporate hierarchy, contractor, and/or suppliers who individually and collectively are responsible for performance across the business value chain.

Breach of the M&AOSB Environmental Policy may result in disciplinary action, up to and including dismissal. Contracted personnel who fail to comply with this policy may have their contract terminated, not renewed, or be subject to other appropriate actions. M&AOSB reserves the right to amend or update this policy as required from time to time.

### COMMITMENT

To achieve this objective, M&AOSB will:

- Implement environmental management plans to monitor and manage impacts as a result of our operations.
- Track and reduce emissions and consumption.
- Promote access to environmentally responsible methods and information across the organization.
- Protect the environment in the communities where we work and live.
- Strive to prevent pollution, and seek improvement with respect to emissions, wastewater discharge, energy consumption, resource consumption and reduction of impact to the environment.



## ENVIRONMENTAL POLICY

CONTINUED

- Monitor the effects of our activities on the environment and take action to address such effects where necessary.
- Openly communicate our environmental performance, with our workforce, government and the host community through a variety of engagement methods that includes, but is not limited to, coordination meetings, disclosure workshops, and performance reviews.
- Comply with both national legislation and industry best practices such as the UN Global Compact on environment, and in particular, the seventh, eighth, and ninth principles of the compact.
- Conduct appropriate training to ensure all our personnel are competent in their respective jobs and understand and adhere to this policy.
- Foster a culture that empowers and rewards everyone to act in accordance with this policy.

## RESPONSIBILITIES

Responsibilities for environmental performance are visible throughout the organization, with clarity for line management accountability. The HSE Department and its working group are committed to embed a responsible culture instilling environmental best practices, develop management plans to monitor impacts, and minimize any adverse impacts from our operation.

## REVIEW, MONITORING AND REPORTING

This policy will be reviewed every two years to ensure that it is aligned with the changes in our business and external environment, including changes in the national context and legal requirements. M&AOSB executive management is accountable for the implementation of this policy. Implementation will be achieved by adhering to our management systems, and where appropriate, the management systems used by those who work with us, such as third party contractors.

( U Myo Tin )

General Manager

Myint & Associates Offshore Supply Base Ltd.





## HEALTH & SAFETY POLICY

DOCUMENT NO. : M&AOSB-CPL-05012018-EP  
DOCUMENT TITLE : HEALTH & SAFETY POLICY  
AUTHOR : HEALTH, SAFETY & ENVIRONMENTAL MANAGER  
DATE : 05 JANUARY 2018  
APPROVED BY : GENERAL MANAGER

### OBJECTIVES

M&AOSB is committed to continuously improving our health, and safety performance. In addition, we strive to embed a safety first culture consistent with our fundamental goals, which include:

- Zero accidents
- No harm to people

### APPLICABILITY

M&AOSB expects active participation in achieving its health and safety goals and commitments by all employees and managers, regardless of corporate hierarchy, contractor, and/or suppliers who individually and collectively are responsible for performance across the business value chain.

Breach of the M&AOSB Health and Safety Policy may result in disciplinary action, up to and including dismissal. Contracted personnel who fail to comply with this policy may have their contract terminated, not renewed, or be subject to other appropriate actions. M&AOSB reserves the right to amend or update this policy as required from time to time.

### COMMITMENT

The M&AOSB Health and Safety Management System is fundamental to our business and applicable to all areas of our operations. Our commitment adheres to and strives to meet the following principles throughout our operations:

- All accidents are preventable.
- No activity is so important that it cannot be done safely.
- Meet or exceed the requirements of applicable health & safety legislation, regulations and company health & safety expectations.





## HEALTH & SAFETY POLICY

CONTINUED

- Health & safety performance depends on all employees and contractor personnel working with M&AOSB. Everyone is responsible for working safely.
- Continually strive to reduce undesirable impact of our business on health and safety by applying safe working practices.
- Continuously mitigate injury risks by rectifying and reporting all actions and conditions which could result in an accident/ incident.
- Conduct appropriate training to ensure all our personnel are competent in their respective jobs and understand and adhere to this policy.
- Ensure business plans and personal objectives include measurable health & safety targets which are established annually and reviewed regularly.

## RESPONSIBILITIES

Responsibilities for health & safety performance are visible throughout the organization, with clarity for line management accountability. The HSE Department and its working group are committed to embed a safety first culture by systematically managing health & safety performance and promoting safe working practices to prevent incidents.

## REVIEW, MONITORING AND REPORTING

The policy will be reviewed every two years to ensure that it is aligned with changes in the business and external environment, including changes in the national context and legal requirements. M&AOSB executive management is accountable for the implementation of this policy. Implementation is achieved by adhering to our management systems, and where appropriate, the management systems used by those who work with us such as third party contractors.

( U Myo Tin )

General Manager

Myint & Associates Offshore Supply Base Ltd.

# **Appendix B – Approval for the Jetty Layout Design from MPA**



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ  
ပို့ဆောင်ရေး နှင့် ဆက်သွယ်ရေးဝန်ကြီးဌာန  
**မြန်မာ့ဆိပ်ကမ်းအာဏာပိုင်**

No. 10, Pansodan Street, Yangon, Myanmar. Tel: (95-1) 379141, 246375, 387116 Fax: (95-1) 391355, 384737.  
P.O. Box. No. 1, Email: mpa@mptmail.net.mm, <http://www.mpa.gov.mm>

စာအမှတ်၊ဆက/မြို့ပြ(M&A)/၁၄၀၁/၂၀၁၈

ရက်စွဲ၊ ၂၀၁၈ ခုနှစ်၊ ဇွန်လ ၂၀ ရက်

အကြောင်းအရာ။ Myint & Associates Offshore Supply Base (M&AOSB)မှ တည်ဆောက်မည့် Jetty Layout Design အပေါ် အတည်ပြုချက်တောင်းခံထားခြင်းကိစ္စ။

ရည်ညွှန်းချက်။ Myint & Associates Offshore Supply Base Ltd ၏ ၇-၅-၂၀၁၈ ရက်စွဲပါ စာအမှတ်၊ M&AOSB/LET-056/2018

၁။ ဧရာဝတီတိုင်းဒေသကြီး၊ ပုသိမ်ခရိုင်၊ ငပုတောမြို့နယ်၊ ငရုတ်ကောင်းမြို့နယ်ခွဲ၊ နံသာပုကျေးရွာအနီးပင်လယ်ကမ်းနဖူးတွင် Myint & Associates Offshore Supply Base Ltd (M&AOSB)မှ ကမ်းလွန်ရေနေ့တွင်းများအတွက် လိုအပ်သောဝန်ဆောင်မှုများ ဆောင်ရွက်ရန် ကမ်းလွန်ထောက်ပံ့ရေးအခြေစိုက်စခန်းပါ ဆိပ်ခံတံတား၏ Jetty Layout Design ကို Royal Haskoning DHV Myanmar Company Limited မှ ရေးဆွဲထားပြီးဖြစ်ပါ၍ EPC Tender ခေါ်ယူရန် စီစဉ်ဆောင်ရွက်လျက်ရှိသည့်အတွက်ကြောင့် တည်ဆောက်မည့် Overall Layout Terminal နှင့် General Layout Port Design တို့အား စိစစ်အကြံပြုနိုင်ပါရန်နှင့် အတည်ပြုချက်ပေးနိုင်ပါရန် ရည်ညွှန်းချက်ပါစာဖြင့် တင်ပြလာပါသည်။


၂။ Myint & Associates Offshore Supply Base Ltd (M&AOSB) မှ ကမ်းလွန်ထောက်ပံ့ရေး အခြေစိုက်စခန်းတွင် တည်ဆောက်မည့် ဆိပ်ခံတံတား၏ ပုံစံဒီဇိုင်းတည်နေရာပြပုံ (Jetty Layout Design) အပေါ် မြို့ပြအင်ဂျင်နီယာရှုထောင့်မှ အထူးမှတ်ချက်ပြုရန်မရှိပါကြောင်း စိစစ်တွေ့ရှိရပါသည်။

၃။ သို့ရာတွင် Royal Haskoning DHV Myanmar Company Limited မှ Design Site နှင့်ပတ်သက်၍ နောက်ဆက်တွဲ(က)ပါ တင်ပြထားမှုအပေါ် အောက်ပါအတိုင်း စိစစ်တွေ့ရှိရပါသည် -

- (က) Jetty နေရာတွင် Closed Structure ဖြစ်သောကြောင့် ရေစီးနှုန်းအလွန်နည်းပါးခြင်း၊ လှိုင်းအမြင့်မှာလည်း 0.2 M ခန့်သာရှိနိုင်ခြင်း၊ မုတ်သုန်လေ တိုက်ခတ်ချိန်တွင်လည်း လေကွယ်ရရှိသည့်အနေအထားကြောင့် သင်္ဘောပေါ် လေတိုက်မှုသက်ရောက်အားနည်းပါးခြင်းများရရှိကြောင်း တွေ့ရှိရပါသည်။

19.6



- (ခ) Jetty ပုံစံကို ကမ်းခြေမှရေထဲသို့ Causeway တည်ဆောက်ပြီး ၎င်းထိပ်တွင် Jetty များတည်ဆောက်ရန် လျာထားသည့်အတွက် တံတားပုံစံမှာ နောက်ဆက်တွဲ(ခ) ပါ ပုံအတိုင်း ရှိနေပါသည်။ သင်္ဘောကြီးများ ဆိုက်ကပ်သည့်တံတားနှင့် သင်္ဘောငယ် များဆိုက်ကပ်တံတားသည်  ပုံစံ ဖြစ်နေသောကြောင့် သင်္ဘောကြီး ဆိုက်ကပ် မည့်အတွင်းပိုင်း Jetty End သည် ကျဉ်းမြောင်းနေသည်ကို တွေ့ရှိရပါသည်။
- (ဂ) Approach Channel ကို နောက်ဆက်တွဲ(ခ)ပါပုံအရ အကွေ့များဖြင့် လျာထား သည်ကိုတွေ့ရှိရပါသည်။ ပတ်ဝန်းကျင်တွင်ရေအနက်လုံလောက်စွာရှိသဖြင့် Approach Channel ကို ဖြောင့်တန်းပေးပါက ရေယာဉ်ကိုင်တွယ်ရ ပိုမိုကောင်းမွန်ပြီး Turning Basin သို့ ဝင်ရောက်ရာတွင်လည်း ရေယာဉ်အရှိန်လျော့ချရပ်တန့်ရာတွင် ပို၍ ကိုင်တွယ်ရ ကောင်းမွန်လာနိုင်ပါသည်။

၄။ သို့ဖြစ်ပါ၍ မြန်မာ့ဆိပ်ကမ်းအာဏာပိုင်အနေဖြင့် Jetty Layout အပေါ် လက်ခံပေးနိုင် ပါသည်။ ရေယာဉ်များ ဆိုက်ကပ်ရာတွင်လည်း Tug Boat အကူအညီပါ ပေးမည်ဖြစ်သောကြောင့် အခက်အခဲမရှိနိုင်ပါကြောင်း၊ သင်္ဘောကြီးကပ်မည့်တံတား၏ အပြင်ဘက် Jetty End အနီးတွင် Mooring Dolphin တစ်ခုထပ်မံဖြည့်ဆည်းပေးပါက ဆိုက်ကပ်မည့် တံတားနှင့် Dolphin တို့ကို ကြိုတင်မှေး၍ ဆိုက်ကပ်ပြီး ကျဉ်းမြောင်းသည့် Jetty End ဘက်သို့တိုးယူဆိုက်ကပ်နိုင်မည် ဖြစ်ပါကြောင်း၊ Turning Basin သည်လည်း Design Ship LOA ၏ ၂ ဆ လျာထားသဖြင့် လုံလောက်မှုရှိပါကြောင်းနှင့် Approach Channel ကို ဖြောင့်တန်းစွာ လုပ်ဆောင်ပေးပါက ပို၍ ကောင်းမွန်ပါကြောင်း အကြံပြုပြန်ကြားအပ်ပါသည်။



ဦးဆောင်ညွှန်ကြားရေးမှူး(ကိုယ်စား)

စိုးသိန်း၊ အင်ဂျင်နီယာချုပ်(မြို့ပြ)

ဦးမျိုးတင်(ဒါရိုက်တာ)

Myint & Associates Offshore Supply Base Ltd

## **Appendix C – Local land owners (the purchasing contract list and copy of one contract)**

ဧရာဝတီတိုင်းဒေသကြီး ၊ ငရုတ်ကောင်း မြို့နယ် ၊ နံသာပုကျေးရွာ ၌ မြင့်အင် (နံ) အဆိုစီရိတ် (စံ)  
ကုမ္ပဏီမှ ဝယ်ယူထားသောဆိုင်အဝင်လမ်းမြေ ( ၁.၆၃၁ ဧက )

စဉ်	မြေရောင်းချသူအမည်	မြေဝယ်ယူသူအမည်	ဧရိယာ (ဧက)	တည်နေရာ	မြေအမျိုးအစား
၁	ဦးအဝမ်း	မြင့်အင်(နံ)အဆိုစီရိတ်(စံ) ကုမ္ပဏီလီမိတက်	၀.၀၆၈	ကွင်းအမှတ်(၁၉၅၃)၊ဦးပိုင်အမှတ် (၉၅/၂) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင် ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့နယ်၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	ဥယျာဉ်ခြံမြေ
၂	ဦးမောင်ဖလေ့	မြင့်အင်(နံ)အဆိုစီရိတ်(စံ) ကုမ္ပဏီလီမိတက်	၀.၂၅၉	ကွင်းအမှတ်(၁၉၅၃)၊ဦးပိုင်အမှတ် (၅၂ /၁၀၂) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင်ရပ်ကွက်၊ ငရုတ် ကောင်းမြို့၊ ငပုတောမြို့ နယ်၊ ဧရာဝတီတိုင်း ဒေသကြီး။	ဥယျာဉ်ခြံမြေ
၃	ဒေါ်သကြီနီ	မြင့်အင်(နံ)အဆိုစီရိတ်(စံ) ကုမ္ပဏီလီမိတက်	၀.၁၂၉	ကွင်းအမှတ်( ၁၉၅၃ )၊ဦးပိုင်အမှတ် (    ) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင်ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်း ဒေသကြီး။	ဥယျာဉ်ခြံမြေ

၄	ဦးတိုင်လေ	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၀၉၀	ကွင်းအမှတ်၊( )၊ဦးပိုင်အမှတ် ( )၊ နံသာပု ကျေးရွာ၊ဇင်ယော်ချောင် ရပ်ကွက်၊ ငရုတ်ကောင်း မြို့နယ်၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသ ကြီး။	ဥယျာဉ်ခြံမြေ
၅	ဦးဘိုကေ	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၀၆၂	ကွင်းအမှတ်၊( )၊ဦးပိုင်အမှတ် ( ) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင် ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့ နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	ဥယျာဉ်ခြံမြေ
၆	ဒေါ်မူဆိပ်	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၀၇၈	ကွင်းအမှတ်၊( ၁၉၅၃ )၊ဦးပိုင်အမှတ် ( ) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင်ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	ဥယျာဉ်ခြံမြေ
၇	ဦးဟိုင်းစယ်	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၁၃၇	ကွင်းအမှတ်၊( )၊ဦးပိုင်အမှတ် ( ) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင် ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	ဥယျာဉ်ခြံမြေ





၈	ဦးပြည်တော်အေး	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၃၆၅၀၀၀	ကွင်းအမှတ်(၁၉၅၃)၊ဦးပိုင်အမှတ် (၁၀၆)၊ နံသာပုကျေးရွာ၊ဇင်ယော်ချောင်ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	ဥယျာဉ်ခြံမြေ/ လယ်မြေ
၉	ဦးမိုးညို	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၀၃၉	ကွင်းအမှတ်( )၊ဦးပိုင်အမှတ် ( ) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင်ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	ဥယျာဉ်ခြံမြေ
၁၀	သတ္တမအသင်းတော်	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၂၉၄	ကွင်းအမှတ်( )၊ဦးပိုင်အမှတ် ( ) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင်ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	ဥယျာဉ်ခြံမြေ
၁၁	ဦးအေဝမ်း	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၀၀၂၇၅	ကွင်းအမှတ်( )၊ဦးပိုင်အမှတ် ( ) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင်ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	လယ်မြေ
၁၂	ဦးပြည်တော်အေး	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၀၉၃	ကွင်းအမှတ်(၁၉၅၃)၊ဦးပိုင်အမှတ် (၁၀၆)၊ နံသာပုကျေးရွာ၊ဇင်ယော်ချောင်ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	လယ်မြေ
၁၃	ဦးအေဝမ်း	မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကုမ္ပဏီလီမိတက်	၀.၀၁၄	ကွင်းအမှတ်(၁၉၅၃)၊ဦးပိုင်အမှတ် (၉၅/၂) ၊နံသာပုကျေးရွာ၊ဇင်ယော်ချောင် ရပ်ကွက်၊ ငရုတ်ကောင်းမြို့နယ်၊ ငပုတောမြို့နယ်၊ ဧရာဝတီတိုင်းဒေသကြီး။	လယ်မြေ



စုစုပေါင်းဝယ်ယူပြီး လမ်းမြေ ဧက




၁.၆၃၁




# **Appendix D – Terrestrial Biodiversity Species Lists**

Flora Species Inventory List of the Study Area




No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
1	<i>Acanthus</i>	<i>ilicifolius</i>	Kha-yar	Acanthaceae	NA	LC	S	
2	<i>Ageratum</i>	<i>conyzoides</i>	Kadu-hpo	Asteraceae	NA	NA	S	


No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
3	<i>Amorphophallus</i>	<i>campanulatus</i>	Wa-u-pin	Araceae	NA	NA	H	
4	<i>Anogeissus</i>	<i>acuminata</i>	Yon	Combretaceae	NA	NA	T	




No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
5	<i>Areca</i>	<i>catechu</i>	Kunthi-pin	Arecaceae	NA	NA	T	
6	<i>Albizia</i>	<i>lebbek</i>	Kokko	Fabaceae	NA	NA	T	
7	<i>Calophyllum</i>	<i>inophyllum</i>	Pon-nyet	Hypericaceae	NA	LC	T	


No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
8	<i>Canavalia</i>	<i>rosea</i>	Notknown	Fabaceae	NA	NA	CR	
9	<i>Cassia</i>	<i>fistula</i>	Ngu	Fabaceae	NA	NA	T	
10	<i>Cassia</i>	<i>tora</i>	Dangywe	Fabaceae	NA	NA	S	





No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
11	<i>Chromolaena</i>	<i>odorata</i>	Bizat	Asteraceae	NA	NA	S	
12	<i>Clerodendrum</i>	<i>inerve</i>	Pinle-kyauk-pan	Verbenaceae	NA	NA	S	
13	<i>Cocos</i>	<i>nucifera</i>	Ohn	Areaceae	NA	NA	T	




No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
14	<i>Codiaeum</i>	<i>variegatum</i>	Ywethla	Euphobiaceae	NA	NA	S	
15	<i>Corchorus</i>	<i>trilocularis</i>	Pilaw-apo	Malvaceae	NA	NA	S	
16	<i>Costus</i>	<i>speciosus</i>	Phalan-taung-hmwe	Costaceae	NA	NA	H	

No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
17	<i>Crinum</i>	<i>asiaticum</i>	Koyan-gyi	Amaryllidaceae	NA	NA	H	
18	<i>Dioscorea</i>	<i>alata</i>	Myauk-u	Dioscoreaceae	NA	NA	CL	
19	<i>Dillenia</i>	<i>indica</i>	Thabyu	Dilleniaceae	NA	NA	T	




No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
20	<i>Euphorbia</i>	<i>hirta</i>	Not known	Euphobiaceae	NA	NA	H	
21	<i>Flacourtia</i>	<i>inermis</i>	Naywe	Flacourtiaceae	NA	NA	T	




No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
22	<i>Globba</i>	<i>marantina</i>	Waso pan	Zingiberaceae	NA	NA	H	
23	<i>Gloriosa</i>	<i>superba</i>	Simidauk	Colchicaceae	NA	NA	CL	
24	<i>Harrisonia</i>	<i>perforata</i>	Not known	Rutaceae	NA	NA	ST	



No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
25	<i>Hyptis</i>	<i>suaveolens</i>	Not known	Lamiaceae	NA	NA	S	
26	<i>Ipomoea</i>	<i>pes-caprae</i>	Pinle-kazun	Convolvulaceae	NA	NA	CL	
27	<i>Ixora</i>	<i>rosea</i>	Ponna-yeik	Rubiaceae	NA	NA	S	




No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
28	<i>Mangifera</i>	<i>indica</i>	Thayet	Anacardiaceae	NA	NA	T	
29	<i>Mimosa</i>	<i>pudica</i>	Tikayon	Mimosaceae	NA	NA	H	
30	<i>Morinda</i>	<i>elliptica</i>	Mai-yaw	Rubiaceae	NA	NA	ST	








No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
31	<i>Nypa</i>	<i>fruticans</i>	Dani	Arecaceae	NA	LC	ST	
32	<i>Oroxylum</i>	<i>indicum</i>	Kyaung-sha	Bignoniaceae	NA	NA	T	
33	<i>Pandanus</i>	<i>odoratissimus</i>	Sat-thapoo	Pandanaceae	NA	NA	T	

No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
34	<i>Physalis</i>	<i>minima</i>	Bauk-pin	Solanaceae	NA	NA	H	
35	<i>Piper</i>	<i>longum</i>	Peik-chin	Piperaceae	NA	NA	CL	
36	<i>Piper</i>	<i>nigrum</i>	Nga-yok-kaung,	Piperaceae	NA	NA	CL	

No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
37	<i>Pterospermum</i>	<i>acerifolium</i>	Taung-phet-wun	Malvaceae	NA	NA	T	
38	<i>Scaevola</i>	<i>taccada</i>	Pinle-tan	Goodeniaceae	NA	NA	S	
39	<i>Schumannianthus</i>	<i>dichotomus</i>	Thin	Marantaceae	NA	NA	H	

No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
40	<i>Scoparia</i>	<i>dulcis</i>	Dana-thuka	Scrophulariaceae	NA	NA	H	
41	<i>Sesbania</i>	<i>paludosa</i>	Nyan	Fabaceae	NA	NA	S	
42	<i>Sida</i>	<i>acuta</i>	Not known	Malvaceae	NA	NA	H	



No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
43	<i>Stachytarpheta</i>	<i>indica</i>	Aseik-taya	Verbenaceae	NA	NA	H	
44	<i>Terminalia</i>	<i>catappa</i>	Banda	Combretaceae	NA	NA	T	
45	<i>Thespesia</i>	<i>populnea</i>	Sabu-bani	Malvaceae	NA	NA	ST	

No.	Genus Name	Species name	Myanmar Name	Family Name	Myanmar Protected Species	IUCN Red List Status	Habit	Photo
46	<i>Urena</i>	<i>lobata</i>	Wetchi-pane	Malvaceae	NA	NA	S	
47	<i>Ziziphus</i>	<i>jujuba</i>	Zi	Rhamnaceae	NA	NA	T	



DD - Data Deficient, NE- Not Evaluated, LC- Least Concern, NT- Near Threatened, VU - Vulnerable, EN - Endangered, NA - Not Yet Assessed



S - Shrub, H - Herb, T - Tree, CR - Creeper, CL - Climber, ST - Small Tree




*Bird Species Recorded during the Survey Period*



Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
I		Passeriformes				
1	Acrocephalidae	<i>Acrocephalus agricola</i>	Paddyfield Warbler	NA	LC	
2	Covidae	<i>Dicrurus macrocercus</i>	Black Drongo	NA	LC	







Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
3	Corvidae	<i>Corvus macrorhynchos</i>	Large-Billed Crow	NA	LC	
4	Dicruridae	<i>Dicrurus remifer</i>	Lesser Rasket-Tailed Drongo	NA	LC	



Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
5	Estrildidae	<i>Lonchura striate</i>	White-Rumped Munia	NA	NA	
6	Passeridae	<i>Passer domesticus</i>	House Sparrow	NA	LC	

Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
7	Passeridae	<i>Passer montanus</i>	Eurasian Tree Sparrow	NA	LC	
8	Ploceidae	<i>Lonchua punctulata</i>	Scaly-Breasted Munia	NA	NA	
9	Sturnidae	<i>Acridotheres tristis</i>	Common Myna	NA	LC	

Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
10	Sturnidae	<i>Acridotheres fuscus</i>	Jungle Myna	NA	LC	
11	Columbidae	<i>Spilopelia chinensis</i>	Spotted Dove	NA	LC	


Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
12	Columbidae	<i>Columba livia</i>	Rock Pigeon	NA	LC	
13	Columbidae	<i>Streptopelia tranquebarica</i>	Red Collared Dove	NA	LC	



Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
14	Pycnonotidae	<i>Pycnonotus jocosus</i>	Red-Whiskered Bulbul	NA	LC	
15	Pycnonotidae	<i>Pycnonotus cafer</i>	Red-vented Bulbul	NA	LC	

Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
16	Pycnonotidae	<i>Pycnonotus blanfordi</i>	Streak Eared Bulbul	NA	LC	
17	Nectariniidae	<i>Leptocoma calcostetha</i>	Copper-Throated Sunbird	NA	LC	







Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
19	Megalaimidae	<i>Megalaima haemacephala</i>	Coppersmith Barbet	NA	LC	
III		Apodiformes				
20	Apodidae	<i>Aerodramus fuciphagus</i>	Edible-Nest Swiftlet	NA	LC	
IV		Charadriiformes				



Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
21	Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpipe	NA	LC	
V Pelecaniformes						
22	Ardeidae	<i>Ardea purpurea</i>	Purple Heron	NA	LC	


Sr.	Order/ Family	Scientific Name	Common Name	Myanmar Protected Species	IUCN Red List Status	Photo
23	Ardeidae	<i>Ardea herodias</i>	Great Blue Heron	NA	LC	
VI						
		Cuculiformes				
24	Centropodidae	<i>Centropus sinensis</i>	Greater Coucal	NA	LC	

DD - Data Deficient, NE- Not Evaluated, LC- Least Concern, NT- Near Threatened, VU - Vulnerable, EN - Endangered, NA - Not Yet Assessed

### *Reptile Species Recorded during the Survey Period*

Sr.	Order/Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Type of evidence	Photos
I		Squamata ( <b>Lizard</b> )					
1	Agamidae	<i>Calotes chincollium</i>	Collared Forest Lizard	NA	LC	Observed	
2	Agamidae	<i>Calotes htunwini</i>	Htunwin's Forest Lizard	NA	NA	Observed	

Sr.	Order/Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Type of evidence	Photos
3	Agamidae	<i>Bronchocela smaragdina</i>	Chanthabun Forest Lizard	NA	VU	Observed	
Squamata (Snake)							
4	Elapidae	<i>Laticauda colubrina</i>	Yellow-Lipped Sea Krait	NA	LC	Observed	
5	Elapidae	<i>Bungarus fasciatus</i>	Banded Krait	NA	LC	Interviewed	-



Sr.	Order/Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Type of evidence	Photos
6	Colubridae	Chrysopelea ornata	Golden Tree Snake	NA	NE	Observed	
7	Colubridae	Xenochrophis piscator	Asiatic water snake	NA	NE	Interviewed	-




DD - Data Deficient, NE- Not Evaluated, LC- Least Concern, NT- Near Threatened, VU - Vulnerable, EN - Endangered, NA - Not Yet Assess

No. of species - 7, No. of Family - 3, No. of Order - 1



### *Amphibian Species Recorded during the Survey Period*


Sr.	Order/Family	Species	Common Name	Myanmar Protected species	IUCN Red List Status	Type of evidence	Photos
Anura							
1	Bufo	<i>Dutlaphrynus melanostictus</i>	True Toad/Phar Pyoke	NA	NE	Observed	
2	Dicroglossidae	<i>Fejervarya limnocharis</i>	Paddy frog	NA	LC	Observed	




Sr.	Order/Family	Species	Common Name	Myanmar Protected species	IUCN Red List Status	Type of evidence	Photos
3	Dicroglossidae	<i>Fejervarya greenii</i>	Montane frog	NA	EN	Observed	
4	Dicroglossidae	<i>Euphlyctis cyanophlyctis</i>	Skittering frog	NA	NE	Observed	
5	Dicroglossidae	<i>Occidozyga laevis</i>	Common puddle frog	NA	LC	Observed	




DD - Data Deficient, NE- Not Evaluated, LC- Least Concern, NT- Near Threatened, VU - Vulnerable, EN - Endangered, NA - Not Yet Assess


No. of Species - 5, No. of Order - 1, No. of Family - 2




*Butterfly Species Recorded during the Survey Period*

Order/Family	Species	Common Name	Abundance status	Photos
Lepidoptera				
Papilionidae	<i>Papilio memnon agenor</i>	Great Mormon	Common	
Papilionidae	<i>Papilio polytes</i>	Common Mormon	Common	
Papilionidae	<i>Papilio demoleus</i>	Lime butterfly	Common	




Order/Family	Species	Common Name	Abundance status	Photos
Papilionidae	<i>Graphium agamemnon</i>	Tailed Jay	Common	
Pieridae	<i>Catopsilia pomona</i>	Common Emigrant	Abundance	
Pieridae	<i>Pareronia valeria</i>	Common Wanderer	Common	


Order/Family	Species	Common Name	Abundance status	Photos
Pieridae	<i>Eurema hecabe</i>	Common grass yellow	Abundance	
Danaidae	<i>Danaus limniace</i>	Blue Tiger	Common	
Danaidae	<i>Euploea core</i>	Common Indian Crow	Common	




Order/Family	Species	Common Name	Abundance status	Photos
Danaidae	<i>Euploea mulciber</i>	Striped Blue Crow	Common	
Nymphalidae	<i>Hypolimnys bolina</i> (Male)	Great Eggfly	Common	
Nymphalidae	<i>Hypolimnys bolina</i> (Male)	Great Eggfly	Common	




Order/Family	Species	Common Name	Abundance status	Photos
Nymphalidae	<i>Junonia hierta</i> (Male)	Yellow Pansy	Common	  
Nymphalidae	<i>Junonia lemonias</i>	Lemon Pansy	Common	
Nymphalidae	<i>Junonia atlites</i> (Male)	Gray Pansy	Common	



Order/Family	Species	Common Name	Abundance status	Photos
Satyridae	<i>Elymnias hypermnestra</i> (Male)	Common Palm Fly	Common	  
Satyridae	<i>Elymnias hypermnestra</i> (Female)	Common Palm Fly	Common	
Satyridae	<i>Mycalesis perseus</i>	Common Bush Brown	Common	





Order/Family	Species	Common Name	Abundance status	Photos
Satyridae	<i>Ypthima baldus</i>	Common Five ring	Common	
Lycaenidae	<i>Tarucus nara</i>	Striped Pierrot	Common	
Hesperiidae	<i>Caltoris sp.</i>	Swift	Common	






Order/Family	Species	Common Name	Abundance status	Photos
Hesperiidae	<i>Pelopidas</i> sp.	Branded Swifts or Millet Skippers	Common	
Hesperiidae	<i>Pelopidas conjunctus</i>	Conjoined Swift	Common	
Hesperiidae	<i>Tagiades japetus</i>	Pied flat(or) Common Snow Flat	Common	






Order/Family	Species	Common Name	Abundance status	Photos
Hesperiidae	<i>Ancistroides nigrita</i>	Chocolate Demon	Common	
Hesperiidae	<i>Pelopidas</i> sp.	Branded Swifts or Millet Skippers	Common	
Hesperiidae	<i>Nastra lherminier</i>	Swarthy Skipper	Common	

No. of species – 27, No. of Order – 1, No. of Family – 7

*Dragonfly Species Recorded during the Survey Period in Proposed Project Area*

Order/Family	Species	Common Name	Abundance status	IUCN Red List Status	Photos
Odonata (Dragonfly)					
Libellulidae	<i>Potamarcha congener</i> (Male)	Yellow-tailed ashy skimmer or common chaser	Common	LC	
Libellulidae	<i>Potamarcha congener</i> (Female)	Yellow-tailed ashy skimmer or common chaser	Common	LC	
Libellulidae	<i>Neurothemis fulvia</i> (Male)	Fulvous Forest Skimmer	Common	LC	
Libellulidae	<i>Orthetrum sabina</i>	Slender Skimmer/ Green Marsh Hawk	Abundance	LC	




Order/Family	Species	Common Name	Abundance status	IUCN Red List Status	Photos
Libellulidae	<i>Brachythemis contaminata</i> (Male)	Ditch Jewel	Abundance	LC	
Libellulidae	<i>Brachythemis contaminata</i> (Female)	Ditch Jewel	Abundance	LC	
Libellulidae	<i>Diplacodes trivialis</i> (Male)	Ground Skimmer/Chalky Percher	Abundance	LC	
Libellulidae	<i>Diplacodes trivialis</i> (Female)	Ground Skimmer/Chalky Percher	Abundance	LC	
Libellulidae	<i>Crocothemis servilia</i> (Male)	Scarlet Skimmer/Ruddy Marsh Skimmer	Abundance	LC	

Order/Family	Species	Common Name	Abundance status	IUCN Red List Status	Photos
Libellulidae	<i>Crocothemis servilia</i> (Female)	Scarlet Skimmer/Ruddy Marsh Skimmer	Abundance	LC	
Libellulidae	<i>Pantala flavescens</i>	Globe Skimmer, Globe Wanderer or Wandering glider	Common	LC	
Libellulidae	<i>Trithemis pallidinervis</i>	Long-Legged Marsh Glider	Common	LC	
<b>Odonata (Damselfly)</b>					
Coenagrionidae	<i>Ischnura elegans</i> (Male)	Blue-tailed Damselfly	Abundance	LC	
Coenagrionidae	<i>Ischnura elegans</i> (Female)	Blue-tailed Damselfly	Common	LC	





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*Fish, Mud crab, Lobster and Shrimp Species Recorded during the Survey Period in Proposed Project Area*

Sr .	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status r	Photos
I	Fish						
1	Perciformes	Trichiuridae	<i>Lepturacanthus savala</i>	Savalani Hairtail	VU	NE	
2	Perciformes	Carangidae	<i>Caranx sexfasciatus</i>	Bigeye Trevally	NA	LC	
3	Perciformes	Gerreidae	<i>Gerres filamentosus</i>	Whipfin Silverbiddy	NA	LC	

Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
4	Perciformes	Leiognathidae	<i>Leiognathus equulus</i>	Common Ponyfish	NA	LC	
5	Perciformes	Carangidae	<i>Scomberoides lysan</i>	Doublespotted Queenfish	NA	LC	
6	Perciformes	Lethrinidae	<i>Lethrinus lentjan</i>	Pink Ear Emperor	VU	LC	
7	Perciformes	Carangidae	<i>Atropus atropus</i>	Cleftbelly Trevally	NA	NE	

Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
8	Perciformes	Sciaenidae	<i>Otolithes ruber</i>	Tiger-toothed Croaker	VU	NE	
9	Perciformes	Scombridae	<i>Thunnus obesus</i>	Bigeye Tuna	NA	VU	
10	Perciformes	Sciaeridae	<i>Pennahia anea</i>	Greyfin Croaker	NA	NE	
11	Perciformes	Mullidae	<i>Upeneus sulphureus</i>	Sulphur goatfish	VU	LC	

Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
12	Perciformes	Carangidae	<i>Alectis ciliaris</i>	Thred fish Trevally	NA	LC	
13	Perciformes	Lutjanidae	<i>Lutjanus lutjanus</i>	Bigeye Snapper	NA	LC	
14	Perciformes	Latidae	<i>Lates calcarifer</i>	Giant Seabass	VU	NE	
15	Perciformes	Scombridae	<i>Scomberomorus guttatus</i>	Indo-Pacific King Mackerel	VU	DD	





Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
16	Perciformes	Polynemidae	<i>Polynemus indicus</i>	Indian Thredfin	EN	NE	
17	Perciformes	Scombridae	<i>Rastrelliger kanagurta</i>	India Mackerel	VU	DD	
18	Perciformes	Lactariidae	<i>Lactarius lactarius</i>	False Trevally	VU	NE	
19	Perciformes	Pomacanthidae	<i>Pomacanthu annularis</i>	Bluering Angelfish	NA	NE	



Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
20	Perciformes	Carangidae	<i>Caranx ignobilis</i>	Giant Trevally	NA	LC	
21	Pleuronectiformes	Soleidae	<i>Pseudorhombus arsius</i>	Large-tooth Flounder	NA	NE	
22	Scorpaeniformes	Platycephalidae	<i>Platycephalus indicus</i>	Bartail Flathead	NA	DD	
23	Clupeiformes	Chirocentridae	<i>Chirocentrus dorab</i>	Dorab Wolf-herring	NA	NE	

Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
24	Clupeiformes	Clupeidae	<i>Anodontostoma chacunda</i>	Chacunda Gizzard Shad	NA	NE	
25	Clupeiformes	Pristigasteridae	<i>Pellona ditchela</i>	Pellona	NA	LC	
26	Clupeiformes	Clupeidae	<i>Tenualosa ilisha</i>	Hilsa Shad	CR	LC	
27	Clupeiformes	Engraulidae	<i>Stolephorus indicus</i>	Indian Anchovy	NA	NE	




Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
28	Siluriformes	Arridae	<i>Nemapteryx caelatus</i>	Engraved catfish	NA	NE	
29	Spariformes	Nemipteridae	<i>Scolopsis vosmeri</i>	Whitecheek Monocle Bream	NA	NE	
30	Spariformes	Nemipteridae	<i>Scolopsis bimaculatus</i>	Thumbprint Monocel Bream	NA	NE	
31	Aulopiformes	Synodontidae	<i>Saurida undosquamis</i>	Brushtooth Lizardfish	VU	LC	

Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
32	Myliobatiformes	Dasyatidae	<i>Dasyatis zugei</i>	Pale Edged Stingray	NA	NT	
33	Myliobatiformes	Myliobatidae	<i>Mobula japanica</i>	Spinetail Devilray	NA	NT	
34	Tetradontiformes	Ostraciidae	<i>Lactoria cornuta</i>	Longhorn Cowfish	NA	NE	
<b>II Shrimp</b>							
35	Decapoda	Penaeidae	<i>Penaeus indicus</i>	White shrimps	VU	NE	

Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
36	Decapoda	Palinuridae	<i>Panulirus polyphagus</i>	Mud Spiny Lobster	EN	LC	
37	Decapoda	Palinuridae	<i>Panulirus versicolor</i>	Painted Spiny Lobster	EN	LC	
III		Mud crab					

Sr.	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status	Photos
38	Decapoda	Portunidae	<i>Portunus sanguinolentus</i>	Redspot swimming crab	VU	NE	
39	Decapoda	Portunidae	<i>Charybdis feriata</i>	Coral crab	VU	NE	
40	Decapoda	Ocypodidae	<i>Uca annulipes</i>	Ring-Legged Fiddler Crab (Male)	NA	NE	
41	Decapoda	Ocypodidae	<i>Ocypode pallidula</i>	Pallid Ghost Crab	NA	NE	

Sr .	Order	Family	Species	Common Name	Myanmar Protected Species	IUCN Red List Status r	Photos
42	Decapoda	Ocypodidae	<i>Ocypode gaudichaudii</i>	Painted Ghost Crab/ Cart Driver Crab	NA	NE	

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# **Appendix E - Benthic Species Lists**

Phylum	Class	Order	Family	Species	B1-R1	B1-R2	B2-R1	B2-R2	B3-R1	B3-R2	B4-R1	B4-R2	B5-R1	B5-R2	B6-R1	B6-R2	C1	B1	B2	B3	B4	C2		
Annélida	Polychaeta	Capitellida	Capitellidae	Mediomastus californiensis	0	1	0	0	1	0	0	2	0	0	0	0	0	0.5	0.5	0	1	0	0	4
Annélida	Polychaeta	Eunicida	Eunicidae	Marphysa sanguinea	0	0	0	0	0	0	0	0	0	0	1	0	0	0.25	0	0	0	0.5	0	1
Annélida	Polychaeta	Eunicida	Lumbrineridae	Lumbrineris sp.	0	1	1	1	0	0	0	3	0	1	0	0	0	0.25	1	0	1.5	0.5	0	7
Annélida	Polychaeta	Eunicida	Onuphidae	Diopatra chiliensis	0	0	0	0	1	3	1	0	4	1	0	0	0	0.25	0	2	0.5	2.5	0	10
Annélida	Polychaeta	Eunicida	Onuphidae	Onuphis eremita	0	2	0	0	1	1	0	0	0	0	0	2	0	0.5	0	1	0	0	1	6
Annélida	Polychaeta	Orbiniida	Orbiniidae	Scoloplos marsupialis	2	4	0	0	0	7	0	0	1	0	4	1	0	2	0	3.5	0	0.5	2.5	19
Annélida	Polychaeta	Oweniida	Oweniidae	Owenia fuisformis	0	1	0	2	0	0	0	0	0	0	0	0	0	1.75	1	0	0	0	0	3
Annélida	Polychaeta	Phyllodocida	Glyceridae	Glycera chirori	5	2	1	1	2	3	1	0	2	2	1	0	0	2	1	2.5	0.5	2	0.5	20
Annélida	Polychaeta	Phyllodocida	Goniadidae	Glycinde gurbanovae	0	0	0	0	0	4	0	0	0	0	0	1	0	1.75	0	2	0	0	0.5	5
Annélida	Polychaeta	Phyllodocida	Nephtyidae	Aglaophamus sinensis	0	0	0	0	0	2	0	1	1	1	1	0	0	0	0	1	0.5	1	0	5
Annélida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys oligobranchia	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	2
Annélida	Polychaeta	Phyllodocida	Phyllodocidae	Phyllodoce papillosa	1	1	1	1	0	1	1	1	0	0	0	0	0	0.5	1	0.5	1	0	0	7
Annélida	Polychaeta	Phyllodocida	Pilargidae	Pilargis mohri	0	0	0	1	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	0	1
Annélida	Polychaeta	Phyllodocida	Sigalionidae	Sthenolepis japonica	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	2
Annélida	Polychaeta	Sabellida	Sabellidae	Potamilla sp.	0	2	0	0	1	0	0	0	0	0	0	0	0	0.5	0	0.5	0	0	0	3
Annélida	Polychaeta	Scolecida	Maldanidae	Euchylene sp.	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0.5	0	0	0	3
Annélida	Polychaeta	Spionida	Cirratulidae	Chaetozone setosa	0	0	0	0	0	0	1	1	0	0	0	1	0	0.5	0	0	1	0	0.5	3
Annélida	Polychaeta	Spionida	Magelonidae	Magelona pacifica	0	0	0	1	0	0	0	1	0	1	0	1	0	0	0	0	0.5	0	0	3
Annélida	Polychaeta	Spionida	Spionidae	Paraprionospio pinnata	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0.5	0.5	0	0	2
Annélida	Polychaeta	Spionida	Spionidae	Prionospio ehlersi	0	0	2	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	4
Annélida	Polychaeta	Spionida	Spionidae	Prionospio queenslandica	1	0	0	0	0	0	1	0	0	0	0	1	0	0.25	0	0	0.5	0	0.5	3
Annélida	Polychaeta	Terebellida	Ampharetidae	Auchenoplax worsfolds	0	0	1	0	0	0	0	0	0	0	0	0	0	0.25	0.5	0	0	0	0	1
Annélida	Polychaeta	Terebellida	Ampharetidae	Samytha japonica	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	1	0	0.5	0	3
Annélida	Polychaeta	Terebellida	Pectinariidae	Amphiclene japonica	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0.5	0	0	0.5	0	2
Annélida	Polychaeta	Terebellida	Sternaspidae	Sternaspis scutata	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Annélida	Polychaeta	Terebellida	Terebellidae	Loimia medusa	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.5	0	1
Annélida	Polychaeta	Terebellida	Terebellidae	Pista cristata	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.5	0	1
Annélida	Polychaeta	Terebellida	Trichobranchidae	Terebellides stroemii	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.5	0	0	0	1
Arthropoda	Crustacea	Decapoda	Albuncidae	Albunea groening	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.5	1
Arthropoda	Crustacea	Decapoda	Paranthuridae	Paranthura japonica	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	2
Arthropoda	Crustacea	Decapoda	Varunidae	Pseudohelice subquadrata	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.5	0	1
Arthropoda	Crustacea	Amphipoda	Ampeliscidae	Byblis sp.	2	3	1	0	1	5	1	1	2	1	2	0	0	1.25	0.5	3	1	1.5	1	19
Arthropoda	Crustacea	Amphipoda	Corophiidae	Corophium sp.	0	1	0	0	0	6	0	0	0	0	0	0	0	1.5	0	3	0	0	0	7
Arthropoda	Crustacea	Decapoda	Aegidae	Aega dofleini	0	0	0	0	0	0	1	0	0	0	0	0	0	0.25	0	0	0.5	0	0	1
Arthropoda	Crustacea	Decapoda	Alpheidae	Alpheus sp.	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	2
Arthropoda	Crustacea	Decapoda	Bodotriidae	Iphinoe sp.	0	1	0	0	0	0	0	0	0	1	0	1	0	0.25	0	0	0	0.5	0.5	3
Arthropoda	Crustacea	Decapoda	Squillidae	Clorida microphthalma	0	0	1	2	0	0	0	0	0	1	1	0	0	0.25	1.5	0	0	1	0	5
Arthropoda	Crustacea	Decapoda	Xenophthalmidae	Neoxenophthalmus obscurus	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Echinodermata	Echinoidea	Holactypoida	Fibulariidae	Fibularia angulipora	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	1.5	0	0	4
Echinodermata	Holothuroidea	Dendrochirotia	Phyllophoridae	Phylliphorus spiculata	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	1.5	0.5	0	3
Echinodermata	Stellerioidea	Ophiurida	Amphiuridae	Amphiplus laevis	0	0	0	0	0	1	1	0	1	0	0	1	0	0	0	0.5	0.5	0.5	0.5	4
Mollusca	Bivalvia	Veneroida	Mactridae	Mactra mauculata	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.5	1
Mollusca	Bivalvia	Veneroida	Tellinidae	Elpidollina sp.	1	0	0	0	0	0	0	0	0	0	0	0	0	0.25	0	0	0	0	0	1
Mollusca	Bivalvia	Veneroida	Tellinidae	Macoma candida	0	0	0	1	0	0	0	0	0	0	0	0	0	0.25	0.5	0	0	0	0	1
Mollusca	Bivalvia	Veneroida	Tellinidae	Nitidotellina iridella	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Mollusca	Bivalvia	Veneroida	Veneridae	Callista erycina	1	0	0	0	0	0	0	0	0	0	0	1	0	0.25	0	0	0	0	0.5	2
Mollusca	Bivalvia	Veneroida	Veneridae	Timoclea imbricata	0	0	0	0	0	1	0	0	1	0	0	0	0	0.25	0	0.5	0	0.5	0	2
Mollusca	Gastropoda	Heterogastropoda	Melanellidae	Eulima bifascialis	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.5	0	0	1
Mollusca	Gastropoda	Mesogastropoda	Potamididae	Cerithidea cingulata	2	0	0	0	0	1	0	0	0	1	0	0	0	0.5	0	0.5	0	0.5	0	4
Mollusca	Gastropoda	Neogastropoda	Olividae	Oliva miniacea	1	0	0	0	0	0	0	0	0	0	0	0	0	0.75	0	0	0	0	0	1
Mollusca	Gastropoda	Neogastropoda	Olividae	Oliva mustelina	0	0	0	0	0	0	0	0	0	0	0	0	1	0.25	0	0	0	0	0.5	1
Nemertinea	Anopla	Heteronemertea	Cerebratulidae	Cerebratulus sp.	0	0	0	0	1	1	0	0	1	0	1	0	0	0	1	0	0	0.5	0.5	4
Sipuncula	Phascolosomatidea	Phascolosomatida	Phascolosomatidae	Apionsoma trichocephala	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.5	0	0	0	1
					17	20																		
					37		21		61		26		32		22									
					18.5																			
Abundance					199																			
					124	62.31%																		
					43	21.61%																		
					11	5.53%																		
					16	8.04%																		
					4	2.01%																		
					1	0.50%																		



Phylum	Class	Order	Family	Species	B1-R1	B1-R2	B2-R1	B2-R2	B3-R1	B3-R2	B4-R1	B4-R2	B5-R1	B5-R2	B6-R1	B6-R2		B1	B2	B3	B4	B5	B6	
Annelida	Polychaeta	Capitellida	Capitellidae	Mediomastus californiensis	0	0.0021	0	0.0026	0	0	0.002	0	0	0	0	0	0.00105	0.0013	0	0	0.001	0	0	0.0067
Annelida	Polychaeta	Eunicida	Eunicidae	Marphysa sanguinea	0	0	0	0	0	0	0	0	0	0.006	0	0	0.000525	0	0	0	0	0.003	0	0.006
Annelida	Polychaeta	Eunicida	Lumbrineridae	Lumbrineris sp.	0	0.0296	0.0096	0.0014	0	0	0	0.0078	0	0.017	0	0	0.0074	0.0055	0	0	0.0039	0.0085	0	0.0654
Annelida	Polychaeta	Eunicida	Onuphidae	Diopatra chiliensis	0	0	0	0	0.0221	0.0227	0.0098	0	0.0176	0.0104	0	0	0.0074	0	0.0224	0.0049	0.014	0	0	0.0826
Annelida	Polychaeta	Eunicida	Onuphidae	Onuphis eremita	0	0.0038	0	0	0.0009	0.0008	0	0	0	0	0.0108	0	0.00095	0	0.00085	0	0	0	0.0054	0.0163
Annelida	Polychaeta	Orbiniida	Orbiniidae	Scoloplos marsupialis	0.0048	0.0148	0	0	0	0.0682	0	0	0.0009	0	0.0076	0.0012	0.00585	0	0.0341	0	0.00045	0.0044	0	0.0975
Annelida	Polychaeta	Oweniida	Oweniidae	Owenia fuisformis	0	0.0211	0	0.0013	0	0	0	0	0	0	0	0	0.010175	0.00065	0	0	0	0	0	0.0224
Annelida	Polychaeta	Phyllodocida	Glyceridae	Glycera chiori	0.0161	0.0124	0.0083	0.0025	0.0006	0.0024	0.0006	0	0.0277	0.0036	0.0022	0	0.0124	0.0054	0.0015	0.0003	0.01565	0.0011	0	0.0764
Annelida	Polychaeta	Phyllodocida	Goniadidae	Glycinde gurjanovae	0	0	0	0	0	0.0031	0	0	0	0	0.0002	0	0.007125	0	0.00155	0	0	0.0001	0	0.0033
Annelida	Polychaeta	Phyllodocida	Nephtyidae	Aglaophamus sinensis	0	0	0	0	0	0.0218	0	0.0016	0.003	0.0032	0	0	0	0	0.0109	0.0008	0.0031	0	0	0.0296
Annelida	Polychaeta	Phyllodocida	Nephtyidae	Nephtys oligobranchia	0	0	0	0	0	0	0	0	0	0	0.0004	0	0	0	0	0	0	0	0.0002	0.0004
Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Phyllodoce papillosa	0.0012	0.0005	0.0038	0.0014	0	0.0069	0.0025	0.0002	0	0	0	0	0.000425	0.0026	0.00345	0.00135	0	0	0	0.0165
Annelida	Polychaeta	Phyllodocida	Pilargidae	Pilargis mohri	0	0	0	0.0012	0	0	0	0	0	0	0	0	0.000425	0.0006	0	0	0	0	0	0.0012
Annelida	Polychaeta	Phyllodocida	Sigalionidae	Sihenolepis japonica	0	0	0	0	0	0	0	0	0.0051	0.0013	0	0	0	0	0	0	0	0.0032	0	0.0064
Annelida	Polychaeta	Sabellida	Sabellidae	Potamilla sp.	0	0.0037	0	0	0.0067	0	0	0	0	0	0	0	0.000925	0	0.00335	0	0	0	0	0.0104
Annelida	Polychaeta	Scolecida	Maldanidae	Euclymene sp.	0.0029	0.0021	0	0	0	0.006	0	0	0	0	0	0	0.002175	0	0.003	0	0	0	0	0.011
Annelida	Polychaeta	Spionida	Cirratulidae	Chaetozone setosa	0	0	0	0	0	0	0.0002	0.0002	0	0	0.0002	0	0.00125	0	0	0.0002	0	0	0.0001	0.0006
Annelida	Polychaeta	Spionida	Mageloniidae	Magelona pacifica	0	0	0	0.0008	0	0	0.0002	0	0.0002	0	0.0002	0	0	0.0004	0	0.0001	0.0001	0	0	0.0012
Annelida	Polychaeta	Spionida	Spionidae	Paraprionospio pinnata	0	0	0	0	0	0.001	0	0.0021	0	0	0	0	0	0	0.0005	0.00105	0	0	0	0.0031
Annelida	Polychaeta	Spionida	Spionidae	Prionospio ehlersi	0	0	0.0057	0	0.0002	0.0003	0	0	0	0	0	0	0	0.00285	0.00025	0	0	0	0	0.0062
Annelida	Polychaeta	Spionida	Prionospio queenslandica	0.0018	0	0	0	0	0	0	0.0002	0	0	0	0.0003	0	0.00045	0	0	0.0001	0	0.00015	0	0.0023
Annelida	Polychaeta	Terebellida	Ampharetidae	Auchenoplax worsfoldi	0	0	0.0124	0	0	0	0	0	0	0	0	0	0.00045	0.0062	0	0	0	0	0	0.0124
Annelida	Polychaeta	Terebellida	Appharetidae	Samytha japonica	0	0	0	0	0	0.0028	0	0	0	0.0028	0	0	0	0	0.0014	0	0.0014	0	0	0.0056
Annelida	Polychaeta	Terebellida	Pectinariidae	Amphictene japonica	0	0	0	0.0051	0	0	0	0	0.0111	0	0	0	0	0.00255	0	0	0.00555	0	0	0.0162
Annelida	Polychaeta	Terebellida	Sternaspidae	Sternaspis scutata	0	0	0	0	0	0.0291	0	0	0	0	0	0	0	0	0.01455	0	0	0	0	0.0291
Annelida	Polychaeta	Terebellida	Loimia medusa	0	0	0	0	0	0	0	0	0	0	0.0162	0	0	0	0	0	0	0.0081	0	0.0162	
Annelida	Polychaeta	Terebellida	Terebellidae	Pista cristata	0	0	0	0	0	0	0	0	0	0.0087	0	0	0	0	0	0	0.00435	0	0	0.0087
Annelida	Polychaeta	Terebellida	Trichobranchidae	Terebellides stroemii	0	0	0	0	0	0.0272	0	0	0	0	0	0	0	0	0.0136	0	0	0	0	0.0272
Arthropod	Crustacea	Decapoda	Albunecidae	Albunea groening	0	0	0	0	0	0	0	0	0	0	0	0.3813	0	0	0	0	0	0	0.19065	0.3813
Arthropod	Crustacea	Decapoda	Paranthuridae	Paranthura japonica	0	0	0	0	0	0	0	0.0011	0	0	0	0	0	0	0	0	0.00055	0	0	0.0011
Arthropod	Crustacea	Decapoda	Varunidae	Pseudohelice subquadrata	0	0	0	0	0	0	0	0	0	0.0581	0	0	0	0	0	0	0	0.02905	0	0.0581
Arthropod	Crustacea	Amphipoda	Ampeliscaidae	Byblis sp.	0.001	0.0035	0.0007	0	0.0005	0.0137	0.0059	0.0013	0.0022	0.0002	0.0094	0	0.001125	0.00035	0.0071	0.0036	0.0012	0.0047	0	0.0384
Arthropod	Crustacea	Amphipoda	Corophiidae	Corophium sp.	0	0.0002	0	0	0	0.0032	0	0	0	0	0	0	0.001175	0	0.0016	0	0	0	0	0.0034
Arthropod	Crustacea	Decapoda	Aegidae	Aega dofleini	0	0	0	0	0	0	0.0045	0	0	0	0	0	0.00005	0	0	0.00225	0	0	0	0.0045
Arthropod	Crustacea	Decapoda	Alpheidae	Alpheus sp.	0	0	0	0.0023	0	0.0123	0	0	0	0	0	0	0	0.00115	0.00615	0	0	0	0	0.0146
Arthropod	Crustacea	Decapoda	Bodotriidae	Iphinoe sp.	0	0.0002	0	0	0	0	0	0	0.0006	0	0.0006	0	0.00005	0	0	0	0.0003	0.0003	0	0.0014
Arthropod	Crustacea	Decapoda	Squillidae	Clorida microphthalmal	0	0	0.2402	0.2259	0	0	0	0	0.0168	0.0124	0	0	0.00005	0.23305	0	0	0.0146	0	0	0.4953
Arthropod	Crustacea	Decapoda	Xenophthalmidae	Neoxenophthalmus obscurus	0	0	0	0	0	0.0941	0	0	0	0	0	0	0	0	0.04705	0	0	0	0	0.0941
Echinoder	Echinoidea	Holcetypoida	Fibulariidae	Fibularia angulipora	0	0	0	0	0	0	0.003	0.0149	0	0	0	0	0	0	0	0.00895	0	0	0	0.0179
Echinoder	Holothuroidea	Dendrochirotia	Phylloporidae	Phylloporus spiculata	0	0	0	0	0	0.2914	0	0.0038	0	0	0	0	0	0	0.1457	0.0019	0	0	0	0.2952
Echinoder	Stellerioidea	Ophiurida	Amphiuridae	Amphiopius laevis	0	0	0	0	0	0.0158	0.0023	0	0.0054	0	0	0.0023	0	0	0.0079	0.00115	0.0027	0.00115	0	0.0258
Mollusca	Bivalvia	Veneroida	Macluridae	Mactra maclata	0	0	0	0	0	0	0	0	0	0	0.1565	0	0	0	0	0	0	0.07825	0	0.1565
Mollusca	Bivalvia	Veneroida	Tellinidae	Elpidollina sp.	3.6055	0	0	0	0	0	0	0	0	0	0	0	0.901375	0	0	0	0	0	0	3.6055
Mollusca	Bivalvia	Veneroida	Tellinidae	Macoma candida	0	0	0	2.3804	0	0	0	0	0	0	0	0	0.901375	1.1902	0	0	0	0	0	2.3804
Mollusca	Bivalvia	Veneroida	Tellinidae	Nitidotellina iridella	0	0	0	0	0.1631	0.0202	0	0	0	0	0	0	0	0	0.09165	0	0	0	0	0.1833
Mollusca	Bivalvia	Veneroida	Veneridae	Callista erycina	1.4148	0	0	0	0	0	0	0	0	0	0.3281	0	0.3537	0	0	0	0	0.16405	0	1.7429
Mollusca	Bivalvia	Veneroida	Veneridae	Timoclea imbricata	0	0	0	0	0	0.0224	0	0	0.0207	0	0	0	0.3537	0	0.0112	0	0.01035	0	0	0.0431
Mollusca	Gastropoda	Heterogastropoda	Melanellidae	Eulima bifascialis	0	0	0	0	0	0	0	0.0378	0	0	0	0	0	0	0	0	0.0189	0	0	0.0378
Mollusca	Gastropoda	Mesogastropoda	Potamididae	Cerithidea cingulata	0.2884	0	0	0	0	0.0281	0	0	0	0.3047	0	0	0.0721	0	0.01405	0	0.15235	0	0	0.6212
Mollusca	Gastropoda	Neogastropoda	Olividae	Oliva miniacea	0.3682	0	0	0	0	0	0	0	0	0	0	0	0.16415	0	0	0	0	0	0	0.3682
Mollusca	Gastropoda	Neogastropoda	Olividae	Oliva mustelina	0	0	0	0	0	0	0	0	0	0	0	2.0122	0.09205	0	0	0	0	0	1.0061	2.0122
Nemertine	Anopla	Heteronemertea	Cerebratulidae	Cerebratulina sp.	0	0	0	0	0.0014	0.0042	0	0	0.0282	0	0.0028	0	0	0	0.0028	0	0.0141	0.0014	0	0.0366
Sipuncula	Phascolosomatidea	Phascolosomatida	Phascolosomatidae	Apionsoma trichocephala	0	0	0	0	0	0.0002	0	0	0	0	0	0	0	0	0.0001	0	0	0	0	0.0002
					5.7047	0.094																		
					5.7987		2.9056		0.8934		0.102		0.5841			2.9161								3.6055
					2.89935																			
Biomass (g)					13.1999																			
					0.5809	4.40%																		
					1.0922	8.27%																		
					0.3389	2.57%																		
					11.1511	84.48%																		
					0.0366	0.28%																		
					0.0002	0.00%																		

# **Appendix F - Emergency Response Plan & Oil Spill Contingency Plan**

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**Myint & Associates Co., Ltd.**

# **Emergency Response Plan**

Prepared By: Management Representative

Approved By: General Manager

Date: 02 February 2016

**Emergency Response Plan****DOCUMENT DISTRIBUTION**

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03	U Myo Tin, Group General Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
04	U Tin Ohn, Financial& Tax Consultant	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
05	U Soe Khine, General Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
06	Daw Nu Nu Lwin, Deputy General Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
07	U Win Phyto, Assistant General Manager-1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
08	U Soe Lwin, Assistant General Manager-2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
09	U Nay Myo Aung, Health, Safety and Environment Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	Daw Myint Myint Swe, Head of Internal Audit	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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12	U Zaw Min Soe, Administrative Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13	Daw Aye Aye Kyi, Human Resources Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
14	U Ko Ko Naing, Operations & Logistics Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
15	U Thaike Soe, Business Development Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
16	U Win Ko, Catering and Beverages Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
17	U Myo Win, Motor Transport Officer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
18	U Aung Zaw Moe, Assistant Engineer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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## 1. INTRODUCTION

An emergency is an unforeseen combination of circumstances that disrupt normal operating conditions and pose an actual or a potential threat to human life, health, property, or the environment if not controlled, contained, or eliminated immediately.

Protection Priorities ( Strategic Objectives for Emergency Response )

- People: Employees, contractors, suppliers, customers, and communities
- Environment: Air, water, land, spillages, and area of sensitivity
- Property: M&A, contractors, communities, third party facilities and offices
- Business: Supply, production, and reputation

At the outset of any emergency it is critical to identify the body/organization which has overall responsibility for the execution of whole or part of the immediate response in the protection of personnel, the environment and property during an emergency.

### 1.1 HSE Objectives

M&A HSE objectives are;

- foster a positive safety culture characterized by a shared commitment to safety and hazard prevention;
- establish HSE responsibility and accountability at every level of our organization;
- ensure that potential impacts on the natural environment are minimized, and water, energy and other natural resources are conserved where practicable;
- identify and assess HSE risks through a formal and structured process to facilitate effective risk reduction plans and action;
- ensure that systems are established, documented and maintained to ensure the on-going integrity of company and equipment;
- ensure that employees are suitably trained, supervised and provided with the resources to perform their work in a competent manner;
- only engage contractors who share our vision and will work with us to implement these guiding principles;
- develop, implement and continuously improve effective health, safety, and environmental management systems and develop standards that reflect best industry practices.

### 1.2 Scope of this document

The design scope of this Emergency Response Plan, HSE-ERP Issue: 2.0, is;

- Identifies the major risks potentially impacting business operations and local communities.
- Describes the response strategies and the management organization.
- Sets out the roles and responsibilities of the key personnel
- Identifies internal and external notification procedures



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## 2. IMPLEMENTATION OF EMERGENCY RESPONSE PLANS

### 2.1 The Definitions of Emergency Response Plans

Emergency Response Team Commander shall define the coverage of Emergency Response Plans ( ERPs ) for any particular operations applicable to M&A's scope of work. The coverage of emergency response plans shall address as a minimum, but not limit to, the following scenarios;

- a. Chemical Spill / Environmental incident
- b. Forces of Nature (Earthquake / Cyclone)
- c. Fire
- d. Medical Emergency
- e. Traffic Accident ( Minor )
- f. Traffic Accident ( Major )

### 2.2 Existing Emergency Response Plans

In most cases, existing emergency response plans will be in place. These existing emergency response plans have been reviewed, and where appropriate, translated into the Myanmar language to ensure the objectives and goals described in Section 1.1 are achieved.

M&A's HSE Department shall demonstrate the effectiveness of the emergency management system that is currently in place, and such exercises and other activities as required ensuring the employees can effectively respond to identified potential emergencies.

### 2.3 Emergency Response Planning

Prior to the commencement of any new operations, the Emergency Response Team Commander shall be responsible for completing the following tasks;

- Establishing an Emergency Response Center suitably equipped to support any emergency that may occur. This Emergency Response Center shall be capable of providing technical support to the affected facility and the Emergency Response Management Team in M&A's Office if required
- Establishing and maintaining a duty roster and call out procedures as describe in the approved Emergency Response Plans
- Ensuring a full set of Emergency Response Plans and any other emergency response documentation is provided to the work site, is available in the Emergency Response Center in Yangon for daily operations / reference
- Ensuring that Operations Team ( staff, contractors, and allied partners ) has a work familiarity of the defined operation's Emergency Response Plans.

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## 2.4 Test Emergency Response Plans

The Emergency Response Team Commander is accountable that there is an effective emergency response process applied to M&A's operations.

One part of this accountability includes ensuring that the preparedness and competency of ERP Team is tested by conducting regular training exercises, in conjunction with the Emergency Response Center in Yangon.

It is the responsibility of the Emergency Response Team Commander and M&A HSE Department to review these emergency response exercises to identify lessons learned to carry forward to the next planned exercise.

## 3. EMERGENCY RESPONSE PLANS

### 3.1 Chemical Spill

1	<ul style="list-style-type: none"> <li>Whenever you discover a spill of potentially toxic materials, evacuate the area. REMAIN CALM and call Guard House and notify M&amp;A senior staff. Report the location of the spill and type of chemical involved.</li> </ul>	<ul style="list-style-type: none"> <li>Guard House (Ext : 2513 )</li> <li>U Soe Khine, General Manager (95-9 ) 43200699</li> <li>Daw Nu Nu Lwin, Dy. General Manager (95-9 ) 540 5716</li> <li>U Zaw Min Soe, ADM (95-9 ) 5076054</li> </ul>
2	<ul style="list-style-type: none"> <li>M&amp;A senior staff to immediately check MSDS sheet of chemical involved prior to attempting any containment and clean-up operation.</li> </ul>	
3	<ul style="list-style-type: none"> <li>In case deemed necessary by M&amp;AS staff RAISE FIRE ALARM, and EVACUATE M&amp;AS OFFICE IMMEDIATELY, secure work sites, and close all doors. All Delegates (if any) and visitors under supervision of M&amp;A staff to muster at designated Muster Point, or other safe upwind location. Check duty roster and take roll call.</li> <li>M&amp;A to notify authorities, and alert person at neighbouring premises to evacuate.</li> </ul>	<ul style="list-style-type: none"> <li>Fire Department (95 ) 119</li> <li>Hlaing Fire Department (95-1 ) 519578</li> <li>Police (95 ) 199</li> <li>Hlaing Police Station (95-1 ) 519 531, 519 532, (95-9 ) 730 88550</li> <li>Thukhagabar Hospital (95-1 ) 504 545, 526 329, 500 100</li> <li>Green Cross Hospital (95-1 ) 230 0652 ~ 3</li> <li>Green Cross Ambulance (95-1 ) 230 0551</li> </ul>



**Emergency Response Plan**

4	<ul style="list-style-type: none"><li>• Use protective equipment as per MSDS when attempting to clean up the spill.</li><li>• When toxic chemicals have made contact with skin, remove any clothing and immediately flush the affected area with ample and clean water for fifteen minutes. Seek immediately medical attention</li><li>• If the chemical splashes into a person's eye, immediately flush with ample and clean water for fifteen minutes.</li></ul>	<ul style="list-style-type: none"><li>• U Nay Myo Aung ( 95-9 ) 4318 2225</li><li>• Thukhagabar Hospital ( 95-1 ) 504 545, 526 329, 500 100</li><li>• Green Cross Hospital ( 95-1 ) 230 0652 ~ 3</li><li>• Green Cross Ambulance ( 95-1 ) 230 0551</li></ul>
5	<ul style="list-style-type: none"><li>• In case chemical spill is contained: Wait for the Fire Department, appointed M&amp;A staff to declare the building safe for re-entry;</li></ul>	
FollowUp	<ul style="list-style-type: none"><li>• HSEM to make decision on continuing training or not ( if applicable ).</li><li>• Investigation of chemical spill by Investigative Team and specialist ( s ) if required.</li><li>• Incident report to be completed and distributed.</li></ul>	

**3.2 Forces of Nature ( Earthquake )**

1	<ul style="list-style-type: none"><li>• REMAIN CALM: Take cover under a table or desk to avoid falling objects</li><li>• Do not attempt to evacuate from the M&amp;A office until it is safe to do so.</li><li>• Stay away from windows or tall cabinets that could fall.</li><li>• When walking through the building, move cautiously to avoid damaged stairways, doors or exposed electrical cables. If possible, carry a large book or a thick bag to cover your head.</li><li>• If you are outside, move away from buildings, trees or power lines.</li><li>• Call for help if you are trapped, or injured;</li></ul>	
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**Emergency Response Plan**

2	<ul style="list-style-type: none"><li>• EVACUATE M&amp;A OFFICE, and be prepared for aftershocks.</li><li>• When evacuating open doors carefully, watch for falling objects or exposed electrical cables, and be prepared for damaged stairways.</li><li>• When safe, M&amp;A staff will conduct a search of the building for anyone who might be trapped or afraid to leave.</li><li>• Do not attempt to move injured persons unless there is a danger of further injury from collapsing structure, fire, etc.</li><li>• All Delegates ( if any ) and visitors under supervision of one M&amp;A staff to muster at designated Muster Point. Check duty roster and take roll call;</li></ul>	
3	<ul style="list-style-type: none"><li>• In case of fire: M&amp;A / HSE staff to ATTEMPT TO CONTAIN THE FIRE with appropriate portable fire extinguishers. In case of people missing or injured; M&amp;A / HSE staff to ENTER AND SEARCH THE BUILDING FOR MISSING PERSONS exercising extreme caution. Contact Yangon Fire Department, Police, or Hospital services for assistance, if required;</li></ul>	<ul style="list-style-type: none"><li>• Fire Department ( 95 ) 119</li><li>• Hlaing Fire Department ( 95-1 ) 519578</li><li>• Police ( 95 ) 199</li><li>• Hlaing Police Station ( 95-1 ) 519 531, 519 532, ( 95-9 ) 730 88550</li><li>• Thukhagabar Hospital ( 95-1 ) 504 545, 526 329, 500 100</li><li>• Green Cross Hospital ( 9</li></ul>
4	<ul style="list-style-type: none"><li>• CONTACT Management</li></ul>	<ul style="list-style-type: none"><li>• Guard House ( Ext : 2513 )</li><li>• U Soe Khine, General Manager ( 95-9 ) 43200699</li><li>• Daw Nu Nu Lwin, Dy. General Manager ( 95-9 ) 540 5716</li><li>• U Zaw Min Soe, ADM ( 95-9 ) 507 6054</li></ul>
5	<ul style="list-style-type: none"><li>• Wait for the Fire Department, appointed M&amp;A staff to declare the building safe for re-entry and authorities;</li></ul>	



**Emergency Response Plan**

<b>FollowUp</b>	<ul style="list-style-type: none"> <li>• Check building integrity by Investigative Team and specialist if required.</li> </ul>	
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**3.3 Fire**

<b>1</b>	<ul style="list-style-type: none"> <li>• REMAIN CALM and RAISE ALARM (break glass of call point, call Guard House, or shout for help</li> </ul>	<ul style="list-style-type: none"> <li>• Guard House ( Ext : 2513 )</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• EVACUATE M&amp;AS OFFICE IMMEDIATELY, secure worksites, and close all doors. All Delegates (if any) and visitors under supervision of M&amp;A staff to muster at designated Muster Point. Check duty roster and take roll call;</li> </ul>	
<b>3</b>	<ul style="list-style-type: none"> <li>• M&amp;A / HSE staff to ATTEMPT TO CONTAIN THE FIRE with appropriate portable fire extinguishers. Contact Yangon Fire Department for assistance, if required;</li> </ul>	<ul style="list-style-type: none"> <li>• Fire Department ( 95-1 ) 119</li> <li>• Hlaing Fire Department ( 95-1 ) 519578</li> <li>• Police ( 95 ) 199</li> <li>• Hlaing Police Station ( 95-1 ) 519 531, 519 532, ( 95-9 ) 730 88550</li> <li>• Thukhagabar Hospital ( 95-1 ) 504 545, 526 329, 500 100</li> <li>• Green Cross Hospital ( 95-1 ) 230 0652 ~ 3</li> <li>• Green Cross Ambulance ( 95-1 ) 230 0551</li> </ul>



**Emergency Response Plan**

4	<ul style="list-style-type: none"><li>• CONTACT Management</li></ul>	<ul style="list-style-type: none"><li>• U Soe Khine, General Manager ( 95-9 ) 43200699</li><li>• Daw Nu Nu Lwin, Dy. General Manager ( 95-9 ) 540 5716</li><li>• U Zaw Min Soe, ADM ( 95-9 ) 5076054</li></ul>
5	<ul style="list-style-type: none"><li>• In case fire is contained: Wait for the Fire Department, appointed M&amp;A staff to declare the building safe for re-entry;</li></ul>	
FollowUp	<ul style="list-style-type: none"><li>• Investigation of fire by Investigative Team and specialist if required.</li><li>• Incident report to be completed and distributed by HSE team.</li></ul>	



**Emergency Response Plan**

**3.4 Medical Emergency**

1	<ul style="list-style-type: none"> <li>• M&amp;A staff to assess patient;</li> <li>• Check ABC; patient condition assessed and the basic life support and first aid treatment administered by HSE officer.</li> <li>• Remaining Delegates to clear the area, and remain under supervision of M&amp;AS staff at all times.</li> </ul>	<ul style="list-style-type: none"> <li>• Guard House ( Ext : 2513 )</li> </ul>
2	<ul style="list-style-type: none"> <li>• Senior staff and first aider to determine if further treatment is necessary. Obtain medical advice through Thukhagabar or Green Cross Hospital, if necessary;</li> <li>• If indicated, patient to be transported to Thukhagabar or Green Cross Hospital with M&amp;A vehicle using stretcher, or ambulance service.</li> <li>• If visit to Thukhagabar or Green Cross Hospital is deemed necessary, patient's medical form and HSE officer to accompany patient to hospital.</li> </ul>	<ul style="list-style-type: none"> <li>• U Nay Myo Aung, HSE Manager ( 95-9 ) 4318 2225</li> <li>• Thukhagabar Hospital ( 95-1 ) 504 545, 526 329, 500 100</li> <li>• Green Cross Hospital ( 95-1 ) 230 0652 ~ 3</li> <li>• Green Cross Ambulance ( 95-1 ) 230 0551</li> </ul>
3	<ul style="list-style-type: none"> <li>• Appointed staff to inform patient's employing company and / or next of kin of patient;</li> </ul>	<p>Check next of kind data on patient's medical form if applicable</p>
4	<ul style="list-style-type: none"> <li>• CONTACT Management</li> </ul>	<ul style="list-style-type: none"> <li>• U Soe Khine, General Manager ( 95-9 ) 43200699</li> <li>• Daw Nu Nu Lwin, Dy. General Manager ( 95-9 ) 540 5716</li> <li>• U Zaw Min Soe, ADM ( 95-9 ) 5076054</li> </ul>
FollowUp	<ul style="list-style-type: none"> <li>• Obtain copy of medical report;</li> <li>• Investigation of incident by investigative Team;</li> <li>• Incident report to be completed and distributed by HSE Team.</li> </ul>	



**Emergency Response Plan****3.5 Traffic Accident (Minor)**

<b>1</b>	<ul style="list-style-type: none"><li>Examine any injuries inflicted to passengers on board and vehicle damage. IF CRITICAL INJURY INVOLVED, FOLLOW ERP TRAFFIC ( MAJOR ).</li><li>Get any and all information of all parties involved. ( e.g. license plate, driver's license, vehicle description). If possible, take pictures of accident using cell phone or a camera.</li><li>Make sure other party remains at accident location.</li></ul>	<ul style="list-style-type: none"><li>U Myo Win, MTO ( 95-9 ) 506 0801, 503 1774</li><li>M&amp;A H.O. ( 95-1 ) 230 7722 ( Pilot ) , 230 7721 ~ 9</li></ul>
<b>2</b>	<ul style="list-style-type: none"><li>Inform MTO by using public phone or any means necessary.</li><li>If negotiation fails with parties involved, notify police at nearest intersection or call police department.</li></ul>	<ul style="list-style-type: none"><li>Police ( 95 ) 199</li><li>Hlaing Police Station ( 95-1 ) 519 531, 519 532, ( 95-9 ) 730 88550</li></ul>
<b>3</b>	<ul style="list-style-type: none"><li>Wait for MTO personnel to arrive at accident scene.</li></ul>	
<b>4</b>	<ul style="list-style-type: none"><li>Notify Management</li></ul>	<ul style="list-style-type: none"><li>U Soe Khine, General Manager ( 95-9 ) 43200699</li><li>Daw Nu Nu Lwin, Dy. General Manager ( 95-9 ) 540 5716</li><li>U Zaw Min Soe, ADM ( 95-9 ) 5076054</li></ul>
<b>FollowUp</b>	<ul style="list-style-type: none"><li>Incident report to be completed and distributed by MTO to Admin and HSE departments.</li><li>Investigation of accident / incident by Investigative Team and specialist if required ( HSE Team ).</li><li>Distribute all findings to all departments.</li></ul>	

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### 3.6 Traffic Accident ( Major )

1	<ul style="list-style-type: none"> <li>Assess any injuries inflicted to passengers on board and vehicle damage.</li> <li>IF CRITICAL INJURY INVOLVED, stabilize victim immediately.</li> <li>Get any and all information of any parties involved. ( . license plate, driver's license, vehicle description ).</li> </ul>	<ul style="list-style-type: none"> <li>U Myo Win, MTO ( 95-9 ) 506 0801, 503 1774</li> <li>M&amp;A H.O. ( 95-1 ) 230 7722 ( Pilot ) , 230 7721 ~ 9</li> </ul>
2	<ul style="list-style-type: none"> <li>Proceed to Yangon General Hospital ( Accident and emergency department ) in a safe manner using own vehicle or public transport ( taxi ).</li> </ul>	<ul style="list-style-type: none"> <li>Yangon General Hospital ( 95-1 ) 256 112, 256 123</li> </ul>
3	<ul style="list-style-type: none"> <li>Inform MTO by using public phone or any means necessary after reaching Yangon General Hospital.</li> </ul>	
4	<ul style="list-style-type: none"> <li>Notify ERP Management.</li> <li>Follow orders by MTO and Management.</li> </ul>	<ul style="list-style-type: none"> <li>U Soe Khine, General Manager ( 95-9 ) 43200699</li> <li>Daw Nu Nu Lwin, Dy. General Manager ( 95-9 ) 540 5716</li> <li>U Zaw Min Soe, ADM ( 95-9 ) 5076054</li> </ul>
FollowUp	<ul style="list-style-type: none"> <li>Incident report to be completed and distributed by MTO to Admin and HSE departments.</li> <li>Investigation of accident / incident by Investigative Team and specialist if required ( HSE Team ).</li> <li>Distribute all findings to all departments.</li> </ul>	

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#### 4. EMERGENCY RESPONSE MANAGEMENT TEAM

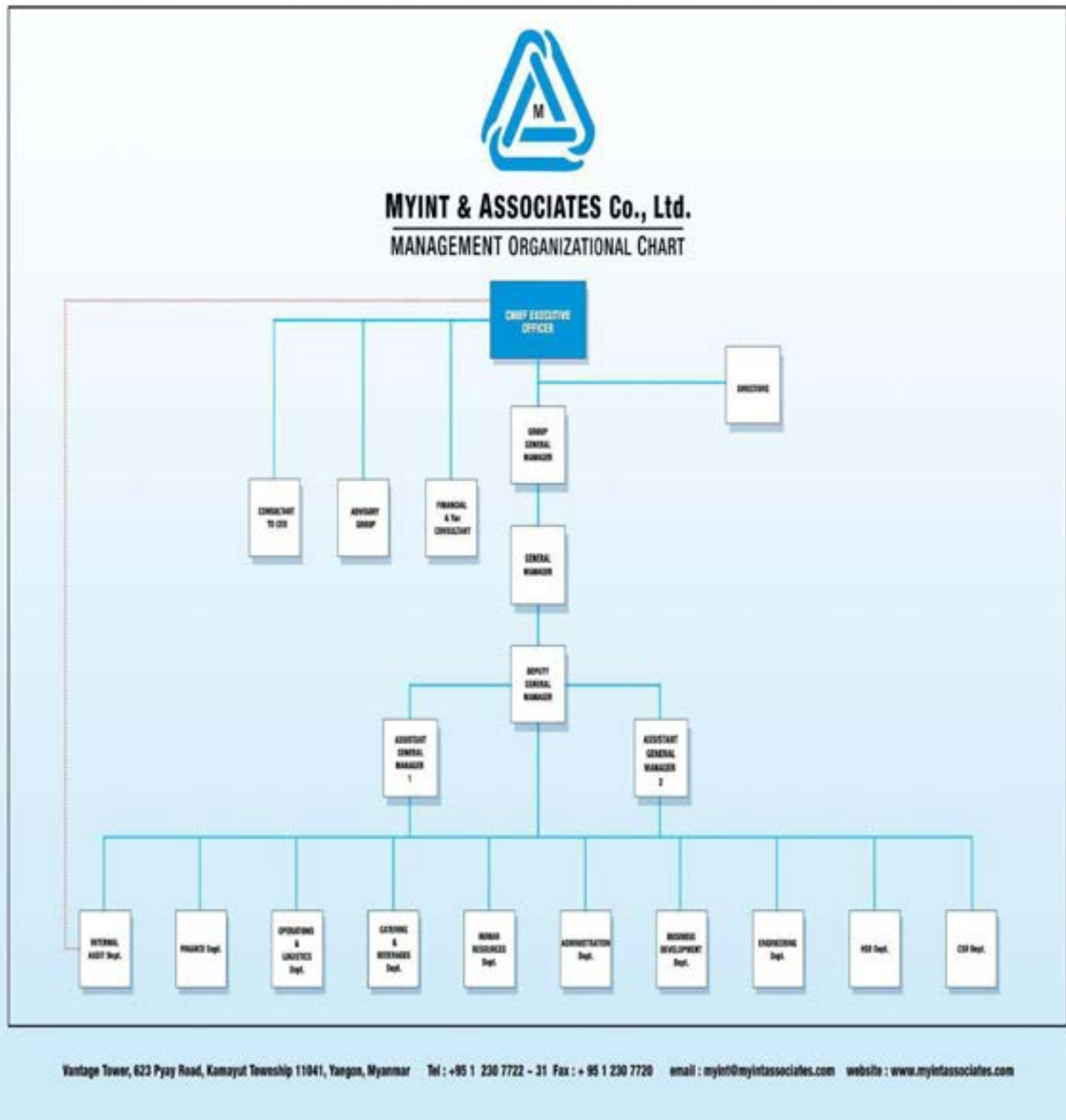
##### 4.1 Roles and Responsibilities

The primary role and responsibility of the Emergency Response Management Team formed under the guidance of this Emergency Response Plan is to provide for the safe and efficient evacuation of all personnel during an emergency situation. The secondary responsibility will be to manage the mitigation of the emergency whether it is within the capabilities of the Team or outside help is needed. The core team will be comprised of the following members:

- |  |        |
|--|--------|
| • Emergency Response Team Commander              | ERTC   |
| • Deputy Emergency Response Team Commander       | DERTC  |
| • Emergency Response Team Scribe                 | ERTS   |
| • Emergency Response Logistic Coordinator        | ERLC   |
| • Emergency Response Team HSE Manager            | HSEM   |
| • Field Emergency Response Team Commander        | FERTC  |
| • Deputy Field Emergency Response Team Commander | DFERTC |
| • Field HSE Officer                              | FHSEO  |

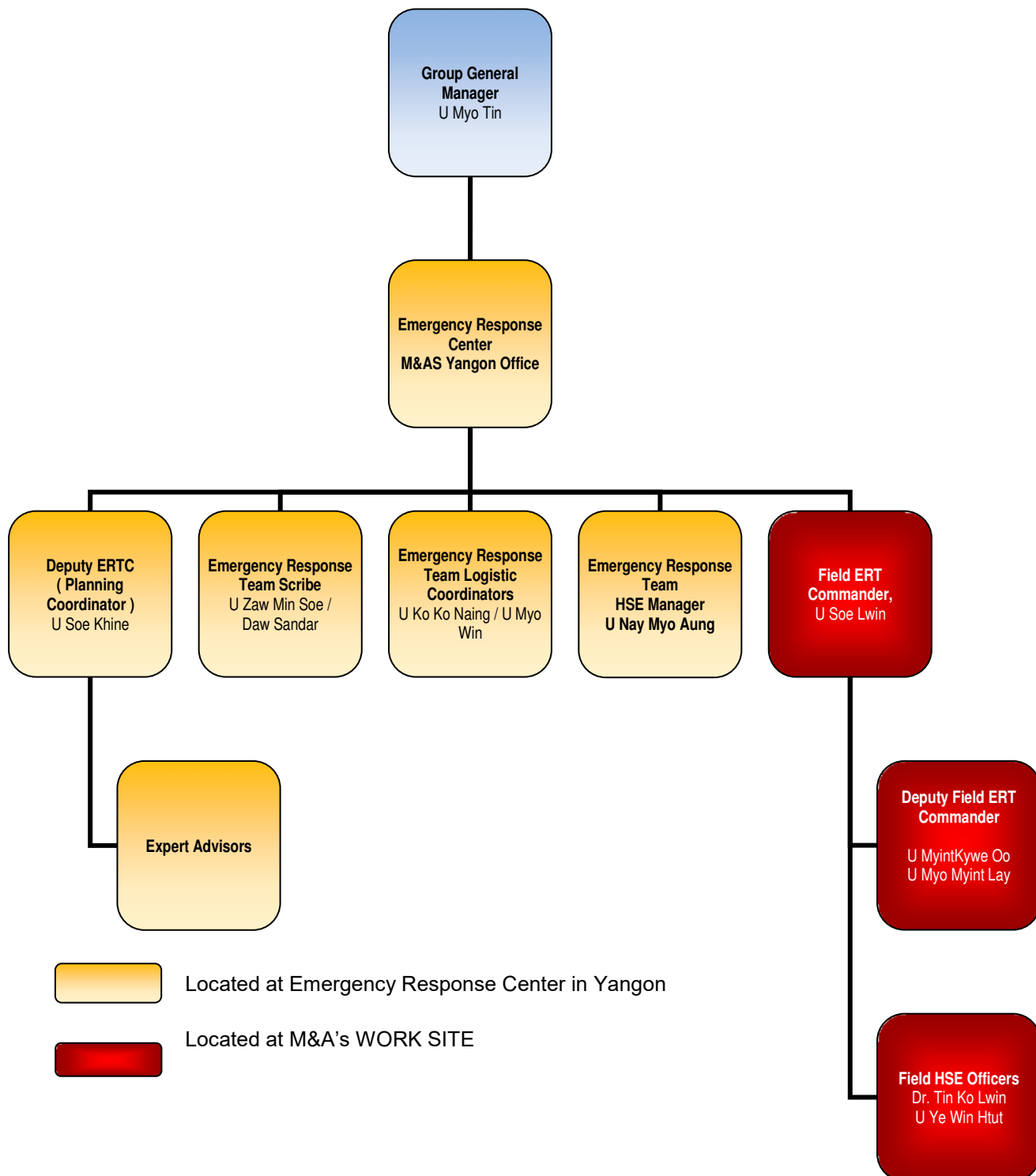


**Figure 1 – M&A Organization Chart during Normal Operations**



**Figure 2 – Emergency Response Team Organization Chart**

Note: Emergency Response Center in Yangon is activated to bring more resources to the event. These resources include expert advisors outside of M&A.



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## 4.2 M&A Representations

### 4.2.1 Group General Manager – U Myo Tin

Under M&A Management System, Group General Manager is accountable for establishing a crisis management system. The group general manager also has certain corporate roles to manage communication links with governments, media and external parties on matters of material significance on a national basis and to manage the inter-Company communication of such activities.

Group General Manager's roles and responsibilities during an emergency are;

- Direct the establishment of a Crisis Management System in M&A Yangon Office
- Keep Chief Executive Officer (CEO) advised of the incident status and the M&A position in the country.
- Consult with Emergency Response Team Commander ( ERTC ) on media, government and public relations activities and strategies, and agree on the M&A spokesperson's role.
- Consult with Legal and elsewhere as necessary on the corporate statutory obligations in terms of the incident.
- Provision of all the necessary facts in order to produce suitable Press Releases.
- Establish a media strategy.
- Secure additional financial authority if required beyond the normal delegated level.

## 4.3 Emergency Response Center, Yangon

### 4.3.1 Emergency Response Team Commander ( ERTC ) – U Myo Tin

The Emergency Response Team Commander ( ERTC ) shall be located in Yangon and upon activation of the Emergency Response System will assume overall command of the emergency. His duties include but are not limited to:

- Oversees the preparation of the Emergency Response Plan.
- Assist in the selection of other ERT members.
- Runs the Emergency Response Center.
- Obtains initial information regarding a crisis situation. "Briefs" the other ERT members regarding the nature and status of the crisis.
- Determines the need for emergency response.
- Determines what outside agencies should be notified.
- Determines if evacuations are in order, and for what area (s).
- Instructs Team Leaders as to the movement and actions of their personnel during the emergency.
- Activates "replacement members" of the ERT whenever original Team Members are unavailable, and appoints additional replacement members if necessary.

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- Assigns “in-house” resources as appropriate.
- Establishes initial interfaces with outside agencies.

#### **4.3.2 Deputy Emergency Response Team Commander ( DERTC ) – U Soe Khine**

Under the direction of the Emergency Response Team Commander ( ERTC ), the Deputy Emergency Response Team Commander ( DERTC ) shall:

- Assume Team Leader for planning and overseeing the planning activities of the M&A resources and outside resources.
- Assist the ERT Commander as directed.
- Assume interim command and responsibility for ERT Commander Duties when the ERT Commander is not available.
- Verify execution of the ERT Commander's directives.
- Appoint department personnel as representatives to be located at the command centers of outside agencies.
- Review situation reports, journals, and other reports for completeness.

#### **4.3.3 Emergency Response Team Scribe ( ERTS ) –U Zaw Min Soe / Daw Sandar**

Scribes shall try to answer *who, what, when, where, how, and why* on the command side. They write down any specific instructions that were given by or to the ERT Commander.

Scribes shall document anyone whom the ERT commander talked to over the phone outside the chain of command. This helps eliminate having to ask dispatch for the same information or asking them to have someone call you back.

At the direction of the ERT Commander, the Scribe shall record information from all incident message forms with reference to time, message and action taken. Responsibilities include:

- Maintaining and periodically distributing a situation report.
- Ensuring that all messages are appropriately routed.
- Ensuring that the incident communications and messages are established.
- Setting up telephone and public address systems as required.
- Establishing appropriate communications to and from all relevant locations.
- Ensuring that these communications systems are operating properly and efficiently.
- Will maintain contact with the Emergency Response Management Team at M&A Yangon Office.



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#### **4.3.4 Emergency Response Team Logistics Coordinator ( ERTLC ) – U Ko Ko Naing / U Myo Win**

The ERT Logistical Resource Coordinator is responsible for coordinating providing facilities, services, and materials for the incident response and provides all incident support needs such as:

- Facilities
- Transportation
- Communications
- Supplies
- Equipment Maintenance
- Provides logistical input to the ERT Commander in preparing the Emergency Response Plan.
- Identify anticipated and known logistical service and support requirements impacting incident.
- Request additional logistical resources as needed.

#### **4.3.5 Emergency Response Team HSE Manager – U Nay Myo Aung**

Health, Safety and Environment Manager ( HSEM ) role is to develop and recommend measures to the ERMT and / or FERT for assuring personnel health and safety and to assess and/or anticipate hazardous and unsafe situations. Health, Safety and Environment Manager ( HSEM ) also develops the Site Safety Plan, reviews the Emergency Response Plan for safety implications, and provides timely, complete, specific, and accurate assessment of hazards and required controls. His duties include but are not limited to:

- Participate in planning and strategy and meetings providing HSE input as necessary.
- Periodic assessment and identification of hazardous situations associated with the incident and prevent accidents.
- Assign assistants qualified to evaluate special hazards.
- Review the Emergency Response Plan for safety implications and prepare specific safety message or plan based on hazards and problems.
- Exercise emergency authority to stop and prevent unsafe actions.
- Initiate preliminary investigation of accidents that have occurred within the incident area.
- Ensure safety messages and briefings are made as needed.
- Conduct risk assessments on activities associated with response to incident.

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#### **4.3.6 Emergency Response Center Supplies ( M&A Head Office )**

The Emergency Response Center will serve as the nucleus for response to an emergency situation. As such it is important that it contain the necessary resources, equipment, supplies, personnel, etc. The following is a list of basics that should be used as a minimum guideline:

- Telephones with international access
- Mobile phones
- Teleconference phone with speaker phone
- Laptops with Internet Access
- Mass Notification System
- Contact lists
- Maps
- Printer (s), Copier, Scanner
- Fax
- Overhead projector
- Pin board and white board
- Flip charts and markers
- Office supplies-staplers, tape, pens, paper
- Access to water, food, coffee, tea

These supplies will be located in a designated area in the M&AS office in Yangon

#### **4.4 M&A Work Sites and Emergency Location**

##### **4.4.1 Field Emergency Response Team Commander ( FERTC ) – U Soe Lwin**

The Field Emergency Response Team Commander ( FERTC ) is responsible for all aspects of the response, including developing incident objectives and managing all incident operations.

The FERT Commander is faced with many responsibilities when he / she arrives on scene. Unless specifically assigned to another member of the ERT, these responsibilities remain with the FERT Commander. Some of the more complex responsibilities include:

- Establish immediate priorities especially the safety of responders, other emergency workers, bystanders, and people involved in the emergency.
- Stabilize the incident by ensuring safety of life and managing all resources efficiently and cost effectively.
- Determine incident objectives and coordinate strategy with ERT Commander to achieve the objectives.
- Establish and monitor incident organization in accordance with this emergency response plan to achieve objectives.

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- Approve the implementation of the written or oral Emergency Response Plan.
- Ensure adequate health and safety measures are in place.
- Establish and maintain coordination with ERT Command Center in Yangon Head Office.

#### **4.4.2 Deputy Field Emergency Response Team Commander ( DFERTC ) – U Myint Kywe Oo / U Myo Myint Lay**

In addition to being prepared to assume the duties of the FERT Commander, the following is a list of responsibilities that the Deputy Field ERT ( DFERTC ) Commander should perform or assign to appropriate members of the Command as directed by the FERT Commander:

- Provide response direction.
- Coordinate effective communication.
- Coordinate resources.
- Establish incident priorities.
- Develop mutually agreed-upon incident objectives and approve response strategies.
- Assign objectives to the response structure.
- Review and approve Emergency Response Plans.
- Ensure integration of response organizations into the emergency as required.
- Establish protocols.
- Ensure worker and public health and safety.

#### **4.4.3 Field HSE Officer ( FHSEO ) – Dr. Tin Ko Lwin / U Ye Win Htut**

The Field HSE Officer ( FHSEO ) role is to develop and recommend measures to the ERT and / or FERT for assuring personnel health and safety and to assess and/or anticipate hazardous and unsafe situations. The Field HSE Officer ( FHSEO ) also develops the Emergency Response Plan and provides timely, complete, specific, and accurate assessment of hazards and required controls. His duties include but are not limited to:

- Participate in planning and strategy and meetings providing HSE input as necessary.
- Periodic assessment and identification of hazardous situations associated with the incident and prevent accidents.
- Assign assistants qualified to evaluate special hazards.
- Review the Emergency Response Plan for safety implications and prepare specific safety message or plan based on hazards, problems, or EIA requirements.
- Exercise emergency authority to stop and prevent unsafe actions.

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- Initiate preliminary investigation of accidents that have occurred within the incident area
- Ensure safety messages and briefings are made as needed.
- Conduct risk assessments on activities associated with response to incident.
- Conduct safety meetings and toolbox talks using relevant topics to activities associated with the incident.

## 5. ATTACHMENT

M&A Emergency Response Team shall utilize the following attachments as reference. The M&A Incident report shall be filled out as necessary after any accident, incident, near-miss or emergency. ERP Team and emergency service contact details will be periodically reviewed and updated and changes will be recorded with the revised version of this document and redistributed to all head of departments. ERP procedures will be posted in visible areas of every department and site locations.

### ATTACHMENT 1 M&A INCIDENT REPORT FORM

#### Instruction / လမ်းညွှန်ချက်

01. This form should be completed as much as possible and sent to the HSE and / or Administration Department within twenty-four (24) hours of the occurrence.  
 ၀၁။ ဤပုံစံကို တတ်နိုင်သမျှ ပြီးပြည့်စုံအောင်ဖြည့်စွက်ပြီး HSE ဌာနနှင့် (သို့) Admin ဌာနသို့ ထူးခြားဖြစ်စဉ်ဖြစ်ပြီး (၂၄)နာရီအတွင်းပေးပို့ရန်။
02. The supervisor or other authorized personnel should complete the form if the injured person is unable to do so.  
 ၀၂။ ထိခိုက်ဒဏ်ရာရရှိသူမဖြစ်နိုင်လျှင် ၎င်း၏ကြီးကြပ်သူ (သို့) အခြားတာဝန်ရှိသူတစ်ဦးမှ ဖြည့်စွက်ရန်။
03. The completed form **must** have all the required signatures.  
 ၀၃။ လိုအပ်သောသူများ၏ လက်မှတ်အားလုံးပါဝင်ရမည်။



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**DETAILS OF PERSON FILLING REPORT FORM / ပုံစံဖြည့်စွက်သူ၏အချက်အလက်**

Name:  
(အမည်)

Job Title:  
(ရာထူး)

Department:  
(ဌာန)

**PERSON ( S ) INVOLVED**

ဖြစ်ပွားမှုတွင် ပါဝင်သူ (များ)

Name:  
(အမည်)

Job Title:  
(ရာထူး)

Department:  
(ဌာန)

Contact Info:  
(ဆက်သွယ်ရန်)

**DETAILS OF CASE**

ထူးခြားဖြစ်စဉ်အချက်အလက်

Time of incident:  
(ဖြစ်ပွားချိန်)

Was a third party involved?  
(ပြင်ပမှလူပါဝင်ခြင်း ရှိ/မရှိ)

Yes ☐ No ☐

Date of incident:  
(ဖြစ်ပွားသည့်နေ့စွဲ)

Was the police involved?  
(ရဲဌာနမှပါဝင်မှု ရှိ/မရှိ)

Yes ☐ No ☐

Precise location:  
(ဖြစ်ပွားသည့်နေရာ)

Were there any pictures taken of the incident or incident location?  
(ဖြစ်စဉ်(သို့)ဖြစ်ပွားသည့်နေရာအား ဓာတ်ပုံရိုက်ထားခြင်း ရှိ/မရှိ)

Yes ☐ No ☐

Was there anyone injured?  
(ထိခိုက်ဒဏ်ရာရရှိသူ ရှိ/မရှိ)

Yes ☐ No ☐

Was there property damaged?  
(ပစ္စည်းများထိခိုက်ပျက်စီးမှု ရှိ/မရှိ)

Yes ☐ No ☐

**INJURY OR ILLNESS**

ထိခိုက်ဒဏ်ရာရရှိမှု / နာမကျန်းဖြစ်ခြင်း

**PROPERTY LOSS / DAMAGE / FIRE**

ပစ္စည်း ဆုံးရှုံးမှု / ပျက်စီးမှု / မီးဘေး

Injured's name:  
(ဒဏ်ရာရသူ၏အမည်)

Nature of damage:  
(ပျက်စီးဆုံးရှုံးမှုအမျိုးအစား)

Nature of injury or illness(including part of body):  
ထိခိုက်သည့်နေရာ(သို့)နာမကျန်းဖြစ်ပုံ(ကိုယ်ခန္ဓာအစိတ်အပိုင်းအား ဖော်ပြပေးရန်)

Cost estimate:  
(ဆုံးရှုံးမှုတန်ဖိုး)

Treatment provided:  
(ကုသမှု)

☐None ☐ First Aid ☐ Doctor ☐ Hospital ☐ Other (specify) .....  
(မရှိ) (ရှေးဦးသူနာပြု) (ဆရာဝန်) (ဆေးရုံ) (အခြား၊ ဖော်ပြပါ)

**Myint& Associates Co., Ltd.**





(နေ့စွဲ)



**Myint& Associates Co., Ltd.**

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**SUPERVISOR / (ကြီးကြပ်သူ)**



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Name of immediate supervisor: (ဝန်ထမ်းအမည်)	Signature:Date: (လက်မှတ်)	(နေ့စွဲ)
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## ATTACHMENT 2      EMERGENCY RESPONSE TEAM CONTACT DETAILS

Emergency Response Roles	Name	Phone Number
Emergency Response Center Vantage Tower, 623 Pyay Road, University P.O., Kamaryut Township, Yangon, Myanmar	M&AS Head Office	Tel: ( 95-1 ) 230 7722 / 230 7721~9
Emergency Response Team Commander (ERTC)	U Myo Tin ( GXM )	Mob: ( 95-9 ) 508 2428 E-mail: gxm.myotin@mprlexp.com
Deputy Emergency Response Team Commander (DERTC)	U Soe Khine ( GMS )	Mob: ( 95-9 ) 43200699
Emergency Response Team Scribe ( ERTS )	U Zaw Min Soe ( ADM ) Daw Sandar ( ADO )	Mob: ( 95-9 ) 507 6054 Mob: ( 95-9 ) 515 6483
Emergency Response Team HSE Manager	U Nay Myo Aung ( HSEM )	Mob: ( 95-9 ) 4318 2225
Emergency Response Logistic Coordinator ( ERLC )	U Ko Ko Naing ( OLM ) U Myo Win ( MTO ) U Win Naing Moe ( MTO )	Mob: ( 95-9 ) 505 6654 Mob: ( 95-9 ) 5060801 Mob: ( 95-9 ) 503 1774
Field Emergency Response Team Commander (FERTC)	U Zaw Min Soe ( ADM )	Mob: ( 95-9 ) 507 6054
Deputy Field Emergency Response Team Commander ( DFERTC )	U Myint Kywe Oo U Myo Myint Lay	Mob: ( 95-9 ) 862 4503 Mob: ( 95-9 ) 862 4487
Field HSE Coordinator ( FHSEC )	Dr. Tin Ko Lwin U Ye Win Htut	Mob: ( 95-9 ) 517 9842 Mob: ( 95-9 ) 975 489271

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### ATTACHMENT 3      EMERGENCY SERVICE CONTACT DETAILS

<b>POLICE</b>		
Hlaing Police Station	No. 218, Yangon – Insein Road, Hlaing Township, Yangon.	Tel: (95-1)519531, 519 532,(95-9) 730 88550
<b>FIRE STATION</b>		
Hlaing Fire Station	Bata Bus Stop, Ward ( 12), Hlaing Township, Yangon – Insein Road, Hlaing Township, Yangon.	Tel: (95-1) 519 578
<b>HOSPITAL</b>		
Thukhagabar Hospital	615(E), Marlar Street, Pyay Rd, Kamayut Township, Yangon.	Tel: (95-1) 504 545, 526 329, 500 100
Green Cross Hospital	101, Lan Thit Street, Lanmadaw Township, Yangon.	Tel: (95-1) 286863 / 286864
New Yangon General Hospital	Bogyoke Aung San Road and Pyay Road Junction, Yangon.	Tel: (95-1) 283022 / 283455

Thukhagabar Hospital	Green Cross Hospital	Hlaing Fire Station	HlaingPolice Station
2km	5km	5 km	5 km
5 minutes	25 minutes	13 minutes	13 minutes

**Note - Distances from M&AS Head Office in Yangon**

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**ATTACHMENT 4 EMERGENCY RESPONSE PLAN IN MYANMAR LANGUAGE**

အရေးပေါ်အခြေအနေတွင် တုံ့ပြန်ဆောင်ရွက်ရမည့်အစီအစဉ်  
ဓါတုဗေဒပစ္စည်းများယိုဖိတ်မှုဖြစ်စဉ်

<b>1</b>	<ul style="list-style-type: none"> <li>• အဆိပ်ဖြစ်စေနိုင်သောဓါတုဗေဒပစ္စည်းများ ယိုဖိတ်နေသည်ကို တွေ့ရှိရပါက - (၁) ယင်းနေရာမှ ထွက်ခွာပါ။ (၂) စိတ်တည်ငြိမ်စွာထားပြီး၊ လုံခြုံရေးတာဝန်ကျ နှင့် M&amp;A အုပ်ချုပ်ရေးအဖွဲ့သို့ အောက်ပါအချက်များအား သတင်းပို့ပါ။ (က) ယိုဖိတ်မှုစတင်ဖြစ်ပွားသောနေရာ (ခ) ဓါတုဗေဒပစ္စည်း အမျိုးအစား</li> </ul>	<ul style="list-style-type: none"> <li>• လုံခြုံရေးဌာန (လိုင်းခွဲ - ၂၅၁၃ )</li> <li>• ဦးစိုးခိုင် (GMS) ( 95-9 ) 4320 0699</li> <li>• ဒေါ်နုနုလွင် (DGM) ( 95-9 ) 540 5716</li> <li>• ဦးဇော်မင်းစိုး (ADM) ( 95-9 ) 5076054</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• အုပ်ချုပ်ရေးအဖွဲ့မှချက်ချင်းစုံစမ်းစစ်ဆေးမှုပြုလုပ်ရန်။ ၎င်းယိုဖိတ်မှုအားမရှင်းပစ်မီ MSDS ပုံစံပါအတိုင်းစစ်ဆေးဆောင်ရွက်မှုများပြုလုပ်ရန်။</li> </ul>	
<b>3</b>	<ul style="list-style-type: none"> <li>• လိုအပ်ပါကတာဝန်ကျဝန်ထမ်းမှမီးသတိပေးအချက်ပေးပြုလုပ်မည်။ ယင်းနောက်ရုံးအားဘေးအန္တရာယ်မှဖယ်ရှားရေးကိုချက်ချင်းပြုလုပ်မည်။ လုပ်ငန်းခွင်လုံခြုံရေးအရ ရုံးတံခါးအာလုံးအားပိတ်မည်။ ဧည့်သည်များအပါအဝင်၊ ရုံးဝန်ထမ်းအားလုံး (မည်သူမဆို) တာဝန်ကျဝန်ထမ်း၏ဦးဆောင်မှုအရ ပြဌာန်းထားသော စုရပ် နေရာတွင်စုဝေးရမည်။ ၎င်းစုရပ်နေရာမှာ M&amp;A ရုံး၏မြေညီထပ်၊ စားသောက်ခန်းအရှေ့တွင်သော်လည်းကောင်း၊ အခြားလုံခြုံစိတ်ချရသောလေတင်အရပ်သော်လည်းကောင်းဖြစ်သည်။ စုရပ်နေရာတွင် လူဦးရေစာရင်းစစ်တမ်းကောက်ယူမည်။</li> <li>• M&amp;A မှ ဒေသဆိုင်ရာအုပ်ချုပ်ရေးသို့လည်းကောင်း၊ အနီးပတ်ဝန်းကျင်တွင်နေထိုင်သောလူထုသို့လည်းကောင်း</li> </ul>	<ul style="list-style-type: none"> <li>• လှိုင်မြို့နယ် မီးသတ်ဌာန ( 95-1 ) 519 578</li> <li>• လှိုင်မြို့နယ် ရဲဌာန ( 95-1 ) 519 531, 519 532, ( 95-9 ) 730 88550</li> <li>• မီးသတ်ဌာန ( 95 ) 119</li> <li>• ရဲဌာန ( 95 ) 199</li> <li>• သုခက္ခမာဆေးရုံ ( 95-1 ) 504 545, 526 329, 500 100</li> </ul>



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	<p>အန္တရာယ်အားသတိပေး၍၊ အန္တရာယ်ကင်းရာသို့ရှောင်ရှားနိုင်ရေးအား အသိပေးညွှန်ကြားပါမည်။</p>	<ul style="list-style-type: none"> <li>• Green Crossဆေးရုံ ( 95-1 ) 230 0652 ~ 3</li> <li>• Green Cross လူနာတင်ယာဉ် ( 95-1 ) 230 0551</li> </ul>
4	<ul style="list-style-type: none"> <li>• MSDS မှ လိုအပ်ချက်အတိုင်း ကာကွယ်ရေးပစ္စည်းများကို အသုံးပြု၍ ဖိတ်စင်မှုကို သန့်ရှင်းရေးပြုရန်။</li> <li>• အရေပြားနှင့်ထိစပ်မိသောနေရာအား သန့်ရှင်းသောရေဖြင့် (၁၅)မိနစ်ခန့်ဆေးကြောပါ။ အဝတ်များကိုဖယ်ရှားပါ။ ဆေးကုသမှုကို ခံယူပါ။</li> <li>• မျက်စိတွင်းသို့ ထိစပ်မိပါက ချက်ချင်း သန့်ရှင်းသောရေဖြင့် (၁၅)မိနစ်ခန့် ဆေးကြောပါ။ နီးစပ်ရာ မျက်စိဆေးရန် နေရာတွင်လည်း ဆေးကြောနိုင်သည်။</li> </ul>	<ul style="list-style-type: none"> <li>• ဦးနေမျိုးအောင် ( HSEM ) ( 95-9 ) 4318 2225</li> <li>• သုခကမ္ဘာဆေးရုံ ( 95-1 ) 504 545, 526 329, 500 100</li> <li>• Green Crossဆေးရုံ ( 95-1 ) 230 0652 ~ 3</li> <li>• Green Cross လူနာတင်ယာဉ် ( 95-1 ) 230 0551</li> </ul>
5	<ul style="list-style-type: none"> <li>• ဖိတ်စဉ်မှုအားထိန်းချုပ်နိုင်လျှင် (မီးသတ်ဌာနအားစောင့်ဆိုင်းရန်)၊ M&amp;A အုပ်ချုပ်ရေးအဖွဲ့မှ လုံခြုံသောအခါ အဆောက်အဦးတွင်း ပြန်လည်ဝင်ရောက်ရန် အသိပေးပါမည်။</li> </ul>	
FollowUp	<ul style="list-style-type: none"> <li>• HSEM မှ ဤသို့ဖြစ်စဉ်များအတွက် သင်တန်းပေးရန် အတွက် ဆုံးဖြတ်မှုပေးပါမည်။</li> <li>• ခါတုဖိတ်စဉ်မှုအတွက် စုံစမ်းရေးအဖွဲ့၊ ကျွမ်းကျင်သူများမှ လိုအပ်လျှင်စုံစမ်းစစ်ဆေးရေး ပြုလုပ်ပါမည်။</li> <li>• ဤဖြစ်စဉ်အား စစ်ဆေးပြီးရလဒ်များအား ဖြန့်ဝေပါမည်။</li> </ul>	





## မြေငလျင်အန္တရာယ်ဖြစ်စဉ်

1	<p>စိတ်တည်ငြိမ်စွာဖြင့် စားပွဲခုံအောက်တွင် အကာအကွယ်ယူပါ။</p> <ul style="list-style-type: none"> <li>ရုံးမှလုံခြုံစိတ်ချရမှုမရှိမခြင်း မထွက်ခွာပါနှင့်။</li> <li>မြင့်သောဘီဒို၊ ပြတင်းပေါက်များမှ ဝေးရာသို့ဖယ်ရှားနေပါ။</li> <li>ပျက်စီးနေသောလှေကား၊ တံခါးများ၊ လျှပ်စစ်မီးကြိုးများအား သတိဖြင့်ရှောင်ရှားပါ။ ဖြစ်နိုင်လျှင် စာအုပ်အထူ(သို့)သင့်လက်ကိုင်အိတ်အား သင့်ခေါင်းပေါ်တွင်အုပ်မိုး၍အဆောက်အဦး အတွင်းတွင်သွားလာပါ။</li> <li>အကယ်၍ရုံးပြင်တွင်သင်ရောက်နေလျှင်အဆောက်အဦးသစ်ပင်၊ လျှပ်စစ်မီးကြိုးများ အောက်တွင်မနေပါ နှင့်။</li> <li>အကယ်၍ ဒဏ်ရာရလျှင်၊ အတွင်းတွင်ဖိမိ၊ ပိတ်မိနေလျှင် အကူအညီတောင်း၍ သတိပေးပါ။</li> </ul>	
2	<p>အဆောက်အဦးအတွင်းမှအန္တရာယ်ကင်းစွာဖြင့်ပြောင်းရွှေ့ရေးဆောင်ရွက်ရာတွင် -</p> <ul style="list-style-type: none"> <li>တံခါးများကိုသတိဖြင့်ဖွင့်ပါ။ အပေါ်မှကျလာနိုင်သောပစ္စည်းများ လျှပ်စစ်မီးကြိုးများ၊ ပျက်စီးနေသောလှေကားများအား သတိပြုပါ။</li> <li>လုံခြုံစိတ်ချရသောအခါရုံးဝန်ထမ်းမှအဆောက်အဦးအတွင်းတွင် ပိတ်မိနေသူများအား လိုက်လံရှာဖွေပါမည်။</li> <li>ပြိုကျလာနိုင်သောအရာများ၊ မီးအန္တရာယ်စသည်များမရှိလျှင် ဒဏ်ရာရနေသူများအား ဖယ်ရှားပါမည်။</li> <li>M&amp;A အုပ်ချုပ်ရေးအဖွဲ့၏ညွှန်ကြားမှုအောက်တွင် ဧည့်သည်များအပါအဝင် မည်သူမဆိုပြဋ္ဌာန်းထားသော စုရပ်တွင်စုဝေးရပါမည်။ ၎င်းစုရပ်တွင်လူစာရင်း ကောက်ယူပါမည်။</li> </ul>	



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<p style="text-align: center;"><b>3</b></p>	<ul style="list-style-type: none"> <li>• မီးလောင်မှုဖြစ်ပွားခဲ့လျှင် : M&amp;A / HSE ဝန်ထမ်းများမှ မီးသတ်ဆေးဗူးများဖြင့် မီးကိုငြိမ်းသတ်ရန်ကြိုးစားပါမည်။ လိုအပ်လျှင် ရန်ကုန်ဗဟိုမီးသတ်ဌာန၊ ပြည်သူ့ရဲဌာန၊ ဆေးရုံများကို အကြောင်းကြား၍ အကူအညီတောင်းခံရန်။ ပျောက်ဆုံး၊ ဒဏ်ရာရသူများရှိလျှင် အဆောက်အဦအတွင်း ဝင်ရောက်ရှာဖွေရာ၌ သတိကြီးစွာထားရမည်။</li> </ul>	<ul style="list-style-type: none"> <li>• လှိုင်မြို့နယ် မီးသတ်ဌာန ( 95-1 ) 519 578</li> <li>• လှိုင်မြို့နယ် ရဲဌာန ( 95-1 ) 519 531, 519 532, ( 95-9 ) 730 88550</li> <li>• မီးသတ်ဌာန ( 95 ) 119</li> <li>• ရဲဌာန ( 95 ) 199</li> <li>• သုခကမ္ဘာဆေးရုံ ( 95-1 ) 504 545, 526 329, 500 100</li> <li>• Green Crossဆေးရုံ ( 95-1 ) 230 0652 ~ 3</li> <li>• Green Crossလူနာတင်ယာဉ် ( 95-1 ) 230 0551</li> </ul>
<p style="text-align: center;"><b>4</b></p>	<ul style="list-style-type: none"> <li>• <b>M&amp;A</b> အုပ်ချုပ်ရေးအဖွဲ့သို့ ဆက်သွယ်ရန်။</li> </ul>	<ul style="list-style-type: none"> <li>• လုံခြုံရေးဌာန (လှိုင်ခွဲ - ၂၅၁၃ )</li> <li>• ဦးစိုးခိုင် (GMS) ( 95-9 ) 4320 0699</li> <li>• ဒေါ်နုနုလွင် (DGM) ( 95-9 ) 540 5716</li> <li>• ဦးဇော်မင်းစိုး (ADM) ( 95-9 ) 507 6054</li> </ul>



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**5**

- အဆောက်အဦးတွင်း ပြန်လည်ဝင်ရောက်ရန် လုံခြုံ၊ စိတ်ချရကြောင်း M&A အုပ်ချုပ်ရေးအရာရှိနှင့် မီးသတ်ဌာန၏ခွင့်ပြုချက်ကို စောင့်ရန်။

**FollowUp**

- အဆောက်အဦး၏ကြံ့ခိုင်မှုအခြေအနေကို လိုအပ်လျှင်စုံစမ်းရေးအဖွဲ့၊ ကျွမ်းကျင်သူများမှ စစ်ဆေးမည်။



## မီးအန္တရာယ်ဖြစ်စဉ်

1	<ul style="list-style-type: none"> <li>စိတ်တည်ငြိမ်စွာဖြင့် မီးအချက်ပေးပြုလုပ်ရန်၊ အကူအညီခေါ်ရန်၊ တာဝန်ကျအစောင့်အား သတိပေးရန်။</li> </ul>	<ul style="list-style-type: none"> <li>လုံခြုံရေးဌာန (လိုင်းခွဲ - ၂၅၁၃ )</li> </ul>
2	<ul style="list-style-type: none"> <li>ရုံးမှ ဘေးအန္တရာယ်ကင်းရှင်းစွာဖယ်ရှားရေးကို ချက်ချင်းဆောင်ရွက်ရန်။ လုပ်ငန်းခွင်အား သီးခြားပိတ်ရန်။ M&amp;A တာဝန်ကျဝန်ထမ်း၏ ညွှန်ကြားမှုအောက်တွင် ဧည့်သည်များ အပါအဝင်၊ မည်သူမဆို ပြဌာန်းထားသော စုရပ်တွင်စုဝေးရပါမည်။ ၎င်းစုရပ်တွင် လူစာရင်း ကောက်ယူမည်။</li> </ul>	
3	<ul style="list-style-type: none"> <li>M&amp;A / HSE ဝန်ထမ်းများမှ မီးသတ်ဆေးဗူးများ အသုံးပြု၍ မီးငြိမ်းသတ်မည်။ လိုအပ်လျှင် ရန်ကုန်ဗဟိုမီးသတ်ဌာနအား အကူအညီတောင်းခံရန်။</li> </ul>	<ul style="list-style-type: none"> <li>လှိုင်မြို့နယ် မီးသတ်ဌာန ( 95-1 ) 519 578</li> <li>လှိုင်မြို့နယ် ရဲဌာန ( 95-1 ) 519 531, 519 532, ( 95-9 ) 730 88550</li> <li>မီးသတ်ဌာန ( 95 ) 119</li> <li>ရဲဌာန ( 95 ) 199</li> <li>သုခကမ္ဘာဆေးရုံ ( 95-1 ) 504 545, 526 329, 500 100</li> <li>Green Crossဆေးရုံ ( 95-1 ) 230 0652 ~ 3</li> <li>Green Cross လူနာတင်ယာဉ် ( 95-1 ) 230 0551</li> </ul>



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4	<ul style="list-style-type: none"><li>M&amp;A အုပ်ချုပ်ရေးအဖွဲ့သို့ ဆက်သွယ်ရန်။</li></ul>	<ul style="list-style-type: none"><li>ဦးစိုးခိုင် (GMS) ( 95-9 ) 4320 0699</li><li>ဒေါ်နုနုလွင် (DGM) ( 95-9 ) 540 5716</li><li>ဦးဇော်မင်းစိုး (ADM) ( 95-9 ) 507 6054</li></ul>
5	<ul style="list-style-type: none"><li>အဆောက်အဦးအတွင်း ပြန်လည်ဝင်ရန် လုံခြုံစိတ်ချရ ကြောင်း M&amp;A အုပ်ချုပ်ရေးအဖွဲ့နှင့် မီးသတ်ဌာန၏ ခွင့်ပြုချက်ကို စောင့်ရန်။</li></ul>	
FollowUp	<ul style="list-style-type: none"><li>လိုအပ်လျှင် စုံစမ်းရေးအဖွဲ့ ၊ ကျွမ်းကျင်သူများမှ မီးလောင်မှုအတွက် စစ်ဆေးမှုများ ပြုလုပ်ပါမည်။ ဤထူးခြားဖြစ်စဉ် အား စုံစမ်းစစ်ဆေးပြီး၊ ရလဒ်များအား ဖြန့်ဝေပါမည်။</li></ul>	



## ကျန်းမာရေးအရေးပေါ်ဖြစ်စဉ်

1	<ul style="list-style-type: none"> <li>• လူနာအား စစ်ဆေးရန်</li> <li>• အခြေခံရှေးဦးသူနာပြုအဖြစ်၊ အသက်ရှူမှုနှင့် နှလုံးခုန်မှုများ၊ သွေးထွက်လွန်မှုရှိ/မရှိ စသည်တို့ကို စစ်ဆေးရန်။</li> <li>• တာဝန်ကျဝန်ထမ်း၏ ညွှန်ကြားမှုအောက်တွင် ဆက်လက်ဆောင်ရွက်ရန်။ မသက်ဆိုင်သူများ၊ အခင်းဖြစ်ရာ နေရာမှ ဖယ်ရှားပေးရန်။</li> </ul>	<ul style="list-style-type: none"> <li>• လုံခြုံရေးဌာန (လိုင်းခွဲ - ၂၅၁၃ )</li> </ul>
2	<ul style="list-style-type: none"> <li>• ရှေးဦးသူနာပြုစုသူ ( သို့ ) ဝါရင့်နားလည်တတ်ကျွမ်းသူမှ လိုအပ်လျှင် လူနာအားပြုစုရန်။ သုခကမ္ဘာ (သို့) Green Cross ဆေးရုံ၏ ဆေးပညာအကြံပေးချက်ကို ရယူရန်။</li> <li>• လိုအပ်လျှင် သုခကမ္ဘာ (သို့) Green Cross ဆေးရုံသို့ လူနာအား လူနာတင်ယာဉ် (သို့) သင့်တော်ရာ အခြားယာဉ်များဖြင့် ပို့ဆောင်ရန်။</li> <li>• လူနာ၏ ဆေးစာနှင့်အတူ သူနာပြုစုသူက သုခကမ္ဘာ (သို့) Green Cross ဆေးရုံသို့ လိုက်ပါသွားရန်။</li> </ul>	<ul style="list-style-type: none"> <li>• ဦးနေမျိုးအောင် ( HSEM ) ( 95-9 ) 4318 2225</li> <li>• သုခကမ္ဘာဆေးရုံ ( 95-1 ) 504 545, 526 329, 500 100</li> <li>• Green Cross ဆေးရုံ ( 95-1 ) 230 0652 ~ 3</li> <li>• Green Cross လူနာတင်ယာဉ် ( 95-1 ) 230 0551</li> </ul>
3	<ul style="list-style-type: none"> <li>• လူနာ၏ နီးစပ်သူ (သို့) အလုပ်ရှင်ကုမ္ပဏီသို့ကြောင်းကြားရန်။</li> </ul>	လူနာ၏ နီးစပ်သူ ကို လူနာ၏ဆေးရာဇဝင်ပုံစံ တွင် ကြည့်ပါ။
4	<ul style="list-style-type: none"> <li>• <b>M&amp;A</b> အုပ်ချုပ်ရေးအဖွဲ့သို့ ဆက်သွယ်ရန်။</li> </ul>	<ul style="list-style-type: none"> <li>• လုံခြုံရေးဌာန (လိုင်းခွဲ - ၂၅၁၃ )</li> <li>• ဦးစိုးခိုင် (GMS) ( 95-9 ) 4320 0699</li> <li>• ဒေါ်နုနုလွင် (DGM) ( 95-9 ) 540 5716</li> <li>• ဦးဇော်မင်းစိုး (ADM) ( 95-9 ) 507 6054</li> </ul>

<b>FollowUp</b>	<ul style="list-style-type: none"> <li>ဆေးစာမိတ္တူရယူရန်။</li> <li>ထူးခြားဖြစ်စဉ်အား စုံစမ်းစစ်ဆေးမှုများပြုလုပ်ရန်။</li> <li>၎င်းစုံစမ်းစစ်ဆေးမှုရလဒ်များအား ပြည်စုံစာပြုလုပ်ပြီး ဖြန့်ဝေရန်။</li> </ul>	
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## ယာဉ်တိုက်မှုအရေးပေါ်ဖြစ်စဉ် ( သာမန် )

<b>1</b>	<ul style="list-style-type: none"> <li>ယာဉ်ထိခိုက်ပျက်စီးမှု၊ ယာဉ်စီးသူခရီးသည်များ ထိခိုက်မှု ရှိ / မရှိ စစ်ဆေးရန်။ အကယ်၍ အသက်အန္တရာယ် ရှိသော ဒဏ်ရာရရှိလျှင်၊ အရေးပေါ် ဖြစ်စဉ်နည်းလမ်းများအား လိုက်နာရန်။</li> <li>ဖြစ်ပွားသော ယာဉ်၏ လိုင်စင်နံပါတ်၊ ယာဉ်မောင်း လိုင်စင်၊ ယာဉ်အမျိုးအစား ဖော်ပြချက်များကို စုဆောင်းရန်။ ဖြစ်နိုင်လျှင် ဓါတ်ပုံရိုက်ယူရန်။</li> <li>အခြားသော ပါဝင်ပတ်သက်သူများနှင့် တွေ့ဆုံမေးမြန်းရန်။</li> </ul>	<ul style="list-style-type: none"> <li>ဦးမျိုးဝင်း ( MTO ) ( 95-9 ) 506 0801</li> <li>M&amp;A ရုံးချုပ် ( 95-1 ) 230 7722, 230 7721 ~ 9</li> <li>ဦးဇော်မင်းစိုး (ADM) ( 95-9 ) 507 6054</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>MTO သို့ ဖုန်းဆက်အကြောင်းကြားရန်။</li> <li>ကြိုတင်ညှိနှိုင်းချက်များ မအောင်မြင်လျှင်၊ နီးစပ်ရာ ယာဉ်ထိန်းရဲအား အကြောင်းကြားရန်။</li> </ul>	<ul style="list-style-type: none"> <li>လှိုင်မြို့နယ် ရဲဌာန ( 95-1 ) 519 531, 519 532, ( 95-9 ) 730 88550</li> <li>ရဲဌာန ( 95 ) 199</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>MTO တာဝန်ကျဝန်ထမ်း အခင်းဖြစ်ပွားရာ နေရာသို့ ရောက်ရှိသည် အထိ စောင့်ဆိုင်းရန်။</li> </ul>	
<b>4</b>	<ul style="list-style-type: none"> <li>M&amp;A အုပ်ချုပ်ရေးအဖွဲ့သို့ ဆက်သွယ်ရန်။</li> </ul>	<ul style="list-style-type: none"> <li>ဦးစိုးခိုင် (GMS) ( 95-9 ) 4320 0699</li> <li>ဒေါ်နုနုလွင် (DGM)</li> </ul>



 <b>Myint &amp; Associates Co., Ltd.</b>	<b>Issue Date:</b> 02 February 2016  <b>Effective Date:</b> 09 February 2016	<b>M&amp;A-HSE-PO-002</b>  <b>Issue: 3.0</b>
<b>Emergency Response Plan</b>		<b>Page 41 of 41</b>

		( 95-9 ) 540 5716 • ဦးဇော်မင်းစိုး(ADM) ( 95-9 ) 5076054
<b>FollowUp</b>	<ul style="list-style-type: none"> <li>• လိုအပ်လျှင် စုံစမ်းရေးအဖွဲ့၊ ကျွမ်းကျင်သူများမှ ဤထူးခြားဖြစ်စဉ်အား စစ်ဆေးမှုပြုလုပ်ပါမည်။</li> <li>• ၎င်းဖြစ်စဉ်အား စစ်ဆေးပြီးလျှင်ရလဒ်များအား MTO အရာရှိမှ အုပ်ချုပ်ရေးအဖွဲ့နှင့် HSE ဌာနအား ဖြန့်ဝေရန်။</li> <li>• စုံစမ်းတွေ့ရှိချက်များကို ဌာနအားလုံးသို့ ဖြန့်ဝေရန်။</li> </ul>	

## ယာဉ်တိုက်မှုအရေးပေါ်ဖြစ်စဉ် ( အကြီးစား )

<b>1</b>	<ul style="list-style-type: none"> <li>• ယာဉ်ထိခိုက်ပျက်စီးမှု၊ ယာဉ်စီးသူခရီးသည်များ ထိခိုက်မှု ရှိ / မရှိ စစ်ဆေးရန်။ အကယ်၍ အသက်အန္တရာယ် ရှိသော ဒဏ်ရာရရှိလျှင်၊ လူနာအား ရှေးဦးစွာ အသက်အန္တရာယ်မှ စိတ်ချရအောင် ပြုလုပ်ရန်။</li> <li>• ဖြစ်ပွားသော ယာဉ်၏ လိုင်စင်နံပါတ်၊ ယာဉ်မောင်း လိုင်စင်၊ ယာဉ်အမျိုးအစား ဖော်ပြချက်များကို စုဆောင်းရန်။ ဖြစ်နိုင်လျှင် ဓါတ်ပုံရိုက်ယူရန်။</li> <li>• အခြားသော ပါဝင်ပတ်သက်သူများနှင့် တွေ့ဆုံမေးမြန်းရန်။</li> </ul>	<ul style="list-style-type: none"> <li>• ဦးမျိုးဝင်း ( MTO ) ( 95-9 ) 506 0801</li> <li>• M&amp;A ရုံးချုပ် ( 95-1 ) 230 7722, 230 7721 ~ 9</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• ရန်ကုန်ဆေးရုံကြီး ထိခိုက်ဒဏ်ရာ အရေးပေါ်ဌာနသို့ လူနာအား လုံခြုံစိတ်ချရသော အစီအမံများဖြင့် ပို့ဆောင်ရန်။</li> </ul>	<ul style="list-style-type: none"> <li>• အရေးပေါ်ဌာန ( 95-1 ) 256 112, 256 123</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>• MTO သို့ ဖုန်းဆက်အကြောင်းကြားရန်။</li> </ul>	



Emergency Response Plan

4	<ul style="list-style-type: none"><li>• MTO အရာရှိ၏ ညွှန်ကြားချက်များအား လိုက်နာဆောင်ရွက်ရန်။</li><li>• အုပ်ချုပ်ရေးအဖွဲ့သို့ ဆက်သွယ်ရန် နှင့် ညွှန်ကြားချက်များ အား ဆက်လက် လိုက်နာဆောင်ရွက်ရန်။</li></ul>	<ul style="list-style-type: none"><li>• ဦးစိုးခိုင် (GMS) ( 95-9 ) 4320 0699</li><li>• ဒေါ်နုနုလွင် (DGM) ( 95-9 ) 540 5716</li><li>• ဦးဇော်မင်းစိုး (ADM) ( 95-9 ) 507 6054</li></ul>
FollowUp	<ul style="list-style-type: none"><li>• လိုအပ်လျှင် စုံစမ်းရေးအဖွဲ့၊ ကျွမ်းကျင်သူများမှ ဤထူးခြား ဖြစ်စဉ်အား စစ်ဆေးမှုပြုလုပ်ပါမည်။</li><li>• ၎င်းဖြစ်စဉ်အား စစ်ဆေးပြီးလျှင်ရလဒ်များအား MTO အရာရှိမှ အုပ်ချုပ်ရေးအဖွဲ့နှင့် HSE ဌာနအား ဖြန့်ဝေရန်။</li><li>• စုံစမ်းတွေ့ရှိချက်များကို ဌာနအားလုံးသို့ ဖြန့်ဝေရန်။</li></ul>	

## **Oil Spill Contingency Plan**

### **1.0 Purpose**

M&AOSB will put in place appropriate management of spills to minimize any risk to the environment from pollution. M&AOSB has developed this plan to formalize the processes required to ensure that there are adequate resources available and procedures in place to ensure that all spills are cleaned up immediately and reported promptly.

### **2.0 Responsibility Summary**

In the event of an oil release, the staff of M&AOSB shall carry out the procedures outlined herein.

M&AOSB Staff will respond to any emergency situation in accordance with their knowledge and skills.

Staff shall insure that M&AOSB Supervision is notified immediately, and may be required to assist with follow up response actions as instructed by M&AOSB Supervision/ HSE Team/ Management.

M&AOSB personnel are responsible for reporting all spills to the M&AOSB Supervisor/ Client Supervisor/ HSE Team immediately.

The Emergency Response Team/ committee are to initialize Emergency Response Procedures as per (Emergency Response Plan).

The M&AOSB Supervisor/ Management/ HSE Team (Emergency Response Team) shall report spills to appropriate departments as soon as possible.

### **3.0 Abbreviations & Definitions**

BU – M&AOSB Supply Base

ERC - Emergency Response Committee (Team). Includes Chief Fire Wardens, Fire Wardens and First Aid Officers

ERT - Emergency Response Team

SDS - Safety Data Sheet

Contractor - A person or firm that undertakes a contract to provide materials or labour to perform a service or do a job

Incident - An unplanned event that has or could have caused personal injury or damage to property, equipment, the environment or a loss of business

Worker - Employees of M&AOSB

#### **4.0 Spill Procedures**

M&AOSB will put in place appropriate management of spills to minimize any risk to the environment from pollution. M&AOSB has developed this plan to formalize the processes required to ensure that there are adequate resources available and procedures in place to ensure that all spills are cleaned up immediately and reported promptly.

#### **5.0 Dealing with Minor Spills**

A small spill is considered to be a spill of 5 litres or less, providing the product is not concentrated. For concentrated products of any quantity, the spill must be treated as a large spill. The following steps will be taken in the event of a small spill:

- ❖ Assess safety - Make sure that people are kept clear, and that you have the right training and equipment to deal with the spill.
- ❖ Stop the source - Providing it is safe to do so, stop the spill at its source. This may involve righting an overturned container or sealing holes or cracks in containers.
- ❖ Contain and clean up the spill - The spill should be mopped up immediately
- ❖ Record the spill - Record when, what, how and where the spill occurred, clean up measures undertaken and the names of any witnesses. Also make note of what changes can be made when handling, transporting or storing chemicals to ensure a similar incident does not happen again.

#### **6.0 Dealing with Large Spills**

A large spill is considered to be anything over 5 litres or concentrated chemicals of any volume. The following steps will be taken in the event of a large spill:

- ❖ Assess safety - Make sure that people are kept clear, and that you have the right training and equipment to deal with the spill.
- ❖ Consult the Safety Data Sheet (SDS) - The SDS will have instructions on how to deal with specific spills.
- ❖ Put on protective clothing - If necessary, put on gloves and goggles, a mask and an apron.

- ❖ Stop the source - Providing it is safe to do so, stop the spill at its source. This may involve righting an overturned container or sealing holes or cracks in containers.
- ❖ Contain and control the flow - The spill should be prevented from filtrating into the ground or entering the storm water system. The outer edge of the spill should be dammed with rags, blankets, sand, sands bags, mops and/or absorbent booms.
- ❖ Clean up the spill - Promptly cover the spill using absorbent materials such as the correct absorbent granules for the product (note that some strong acids will react with some types of granules and sawdust), sand and rags, being mindful not to splash the spill. Using a dustpan or spade, the absorbent granules or sand must then be scooped up and placed into a container.
- ❖ Record the incident - Record what, how and where the spill occurred and the names of any witnesses. Also make note of what changes can be made when handling, transporting or storing chemicals to ensure a similar incident does not happen again.
- ❖ In an emergency situation the ERC must be notified (i.e. Chief Fire Warden). Refer to relative emergency response plan.

## **7.0 Reporting Spills**

All uncontrolled spills on a site, requires an Incident Report to be generated. For all spills occurring outside of an M&AOSB facility, regardless of volume, requires an incident report to be generated. The report must be completed within 24 hours of the incident. Clean-up of the spill must not occur until the BU Manager /or HSEQ Advisor are notified and an appropriate response initiated.

## **8.0 General purpose spill kits**

A basic general purpose spill kit must contain at least three components. Personal protective equipment (PPE) must be supplied to enable employees to mop up spillage safely. The extent of the PPE must be suitable for the spillages likely to be encountered. Small spill kits should contain safety gloves, while larger kits for dealing with spillages of solvents.

Basic spill kit contents list

- Protective clothing (gloves, overalls, overshoes, safety goggles)
- Absorbent materials (paper towels, spill pads, spill socks)
- Disposal bags with tape or twist ties
- Dustpan and polypropylene broom
- Container for waste



CSKT

# **Appendix G – Stakeholder Engagement; Meeting Minutes, and Materials**



## Meeting of Minutes – Question and Answer Session

Detail			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Ayeyarwady Regional Government Office	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Pathein	<b>Township</b>	Pathein
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	16 <sup>th</sup> Jan 2017		
<b>Time</b>	12:00 – 1:30 PM		
<b>Attendee List</b>	<b>Government (3)</b> 1) U Win Htay, Region Minister, Transportation, Electricity, Industry, Communication, Energy and Highway Ministry of Ayeyarwady Region 2) U Soe Aung, Director of MIC, Ayeyarwady Region 3) U Aung Khine Soe, Director, ECD, Ayeyarwady Region		

Discussion and Comment
<p><b>Q 1): U Win Htay (Minister of Transportation, Electricity, Industry, Communication, Energy and Highway, Ayeyarwady Region):</b> Can these project activities effect the local fishing activities or not?</p> <p><b>A 1): Becky Summons (Senior Consultant, ERM):</b> We will assess this in the EIA Study. At the moment, we are gathering information to assess the potential impacts of the Project.</p> <p><b>Q 2): U Aung Khine Soe (Director, ECD, Ayeyarwady Region):</b> Suggest that you assess in detail the biodiversity because there are marine resources around that area. Please explain the Project and potential impacts in detail to the local people when you meet with them as graduation level is low in that area.</p> <p><b>A 2): Becky Summons (Senior Consultant, ERM):</b> Yes, we will do. And we will follow the laws, procedures and guidelines from Myanmar Government.</p> <p><b>Q 3): U Win Htay (Minister of Transportation, Electricity, Industry, Communication, Energy and Highway, Ayeyarwady Region):</b> What are the operation/ construction activities of the Project?</p> <p><b>A 3): U Myo Zaw Oo (Senior Stakeholder Engagement Officer, M&amp; A):</b> Our Project is a supply base consisting of an island jetty head with small deck, a causeway and an onshore facility. The onshore facility is likely to consist of a long term storage facility, custom inspection area, main office area, accommodation area and utilities.</p> <p><b>Q 4): U Win Htay (Minister of Transportation, Electricity, Industry, Communication, Energy and Highway, Ayeyarwady Region):</b> When you disclose information, please invite the CSO from that area. I heard that they are concerned that you will block the way that the fishing boats go to fish to the sea.</p> <p><b>A 4): Becky Summons (Senior Consultant, ERM):</b> Thank you for your suggestion. We will invite CSO to the meetings.</p>

## Meeting of Minutes – Question and Answer Session

<i>Detail</i>			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Ngapudaw GAD Office	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Pathein	<b>Township</b>	Ngapudaw
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	16 <sup>th</sup> Jan 2017		
<b>Time</b>	3:00 – 3:30 PM		
<b>Attendee List</b>	<b>Government (1)</b> U Han Win Soe (Deputy GAD Officer, Ngapudaw GAD)		

<i>Discussion and Comment</i>
<p><b>Q 1): U Han Win Soe (Deputy GAD Officer, Ngapudaw GAD):</b> I want to suggest that should invite other related departments for this meeting.</p> <p><b>A 1): Becky Summons (Senior Consultant, ERM):</b> This stage is scoping stage and we are just gather information from local communities to assess the potential impacts. We can engage more departments in Ngapudaw during the EIA Stage when we will have more information to present.</p> <p><b>Q 2): U (Deputy officer, Napudaw GAD):</b> We, Ngapudaw Township, will connect with the Nga Yoke Kaung GAD for the consultation meeting.</p> <p><b>Q 2): Becky Summons (Senior Consultant, ERM):</b> Thank you very much.</p>

## Meeting of Minutes – Question and Answer

Detail			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Nga Yoke Kaung GAD Office	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Pathein	<b>Township</b>	Ngapudaw
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	17 <sup>th</sup> Jan 2017		
<b>Time</b>	1:00 – 2:30 PM		
<b>Attendee List</b>	<b>Government (6)</b> 1) U Kyaw Zin Lin (Nga Yoke Kaung, GAD officer) 2) U Tin Naing (Nga Yoke Kaung, Department of Fishery) 3) U Myint Aung (Nga Yoke Kaung, Agricultural Department) 4) U Thet Min Oo (Nga Yoke Kaung City development/ Municipal Department) 5) U Maung Maung Thwin (Nga Yoke Kaung, Transportation Department) 6) U Zaw Wan (Village Leader of Nan Thar Pu village tract)		

Discussion and Comment
<p><b>Q 1): U Tin Naung (Nga Yoke Kaung, Department of Fishery):</b> I would like to know how to M&amp;A will provide CSR (social benefits) for local people, especially relating to transportation services?</p> <p><b>A 1): U Myo Zaw Oo (Senior Stakeholder Engagement Officer, M&amp;A):</b> Currently, we are in the early Scoping Stages of the Project. However, if the Project develops M&amp;A will consider for the CSR in the area.</p> <p><b>Q 2): U Tin Naung (Nga Yoke Kaung, Department of Fishery):</b> What are the project activities?</p> <p><b>A 2): U Zarni Aung, Monitoring and Evaluation officer, M&amp;A:</b> The Project would be a supply base for offshore oil and gas operations. The supply base (onshore) consists of an island jetty head with small deck, a causeway and an onshore facility. The onshore facility is likely to consist of a long term storage facility, custom inspection area, main office area, accommodation area and utilities.</p> <p><b>Q 3): U Thet Min Oo (Nga Yoke Kaung, City development/ Municipal Department):</b> In this area, local people are confusing two supply base projects one by SIM company and the other by M&amp;A Company.</p> <p><b>A 3): U Myo Zaw Oo, Senior Stakeholder Engagement Officer, M&amp;A:</b> We are M&amp;A company, and we are currently in the early “scoping” stages for this Project. We have not yet decided if the Project will go ahead, we will tender to MOGE.</p> <p><b>Q 4): U Kyaw Zin Lin (Nga Yoke Kaung, GAD officer):</b> You should go to meet with the Zin Yaw Gaung villagers as that village is very close to the Project Area. Also you can invite people from Seikan village and Kyauk Phar village. Secondly, should do separate consultation with CSO and local people.</p> <p><b>A 4): Becky Summons (ERM, Senior Consultant):</b> Thank you, Sir. This visit we did go to Zin Yaw Gaung village. For this round, we did request to meet CSO however during the next engagement as part of the EIA Stage we will undertake more engagement and also will include your suggestions to meet with CSO separately.</p> <p><b>Q 5): U Thet Min Oo (Nga Yoke Kaung City development/ Municipal Department):</b> So, there will be two Supply Base projects in Nga Yoke Kaung area.</p> <p><b>A 5): U Myo Zaw Oo, Senior Stakeholder Engagement Officer, M&amp; A:</b> After Environmental Impact Assessment (EIA) process, we will submit this report to related government departments. The government will decide which Project goes ahead.</p>

Stakeholder Consultation for Nga Yoke Kaung Supply Base project			
Date- 18.01.2017			
9:00 AM to 11:00 AM			
Zin Yaw Gyaung village			
Public			
No.	Name	Address	Note
1	U Poe Lel	Zin Yaw Gyaung village	
2	Daw Maw Say	Zin Yaw Gyaung village	
3	U Aung Gyi	Kyuk Phar village	
4	Daw Aye Aye Ngwe	Zin Yaw Gyaung village	
5	Daw Win Win Than	Zin Yaw Gyaung village	Village Leader of Zin Yaw Gyaung
6	Daw Khin Yi	Zin Yaw Gyaung village	
7	U Aung Min Thu	Zin Yaw Gyaung village	
8	U Sa Myo Htet	Zin Yaw Gyaung village	
9	U Maung Latt	Zin Yaw Gyaung village	
10	Daw Khin San Myint	Zin Yaw Gyaung village	
11	U Moe Khine	Kyuk Phar village	
12	Daw Nay Chi	Seikan village	
13	Daw Khin Hnin Wai	Seikan village	
14	Daw Poe Ei Phyu	Seikan village	
15	Daw Khin San Htwe	Zin Yaw Gyaung village	
16	Daw Win Shwe	Seikan village	
17	U Aya Wan	Zin Yaw Gyaung village	
18	U Htun Kywe	Zin Yaw Gyaung village	
19	Daw Li Li Win	Zin Yaw Gyaung village	
20	Daw Say Hlan	Zin Yaw Gyaung village	
21	Daw Nan Dal	Zin Yaw Gyaung village	
22	U Moe Naing	Zin Yaw Gyaung village	
23	U Taing Lay	Zin Yaw Gyaung village	
24	Daw Pan Sein	Zin Yaw Gyaung village	
25	Daw Ni Ni Win	Zin Yaw Gyaung village	
26	U Nyo Ma Chaw	Zin Yaw Gyaung village	
27	U Shwe Taung	Zin Yaw Gyaung village	
28	U Moe Kyaw	Zin Yaw Gyaung village	
29	Daw Naw Ku Ma	Zin Yaw Gyaung village	
30	U Moe Thiha	Zin Yaw Gyaung village	
31	U In Gar	Zin Yaw Gyaung village	

Organization		
No.	Name	Department
1	U Myo Zaw Oo	M &A
2	U Zarni Aung	M &A
5	Becky Summons	ERM
6	U Han Htet Ko	ERM

## Meeting of Minutes – Question and Answer Session

Detail			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Zin Yaw Gaung village	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Pathein	<b>Township</b>	Ngapudaw
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	18 <sup>th</sup> Jan 2017		
<b>Time</b>	9:00 – 10:30 PM		
<b>Attendee List</b>	<u>Local (31) - see list</u>		

Discussion and Comment
<p><b>Q 1): U Htun Khawe (Villager, Zin Yaw Gaung):</b> We (local people) don't know what the impacts are that will affect the community, but we want to be not impact to us.</p> <p><b>A 1): Becky Summons (ERM, Senior Consultant):</b> At this stage, we are gathering data to find out what the impacts might be. We will come back again to present more information on the potential impacts once this stage is complete. We will undertake the EIA in accordance with Myanmar legislation and guidelines (Emission Guidelines).</p> <p><b>Q 2): Daw Ei Yo (Zin Yaw Gaung leader):</b> We are concerned about air/ noise impact because our village is very close to the Project Area. We have lived in this area a long time. If we need to move to another place, we will have impacts on our livelihoods.</p> <p><b>A 2): Becky Summons (ERM, Senior Consultant):</b> We will assess the impacts from noise during construction and operation and if necessary, we will recommend mitigation measures (such as noise barriers) to be used if necessary. Importantly, the noise and air emissions will have to be in line with Myanmar Standards (Emission Guidelines).</p> <p><b>Q 3): Daw Khin San Myint (Villager, Zin Yaw Gaung):</b> I really want to know which type of materials will be stores within the Site.</p> <p><b>A 3): U Zarni Aung (Monitoring and Evaluation officer, M &amp; A):</b> Our Project consists of an island jetty head with small deck, a causeway and an onshore facility. The main supply base (onshore) is likely to consist of a long term storage facility, which will store supplies for oil and gas operations. This may include waste from vessels but this will be confined in the EIA Report.</p> <p><b>Q 4): U Inn Gar (Villager, Zin Yaw Gaung):</b> If air impacts can occur, will each related specialist come and assess?</p> <p><b>A 4): Becky Summons (ERM, Senior Consultant):</b> Yes, each related specialist will study for this Project. It will also be conducted in accordance with Myanmar Standards (Emission Guidelines) i.e. emissions and discharges will have to be within the permitted levels.</p>

Stakeholder Consultation for Nga Yoke Kaung Supply Base project			
Date- 18.01.2017			
12:00 PM to 1:30 PM			
Gu Chaung village			
Public			
No.	Name	Address	Note
1	Daw Nwe Nwe Soe	Gu Chaung village	
2	Daw Ju Ju Hlaing	Gu Chaung village	
3	Daw Tin Tin Khine	Gu Chaung village	
4	Daw San San Maw	Gu Chaung village	
5	Daw Shwe Kyi	Gu Chaung village	
6	Daw Aye Aye Aung	Gu Chaung village	
7	U Aung Ko Min	Natharpu	
8	U Myint Win	Gu Chaung village	village leader of Gu Chaung
9	Daw Thein Thein Ngwe	Gu Chaung village	
10	Daw Cho Cho Mhwe	Gu Chaung village	
11	U Phyo	Natharpu	
12	Daw Mi Su	Gu Chaung village	
13	U Phyone Maung Maung	Gu Chaung village	
14	U Naing Zaw Lin	Gu Chaung village	
15	U Kyaw Lwin	Gu Chaung village	

Organization		
No.	Name	Department
1	U Myo Zaw Oo	M &A
2	U Zarni Aung	M &A
5	Becky Summons	ERM
6	U Han Htet Ko	ERM

## Meeting of Minutes – Question and Answer Session

Detail			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Gu Chaung	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Patheingyi	<b>Township</b>	Ngazun
<b>Objective</b>	Stakeholder Consultation for Scoping Phase of EIA Study		
<b>Date</b>	18 <sup>th</sup> Jan 2017		
<b>Time</b>	12:00 – 1:30 PM		
<b>Attendee List</b>	<u>Local (15) – see list</u>		

Discussion and Comment
<p><b>Q 1): U Kyaw Kyaw (Villager, Gu Chaung):</b> There are fishing activities in the marine waters in front of the Project Area. I want to know if we can fish or not around in that area when vessels are coming to the jetty.</p> <p><b>A 1): Becky Summons (ERM, Senior Consultant):</b> There will be an area excluded from fishing near the jetty and during construction. This is for health and safety reasons. This area will be confirmed in the EIA Report. You can continue to fish either side of the jetty outside of this area. We are here now to find out about what the Potential impacts are to your fishing activities so please provide us information on where and when you fish.</p> <p><b>Q 2): U Aung Ko Min (Villager, Gu Chaung):</b> I want to know whether the Project will create job opportunities for local people.</p> <p><b>A 2): U Myo Zaw Oo (Senior Stakeholder Engagement Officer, M&amp; A):</b> Currently, we are in the Scoping Stage. However, we intend to create job opportunities for local people in during operation (when the project starts). M &amp; A will consider job opportunities depend on education levels.</p> <p><b>Q 3): U Kyaw Kyaw (Villager, Gu Chaung):</b> There are some coral reefs around our area so please consider this in the Study.</p> <p><b>A 3): Becky Summons (ERM, Senior Consultant):</b> Thank you for the information. We will assess impacts to marine biodiversity around the Project Area in the EIA Study. For coral reef, we may be required to undertake baseline surveys (such as using drop down cameras). The requirement for these surveys will be confirmed at the end of this initial scoping study.</p> <p><b>Q 4): U Aung Ko Min (Villager, Gu Chaung):</b> I would like to suggest that you invite CSOs to meeting during the future EIA consultation.</p> <p><b>A 4): Becky Summons (ERM, Senior Consultant):</b> During EIA Phase, we will engage more stakeholders. We will also invite CSOs for the area and will arrange this in conjunction with U Zaw Wan (Natharpu Village Tract Leader).</p>



## Meeting Minutes

<i>Detail</i>			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Ayeyarwady Regional Government Office	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Pathein	<b>Township</b>	Pathein
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	16 <sup>th</sup> Jan 2017		
<b>Time</b>	12:00 – 1:30 PM		
<b>Attendee List</b>	<b><u>Government (3)</u></b> 1) U Win Htay, Region Minister, Transportation, Electricity, Industry, Communication, Energy and Highway Ministry of Ayeyarwady Region 2) U Soe Aung, Director of MIC, Ayeyarwady Region 3) U Aung Khine Soe, Director, ECD, Ayeyarwady Region		

<i>Discussion and Comment</i>
<p><b>Q 1): U Win Htay (Minister of Transportation, Electricity, Industry, Communication, Energy and Highway, Ayeyarwady Region):</b> Can these project activities effect the local fishing activities or not?</p> <p><b>A 1): Becky Summons (Senior Consultant, ERM):</b> We will assess this in the EIA Study. At the moment, we are gathering information to assess the potential impacts of the Project.</p> <p><b>Q 2): U Aung Khine Soe (Director, ECD, Ayeyarwady Region):</b> Suggest that you assess in detail the biodiversity because there are marine resources around that area. Please explain the Project and potential impacts in detail to the local people when you meet with them as graduation level is low in that area.</p> <p><b>A 2): Becky Summons (Senior Consultant, ERM):</b> Yes, we will do. And we will follow the laws, procedures and guidelines from Myanmar Government.</p> <p><b>Q 3): U Win Htay (Minister of Transportation, Electricity, Industry, Communication, Energy and Highway, Ayeyarwady Region):</b> What are the operation/ construction activities of the Project?</p> <p><b>A 3): U Myo Zaw Oo (Senior Stakeholder Engagement Officer, M&amp; A):</b> Our Project is a supply base consisting of an island jetty head with small deck, a causeway and an onshore facility. The onshore facility is likely to consist of a long term storage facility, custom inspection area, main office area, accommodation area and utilities.</p> <p><b>Q 4): U Win Htay (Minister of Transportation, Electricity, Industry, Communication, Energy and Highway, Ayeyarwady Region):</b> When you disclose information, please invite the CSO from that area. I heard that they are concerned that you will block the way that the fishing boats go to fish to the sea.</p> <p><b>A 4): Becky Summons (Senior Consultant, ERM):</b> Thank you for your suggestion. We will invite CSO to the meetings.</p>

<i>Detail</i>			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Ngapudaw GAD Office	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Pathein	<b>Township</b>	Ngapudaw
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	16 <sup>th</sup> Jan 2017		
<b>Time</b>	3:00 – 3:30 PM		
<b>Attendee List</b>	<b><u>Government (1)</u></b> U Han Win Soe (Deputy GAD Officer, Ngapudaw GAD)		

<i>Discussion and Comment</i>
<p><b>Q 1): U Han Win Soe (Deputy GAD Officer, Ngapudaw GAD):</b> I want to suggest that should invite other related departments for this meeting.</p> <p><b>A 1): Becky Summons (Senior Consultant, ERM):</b> This stage is scoping stage and we are just gather information from local communities to assess the potential impacts. We can engage more departments in Ngapudaw during the EIA Stage when we will have more information to present.</p> <p><b>Q 2): U (Deputy officer, Ngapudaw GAD):</b> We, Ngapudaw Township, will connect with the Nga Yoke Kaung GAD for the consultation meeting.</p> <p><b>Q 2): Becky Summons (Senior Consultant, ERM):</b> Thank you very much.</p>

<i>Detail</i>			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Nga Yoke Kaung GAD Office	<b>Region/State</b>	Ayeyarwady
<b>District</b>	Patheingyi	<b>Township</b>	Ngazun
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	17 <sup>th</sup> Jan 2017		
<b>Time</b>	1:00 – 2:30 PM		
<b>Attendee List</b>	<b><u>Government (6)</u></b> 1) U Kyaw Zin Lin (Nga Yoke Kaung, GAD officer) 2) U Tin Naing (Nga Yoke Kaung, Department of Fishery) 3) U Myint Aung (Nga Yoke Kaung, Agricultural Department) 4) U Thet Min Oo (Nga Yoke Kaung City development/ Municipal Department) 5) U Maung Maung Thwin (Nga Yoke Kaung, Transportation Department) 6) U Zaw Wan (Village Leader of Nan Thar Pu village tract)		

<i>Discussion and Comment</i>
<p><b>Q 1): U Tin Naing (Nga Yoke Kaung, Department of Fishery):</b> I would like to know how to M&amp;A will provide CSR (social benefits) for local people, especially relating to transportation services?</p> <p><b>A 1): U Myo Zaw Oo (Senior Stakeholder Engagement Officer, M&amp;A):</b> Currently, we are in the early Scoping Stages of the Project. However, if the Project develops M&amp;A will consider for the CSR in the area.</p> <p><b>Q 2): U Tin Naing (Nga Yoke Kaung, Department of Fishery):</b> What are the project activities?</p> <p><b>A 2): U Zarni Aung, Monitoring and Evaluation officer, M&amp;A:</b> The Project would be a supply base for offshore oil and gas operations. The supply base (onshore) consists of an island jetty head with small deck, a causeway and an onshore facility. The onshore facility is likely to consist of a long term storage facility, custom inspection area, main office area, accommodation area and utilities.</p> <p><b>Q 3): U Thet Min Oo (Nga Yoke Kaung, City development/ Municipal Department):</b> In this area, local people are confusing two supply base projects one by SIM company and the other by M&amp;A Company.</p> <p><b>A 3): U Myo Zaw Oo, Senior Stakeholder Engagement Officer, M&amp;A:</b> We are M&amp;A company, and we are currently in the early “scoping” stages for this Project. We have not yet decided if the Project will go ahead, we will tender to MOGE.</p> <p><b>Q 4): U Kyaw Zin Lin (Nga Yoke Kaung, GAD officer):</b> You should go to meet with the Zin Yaw Gaung villagers as that village is very close to the Project Area. Also you can invite people from Seikan village and Kyauk Phar village. Secondly, should do separate consultation with CSO and local people.</p> <p><b>A 4): Becky Summons (ERM, Senior Consultant):</b> Thank you, Sir. This visit we did go to Zin Yaw Gaung village. For this round, we did request to meet CSO however during the next engagement as part of the EIA Stage we will undertake more engagement and also will include your suggestions to meet with CSO separately.</p> <p><b>Q 5): U Thet Min Oo (Nga Yoke Kaung City development/ Municipal Department):</b> So, there will be two Supply Base projects in Nga Yoke Kaung area.</p>

Stakeholder Consultation for Nga Yoke Kaung Supply Base project			
Date- 18.01.2017			
9:00 AM to 11:00 AM			
Zin Yaw Gyaung village			
No.	Name	Address	Note
1	U Poe Lel	Zin Yaw Gyaung village	
2	Daw Maw Say	Zin Yaw Gyaung village	
3	U Aung Gyi	Kyuk Phar village	
4	Daw Aye Aye Ngwe	Zin Yaw Gyaung village	
5	Daw Win Win Than	Zin Yaw Gyaung village	Village Leader
6	Daw Khin Yi	Zin Yaw Gyaung village	
7	U Aung Min Thu	Zin Yaw Gyaung village	
8	U Sa Myo Htet	Zin Yaw Gyaung village	
9	U Maung Latt	Zin Yaw Gyaung village	
10	Daw Khin San Myint	Zin Yaw Gyaung village	
11	U Moe Khine	Kyuk Phar village	
12	Daw Nay Chi	Seikan village	
13	Daw Khin Hnin Wai	Seikan village	
14	Daw Poe Ei Phyu	Seikan village	
15	Daw Khin San Htwe	Zin Yaw Gyaung village	
16	Daw Win Shwe	Seikan village	
17	U Aya Wan	Zin Yaw Gyaung village	
18	U Htun Kywe	Zin Yaw Gyaung village	
19	Daw Li Li Win	Zin Yaw Gyaung village	
20	Daw Say Hlan	Zin Yaw Gyaung village	
21	Daw Nan Dal	Zin Yaw Gyaung village	
22	U Moe Naing	Zin Yaw Gyaung village	
23	U Taing Lay	Zin Yaw Gyaung village	
24	Daw Pan Sein	Zin Yaw Gyaung village	
25	Daw Ni Ni Win	Zin Yaw Gyaung village	
26	U Nyo Ma Chaw	Zin Yaw Gyaung village	
27	U Shwe Taung	Zin Yaw Gyaung village	
28	U Moe Kyaw	Zin Yaw Gyaung village	
29	Daw Naw Ku Ma	Zin Yaw Gyaung village	
30	U Moe Thiha	Zin Yaw Gyaung village	
31	U In Gar	Zin Yaw Gyaung village	

No.	Name	Department
1	U Myo Zaw Oo	M &A
2	U Zarni Aung	M &A
5	Becky Summons	ERM
6	U Han Htet Ko	ERM

Detail			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Zin Yaw Gaung village	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Patheingyi	<b>Township</b>	Ngazun
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	18 <sup>th</sup> Jan 2017		
<b>Time</b>	9:00 – 10:30 PM		
<b>Attendee List</b>	<u>Local (31) - see list</u>		

Discussion and Comment
<p><b>Q 1): U Htun Khaw (Villager, Zin Yaw Gaung):</b> We (local people) don't know what the impacts are that will affect the community, but we want to be not impact to us.</p> <p><b>A 1): Becky Summons (ERM, Senior Consultant):</b> At this stage, we are gathering data to find out what the impacts might be. We will come back again to present more information on the potential impacts once this stage is complete. We will undertake the EIA in accordance with Myanmar legislation and guidelines (Emission Guidelines).</p> <p><b>Q 2): Daw Ei Yo (Zin Yaw Gaung leader):</b> We are concerned about air/ noise impact because our village is very close to the Project Area. We have lived in this area a long time. If we need to move to another place, we will have impacts on our livelihoods.</p> <p><b>A 2): Becky Summons (ERM, Senior Consultant):</b> We will assess the impacts from noise during construction and operation and if necessary, we will recommend mitigation measures (such as noise barriers) to be used if necessary. Importantly, the noise and air emissions will have to be in line with Myanmar Standards (Emission Guidelines).</p> <p><b>Q 3): Daw Khin San Myint (Villager, Zin Yaw Gaung):</b> I really want to know which type of materials will be stores within the Site.</p> <p><b>A 3): U Zarni Aung (Monitoring and Evaluation officer, M &amp; A):</b> Our Project consists of an island jetty head with small deck, a causeway and an onshore facility. The main supply base (onshore) is likely to consist of a long term storage facility, which will store supplies for oil and gas operations. This may include waste from vessels but this will be confined in the EIA Report.</p> <p><b>Q 4): U Inn Gar (Villager, Zin Yaw Gaung):</b> If air impacts can occur, will each related specialist come and assess?</p> <p><b>A 4): Becky Summons (ERM, Senior Consultant):</b> Yes, each related specialist will study for this Project. It will also be conducted in accordance with Myanmar Standards (Emission Guidelines) i.e. emissions and discharges will have to be within the permitted levels.</p>

Stakeholder Consultation for Nga Yoke Kaung Supply Base			
Date- 18.01.2017			
12:00 PM to 1:30 PM			
Gu Chaung village			

No.	Name	Address	Note
1	Daw Nwe Nwe Soe	Gu Chaung village	
2	Daw Ju Ju Hlaing	Gu Chaung village	
3	Daw Tin Tin Khine	Gu Chaung village	
4	Daw San San Maw	Gu Chaung village	
5	Daw Shwe Kyi	Gu Chaung village	
6	Daw Aye Aye Aung	Gu Chaung village	
7	U Aung Ko Min	Natharpu	
8	U Myint Win	Gu Chaung village	village leader of Gu Chaung
9	Daw Thein Thein Ngwe	Gu Chaung village	
10	Daw Cho Cho Mhwe	Gu Chaung village	
11	U Phyo	Natharpu	
12	Daw Mi Su	Gu Chaung village	
13	U Phyo Maung Maung	Gu Chaung village	
14	U Naing Zaw Lin	Gu Chaung village	
15	U Kyaw Lwin	Gu Chaung village	

No.	Name	Department
1	U Myo Zaw Oo	M &A
2	U Zarni Aung	M &A
5	Becky Summons	ERM
6	U Han Htet Ko	ERM

<i>Detail</i>			
<b>Project</b>	Nga Yoke Kaung Supply Base Project		
<b>Venue</b>	Gu Chaung	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Patheingyi	<b>Township</b>	Ngazun
<b>Objective</b>	Stakeholder Consultation for Scoping Phase of EIA Study		
<b>Date</b>	18 <sup>th</sup> Jan 2017		
<b>Time</b>	12:00 – 1:30 PM		
<b>Attendee List</b>	<u>Local (15) – see list</u>		

<i>Discussion and Comment</i>
<p><b>Q 1): U Kyaw Kyaw (Villager, Gu Chaung):</b> There are fishing activities in the marine waters in front of the Project Area. I want to know if we can fish or not around in that area when vessels are coming to the jetty.</p> <p><b>A 1): Becky Summons (ERM, Senior Consultant):</b> There will be an area excluded from fishing near the jetty and during construction. This is for health and safety reasons. This area will be confirmed in the EIA Report. You can continue to fish either side of the jetty outside of this area. We are here now to find out about what the Potential impacts are to your fishing activities so please provide us information on where and when you fish.</p> <p><b>Q 2): U Aung Ko Min (Villager, Gu Chaung):</b> I want to know whether the Project will create job opportunities for local people.</p> <p><b>A 2): U Myo Zaw Oo (Senior Stakeholder Engagement Officer, M&amp; A):</b> Currently, we are in the Scoping Stage. However, we intend to create job opportunities for local people in during operation (when the project starts). M &amp; A will consider job opportunities depend on education levels.</p> <p><b>Q 3): U Kyaw Kyaw (Villager, Gu Chaung):</b> There are some coral reefs around our area so please consider this in the Study.</p> <p><b>A 3): Becky Summons (ERM, Senior Consultant):</b> Thank you for the information. We will assess impacts to marine biodiversity around the Project Area in the EIA Study. For coral reef, we may be required to undertake baseline surveys (such as using drop down cameras). The requirement for these surveys will be confirmed at the end of this initial scoping study.</p> <p><b>Q 4): U Aung Ko Min (Villager, Gu Chaung):</b> I would like to suggest that you invite CSOs to meeting during the future EIA consultation.</p> <p><b>A 4): Becky Summons (ERM, Senior Consultant):</b> During EIA Phase, we will engage more stakeholders. We will also invite CSOs for the area and will arrange this in conjunction with U Zaw Wan (Natharpu Village Tract Leader).</p>



<i>Detail</i>			
<b>Project</b>	M & A Offshore Supply Base Project		
<b>Venue</b>	Nga Pu Taw, Religious Hall	<b>Region/State</b>	Ayeyarwady
<b>District</b>	Patheingyi	<b>Township</b>	Nga Pu Taw
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	28 <sup>th</sup> Feb 2017		
<b>Time</b>	10:00 – 12:00 PM		

U Myo Zaw Oo (M & A) explained about the project and Daw Myat Mon Swe (Senior Consultant, ERM) gave details regarding EIA investigations.

U Myo Zaw Oo (M & A) explained about the project as follow:-

- Explained the objectives and the proposed project area
- Explained the facilities – jetty, accommodation etc.

Daw Myat Mon Swe (ERM) explained about the EIA of the project as follow:-

- Explained the offshore sensitive areas such as mangroves and coral reef
- Explained the onshore sensitive areas such as farmland, tourism
- Explained the scoping which included mitigation measures of air quality, noise & vibration, water quality, waste, biodiversity, social
- Explained the result of EIA based on secondary data
- Explained the consultation schedule

<i>Discussion and Comment</i>
<p><b>Q 1):</b> Some participants said they had heard about this project a year ago.</p> <p><b>Q2):</b> One of the leaders from Nan Thar Pu was invited to speak out, and he said most local people (60%) feel positive about the Project.</p> <p><b>A1): Daw Myat Mon Swe (ERM):</b> ERM will be collecting further information, and encouraged the participants to share this EIA presentation with locals and people who are interested. Some percentage of the benefits of the Project will be used in community development; should the Project go ahead.</p>

**Environmental Impact Assessment (EIA) for Future Development of the Myint and Association Project Attendee' list of MNA in NgaPuTaw on 28<sup>th</sup> February**

No.	Name	Position	Department	Address
1	U Nyo Win	Clark	District GAD	NgaPuTaw
2	U Hlaing Zaw Tun	Clark	District GAD	NgaPuTaw
3	U Htet Aung Kyaw	Clark	District GAD	NgaPuTaw
4	U Kyaw Lin Htay	Clark	District GAD	NgaPuTaw
5	U Aung Aung	Clark	District GAD	NgaPuTaw
6	U Sik Moe Lwin	Clark	District GAD	Kan Chaung
7	U Kyaw Soe Moe	Clark	District GAD	Chaung Wa
8	U Maung Maung	Clark	District GAD	NgaPuTaw
9	U Ohm Myint	Clark	District GAD	NgaPuTaw
10	U Aung Ko Han	Clark	District GAD	WerKone
11	U Aung Kyaw Oo	Clark	District GAD	Okk Thinbaw
12	U Tun Tun Naing	Clark	District GAD	Ohm Pin Su
13	U Myo Kyaw Thu	Clark	District GAD	Koe Htawn
14	U San Shwe Myint	Clark	District GAD	Kyar Twin
15	U Sa Kyin Oo	Clark	District GAD	PhaYarHla
16	U Hlwan Moe Aung	Clark	District GAD	NyaungWine
17	U Lin Ko Ko	Clark	District GAD	Thet Kal Saung
18	U Khin Maung Tin	Clark	District GAD	DeeDuKone
19	U Phone Zaw Htet	Clark	District GAD	AwaPate
20	U Min Min Tun	Clark	District GAD	TaungKaLay
21	U Mya Win	GAD Officer	District GAD	KaNyinSu
22	U Mann Jaw Ni	GAD Officer	District GAD	AwaPate
23	U Thein Soe	GAD Officer	District GAD	Kyar Kan
24	U Tun Tun	GAD Officer	District GAD	Koe Htawn
25	U Aye Min Thein	GAD Officer	District GAD	Zee Phyu Seik
26	U Kyaw Moe Aung	GAD Officer	District GAD	Phoe Kyar Eine
27	Saw Sel Htee	GAD Officer	District GAD	Kyauk Su
28	U Soe Naing	GAD Officer	District GAD	Pyin
29	U Aung Moe	-	District GAD	Chaung Wa
30	U Aung Soe Oo	-	District GAD	Pyin
31	U Khin Shwe	-	District GAD	Chaung Wa
32	U Kyi Shin	-	District GAD	NyaungWine
33	U Win Than	-	District GAD	NgaPuTaw
34	U Paw Win	-	District GAD	Kyauk Tagar
35	U Kan Yin	Clark	District GAD	ThinGan
36	U Kyaw Myo	Clark	District GAD	Kyauk Tan
37	U Aung Naing	Clark	District GAD	PhyanYayKyaw
38	U Toe Toe	Clark	District GAD	DawnGyi
39	U Aung Kyaw Moe	Clark	District GAD	HngatPauk
40	U Myint Oo	Clark	District GAD	ThitNgote
41	U Myint Naing Moe	Clark	District GAD	SannChaung

No.	Name	Position	Department	Address
42	Daw Kyi Kyi Mar	Clark	District GAD	NgaPuTaw
43	Daw Ma Aye	Clark	District GAD	HinOeChaung
44	Daw Aye Aye Myint	Clark	District GAD	TaungPine
45	Saw El Chris	Clark	District GAD	Kyauk Pon
46	U Win Thein	Clark	District GAD	Myauk Pine
47	U Wai Lin Aung	Clark	District GAD	Taung Pine
48	U Kaung Htet Zaw	Clark	District GAD	Myauk Pine
49	U San Oo	Yay Kyaw GAD	District GAD	Yay Kyaw
50	U Kyaw Phay	KaNyin GAD	District GAD	NgaPuTaw
51	U Thaung Zin	SaParGyi GAD	District GAD	SaParGyi
52	U Kyin Aung	NgaYokeKaung GAD	District GAD	NhaYokeKaung
53	U Zaw Nyi Thu	Clark	District GAD	HtawGyi
54	U Naing Win	Clark	District GAD	NayKyawGyi
55	U Min Aung	-	District GAD	PhyanYayKyaw
56	U Aye Hlaing	-	District GAD	WakGu
57	U Aung Nyein	-	District GAD	Anauk Pine
58	U Myat Si	-	District GAD	Sin Zay Gyi
59	U Kyaw Swar	-	District GAD	Gon Nyin
60	U Chit Hlaing	-	District GAD	Thit Yawn
61	U Htay Naing	-	District GAD	Kyway Chine
62	U Lin Lin	-	District GAD	Nga Yoke Kaung
63	U Win Nyunt	-	District GAD	ThanMarDayWa
64	U Kyin Shwe	-	District GAD	Kyauk Tan
65	U Thein Win	GAD Officer	District GAD	Taw Gyi
66	U Hla Kyaw	GAD Officer	District GAD	NgaPuTaw
67	U Thar Shwe Tun	GAD Officer	District GAD	KhaYinWar
68	U Aye Win	GAD Officer	District GAD	Kan Kwin
69	U Kyaw Htay	-	District GAD	Moe Tain Pyin
70	U Myo Min Tun	-	District GAD	NatMawSu

No.	Name	Position	Department	Address
71	U Tin Htwe	-	District GAD	Yay Kyaw
72	U Zin Phyo Lin	Clark	District GAD	WonHmaw
73	U Kyaw Sein	Clark	District GAD	ThitYawn
74	U Myo Zin Oo	Clark	District GAD	NgaPuTaw
75	U Than Htay	Clark	District GAD	Okk Shik Twin
76	U Tun Sein	GAD Officer	District GAD	ThaYakTaw
77	U Kyaw Min Aung	GAD Officer	District GAD	Yay Kyaw
78	U Chit Thein	GAD Officer	District GAD	-
79	U Chit Oo Maung	GAD Officer	District GAD	Ye Khaung Gyi
80	U Win Nyunt	Clark	District GAD	QwayChine
81	U Phyo Wai Soe	Clark	District GAD	NantTharPu
82	U Soe Win	Clark	District GAD	MaGyiPin
83	U Naing Oo	-	District GAD	PanHmaw
84	U Zay Yar Min	Clark	District GAD	NatMawSu
85	U Phyo Wai Tun	Clark	District GAD	AyoeDar
86	U Thet Zaw	Clark	District GAD	Kwin Chaung
87	U Zin Thu Aung	Junior Clark	District GAD	Pathein
88	U Myat Min	Junior Clark	District GAD	NgaPuTaw
89	U Soe Min Thein	Junior Clark	District GAD	SaParGyi
90	U Than Htike Lin	Junior Clark	District GAD	Nga Yoke Kaung
91	U Wai Yan Lin	GAD Officer	District GAD	GwayChaung
92	U Myint Kyine	GAD Officer	District GAD	DawnGyi
93	U Than Win	GAD Officer	District GAD	HngatPauk
94	U Tun Tun Oo	GAD Officer	District GAD	ThitPokeSeik
95	U Kyaw Kyaw	GAD Officer	District GAD	Tha Min Kyun
96	U Myint Htay	GAD Officer	District GAD	NgaPyayMa
97	Saw Aung Naing	AyoeDar GAD	District GAD	AyoeDar
98	U Pyone Cho	AyoeDar GAD	District GAD	Kwin Chaung
99	U Than Htay	Thel Phyu GAD	District GAD	Thel Phyu
100	Daw Khin Myo Aye	Clark	District GAD	KyoneKu
101	Daw Aung Kyi	Clark	District GAD	Yay Kyaw
102	Daw Khin Aye Tin	Clark	District GAD	Anauk Pine
103	U Than Toe Naing	Clark	District GAD	Taung Pine
104	U Aung Soe Oo	Clark	District GAD	Nga Yoke Kaung
105	U Ye Pyae Son	Clark	District GAD	Kwin Bak
106	U Sai Thiha Kyaw	Clark	District GAD	Taung Pine
107	U Nay Win Aung	Clark	District GAD	Myot Thit
108	U Tin Myo Naing	Clark	District GAD	Fawn Noe
109	U Win Myint	Clark	District GAD	NgaPuTaw

Detail			
<b>Project</b>	M & A Offshore Supply Base Project		
<b>Venue</b>	Nan Thar Pu, Nga Yoke Kaung	<b>Region/State</b>	Ayeyarwady Region
<b>District</b>	Patheingyi	<b>Township</b>	Nga Pu Taw
<b>Objective</b>	Stakeholder Consultation		
<b>Date</b>	3 <sup>rd</sup> March 2017		
<b>Time</b>	13:00 – 15:30 PM		

Discussion and Comment
<p><b>Q1) U Thaung Aye (local, Nan Thar Pu):</b> The provisions in the EIA Procedure are OK but no one follows the law, and there is no place to complain about the loss of our fishing nets. We can't fish over ten miles from the coast due to the instruction from the DOF but there are fishing boats from other areas over ten miles.</p> <p><b>A1): Daw Myat Mon Swe (ERM):</b> All fishing boats can be distinguished in colour because all boats from different areas have different colour. We can see that there are boats from Tanintharyi and Yangon Region in Rakhine water. There might be illegal fishing but now the government is trying their best to stop this. The current government is new and we may wait and be patient to have law enforcement. M&amp;A will have a grievance redressal mechanism to solve any problems you have; we will investigate your claims.</p> <p><b>Q2) Daw Nan Cho Pyone (Farmer, Nan Thar Pu):</b> As you have said that to consult with Project affected people, you have to liaise with the Government step by step to get national, regional and township levels' approvals. But you are speaking like a representative of the government. We don't understand the measurement in metre in your presentation, and you may need to mention in feet or miles so the locals can understand.</p> <p><b>A2): Daw Myat Mon Swe (ERM):</b> ERM is a third party to do the EIA for the proposed Project and we are not like a representative of any organizations. One metre is about 3.28 feet and next time we will provide the unit of the distance in feet for local use.</p> <p><b>Q3): Daw Nant Cho Pyone (Farmer, Nan Thar Pu):</b> As you mentioned the community development by job opportunities of this Project. You mentioned we want change but what kind of change do you mean? What is the solution of the fishing boats from other areas fishing in our areas? For us we don't want to change like in Dawei Special Economic Zone. A lot of farmers lost their lands due to that project.</p> <p><b>Q 4): U Than Aye (Local, Nan Thar Pu):</b> My lands here are joined with the proposed project lands. The drainage or discharges from the project may affect my lands. How could we trust that this EIA is checked by the concerned departments which have given the approval to do the project to the clients?</p> <p><b>A3 &amp; 4) Daw Myat Mon Swe (ERM):</b> In case of the illegal fishing boats this depends on the government enforcing the fishing laws and is not to be confused with this EIA. There is an EMP in the EIA which includes the detail information on the mitigation measure for the any drainage and wastewater discharge and commitments of the Project i.e. how it will be carried out to reduce the impact. A monitoring report has to be submitted to the related Ministries every 6 months and checked regularly. The project can be terminated if they don't follow the rules and regulations mentioned on EMP. Because of the lack of jobs and opportunities of industries in developed countries, our new generation (our children have to work in foreign countries). So that if we have many factories in Myanmar, we can learn the advanced technologies. Then our children do not need to work abroad. There is a change in our country by new Government. Related with change, as an example that you</p>

## Discussion and Comment

There will have grievance procedure in place to investigate any complaints and losses of project effected people by the project activities, and the public has to watch and learn on the project activities in the construction and operation phase whether it is still affecting on the society and environment. Monitoring will be conducted during the Project.

**Q 5) Daw Myo Thu Zar (Local, Nga Yoke Kaung):** Who will create the standards and who will watch if the company is following the standards?

**A5) Daw Myat Mon Swe (ERM):** There is National Environmental Emissions Standards which has already issued by Ministry of Natural Resources and Environmental Conservation and also the relevant International standards. There is also an EMP in the EIA report which includes the commitments of the EIA Study to reduce the impacts. The project can be terminated if they don't follow the rules and regulations in the EIA procedure.

**Q6) Ko Thant Ke Taung (Fishermen, Kyauk Phyar):** You said there will be job opportunities for the locals. As local people don't have education, diploma and certificates, local people will only be able to work like the stone carrying. Will there be any plans for local people to create good jobs?

**A6) Myat Mon Swe (ERM):** On the job training will be provided. For example in the Thilawa SEZ Project, there was training created for the relevant jobs for the project affected people. Some of the training was given abroad. Because of more income in families working in industries, the living standards are higher than before. Because of the industrial development in Thilawa, the infrastructure is being improved.

**Q 7) U Than Aye (Farmer, Nan Thar Pu):** I just worried about the drainage from the project to my land. Furthermore, this EIA is for the receiving approval process for the clients to do their business. For us, my four working-days have been ruined as I've been helping you for the meeting and social survey without getting anything.

**A 7) Daw Myat Mon Swe (ERM):** This EIA is only for tender application process and there will be EIA investigation including EMP and in which there will be included the detail information how to reduce the impacts on the water discharge and its mitigation measure. I saw there are some guesthouses in this area; not sure if they are registered. If the guesthouses are not properly disposing of the waste, that may also have impact on the community.

**Q8) Daw Nant Cho Pyone (Local, Nan Thar Pu):** The guesthouses as part of CBT (community based tourism) are allowed here as a probationary period for three years without registration.

**A8) Most of Participants (in agreement):** There is bad waste discharge by the guesthouse and visitors around the area and it is coming terribly worse and there is no one to take the responsibilities.



# Environmental Impact Assessment (EIA) for Future Development of the Myint and Associates

## Project Attendee' list of M&A in Nan Thar Pu on 28th February

### Public

Sr. No.	Name	Position	Address
1	Daw De De Win	Villager	Alekone
2	Daw Awae	Villager	Seikkan
3	U Man Eain Khan	Villager	Seikkan
4	U Khaing Zaw	Villager	Alekone
5	U Man Mya Kyi	Villager	Seikkan
6	U San Oo	Villager	Alekone
7	U Bu Hnit	Villager	Gainglay
8	Daw Khin Mar Aye	Villager	Alekone
9	Daw Me Htoo	Villager	Alekone
10	U Kyi Lwin Thaw	Villager	Zin Yaw Chaung
11	Maung Yeke	Villager	Kyauk Phywer
12	U Thant Ke Taung	Villager	Kyauk Phywer
13	Daw Toe Toe Myint	Villager	Alekone
14	Daw Nan Nu Yin	Villager	Alekone
15	Daw Naw Phaw Se	Villager	Zin Yaw Chaung
16	Daw May Thu Win Maung	Villager	Alekone
17	Daw Win Win Than	Villager	Zin Yaw Chaung
18	Daw Aye Myint	Villager	Kyauk Phywer
19	Daw Kaw Yoke	Villager	Kyauk Phywer
20	Daw Khin Htar	Villager	Kyauk Phywer
21	Nant Hteik Yin	Villager	Nantharpu
22	Nant Thin Kyu	Villager	Nantharpu
23	Ma Sandar Kyaw	Villager	Nantharpu
24	U Kyi Aye	Villager	Nantharpu
25	U Saw Ngwe	Villager	Kyauk Phywer
26	U Myint Kyi	Villager	Seikkan
27	U Sa Lar Kha Lain	Villager	Zin Yaw Chaung
28	Man Shwe Taung	Villager	Zin Yaw Chaung
29	U Aye San	Villager	Zin Yaw Chaung
30	U Aung Kyaw Nyunt	Villager	Gyaing Lay
31	U Htee Tin Aye	Villager	Seikkan
32	Daw Thin Thin Kyi	Villager	Kyauk Phywer
33	Daw Pu	Villager	Kyauk Phywer
34	U Thein Soe	Villager	Nantharpu
35	Daw Naw Pu Ma	Villager	Zin Yaw Chaung
36	Daw Si Si Thein	Villager	Alekone
37	Nan Marlar	Villager	Kyauk Phywer
38	Daw Mi Mi	Villager	Kyauk Phywer
39	Nant Owe Lar	Villager	Kyauk Phywer
40	Nant Su Kyi	Villager	Zin Yaw Chaung
41	Ma Moe Thuzar	Villager	Kyauk Phywer
42	Ma Aye Aye Shwe	Villager	Zin Yaw Chaung
43	Daw Be Mee	Villager	Alekone
44	Daw Nyo Nyo San	Villager	Alekone
45	Daw Aye Aye Than	Villager	Alekone
46	U Tun Lwin	Villager	Kyauk Phywer



Sr. No.	Name	Position	Address
47	Nant Cho Phone	Villager	Nantharpu
48	U Than Aye	Villager	Gyaing Lay
49	Ko Ye Min Soe	Villager	Kyauk Phywer
50	Daw Shwe Kyi	Villager	Nantharpu
51	Daw Mi Mi Htay	Villager	Kyauk Phywer
52	Daw Yin Yin Htay	Villager	Seikkan
53	Daw Tin Zar Maw	Villager	Seikkan
54	Ma Hla Htay	Villager	Seikkan
55	Daw Sa Toe	Villager	Zin Yaw Chaung
56	Daw Sein Aung Myint	Villager	Alekone
57	Daw Thein Thein	Villager	Seikkan
58	Daw Si Si Win	Villager	Alekone

### Company

Sr. No.	Name		Address
1	Daw Myo Thuzar	CSO	President, Kan Chay Arr Man (Nga Yoke Kaung)



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 ၀၉ ၄၄၃၀၇၇၇၇၇, ၀၉ ၆၁၃-၆၈၂၉၄၄  
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- Diploma in Network Communication
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**ဆက်သွယ်ရန်ဖုန်း**

၀၉-၂၆၂၆၀၀၃၁၊ ၉၆၆၀၄၆၂၅၊ ၀၁-၅၀၁၂၄၃၊ ၃၉၁၂၆၆၊ ၃၉၁၂၇၃၊ ၃၉၄၂၆၈၊ ၅၀၂၂၁၊ ၅၀၂၂၃၃၊ ၅၄၁၃၂၈၊ ၂၂၀၅၅၅

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ဟတ်ဒ်ဝဲအင်္ဂါနှင့် လူ့ဘဝထိခိုက်မှု အခါခါခြေစိုက် (ESIA)

[illegible]

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော် ဟက်နီလတ်တီဗီဂျာဆန်စ်မြို့ဆိုင်ရာဌာနဆိုင်ရာ နည်းဥပဒေများ ၁၀၃ MHAOSB သည် အဆိုပြုလုပ်ငန်းစဉ်အတွက် ဟက်နီလတ်တီဗီဂျာဆန်စ်အစုအဝေးကို လိုက်နာ စောင့်ကြည့်မှု သက်သေခံလက်မှတ် (EOC) စနစ်မှ ဟက်နီလတ်တီဗီဂျာဆန်စ်မြို့ (EIA) အား သတ်သတ်မှတ်မှန် လိုက်နာပါသည်။ အဆိုပါ စီမံကိန်းမှတ်သားသည့် ဟက်နီလတ်တီဗီဂျာဆန်စ် ခရိုင်လုပ်ငန်းစဉ် Environmental Resources Management (ERM) မှ MHAOSB အား လိုက်နာ စောင့်ကြည့်မှုများပေါ် မြဲစွာ အဆိုပါလုပ်ငန်းစဉ်များတွင် ထွက်ကောက်သော စီမံကိန်းမှတ်သား သက်သေခံလုပ်ငန်းစဉ် ခရိုင်သမ္မတမြန်မာလတ်တီဗီဂျာဆန်စ် မြို့ပါသည်။ ဟက်နီလတ်တီဗီဂျာဆန်စ်မြို့ရှိ မြန်မာနိုင်ငံတော် ဟက်နီလတ်တီဗီဂျာဆန်စ်မြို့ ဆန်စ်မြို့ ဆိုင်ရာ လုပ်ငန်းစဉ်များ (၂၁၀၅) နှစ်အထိ ခရိုင်လုပ်ငန်းစဉ်များပါရှိပါသည်။

အဆိုပါ လုပ်ငန်းစဉ်နှင့်ပတ်သက်၍ စတင်ကမ်းခြေကုန်များ (သို့) များပြားစွာလည်ပတ်မှုများ ဆိုသည့်အချက်များနှင့်  
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## Thai junta says knows whereabouts of former PM Yingluck

BANGKOK — Thailand's junta leader said on Tuesday that he knows where ousted former prime minister Yingluck Shinawatra is but will not disclose her location until after a verdict is delivered later this week in her negligence trial.

Yingluck disappeared from Thailand shortly before a Supreme Court verdict scheduled on 25 August. Her lawyer said she was ill with an ear problem and could not appear in court.

"I know, but I won't say yet," Prime Minister Prayuth Chan-ocha, a then-army chief who toppled Yingluck's government in a May 2014 coup, told reporters after a weekly cabinet meeting.

"I'll tell you where she is after 27 September. I have spies," he said, adding that to his knowledge Yingluck has not sought asylum abroad.

A verdict is to be delivered on Wednesday, 27 September. Yingluck faces up

to 10 years in prison if found guilty of negligence over a costly rice subsidy scheme that helped to bring her to power in a 2011 general election.

Yingluck, who was ac-

tive on social media, has not commented publicly since disappearing from public view last month.

Her Pua Thai Party has said that the party does not know where Yingluck

is. Reuters reported last month that she had fled to Dubai where her brother and former prime minister Thaksin has a home and lives in self-imposed exile to avoid a 2008 jail sentence

for corruption. Thai authorities investigating how she escaped said last week they have questioned three police officers who admitted to helping Yingluck flee. — Reuters ■



Prime Minister Prayuth Chan-ocha  
PHOTO: REUTERS

## North Korea accuses US of declaring war, says can take countermeasures

PYONGYANG — North Korea's foreign minister said on Monday that US President Donald Trump had declared war on North Korea and that Pyongyang reserves the right to take countermeasures, including shooting down US strategic bombers even if they are not in the country's air space.

"The whole world should clearly remember it was the US who first declared war on our country," Foreign Minister Ri Yong Ho told reporters in New York.

"Since the United States declared war on our country, we will have every right to make countermeasures, including the right to shoot down United States strategic bombers even when they are not inside the airspace border of our country."

Ri, who made the remarks before leaving New York where he had

attended last week's UN General Assembly, made the statement then returned from his car to the press microphones to add "In light of the declaration of war by Trump, all options will be on the operations table of the supreme leadership of the DPRK (Democratic Peoples Republic of Korea)."

His words echoed warnings from the Trump administration that all options were on the table in dealing with North Korea's nuclear and missile development and its threats to have a weapon capable of reaching the continental United States.

On Saturday, Ri told the UN General Assembly that targeting the US mainland with its rockets was inevitable after "Mr Evil President" Trump called Pyongyang's leader a "rocket man" on a suicide mission. — Reuters ■

### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR MYINT & ASSOCIATES OFFSHORE SUPPLY BASE, AYEYARWADDY REGION

Myint & Associates Offshore Supply Base Ltd. (M&AOSB) is proposing to construct an Offshore Supply Base (OSB) near Nga Yoke Kaung Bay in Ayeiawaddy Region, which is located approximately 40 km south of the town of Ngazun. The facilities will initially include a jetty with a platform of about 0.6 ha and 30.4 acre for the offshore base plus 1.1 acre of access road. There is currently no infrastructure at the proposed Project. An access road will be included in the Project to connect to the nearest road within the village. The construction phase is estimated to take from 1.5 to 2 years to complete, commencing around 2018.

Under the Environmental Conservation Law and Environmental Conservation Rules of the Republic of the Union of Myanmar, M&AOSB are required to undertake an Environmental Impact Assessment (EIA) in order to obtain an Environmental Compliance Certificate (ECC) for the proposed activity. Environmental Resource Management (ERM), on behalf of M&AOSB, is currently undertaking an EIA Study, which includes stakeholder engagement in Nga Yoke Kaung. The EIA will be conducted in accordance with the Myanmar EIA Procedure (2015).

Any Information requests, or queries, comments and suggestions on the Project can be provided to [myintfeedback@myintassociates.com](mailto:myintfeedback@myintassociates.com) or 09-7949-11088. Information on the proponents of the project and this announcement are also available on the Myint & Associates Offshore Supply Base Ltd. website at [www.myintassociates.com](http://www.myintassociates.com).

### Symposium on "Environmental Microbes and the Impact on Health; the Good, the Bad and the Ugly" on 30 September

The Microbiology Society of Myanmar Medical Association will hold a Symposium on "Environmental Microbes and the Impact on Health; the Good, the Bad and the Ugly". The Speakers include Prof. Kyi Kyi Thant (Emeritus Professor, UM), Prof. David Danes (LUMWRU) and Prof. Khin Myung Lwin (National Water Resources Committee). The symposium will be held on 30 September (Saturday) (9:30am to 12:00 noon) at Myanmar Medical Registration can be done at Microbiology Department, University of Medicine (1, 2) and Defense Services Medical Academy during office hours. Microbiology Society (Myanmar Medical Association)

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U Kyi Win Associates  
for AMERICAN BEVERAGE COMPANY PTE LTD.

BY ITS ATTORNEY  
ACTIP IP LIMITED  
P.O. Box No. 26, Yangon.  
Phone: 372416  
Dated: 27<sup>th</sup> September, 2017

### Invitation for Market Sounding Meeting

It is invited that Market Sounding Meeting, for the Heho airport, Kawthaung airport and Mawlamying airport to be implemented by (PPP) Scheme will be held on the following agenda:

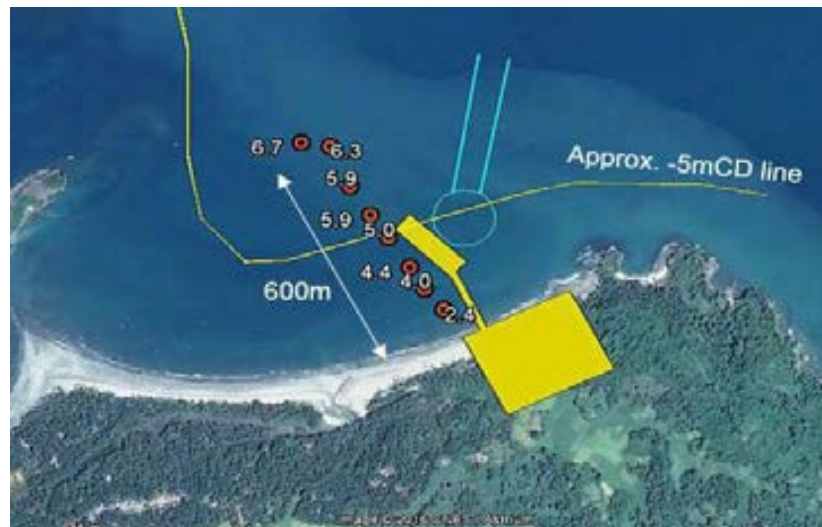
Date : 29 September 2017 (Friday)  
Time : 10:00AM  
(Registration Start on 09:30AM)  
Place : Civil Aviation Training Institute, Auditorium Hall,  
Airport Road Mingaladon Township.  
Note : Maximum 3 seats available for each EOI document purchased company only.

Department of Civil Aviation  
Ministry of Transport and Communications

# ငရုပ်ကောင်း အခြေခံကမ်းလွန်ရေနံထောက်ပို့ရေးဆိုင်ရာ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း

M&A သည် ငရုပ်ကောင်းမြို့နယ်တွင်ဆောင်ရွက်မည့် အခြေခံကမ်းလွန်ရေနံထောက်ပို့ရေး နှင့် ၎င်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) ကို ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။

အကျိုးတူ ပူးပေါင်းဖွဲ့စည်းထားသော အဖွဲ့မှ Environmental Resource Management (ERM) အား ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း (EIA)ဆိုင်ရာ လေ့လာခြင်း အတွက် တာဝန်ပေး အပ်ခဲ့ပါသည်။



- ကမ်းလွန်ရေနံထောက်ပို့ရေးဆိုင်ရာ အခြေစိုက်စခန်း သည် ဧရာဝတီတိုင်း ဒေသ ကြီး၊ ငရုပ်ကောင်းမြို့တွင် တည်ရှိပါသည်။
- စီမံကိန်းတွင် သေးငယ်သော ကုန်းပတ် ပါဝင်သည့် ဆိပ်ခံဘောတံတား၊ တာလမ်း နှင့် လိုအပ်သည့် ကုန်းတွင်းအခြေခံအဆောက်အအုံများ (အဓိက ထောက်ပို့ရေး အခြေစိုက်စခန်း) တို့ ပါဝင်ပါသည်။
- အဓိကအားဖြင့် ကမ်းလွန်ရေနံထောက်ပို့ရေးဆိုင်ရာအခြေစိုက်စခန်း (ကုန်းတွင်း ပိုင်း) တွင် သိုလှောင်ရုံများ၊ ကုန်တင်ကုန်ချ စစ်ဆေးရေးဧရိယာ၊ အလုပ်ရုံဧရိယာ၊ လူနေအဆောက်အဦး ဧရိယာနှင့် အခြားအသုံးပြုမှုများပါဝင်မည် ဖြစ်ပါသည်။

ဖြစ်ပေါ်လာနိုင်သည့် ထိခိုက်မှုများ	ပတ်ဝန်းကျင်ထိခိုက်လွယ်မှု	ထိခိုက်မှုပမာဏ	ကြွင်းကျန်ထိခိုက်မှု၏ အရေးပါမှု
လေထုတွင်းထုတ်လွှတ်မှုကြောင့် လေအရည်အသွေးထိခိုက်မှုများ၊ (လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော
အသံဆူညံမှု (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော
ရေအရည်အသွေးနှင့် အရင်းအမြစ်များအပေါ်ထိခိုက်မှုများ၊ (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	နိမ့်ပါးသော	နိမ့်ပါးသော	အရေးမပါသော
အမှိုက်များ သိုလှောင်ခြင်း၊ စွန့်ပစ်ခြင်းများ နှင့် မတော်တဆဖြစ်ရပ်များကြောင့် မြေညစ်ညမ်းမှုများ၊ (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော
ရေနံသတ္တဝါဖိစီးမှု၊ ချေးကွေးမှုများ အပေါ် ထိခိုက်မှု (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	ကြီးမားသော	နိမ့်ပါးသော	အတန်အသင့်ဖြစ်သော
လေထုညစ်ညမ်းခြင်းနှင့် ဆူညံသံများကြောင့် ဒေသဝန်းကျင်နှင့် လုပ်ငန်းဆိုင်ရာ ကျန်းမာရေးနှင့်လုံခြုံရေး ထိခိုက်မှုများ (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော
စီမံကိန်းကြောင့် အလုပ်အကိုင်အခွင့်အလမ်းတိုးပွားလာခြင်းကြောင့် စီးပွားရေးနှင့် အသက်မွေးမှုဆိုင်ရာ ထိခိုက်သက်ရောက်မှုများ (ကောင်းကျိုး/ဆိုးကျိုး) (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော (လမ်းများ)
	မရရှိပါ	မရရှိပါ	အပြုသဘောဆောင်သော (အလုပ်အကိုင်များ)
ရေလုပ်ငန်းနှင့်ခရီးသွားလာရေးအပေါ်ထိခိုက်မှုများ (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	အလယ်အလတ်ဖြစ်သော	အတန်အသင့်ဖြစ်သော
မတော်တဆမှုများ ကြောင့် သက်ရှိတို့နေရာဒေသများ နှင့် မျိုးစိတ်များအပေါ် ထိခိုက်မှု	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော

စီမံကိန်းဆိုင်ရာ အချက်အလက်များနှင့်  
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ဝေဖန်အကြံပြုလို၍ဖြစ်စေ အောက်ဖော်ပြပါ  
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အီးလ်မေးလ် : win.phyo@myintassociates.com



## Focus Group Discussion

Name of Village				Gu Chaung			
Village Track				Nant Thar Pu			
Township				NgaYokeKaung			
District				-			
Region				Ayarwady			
Date of Consultation				18 <sup>th</sup> January 2018			
Boats							
Type of Boats	Size	Carrying Capacity	Distance covered (units)	Usually moves in Depth of (units)	Number of HHs & Number of Fishermen	Average fishing trip (time spent)	How many boats are there in this village?
Small	25ft. length	1000 viss ( 1 viss = 1.63293 kg)	>10 miles	100 m	100%	4AM to 1PM	15
Large	50 ft. length	5000 viss	>10 miles	100 m	100%	4PM to 6AM	15
	Questions				Responses		
	Fishing: Locations, Techniques and Seasonal Patterns						
1.	Where: What are the best fishing locations? How far are these locations? Indicate on a map				Refer to map in Scoping Report		
2.	When: What are the major fishing months? Which are the peak months? [see FISHING CALENDAR- Annex 1]				Fish the whole year. Fishing mostly undertaken in Jan to March.		
3.	How: What are the typical fishing techniques used? [see FISHING METHODS SHEET- Annex 2]				- Purse Seine - Herring/ Sardine/ Anchovy net		
4.	Type of fish: What are the major fish species caught in this area: List with annual/monthly production/season [see PICTURES]				- Squid - Tuna - Mullet - Mahi mahi - Trevelley /scad - Herring/ Sardine/ Anchovy - Hilsa shad - Goldstripe sardinella		
	Restrictions and exclusion zone						
5.	Are there any fishing restrictions imposed by the Fisheries Department? Where do you get information?				DOF provides information in Nga Yoke Kaung		

FISHING CALENDAR			Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Months with Maximum Fish Catch														
Months with less fish catch														
Type of nets used	Type 1 Net:	Purse Seine												
	Type 2 Net:	Grilling netting												
	Type 3 Net:	Netting												
	Type 4 Net:	Beach Seine												
Fish Breeding Season (where large numbers of species come together in one place)														
Influx from other villages														

FISHING METHOD	Location (from coast or water depth)	Type of fish (use pictures)	Season (when/ what time of year)	Small / medium / large (boats)	Dimensions of net (length, width, height)	Location in water column (bottom, surface or mid-water)?
Purse Seine	Within 10 miles of coast	None targeted, catch anything	October to March	Small & Big	750 ft (150 * 5 ft)	Bottom
Grilling netting	Within 10 miles of coast	Hilsa shad	July to September	Small & Big	750 ft	Bottom
Netting	Within 10 miles of coast	None targeted, catch anything	October to February	Small & Big	750 ft	Bottom
Beach Seine	Within 10 miles of coast	None targeted, catch anything	June to August	Small & Big	750 ft	Surface



<b>Name of Village</b>		<b>Nant Thar Pu</b>
<b>Village Track</b>		Nant Thar Pu
<b>Township</b>		<b>NgaYokeKaung</b>
<b>District</b>		-
<b>Region</b>		Ayarwady
<b>Date of Consultation</b>		03-01-2017
	<b>Boats</b>	
1	How do you classify the boats?	
	Type of Boats	
	Size	small,medium,large
	Carrying Capacity	500,1000,2000 (Vazz)
	Motor capacity	7,12,25 (Hp)
	Distance covered (units)	5,10,25 (mile)
	Usually moves in Depth of (units)	400ft
	Number of HHs & Number of Fishermen	75% 200HH
	Average fishing trip (time spent)	1,4,5 (day)
	How many boats are there in this village?	25,25,20 (over 70nos.)
	<b>Questions</b>	
	<b>Fishing: Locations, Techniques and Seasonal Patterns</b>	
2	<b>Where:</b> What are the best fishing locations? How far are these locations?	within 2 to 3mile 25 to 30mile
3	<b>When:</b> What are the major fishing months? Which are the peak months?	Jun to Sept(NgaThaLauk) Oct to Nov (NgaTan,Prawn)
4	<b>How:</b> What are the typical fishing techniques used?	Gill Netting
5	<b>Type of fish:</b> What are the major fish species caught in this area: List with annual/monthly production/season	NgaKonNyo,NgaThaLauk, NgaTan,Prawn,etc.
	<b>Restrictions and exclusion zone</b>	
6	Are there any fishing restrictions imposed by the Fisheries Department?	
	Seasonal restrictions?	July to Sep
	Which locations?	-
	Restricts on species caught?	-
	Spawning areas?	-
7	Are these observed by fishermen?	Yes
8	What do you do if a certain area ( which happens to be your fishing ground) is restricted for certain period	
	Would you go to other fishing grounds?	Yes
	Would you go further in deep sea?	-
	Would it affect your fish catch	-
	<b>FISHING CALENDAR</b>	
9	Months with Maximum Fish Catch	June to Nov
10	Months with less fish catch	Jan to Feb
11	Type of Fish catch	NgaThaLauk,NgaTan,Prawn
12	Type of nets used	Netting
13	Fish Breeding Season (where large numbers of species come together in one place	-
14	Fishing restriction by Government	Turtles
15	Influx from other villages	-
	<b>FISHING METHOD</b>	
16	Location (from coast or water depth)	Within 10 miles-
17	Fishing Method	- Purse Seine - Herring/ Sardine/ Anchovy net
	<b>FISHING METHOD</b>	
18	Season (when/ what time of year)	
19	Small / medium / large (boats)	Small
20	Dimensions of net (length, width, height)	750 ft
21	Location in water column (bottom, surface or mid- water)?	Mid water

## **Appendix H – Disclosure Report**



**Environmental Impact Assessment  
(EIA), Social Impact Assessment (SIA)  
& Environmental Management Plan  
(EMP) and Social Management Plan  
(SMP) for Offshore Supply Base Nga  
Yoke Kaung**

**Disclosure Report**

6 April 2018

**ERM-Hong Kong, Limited**

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# Provision of Environmental Impact Assessment (EIA), Social Impact Assessment (SIA) & Environmental Management Plan (EMP) and Social Management Plan (SMP) for Offshore Supply Base Nga Yoke Kaung

## Disclosure Report

### Environmental Resources Management

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**Document Code: 0385545\_M&A\_OSB\_Disclosure Report**

Client:		No:			
Myint & Associates Company Ltd.		0385545			
Summary:		Date:			
<p>This document presents the Disclosure Report for the Environmental Impact Assessment (EIA), Social Impact Assessment (SIA) &amp; Environmental Management Plan (EMP) and Social Management Plan (SMP) for Offshore Supply Base Nga Yoke Kaung.</p>		6 April 2018			
		Approved by:  ..... Craig A Reid Partner			
1	Final to M&AOSB	RS	AS	RS	06/04/18
Revision	Description	By	Checked	Approved	Date
		Distribution			
		<input type="checkbox"/> Public			
		<input checked="" type="checkbox"/> Government			
		<input type="checkbox"/> Confidential			
		 			

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## ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AOI	Area of Influence
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
EIA	Environmental Impact Assessment
M&A OSB	Myint & Associates Offshore Supply Base Ltd.
MIC	Myanmar investment commission
NGO	Non-Governmental Organisation
OHS	Occupational, Health and Safety
OGM	Operational Grievance Mechanism

This document is the EIA Disclosure Report for Myint & Associates Offshore Supply Base Ltd (M&A OSB).

Stakeholder engagement was conducted by **M&A OSB** and **Environmental Resources Management (ERM)** Hong Kong Ltd., who were engaged by M&A OSB to undertake the EIA Study for the Offshore Supply Base in Nga Yoke Kaung Bay. **Environmental Quality Management Co Ltd (EQM)** assisted ERM in facilitating of meetings.

The scope of the EIA Disclosure meetings includes the EIA findings as well as an explanation of the associated Corporate Social Responsibility (CSR) and Operational Grievance Mechanism (OGM) of M&A OSB.

Public consultation in Ayeyarwaddy has previously been conducted as per the Myanmar EIA Procedure during the Scoping and EIA investigation stages which were defined in the EIA report.

These EIA disclosure meetings were held as a public forum at Vantage Tower in Yangon on 8th March 2018 with the different levels of related Government organisations, Non Government Organisations (NGOs), Civil society organizations (CSOs) and interest groups. Nine disclosure meetings were held in Patheingyi, Ngathayau, Nga Yoke Kaung, and Nantharpu of Ayeyarwady Region from 12th to 16th March 2018. Stakeholder included NGOs, government officials, Parliament members, CSOs, and potentially affected communities within the Project's Area of Influence (AOI).

### **1.1 EIA DISCLOSURE'S OBJECTIVES:**

The objectives of engaging stakeholders for EIA information disclosure include:

- **Ensuring Understanding:** An open, inclusive, and transparent process of culturally appropriate engagement and communication is undertaken to ensure that stakeholders are well informed about the EIA findings and any potential impacts and associated mitigation. Feedback is also provided to communities on how their concerns are taken into account in the EIA.
- **Involving Stakeholders in the Assessment:** Stakeholders are included in the scoping of issues, the assessment of impacts, and the development of mitigation and management measures in relation to M&A OSB activities and minimising negative impacts and maximising potential benefits from M&A OSB activities.



- **Building Relationships**: Through supporting open OGM and providing CSR programme which will be strengthen the existing positive relationships between M&A OSB and stakeholders, such as, but not limited to, local communities, key government representatives, CSOs, and regional parliament members.
- **Engaging Potentially Affected People**: An open and inclusive approach to EIA's information disclosure consultation increases the opportunity of stakeholders to provide comment on any relevant M&A OSB activities and to voice their concerns.
- **Ensuring Compliance**: The process is well designed to ensure compliance with both local regulatory requirements and international good practice.

All engagement was conducted to the principles of free, prior, and informed consultation of stakeholders:

- Free: Engagement free of external manipulation or coercion and intimidation;
- Prior: Engagement undertaken in a timely manner,
- Informed: Engagement enabled by relevant, understandable, and accessible information including presentation of information in Myanmar language.

## 1.2

### KEY STAKEHOLDERS

A stakeholder is defined as any individual or group potentially affected (positively or adversely) by M&A OSB activities, or who has an interest in M&A OSB activities and their potential impacts, and whose actions can impact or influence M&A OSB activities. The following stakeholders/stakeholder groups were identified as having an active role or a potential interest in the development of the proposed project:

- Government at the Regional, District, Township, Town levels;
- Parliament members;
- NGOs;
- CSOs;
- Other interest groups; and
- Residents in the villages within the Project's AOI.

Table 1.1 presents the various stakeholder groups and individuals participated in the disclosure meetings.

**Table 1.1 Stakeholder Groups of EIA Disclosure**

Type	Stakeholder Group - Level	Roles / Responsibilities /	Location
<b>Government</b>	Chief Minister and Minister of Ministry of Electricity, Energy, industry and transportation, Ayeyarwady Region	Chief Minister offices gives approval for the Project proponent to conduct stakeholder engagement at the Township and Village level.	Pathein
	Myanmar investment commission (MIC), Regional (Yangon and Ayeyarwady Region)		Yangon
	Myanmar Port Authority- National		Yangon
	Ministry of Natural Resources and Environmental Conservation (MONREC) through its Environmental Conservation Department (ECD)	This ministry is responsible for the administration of EIA Procedures (2015) of Myanmar (approval of M&A OSB's EIAs) as well as monitoring of ongoing environmental performance of M&A OSB operations. It is also responsible for monitoring the implementation of the M&A OSB operation.	Yangon, Pathein
	Myanmar Oil and Gas Enterprise- MOGE- National	MOGE oversees the development of Offshore projects and Offshore Supply Base projects. It communicates and coordinates with various levels of different government agencies for HSE-related issues at Offshore supply base.	Yangon
	Forest Department - Regional	The Forest Department will also monitor the replantation programme.	Yangon, Ngaputaw, Nga Yoke Kaung,
	Land-use Division, Department of Agriculture- Regional		Yangon

Type	Stakeholder Group - Level	Roles / Responsibilities /	Location
	Department of Fisheries	This department lies under the Ministry of Livestock, Fisheries and Rural Development of Myanmar. It is charged with promoting and increasing domestic production and consumption of livestock and fishery resources, controlling infectious diseases and zoonosis, ensuring livestock quality.	Ngaputaw, Nga Yoke Kaung
	Department of Information		Pathein
	Regional Secretary, General Administration Department (GAD), Ayeyarwady Region	The regional secretary issued the letter to Township GADs (Pathein and Nantharpu Township). He participated in the CM meeting.	Pathein
	District General Administration Department (GAD) at Pathein	The District GAD has been supporting M&A OSB's engagement process to date through, e.g. arranging meetings with stakeholders at Township level of Pathein and Ngaputaw.	Pathein
	Township General Administration Department (GAD) at Ngaputaw	The District GAD has been supporting M&A OSB's engagement process to date through, e.g. arranging meetings with stakeholders at Town level of Nga Yoke Kaung.	Ngaputaw
	Town General Administration Department (GAD) at Nga Yoke Kaung	The Township GAD has been supporting M&A OSB's engagement process to date through, e.g. arranging meetings with stakeholders at village levels of Nantharpu Villages group	Nga Yoke Kaung
	Village Tract General Administration Department (GAD) at Nantharpu	The Township GAD has been supporting M&A OSB's engagement process to date through, e.g. arranging meetings with stakeholders at Nantharpu village level.	Nantharpu
<b>Local Community</b>	Nantharpu Village group - Local	Nantharpu villages group is located around the project.	Nantharpu
<b>CSOs</b>	Biodiversity And Nature Conservation Association (BANCA)	This CSO is a partner of Bird Life International and member of International Union for Nature Conservation (IUCN), participated at workshop.	Yangon
	Myanmar Green Network		Yangon

Type	Stakeholder Group - Level	Roles / Responsibilities /	Location
	Myanmar Centre of Responsible Business (MCRB) – National	This CSO is concerned about disclosure of project information, community engagement as well as EIA related to the project.	Yangon
	Ayeyarwady Integrated River Basin Management		Yangon
Company	Woodside		Yangon
	Bangkok Bank		Yangon
	Shwe Taung Co., Ltd		Yangon
NGOs	Ecosystem Conservation and Community Development Initiative (ECCDI)	This NGO is interested in the EIA process, including consultation.	Yangon
	Another Development (AD)	AD is a local policy think-tank and a non-profit organization set up to be part of the solution to the problems and conflicts prevailing in Myanmar by advocating effective public policy change.	Yangon
Media	Myanmar International TV (MITV) News		Yangon

To continue active engagement and provide meaningful feedback with stakeholders; EIA Disclosure Engagement was undertaken for the Environmental Impact Assessment (EIA) of the Offshore Supply Base project. This was carried out by EIA consultants from ERM and M&A OSB personnel in various locations between 8<sup>th</sup> March 2018 and 16<sup>th</sup> March 2018.

### **2.1 DISCLOSURE WORKSHOP/FORUM IN YANGON HELD ON 8 MARCH, 2018**

As per the requirements of the Myanmar EIA Procedure, the draft EIA Report, including an Executive Summary in Myanmar language, was made available on M&A OSB's Website: <http://myintassociatesosb.com>. Hard copies of the Executive Summary were also distributed to Nga Yoke Kaung.

During the invitation process, all attendees were informed about where they could view the EIA Report.

Stakeholders such as NGOs and CSOs were invited via email, whilst Governmental Organisations were invited directly by way of invitation card, three (3) days before the date of workshop.

The invitation lists for Yangon Forum are provided in Annex 6(a).

### **2.2 DISCLOSURE MEETINGS IN AYEYARWADY REGION HELD ON 12<sup>TH</sup> TO 16<sup>TH</sup> MARCH 2018**

The stakeholders were informed by a notification in local newspapers in both English and Myanmar language on 17<sup>th</sup> February 2018. The draft EIA report including an Executive Summary of EIA report in Myanmar language was made available on M&A OSB's website: <http://myintassociatesosb.com> including contact details for inquiries or requests for further information.

The Executive Summary of the EIA report in Myanmar language, a factsheet including project information, and handouts were provided at the meetings.

In Ayeyarwady Region, there were nine meetings were held in Patheingyi, Ngathay, Nga Yoke Kaung and Nantharpu.

For approval for the holding of disclosure meetings at Township and village levels, an official letter was submitted to Chief Minister of the Ayeyarwady Region on 8<sup>th</sup> March 2018 and an appointment was made to meet with President of Ayeyarwady regional Parliament on 5<sup>th</sup> March 2018. See *Annex 6(c)*.

An approval letter was issued on 12<sup>th</sup> March 2018 by the Chief Minister and the consultation arrangement was conducted with District Administrators of General Administration Department of Patheingyi. The holding of EIA Disclosure meetings in Ngaputaw, Nga Yoke Kaung and Nantharpu were arranged. Invitation cards were sent to the related government officers, CSOs and public of communities.

The date, venue, and stakeholders who attended the meetings were recorded and are provided in *Table 2.1*.

The minutes of the Q&A sessions, attendance lists, and photos from the meetings are provided in *Section 3*.

The invitation lists and cards sent are provided in Annex A and the Presentation materials and factsheet used during the meeting are available in Annex B.

**Table 2.1**      *Schedule of M&A OSB EIA Disclosure Forum and Meetings*

No.	Date	Meeting Venue	Attendees
1.	8-3-2018	Vantage Tower, Yangon	MOGE, M&A, MPRL E&P, ERM, ECD, Government Departments, Companies, NGOs and CSOs
2.	12-3-2018	Ayeyarwady Regional Government Office	Chief Minister, Minister and Government Departments, ERM, M&A
3.	12-3-2018	Patheingyi District General Administrative Department	Patheingyi District Government Administrator, Government Departments, ERM, M&A
4.	12-3-2018	Parliament of Vice President Office	Parliament of Vice President, ERM, M&A
5.	13-3-2018	Ngathayau Township General Administrative Office	M&A, ERM, Government Departments,
6.	13-3-2018	Patheingyi Hotel	M&A, ERM, Government Departments, NGOs, CSOs, Media
7.	14-3-2018	Nga Yoke Kaung Township General Administrative Office	M&A, ERM, Government Departments
8.	14-3-2018	Nga Yoke Kaung Township Monastery	M&A, ERM, Government Departments
9.	15-3-2018	Nga Yoke Kaung Township Monastery	M&A, ERM, Villagers, CSOs
10.	16-3-2018	Parliament Meeting Office	M&A, ERM, Members of Parliament



The following section presents the minutes of the meetings, including Q&A sessions as well as photos and attendance lists from each meeting.

### 3.1.1 Meeting Minutes of Yangon Workshop

Detail	
<b>Project</b>	EIA Disclosure Workshop for Myint & Associates Offshore Supply Base
<b>Venue</b>	Vantage Tower
<b>Township</b>	Kamaryut Township, Yangon
<b>Objective</b>	EIA Disclosure Workshop
<b>Date</b>	8 <sup>th</sup> March, 2018
<b>Time</b>	10:00 to 12:00
<b>Attendee List</b>	Total (41)

#### Summary of Speeches:

##### U Si Thu Zay Ya (Assistant HSE Manager) from MPRL E&P GOCs:

- Explained about HSE facilities.
- Gave information on building structures including locations of emergency exits.
- Discussed procedure for evacuation including in case of emergency.

##### U Tint Swe (Executive Director, Government & Public Affairs) from MPRL E&P GOCs:

- Introduced MPRL E&P and Myint & Associates Company Ltd.
- MPRL E&P Company has found potential oil and gas 65 km offshore from the proposed Project. This offshore supply base will provide necessary materials and fuel as well as logistics and storage services for current and future oil & gas exploration and production activities in Myanmar.

##### Mr. Martijn Coopman (Project Director) from MPRL E&P GOCs:

- Explained about site selection process.
- M&A OSB initially evaluated five potential sites for the OSB to serve the upcoming offshore oil & gas industry including Kyaukphyu, Nga Yoke Kaung Bay, Thilawa/Thaketa, Mawlamyine, and Dawei.
- Nga Yoke Kaung Bay was preferred choice due to its location as it can serve most offshore oil and gas fields within a 24 hour response time.
- The criteria for selection included water depth, natural protection, and amount of maintenance and dredging required, onshore land availability, impact on locals, environmental impact, local transport and relative cost. Land availability is likely to be a decisive factor.

##### U Myo Zaw Thant (Senior Engineer) from MPRL E&P GOCs:

- Discussed the site selection locations in more detail.
- The location is selected considering various technical parameters in bathymetry (water depth) and wave heights.

### Summary of Speeches:

- Another factor of consideration is sediment data. Based on the survey results a close-type jetty structure was chosen.

#### **Mr. Craig A. Reid (Country Manager) from ERM:**

- Presented information on ERM.
- Discussed the applicable EIA Procedure and relevant legislation.
- Discussed the EIA Procedure, including the scoping and EIA phase, as well as work undertaken such as baseline surveys and public consultation.
- Presented summary of primary baseline data collection such as air quality, ambient noise, ground water quality, and soil quality, seawater physio-chemical sampling, biology and biodiversity.
- In summary, the EIA identified no major impacts, with the majority being minor with the proposed mitigation measures.

#### **Daw Kyi Sin Htin Aung (Corporate Affairs Manager) from M&A OSB:**

- Explained that the Project is in its initial stage (prior to construction).
- Discussed the Grievance Mechanism that is currently in place since early 2017.
- Explained that should a grievance be communicated, the M&A OSB staff from the project site will investigate together with local community leaders, village leaders, and some authorities. After studying the situation the case would be registered.
- Explained about consideration of local community comments on the CSR strategy especially the communities desire to have employment opportunities.
- Discussed the current CSR activities including plan to support the education of local community in order to provide needed skills and knowledge.
- Explained some other CSR measures, including construction of middle schools of Nan Ta Pu village.
- Discussed plans to implement next step in 2018 and 2019.

### Discussion

#### **Question: (U Sein Myint, Myanmar Green Network retired from government sector)**

- Nga Yoke Kaung is a tourism site and this needs to be considered in terms of impacts from the Project.
- M&A OSB have responsibility get relevant permits. Presented experience with other company in which Myanmar lost taxes as company didn't get the required permits. Requested to provide capacity building and training to local communities to be qualified labourers for future employment opportunities.

#### **Answer: (Mr. Martijn Coopman, Project Director (M&A OSB))**

- Thank you very much for your questions.
- Tourism was key consideration and design of the Project was selected to reduce impacts to the beach.
- We want to operate the base without any impacts to local tourism. We will have fencing around the base, and workers will stay close the base. This will reduce any impacts to communities. Some of the men and women from the villages could learn and trade from the workers at the base. I see only positive impacts to the local villages.

#### **Answer (U Thike Soe, M&A OSB)**

- We are aware of the tourism at Gawyangyi Island. In the site selection phase, we initially selected four areas with the aim of selecting the area with the least impact to

## Discussion

local communities (in terms of fishing and tourism). Finally we selected the proposed area which is furthest from Gawyangyi Island. I would to confirm that our offshore supply base won't affect the development of community based tourism.

- We had completed the required procedures, documents and taxes with the respective ministries and departments. We have been collaborating with respective ministries for any requirements of our project including the Ministry of Energy. As we have been planning to build a jetty, we have also been negotiating a contract with Myanmar port authorities (MPA) and ministry of transportation. For further new facilities and permits, we have been collaborating with related departments in required specifications. In addition, we have been negotiating with custom department and ministry of finance. We will conduct all required procedures.

### **Additional Suggestions: ( U Sein Myint)**

- MOGE pay their taxes for the storage tanks for the Maday Island, Kyauk Phyu port project. MOGE's partner company paid the taxes after one and half years therefore, MOGE seems weak in collaborating with its partners. Both sides (government and company) do not benefit if the project doesn't meet laws and standards of operating procedure.

### **Answer: (U Zayar Moe, Deputy Manager, MOGE)**

- We implemented the Kyauk Phyu Port project under the previous government. In doing so, respective organizations such as the MPA, Marine transportation, ministry of transportation, Myanmar navy, and the MOGE etc. are included in the implementation of the project. We did not collaborate effectively with other organizations in the Kyauk Phyu project. So we are now collaborating with other organisations. I believe that this project will be successful if we see the examples of the Kyauk Phyu port as a lessons learnt.
- We have a small supply base in Thakata Township that is not large enough to supply to the oil and gas exploration facilities. Therefore, we have to use the Ranong port which is in Thailand and ports in Singapore and Malaysia. Most of our country's foreign income goes to another country in this case.
- If this project is successful, our country will have a world class offshore supply base which can compete with other supply bases in Thailand, Singapore and Malaysia. This will increase foreign income and employment opportunities for local people. I would like to suggest that you give some training, for example welding training, to the local community youth.

### **Question: (U Win Min, MCRB)**

- Asked about the EIA engagement, EIA consultation/social data and grievance mechanism.

### **Answer: (Mr. Craig, ERM)**

- In Myanmar, the engagement stage and the consideration of social impacts are actually a larger part of the EIA than the assessment the other environmental impacts. In this stage of engagement, we treat the consultation of local people very seriously.

### **Answer: (Daw Myat Mon Swe, ERM)**

- There are three phases; the national level, regional level, and township (village) levels in our public consultation process. To identify the setting unit and study area, we

## Discussion

consider the type of project and the local community situation at first. For example, in our assessment, we consider the inshore fishermen who usually fish within 10-30 miles from the beach rather than the offshore fishermen. This is because this project is near shore and we assume that its impacts won't affect the offshore fishery. For this reason we selected the six villages in the coastal area for our study.

- We conducted consultation meetings during the scoping and EIA stage and collected socio-economic data collection and focus group discussion. There are three types of focus group discussion; fishermen focus group discussion, farmer focus group discussion, and women's focus group discussion. We have to consider the livelihood conditions of community when we establish the study area.

### **Answer: (Daw Kyi Sin Htin Aung, Corporate Affairs Manager)**

- U Win Min said that the grievance redress mechanism is acceptable. This mechanism needs to be useable and accessible. We have set up various channels with site managers, and site officers. If you don't like to contact directly, you can contact local a volunteer or you can contact the Yangon office directly via phone number displayed on the poster. We also support training around the Grievance Mechanism (GRM) to promote understanding.

### **Suggestion: (Daw Devi Thant Cin, Myanmar Green Network)**

- Not only the government, but also the community should take responsibility. In Myanmar, we have no experience of these large ships. Investment companies and joint ventures should consider the Lat Pa Daung as an example. Without the EIA and foreign investment law, published in 2012, there are no rules to control. I would like to suggest how to address impacts of the project; in case of government failure; the company should keep the systems in place. The impact assessment should cover the generation of dust from road construction activities and rock breaking which is the main issue on the project site.

### **Answer: (U Tint Swe, Executive Director, MPRL E&P GOCs)**

- This project has potential to bring foreign income. Supply base is situated 65 km away from Nga Yoke Kaung. We also discussed with local people from Nga Yoke Kaung in the first consultation meeting.

### **Suggestion: (Daw Saw Mar Gay Htoo, Another Development)**

- I find that M&A OSB is transparent. ERM has also complied with IFC and guidelines from ECD. If three prior concepts are added, this project will be positive, especially concerning local people.



## Photos



## Photos



### Attendant List :

Sr.	Name	Organization/ Department	E-mail address	Contact Phone
1.	Daw Htay Myint	DOA/ Land Use Division	htay2myint85@gmail.com	09 444451784
2.	U Aung Soe Min	ERM	aungsoemin@erm.com	09 254451650
3.	Daw Myat Mon Swe	ERM	myatmon.swe@erm.com	09 420111902
4.	U Soe Min Naing	ECC DI	minsoen99@gmail.com	09 444451678
5.	U Tha Htu		thahtu@gmail.com	09 5013978
6.	Daw Khaing Shwe Wah	BANCA		
7.	Daw San Htwe	MRTV-News		09 5059903
8.	Daw Mya Tin Khaing	MRTV-News		
9.	U Win Htun	MRTV-News		
10.	U Kaung Set Moe	Shwe Taung Group	ksm.kaungsetmoe@gmail.com	09 965156050
11.	U Si Thu Mg	Shwe Taung Group		09 251042330
12.	U Sein Myint	MGN		09 421126447

Attendant List :				
Sr.	Name	Organization/ Department	E-mail address	Contact Phone
13.	Devi Thant Cin	MGN		09 2450211
14.	Pinieuwkerk	TOLL		09 417174041
15.	U Ko Lay	MITV		
16.	U Win Min	MCRB	win.min@myanmar-responsiblebusiness.com	09 953 428 351
17.	U Zayar Moe	MOGE	zeyarmoe9@gmail.com	09 5152368
18.	U Thein Toe	Forest Department	yangon.fd@gmail.com	09 5343237
19.	Daw Nandar Win	MNA	ndwin2011@gmail.com	09 5139682
20.	U Mg Htay	MPA	mngmghtay@gmail.com	09254285872
21.	Daw Hnin Thiri Lwin	Shwe Taung Group	hninthirilwin92@gmail.com	09 420068764
22.	Daw Thura Aung	REM	thura@enviromyanmar.net	09 5192143
23.	Daw Thiri Thein	ERM	thithi.thein@erm.com	09 73059830
24.	Martiyu	M&A OSB		09 97299519
25.	Mr. Craig Reid	ERM	craig.reid@erm.com	09 260016795
26.	Ms. Sarah Wai	MITV	sarahwai.mitv24@gmail.com	01 536956
27.	Daw Saw Mar Gay Htu	Another Development	sawmargayhtoo@gmail.com	09 261583401
28.	Daw Phyu Win Oo	Woodside	phyuphyu.winoo@gmail.com	09 2044023
29.	Carol Moet Aye	Another Development	carolaye24@gmail.com	09 5661506
30.	Aung Khaing Nyi	Shwe Taung Cement	aungknyi@shwetaungrealestate.com	09 977830269
31.	Daw Mazon Aung Thu	Shwe Taung Cement	mza.thu@shwetaungcement.com	09 977831342
32.	U Aung Naing Myo	AIRSMP	aungait@yahoo.com	09 964302748
33.	U Thet Shwe Aye	AIRSMP	thetsa@gmail.com	09 798527066
34.	Daw Chan Nyein Htet	ECD (Yangon)	channyeinh tet.99@gmail.com	09790877427
35.	U Si Thu Zay Ya	MPRL E&P GOCs		-
36.	U Tint Swe	MPRL E&P GOCs		-
37.	Mr. Mertijn Coopman	M&A OSB	martijn.coopman@myintassociatesosb.com	-
38.	U Thike Soe	M&A OSB		-
39.	U Myo Zaw That	M&A OSB		-
40.	Daw Kyi Sin Htin Aung	MPRL E&P GOCs	kyisin.h.aung@mprlexp.com	-
41.	U Myo Paing	MPRL E&P GOCs	myo.paing@mprlexp.com	-



### 3.1.2

### Meeting Minutes of Chief Minister in Ayeyarwady Region

Detail	
<b>Project</b>	EIA Disclosure for Myint & Associates Offshore Supply Base
<b>Venue</b>	Ayeyarwady Regional Government Office
<b>Township</b>	Patheingyi Township, Ayeyarwady region.
<b>Objective</b>	EIA Disclosure
<b>Date</b>	12 <sup>nd</sup> March, 2018
<b>Time</b>	11:00 to 12:00
<b>Attendee List</b>	14

The summary of presentations is provided in *Section 3.1.1*.

Discussion (Questions and Answers)
<p><b>Comment 1: U Aung Khaing Soe, Environmental conservation department</b></p> <ul style="list-style-type: none"> <li>We have received the letter permitting the Environmental Compliance Certificate (ECC) for this project. We know that there have already been discussions about the program and how it will handle complaints (e.g. grievance mechanisms, CSR programs) in Yangon.</li> <li>In Tanintharyi, for the Dawei deep-sea port project this was also the case and it is better to implement these projects this way. According to EIA procedure, disclosure of EIA must be announced on websites for local stakeholders, CSOs, and others related persons within two weeks. This EIA is found to have skipped one step, based on the ERM presentation. This may be because of a delay in the English to Myanmar translation and other language problems. Everything else has been done in compliance with the guidelines and we have no separate comments or feedback.</li> </ul>
<p><b>Comment 2: U Soe Aung, Myanmar investment commission (MIC)</b></p> <ul style="list-style-type: none"> <li>Nay Pyi Taw MIC announced their permit letter in 2017, June 26 for this project. According to MIC laws, the project implementation report has to be submitted to MIC every three months. It is better to add the accomplishments of the EIA, SIA, CSR programs into this report. It is also necessary to address to the President of the MIC, which means Union MIC.</li> <li>I would like M&amp;A OSB to inform the regional government and regional MIC as well so that we can easily explain the project to them. We have three offshore supply base projects including M&amp;A OSB, SEM, and JMOE. Whilst conducting your CSR, it is important to keep in touch with local people and local surroundings.</li> <li>I received many questions concerning this project from journalists. For example; how will MIC handle issues that arise with the company's CSR strategy after MIC permit? Generally, MIC used to handle the project after getting permit from the respective departments. But it has changed and now MIC handle the project first and then the related departments such as ECD process it accordingly. That is because companies want their construction periods to finish before the change of government. I know that M&amp;A OSB only has a 28 month construction period.</li> </ul>
<p><b>Comment 3: U Min Aung, Land Record Department</b></p> <ul style="list-style-type: none"> <li>We presented the M&amp;A OSB report to the regional land record committee according to the free land/wild land law. The land record committee had already guided the</li> </ul>

### Discussion (Questions and Answers)

process accordingly. We also guided the Township Land Record Department to implement the instructions. After implementation the guide instructions, we will present the final report.

#### **Comment 4: U Win Htay, Ministry of Electricity, Energy, Mechanical and Transportation**

- JMOE, is conducting their first initiative and they will meet regional governments and undertake public consultation. Many questions were asked in Hluttaw about this. If we undertake EIA, SIA and EMP continuously after getting the MIC permit then Myanmar seems to get many foreign direct investments (FDI). Concerning the M&A OSB project, the committee knows about the project because M&A OSB director and his groups have already presented it. I will try to announce in the Hluttaw in order to let all Hluttaw representatives know the project information.
- It is better not to construct a separate jetty. If a separate jetty is constructed, it will have an impact on the local fishery and local fishing boats (e.g. can local fishing boat pass under the jetty?). The company needs to implement the ERM's suggestions and findings. The main developer has the responsibility to do this and they are in charge of all sub-contractors to ensure compliance with the EMP. The grievance mechanism is a good resource for people to voice complaints. We have three Technological Universities (TU); Maubin, Hinthata, and Patheingyi and many graduates. I would like to request to create employment opportunities in the project for these graduates. Employment opportunities are higher in the construction phase and there may be a need for civil, mechanical and electrical engineers.

#### **Comment 5: U Hla Moe Aung, Chief Minister**

- If we create opportunities for our local graduates from the three Technology Universities, our new generation will gain in confidence and their horizons will grow. I would like to request to implement the project. Our country is still developing and it is important to proceed with this project quickly and efficiently.

### Photos



## Photos



## Attendant List :

Sr.	Name	Organization
1.	U Hla Moe Aung	Ayeyarwady Chief Minister
2.	U Win Htay	Minister of Electricity, Energy, Mechanical and Transportation
3.	U Than Swe Win	Regional administrator
4.	U Min Aung	Deputy regional officer( LRD)
5.	U Soe Aung	Regional Officer (MIC)
6.	U Kyaw Khaing Soe	Regional Officer (ECD)
7.	U Wai Phyo Oo	Officer
8.	Daw Thi Aung	Deputy officer
9.	U Tin Swe	MPRL E&P GOCs
10.	Daw Kyisin Htin Aung	MPRL E&P GOCs
11.	U Myo Zaw Oo	MPRL E&P GOCs
12.	U Myo Zaw Thant	M&A OSB
13.	Daw Myat Mon Swe	ERM
14.	U Aung Soe Min	ERM

### 3.1.3

#### Meeting Minutes of Patheingyi District GAD Office

Detail	
Project	EIA Disclosure for Myint & Associates Offshore Supply Base
Venue	Patheingyi District General Administrative Department
Township	Patheingyi Township, Ayeyarwady region.
Objective	EIA Disclosure
Date	12/3/2018
Time	15:00 to 15:30
Attendee List	7

The summary of presentations is provided in *Section 3.1.1*.

Discussion (Questions and Answers)
<p><b>Question: (Daw Mi Mi Aung, Deputy Director, District Planning Department)</b></p> <ul style="list-style-type: none"> <li>What percentage of this project's budget will go into Ngaputaw's private sector investment?</li> </ul> <p><b>Response: (U Tint Swe, MPRL E&amp;P GOCS)</b></p> <ul style="list-style-type: none"> <li>We have to prepare the project completion report every three months. The Minister and an officer from MIC are also requested to submit the report to regional governments and related departments. We will try to present the report at the end of March. Our planned budget is USD 55 million. At present, we have invested 7 USD million in this project. I will present further detail in the report.</li> </ul> <p><b>Suggestion: (Daw Mi Mi Aung, Deputy Director, District Planning Department)</b></p> <ul style="list-style-type: none"> <li>Yes, I would like to request you send us a copy of those sending report, if you send report to regional government and related departments. We need these data to calculate the GDP development of the region.</li> </ul> <p><b>Comment: U Tin Aung Win (District officer, Land record department)</b></p> <ul style="list-style-type: none"> <li>We have already clarified that the farm land cannot be permitted by central committee at present, garden land is fine. We presented the information for beach land and other land to central committee according to procedures. This will have reached the township level and they will proceed accordingly soon.</li> </ul> <p><b>Response: (U Tint Swe, MPRL E&amp;P GOCS)</b></p> <ul style="list-style-type: none"> <li>MPRL E&amp;P Company has found oil and gas in the Block A-6 area, which is 65 km from the proposed offshore supply base. We intend, together with MOGE, to extract oil and gas by 2023. So, to make our target, a main requirement for us is the offshore supply base. We are planning to finish the construction of OSB by 2020 and this will support offshore vessels in Ayeyarwady and Rakhine regions.</li> <li>We want to develop a world-class offshore supply base near Nga Yoke Kaung bay in Ngaputaw Township in Ayeyarwady region and deliver logistics services to the offshore oil and gas industry in Myanmar.</li> </ul> <p><b>Question: (Daw Mi Mi Aung, Deputy Director, District Planning Department)</b></p> <ul style="list-style-type: none"> <li>How about employment opportunities for this region?</li> </ul> <p><b>Answer: (U Tint Swe, MPRL E&amp;P GOCS)</b></p>



### Discussion (Questions and Answers)

- The Chief Minister of Ayeyarwady region said that regional governments would collect the lists of graduates from three Technological universities. We then have to create employment opportunities for them. Most graduates have limited opportunities due to the lack of projects. We have planned to interview the graduates from this region and give jobs to qualified people. We are planning to start our project in January 2019.

### Photos



### Attendant List :

Sr.	Name	Position
1.	U Aung Cho	Director
2.	Daw Mi Mi Aung	Deputy Director
3.	U Tin Aung Win	District officer (Land Record Department)
4.	U Tin Swe	MPRL E&P GOCs
5.	Daw Kyisin Htin Aung	MPRL E&P GOCs
6.	U Myo Zaw Thant	M&A OSB
7.	Daw Myat Mon Swe	ERM

Detail	
<b>Project</b>	EIA Disclosure for Myint & Associates Offshore Supply Base
<b>Venue</b>	Parliament of Vice President Office
<b>Township</b>	Patheingyi Township, Ayeyarwady region.
<b>Objective</b>	EIA Disclosure
<b>Date</b>	12nd March 2018
<b>Time</b>	15:45 to 16:45
<b>Attendee List</b>	6

The summary of presentations is provided in *Section 3.1.1*.

#### Discussion (Questions and Answers)

##### Comment: (Parliament of Vice President)

- Many companies are coming and conducting survey in the region and they have since disappeared. A hluttaw representative suggested that there is a need to send committed investors to the Nga Yoke Kaung region. The land prices are rising because of these surveys and may, in future become too expensive for investments.

##### Response: (U Tint Swe, MPRL E&P GOCS)

- Our company has a well-supported case. In 2007, we had an agreement with MOGE for operation of the offshore Block A-6 in Rakhine for 5 years. In 2012, we found oil and gas in the Kyi-Thar well in shallow water depth. Similarly, oil and gas existence was found in Shwe-yee-tun well in 2016, and in Pyi-tharyar and Pyi-thit wells in 2017. We have provided our findings to U Man Jonny, former chief minister and mister U Win Htay at that time.
- MPRL E&P Company has found oil and gas in the Block A-6 area, which is 65 km from the proposed offshore supply base. We intend, together with MOGE, to extract oil and gas by 2023. So, to make our target, a main requirement for us is the offshore supply base. We are planning to finish the construction of OSB by 2020 and this will support offshore vessels in Ayeyarwady and Rakhine regions.
- We want to explain the EIA to local communities, local NGOs, CSOs and government authorities and media. After this meeting, we will go and see with the deputy hluttaw president. We will have further meetings in Ngaputaw Township and the Patheingyi hotel. We would like to request to proceed with our meetings. We have also planned to hold meetings in the Nga yoke Kaung Township and in Nan Ta Pu Village.

##### Comment: (Parliament of Vice President)

- When you have a public consultation in the villages, what is their feedback? Other villages are wondering why the meetings are always held in Nan Ta Pu? Why don't you have meetings in other villages? Many of the people have experienced many meetings and surveys in this area. I received many letters from Nga yoke kaung region about this and similarly, the hluttaw representatives are concerned with these issues.
- U San Min Aung shared his experience of an old coal project in Ngayokekaung region and explained Daw Nant Cho Pyone's performances in most of meetings. He shared his experiences concerning public disclosure in many investments.

### *Discussion (Questions and Answers)*

**Response: Daw Myat Mon Swe (ERM),**

- Shared similar experiences concerning with public consultation in Nan Ta Pu village.

**Comment: (Vice President of Parliament)**

- I would like this information explained to our Hluttaw representatives including the Hluttaw president. After meeting, I may know whether all Hluttaw representatives agree on this project or not.
- He explained the challenges of Ayeyarwady region and that Ayeyarwady regional governments are expecting to get more investment and that investments are welcome. He requested that all of this information is distributed to all Hluttaw representatives.

### *Attendant List :*

Sr.	Name	Organization
1.	U San Min Aung	Parliament of Vice President
2.	U Tin Swe	MPRL E&P GOCs
3.	Daw Kyisin Htin Aung	MPRL E&P GOCs
4.	U Myo Zaw Oo	MPRL E&P GOCs
5.	U Myo Zaw Thant	M&A OSB
6.	Daw Myat Mon Swe	ERM



### 3.1.5

#### Meeting Minutes of Ngaputaw GAD Office

Detail	
<b>Project</b>	EIA Disclosure for Myint & Associates Offshore Supply Base
<b>Venue</b>	Township General Administrative Office
<b>Township</b>	Ngaputaw Township, Ayeyarwady region.
<b>Objective</b>	EIA Disclosure
<b>Date</b>	13rd March 2018 (Tuesday)
<b>Time</b>	11:00 to 13:15
<b>Attendee List</b>	42

The summary of presentations is provided in *Section 3.1.1*.

Discussion (Questions and Answers)
<p><b>Question: (U Kyaw Aye, member of Township Development Committee)</b></p> <ul style="list-style-type: none"> <li>How does M&amp;A OSB plan to responsible for the health of local community?</li> </ul> <p><b>Answer: (Daw Myat Mon Swe, ERM)</b></p> <ul style="list-style-type: none"> <li>A health and safety management plan is already included in Environmental management plan (EMP).</li> </ul> <p><b>Answer: (U Myo Zaw Thant, Senior Engineer)</b></p> <ul style="list-style-type: none"> <li>We will have a Health and Safety Management plan for our project site in case an accident should occur. We will install a clinic in the project, this clinic will not only be for us but also for the local community. We plan to give assistance to the local community as much as we can.</li> </ul> <p><b>Answer: (U Tint Swe, Executive Director of M&amp;A OSB)</b></p> <ul style="list-style-type: none"> <li>We prioritise health and safety in all of our projects. Our project is still in its initial phase, we did not have any facilities yet. We have a health and safety management plan for the Mann Field and our offshore block A-6. If you are in Yangon, please come and visit to our office, and we can show you how we plan our health and safety. We always have safety presentations before every meeting in order to explain our health and safety plan. We consider the health of local community in our CSR program. Since we applied for the permit at MIC, we have already agreed a commitment to apply 3% of profit to the CSR program. We are promoting education as a first priority of CSR. At the start our project, we will have 80 labourers from M&amp;A OSB and may need more than 200 labourers for the initial phase. For the main construction phase, we will need 400-700 labourers.</li> </ul>

## Photos



### Attendant List :

Sr.	Name	Position/Organization
1.	U Kyaw Swe Win	Administrator (township administrative department)
2.	U Myo Win	Township Officer (Police)
3.	U Htay Hlaing	Executive officer (Township Development Committee)
4.	U Soe Win	Township officer (Education)
5.	U Kyaw Thu Min	Assistant Director (Rural Development)
6.	Daw Nan Shoon Le	Township court
7.	U Nay Min Aung	Township Lawyer

Attendant List :		
Sr.	Name	Position/Organization
8.	Daw Aye Aye Myint	Township Officer (Township Cooperative)
9.	U Win Soe Oo	Township Officer (Agricultural Department)
10.	U Soe Myint Aung	Township Officer (Veterinary)
11.	U Pyone Naing	Township Officer (Forest Department)
12.	Daw New New Soe	Township Officer (Planning Department)
13.	Dr. Soe Sandar Lwin	Township doctor (Health Department)
14.	Daw Than Than Aye	Township Officer (Township Statistical Department)
15.	Daw Zin Min War	Township Officer (Tax Department)
16.	U Aye Cho	Township Officer (Civil) Department of highway
17.	U Min Aung	Officer (Township Fire Service)
18.	U Tun Min	Officer (Department of Irrigation)
19.	U Tun Tun Win	Officer (Township farmland Department)
20.	U Ko Ko Lwin	Officer (Traditional medicine)
21.	Daw Khin Lay Myint	Officer (Post office)
22.	U Htet Lin Tun	Officer (Micro wave)
23.	Daw Win New	Officer (Auto exchange)
24.	U Myat Soe Aung	Township Officer (Electrification department)
25.	U Win Naing Soe	Township Officer (immigration department)
26.	Daw Khin Thandar Soe	Officer (Township sport)
27.	Daw Khin Aye Maw	Township Manager (Myanmar Economic Bank)
28.	Daw Nu Nu Aye	Deputy officer (Township Information Department)
29.	U Tun Tun Oo	Township Officer (Department of Fishery)
30.	Daw Myint Myint San	Officer (Department of Consumers)
31.	Daw Ye Ye Swe	Manager (Myanmar Farmer Development Bank)
32.	U Aung Zaw Win	Officer (Township Religious department)
33.	U Tin Oo	President (Township development committee)
34.	U Kyaw Aye	Member (Township development committee)
35.	U Aung Than Zaw	Member (Township development committee)
36.	U Hla Win Htut	Reporter
37.	U Tin Swe	MPRL E&P GOCs
38.	Daw Kyisin Htin Aung	MPRL E&P GOCs
39.	U Myo Zaw Oo	MPRL E&P GOCs
40.	U Myo Zaw Thant	M&A OSB
41.	Daw Myat Mon Swe	ERM
42.	U Aung Soe Min	ERM

### 3.1.6

#### Meeting Minutes of CSOs at Pathein Hotel

Detail	
<b>Project</b>	EIA Disclosure for Myint & Associates Offshore Supply Base
<b>Venue</b>	Pathein Hotel
<b>Township</b>	Pathein Township, Ayeyarwady region.
<b>Objective</b>	EIA Disclosure
<b>Date</b>	13 <sup>rd</sup> March, 2018
<b>Time</b>	15:00 to 17:00
<b>Attendee List</b>	41

The summary of presentations is provided in *Section 3.1.1*.

Discussion (Questions and Answers)
<p><b>Question: (U Kyaw Min Soe, retired professor from Hinthata University)</b></p> <ul style="list-style-type: none"> <li>How have you created a Biodiversity Action Plan for this of the project? Secondly, if oil and gas can be produced, how can our country and local community profit?</li> </ul> <p><b>Answer: (Daw Myat Mon Swe, ERM)</b></p> <ul style="list-style-type: none"> <li>The replantation action plan will be implemented for and removed species.</li> </ul> <p><b>Answer: (U Tint Swe, Executive Director, MPRL E&amp;P GOCs)</b></p> <ul style="list-style-type: none"> <li>This is different from the Yadanar oil and gas example. The drilling cost of one well is between USD 70 and 90 million. We are operator. We are contracted under the MOGE and the government will plan how we go forward. If gas comes out at 550 cubic feet million per day in 2023-24, it will be of benefit to the country. According to profit ratio, Total and Woodside will obtain 40% respectively, MPRL 10 % and MOGE will get 10%.</li> </ul>
<p><b>Question: (Ko Naing Oo, MATA, Phyu Sin Myittar)</b></p> <ul style="list-style-type: none"> <li>How many local people were included in the EIA study group? How long did the EIA field study take? How many international experts were include in this EIA? How much will the EMP cost? How long will the international EIA take?</li> </ul> <p><b>Answer: (Daw Myat Mon Swe, ERM)</b></p> <ul style="list-style-type: none"> <li>In the EIA process, scoping stage takes 3 months and an EIA investigation takes 6 months. In total, 9 months.</li> <li>It will take 9 to 12 months for an International Environmental Impact Assessment (EIA).</li> <li>In the scoping phase, there are two groups; the social team and the baseline team. I led the social team and we worked together with Resource and Environmental Management (REM) and Flora and Fauna International (FFI). WCS was also included. We have international social and biodiversity experts within ERM they provided the methodology for the survey. ERM is a Hong-</li> </ul>



### **Discussion (Questions and Answers)**

Kong Based Company. Once the EIA is completed we then have to submit it to ECD.

- The costs for an EMP vary dependant on the type, location, distance, and situation of the project.

#### **Question: (Ko Phoe Pauk, AYA MATA)**

- ERM is a company or department? Who is the owner of ERM? Is there a clear and reliable relationship between M&AOSB and ERM? Who will take responsibility if the CSR strategy finds that the EIA procedure is not in compliance with typical standards?

#### **Answered by Daw Myat Mon Swe (ERM)**

- There is not any relationship between M&AOSB and ERM. We don't have any chance to choose a third party. ERM is a company organized by 160 offices in 40 different countries. If the CSR strategy finds that the EIA procedure are not in compliance with typical standards, the company will amend the strategy.

#### **Question: (U Naing Lin Htut, MATA)**

- Who will be responsible for that if there is a change in wave direction and any damage to natural beauty and scenery?
- I wonder how the company will take responsibility if there is an accident such as a leakage of oil and gas from damaged pipelines.
- It is necessary that the potentially affected people participate in this meeting so that the CSR strategy can be explained to them.
- How will the assessment performance be able to cover the whole coastal area if the assessments are conducted in only two villages?

#### **Answered: (U Myo Zaw Thant, Senior Engineer)**

- Concerning impacts of wave direction and current speed; there will not be any erosion in the area concerned because the project area is in the third bay and the first two bays act as a defence of project area.
- If there is an accident on this project such as a leakage of oil and gas, an emergency response plan will be implemented and actions taken immediately.

#### **Answered: Daw Kyi Zin Htin Aung (Corporate Affairs Manager)**

- Regarding public awareness about the strategic CSR. The CSR program was held in 2018 inviting the ten-households.

#### **Answered by Daw Myat Mon Swe (ERM)**

- The baseline survey has been designated in accordance with calculations based on map data.

#### **Question: U Soe Hlaing Oo, 88 Pwint Lin)**

- I think that there is no transparency on finance and selling issues between government and company.

#### **Answered by U Tint Swe (Executive Director)**

### *Discussion (Questions and Answers)*

- Finance and selling is the role of government. Information from our side has been submitted to MOGE. There used to be no direct investment. Although the company has submitted a case to the government for direct investment, we are unsure whether it will succeed.

## Photos



Introduction by U Tint Swe, Executive Director



Explanation by U Myo Zaw Thant, Senior Engineer



Explanation by Daw Myat Mon Swe, Senior consultant, ERM



Explanation by Daw Kyi Sin Htin Aung, Cooperate Affairs Manager,



Question 1



Question 2



## Photos



Question 3



Question 4



Question 5



Addendants of the Meeting at Pathein Hotel



Interview session with Media



Interview session with Media

### Attendant List :

Sr.	Name	Position
1.	U Ngwe Htun	Department of Communication and Information Technology
2.	U Kyaw Min Soe	MATA (AYY)
3.	U Mg Mg Mya	

Attendant List :		
Sr.	Name	Position
4.	U Soe Myint Soe	Myanmar Times
5.	U Mg Mg Soe	Myawadi
6.	Daw Hnin Nu Win	Regional education
7.	U Soe Thein	Sky net
8.	U Naing Min Htet	Sky net
9.	U Than Htun Naing	Phyu Sin Myittar
10.	U Khin Nyunt	88/ Nyein/pwint MATA
11.	U Sithu Mg Mg	Mizzima
12.	U Zaw thint	The Voice
13.	Ye thaw ei	MCN
14.	Ko Myo Zaw	MATA
15.	Dr. Aung Kyaing	MATA
16.	U Khin Zaw	ESE
17.	U Aung Khine Soe	ECD
18.	Ko Moe	MATA
19.	Soe Hlaing Oo	88 Generation /pwintlin
20.	Zar Zar Win	Ayeyarwady youth network
21.	U Myint Soe	MATA
22.	U Aung Cho	Patheingyi District GAD
23.	U San Lwin Oo	MATA
24.	U Myo Myin Kyaw	MRTV.NRC
25.	U Kyaw Myo Htet	MRTV.NRC
26.	U Htun Zaw Naing	SB
27.	Min Thu Win Htut	Eleven Media
28.	Daw Aye Aye Maw	Regional education
29.	Daw Mi Mi Aung	District Planning Department
30.	U Thaw Zir Myo	DVB
31.	U Naing Linn Htut	MATA
32.	Daw Nan Aye Aye Khaing	Ayeyarwady youth network
33.	U Nyein Myint	Ga yu nar CSOs
34.	U Aung Bo Bo Htet	MATA AYA
35.	U Soe Zaw latt Myint	MATA CO
36.	U Tin Swe	MPRL E&P GOCs
37.	Daw Kyisin Htin Aung	MPRL E&P GOCs
38.	U Myo Zaw Oo	MPRL E&P GOCs
39.	U Myo Zaw Thant	M&A OSB
40.	Daw Myat Mon Swe	ERM
41.	U Aung Soe Min	ERM

Detail	
<b>Project</b>	EIA Disclosure for Myint & Associates Offshore Supply Base
<b>Venue</b>	Township General Administrative Office
<b>Township</b>	Nga Yoke Kaung Township, Ayeyarwady region.
<b>Objective</b>	EIA Disclosure
<b>Date</b>	14/3/2018 (Wednesday)
<b>Time</b>	13:00 to 15:00
<b>Attendee List</b>	34

The summary of presentations is provided in *Section 3.1.1*.

Discussion (Questions and Answers)
<p><b>Question: (U Than Nyunt, Local people from Nga Yoke Kaung Township)</b></p> <ul style="list-style-type: none"> <li>• After submitting EIA report, will the environmental impact assessment continue?</li> <li>• Are there plans for job opportunities in the local communities?</li> </ul> <p><b>Answer: (Daw Myat Mon Swe, ERM)</b></p> <ul style="list-style-type: none"> <li>• After submitting the EIA for review to ECD (MONREC), a group which includes representatives from 15 ministries. A 3rd party International consultant group from the Norway environment agency (NEA) analysed the EIA and had a review meeting to make comments. These comments instructed additional surveys or amendments etc. to be applied to the EIA. We revised our EIA in compliance with those comments and submitted again to ECD. Meanwhile, we continuously collected local people's concerns and potential impacts through EIA disclosure and public consultation. We presented the public concerns and detailed the mitigation measures required and potential impacts in the review meeting. After this process and the 15 ministries (including law, Fishery and ECD) are satisfied the EIA study we submit the revised EIA version. The Environmental Compliance Certificate (ECC) will be gained if all authorities are satisfied. After getting the ECC the project proponent will proceed with the project accordingly.</li> </ul> <p><b>Next question:</b> Is ERM supervising the air and noise monitoring along the whole project period? ERM had already studied air, water, and soil pollution, why is it not finished?</p> <p><b>Answer: (Daw Myat Mon Swe, ERM)</b></p> <ul style="list-style-type: none"> <li>• In the EIA, there is the environmental management plan (EMP) which includes emergency response plan and monitoring plans etc. According to EMP, the project proponent will have to conduct monitoring every 6 months by hiring a third party (which could be ERM). After this, they will submit a monitoring report to the related department. The ECD will investigate whether all monitoring is done in compliance with EMP. If not found in compliance, the inspection team will pay penalties including possible closing of the project according to law.</li> </ul> <p><b>Answer: (U Tint Swe, Executive Director, MPRL E&amp;P GOCs)</b></p>



### Discussion (Questions and Answers)

- At the start our project, we will have 80 labourers from M&A OSB and may need more than 200 labourers for the first phase. For the main construction phase, we will need 400-700 labourers. Concerning the employment opportunities of this project, we will use local people. We focused on education in order to improve skill development through our CSR programs. We will run this project as a 30 year (long-term) project. The Chief Minister of Ayeyarwady region has said that regional governments would collect the lists of graduates from three Technological universities. We then have to create employment opportunities for them. Most graduates have limited opportunities due to the lack of projects. We have planned to interview the graduates from this region and give jobs to qualified people. We are planning to start our project in January 2019. Although we would like to start this for our project, we are waiting to get the ECC for the project.

### Comment: (Daw Myat Mon Swe, ERM)

- According to the officer from department of fishery, the DOF restricted the offshore fishing on the 16 May to 15 August 2018. This is new information for us.

### Photos



## Photos



Attendant List :		
Sr.	Name	Position
1.	U Tun Ngwe	
2.	U Zaw Win	
3.	U Kyin Aung	
4.	U Thein Htay	
5.	U Nyunt Soe	
6.	U Myo Thuya Zaw	Assistant officer (department of fishery)
7.	U Maung Maung	
8.	U Myint Soe	
9.	U Maung Maung Lwin	Department of Highway
10.	U Myo Myint	
11.	U Lin Lin	Ward (2) administrator
12.	U Zaw Min Oo	Kywe Gyaing administrator
13.	U Wint Nyunt	Kywe Gyaing
14.	U Kyaw Htay	Moe Dain Pyin administrator
15.	Dw Kyaw Marlar Lwin	Deputy officer
16.	U Phyo Wai Soe	Nan Tar Pu
17.	U Thant Zin Hlaing	Second supervisor (electricity)
18.	U Set Minn Oo	Executive officer (Township development committee)
19.	U Myo Zaw Aung	Sabagyi
20.	U Than Nyunt	Nga Yoke Kaung
21.	U Hla Kyaing	
22.	U Phone Lwin	
23.	U Soe Lwin	Township officer (land record department)
24.	U Kyaw Swar Htun	Township Officer (Agriculture)
25.	Daw Ni Ni Win	Post Officer
26.	U Than Htay Aung	Officer (Firestation)
27.	U Shwe Aung	Policeman
28.	U Thuya	Nga yoke kaung

Attendant List :		
Sr.	Name	Position
29.	U Tin Swe	MPRL E&P GOCs
30.	Daw Kyisin Htin Aung	MPRL E&P GOCs
31.	U Myo Zaw Oo	MPRL E&P GOCs
32.	U Myo Zaw Thant	M&A OSB
33.	Daw Myat Mon Swe	ERM
34.	U Aung Soe Min	ERM

Detail	
<b>Project</b>	EIA for Myint & Associates Offshore Supply Base
<b>Venue</b>	Monastery
<b>Township</b>	Nga yoke kaung Township, Ayeyarwady region.
<b>Objective</b>	EIA Disclosure
<b>Date</b>	14/3/2018 (Wednesday)
<b>Time</b>	3:30 Am to 5:00 Pm
<b>Attendee List</b>	36

#### Discussion (Questions and Answers)

##### Question: (Villager)

- How about job opportunities for graduates from local community. Is there any detail plans for employment opportunities?

##### Answer: U Tint Swe, (Executive Director, MPRL E&P GOCs)

- At the start our project, we will have 80 labourers from M&A OSB and may need more than 200 labourers for the first phase. For the main construction phase, we will need 400-700 labourers. Concerning the employment opportunities of this project, we will use local people. We focused on education in order to improve skill development through our CSR programs. We will run this project as a 30 year (long-term) project. The Chief Minister of Ayeyarwady region has said that regional governments would collect the lists of graduates from three Technological universities. We then have to create employment opportunities for them. Most graduates have limited opportunities due to the lack of projects. We have planned to interview the graduates from this region and give jobs to qualified people. We are planning to start our project in January 2019. Although we would like to start this for our project, we are waiting to get the ECC for the project.
- Moreover, we would like to request the trust of the community.

##### Replied by Local Villagers

- We are willing to trust the information is correct. So please implement this project.



## Photos



### Attendant List :

Sr.	Name	Position
1.	U Soe Maung	Villager
2.	U San Myint	10 HH leader
3.	U Myint Aung	Villager
4.	U Aung Kyaw Myint	Township development committee
5.	U Hla Kywe	Villager
6.	U Hla Myint	Villager
7.	U Than Nyunt	Villager
8.	U Hla Soe	14/ nga pa ta (N) 082536
9.	U Zaw Myo Oo	14/ ma ma na(N) 206385
10.	U Than Aung	Villager
11.	U Kyaw Khin	Villager
12.	U Zaw Win	Villager
13.	U Myint Shwe	Villager
14.	U Aung Aung	Villager
15.	U Nay Win Htike	Villager

Attendant List :		
Sr.	Name	Position
16.	U Min Naing	Villager
17.	Mg Zin min thant	Villager
18.	U Han Myint	Villager
19.	U Htay Win	Villager
20.	U Hla Win Aung	Villager
21.	U Tun Ngwe	Villager
22.	U Win Khaing	Villager
23.	U Kyaw Linn Aung	Villager
24.	U Wunna Mg Mg	Villager
25.	U Thet Oo	Villager
26.	U Aye Ko	Villager
27.	U Saw	Villager
28.	U Nyo Mine	Villager
29.	U Htun Kyi	Villager
30.	U Win Shwe	Villager
31.	U Maung Htay	Villager
32.	U Chit Own	Villager
33.	U Maung Pu	Villager
34.	Daw Cho Cho Wai	Villager
35.	Daw Htay	Villager
36.	U Tin Own	Villager

### 3.1.9

### Meeting Minutes of Nant Thar Pu Village

Detail	
<b>Project</b>	EIA for Myint & Associates Offshore Supply Base
<b>Venue</b>	Chapel
<b>Township</b>	Nant Thar Pu Village, Ayeyarwady region.
<b>Objective</b>	EIA Disclosure
<b>Date</b>	15/3/2018 (Thursday)
<b>Time</b>	1:00 Am to 3:00 Pm
<b>Attendee List</b>	91

Discussion (Questions and Answers)
<p><b>Question U Kyi Aye (Kywe-Chaing)</b></p> <ul style="list-style-type: none"> <li>• Could you provide the project's location before EIA Study?</li> <li>• How will the potential impacts on fishermen be identified?</li> <li>• Why was the EIA study only in Nan Ta pu village?</li> <li>• Why did ERM exclude other villages?</li> <li>• We would like to know the distance of EIA study from the village.</li> </ul> <p><b>Answered by U Tint Swe (Executive Director, MPRL E&amp;P GOCs)</b></p> <ul style="list-style-type: none"> <li>• We are planning to start our project in January 2019. In first phase, the project area will be about 30 acres and increase to 40 acres for next phase. Total area will be between 60 and 70 acres. The EIA study is the role of third party, ERM. The EIA must be undertaken for every operation. The EIA study area distance around the site is 5km.</li> </ul> <p><b>Answered by U Myo Zaw Thant (Senior Engineer, M&amp;A OSB)</b></p> <ul style="list-style-type: none"> <li>• If there is an accident in this project such as leakage of oil and gas, the replacement and resettlement procedures will be conducted urgently. Emergency Response Plan in HSE policy will be continued.</li> </ul> <p><b>Answered by Daw Myat Mon Swe (Senior Consultant, ERM)</b></p> <ul style="list-style-type: none"> <li>• The EIA study has to be undertaken within a specific time frame. You can study all procedures in the Myanmar EIA procedure 2015. We have to select sample points considering limitations such as time, work-done etc. We have to conduct this EIA according to EIA procedures, which is why we have explained the EIA process to you.</li> </ul> <p><b>Response by Daw Nant Cho Pyone</b></p> <ul style="list-style-type: none"> <li>• This consultation meeting seems skipped so many steps. For example, local people did not know what CSR was until now. Company must take the responsibility to explain everything. Please could you explain more?</li> </ul> <p><b>Answered by U Tint Swe (Executive Director, MPRL E&amp;P GOCs)</b></p> <ul style="list-style-type: none"> <li>• I would like to apologise if there have been misunderstandings. The main reason why we came today here is to explain Environmental impact assessment.</li> </ul> <p><b>Replied by Daw Nant Cho Pyone</b></p> <ul style="list-style-type: none"> <li>• Please also explain the CSR strategy.</li> </ul>

### Discussion (Questions and Answers)

#### Answered by U Tint Swe (Executive Director, MPRL E&P GOCs)

- U Tint Swe explained CSR to the meeting room. CSR starts when the project is initiated. In the Mann oil field, we had been conducting our CSR strategy for 22 years and there have been many lessons learnt during this process. If something happens, all related persons have to take action and take the responsibility solve the problem.

#### Suggested by U Aye Kyaw, Kywe Gyaing Villager

- There is a need for a centre for us to raise any complaints so we can solve any upcoming problems.

#### Question: Daw Nant Cho Pyone.

- How many times did you meet with local community concerning with EIA?

#### Answered by Daw Myat Mon Swe, ERM,

- We met with local community on January 16<sup>th</sup> 2017 and a second time between February and March. A third meeting concerned an air and water monitoring survey. In total we have met with stakeholders 8 times including baseline surveys and public consultations.

#### Question 3. Asked by Ko Than Zaw Lay

- In this EIA disclosure, it is stated that only 34 species were found in terms of fish species. Actually, we know that there is more than 200 species around this area. Shark are also here but they mentioned that they didn't find. In my opinion, this study is not detailed enough.

#### Answered by Daw Myat Mon Swe, ERM

- The fish species we presented is what we found at the baseline biodiversity's survey period. In the literature, there are more than 200 species.

#### Suggested by Ko Nay Tar

- A Nan Ta Pu villager said that they don't like this project because they feel that they, the Nan Tha Pu people are concerned with the pros and cons of this project. Other villages (such as Kywe Gyaing) have always disturbed the meetings that were held in Nan Tha Pu village. They came with the bad points of view. Therefore, there is needed to separate these villagers in future meetings.



## Photos



Registration session



Attendents



Explanation by U Tint Swe



Explanation by U Myo Zaw Thant



Explanation by Daw Myat Mon Swe



Explanation by Daw Kyi Sin Htet Aung

## Photos



Question by U Kyi Aye



Question by Daw Nant Cho Pyone



Question by Than Zaw Lay



Explanation CSR

### Attendant List :

Sr.	Name	Position/address
1.	U Phyo Wai	Kyauk pyar
2.	Ma Hnin Su Linn	Nga yoke kaung
3.	U Htun Kywe	
4.	U Taing phay	
5.	U Chit Oo	Ale kone
6.	Daw Shwe Than	
7.	Daw Win Win Than	Zin yaw gyaung
8.	Ma Hnin Hnin Aye	
9.	U Aung Gyi	Sate Kam
10.	U Aung Ko Minn	Nan Ta pu
11.	Daw Kyi Aye	
12.	Ma Arr San	
13.	Ko Htun Htun Oo	Gyaing Ka lay
14.	Daw Mya Mya	
15.	U Htun Htun	Ale kone



Attendant List :		
Sr.	Name	Position/address
16.	U Aung Kyaw Htun	Kywe Gyaing
17.	U Kyi Aye	Kywe Gyaing
18.	Ma San Htwe	
19.	Ma Nan Cho Win	
20.	U Myo Ko Naing	
21.	Ma Khin Mar Aye	Ale kone
22.	Daw Moe Thu Zar	Kyauk pyar
23.	Daw Nant Noe lar	Kyauk pyar
24.	Ma Thin Myat Htun	Nga yoke kaung
25.	U Phyo Lwin Oo	Nga yoke kaung
26.	U Nyan Htun Linn	
27.	Daw Nan	
28.	U Aung Aung	Kyauk pyar
29.	U Kaung myat san	Sate kam
30.	U Ye Kyaw Thu	Ale kone
31.	U Shwe Daing Linn	Nan Ta pu
32.	U Htun Lwin	Nan Ta pu
33.	U Moe Kyaw	Nan Ta pu
34.	U Nyein Chan	
35.	Daw Khin Ye	
36.	U chin Htoo	
37.	Daw Win Sandar	
38.	Daw Aye Aye Win	
39.	Daw Nant Cho Pyone	
40.	Daw Nant Aye Cho	
41.	Daw Nu Yin	Ale kone
42.	Ko Chit Ka lay	Ale kone
43.	Daw Kyu Kyu	Nan Ta Pu
44.	U Tun Shwe	Gyaing lay
45.	Ma Nyo	
46.	Mg Thet Naung	Gyaing Lay
47.	Daw Kaw Yoke	Kyauk Pyar
48.	Daw Yin Yin Nu	Ale kone
49.	Daw Khin San Myint	Kyauk Pyar
50.	Daw Si Si Win	Ale kone
51.	U Man Pyi Taw Aye	
52.	U Mya Kyan	
53.	U Tin Oo	
54.	U Zaw Min Lay	
55.	Daw Than win	Sate kam
56.	U Thein Win	Sate kam
57.	U Man thit	Ale kone



Attendant List :		
Sr.	Name	Position/address
58.	Daw Saw Ngwe	Kyauk Pyar
59.	Daw Taung Kyi	
60.	U Aung Soe	Gyaing Lay
61.	Daw Nant Yin Yin Htike	Nan Ta Pu
62.	Daw Nant Thin Kyu	Nan Ta Pu
63.	U Thein Soe	Nan Ta Pu
64.	U Aye Kyaw	Nan Ta Pu
65.	U Zayar Thein	Nan Ta Pu
66.	Daw Ei Ei Phyo	Gyaing lay
67.	U Min Nyunt	Ale kone
68.	Daw kyi ya Aung	Gyaing lay
69.	Daw Nant Aye Mi Cho	Gyaing lay
70.	Daw maw saw phalar htoo	Ale kone
71.	U Yan Naing Oo	Nan Ta Pu
72.	U Henry	Ale kone
73.	U Mya Than Htun	Ale kone
74.	U phoe Ate	Sate kam
75.	U Myo Thaw	Zin Yaw Gyaung
76.	Daw Nan Myint Myint Aye	Nan Ta Pu
77.	Daw Pu Si	
78.	Daw Moe Moe	
79.	U Khin Kyaw Oo	
80.	Daw Nant Than Than Htwe	Kyauk pyar
81.	U Htun Lwe	Kyauk Pyar
82.	U Hay Myo San	Ale kone
83.	U Ba Win Kyi	Gyaing Lay
84.	Ma Yin Hla	
85.	U Than Zaw Lay	Kyauk pyar
86.	U Soe Myint	Kyauk pyar
87.	Daw Nu Nu Lwin	Ale kone
88.	Ma Lin Lin Soe	Kyauk Pyar
89.	Daw Nay Zar	Kywe Gyaing
90.	Daw Nant Marlar	Nan Ta Pu
91.	U Saw Ngwe	Nan Ta Pu

### 3.1.10

### Meeting Minutes of Parliament Meeting

Detail	
<b>Project</b>	EIA for Myint & Associates Offshore Supply Base
<b>Venue</b>	Parliament Meeting Office
<b>Township</b>	Patheingyi Township, Ayeyarwady region.
<b>Objective</b>	EIA Disclosure
<b>Date</b>	16/3/2018
<b>Time</b>	1:00 pm to 3:00 pm
<b>Attendee List</b>	14

Discussion (Questions and Answers)
<p><b>Question: How did you acquire land? How many acres is the project area? How have you discussed with local people? How are you conserving the coral reefs.</b></p> <p><b>Answered: M&amp;AOSB</b></p> <ul style="list-style-type: none"> <li>We have ~30 acres of land to be acquired including 3 acres of garden land, 12.17 acres of farmland, and 14 acres of other lands. We bought the garden land at current land prices from local people. Our investment on land acquisition is 3 USD million until now. We have permits from the central committee. However, we are waiting to get a permit for 14 acres of other land. We have another 20 acres, which have been bought for an additional phase. The total land area we have is nearly 50 acres. We submitted to MIC with 30 acres for project areas. We have already prepared EIA report and already submitted to ECD. If we get an Environmental Compliance Certificate (ECC), we are planning to start construction in January 2019. We hope the permit for other lands (14 acres) will be received at this time.</li> </ul> <p><b>Question: Hluttaw representative: Are the other lands free land or Form 7?</b></p> <p><b>Answered by M&amp;AOSB:</b></p> <ul style="list-style-type: none"> <li>Other lands are free land. However, the extra land 20 acres that we bought are farmland. We hope total project area will be nearly 70 acres.</li> </ul> <p><b>Answered by Daw Myat Mon Swe, ERM</b></p> <ul style="list-style-type: none"> <li>At the public disclosure meeting in Yangon, we discussed with Daw Day Ve Thant Sin (Myanmar Green Network) and other NGOs, CSOs about this EIA. Their main concern was around building trust with local people and transparency.</li> <li>We discussed with CSOs in Patheingyi. Their concern was about how ERM relate with MPRL (M&amp;A OSB)?</li> <li>According to the results of the meeting, the local community didn't have any concerns about coral reefs. They only had concerns about the CSR policy.</li> <li>In this meeting we were shown some additional fish species that were present in the area. This information was very useful for us and we welcomed the local people's contributions. We will revise and update this new information in our EIA.</li> </ul> <p><b>Question: Hluttaw representative</b></p> <ul style="list-style-type: none"> <li>How do you plan on obtaining the required energy if construction starts?</li> </ul>

### Discussion (Questions and Answers)

#### Answered by U Tint Swe.

- In the long-term, we plan to use generator for our energy requirements. At we are using solar energy for lighting.

#### Question: Hluttaw representative asked about employment opportunities?

#### Answered by U Tint Swe (Executive Director, MPRL E&P GOCs)

- The Chief Minister of Ayeyarwady region has said that regional governments would collect the lists of graduates from three Technological universities. We then have to create employment opportunities for them. Most graduates have limited opportunities due to the lack of projects. We have planned to interview the graduates from this region and give jobs to qualified people. We are planning to start our project in January 2019.
- At the start our project, we will have 80 labourers from M&A OSB and may need more than 200 labourers for the first phase. For the main construction phase, we will need 400-700 labourers. Concerning the employment opportunities of this project, we will use local people. We focused on education in order to improve skill development through our CSR programs. We will run this project as a 30 year (long-term) project..

#### Additional Comment

- How do you plan to use water supply if construction starts? If the jetty is 10m high, what kinds of ship will use this OSB? Could you show layout plan of project?

#### Answered by U Myo Zaw Thant

- We obtain water in three different ways; firstly by using treated sea water, secondly by using ground water (which may affect the surrounding environment) and thirdly by constructing a reservoir. The best options for us is treated sea water.
- The ship that we use is 8m high (max 10m and 13000 tonnes).
- In terms of layout plan, we are modifying the layout plan but I can explain if you want using the image in the presentation.

#### How do you plan to mitigate any noise from construction, it may disturb tourists? What is EIA study distance? How will you dispose of waste water?

#### Answered by ERM

- We will install a noise barrier (you can see the noise barrier near Shwegonedaing bridge in Yangon) in order to mitigate noise impacts. Good maintenance of equipment will mean it will have less effect on the surrounding environment.
- The EIA study distance is 5km from the project site.
- In terms of wastewater, they will install water treatment plant in accordance with the EMP.

## Photos



## Attendant List :

Sr.	Name	Position
1.	U Tin Swe	Executive Director, MPRL E&P
2.	Daw Kyisin Htin Aung	Corporate Affairs Manager, MPRL E&P
3.	U Myo Zaw Thant	Senior Engineer, M&A OSB
4.	U Myo Zaw Oo	Senior Officer, MPRL E&P
5.	Daw Myat Mon Swe	Senior Consultant, ERM
6.	Aung Soe Min	Assistant Consultant
7.	Dr. Soe Thein	Regional 1
8.	U Bo Bo Zin	Regional 2
9.	U Soe Khaing	Member of Parliament
10.	U Khaing Win	Member of Parliament
11.	U Wai Yan Tun	Member of Parliament
12.	U Aung Naing Tun	Member of Parliament
13.	Daw Yee Yee Tun	Member of Parliament
14.	U Phyo Zaw Shwe	Member of Parliament

Annex (A)

(Invitation List and Card)

## Invitation List (Yangon)

No.	Name / Organization	Mail	Contacts
<b>Government</b>			
1.	Daw Khin Thida Tin / ECD	Director	09 255801255
2.	Myanmar Port Authority	E-mail : mpa@mptmail.net.mm, mpa-sad@mptmail.net.mm	Tel: +95-1 382722, 384732, 384738 Fax: +95-1 295134, 256321, 256336, 391355, 246781
3.	U Thant Zin, Department of Fishery		
<b>NGOs</b>			
4.	Biodiversity And Nature Conservation Association	banca@yangon.net.mm	667067
5.	EcoDev	ecodev@myanmar.com.mm; winmyothu@gmail.com	500464
6.	Ecosystem Conservation and Community Development Initiative	eccdi.myanmar@mptmail.net.mm, eccdi.mm@gmail.com	510902; 504225
7.	Environmental and Economic Research Institute		245762, 249152, 395512 246634, 652236, 6252237, Ext 102
8.	Fauna & Flora International	frank.momberg.fifi@gmail.com	01667067
9.	Forest Resource Environment Development & conversation Association	fredamyanmar@gmail.com	01243827
10.	Friends of Rainforests in Myanmar	form.myanmar@gmail.com	01503671
11.	Global Green Group	3g.globalgreen@gmail.com	01374714 09-2450211
12.	Green Memo	greenmemo9@gmail.com	01 66 55 42
13.	Green Nature Group	gnature21@gmail.com wincho1020@gmail.com	09-8033554
14.	International Commission of Jurists (Geneva based NGO)	seanjbainwork@gmail.com	09-263533230
15.	Mangrove and Environmental Rehabilitation Network	mern.myanmar@gmail.com , mernmyanmar@goldenland.com.mm	554254
16.	Marine Science Association Myanmar	msam1973@gmail.com, tintun@gmail.com	513165, 095417527
17.	Myanmar Centre for Responsible Business (MCRB)	<a href="mailto:vicky.bowman@myanmar-responsiblebusiness.org">vicky.bowman@myanmar-responsiblebusiness.org</a>	09 448011895
18.	Water, Research and Training Centre	wrtcmyan@gmail.com aiweb.lead@gmail.com	09 511 1880 0943154667
19.	Wildlife Conservation Society	wcsmm@mptmail.net.mm/	524893, 512984




No.	Name / Organization	Mail	Contacts
		wcsmp@myanmar.com.mm	
20.	Youth Empowerment Association	rocketphilo@gmail.com	09 513 2285, 535049; 549654
21.	Myanmar Fisheries Federation	<a href="mailto:fishfedmyanmar@gmail.com">fishfedmyanmar@gmail.com</a> info@fishfedmyanmar.com fishfed.mff@gmail.com	095-1-683652, 095-1- 683653, 095-1-683657, 095-1-683658
22.	Marine Science Association Myanmar	tintwai63@gmail.com	(+95)09420025484 - Tint Wai
23.	Myanmar Environment Rehabilitation- Conservation Network (MENR)	mern.myanmar@gmail.com	(+95) 09 33608339, 09 448016358
24.	Biodiversity and Nature Conservation Association (BANCA)		banca@yangon.net.mm
25.	U Saw Htun, Wildlife Conservation Society - Myanmar Program	sawhtunwcs@gmail.com	P: +95 1 524893/ 512984 F: +95 1 512838 M: +95 9 254079030
26.	U Ohn (Chairman), Forest Resource Environment Development And Conservation Association (FREDA)	freda@mptmail.net.mm , fredamyanmar@gmail.com	Phone: 01-243827
27.	Donald Kyaw Hla, Mangrove Services Network	dkiyawhla@gmail.com	0973213356 (office) 0943024157, 0973152702
<b>Media</b>			
28.	MRTV-4	<a href="mailto:enquiry.mrtv4@gmail.com">enquiry.mrtv4@gmail.com</a> MRTV Compound မြန်မာ့ ရန်ကုန်မြို့	+01 2399444
29.	7days news		01 513 515
30.	Myanmar Times News	No.379/383, Bo Aung Kyaw Street, Kyauktada Township Yangon	01 392 928
31.	Global New Light of Myanmar	#150, Ngar Htat Gyi Pagoda Street, Bahan Township Yangon 11201	01 860 4529



*Invitation List (Ayeyarwady)*

Invitation List in Ayeyarwady
Government Offices
General Administration Department (District, Township, local village leader)
Environmental Conservation Department (ECD)
Department of Fishery
Department Agriculture Land Management and Statistic
Department of Agriculture
Department of Forestry
Parliament Member (House of Representatives)
Parliament Member (House of nationalities)
CSOs
NGOs
Fishermen
Media
Local People/ Interest people

Invitation card



## ဖိတ်ကြားလွှာ

Myint & Associates Offshore Supply Base Ltd. (M&AOSB) သည် မြန်မာနိုင်ငံ၊ ဧရာဝတီတိုင်းဒေသကြီး၊ ငရှပ်ကောင်း ပင်လယ်အော်အနီးတွင် ကမ်းလွန်ထောက်ပို့ရေးစခန်းတစ်ခုအား တည်ဆောက်ရန် ရည်ရွယ်လျက် ရှိပါသည်။

ဤစီမံကိန်းဆောင်ရွက်ရာတွင် မြန်မာနိုင်ငံ၏ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး နည်းဥပဒေ (၂၀၁၄)နှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်း(၂၀၁၅) တို့အရ ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA ) အား Environmental Resources Management -ERM နှင့် Resource and Environment Myanmar (REM) တို့မှ M&AOSB ကိုယ်စား ဆောင်ရွက်ခဲ့ပြီး ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာအား သံယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသို့ တင်ပြခဲ့ပြီးဖြစ်ပါသည်။

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းတွင် တစ်ခုအပါအဝင်ဖြစ်သော ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ၏ စီမံကိန်းအကျဉ်းချုပ် ထုတ်ပြန်ခြင်းနှင့် သက်ဆိုင်ရာ စီမံကိန်းနှင့် ပတ်သက်ဆက်နွှယ်သူများနှင့် တွေ့ဆုံ၍ သတင်းအချက်အလက်များ ဖြန့်ဝေမည့် ဆွေးနွေးပွဲအား အောက်ပါအတိုင်း ကျင်းပပြုလုပ်သွားမည်ဖြစ်ပါသဖြင့် ကြွရောက်ပေးပါရန် လေးစားစွာဖြင့် ဖိတ်ကြားအပ်ပါသည်။

နေ့ရက်။	။	၂၀၁၈ခုနှစ်၊ မတ်လ (၈)ရက် (ကြာသောပတ်စနေ)
အချိန်။	။	နံနက် ၁၀:၀၀ မှ ၁၂:၀၀ နာရီထိ
နေရာ။	။	Vantage Tower ၆၂၊ ပြည်လမ်း၊ ကမာရွတ်မြို့နယ်၊ ရန်ကုန်မြို့

Annex (B)

(Presentation and Factsheets)



## MPRL E&P ကုမ္ပဏီအဖွဲ့ အစည်းများ



**အထက်ပိုင်းအဖွဲ့**  
ကုမ္ပဏီအဖွဲ့အစည်းများ  
ကုမ္ပဏီအဖွဲ့အစည်းများ

- မြန်မာနိုင်ငံတော်အတွင်းရှိ အဓိကကုမ္ပဏီများနှင့် ပူးပေါင်းဆောင်ရွက်နေပါသည်။
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**အထက်ပိုင်းအဖွဲ့**  
ကုမ္ပဏီအဖွဲ့အစည်းများ  
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**Mynt & Associates**  
ကုမ္ပဏီအဖွဲ့အစည်းများ  
ကုမ္ပဏီအဖွဲ့အစည်းများ

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## MPRL E&P Group of Companies



**Upstream E&P Company**  
Founded in 1996  
200 direct & 1,204 indirect employees  
• One of the largest Myanmar energy traders in the country, upstream oil and gas sector  
• Main contractor to MOGE in Block 4  
• Operator of offshore Block A 6



**Upstream E&P Company**  
Established in 2014  
• Partner in offshore Blocks A 4 and A 7 together with Winadale and BSC  
• Also participating in offshore Blocks B27 & B28 together with BSC



**Service Company**  
Founded in 1989  
700 employees  
• Founding member of the group  
• General service contractor for a broad range of services, including consulting, logistics & procurement, catering & housekeeping, design & architecture, engineering, construction & maintenance



**Offshore Supply Base Company**  
Founded in 2007  
• Established to develop a world class offshore supply base near Taga Taka island and deliver logistics services for the offshore oil and gas industry in Myanmar

## မိမိတို့၏မိမိတို့



- မြန်မာနိုင်ငံတော်အတွင်းရှိ အဓိကကုမ္ပဏီများနှင့် ပူးပေါင်းဆောင်ရွက်နေပါသည်။
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## Project Introduction



- Mynt & Associates Offshore Supply Base Ltd intends to develop a world class offshore supply base which can compete with other supply bases in Thailand, Singapore and Malaysia
- This offshore supply base will provide necessary materials and fuel as well as logistics and storage services to current and future Oil & Gas Exploration and Production activities in Myanmar Offshore



မိမိတို့တည်နေရာ ရွေးချယ်ခြင်း - ဒေသအလိုက်

[illegible]

- ဆရာတော်မြို့ - ဘဒ္ဒေါလမြို့နယ်
- ဆူဆီတောင်ကြီးဝယ်တောင်
- သီပေါ - သာစာတောင် - မြို့နယ်တစ်ခု
- ခရီး - မြို့ - ခရီးတစ်ခု
- သာစာတောင် - ခရီးတစ်ခု

[illegible]

## Site Selection - Regional

M&A initially evaluated five potential sites for an O&G to serve the upcoming Offshore Oil & Gas industry:

- Kyaikphyi – too remote
- Nga Uko Kaung Bay
- Thilawa/Thaketa – too congested
- Mandalay – too exposed
- Dawei – too complex

In terms of location and time, constructability and complexity to develop, Nga Voke Kaung Bay was clearly preferred. Due to its location it can serve the most fields within 24 hours response time.



ပီပံဂီနီးတည်နေရာ မွေးဖွားခြင်း - အသားစိတ်



### 5) Initial Concept Layout

### Site Selection (Planning)

4. Credit and selection analysis (credit selection analysis) are done without any weighting factor
5. The following criteria are:
- Market Growth
  - Relative Profitability
  - Manufacturing strategy required
  - Customer base sustainability
  - Impact on brands
  - Environmental impact
  - Industry trend comparison
  - Relative cost
- The following table shows the results of the credit and selection analysis for the three products.
- |                                 | High Value | Low Value |
|---------------------------------|------------|-----------|
| Market Growth                   | High       | Low       |
| Relative Profitability          | High       | Low       |
| Manufacturing strategy required | High       | Low       |
| Customer base sustainability    | High       | Low       |
| Impact on brands                | High       | Low       |
| Environmental impact            | High       | Low       |
| Industry trend comparison       | High       | Low       |
| Relative cost                   | High       | Low       |

*Always handling as based on the limited information available at the stage and our engineering judgement*

It is recommended to repeat this test after more detailed average body mass stabilisation.

Land availability is likely to be the limiting factor.

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[illegible]

## Site Selection - Detailed



### 5) Initial Concept Layout

## Site Selection (Ranking)

- Quick site selection analysis: distribution analysis; site data; rainfall; any weighting factor
  - The weighting criteria are:
    - Water supply
    - Natural Protection
    - Infrastructure development required
    - Land use compatibility
    - Impact on locals
    - Environmental impact
    - Government ownership
    - Distance cost
- |                                     | Weighting factor | Rank | Location   |
|-------------------------------------|------------------|------|------------|
| Water supply                        | 1                | 1    | Location 1 |
| Natural Protection                  | 2                | 2    | Location 2 |
| Infrastructure development required | 3                | 3    | Location 3 |
| Land use compatibility              | 4                | 4    | Location 4 |
| Impact on locals                    | 5                | 5    | Location 5 |
| Environmental impact                | 6                | 6    | Location 6 |
| Government ownership                | 7                | 7    | Location 7 |
| Distance cost                       | 8                | 8    | Location 8 |

None coding is based on the linked information available at the stage and our engineering judgement.

It is recommended to present this paper with the usual methods of survey data: focus, quantitative

Land availability is studied on the other direction factor.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

**Layout**

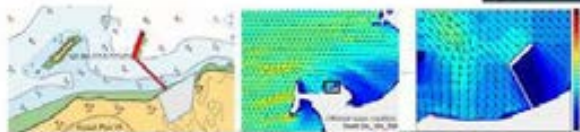
(Multi-criteria analysis) table

	Score	Location A	Location B	Location C	Location D	Location E	Location F	Location G	Location H	Location I	Location J	Location K	Location L	Location M	Location N	Location O	Location P	Location Q	Location R	Location S	Location T	Location U	Location V	Location W	Location X	Location Y	Location Z							
Criterion 1	10	9	8	7	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20			
Criterion 2	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	
Criterion 3	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	-1	-2	
Criterion 4	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	
Criterion 5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
Criterion 6	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27
Criterion 7	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
Criterion 8	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47
Criterion 9	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57
Criterion 10	100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67



## ဒီဇိုင်းဆွဲချက်

မိလိက-ဒီဇိုင်းဆွဲချက်ဆိုင်ရာ အချက်အလက်များအပေါ် အခြေခံ၍ ဆွဲချက်ပြုစုခြင်း



◆ Bathymetric Data (Water Depth) ◆ Metocean Data (Waves)

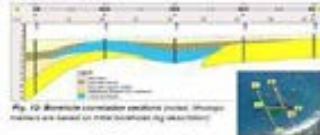
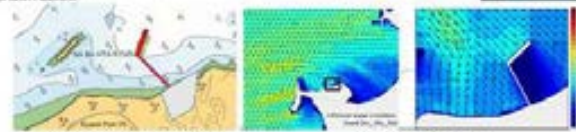


Fig. 12. Jetties cross-section (notes: change values are based on other locations by observation)

◆ Geotechnical Data

## Design Selection

The jetty design is selected on the basis of the technical parameters as shown below



◆ Bathymetric Data (Water Depth) ◆ Metocean Data (Waves)

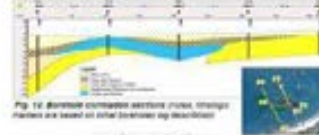


Fig. 13. Jetties cross-section (notes: change values are based on other locations by observation)

◆ Geotechnical Data

## ဒီဇိုင်းဆွဲချက်

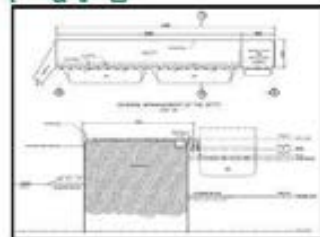


Fig. 14. Jetty Design (Notes)



Fig. 15. Jetty Design (Notes)



ကန့်သတ်

Gravity Type Cofferdam ကို အသုံးပြုခြင်း

- 1) Sheltered Berth အဖြစ် အသုံးပြုခြင်း
- 2) Hard Soil Condition မှာ အကျိုးရှိစေခြင်း

## Design Selection

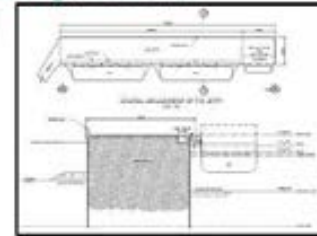


Fig. 16. Jetty Design (Notes)

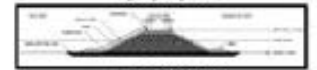


Fig. 17. Jetty Design (Notes)



Conclusion

A gravity type cofferdam structure is selected as it is

- ◆ Creating Sheltered Berth
- ◆ Creates less impact during construction in view of the hard soil condition



## ပီတင်နီဆိုင်ရာ အသေးစိတ်အချက်အလက်များ

အမည်အမျိုး	အချက်အလက်များ
ပီတင်နီအမည်	ပီတင်နီ အသေးစိတ်အချက်အလက်များ
ပီတင်နီအမည်	Myint & Associates Offshore Supply Base Ltd (MSAOBS)
ပီတင်နီအမည်	ပီတင်နီ အသေးစိတ်အချက်အလက်များ
အသေးစိတ်အချက်အလက်များ	ပီတင်နီ အသေးစိတ်အချက်အလက်များ
ပီတင်နီအမည်	ပီတင်နီ အသေးစိတ်အချက်အလက်များ



## Project Description

Component	Details
Name of the Project	Myint & Associates Offshore Supply Base
Project Owner	Myint & Associates Offshore Supply Base Ltd. (MSAOBS)
Area of the Project	12.12 ha (onshore) and 1.2 ha (offshore). This could be expanded up to 50 ha in the future.
Type of Infrastructure	Jetty with a platform and a main onshore base
Plans after commencement of the Project operation	To be used as an offshore supply base for current / future offshore operations



## ပီတင်နီဆိုင်ရာ



## Project Setting



## ERM

- ERM သည် ယင်းတို့၏အားကိုးကွယ်မှုများကို အခြေခံ၍ အကောင်အထည်ဖော်နိုင်သည့် အခြေခံအုတ်မြစ်များကို ဖန်တီးခဲ့သည်။
- နိုင်ငံတော်အဆင့်ရှိ အကောင်အထည်ဖော်မှုများကို ဖန်တီးခဲ့သည်။
- မြန်မာနိုင်ငံရှိ ဗဟိုဘဏ်နှင့် ဗဟိုဘဏ်ချုပ်မှူးချုပ်၏ နှစ်စဉ်အသုံးပြု အကောင်အထည်ဖော်မှုများကို ဖန်တီးခဲ့သည်။
- ERM သည် ယင်းတို့၏အားကိုးကွယ်မှုများကို (EIA) အကောင်အထည်ဖော်မှုများကို အကောင်အထည်ဖော်နိုင်သည့် အခြေခံအုတ်မြစ်များကို ဖန်တီးခဲ့သည်။
- ERM သည် အကောင်အထည်ဖော်မှုများကို (EIA) အကောင်အထည်ဖော်မှုများကို အကောင်အထည်ဖော်နိုင်သည့် အခြေခံအုတ်မြစ်များကို ဖန်တီးခဲ့သည်။
- ERM သည် အကောင်အထည်ဖော်မှုများကို (EIA) အကောင်အထည်ဖော်မှုများကို အကောင်အထည်ဖော်နိုင်သည့် အခြေခံအုတ်မြစ်များကို ဖန်တီးခဲ့သည်။
- ERM သည် အကောင်အထည်ဖော်မှုများကို (EIA) အကောင်အထည်ဖော်မှုများကို အကောင်အထည်ဖော်နိုင်သည့် အခြေခံအုတ်မြစ်များကို ဖန်တီးခဲ့သည်။

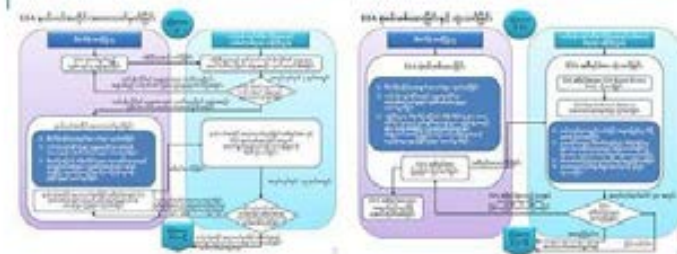


## ERM

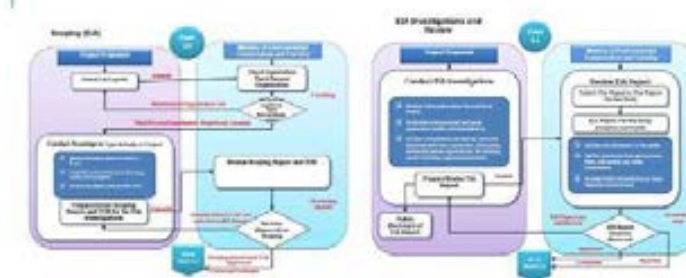
- ERM is a **Environmental, Health and Social** Consulting Company
- Present in **40 different countries**
- ERM has an office in **Yangon** with **local and international staff**
- ERM is **registered** as an EIA Consulting Firm with **MONREC**
- ERM has been active in Myanmar since **1996** and have completed over **100 IEE, EIA, and EMPs**
- Teamed with **Resource and Environment Myanmar Ltd** for baseline surveys



## မြန်မာနိုင်ငံ ယင်းတို့၏အားကိုးကွယ်မှုများကို အခြေခံ၍ အကောင်အထည်ဖော်နိုင်သည့် အခြေခံအုတ်မြစ်များကို ဖန်တီးခဲ့သည်။ (၂၀၁၅)



## Myanmar EIA Procedures (2015)









## ကပ်မရာချမှန်မြှုပ်နှံလေ့လာခြင်း

### လေ့လာရေးတာဝန်

- ၂၀၁၇ခုနှစ် စက်တင်ဘာလ (ပျိုရာသီ)
- လေ့လာရေးတွင် အသုံးပြုသည့်နည်းလမ်းများ
- ကပ်မရာကို ၅ မီနစ်ကြာမျှန်မြှုပ်နှံခြင်းကို လေ့လာခြင်း
- စုစုပေါင်း စီမံချက်ချမှန်မြှုပ်နှံခြင်း စစ်ဆေးလေ့လာ ခဲ့ပါသည်။
- လေ့လာမှုရလဒ်များ
- မင်္ဂလာဒုံမရေအောက်ကြမ်းပြင်သစ် သစ်နှင့် ပိုမိုသက်သေကောက်ခံနိုင် နေသည့်ကုန်ကျစရိတ်ချုပ်ချယ်ခြင်း
- အသုံးပြုသောကုန်ပစ္စည်းပေါ်မူတည်၍ အသုံးပြုသည့် ဝတ်စုံအမျိုးမျိုးကို အသုံးပြုသည့် ဝတ်စုံအမျိုးမျိုးမှ မတွေ့ရှိရပါ။



## Drop Camera Surveys

### Survey Period:

- Sep 2017 (Wet Season)

### Survey Methodology:

- The camera was deployed for a period of ~5 minutes
- A total of six spot checks were conducted

### Survey Results:

- The seabed is mainly composed of sand and mud
- No corals were identified at the proposed jetty or dredging area



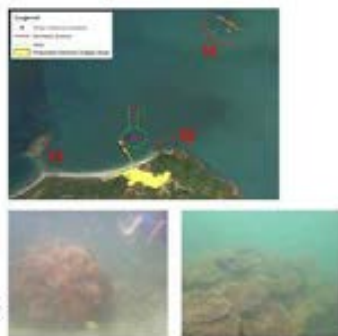
## ရေဝပ်၍ လေ့လာခြင်း

### လေ့လာရေးတာဝန်

- ၂၀၁၇ခုနှစ် စက်တင်ဘာလ (ပျိုရာသီ)
- လေ့လာရေးတွင် အသုံးပြုသည့်နည်းလမ်းများ
- ကပ်မရာမြှုပ်နှံခြင်းကို ရေဝပ်၍လေ့လာခြင်း
- ဝိတာ ၂၀၀ အနက်တွင် မှတ်တမ်းယူခြင်း
- မင်္ဂလာဒုံမရေအောက်ကြမ်းပြင်သစ် သစ်နှင့် ပိုမိုသက်သေကောက်ခံနိုင် နေသည့်ကုန်ကျစရိတ်ချုပ်ချယ်ခြင်း

### လေ့လာမှုရလဒ်များ

- T1 တွင် သမုတုအောက်တန်းအရွယ်ရှိ ၈၆% မှ ၁၀၀% ခန့် ဖုံးလွှမ်းနေသည့်ကို လေ့လာတွေ့ရှိရပါသည်။
- T2: တွင် သမုတုအောက်တန်းအရွယ်ရှိ ၈၀% မှ ၁၀၀% ခန့် ဖုံးလွှမ်းနေသည့်ကို လေ့လာတွေ့ရှိရပါသည်။
- T3: တွင် သမုတုအောက်တန်းအရွယ်ရှိ ၈၆% မှ ၁၀၀% ခန့် ဖုံးလွှမ်းနေသည့်ကို လေ့လာတွေ့ရှိရပါသည်။



## Snorkel Surveys

### Survey Period:

- Sep 2017 (Wet Season)

### Survey Methodology:

- Free-swims parallel to the shore
- Recorded as 200m transects
- Representative underwater video footage and photographs were recorded

### Survey Results:

- T1: Hard Coral 5-10% coverage
- T2: Hard Coral 51-75% coverage
- T3: Hard Coral 76-100% coverage







## လူမှုပတ်ဝန်းကျင်

- **ရွာသူကြီး**၊ မိမိတပ်စုဝင်သားများ လက်ထဲမှာ အသက်ရှင်နေသော နိုင်ငံသား ငွေကြေးကြည့်ရင်း
- **အသက်ရှင်နေကြိုက်သလိုပဲ**၊ ဗိုလ်ကြီးကြီး၊ ဗိုလ်မှူးကြီး
- **အသက်ရှင်နေကြိုက်သလိုပဲ** - နေထိုင်ကြည့်ရင် အသက်ရှင်နေသောများမှာ ဖုန်းကြည့်နေကြတာတွေကို သေချာစစ်ဆေးတဲ့ လက်ထဲမှာ



### Social Setting

- **Name of Villages:** Seik Kenn, Zin Yaw Gaung, Kyauk Phyar, Ale Gone, Nant Thar Pu and Gyaing Galay
- **Livelihood:** Rice cultivation and fishing are the most typical livelihoods
- **Local infrastructure:** One hour drive to Hospital and High School in Nya Uke Kaung. Drinking water is provided from wells.



## လူမှုပတ်ဝန်းကျင်

- **မိမိတို့အဖွဲ့အစည်း** အကျိုးအမြတ် ခွဲဝေမှု ပြင်ဆင်မှုအားလုံးကို (အသက်မွေးဝမ်းကျောင်းမှ ရသမျှ အမြတ်အကျိုးအစားအသုံးအဆောင်များ) အသက်မွေးဝမ်းကျောင်း (ပုံစံ) ခံနိုင်ရည်အား မရှိမည်နှင့်မရှိမည်ဖြစ်သည်။
- **ယဉ်ကျေးမှုအရ** ပြင်ဆင်မှုအား ဥပဒေနှင့်အညီ အသက်မွေးဝမ်းကျောင်းမှ ရသမျှ အမြတ်အကျိုးအစားအသုံးအဆောင်များ (ပုံစံ) ခံနိုင်ရည်အား မရှိမည်နှင့်မရှိမည်ဖြစ်သည်။



### Social Setting

- **Tourism:** The two main areas are Ngwe Saung Beach, located approximately 140 km north and Goyangyi Island, 5-10 km west and southwest of the Project.
- **Cultural heritage:** Pagoda in Goyangyi Island 3.5 km from Project Area





## လူထုဝတွ့ဆုံညှိနှိုင်းဆွေးနွေးခြင်း



## Stakeholder Engagement



## လူထုဝတွ့ဆုံညှိနှိုင်းဆွေးနွေးခြင်း - နယ်ပယ်တိုင်းတာသည့်အဆင့်

ဆွေးနွေးဆုံညှိနှိုင်းဆွေးနွေးခြင်း	လူထုဝတွ့ဆုံညှိနှိုင်းဆွေးနွေးခြင်း		
၂၀၁၇ ခုနှစ်၊ ဇန်နဝါရီလ	ပြည်ထောင်စု		
၂၀၁၇ ခုနှစ်၊ ဇန်နဝါရီလ	ပြည်နယ်		
၂၀၁၇ ခုနှစ်၊ ဇန်နဝါရီလ	မြို့နယ်		
၂၀၁၇ ခုနှစ်၊ ဇန်နဝါရီလ	ကျေးရွာ		

## Stakeholder Consultation – Scoping Phase

Date of Consultation	Stakeholder(s) Consulted		
16 January 2017	Patheingyi and Ngazun District • Minister of Electricity and Transport in Patheingyi Chief Minister office • Ngazun District Township GAD		
17 January 2017	Ngazun District • Ngazun District Township GAD		
18 January 2017	Nan Shan Pu Village Tract • Zin Yan Ching Village • Gu Ching Village		
18 January 2017	Ngazun District and Project Area • Site visit to Project Area, Goyangzi Island and Ngazun District		

## လူထုထုတ်ဖော်ခံယူမှုမန္တလေး - EIA ဖော်ပြချက်

လူထုထုတ်ဖော်ခံယူမှု	လူထုထုတ်ဖော်ခံယူမှု
၂၀၁၇ ခုနှစ်၊ ဧပြီလ ၂ ရက်	လူထု • လူထုထုတ်ဖော်ခံယူမှု
၂၀၁၇ ခုနှစ်၊ ဧပြီလ ၂ ရက်	လူထုထုတ်ဖော်ခံယူမှု • လူထုထုတ်ဖော်ခံယူမှု
၂၀၁၇ ခုနှစ်၊ ဧပြီလ ၂ ရက်	လူထုထုတ်ဖော်ခံယူမှု • လူထုထုတ်ဖော်ခံယူမှု
၂၀၁၇ ခုနှစ်၊ ဧပြီလ ၂ ရက်	လူထုထုတ်ဖော်ခံယူမှု • လူထုထုတ်ဖော်ခံယူမှု



## Stakeholder Consultation – EIA Investigation

Date of Consultation	Stakeholder(s) Consulted
28 February 2017	Nga Phu Daw • Nga Phu Daw Township GAO
3 March 2017	Nan Thar Phu Village Tract • Nan Thar Phu Village
2 March 2017	Nga Yoke Hsing and Goyangon Island • Site visit to Project Area, Goyangon Island and Nga Yoke Hsing Bay
3 March 2017	Nan Thar Phu Village Tract • Villagers and CSOs in Nan Thar Phu



## လူထုထုတ်ဖော်ခံယူမှု



မေးခွန်း	အဖြေ
မေးခွန်း ၁: လူထုထုတ်ဖော်ခံယူမှု (EIA) မှာ လူထုထုတ်ဖော်ခံယူမှု အမျိုးမျိုး ရှိသည်။	မေးခွန်း ၁: လူထုထုတ်ဖော်ခံယူမှု (EIA) မှာ လူထုထုတ်ဖော်ခံယူမှု အမျိုးမျိုး ရှိသည်။
မေးခွန်း ၂: လူထုထုတ်ဖော်ခံယူမှု (EIA) မှာ လူထုထုတ်ဖော်ခံယူမှု အမျိုးမျိုး ရှိသည်။	မေးခွန်း ၂: လူထုထုတ်ဖော်ခံယူမှု (EIA) မှာ လူထုထုတ်ဖော်ခံယူမှု အမျိုးမျိုး ရှိသည်။
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## Concerns raised during Consultation



Concerns	Responses
Corporate Social Responsibility (CSR) and Social Investment from the Project	Should the Project develop, MSA will consider CSR in more detail
Project impacts on fishing grounds by increase of traffic in the region when vessels visit the CSO	There will be no exclusion area around the jetty
Job opportunities for local communities	There will be opportunities for jobs during the construction and the majority of the workforce
Potential impacts to sensitive offshore habitats such as coral reefs	Offshore habitat surveys were conducted
Air and noise impacts	The impact assessment for air and noise was included in the EIA and mitigation measures were outlined
Disclosure of information to CSOs	CSOs were invited to the public engagement meetings

## ထိခိုက်မှုဆန်းစစ်ခြင်း

- နိုင်ငံတော်အတွက် အရေးကြီးသော အရာများကို စီမံကိန်းဆောင်ရွက်ရန် အစိုးရသည် အသုံးပြုနိုင်သည့် နည်းလမ်းများကို ရှာဖွေရမည်။
- နိုင်ငံတော်အတွက် အရေးကြီးသော အရာများကို စီမံကိန်းဆောင်ရွက်ရန် အစိုးရသည် အသုံးပြုနိုင်သည့် နည်းလမ်းများကို ရှာဖွေရမည်။
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## Impact Assessment

- **Impact prediction:** to determine what could potentially happen to resource/receptors as a consequence of the Project and its associated activities.
- **Impact evaluation:** to evaluate the significance of the predicted impacts by considering their magnitude or likelihood of occurrence (for unplanned events), and the sensitivity, value and/or importance of the affected resource/receptor.
- **Mitigation and enhancement:** to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts.
- **Residual impact evaluation:** to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.



## ထိခိုက်မှုဆန်းစစ်ခြင်းနည်းလမ်း

၂၈၀ - ပါးပင်ကုသဝါးကို ဆွေသင်္ကန်းကုသဝါး သက်သေခံရခြင်း  
 မူရင်း - မူရင်းပါးပင်ကုသဝါး

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	Beneficiality	Beneficiality	Beneficiality	Beneficiality	
	Beneficiality	Beneficiality	Beneficiality	Beneficiality	

[illegible]

### Impact Assessment

**Example: Impacts to Marine Fauna from Underwater Noise – Construction Phase**

		Sensitizing (Hypersensitized) patients (active or latent TB infection)		
		Low	Medium	High
Regimen A (preferred)	Isoniazid	Isoniazid	Isoniazid	Isoniazid
	rifampin	Isoniazid	Rifampin	Rifampin
	ethambutol	Rifampin	Rifampin	Rifampin
	pyrazinamide	Rifampin	Rifampin	Rifampin

[illegible]



တိရိစ္ဆာန်များနှင့်လျော့ချနိုင်သောနည်းလမ်းများ အကျဉ်းချုပ်		
ပြင်ဆင်ထားသည့် အန္တရာယ်များ	အကျဉ်းချုပ်ချမှတ်သည့် နည်းလမ်းများ	အန္တရာယ်အဆင့်
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အန္တရာယ်ရှိသော အန္တရာယ်များ (အန္တရာယ်ရှိသော) အန္တရာယ်	<ul style="list-style-type: none"> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> </ul>	အန္တရာယ်ရှိသော
အန္တရာယ်ရှိသော အန္တရာယ်များ (အန္တရာယ်ရှိသော) အန္တရာယ်	<ul style="list-style-type: none"> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> </ul>	အန္တရာယ်ရှိသော
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Summary of Impacts and Mitigation Measures		
Potential Impacts	Proposed Mitigation Measures	Impact Significance
Dust and emissions and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>Site hoarding along the Project Area boundary.</li> <li>Control the height of unloading of fill materials.</li> <li>Regularly maintain all demarcated equipment to reduce emissions of SO<sub>2</sub> and SC<sub>2</sub>.</li> <li>Apply dust suppression methods.</li> <li>Use alternative fuels and fuel mixes where possible.</li> </ul>	Minor
Increase in ambient noise levels and nuisance impacts for local communities	<ul style="list-style-type: none"> <li>Only well-maintained equipment should be operated on site.</li> <li>Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components should be conducted.</li> </ul>	Minor
Visual impacts for local communities	<ul style="list-style-type: none"> <li>Direct fencing between On View Chong and the CGO to reduce visual impacts. The hoarding should be of sufficient height to ensure that there is no direct line of sight between the CGO and On View Chong.</li> </ul>	Moderate
Physical presence of the mining waste pile	<ul style="list-style-type: none"> <li>Where possible, the engineering design of the pile, i.e. configuration of the pile, will incorporate environmental considerations on minimising impacts to the hydrodynamics and water quality of the area.</li> </ul>	Minor

တိရိစ္ဆာန်များနှင့်လျော့ချနိုင်သောနည်းလမ်းများ အကျဉ်းချုပ်		
ပြင်ဆင်ထားသည့် အန္တရာယ်များ	အကျဉ်းချုပ်ချမှတ်သည့် နည်းလမ်းများ	အန္တရာယ်အဆင့်
တိရိစ္ဆာန်များနှင့် အန္တရာယ်များ (အန္တရာယ်ရှိသော) အန္တရာယ်	<ul style="list-style-type: none"> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> </ul>	အန္တရာယ်ရှိသော
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အန္တရာယ်ရှိသော အန္တရာယ်များ (အန္တရာယ်ရှိသော) အန္တရာယ်	<ul style="list-style-type: none"> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> </ul>	အန္တရာယ်ရှိသော
အန္တရာယ်ရှိသော အန္တရာယ်များ (အန္တရာယ်ရှိသော) အန္တရာယ်	<ul style="list-style-type: none"> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> <li>အန္တရာယ်ရှိသောနေရာများကို အန္တရာယ်ရှိသောနေရာများမှ ခွာရှင်းရန်</li> </ul>	အန္တရာယ်ရှိသော

Summary of Impacts and Mitigation Measures		
Potential Impacts	Proposed Mitigation Measures	Impact Significance
Impact to water quality	<ul style="list-style-type: none"> <li>Appropriate surface drainage will be designed and provided where necessary.</li> <li>Surface runoff from potential sources of contamination will be prevented.</li> <li>Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds).</li> </ul>	High/Low
Smothering and marine habitat loss	<ul style="list-style-type: none"> <li>Minimize size of footprint on seabed.</li> <li>Avoid construction in sensitive habitats (e.g. coral reefs).</li> <li>Soft outcrops will be deployed during dredging of the navigation channel to reduce the elevation of suspended solids to nearby sensitive receptors.</li> </ul>	Moderate (construction) Minor (operation)
Loss of beach habitat and disturbance to nesting behaviour	<ul style="list-style-type: none"> <li>The contractor should verify that the works area is clear of sea turtle nests prior to commencement of works to avoid destruction of any buried nests.</li> <li>Minimizing lighting to that which is absolutely necessary for the construction / operation area.</li> <li>No illegal gathering of eggs by contractors.</li> </ul>	Moderate
Disturbance to marine fauna	<ul style="list-style-type: none"> <li>Hammer and pile will be enclosed in protective screens.</li> <li>Piers will be acoustically damped to reduce vibration and transmit less noise to the seabed (e.g. aggregate pads) and piers will be carefully aligned with hammer for correct contact.</li> </ul>	Minor (noise)

ထိခိုက်မှုများနှင့်လျော့ချနိုင်သောနည်းလမ်းများ အကျဉ်းချုပ်
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[illegible]

### Summary of Impacts and Mitigation Measures



Potential Impacts	Proposed Mitigation Measures	Impact Significance
Terrestrial habitat loss	<ul style="list-style-type: none"> <li>Footprint of the proposed OSB is minimised during the design stage and existing vegetation should be retained as far as practicable.</li> <li>Landscape planting will be implemented by planting native tree species which are fast growing in nature.</li> <li>Construction activities will be restricted to works areas that will be clearly demarcated.</li> </ul>	Minor
Community health and safety, increased risk of accidents, security issues for public.	<ul style="list-style-type: none"> <li>There will be a perimeter wall around the premises to stop anyone trespassing onto the site.</li> <li>MIA will also provide navigation guidance for all vessels in line with Myanmar national requirements.</li> <li>As discussed in other sections on vessel movements, MIA will provide regular communications to fishermen on vessel movements as required.</li> <li>Traffic Management Plan to be developed to minimise traffic related impacts.</li> </ul>	Moderate
Unsteadiness and oceanic swell creation, job creation, fishing impacts.	<ul style="list-style-type: none"> <li>Vessel movements should be discussed with Port Authority (as appropriate) to ensure minimal disturbance to ongoing operations and reduce the risk of marine accidents.</li> <li>Jetty and vessels will be appropriately lit with good navigation warning devices, including navigation lights, buoys, mooring, navigation communication equipment and radar reflectors to provide sufficient warning to other vessels in the area.</li> <li>At least four weeks prior to construction activities, relevant authorities and stakeholders (i.e. local fishing and tourism operators, fishery/tourism associations, and local villagers) will be alerted to the final works area design as well as the construction programme and any specific</li> </ul>	Positive (job creation)  Minor (negative fishing)

ထိခိုက်မှုများနှင့်လျော့ချနိုင်သောနည်းလမ်းများ၊ အကျဉ်းချုပ်

[illegible]

### Summary of Impacts and Mitigation Measures



Identified Impacts	Proposed Mitigation Measures	Impact Significance
Occupational health and safety	<ul style="list-style-type: none"> <li>The Project will design an occupational health and safety management plan which will be a subset of the overall EISP system, tailored to the needs of the project.</li> <li>The Project will create and implement a health and safety management system for the project.</li> </ul>	Minor
Impacts to tourism / nuisance / reduction of access to beach	<ul style="list-style-type: none"> <li>Mitigation measures provided above.</li> </ul>	Moderate
Impact to people and environment from waste discharge and disposal	<ul style="list-style-type: none"> <li>Impacts regarding wastes can be managed by good housekeeping practices for waste storage and handling supported by a comprehensive waste management plan (WMP) which will be prepared by MSA.</li> <li>Construction materials will be managed in a way to avoid over-ordering, poor storage and maintenance, mislabeling as well as improper disposal procedures.</li> <li>Segregated wastes will be temporarily stored at designated areas for reuse on site.</li> <li>Waste will be collected regularly by reputable waste collectors.</li> <li>Standardized Operating Procedures for handling / storage / transfer of hazardous materials.</li> <li>Spill/Spot Oil Spill Emergency Plans (MARPOL requirements for larger vessels).</li> <li>MSA Supply Base Oil Spill Response Plan and associated response procedures / protection</li> </ul>	Minor
Impact from spill and leaks	<ul style="list-style-type: none"> <li>MSA Supply Base Oil Spill Response Plan and associated response procedures / protection</li> </ul>	Minor

## အကျဉ်းချုပ်



- ပတ်ဝန်းကျင်ထိခိုက်မှုမေးခွန်းစုံဖြေ(EIA)ကို မြန်မာ့ပတ်ဝန်းကျင်ထိခိုက်မှုမေးခွန်းစုံဖြေမဏ္ဍိုင်မှ လုပ်ထုတ်ချဉ်းပါသော လမ်းဆွဲအောက်တွင်ဆောင်ရွက်ခဲ့ပါသည်။
- ထိခိုက်သက်ရောက်မှုများကို မြန်မာ့ဥပဒေ နှင့် နိုင်ငံတကာစံနှိုင်းညွှန်းတမ်းအရဆန်းစစ်ချက်များကို အခြေခံဆန်းစစ်ချက်ပြုပါသည်။
- ဆောင်ရွက်ရန်လိုအပ်သည့် ထိခိုက်သက်ရောက်မှုမည်သည့်အထိ နှင့် ထိခိုက်မှုမည်သည့်အခြေအနေအထားရှိမည် ဆောင်ရွက်ခြင်း ဖြစ်ပါသည်။
- ထိခိုက်မှုလျှော့ချရေးအစီအစဉ်သည် သက်ဆိုင်ရာအစွဲအနက်အရချဉ်းပါသော ဆုံးဖြတ်ချက်ဆောင်ရွက်ပါသည်။
- စီမံကိန်းဆောင်ရွက်သည့်အတွက် လုပ်ငန်းစဉ်များအပေါ်မတော်တရားလုပ်သည့်နှင့် နှိပ်စက်ညှဉ်းပျက်မှုအပေါ် လိုက်နာသည့် ဆောင်ရွက်မှုရှိပါသည်။
- စီမံကိန်းသက်ဆိုင်သူများ ထိုင်ပိုင်ညွှန်ကြားမှုနှင့် ဆောင်ရွက်သည့်ဖြစ်ပါသည်။
- မည်သည့်ကိစ္စရပ်မျိုးမဆို ထိခိုက်မှုမရှိအောင် စီမံကိန်းမည်သည့်အတွက် စီမံကိန်းဆောင်ရွက်မှုများ ဆောင်ရွက်မည်ဖြစ်ပါသည်။

## Summary



- EIA has been undertaken following the **Myanmar EIA Procedures (2015)**
- Impacts have been assessed against **Myanmar Laws and International Standards / Guidelines**
- EIA identified **no major impacts**, with the majority being minor
- Mitigation Measures have been identified to reduce all impacts
- Proponent will **monitor emissions and discharges and take action as necessary**
- **Consultation** will continue throughout the lifetime of the Project
- Proponent will implement a **Grievance Mechanism** to address any concerns

## ထုတ်ပြန်ချက်



- M&Aဝေဘ်ဆိုက် : <http://myintassociatesonb.com>
- သတင်းစာ (ဂလိုဘယ်နီယူးလိုင်က်စ်မြန်မာ နှင့် မိုက်ရ)
- စီမံကိန်းနေရာတွင် သတင်းစာများဖြင့်လည်းကောင်း
- မြန်မာဘာသာဖြင့် စီမံကိန်းအကျဉ်းချုပ်မိတ္တူကူးလည်း ပုသိမ်၊ လှေတော၊ လွှတ်တောင်နှင့် နံသာဗြူနယ် အစောဆုံးထုတ်ချက်အချက်အလက်အပေါ် အတည်ပြုနိုင်ပါသည်။
- သတင်းစာများအပေါ်ထုတ်ပြန်သည့် အလုပ်များအတွက် ကိုလည်း ဖြန့်ချိပြီး နှင့်လည်းကောင်း ခြုံငုံချက်တွင် ဆောင်ရွက် သွားမည်ဖြစ်ပါသည်။



## Disclosure

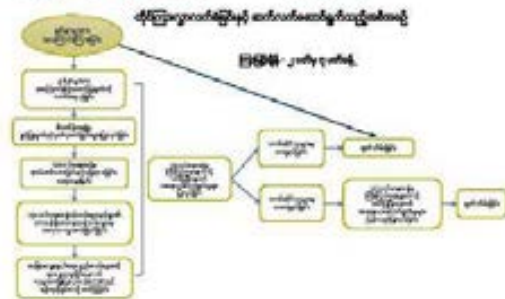


- M&A website : <http://myintassociatesonb.com>
- Newspapers (The Global New Light of Myanmar and The Mirror)
- Signs posted at the Project Site
- Copies of Myanmar Language Summary Document sent to Pathwin, Ngaputaw, Nga Yoke Kaung, Nan Thar Pu GADs
- Disclosure Workshops in Yangon and Nga Yoke Kaung





ထိခိုက်နစ်နာမှုများကို တိုင်ကြားနိုင်သောယန္တရားစနစ်



## Grievance Mechanism



လူမှုတာဝန်သိရပ်ငနးများ (CSR)

**နည်းစနစ်** - ကုလ်နမ်မာသမ်ဂုဏ်ထူးကွက်၊ ကုဏ်မာသမ်မာသမ်  
မာသမ်၊ ကုလ်နမ်၊ မာသမ်၊ ကုလ်နမ်၊ မာသမ်၊ ကုလ်နမ်၊ မာသမ်၊  
ကုလ်နမ်၊ မာသမ်၊ ကုလ်နမ်၊ မာသမ်၊ ကုလ်နမ်၊ မာသမ်၊ ကုလ်နမ်၊ မာသမ်၊

**HPLC-MS** သည် GC-MS အစီအစဉ်များဖြစ်သော ပျော်ကန်မှုနှင့် စွမ်းဆောင်ရည်တို့သည်မဟာဂါယာပြုလုပ်ပြီး မဟာဂါယာမဟာပူဇော် နှစ်သက်ပါ။



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ကမ္ဘာ့ဆွေးနွေးချက်ချက်စာအုပ်အတွက်  
ကျွန်ုပ်တို့အဖွဲ့အစည်းအားလုံးက အားပေးဆောင်ရွက်



**WIAAOS Partners with Test Community-Based Volunteers in Northampton**

**David A. Jaffe**  
 Director, WIAAOS  
 WIAAOS is pleased to announce that it has entered into a partnership with the Test Community-Based Volunteers (TCBV) in Northampton. The TCBV is a group of trained and certified individuals who provide confidential and non-judgmental support to individuals who are at risk of HIV infection. The TCBV is a valuable resource for WIAAOS and its clients. The partnership will allow WIAAOS to provide more comprehensive services to its clients and to increase the reach of its outreach efforts. The TCBV will be providing support to individuals who are at risk of HIV infection and to individuals who are living with HIV. The partnership will also allow WIAAOS to provide more comprehensive services to its clients and to increase the reach of its outreach efforts.

## Corporate Social Responsibility

**Strategy:** Invest in impactful social programs to create shared value for the business and local communities.

M&QSB has inaugurated CSR program in education and capacity building.



### Education



**Community Capacity Building  
& Skills Development**





**MAADSS Partners with Two Community-Based Volunteers in Nanterre**

**MAADSS** is a 501(c)(3) non-profit organization that provides support and resources to the LGBTQ+ community. We are currently seeking volunteers to help with our outreach efforts. If you are interested in helping, please contact us at [info@maadss.org](mailto:info@maadss.org) or call us at (415) 435-1234.



**MAADSS** is a 501(c)(3) non-profit organization that provides support and resources to the LGBTQ+ community. We are currently seeking volunteers to help with our outreach efforts. If you are interested in helping, please contact us at [info@maadss.org](mailto:info@maadss.org) or call us at (415) 435-1234.

**"I'm a lot more confident in myself"**

MAADSS is a 501(c)(3) non-profit organization that provides support and resources to the LGBTQ+ community. We are currently seeking volunteers to help with our outreach efforts. If you are interested in helping, please contact us at [info@maadss.org](mailto:info@maadss.org) or call us at (415) 435-1234.





**မြိုင်ဆင်(နီ)ဆလိုပ်စီတင်(စ်)  
ကမ်းလှည့်ဝန်ဆောင်မှုလုပ်ငန်းဆိုင်ရာ  
ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း**

သို့သော်လည်းကောင်း၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း  
အစီအစဉ်အရ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း  
ပြုလုပ်သွားမည်

**စာတိုက်အမည်အားဖြင့်**  
လိပ်စာ : မြိုင်ဆင်(နီ)ဆလိုပ်စီတင်(စ်) ဘဏ္ဍာ  
ရုံး : ၁၅၅ ဗီ၊ ၂၀၁၇၇၂  
အီးမေးလ် : [myint@myint.com](mailto:myint@myint.com)  
**ERM**  
ရုံး : ၁၅၅ ဗီ၊ ၂၀၁၇၇၂  
အီးမေးလ် : [myint@myint.com](mailto:myint@myint.com)

The business of sustainability




**EIA for Myint & Associates Offshore Supply Base**

To provide comments  
please use the following  
contact details

**Respondent**  
Address: Vantage Tower, Pyay Road, Yangon  
Phone: +88 1 255 7722  
Email: [myint@myint.com](mailto:myint@myint.com)

**ERM**  
Phone: 012304405  
Email: [myint@myint.com](mailto:myint@myint.com)

The business of sustainability



## မြင့်အင်(န်)အဆိုစီရိတ်(စ်) ကမ်းလွန်ဝန်ဆောင်မှုလုပ်ငန်းဆိုင်ရာ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း

မြင့်အင်(န်)အဆိုစီရိတ်(စ်)ကမ်းလွန်ဝန်ဆောင်မှုလုပ်ငန်းသည် ငရုပ်ကောင်းမြို့နယ်တွင် ဆောင်ရွက်မည့် ကမ်းလွန်ဝန်ဆောင်မှုလုပ်ငန်းအတွက် ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) ကို ဆောင်ရွက်ခဲ့ပြီး ဖြစ်ပါသည်။

မြင့်အင်(န်)အဆိုစီရိတ်(စ်)ကမ်းလွန်ဝန်ဆောင်မှုလုပ်ငန်းမှ Environmental Resource Management (ERM) အား ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA)ဆိုင်ရာ လေ့လာခြင်း အတွက် တာဝန်ပေးအပ်ခဲ့ပြီး ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာအား သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဝန်ကြီးဌာနသို့ တင်ပြခဲ့ပြီးဖြစ်ပါသည်။



- ✚ ကမ်းလွန်ထောက်ပံ့ရေးအခြေစိုက်စခန်းသည် ဧရာဝတီတိုင်းဒေသကြီး၊ ငရုပ်ကောင်းမြို့တွင် တည်ရှိပါသည်။
- ✚ စီမံကိန်းတွင် သေးငယ်သော ကုန်းပတ် ပါဝင်သည့် ဆိပ်ခံဘောတံတား၊ တာလမ်နှင့် လိုအပ်သည့် ကုန်းတွင်း အခြေခံ အဆောက်အအုံများ (အဓိက ထောက်ပံ့ရေးအခြေစိုက်စခန်း) တို့ ပါဝင်ပါသည်။
- ✚ အဓိကအားဖြင့် ကမ်းလွန်ထောက်ပံ့ရေးအခြေစိုက်စခန်း (ကုန်းတွင်းပိုင်း) တွင် သိုလှောင်ရုံများ၊ ကုန်တင်ကုန်ချ စစ်ဆေးရေးဧရိယာ၊ အလုပ်ရုံဧရိယာ၊ လူနေအဆောက်အအုံ ဧရိယာနှင့် အခြားအသုံးပြုမှုများပါဝင်မည် ဖြစ်ပါသည်။

ဖြစ်ပေါ်လာနိုင်သည့် ထိခိုက်မှုများ	ပတ်ဝန်းကျင်ထိခိုက်လွယ်မှု	ထိခိုက်မှုမဟာက	ကြွေးတန်ထိခိုက်မှု၏ အရေးပါမှု
လေထုထွင်းထုတ်လွတ်မှုကြောင့် လေအရည်အသွေးထိခိုက်မှုများ (လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော
အသံဆူညံမှု (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော
ရေအရည်အသွေးနှင့် အရင်းအမြစ်များအပေါ် ထိခိုက်မှုများ (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	နိမ့်ပါးသော	နိမ့်ပါးသော	အရေးမပါသော
အမှိုက်များ သိုလှောင်ခြင်း၊ စွန့်ပစ်ခြင်းများ နှင့် မတော်တဆဖြစ်ရပ်များကြောင့် ခြေညစ်ညမ်းမှုများ (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော
ရေနေသတ္တဝါစီစနစ်နည်းစနစ်များအပေါ် ထိခိုက်မှု (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	ကြီးမားသော	နိမ့်ပါးသော	အတန်အသင့်ဖြစ်သော
လေထုညစ်ညမ်းခြင်းနှင့် ဆူညံသံများကြောင့် စေ့ငွေပန်းကုန်နှင့် လုပ်ငန်းဆိုင်ရာ ကုန်းမာရေးနှင့်လုံခြုံရေး ထိခိုက်မှုများ (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော
စီမံကိန်းကြောင့် အလုပ်အကိုင်အခွင့်အလမ်းတိုးပွားလာခြင်းကြောင့် စီးပွားရေးနှင့် အသက်မွေးမှုဆိုင်ရာ ထိခိုက်သက်ရောက်မှုများ (ကောင်းကျိုး/ဆိုးကျိုး) (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော (လမ်းပန်း)
	မရှိပါ	မရှိပါ	အပြည့်သဘောတရား (အလုပ်အကိုင်များ)
ရေလုပ်ငန်းနှင့်စရိတ်သွားလာရေးအပေါ်ထိခိုက်မှုများ (တည်ဆောက်ရေးနှင့် လုပ်ငန်းလည်ပတ်ကာလ)	အလယ်အလတ်ဖြစ်သော	အလယ်အလတ်ဖြစ်သော	အတန်အသင့်ဖြစ်သော
မတော်တဆမှုများကြောင့် သက်ရှိတို့၊ နေရာဒေသများနှင့် မျိုးစိတ်များအပေါ် ထိခိုက်မှု	အလယ်အလတ်ဖြစ်သော	နိမ့်ပါးသော	အရေးမပါသော

စီမံကိန်းဆိုင်ရာ အချက်အလက်များနှင့်  
ပတ်သက်၍ သိလို၍ဖြစ်စေ၊  
ဝေဖန်အကြံပြုလို၍ဖြစ်စေ  
တစ်ဖက်ပါလိပ်စာအတိုင်း ဆက်သွယ်နိုင်ပါရန် -

အမည်- ဒေါ်ကြည်စင်ထင်အောင်  
လိပ်စာ- Vantage Tower ၊ ပြည်လမ်း ကမာရွတ်ဦးနယ်၊ ရန်ကုန်မြို့  
ဖုန်း- +၉၅ ၉ ၇၉၄၉ ၃၁၀၀၉  
အီးမေးလ်- [kyisin.h.aung@mprlexp.com](mailto:kyisin.h.aung@mprlexp.com)

# **Appendix I – CSR Activities**



## Community Mobilization

- Effective and timely communication with key stakeholders is an essential part of projects.



## Priorities and Needs Identified



Through a combination of **observation, key informant interviews, and focus group discussions**, community needs were identified and prioritized.

Entity	Priority				
	#1	#2	#3	#4	#5
Nanttharpu	Furniture	Honorarium for 3 teachers	New school building	-	-
Nga Yoke Kaung	Toilets	Fencing	Teacher's housing unit	Door Renovations	Overhead Water Storage

## Stakeholder Engagements on community investment



Meeting with Assistant Director  
(Regional Education Office-  
Pathein)



Meeting with Pathein District  
Administrator



Progress Sharing with U Aung Kyaw  
Khaing (Chairman of Ayeyarwady  
Region Parliament)



Progress Sharing with MATA  
(Ayeyarwady Region)



Progress Sharing with MP(Nga Pu  
Taw)

Date	Letter	Status
19-Oct 17	Nga Pu Taw Township Education Officer's support letter	Secured
23-Oct 17	M&AOSB's commitment letter	Secured
29-Oct 17	Nanttharpu community's support letter	Secured
1-Nov 17	Nanttharpu School Principal's notification letter	Secured
11-Dec 17	MP's (Nga Pu Taw) support letter	Secured
22-Dec 17	Regional Minister of Education's support letter	Secured
26-Dec 17	Permit to Construct from Ayeyarwady Regional Education Office	Secured

## Stakeholder Engagements

- M&AOSB has repeatedly and continuously engaged with government, civil society, and communities potentially affected by the project and other interested stakeholders.



Project Progress Update



Public Consultation



Project Progress Update



Project Progress Update



Focus Group Discussions



Project Progress Update



## Community Participations

Local community are giving helping hands throughout our CSR programs.



## Ground Breaking Ceremony for community investment in Nanttharpu

- A groundbreaking ceremony commemorating the start of construction of a new school building in Nanttharpu Village Tract took place on 27 January 2018.





## Strategic Community Investment, FY 2017- 2018



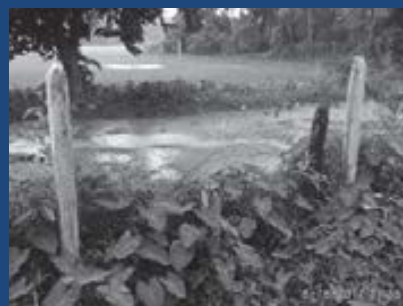
12

## Opening Ceremony

- M&AOSB handed over a new one-storey 90' x 30' R.C. school building to the Ministry of Education, Department of Basic Education, Ngaputaw Township on 29 May 2018.



## Strategic Community Investment, FY 2017- 2018

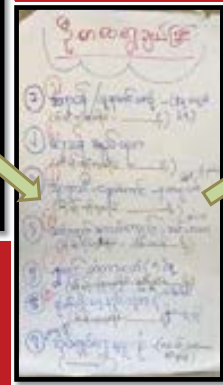
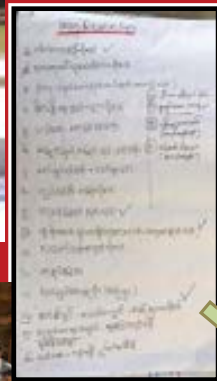


## Strategic Community Investment, FY 2017- 2018





## Need Assessments, FY 2018-2019



### Priorities

1. 5 small bridges (Nantharpu Village Road)
2. 16-mile road renovation to make it accessible all 3 seasons
3. Sin Ngan Sub-Primary School facilities (flooring and wall)
4. Doctor or ambulance
5. Agriculture techniques
6. Water treatment techniques for drinking water



## Reflection Workshops



- M&AOSB hosted reflection workshops to evaluate challenges, lessons learned, and best practices during its first year program.



## Home Gardening Training



**Participants:** 29 Trainees and 2 Observers  
**Training Period:** 7 to 11 July 2018

**Ten trainees have started their own home gardening and plants are being planted.**



## Mobilization for Home Gardening Training





## OGM Awareness



OGM posters were set up across Nanttharpu and Nga Yoke Kaung and OGM awareness sharing sessions had been conducted occasionally.



## Operational Grievance Mechanism



## Corporate Sponsorships



**Karen New Year Festival** together with the Nanttharpu community members and neighboring communities who came to attend it and sponsored the 1st prize for the friendly football match among the 6 wards of Nanttharpu and prizes for the traditional games. Staff members volunteered their time in constructing the stage over a period of two days.



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## Corporate Sponsorships



- M&AOSB believes in the power of sports to strengthen communities and sponsored the Nga Yoke Kaung soccer team in 2017 Ngaputaw Township Soccer Championships.



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## Employee Giving Initiatives



- Employees from the MPRL E&P Group of Companies contributed a padetha tree during the annual Kahtein festival celebrated at the Aung Thuka monastery in Nanttharpu on 26 October 2017.





# **Appendix J – MSDES/ ECD Comments and Responses to Comments Table**

**Final Comment of Environmental Impact Assessment Report for Offshore Supply Base in Nga Yoke Kaung Bay of Ayeyarwaddy region conducted by Myint & Associates**

No.	Section/ (Page No.)	COLUMN A: Findings/Subject	COLUMN B: Suggestion and Comment (13.9.2018)	COLUMN C: ERM Response (22.10.2018)	COLUMN D: Follow Up (12.11.2018)	ERM Response (15.01.19)
<b>1. Executive Summary</b>						
1	1.3.1 (1-3)	<ul style="list-style-type: none"> <li>Alternatives</li> <li>Consideration of options and alternatives is a fundamental requirement in the planning of any project as a means of avoiding or reducing adverse environmental and social impacts and maximising or enhancing project benefits. Alternatives that have been considered for the Project include:</li> <li>Location of the Project: the Project Area is Nga Yoke Kaung in Ayeyarwady Region. There were 8 locations identified as potential sites for the OSB. The selected location is in Palin Gyaing beach on Goyangyi Island.</li> <li>Access Bridge Design: An access bridge/trestle will connect the coast to the main jetty structure offshore. This could be a causeway or piled trestle structure. No piling will take place for the access bridge.</li> <li>Jetty Design: the jetty could either be a closed or open structure. A 'closed' reclaimed structure has been selected which is built of a sand core and rock layers on the outside to protect against erosion by waves and currents.</li> </ul>	<ul style="list-style-type: none"> <li>The selected places to be implemented for offshore supply base (OSB project) (figure-1), are located the places where there are plenty of abundant in marine Biodiversity that is between Ngwesaung and Goringhee island, the current selected place is also located in place where there are rich of Biodiversity that is at the Palin Chaing beach of the cape of the southern edge of Nagayokekaung bay.</li> <li>That Palin Chaing beach is located in Nagayokekaung mangrove area sizing over 2000 acres and at the mouth of the wide Nagayokekaung stream influencing by tide.</li> <li>That Ngayokekaung mangrove is the largest mangrove in the southern beach of Rakaing and there are plenty of (31) species of mangroves and in which there are variety of precious marine biodiversity breeding and habiting in seasonally and that is important for conservation for economic and aquatic resources.</li> <li>In the Jetty Design, the closed type will highly change the natural water flow, this cause sedimentation on the other side of the embankment and this is probable for causing dead to benthic life (aquatic creatures living beneath the sea) due to the sedimentation. (figure-2)</li> <li>The construction of Jetty will cause sediment trap from the sediment of the Nagayokekaung stream, the living of marine biodiversity will interfere by the turbid water as whirling of propellers from passing ships will cause sediment resurfacing process.</li> <li>As petrol spillage due to the accident (crushing, oil spillage at the deck while refilling) will decay the marine ecological footprints from the beneath, it is important to pay attention not to occur such accident during jetty construction and operation)</li> <li>The Phytoplankton habiting in the upper part of the water, which is the basic creature for marine ecological footprint will die due to the oxygen deficit, as the spillage will cause thin film covering.</li> </ul>	<ul style="list-style-type: none"> <li>The alternatives information is updated in Section 4.3.</li> </ul>	<ul style="list-style-type: none"> <li>It was found that Figure 4.5 was stated in Section 4.3.</li> <li>According to Figure 4.5 (Site Selection Criteria), it can be considered that there is no environmental impact in Location A,B,C,D but there is negative environmental impacts in Ngwe Saung, Sinma, Kyali and Opposite of Nga Yoke Kaung.</li> <li>It is stated that there is no impacts on locals in location A, D, Ngwe Saung and Sinma; but there is negative impact on local impact in Location B, C, Kya Li and Opposite of Nga Yoke Kaung</li> <li>Along with the figure 4.5 Score, it is stated that there is no impact on local and environmental impact in selected location D. However, there is no description which sub criteria are used and based as impact criteria.</li> <li>In Table 4.1 (Site Locations Alternative Considered), it is considered that there is few descriptive information statements for the selection criteria.</li> </ul>	<ul style="list-style-type: none"> <li>The detailed description for choosing location D is provided in <b>Section 4.3 (pg. 4-18)</b>.</li> <li>The selected location was location D. The selection considered environmental factors as follows: <ol style="list-style-type: none"> <li>Location A to D are comparable to each other. The land that required to be occupied is farmland and therefore not natural habitat. This will reduce the potential for impacts to terrestrial ecology. Concerning the offshore environment, the footprint of the project is relatively small (i.e., no need for a breakwater or reclamation) and the impacts are similar across Location A to D. Location D was selected as it was in an area with lower / weaker current movements, which means fewer impacts to coastal morphology and lower sedimentation. This would mean that the potential for smothering of sensitive receptors would be reduced.</li> <li>For the other sites, negative ratings were provided for environmental impacts as:</li> <li>For the Ngwe Saung and Sinma sites, large reclamation would likely be required which will increase the project footprint offshore and therefore could have a larger impact on marine habitats and species. Any organisms or habitats within the footprint of the Project would be lost and larger footprint would require more dredging / seabed disturbance, which could lead to smothering of sensitive receptors (corals).</li> <li>For the Kya Li site, in addition to the jetty, a breakwater would likely be required which will also increase the project footprint offshore and therefore could have a larger impact on marine habitats and species; as provided above.</li> <li>For the area opposite of Nga Yoke Kaung village, reclamation into the sea would be required due to very limited flat land area, as well as major leveling off the hill and a large amount of dredging for a long channel due to shallow water depth. This will have larger impacts on both terrestrial and marine habitats and species due to</li> </ol> </li> </ul>

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			<ul style="list-style-type: none"> <li>This will cause death to the Zooplankton that depend on Phytoplankton as no food chain for them. There will be decaying for breeding and causing death to the fish that depend on Zooplankton as the shortage of food.</li> <li>Thus, it is important to care not to happen any spillage to the sea</li> </ul>			sedimentation impacts, land loss and larger project footprint.
2	1.3.2 (1-3/4)	Proposed Project	<ul style="list-style-type: none"> <li>The offshore supply base (OSB project) area is located at the southern edge of the Nagayokekaung bay and due to the construction of Jetty stretching 500 m in length, there will interfere the natural scenic and there will affect the local tourism business.</li> <li>Dredging for jetty construction will cause turbid water and interfere the living of marine biodiversity.</li> <li>Due to the turbid water, there will be insufficient in light, causing dying to the benthos such as coral reefs. The polychaetes will die, as the sediment will settle at the bottom.</li> </ul>	<ul style="list-style-type: none"> <li>Noted</li> <li>Sedimentation impacts included in Section 6.4.6.</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>In Section 6.46 Operation Phase, it is found that there is a change from Impact Significance Negligible to Minor.</li> <li>In Section 6.4.6, sedimentation from dredging impact is stated although there is no sedimentation impact which can be caused by closed jetty design</li> <li>In Section 6.4.6, there is additional statement about water quality impact by sedimentation from dredging section.</li> <li>To add the statement about the monitoring parameters for the water and sediment quality according to the World Bank EHS Ports, Habors and Terminal (2017).</li> <li>In related to the impact on tourism business, section 6.4.14, it is stated that working environmental of Operation Phase and the project building will effect on the tourism business. But, there is no mitigation measures for these.</li> <li>To add the mitigation measures for Operation Phase for the tourism business as it is known that local community and the administration departments are worrying about the tourism business impact.</li> <li>To include these facts in ECC.</li> </ul>	<ul style="list-style-type: none"> <li>Water and sediment monitoring will be conducted and is included in <b>Section 8.5 (Table 8.7)</b>, where relevant. A table of monitoring for the Project is <b>appended</b> to this Response to Comments.</li> <li>Mitigation Measures for tourism impacts from the operational phase have been included in <b>Section 6.4.14 (pg. 6-62)</b> and <b>Table 8.1 (O12.1)</b>. These include but are not limited to: <ol style="list-style-type: none"> <li>Site hoarding along the Project Area</li> <li>Implementation of a regular and rigorous watering and sprinkling regime</li> <li>Provision of a wheel washing facility</li> <li>Regular maintenance of all diesel-powered equipment to reduce emissions of NOx and SO2;</li> <li>Use of low sulphur fuels in heavy good vehicles and diesel powered equipment in collaboration with good management practices for construction phase;</li> <li>M&amp;AOSB will ensure that due consideration is given to the local groundwater resources and availability to minimise impact to communities;</li> <li>Runoff from areas without potential sources of contamination will be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds);</li> <li>Oil water separators and grease traps will be installed and maintained as appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas, if any;</li> <li>The discharge point of treated sewage effluent to aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters;</li> <li>Septic tanks or a permanent sewage treatment plant will be provided;</li> </ol> </li> </ul>

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						11. Sewage from toilets, kitchens and similar facilities will be discharged into a foul sewer. 12. Landscape planting will be implemented 13. A tunnel will be included in the design of the Project on the beach to ensure that local communities and other beach users can have full access to the beach; 14. Vessel movements should be discussed with Port Authority 15. Jetty and vessels will be appropriately lit with good navigation warning devices 16. Any restricted areas will be appropriately marked on Notice to Mariners
			<ul style="list-style-type: none"> <li>During the construction and operation of the project, not to discharge any chemical to the marine environment.</li> <li>A low concentration of some chemicals will cause decaying or enriching, biological pollution (eutrophication), to some marine creatures, and causing negative impact to the marine ecology.</li> <li>No waste should be discharged to the marine environment.</li> <li>For not to encroach any invasive species from others (Ballast water and transportation of invasive marine species via MODU/ vessel hulls, internal niches or in-water equipment) to marine environment of the project area, there needs to comply the rule and regulations of the MPA/DMA.</li> <li>No solid waste should be discharged to the marine environment. Such waste can deter the marine creatures and cause dying.</li> </ul>	<ul style="list-style-type: none"> <li>Noted</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>No Response Required</li> </ul>
3	1.4.3 (10)	Social Baseline Conditions Table 1.3 During the January and February, 2017 consultations a number of wards within Nan Thar Pu village tract were consulted..... Presented in Table 1.3.	<ul style="list-style-type: none"> <li>The presentation is not clear. There described (6) village but not describing the number of households, houses and populations for Seikkanm Kyauk phyar, Nantharpu. There described that 50-household survey was conducted. It should describe the number of household being survey in each village. It should describe in clearly that the data in table were from the response of the respondent of the household survey or description of the response of the village administration authority.</li> </ul>	<ul style="list-style-type: none"> <li>The number of households per village / ward are provided in Section 1.4.3 and Section 9.3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It is needed to state the number of households, housings and population for Seik Kan, Kyauk Phyar, Nant Thar Pu.</li> </ul>	<ul style="list-style-type: none"> <li>The total number of households in Nan Thar Pu is 376. The population of Nan Thar Pu Village Tract for Seik Kann, Zin Yaw Chaung and Gyaing Galay villages are not yet officially recorded by the GAD. Therefore only combined data are available from these sub-wards as shown in <b>Table 1.3</b>.</li> </ul>

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<b>2. Introduction</b>						
4	2.1 (2-1)	Project Overview ....., which is located approximately 40km south of the town of Ngwe Saung.	<ul style="list-style-type: none"> <li>The Project is located at a distance of 40km from the south of the Ngwe Saung beach</li> </ul>	<ul style="list-style-type: none"> <li>Noted</li> </ul>	<ul style="list-style-type: none"> <li>No comments</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
5	Table 2.2 (2-1)	Environmental and Social Consultants for the project	<ul style="list-style-type: none"> <li>The page no is wrong. It has to be 2-3.</li> <li>To modify.</li> <li>As a local input, Dr. Ohmar May Tin Hlaing (Air Quality Expert) from EQM, Dr. Nyo Nyo Lwin (Terrestrial Biodiversity). Daw Myat Mon Swe is from local ERM.</li> <li>As the terrestrial Biodiversity contains two topics (Flora and Fauna), it needs to reply that for which topics</li> </ul>	<ul style="list-style-type: none"> <li>The page number has been updated</li> <li>Local specialists from EQM will attend the meeting.</li> </ul>	<ul style="list-style-type: none"> <li>No comments</li> <li>To state the professional field of local Consultants who conducted this ESIA.</li> <li>To prepare and answer the comments again as the response is not complete to the RT's suggestion.</li> </ul>	<ul style="list-style-type: none"> <li>Dr Nyo Nyo Lwin (fauna) and Dr. Thet Thet Mar (flora) have been included in <b>Table 2.2</b>. Both are local experts from Magway University.</li> </ul>
<b>3. Policy and Legislation</b>						
6	3.2.3/ 3-6	Table 3.2 - Myanmar Legislation Relevant to the Project Conservation of Water Resources and Rivers Law (2006) Section 6 outlines prohibitions for the following activities: .....	<ul style="list-style-type: none"> <li>Section 6 describe the authorizes by the department that is not description for prohibitions</li> <li>This prohibitions are described in Section 10, 11(A), 19. To describe completely the reference sections</li> </ul>	<ul style="list-style-type: none"> <li>The sections of the law have been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>No comments</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
7	3.2.3/ 3-7	Rules On Protection Of Wildlife, And Protected Area Conservation Law (2003) And The Protection Of Wildlife, And Wild Plant And Conservation Of Natural Areas Rules (2002)	<ul style="list-style-type: none"> <li>Need to be confirmed for The Protection of Wildlife and Wild Plant and Conservation of Natural Areas Rules are including or not</li> <li>We noticed that The Protection of Wildlife and Wild Plant and Conservation of Natural Areas Rules are determined in 8th June, 1994. Need to be confirmed the description of year.</li> </ul>	<ul style="list-style-type: none"> <li>The sections of the law have been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	<ul style="list-style-type: none"> <li>The legislation table (<b>Table 3.2</b>) has been revised to show the legal commitments of the Project per Law. This is as agreed during the Review Team meeting. The legislation table <b>appended</b> to this Response to Comment table.</li> </ul>
8	3.2.3/ 3-7  3.2.3/ 3-11  3.2.3/ 3-18	The Burma Wildlife Protection Act, 1936 The Burma Wildlife Protection Rules 1941(Burma Act No. Vii Of 1936) The Science and Technology Development Law (1994) The Outport Act (1914)	<ul style="list-style-type: none"> <li>This laws are revocation laws so that should not be described.</li> </ul>	<ul style="list-style-type: none"> <li>The sections of the law have been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment 7 above.</li> </ul>
9	3.2.3/ 3-9  3.2.3/ 3-15	The Conservation of Antique Objects Law 2016 The Protection and Preservation of Ancient Monuments Law (2016) Labour Organization Law, 2012	<ul style="list-style-type: none"> <li>The laws are described in-</li> <li>The Protection and Preservation of Ancient Monuments Law (Law of Assembly of the Union of Myanmar No.51/2015)</li> <li>The Conservation of Antique Objects Law, (Law of Assembly of the Union of Myanmar No.43/2015)</li> <li>Labour Organization Law (Law of Assembly of the Union of Myanmar No.7/2011)</li> <li>Need to revise the description of year.</li> </ul>	<ul style="list-style-type: none"> <li>The laws have been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment 7 above.</li> </ul>
10	3.2.3/ 3-11	Myanmar Port Authority Law, 2015	<ul style="list-style-type: none"> <li>The law not determine for the descriptions under this law</li> </ul>	<ul style="list-style-type: none"> <li>The laws have been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment 7 above.</li> </ul>



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			<ul style="list-style-type: none"> <li>It is same as the description of the second clause of The Law Amending the Ports Act (August, 2008)</li> </ul>		<ul style="list-style-type: none"> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	
11	3.2.3/ 3-12	Law amending the Territorial Sea and Maritime Zone Law, 2008	<ul style="list-style-type: none"> <li>The descriptions are not clear so that need to be revised</li> </ul>	<ul style="list-style-type: none"> <li>This law is updated by 2017 Law.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment 7 above.</li> </ul>
12	3.2.3/ 3-18	The Protection of rights of National Race Law, 2015	<ul style="list-style-type: none"> <li>The laws amending that determined under this title are-</li> <li>Law on the practice of Monogamy (Law of Assembly of the Union of Myanmar No.54/2015)</li> <li>Buddhist Women Special Marriage Law (Law of Assembly of the Union of Myanmar No.50/2015)</li> <li>Law Concerning Religious Conversion (Law of Assembly of the Union of Myanmar No.48/2015)</li> <li>Law Regarding Population Control and Health (Law of Assembly of the Union of Myanmar No.28/2015)</li> </ul>	<ul style="list-style-type: none"> <li>The laws have been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment 7 above.</li> </ul>
13	4.4.1/ 4-17	4.4.1 Construction activities - Onshore Activities There will also be a supply base area onshore for storage of materials for.....Open concrete yards for warehouse and container stacking will be constructed.	<ul style="list-style-type: none"> <li>As about this description, site preparations will do in constructions phase. Need to consider the Forest Law (State Law and Order Restoration Council Law 8/92)</li> </ul>	<ul style="list-style-type: none"> <li>The Law has been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment 7 above.</li> </ul>
14	4.4.2/ 4-22	4.4.2 operation activities – Traffic (onshore/offshore) Vehicles will be utilised during operation. .... It is estimated that during operations there will be an average of 1 vessel per 2 days.	<ul style="list-style-type: none"> <li>As the description in this clause, need to describe in addition of Law regarding Inland Water Transport Vessels (Law of Assembly of the Union of Myanmar No.29/2015), Myanmar Coastal and maritime transportation law (Law of assembly of the Union of Myanmar No.10/2015) , and other laws related with the vessels.</li> </ul>	<ul style="list-style-type: none"> <li>The Law has been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment 7 above.</li> </ul>
15	4.4.2/ 4-22	4.4.2 Operation activities The Project objective is to provide logistics services to the offshore oil and gas industry in Myanmar.	<ul style="list-style-type: none"> <li>As the purpose of the project, The Petroleum and Petroleum Product Law (Law of Assembly of the Union of Myanmar No.20/2017), The Oilfields Act 1918 and other related laws need to describe in addition.</li> </ul>	<ul style="list-style-type: none"> <li>The Law has been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>Comment: To response again such as, corrected, updated, include in page no...etc</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment 7 above.</li> </ul>
16	4.4.2/ 4-26	4.4.2 Operation activities – Traffic (onshore/offshore) There is also the potential for helicopters to be used during the operation of the project but this will be limited to emergency events, such	<ul style="list-style-type: none"> <li>We noticed the description of the plane will be used in emergency cases so that need to be described in addition of Myanmar National Aviation Law (Law of</li> </ul>	<ul style="list-style-type: none"> <li>The Law Amending the Burma Aircraft Act has been included in Table 3.2.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>



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		as medivac and urgent repairs and will therefore not be regular.	Assembly of the Union of Myanmar No.52/2014)			
17			<ul style="list-style-type: none"> <li>In addition of Convention on biological diversity 1992, Basel convention on the control of transboundary movements of hazardous wastes and their disposal 1992, International Finance Corporation (IFC) EHS Guideline for Offshore Oil and Gas Development and EHS Guideline for Ports, Harbors and Terminals are need to describe in the law section</li> </ul>	<ul style="list-style-type: none"> <li>These international standards considered for this Project are included in Section 3.2.4.</li> </ul>	<ul style="list-style-type: none"> <li>It has already responded according to the comment.</li> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
18			<ul style="list-style-type: none"> <li>To describe Engineering guideline and standard for the construction of project component</li> <li>To describe the guideline and standard for the Fire Fighting System</li> <li>To describe the guideline and standard of other compliances</li> </ul>	<ul style="list-style-type: none"> <li>Engineering standards and firefighting standards are provided in Section 3.2.4.</li> </ul>	<ul style="list-style-type: none"> <li>There are amendments in page 3-25.</li> <li>It has already responded according to the comment.</li> <li>No comments</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
<b>4. Project Description</b>						
19	4.1 (4-1)	Project Details ....M&AOSB will notify ECD of the final layout prior to construction as well as a statement on whether or not these changes affect the findings or commitments of the EIA/EMP.	<ul style="list-style-type: none"> <li>It is mentioned that the final layout will notify ECD prior to construction phase.</li> <li>The project layout in Figure 4.1 and 4.2 need to notify ECD if the layout are modified.</li> <li>The above information need to mention in ECC.</li> </ul>	<ul style="list-style-type: none"> <li>Noted</li> </ul>	<ul style="list-style-type: none"> <li>No comments</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
20	4.2 (4-3)	Project Location The project area encompasses an area of sandy beach and onshore farmland.	<ul style="list-style-type: none"> <li>The project area encompasses an area of sandy beach.</li> </ul>	<ul style="list-style-type: none"> <li>Noted</li> </ul>	<ul style="list-style-type: none"> <li>No comments</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
21	4.3.1 (4.6)	Jetty Design There are three options for the causeway ..... A closed structure is the selected option.	<ul style="list-style-type: none"> <li>There are three options for the causeway and a closed structure is the selected option.</li> <li>Related to the selected causeway chosen under section 62 (D-5 and D-6) of EIA procedure (2015), when the other alternatives are accessed, it is needed to access and mention the comparison of selected alternatives and other alternatives in the proposed project design to reduce adverse environmental and social impacts.</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment No. 1 (alternatives)</li> </ul>	<ul style="list-style-type: none"> <li>It is found that there is amendment as a closed structure is the selected option (i.e. closed causeway) on page 4-6.</li> <li>It is stated that there will be changes in jetty design depending on the soil investing result to build the closed structure of causeway option</li> <li>I would like to suggest to think about the combined design which will include both closed structure and opened structure to mitigate the environmental impact. Because, according to the data from the site survey, it is found that one local person is worrying about the water</li> </ul>	<ul style="list-style-type: none"> <li>M&amp;AOSB have contacted the MPA regarding the jetty design. MPA sent a letter approving the jetty layout. This Letter is <b>appended</b> to this Response Table.</li> <li>M&amp;AOSB commissioned a sediment assessment for the jetty by Royal Haskoning. It was concluded that the jetty would over time have a local and small impact on the shape and position of the coastline. On the up-drift (west) of the jetty accretion will occur and at the down-drift (east) small coastal retreat might occur, however, the latter is expected to be limited due to the presence of harder (rocky) material at this location. The changes are not expected to create significant changes outside of the bay. This is included in <b>Section 6.4.4 (pg. 6-22)</b>.</li> </ul>

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					<p>route changing by closed structure design.</p> <ul style="list-style-type: none"> <li>● Therefore, in decision of environmental consideration in design approval from MPA or regulator for ports and terminals, it is needed to get the suggestion of regulator and to suggest about the optimal and Environmental Friendly design which depend on the Soil Investigation Result.</li> <li>● This fact is needed to consider as the commitment.</li> <li>● To think about the (World Bank EHS 2017) environmental Friendly design as the essential subject. Because, in considering the Jetty Design, the statement about the coastal process, seabed and coastal morphorology (EIA report), p-5.4, 5-6) and abiotic factors (coastal land erosion, sediment transport by wave and tide, and sediment transport deposition) related with Jetty Design can change physical and ecology of coastal environment.</li> <li>● To include this fact as the commitment.</li> </ul>	
22	4.3.3 (4-7)	<p>Location of the Project</p> <p>The project area is Nga Yoke Kaung in Ayeyarwaddy Region. There were 8 locations identified as potential sites for the OSB.</p>	<ul style="list-style-type: none"> <li>● Table 4.1 is just information for comparison study.</li> <li>● Even though the eight project location is selected as project alternatives. There will need to describe the comparison study and the fact of why seven alternative location is selected.</li> </ul>	<ul style="list-style-type: none"> <li>● As per Comment No. 1 (alternatives)</li> </ul>	<ul style="list-style-type: none"> <li>● See in the Follow up Comment on Response No-1.</li> <li>● As the response does not completely support what RT would like to know, revise and provide again the suitable response.</li> <li>● In the Figure 4.5 of the executive summary, Location D was selected as Site Selection Criteria.</li> </ul>	<ul style="list-style-type: none"> <li>● As per Response to Comment No. 1</li> <li>● The climate change considerations made for the Project in terms of open and closed type jetties are provided in <b>Section 4.3.2 and 4.3.3.</b></li> <li>● The WBG EHS Guidelines for Ports, Harbours, and Terminals (2017) have been considered in the design and operation of the OSB.</li> </ul>

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					<ul style="list-style-type: none"> <li>● But the selected Location D is not observed by Third Party organization who is authorized for environmental impact assessments.</li> <li>● Moreover, the revised report needs to describe consideration of environmental status that can support the selection of Location D.</li> <li>● Projected future climate change-related impacts and the development of adaptation measures to enhance resilience, etc need to be included in alternative consideration. (Ref.: World Bank Guideline (2017) Page. 4-5)</li> </ul>	
23	4.3.3 (4-8 to 4-12)	Table 4.1 Site location Alternative Considered	<ul style="list-style-type: none"> <li>● As per Table 4.1 the seven alternative location is selected. However, there is no the description of criteria why the alternative is chosen, the condition of environment and social impacts and the comparison study. Thus, it is observed that there are lack of the location alternative assessment.</li> <li>● Due to the proposed project is located the rich area of marine biodiversity &amp; natural resources and the potential coastal area for tourism destination, the assessment for each reasonable alternative location is to be conducted and described.</li> <li>● <del>This fact is the particular analysis for sustainable development of proposed project. It is submitted to the department to take a consideration.</del></li> </ul>	<ul style="list-style-type: none"> <li>● As per Comment No. 1 (alternatives)</li> </ul>	<ul style="list-style-type: none"> <li>● Please see Follow up comment on Response No.1.</li> <li>● As the response does not completely support what RT would like to know, revise and provide again the suitable response.</li> <li>● Climate change resilience needs consideration of rainfall, flash flood, heat wave, storm, storm surge and high wind speed.</li> <li>● In Design Phase and operation phase of Risk exposure to climate change resilience, risk identification needs to be conducted by regular analysis, evaluation and review and also mitigation measures for Adaptation. This must be included as a commitment.</li> </ul>	<ul style="list-style-type: none"> <li>● As per Response to Comment No. 1</li> <li>● The design considerations for the jetty construction have been included in new <b>Section 4.3</b>. The dominant swell waves at site are higher than the safe operation limit. The downtime (non-operational time) for an open jetty is within the range of 85-100 % year round. Therefore the jetty would need to be protected from these waves to meet safe working conditions. This would result in additional structure (such as a breakwater) needing to be constructed with additional environmental and social impacts.</li> <li>● <b>Sections 4.3.4 to 4.3.8</b> provide the design considerations for cyclones, tsunamis, Storm surges, seismic activity and sea level rise that have been considered in the design of the Project.</li> </ul>
24	4.4.1 (4-13)	Construction Activities (Offshore Activities) .... Only a small portion of non-suitable materials (silts) will be taken away by a ship to an authority approved disposal area.	<ul style="list-style-type: none"> <li>● In order to know if there are impacts from this activities and there is needed to conduct the assessment, the disposal area prior to the construction activities is</li> </ul>	<ul style="list-style-type: none"> <li>● Noted</li> </ul>	<ul style="list-style-type: none"> <li>● Regarding to Disposal area and Disposal plan, follow as per Myanmar Port Authority's guidance and to report back to</li> </ul>	<ul style="list-style-type: none"> <li>● A commitment has been added in <b>Table 8.1 (G4.1)</b> stating that "M&amp;AOSB will follow the Myanmar Port Authority's guidance related to the disposal area and disposal plan, and to report back to ECD for guidance."</li> </ul>

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			needed to notify ECD and follows the further instruction from ECD if necessary.		ECD and if necessary, comply as per ECD's guidance. Include this in ECC.	
25	4.4.1 (4-13)	...which the cells will be filled with clean sand to .....	<ul style="list-style-type: none"> <li>To clearly mention that the sand from where will be used.</li> </ul>	<ul style="list-style-type: none"> <li>Section 4.4.1 and Table 8.1 has been updated with the commitment that the EPC contractor will use sustainable source for sand.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure sustainable source, set up Contractual Agreement with contractor or Monitoring Plan.</li> <li>This information (the EPC contractor will use sustainable source for sand) needs to be included in ECC.</li> </ul>	<ul style="list-style-type: none"> <li>A commitment has been included in <b>Table 8.1 (C6.1)</b> stating "The contractor will use sustainable source for sand used for the Project. This commitment will be included in the contractors' agreements."</li> </ul>
26	4.4.1 (4-13)	There will be no piling of cylindrical piles with pile hammers.....	<ul style="list-style-type: none"> <li>The proposed jetty and the causeway are in shallow water. The sound wave generated from piling activities transmitted far distance and cause disturbance to shallow aquatic species than deep-water.</li> <li>Hence, No piling of cylindrical piles with pile hammers to be mentioned in agreement table.</li> </ul>	<ul style="list-style-type: none"> <li>This is included as a commitment in Table 8.1.</li> </ul>	<ul style="list-style-type: none"> <li>Table 8.1 of Section 8.1 (In case single round piles.. hammer for correct contact) and 23.1 (There will be no piling of cylindrical pile with pile hammers..), are not relevant. It makes the reviewer complicated about the piling activities.</li> <li>In the report, for underwater noise assessment, it needs to exactly describe type of piling (cylindrical or sheet).</li> <li>If hammer will be used, it needs to conduct environmental plan required for underwater noise assessment. To calculate noise decibel based on piling activities used.</li> <li>Impacts on biodiversity resources (marine mammals, turtles, etc..) needs to be observed based on noise traveling distance and describe relevant environmental plans.</li> </ul>	<ul style="list-style-type: none"> <li>The design of the jetty and piling used is not yet confirmed. The appropriate piling method is subject to detailed design.</li> <li>The impact assessment is conservative and based on the noise from the worst-case (loudest) piling. This has been clarified in <b>Section 4.5.1 and 6.4.8.</b></li> </ul>
27	4.4.1 (4-17)	...levelling of rocky hill be conducted and the fill material will be used for jetty/causeway construction.	<ul style="list-style-type: none"> <li>The fill material such as the excavated rock from levelling and dredging materials (410,000 m2) will be used the jetty/causeway contraction.</li> <li>The necessary amount of fill material and amount from levelling and dredging need to be calculated and mention. As a result,</li> </ul>	<ul style="list-style-type: none"> <li>See response to Comment 5 (D) above on fill materials</li> </ul>	<ul style="list-style-type: none"> <li>The response is not relevant.</li> <li>Added on Page 4-8.</li> </ul>	<ul style="list-style-type: none"> <li>The amount of material to be disposed of at the disposal area is not able to be calculated at the time of writing this report. M&amp;AOSB will prepare a disposal plan that will be submitted to MPA prior to construction. This disposal plan will also be provided to ECD via the Environmental Monitoring Report. This has</li> </ul>

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			it will know how to manage the extra amount as solid waste.			been included in <b>Section 4.5.1 (pg. 4-19)</b> and <b>Table 8.1 (C5.1)</b> .
28	4.4.1 (4-18)	Construction Activities (Onshore Activities) Materials to be handled and stored at the base include the following: <ul style="list-style-type: none"> <li>Drilling fluids</li> <li>..</li> <li>..</li> <li>Oilfield chemicals</li> </ul>	<ul style="list-style-type: none"> <li>The drilling fluids and oilfield chemicals will be protected and stored. The chemicals substances and oilfield chemicals included in the drilling fluids need to mention.</li> <li>Therefore, the service provided from this project and the danger of storage and handling chemical substances, impact to environment and environment management plan will be accessed properly.</li> <li>Apart from storage list of substances, the offshore (Oil &amp; Gas) and natural gas service activities need to describe.</li> <li>Related to that service activities, before the offshore natural gas hazardous and non-hazardous waste are sent to downstream treatment facilities, it is needed to confirm if they can be stored temporarily in the project area.</li> <li>If they are stored, the additional assessment and how they will be managed are need to describe.</li> </ul>	<ul style="list-style-type: none"> <li>The likely chemicals used are included in Section 4.4.2.</li> <li>The services are described in Section 4.4.2 including a liquid mud plant.</li> </ul>	<ul style="list-style-type: none"> <li>No comment.</li> <li>There is one comment on services activities, before transporting offshore oil and hazardous and non-hazardous waste to downstream treatment Facilities, is it possible to store temporarily within the project area. And the response to this comment described on Page 4-4 and Section 8.5.3 was not complete.</li> <li>So, the more complete plan on Waste Storage Facility need to be reported to ECD before the project starts.</li> <li>Need that point to include in ECC.</li> </ul>	<ul style="list-style-type: none"> <li>A commitment to provide ECD with additional details of the Waste Storage during operation is provided in <b>Table 8.1 (O13.1)</b>.</li> </ul>
29	4.4.1 (4-19)	Construction Activities (Access Road) .... This will pass through forested area and some paddy fields .....	<ul style="list-style-type: none"> <li>As the construction of access road will pass through the forest area and some paddy field, the permission of related government department and the landowner will be needed. The permission matter is needed to describe in ECC.</li> <li>The access road will pass through the paddy field. But the related impact assessment and the road detail information such as it will construct a new road or use the existing road closely located to Zin Yaw Chaung, type of road and width of road etc. aren't mentioned. If the existing road is used, the impacts to nearby village, traffic, air quality and community should considered. If the new road constructs, the impact to forest, agriculture land and nearby village have to be considered and described.</li> </ul>	<ul style="list-style-type: none"> <li>There is no natural forest, only coconut farms.</li> <li>This has been clarified in Section 4.4.1.</li> <li>Impacts to the community are provided in Section 6.4.11 and include traffic and access road impacts.</li> </ul>	<ul style="list-style-type: none"> <li>It is found that more explanations are described about Access Road in Section 4.4.1.</li> <li>According to Updated Information, as the approach road will be a new road and will cross through Coconut farms and Paddy Field, to get agreement with concerned department's permission and landowners.</li> <li>Need that point to include in ECC.</li> </ul>	<ul style="list-style-type: none"> <li>The land utilized for access road have been purchased by M&amp;AOSB from local land owners. The purchasing contract list is provided in <b>Appendix C of the EIA</b>. This is updated in <b>Section 4.5.1 (pg. 4-26)</b>.</li> </ul>
30	4.4.1 (4-20)	Construction Activities (Tunnel) ..... M&AOSB will construct a tunnel on the beach to allow the local beach users to have access to the beach.	<ul style="list-style-type: none"> <li>A tunnel will be constructed to ensure the local communities have full access to the beach.</li> <li>The alternatives section (section 4.3.1 – page – 4-6) should mention the alternative option for the causeway that If it is possible to construct an open deck on</li> </ul>	<ul style="list-style-type: none"> <li>The rationale for selecting the closed causeway is provided in Section 4.3.1.</li> </ul>	<ul style="list-style-type: none"> <li>There is no complete additional description of Jetty Design selection.</li> <li>The description on Section 4.3.1 was only the definition of Causeway.</li> </ul>	<ul style="list-style-type: none"> <li>The open / closed option relates to the causeway section of the jetty. The dominant swell waves at site are higher than the safe operation limit. The downtime (non-operational time) for an open jetty is within the range of 85-100 % year round. Therefore the jetty would need to be protected from these waves to meet safe working conditions. This would result in</li> </ul>



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			<p>pile structure, there is no need to construct a tunnel.</p> <ul style="list-style-type: none"> <li>Even though the three option is mentioned, there is no explanation why the closed causeway is selected and it has to be described..</li> </ul>		<ul style="list-style-type: none"> <li>We request the description of the reason why Open is not conducted and closed is conducted.</li> <li>Please read Follow up comment no. 21.</li> </ul>	<p>additional structure (such as a breakwater) needing to be constructed with additional environmental and social impacts. In addition, M&amp;AOSB commissioned a sediment assessment for the jetty by Royal Haskoning. It was concluded that the jetty would over time have a local and small impact on the shape and position of the coastline. On the up-drift (west) of the jetty accretion will occur and at the down-drift (east) small coastal retreat might occur, however, the latter is expected to be limited due to the presence of harder (rocky) material at this location. As such, the closed jetty will have limited impacts. This is updated in <b>Section 4.3.1 and 4.3.2.</b></p>
31	4.4.1 (4-20)	Construction Activities (Waste Generation) .... Waste disposal will be carried out by authorized local waste handling facilities.	<ul style="list-style-type: none"> <li>To mention what authorized waste handling facilities will be used.</li> <li>To mention the monitoring plan for the waste disposal</li> <li>Monitoring requirement table (Table 8.3 – Page 8-20) is not included the monitoring plan for waste disposal. Need to mention it completely.</li> </ul>	<ul style="list-style-type: none"> <li>A Waste Management Plan is provided in Section 8.5.3.</li> <li>Hazardous waste will be sent to a licensed waste handling facility in Thilawa (Section 4.4.3).</li> </ul>	<ul style="list-style-type: none"> <li>As the response does not completely support what RT would like to know, revise and provide again the suitable response.</li> <li>To describe type of released Hazardous waste, route to carry Hazardous waste, handling and transportation plan.</li> <li>To describe monitoring plan about waste disposal.</li> </ul>	<ul style="list-style-type: none"> <li>Liquid effluents associated with land-based activities in ports and terminals (such as construction activities, vehicle maintenance and washing, fuel and material storage and transfer, etc.) include storm water, wash water and sewage. A sanitary system for the OSB will be installed to ensure that all waste grey and or black water / fluids are collected, stored and treated. After treatment the effluent shall be discharged in accordance with NEQ Guidelines. Hazardous waste will be sent to a licensed waste handling facility in Thilawa. Typical hazardous wastes include; oil, general industrial chemicals, and specialised chemicals used by the offshore oil and gas industry (such as bentonite, etc.). This is updated in <b>Section 4.5.3 (pg. 4-39)</b>. The types and quantities of waste likely to be stored on site are provided in <b>Table 4.4</b>.</li> <li>The monitoring for effluent discharges is provided in <b>Section 8.5 (Table 8.7)</b> and <b>appended</b> to this Response Table.</li> </ul>
32	4.4.1 (4-22)	<p>Waste Generation Waste generated during construction will include.....Waste disposal will be carried out by authorized local waste handling facilities.</p> <p>In addition to the above, there is also a potential for a helipad to be built on the site for materials to be air freighted to and from the site during operation. This is not expected to be regular activity; rather it will be for emergency delivery only and will seldom occur.</p>	<ul style="list-style-type: none"> <li>Waste disposal will be carried out by authorised local waste handling facilities.</li> <li>But it is unknown that the proposed project use what kind of waste handling facility.</li> <li>If the local waste handling facility is not easily accessible or outdated technology, it is not mention what kind of waste disposal method will be used.</li> <li>During operational, it is mentioned that the landing area (Helipad) for air freighted will be built. Traffic in page 4-26 also mention that it will be for emergency deliveries only. The impact assessment for the construction of Helipad and the</li> </ul>	<ul style="list-style-type: none"> <li>As per Comments No. 31</li> <li>Information on helicopter impacts are included in Table 6.14.</li> </ul>	<ul style="list-style-type: none"> <li>As the response does not completely support what RT would like to know, revise and provide again the suitable response.</li> <li>As per observation by RT Team in Nga Yoke Kaung Town, there is only Land Fill as local waste handling facilities.</li> <li>It needs to be practical in managing the wastes released from construction and operation phase.</li> </ul>	<ul style="list-style-type: none"> <li>The only waste to be treated on site will be grey water and oily water. All residues from the wastewater treatment plant (WWTP) will go to the waste reception centre. The remaining waste will be shipped to Yangon for treatment or disposal. The waste flow chart is provided in <b>Figure 4.23</b> and <b>appended</b> to this Response Table.</li> <li>A helipad will be constructed for emergency use only. Given that this will not be in regular use and will only be used for emergency MEDEVAC requirements, the impacts are not expected to be significant. This is discussed in <b>Section 6.4.2 (pg. 6-17)</b>.</li> </ul>



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			emergency helicopter operation aren't written. Need to describe it.		<ul style="list-style-type: none"> <li>● In Table 6.14, Helicopter Impacts is described as Operation Phase Scope out Impact.</li> <li>● There is no description of assessment on the construction and operation of Helipad. So, please describe.</li> </ul>	<ul style="list-style-type: none"> <li>● Waste will be monitored and reported in the Environmental Monitoring Report (as per <b>Table 8.6</b>)</li> </ul>
33	4.4.2 (4-22, 24)	Liquid Mud Plant Workshops Waste Storage Facility Water Supply	<ul style="list-style-type: none"> <li>● It is viewed that the proposed project of the description of each project component is very general. The complete information for the impact assessment and the mitigation measure are very essential. To add the precise information</li> <li>● Mixing drilling fluid (NADF, WBDF) will conduct at the liquid mud plant that affects negatively to marine resources. It is needed to mention the information on how to treat the wastewater from cleaning and maintenance process.</li> <li>● To mention the liquid and solid waste generated from workshops and industrial service activities</li> <li>● The fresh water is the main part of proposed project. It is needed to mention and access in number about the management of each activities in order to know the local fresh water consumption and fresh water requirement for project.</li> <li>● RO system is used. To describe how to manage the reject water.</li> <li>● As per above the project activities, the information and analysis, the rich area for marine biodiversity, NEQ (Table 3.5) is lack of good control measure for proposed project's effluent discharge.</li> <li>● The jetty activities of discharge parameters and limit, and the offshore and natural gas service activities of discharge parameters and limit have to be described.</li> </ul>	<ul style="list-style-type: none"> <li>● Section 4.4.2 has been updated to include more information on the Project.</li> </ul>	<ul style="list-style-type: none"> <li>● Need to confirm whether the project description on Section 4.42 can cover all the information for RT</li> <li>● If it is confirmed that the project description covers all the information, it is needed to submit the more complete information to ECD before the project starts.</li> <li>● Include that in ECC.</li> <li>● There is no response for the comment of the competition of water source between community used and the amount needed for the project before later phase.</li> <li>● As water storage tank will be constructed in later phase, and on page 45, Compensation Plan and livelihood restoration plan for paddy field is considered, it is stated that additional assessment will not be needed. But it is not enough. Need to submit Environmental Impact as Additional Follow up EIA to ECD before construction of water storage tank.</li> <li>● Include that in ECC.</li> <li>● As the response on Monitoring parameters for sediment and effluent (World Bank 2017) does not completely support what RT would like to know, revise and provide</li> </ul>	<ul style="list-style-type: none"> <li>● In the first phase water will be produced from seawater using a Reverse Osmosis (RO) facility and not in competition with local communities. In Phase 2, a reservoir will be constructed to ensure adequate water supply for the Project and to avoid utilising the local groundwater sources. This has been included in <b>Section 4.5.12 (pg. 4-34)</b>.</li> <li>● The area is within the current site boundary and therefore no additional land will be utilised for the Project. The location of the reservoir is shown in <b>Figure 4.21</b>.</li> <li>● The monitoring requirements for water and sediment are provided in <b>Section 8.5 (Table 8.7)</b> and <b>appended</b> to this Response Table.</li> </ul>

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					<p>again the suitable response.</p> <ul style="list-style-type: none"> <li>This information must be describe in the report as there is weakness on project description and the project location is on plenty of ecosystems. Need to be included in Monitoring Plan Table 8.5. This needs to be included in ECC.</li> </ul>	
34	4.42 (4-24)	<p>Operation Activities Water Supply</p> <p>In the first phase, water will be produced from sea water using RO facility.....M&amp;A OSB currently studying the option of a reservoir however have not yet decided. However, in a later phase, a reservoir may be created a the back of OSB by constructing a dam, between 2 hills and flooding a current paddy area.....on the lines at all times.</p>	<ul style="list-style-type: none"> <li>The report mention at initial stage of project that the fresh water will be produced from seawater using RO facility. But the location point for sea water, water intake and map aren't mentioned. Besides, it is needed to access and describe an aquatic species could get into sucking pipe.</li> <li>Also, the later phase mentions the construction of reservoir for water supply. It is not mentioned the location, design, impacts of reservoir in the report. To mention them in the report.</li> <li>This EIA is intended the second phase. Thus, it is needed to provide the second phase operational information.</li> <li>In conclusion, the project water supply is needed to provide more information in the report.</li> </ul>	<ul style="list-style-type: none"> <li>The intake pipeline will be on Palin Gyaing beach but the location is not yet confirmed.</li> <li>Impacts from entrainment of marine species is included in Section 6.4.9.</li> <li>The EIA covers the second and first phases; this is clarified throughout the report.</li> </ul>	<ul style="list-style-type: none"> <li>Although it describes the potential plans in Water Supply, there is no explanation of actual plans.</li> <li>Although it additionally describes that marine animals can be carried through from sea water using RO in Section 6.4.9, Existing in-place Control was general.</li> <li>Impacts will be more as the water intake volume are larger. So, use International Practices.</li> <li>This needs to be included in ECC.</li> <li>As the response on construction of reservoir, location, design, impacts does not completely support what RT would like to know, revise and provide again the suitable response. Read Follow up Comment 33.</li> </ul>	<ul style="list-style-type: none"> <li>The water will be supplied by Reverse Osmosis and Reservoir (as mentioned in detail is Response to Comment No. 33 above).</li> <li>The commitment measures for entrapment or entrainment of marine organisms are aligned with international good practise.</li> </ul>
35	4.4.2 (4-22,25,26)	<p>Operation Activities</p> <p>.....During the first years of operation all goods will arrive by cargo ship, and will be stored at the base, shipped on an offshore support vessel (OSV) to the rig/platform, shipped back to the base.....by cargo ship. Vessels during operations include:</p> <ul style="list-style-type: none"> <li>. Supply vessels....</li> <li>. General Cargo vessels....</li> <li>. Small Tankers.....</li> </ul>	<ul style="list-style-type: none"> <li>In the report's section (4.4.2), the supply vessel and tanker and other cargo vessels operate in the project's jetty area. It is understood that those factor should consider in the impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>All vessels using this port are operating in compliance with international standards (MARPOL).</li> <li>M&amp;A commit to ensuring all vessels have required certificates as required per vessel class under MARPOL (Table 8.1).</li> </ul>	<ul style="list-style-type: none"> <li>Need to include in commitment.</li> <li>The text (M&amp;A commit to ensuring all vessels have required certificate as required per vessel class under MARPOL) is to be included in ECC.</li> <li>To set up Marine Visual Observer to protect Vessel collision with marine mammal and turtle and Vessel collision</li> </ul>	<ul style="list-style-type: none"> <li>These commitments are all included in <b>Table 8.1 (C7.1, G3.1, and GG4.1)</b>.</li> </ul>

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					<ul style="list-style-type: none"> <li>with fishing boats and material.</li> <li>To have required plans on vessels.</li> <li>Following the guidance of Ministry of Port Authority needs to be included as a commitment.</li> </ul>	
36	4.4.3 (4-26)	Waste Management Construction vessels used for the Project will adopt the applicable MARPOL (international) requirements for waste discharges. No waste will be discharged within 3nm of the coast.	<ul style="list-style-type: none"> <li>To receive a suggestion from Department of Marine Administration (DMA)</li> </ul>	<ul style="list-style-type: none"> <li>M&amp;A will liaise with DMA prior to construction (Table 8.1).</li> </ul>	<ul style="list-style-type: none"> <li>No Comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
<b>5. Description of Environmental and Social Baseline</b>						
37			<ul style="list-style-type: none"> <li>It is found out that selection of locations for baseline data collection is only conducted for the alternative 7 locations and not for each alternative collection.</li> <li>In consideration of Project Alternative, to get the effective assessment for environment, socio-economic and local development, baseline information collection and analysis for alternative collections needs to be described.</li> </ul>	<ul style="list-style-type: none"> <li>No Response</li> </ul>	<ul style="list-style-type: none"> <li>Please read Follow-up Comment 23.</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 23.</li> </ul>
38	5.2.1 (5.2)	Baseline Surveys	<ul style="list-style-type: none"> <li>Marine water and Ground water sampling for the project was observed as water quality assessment.</li> <li>Estuarine water quality assessment is to be conducted as the waste from the project can flow into the nearer stream and can impact the mangrove and other related stuffs due to nature of Myanmar sea's high and low tide.</li> <li>EIA report's water quality assessment referred the book, "ASEAN Marine water quality criteria" described to measure both Marine water quality and estuarine water quality.</li> <li>Estuarine and Marine water quality are to be assessed and described because of project location and surrounding environment. EIA report's water quality assessment referred the book, "ASEAN Marine water quality criteria" described to measure both Marine water quality and estuarine water quality.</li> <li>The project location and environment showed to assess Estuarine and Marine water quality.</li> </ul>	<ul style="list-style-type: none"> <li>As described and agreed in the Review Team Meeting; there is no potential for impact to the estuary so water quality not required to be measured.</li> <li>This is mentioned in Section 5.2.1</li> </ul>	<ul style="list-style-type: none"> <li>There is no such kind of agreement during RT meeting.</li> <li>During RT Meeting, review team give comment to consider the impact significance based on comment 77 which is also linked with baseline surface water sampling.</li> <li>So ERM responded that they can ensure not to impact the estuarine water quality because discharge will be to the ocean, not to the surface water.</li> <li>As per ERM response, Review team again suggested to describe location and discharge point of treated sewage effluent whether to the ocean or surface water because impact significance can be different depending upon</li> </ul>	<ul style="list-style-type: none"> <li>Sewage and sanitary wastewater will be treated prior to disposal. The discharge location will be along the Palin Gyaing Beach to the North of the Project Area. Direct disposal into surface or aquatic waters is not allowed. The treated wastewater will meet the National Environmental Quality (Emissions) Guidelines on Effluent Discharges, which will be monitored regularly. Other in-place controls shall also be applied to reduce the potential for contamination of storm water. With the mitigation in place, the impact of effluent discharges to marine water quality is small magnitude and of MINOR significance. There will be no onshore effluent discharges. The impact of run-off onshore is mitigated and will be of MINOR significance. This is updated in <b>Section 6.4.5 (pg. 6-24)</b>.</li> </ul>

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					<p>sensitivity of receiving water body.</p> <ul style="list-style-type: none"> <li>● It is observed that Section 5.2.1 is updated with the information describing that discharge and water intake will occur along Palin Gyaing beach and hence there is no impact expected to occur to the estuary.</li> <li>● However, again there is no information related to discharge location and its level of sensitivity and assimilative capacity of receiving water body, whether ocean or surface water.</li> <li>● In general, response did not cover all suggestions /comment under No.38.</li> </ul>	
39	5.3.4 (5-4)	Marine Sediment Sampling A total of six stations were surveyed for marine sediment. The sampling locations are presented in figure 5.2. and ....	<ul style="list-style-type: none"> <li>● To describe the coordinates of Sampling location</li> </ul>	<ul style="list-style-type: none"> <li>● Coordinates for the survey are included in Table 5.2.</li> </ul>		No response required
40	5.3.4 (5-9, 5-10,5-11)	Marine Sediment Sampling Table 5.5. Marine Sediment Sampling Result Metals Of the marine sediment samples collected,.....The exceedances of Nickel and Mercury, which had concentration in excess of the ISQG high Value (52 mg/kg for Nickel) and NAGD screening level (21 mg/kg for Nickel and 0.15 mg/kg for mercury,).....with no metal at concentrations of environmental concern.	<ul style="list-style-type: none"> <li>● Section 5.3.4 described that mercury and Nickel concentration in sediment is above ISQG high value, especially at the sampling point S1 in dredging zone.</li> <li>● Section 4.4.1 (4-13) explained that estimated dredging volume is about 410,000 m3 and those loose soil due to dredging will be used for the construction of land reclamation and jetty construction. These volume is about 656,000 metric tonne and it is relatively big volume. (500,000 tons and above are the amount which needs ESIA as per Myanmar EIA procedure)</li> <li>● Therefore, it is assumed the Impact Assessment and Management Plan should be considered for loose soil disposal methods and disposal areas. Moreover, it is suggested to consider Management Practice related to Potential Contaminated Dredged Sediment as Heavy Metal (Mercury) inclusion in Sediment from Sampling Point S1 of dredging zone is above the limit.</li> </ul>	<ul style="list-style-type: none"> <li>● A Sediment Management Plan is provided in Section 8.5.6.</li> <li>● The locations of the disposal areas are not currently known, when confirmed M&amp;AOSB will provide details to ECD.</li> </ul>	<ul style="list-style-type: none"> <li>● Sediment Management plan is provided in updated ESIA report.</li> <li>● Sediment management plan did not cover for Potential Contaminated Dredged Sediment.</li> <li>● M&amp;A OSB will submit an environmental Monitoring Report to the MONREC every six months as per EIA procedure requirement.</li> <li>● To include in ECC "The locations of the disposal areas are not currently known, when confirmed M&amp;AOSB will provide details to ECD"</li> <li>● As sediment survey results from table 5.5, the concentration of mercury, cadmium and nickel in the sediments of S1, S2, S3 and S4 are exceed than the ISQG high value. This heavy metal</li> </ul>	<ul style="list-style-type: none"> <li>● The commitment on disposal locations is provided in <b>Table 8.1 (C4.2)</b>.</li> <li>● Water quality will be measured during operation at the discharge location and is included in <b>Section 8.5.6 (Table 8.7)</b>.</li> <li>● Marine sediments and water will be monitored in line with the WBG EHS Guidelines as appended to this Response Table and included in <b>Section 8.5.6 (Table 8.7)</b>.</li> <li>● Treated wastewater will be measured for the following parameters (in line with NEQEG and considering the WBG EHS Guidelines). This will include monitoring for metal contamination from sediment dredging. This is included in <b>Section 8.5.6 (Table 8.7)</b>.</li> <li>● Sediment dispersion modelling offshore the Project was conducted by Woodside for their A6 well. Woodside was able to demonstrate that seabed and surface discharge of cuttings and fluids did not reach the Myanmar mainland coast, the footprint of the sediment deposition was highly localised, and a zone of predicted ecological impact was limited to within 328 ft. (100 m) of the well site. Deposition and elevated Total Suspended Solids (TSS) return to a minimum level that defines the area of influence (1 mm, and 0.3 mg/L, respectively)</li> </ul>

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					<p>contaminants will be affected to both water column and sediment column, due to the sediment dispersion in dredging (construction and maintenance) period.</p> <ul style="list-style-type: none"> <li>● In Table 8.6, there is not enough monitoring of only one parameter TSS in requirement. To monitor not only TSS but also heavy metal parameters as both water and sediment sample. To monitor as the statement of World Bank EHS Ports, Harbours and Terminal (2017). In table 8.6, the description in Marine Flora and Fauna Aspect is not considered the quality of sediments and maintenance dredging. So that need to take out and to make evaluation, analysis, review and revise for the monitoring.</li> <li>● Sampling locations not should limited to only sensitive receptors transect. It should be taken monitoring activities at Disposal area too.</li> </ul>	<p>within 820 ft. (250 m) of the well site. It is assumed the disposal site would be in a similar location to the A6 well and the disposal for sediment offshore will not impact any sensitive habitats. This is included in <b>Section 6.4.6 (pg. 6-31)</b>.</p>
41	5.3.5 (5.12)	Seawater Physio-chemical sampling The parameters measured are in line with those required to be monitored under the ASEAN Marine Water Quality Criteria.	<ul style="list-style-type: none"> <li>● It is found that Marine water quality is measured by Physical parameters</li> <li>● It is seen that the measurement were not use the parameters from ASEAN Marine water quality criteria. It need to be conducted and added,</li> </ul>	<ul style="list-style-type: none"> <li>● The parameters focused on suspended sediments given that this is the main impact from the project (dredging).</li> <li>● Monitoring of effluent discharges will be conducted and the parameters and frequency are included in Section 8.5.</li> <li>● There will be no toxic or heavy metals discharged for the Project.</li> </ul>	<ul style="list-style-type: none"> <li>● Please check comment on response 40.</li> <li>● The response is not complete for the RT needed, so that need to be clearly responded for the comments.</li> <li>● No comment</li> </ul>	<ul style="list-style-type: none"> <li>● As per Response to Comment No. 40.</li> </ul>
42	5.3.10 (5-30)	Natural Hazards Tsunami Myanmar is .....The Project Area is generally rocky and sandy without Mangrove protection. As such,.....this area is comparatively more vulnerable to potential tsunami.	<ul style="list-style-type: none"> <li>● Since the project location is prone to natural disaster such as Tsunami, Cyclone and sensitive area, the implementation of Emergency Response Plan including natural disaster: Heavy/</li> </ul>	<ul style="list-style-type: none"> <li>● The Emergency Response Plan will include natural hazards.</li> <li>● The ERP is provided in Appendix D.</li> </ul>	<ul style="list-style-type: none"> <li>● This described refer with the ERP of M&amp;AOSB.</li> <li>● In Appendix D, there have not included the emergency response</li> </ul>	<ul style="list-style-type: none"> <li>● The Oil Spill Contingency Plan (OSCP) is included in <b>Appendix G</b> of the EIA.</li> </ul>



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		Cyclone Gale Force Wind.....This area is susceptible to cyclones.	weather/ cyclone plan is considered. However, detailed management plan is not described and it is needed to be.		plans (Cyclone, Tsunami, Flood, etc) and Oil Spill Contingency Plan- OSCP. ● The propose project included to fuel storage so that need to be planned for OSCP and covered with Vessel collision, grounding, spill from bunkering including sensitivity mapping. ● To include this fact in ECC.	
43	5.4.1 (5-31) Figure 5.8 – 5.12	Terrestrial Habitats Survey Results? (Page 5-34)	● It is seen that there are 47 species of Plant (11 species of herbs, 12 shrubs, 6 climbers and 18 trees) are found in the terrestrial Habitats of Offshore Supply Base Project's area.	● Noted	● No comment	● No response required
44	5.4.2 (5-38/39)	Terrestrial Fauna Birds (Page 5-38) Herpetofauna (Amphibians and Reptiles) (Page 5-39) Butterfly (Page 5-39) Dragonfly (Page 5-39)	● Terrestrial fauna: 24 species of birds, 7 species of reptiles, 5 species of amphibians frogs, 27 species of butterfly and 9 species of dragonfly are found in OSB project's habitat. Therefore, the area can be addressed as Terrestrial Key Biodiversity Area.	● This is not a designated KBA.	● To discuss	● The area is not a designated KBA. The impacts are all Minor to Moderate with the proposed mitigation. A monitoring plan is proposed to ensure no impacts to sensitive habitats. Full project monitoring is provided in <b>Table 8.2</b> .
45	5.4.3 (5-40)	Coastal Habitats – Secondary Data Coral Habitats (Page 5-40)	<ul style="list-style-type: none"> <li>● Coral communities can be found as per UNEP's Satellite Images, therefore Ground Truth Survey is required to be done. Images of coral habitats and coral reef are mix match.</li> <li>● Those mangrove habitat are the habitats and nurseries of economically benefited shell, prawn, crab and different types of fish during high tide periods.</li> <li>● Economically benefited mud crab, Scylla serrata and Clams for the community can be found in mangrove habitat.</li> <li>● Therefore, it is very important to conserve the economically important mangrove habitat, marine and coastal conservation.</li> <li>● Seven types of seagrass (Cymodocea rotundata, C. serrulata, Halodule uninervis, H.pinifolia, Thalassia hemprichii, H.decipiens and Halophila major) are dispersedly grown in the coast of TharThaNarDaunt village (Nothorn part of OSB project), PanHmaw village (Southern part of OSB project) and OhnKyunKyi (East).</li> <li>● These seagrass bed under the shallow water and served as nurseries and</li> </ul>	<ul style="list-style-type: none"> <li>● The UNEP map supplements the map showing the three coral areas (T1-3) that ERM surveyed (Figure 5.20). We have verified coral habitat in some of the UNEP areas but not all, therefore both maps are useful to build on the baseline.</li> <li>● Noted.</li> </ul>	● If the ecosystem will be failed, the plan of how to compensate to the related things depend on the ecosystem services.	● No compensation is required as part of the outcomes of this EIA. However, M&AOSB commit to paying any relevant compensation (as required) as per the Myanmar Environmental Conservation Law (2012) and all other laws as listed in <b>Table 3.2</b> and <b>appended</b> to this Response Table. This is include in <b>Table</b> <b>8.1 (G1.1)</b> .



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			<ul style="list-style-type: none"> <li>habitats for economically benefited shell, prawn, crab and different types of fish.</li> <li>Moreover those seagrass beds serve as nurseries and habitats of almost extinct and prohibit dugongs.</li> <li>Therefore it is very important to conserve the economically important seagrass habitat, marine and coastal conservation.</li> <li>It is to notice that Ecosystems will be initially damaged if there is any impact from OSB.</li> <li>If Ecosystems are damaged, the compensation has to be made to the concerned authority based on Ecosystems Services.</li> </ul>			
46	5.4.4 (5-43) Figure 5.15/16	Marine Habitats – Drop Camera Survey Tier I – Categorisation of Benthic Cover (Page 5-46) Tier II – Taxonomic Inventories to Define Types of Benthic Communities (Page 5-46)	<ul style="list-style-type: none"> <li>According to the Drop Camera Survey, there won't be sessile animals which attached to the base but there can be Meiofauna which lives in based sand and mud.</li> <li>Meiofauna as they are the indication of water pollution and food for fish and prawn who live in base, those should be assessed and described.</li> </ul>	<ul style="list-style-type: none"> <li>Appendix C includes the full list of benthic species recorded in surveys.</li> </ul>	<ul style="list-style-type: none"> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
47	5.4.5 (5-49) Figure 5.17 – 5.20 Table 2.11, 5.22/23	Nearshore Survey Transect 1 (T1) (Page 5-51) Transect 2 (T2) (Page 5-53) Transect 3 (T3) (Page 5-55)	<ul style="list-style-type: none"> <li>According to the snorkel survey implemented in SaPaHta island (Transect 1), OSB Project's right hand side, rocky headland (Transect 2) and TikeThoneLone island (Transect 3), it is understood that hard coral coverage in T-1 is 6 – 10 %, T-2 is 50-75% and T-3 is 76-100%.</li> <li>If any impact occurred in the Project area, the Physical Habitats of the nearest coast which includes hard corals and flora and fauna ecology will be directly impacted.</li> <li>Sustainable plans for the NgaYokeKaung bay which is rich in marine biodiversity should be included.</li> </ul>	<ul style="list-style-type: none"> <li>Noted</li> </ul>	<ul style="list-style-type: none"> <li>Need to be resubmit the plan to perform the extend of Nga Yoke Kaung coastal which has the plenty of marine species in long time.</li> <li>To resubmit with consider for the biodiversity compensation.</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment 45.</li> </ul>
48	5.4.6 (5-59)	Plankton	<ul style="list-style-type: none"> <li>Chlorophyll concentration of Phytoplankton and inferred Phytoplankton Standing Crop Levels of OBS project water area in Northeast season (November to March) is more than Southeast (June to September)</li> <li>It is seen that Chlorophyll concentration of Phytoplankton in offshore OSB Project area is less and highest chlorophyll levels (10 mg/m3) in near shore area due to the nutrient sedimentation.</li> <li>If there is impact from the project, primary productivity of Phytoplankton which occur due to the seasonal current can be</li> </ul>	<ul style="list-style-type: none"> <li>Noted</li> </ul>	<ul style="list-style-type: none"> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>

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			impacted due to the seasonal activity of the Project.			
49	5.4.7 (5-59) Table 5.24	Macrobenthos Survey	<ul style="list-style-type: none"> <li>● Grab Samplings in six stations observed that there are 53 types of Benthos inhabit in the Project area.</li> <li>● Benthos types small animals are the food for fish and prawn and the reference for water pollution.</li> <li>● Having many types of Benthos indicates that NgaYokeKaung Bay has no water pollution and Long term sustainable high priority plan for the cleanness of the area has to be included.</li> </ul>	<ul style="list-style-type: none"> <li>● Noted</li> </ul>	<ul style="list-style-type: none"> <li>● To include the commitment,</li> <li>● To include the fact (M&amp;A commit to ensuring all vessels have required certificates as required per vessel class under MARPOL) in ECC.</li> <li>● To be placed Vessel collision with marine mammal and turtle and Vessel collision with fishing boats, needed plan for the vessels and to comply the instructions of ministry of port authority.</li> </ul>	<ul style="list-style-type: none"> <li>● These commitments are all included in <b>Table 8.1 (G2.1 and C14.1)</b>.</li> </ul>
50	5.4.8 (5-63) Figure 5.21/22	Fish Assemblages	<ul style="list-style-type: none"> <li>● OSB Project offshore area is the important inhabit of soft-bone shark species and sting rays.</li> <li>● Whales shark (Rhincodon typus) from IUCN 2016 Red List can inhabit in the Project area from December to March.</li> <li>● Moreover, Hammer Head Sharks (Sphyrna lewini and Sphyrna mokarran) from IUCN 2016 Red List can inhabit in the Project water area.</li> <li>● Soft-bone shark species (Carcharhinus longimanus) and sting rays species (Dasyatis sp.) can be inhabited in OSB Project offshore area.</li> <li>● 42 types of sea fish can be caught near Gaw Yin Gyi island. Among them, Polynemus indicus, Panulirus polyphagus and Panulirus versicolor and considered as Endangered species as per IUCN Red List 2017 and Tenuailosa ilisha is considered as Least Concern.</li> <li>● As per IUCN Red List 2017, Lepturacanthus savala, Lethrinus letjan, Otolighes ruber, Upeneus sulphurous, Lates calcarifer, Scomberomorus guttatus, Rastrelliger kanagurta, Lactarius lactarius, Saurida undosquamis, Penaeus indicus, Portunus sanguinolentus and Charybdis feriata) are considered as Vulnerable and inhabit in the sea near Gaw Yin Gyi island.</li> <li>● Narrow barred Spanish, Mackerel (Scomberomorus commerson) from IUCN 2015 Red List who inhabit in open water</li> </ul>	<ul style="list-style-type: none"> <li>● Noted</li> </ul>	<ul style="list-style-type: none"> <li>● No comment</li> </ul>	<ul style="list-style-type: none"> <li>● No response required</li> </ul>

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			areas can be seen seasonally in the Project offshore water. It is very important to protect those fish and not catch them.			
51	5.4.9 (5-65) Figure 5.21/22	Marine Mammals Cetaceans (Page 5.66) Sirenians (Dugongs) (Page 5-66)	<ul style="list-style-type: none"> <li>There are 21 Cetaceans (Marine Mammals) in Myanmar water and they may inhabit to OSB's project area.</li> <li>IUCN Red List whales: Blue whale (<i>Balaenoptera musculus</i>) (Endangered), fin whale (<i>Balaenoptera physalus</i>) (Endangered) and sperm whale (<i>Physeter macrocephalus</i>) (Vulnerable), Humpback whale (<i>Megaptera novaeangliae</i>) and Bryde's whale (<i>Balaenophora edeni</i>) can inhabit in OSB project's water.</li> <li>A type of marine mammal, IUCN Red List un-listed endanger species, Dugong, relied on seagrass for nutrition can be inhabited in the south and north direction of the Project area.</li> <li>Therefore, it is suggested to protect the seagrass from any kind of impact as it is very important for Dugong.</li> <li>A departure plan for the IUCN Red List un-listed endanger species, Dugong and whales who might occur in the Project area has to be included.</li> </ul>	<ul style="list-style-type: none"> <li>Noted</li> <li>The Project does not block their movements</li> <li>The animals are free to leave the area and will mostly likely avoid the area of construction.</li> </ul>	<ul style="list-style-type: none"> <li>To include at the commitment.</li> <li>This point (M&amp;A commit to ensuring all vessels have required certificates as required per vessel class under MARPOL) is to be described at ECC</li> <li>To prepare Vessel collision with marine mammal and turtle and Vessel collision with fishing boats, have required plans for vessels and to have commitment to follow Ministry of Port Authority regulations.</li> </ul>	<ul style="list-style-type: none"> <li>These commitments are all included in <b>Table 8.1 (G2.1 and C14.1)</b>.</li> </ul>
52	5.4.10 (5-68) Figure 5.23 Table 5.25	Marine Turtles	<ul style="list-style-type: none"> <li>Restricted species such as Marine turtle (Olive Ridley Turtle (<i>Lepidochelys olivacea</i>) (Endangered), Loggerhead Turtle (<i>Caretta caretta</i>) (Endangered), Green Turtle (<i>Chelonia mydas</i>) (Vulnerable), Hawksbill Turtle (<i>Eretmochelys coracea</i>) (Endangered) travels in Myanmar water can potentially reach to the project area anytime.</li> <li>Plans have to be included for letting the Marine Turtle Species, Green and Olive Ridley Turtles to the project area for nesting activity from September to March and allow to travel safely away from the project.</li> </ul>	<ul style="list-style-type: none"> <li>Noted.</li> <li>The Project does not block their movements</li> <li>The animals are free to leave the area and will mostly likely avoid the area of construction.</li> </ul>	<ul style="list-style-type: none"> <li>To read the comment No. 51</li> <li>To consider the compensation program for the conservation plan of the important marine species and ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment 45.</li> </ul>
53	5.4.1 (5-70)	Seabirds	<ul style="list-style-type: none"> <li>Section 5.4.10 followed by section 5.4.1 (to correct it)</li> <li>OSB project's offshore and coastal Myanmar waters, there are 13 species of seabirds (Gulls, Storm petrels, Jaegers (Skuas)) breed.</li> <li>The main food for those seabirds are sea fishes and Benthos, therefore if there is any impact from OSB, Benthos and sea fish will be directly impacted and then those seabirds will be killed.</li> </ul>	<ul style="list-style-type: none"> <li>A bird survey was conducted in the Project Area (Section 5.4.2). Some seabirds and shorebirds were noted during this survey.</li> <li>However, there is no impact to birds offshore from construction or operation activities.</li> </ul>	<ul style="list-style-type: none"> <li>To read comment No. 52</li> <li>Important marine animals and biodiversity conservation is to be considered as Compensation Program.</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment 45.</li> </ul>

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			<ul style="list-style-type: none"> <li>● Close monitoring plan for not to have any impact as the impact can break the marine food chain and damage the Marine Ecosystems has to be included.</li> <li>● Field survey needed to be done and included in order to collect the biology and ecology of the seabirds.</li> </ul>			
54	5.4.2 (5-70) Table 5.26	Protected and Environmentally Sensitive Areas	<ul style="list-style-type: none"> <li>● After Section 5.4.10, it is Section 5.4.2. Need to fix it.</li> <li>● The area of 411 km2 of Ngwe Saung beach located 18 mile (30 km) north of OSB is designated Key Biodiversity Area (KBA) by Instituto Oikos and BANCA.</li> <li>● Nga Yoke Kaung area where OSB located could be a designated Key Biodiversity Area (KBA).</li> <li>● Nga Yoke Kaung area where OSB located is also key potential Marine Protected Area in the future.</li> <li>● If OSB Project area is affected by some impacts, those KBA in Nga Yoke Kaung will be disturbed.</li> <li>● The impacts could be escalated depending on the water current and caused the destruction of marine ecosystems</li> <li>● Planning to implement not to happen those impacts that cause the destruction of food chain in marine ecosystem needed to be included.</li> </ul>	<ul style="list-style-type: none"> <li>● This is not a designated KBA as there are no species of conservation concern.</li> </ul>	<ul style="list-style-type: none"> <li>● According to one of the review team member, biodiversity area will be assigned in the project area.</li> <li>● Updated information of Biodiversity area is to be submitted and if required, to be included in the report.</li> <li>● To read refer to comment 42, 51, 52, 53.</li> <li>● No comment.</li> </ul>	<ul style="list-style-type: none"> <li>● Noted. No new information is currently available.</li> </ul>
55	5.4.7 (5-62)	Table 5.24	<ul style="list-style-type: none"> <li>● To include a Table for Macro benthos's class, order, species name, family name, population density (individuals / known area). They are good ecosystem information for the monitoring plan.</li> </ul>	<ul style="list-style-type: none"> <li>● Appendix C has been included with the list of benthic species found.</li> </ul>	<ul style="list-style-type: none"> <li>● No comment.</li> </ul>	<ul style="list-style-type: none"> <li>● No response required</li> </ul>
56	5.5.1 (5.72)	Data collection methodology Data were collected during site visits in January and March 2017 in Nga Pu Daw town, Nga Yoke Kaung Town and Nan Thar Pu village Tract. The data were collect.....as well as 50 household surveys within Nan Thar Pu. Secondary data sources were also used including the Union of Myanmar Population and Housing Census (2015).	<ul style="list-style-type: none"> <li>● It is found that the social baseline data is collected in January and March.</li> <li>● It is mentioned that 50 house surveys is collected.</li> <li>● It is referenced Myanmar Census data (2015) and GAD social &amp; economic information as the secondary data.</li> <li>● It should mention if the available data from other government department is collected or not.</li> <li>● It is mentioned that the livelihood data such as fishing and farming are collected by using many questionnaires. It should mention the size of household or population and 50 household survey is conducted. The data collection procedure,</li> </ul>	<ul style="list-style-type: none"> <li>● Sources of information for the AOI have been included in Section 5.5.1 including data from household questionnaires and government departments.</li> </ul>	<ul style="list-style-type: none"> <li>● No comment</li> </ul>	<ul style="list-style-type: none"> <li>● No response required</li> </ul>

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			survey team, survey questionnaire should mention completely. Nga Yoke Kaung Township is focused as area of influence for social economic assessment. It is analyzed that the primary data source is not covered the study area and AOI.			
57	5.5.2 (5-74)	In Nan Thar Pu village tract, there are 359 houses and 376 households with Ale Gone and Gyaing Galay wards being the most populous. Karen, Kayin, Bumar and Rakhine people .....The majority of people are Kayin followed by Bumar and Rakhine.....	<ul style="list-style-type: none"> <li>● Karen, Kayin, Bumar is typed wrong. It assumes that household survey data is used. Data source should mention preciously. The population statistics should mention per village. During the construction phase, the cultural factor and living behaviours should consider in the project area when worker from other area comes.</li> </ul>	<ul style="list-style-type: none"> <li>● Spelling mistakes and data sources have been included in Section 5.5.2.</li> <li>● Population statistics has been mentioned per village (5.5.3)</li> </ul>	<ul style="list-style-type: none"> <li>● No comment</li> </ul>	<ul style="list-style-type: none"> <li>● No response required</li> </ul>
58	Table 5.29 (5-75)	Demographics of Nan Thar Pu (collected during social surveys in March 2017)	<ul style="list-style-type: none"> <li>● As per Table 5.29, there are six villages and 367 household in Nan Thar Pu village tract and 50 social survey is completed which mean 13% is done.</li> <li>● The age is mentioned below 12 years and above 12 years. Six villages are included, but Seikkan, kyauk phar, Nan Thar Pu villages aren't included. Even though the result of household survey is used, the presentation of result is not clear. The age condition in the community isn't known completely. The working age community isn't known. It is not complete mentioning the age below 12 and above 12 years while the proposed project is potential to create the job opportunity. The other demographic indicators and living standard and poverty and education and social – economic index should describe.</li> </ul>	<ul style="list-style-type: none"> <li>● The six places included are 'wards' in Nantharpu Village Tract / sub-township.</li> <li>● The ages has been amended to Over 18 years / below 18 years.</li> <li>● Education, livelihoods, etc are presented in the following sections (5.5.3 to 5.5.6).</li> </ul>	<ul style="list-style-type: none"> <li>● No comment</li> </ul>	<ul style="list-style-type: none"> <li>● No response required</li> </ul>
59	5.5.3 (5-77)	The majority of the 50 households surveyed for the Project get their income from either farming or business.....	<ul style="list-style-type: none"> <li>● The total household interview conducted in each village should mention. Depending on the respond of household, the amount of income and type of livelihood should mention per village.</li> </ul>	<ul style="list-style-type: none"> <li>● Total number of household surveys and annual income are mentioned in Section 5.5.3</li> </ul>	<ul style="list-style-type: none"> <li>● No comment</li> </ul>	<ul style="list-style-type: none"> <li>● No response required</li> </ul>
60	5.5.3 (5-78)	Table 5.31 – Livelihood	<ul style="list-style-type: none"> <li>● It could be misunderstood that this Table presentation mention 523,333 kyat is the income from agriculture. It is not mention as annual income. To make clear about it.</li> </ul>	<ul style="list-style-type: none"> <li>● The income amount is clarified in Table 5.31</li> </ul>	<ul style="list-style-type: none"> <li>● No comment</li> </ul>	<ul style="list-style-type: none"> <li>● No response required</li> </ul>
61	5.5.3 (5-80)	Table 5.32 – average of surveyed household expenditure in Nan Thar Pu (per month)	<ul style="list-style-type: none"> <li>● The average household expenditure is mentioned in twelve different section. The monthly household expenditure is quite high. But the food cost isn't mentioned. The education expenditure is high as well. Nan Thar Pu's household's size and education, literacy rate, age should be studied.</li> </ul>	<ul style="list-style-type: none"> <li>● The expenditure amounts are revised in Table 5.32 and throughout.</li> <li>● Education indicators are included in Section 5.5.5.</li> </ul>	<ul style="list-style-type: none"> <li>● No comment</li> </ul>	<ul style="list-style-type: none"> <li>● No response required</li> </ul>



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62	5.5.3 (5-81)	During the consultations; fishing focus group discussions (FGDs) were held in .....	<ul style="list-style-type: none"> <li>To include the fact of how many FDG is conducted and which village in Nan Thar Pu village tract and how many people participate.</li> </ul>	<ul style="list-style-type: none"> <li>The number and location of FDGs is mentioned in Section 5.5.3 and Table 9.2.</li> </ul>	<ul style="list-style-type: none"> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
63	5.5.3 (5-87)	The communities in Nan Thar Pu rely on fishing, small/medium scale businesses, government positions, and motor bike taxi for their income	<ul style="list-style-type: none"> <li>It is found that Table 5.31 is different from the livelihood sources for Nan Thar Pu. 5.5.3 Livelihood profile, the majority of the 50 households surveyed for the project get their income from either farming or business. None of the 50 household surveyed income for fishing however, it was reported by the village tract leader in Gyaing Galay ward at up to 30% of household in that village received some income from fishing. According to household survey, the survey found that there is no fisher. But a response from village tract leader in Kyaing Galay, some household run the fishing business. Therefore, the conclusion of livelihood summary is inconsistent.</li> </ul>	<ul style="list-style-type: none"> <li>The livelihood data has been reviewed and updated in Section 5.5.3.</li> </ul>	<ul style="list-style-type: none"> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
64	5.5.7 (5-90, 5-91)	Tourism The Two main areas .....There are smaller guest houses neighbouring the project area.....The project area is located in Palin Gyaing. There are two guesthouses.....near Zabahtar Island...most popular excursions for tourist.	<ul style="list-style-type: none"> <li>The tourist guesthouse is located in the project area of Paling Gyaing and it is observed that there are the beach and swimming activities around there. The project 2 km buffer zone include Zaba Htar Island where the tourism activities such as the diving and snorkeling is present. Therefore, there will be some impact to tourism activities.</li> </ul>	<ul style="list-style-type: none"> <li>Impacts to tourism (including this guesthouse) are included in Section 6.4.14.</li> </ul>	<ul style="list-style-type: none"> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
<b>6. Impact Assessment and Mitigation</b>						
65			<ul style="list-style-type: none"> <li>To describe the Oil Spill trajectory model.</li> </ul>	<ul style="list-style-type: none"> <li>MSDES oil spill model shows impacts to north of Ngayokekaung bay area.</li> <li>Oil spills unlikely with all the mitigation measures in place.</li> <li>The impact assessment for spills considers impacts to the whole bay area (Section 6.4.16).</li> </ul>	<ul style="list-style-type: none"> <li>Submission from MSDE is just for general understanding of review team members. Just for one season. Furthermore they are not EIA team.</li> <li>To read Follow up Comment no. 42</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 42.</li> </ul>
66	6.2 (6.12)	Table 6.14 Scoped out Impacts and Rationale During operation,.....emission sources on site such as some vehicles and plant (e.g. cranes).....	<ul style="list-style-type: none"> <li>It needs to consider ship propulsion and auxiliary engines and boilers in emission sources according to IFC General EHS guideline, 2007</li> </ul>	<ul style="list-style-type: none"> <li>Ship engines have been considered and included in Table 6.14.</li> </ul>	<ul style="list-style-type: none"> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
67	6.4.1 (6.13)	Potential impact on ambient air quality and local communities ....	<ul style="list-style-type: none"> <li>It was found that there had been studied the impacts of the particulate matters (PM) for the construction phase of the project, the impacts of SO<sub>2</sub>, NO<sub>x</sub>, GHG, PM, VOC emission due to ship propulsion and auxiliary engines and boilers</li> </ul>	<ul style="list-style-type: none"> <li>Noted.</li> </ul>	<ul style="list-style-type: none"> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>



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			(according to IFC guideline, 2007) at the operation phase are to be assessed and described.			
68	6.4.10	Potential Impact on Community Health and Safety The influx of construction workers and Migration change the disease profile in the community resulting.....	<ul style="list-style-type: none"> <li>During the construction phase (up to 1.5 year to 2 year), the labor force approximately 400 to 700 will mobilize to Nantharpu region, it is generally estimated there will occur a big pressure to current public infrastructure. According to baseline data, current public facilities are considered as deficit. That impact needs to explore and a mitigation plan need to be described.</li> </ul>	<ul style="list-style-type: none"> <li>Worker influx is considered in Section 6.4.11.</li> <li>The Livelihood Plan in Section 8.5.4 considers employment of local communities. There are no significant impacts on local communities from the Project so a full Livelihood Restoration Plan is not required.</li> </ul>	<ul style="list-style-type: none"> <li>Response doesn't support the RT's required information so that comment should be replied appropriately and sufficiently.</li> <li>During RT field survey, they found that CSR or Community Development Plan are done by M&amp;A OSB. This information is to be linked and describe at the report.</li> <li>No comment.</li> </ul>	<ul style="list-style-type: none"> <li>As CSR is not part of a Livelihood Restoration Plan or EIA, it is included in a separate Section of the EIA – <b>Section 9.4</b>. Impacts cannot be mitigated through CSR so it is not part of the EIA, EMP, or associated management plans.</li> </ul>
69	6.4.11 (6-43)	Potential Impact on Livelihood and Economy The project will employ between 400 and 700 people during construction, of which around 70% (around 280 to 490 people) will be employed.....	<ul style="list-style-type: none"> <li>The construction will last 1.5 year to 2 year, the labor force require is nearly 400 to 700, 70 % from local community and the rest from other (mobilized workers). There will creating job opportunity for local community. It needs to undertake and monitor the enhancement measure for the important of positive impact. There described that 70% of labor force will from local community, but there was not any plan for job allocation. This plan need to be included.</li> </ul>	<ul style="list-style-type: none"> <li>400 to 700 is a high estimate (200 workers more likely).</li> <li>The contractor will be responsible for employment; 70% will be Myanmar nationals. This is included in Section 6.4.11.</li> </ul>	<ul style="list-style-type: none"> <li>No comment.</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
70	6.4.11 (6-43)	The physical presence of the jetty and offshore supply base would case restriction of visitors to and from Kyauk Chay Htauk. This could have impacts on their livelihood.....	<ul style="list-style-type: none"> <li>According to the Preliminary assessment by M&amp;AOSB, there described there will deter in communication to approximately 50 fishermen daily due to the Nantharpu and Jettty. It is reviewed that the Impact assessment based on assessment of the project proponent is not in conformity with EIA procedure. In collecting social baseline data, it need to analyze and consider data of fisheries utilizing the beach area.</li> </ul>	<ul style="list-style-type: none"> <li>The ~50 fishermen use the beach but not all the beach is excluded. This is clarified in Section 6.4.12 and the assessment updated.</li> </ul>	<ul style="list-style-type: none"> <li>At Data Collection Form for Focus Group Discussion (Appendix D, Page 20-22), only fishing activities and relevant information. No data collection or survey for other possible impacts (Eg. Other beach user, tourism-related local business, utilization of public infrastructure. etc)</li> </ul>	<ul style="list-style-type: none"> <li>Beach users and tourism operators were interviewed and information used in the baseline chapter. These were face-to-face meetings without questionnaires. Photos of the interviews are provided in <b>Figure 9.2</b>.</li> </ul>
71	6.4.11 (6-45)	Table 6.29, impact scale Fishing is not the major source of income in the local communities.....	<ul style="list-style-type: none"> <li>It is reviewed that there is weak in consistency in conclusion and livelihood summary.</li> </ul>	<ul style="list-style-type: none"> <li>Fishing impact assessment has been updated (Section 6.4.12).</li> </ul>	<ul style="list-style-type: none"> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
72	6.4.13 (6-49)	Potential Impact to Tourism The OSB and Jetty could cause impacts to tourism from generation of air and noise emissions, exclusion from beach access and	<ul style="list-style-type: none"> <li>It is observed from the report that the impact for tourism is in moderate due to construction and operation of the OSB and Jetty. That conclusion was based on the assessment of Air, Noise emission, beach access and visual impact, not on the assessment of the economic</li> </ul>	<ul style="list-style-type: none"> <li>ERM and M&amp;A have both engaged with local tourism operators on 2 March 2017 in Nga Yoke Kaung and Goyangyi Island and the baseline (Section 5.5.7) and impact assessment on</li> </ul>	<ul style="list-style-type: none"> <li>Response doesn't support the RT's required information so that comment should be replied appropriately and sufficiently.</li> <li>No comment</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 70.</li> </ul>

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			<p>benefit/impact of the Myanmar tourism sector. They need to be included.</p> <ul style="list-style-type: none"> <li>In the description of additional mitigation measure, it was suggested that the M&amp;A OSB should meet with the Tourism operators and approve for the Impact level. But, there was not mentioning any role for the EIA consultant team in accessing that process.</li> <li>There was reviewed that the complaint for the physical access to beach, it will record through the Grievance mechanism and the passage of the Jetty will allow depend upon on the complaint number. Regarding for the data for the physical access to beach, whether there considered at the social surveying or not, and if considered it is needed to include such data in report.</li> </ul>	Tourism (Section 6.4.14) includes this information.	<ul style="list-style-type: none"> <li>See comment no in Additional comment and suggestion from Vintage Tower Meeting</li> <li>See Followup comment no. 70</li> </ul>	
73	6.4.14 (6-52,6-53)	<p>Source of Impact Construction Phase</p> <p>Activities during construction of the project will generate variety of waste, which can be categorize....such as inert waste.....and refusal.</p> <p>Operation Phase</p> <p>The expected impact...same as construction and .....residual impact significance is minimal.</p> <p>Existing/In place Control</p> <p>Impacts regarding wastes can be managed by good housekeeping practices...by a comprehensive waste management (WMP) which will be prepared by M&amp;A OSB.</p>	<ul style="list-style-type: none"> <li>In section 6.4.1. Impact assessment, there described the type of wastes from the proposed project and there is in "Minimal Impact Significance"</li> <li>However, in section 4.4.3 (44-26). Waste Management Section, there described, as "Hazardous waste will be sent to a licensed waste handling facility in Thilawa. Typical Hazardous was include ..... specialized chemicals used by O&amp;G industry (such as bentonite). It is recommended to re-analyze the Impact significance for the waste impact assessment.</li> <li>Besides, there was not described any waste management plan. There only described comprehensive waste management will prepared by M&amp;A OSB.</li> </ul>	<ul style="list-style-type: none"> <li>No change to assessment – still Minor</li> <li>M&amp;A will provide the Waste Management Plan to ECD prior to construction</li> <li>A Waste Management Plan is provided in Section 8.5.3.</li> </ul>	<ul style="list-style-type: none"> <li>Waste management plan is provided in updated report.</li> <li>Action and management practice for hazardous waste is not provided.</li> <li>Please see comment 31.</li> <li>M&amp;A OSB cannot develop Comprehensive waste management. It has to be done by third party.</li> </ul>	As per Response to Comment No. 31.
74	6.4.2 (6.17)	Table 6.16 Ambient noise impact assessment Impact duration – Noise impact from the construction activities is temporary.	<ul style="list-style-type: none"> <li>It is recommended to re-analyze the impact significant in project phase for the noise sources and receptors.</li> <li>It is recommended to study and analyze in prior using noise simulation study/prediction being paying attention for the Natural Resource of Myanmar Coastal and benefit of the local community.</li> </ul>	<ul style="list-style-type: none"> <li>There is no significant impact from noise given the distance from sensitive receptors.</li> <li>The parameters, location and frequency for noise monitoring is provided in Section 8.5.</li> </ul>	Read Follow-up Comment no. 26	<ul style="list-style-type: none"> <li>As per Response to Comment 26.</li> <li>The monitoring details are provided in <b>Section 8.5</b> and <b>appended</b> to this Response Letter.</li> </ul>
75	6.4.2 (6.17)	Operation Phase ...vehicle usage could be up to 20 trucks per day....	<ul style="list-style-type: none"> <li>For assessment of Potential Noise Impact, it is found that there considered only for onshore activities and not considering for offshore activities of the deporting during operation of the project.</li> </ul>	<ul style="list-style-type: none"> <li>Offshore underwater noise is considered in Section 6.4.8 and onshore in Section 6.4.2</li> </ul>	Read Follow-up Comment no. 26	As per Response to Comment No. 26

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76	6.4.4 (6-21,6-22)	<p>Potential Impacts on Coastal Process</p> <p>In term of present study, it is noted that the site for the proposed jetty lies within an area of high energy with high levels of sediment transport during tidal changes.</p> <p>M&amp;A OSB commissioned a sediment assessment for jetty by Royal Haskoning.....the change are not expected to create significant changes outside the bay. As such, no adverse impacts to coastal processes as a result of jetty would be expected to occur.</p>	<ul style="list-style-type: none"> <li>According to the description of section 6.4.4, it was found that the proposed Jetty location is in "an area of high energy with high levels of sediment transport during tidal changes". It is found that there will impact on Coastal Morphology and sediment dynamic due to Implementing to construct Jetty and heavy dredging process (410, 000 m3) in such area of probable sediment transport process.</li> <li>Although it was described there will no impact for the Jetty construction according to sediment assessment, there was not any description for such facts, figures and maps. Besides, there was not any description for the study and implementation for dredging and maintenance dredging. Thus, it is recommended that in accessing impact of costal process it needs to access not only impact of Jetty construction but also dredging works including maintenance dredging.</li> </ul>	<ul style="list-style-type: none"> <li>The alternatives information is updated in Section 4.3.</li> </ul>	<ul style="list-style-type: none"> <li>Section 4.3 is about Project Alternative.</li> <li>The response is not entirely related to the suggestion / comment given by review team.</li> <li>Read Follow-up Comment no. 40.</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comments No. 40.</li> </ul>
77	6.4.5 (6-25)	<p>Existing and/or in place control</p> <p>The discharge point of treated sewage effluent of aquatic or surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the aquatic waters.</p> <p>During operation, septic tanks or a permanent sewage plant will be provided.</p> <p>Sewage.... will be discharged into foul sewer.....The foul sewer n lead to the either the septic tank or temporary/permanent treatment plant prior to effluent discharge to the ocean.</p>	<ul style="list-style-type: none"> <li>As the design of present project, although the discharge point location cannot be defined, there described the location of aquatic/surface water will be chosen that have adequate assimilative capacity for the discharge point of treated sewage effluent. But there has no description of surface water quality to learn the adequate assimilative capacity has or not in the baseline study report.</li> <li>There described the discharges are not directly to ocean and that will be treated by the permanent treatment plant in operation stage. But there has not describe the discharge point locations.</li> <li>Suggest that need to revise the fact of water quality impact significance is negligible. Because of impact significance can be changed depend on the location of discharge and environmental and social sensitivity of the point of location.</li> </ul>	<ul style="list-style-type: none"> <li>Water quality revised to Minor significance in Section 6.4.5.</li> </ul>	<ul style="list-style-type: none"> <li>The reply doesn't meet the require information need by RT. Therefore, it is needed to address the comment again appropriately.</li> <li>Please see comment 38 and 40 (For parameter reference and to be included in monitoring table)</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comments No. 38 and 40</li> </ul>
78	6.4.11 (6-44,6-45)	<p>Potential Impacts in Livelihoods and Economy</p> <p>Impacts on the economy and livelihoods of local residents may arise from Project land acquisition as well as the possible influx of workers.</p> <p>Restriction of access to fishing grounds due to the establishment of an exclusion zone.</p>	<ul style="list-style-type: none"> <li>In Section 6.4.11, although there is effecting on the fishing activities, that is not major income source, so we noticed that the impact magnitude is negligible.</li> <li>In Consultation Section 9.3 (9-6), we noticed the description of fishing activities are performing in the project area and impact to fishing grounds from the project in Impacts to Fishermen (9-8).</li> </ul>	<ul style="list-style-type: none"> <li>Given that the impact to fishing is not significant, no Resettlement Action Plan for Economic displacement is required (refer to Section 6.4.12).</li> <li>The Project is not located in the main fishing area (shown in Figure 5.38).</li> </ul>	<ul style="list-style-type: none"> <li>The updated report provided figure showing Dive site, fishing ground and resort/tourism.</li> <li>When RT visited the field such as SaBatar Island, Palin Gyaing beach, it is reported that these areas are fishing ground in</li> </ul>	<ul style="list-style-type: none"> <li>Noted. The mitigation and management measures for fisheries impacts are provided in <b>Section 6.4.12 (pg. 6-54)</b>.</li> </ul>

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		Displacement, damage or loss of fishing  Equipment by construction/operational vessel movements.  Impact magnitude is negligible.	<ul style="list-style-type: none"> <li>Need to perform the consideration of resettlement action plan if the fishing ground area is exist or not in the project area, the impact on fishing activities and they have the impact or not and if they have that also need to consider for their loss.</li> <li></li> </ul>		<ul style="list-style-type: none"> <li>rainy season which will be disturbed by ship / vessel. Thus, the good management plan need to describe.</li> <li>This need to include in ECC.</li> </ul>	
<b>8. Environmental Management Plan</b>						
79	8.5.1 (8-17)	Emergency Response Plan .... The plan will include, at a minimum: .....	<ul style="list-style-type: none"> <li>There described 6 plans, including Shipboard Oil Pollution Emergency Plan (SOPEP), M&amp;A OSB Oil Pollution Emergency Plan (OPEP) and other plans.</li> <li>There is no describe the plans in detail and that will be submitted to ECD.</li> <li>Need to attach this plans. So, we can be reviewed of this plans are enough or not for potential emergency cases.</li> </ul>	<ul style="list-style-type: none"> <li>Sub-Plans for waste, emergency response, sediment, biodiversity, livelihood, &amp; occupational H&amp;S, are included in Section 8.5.</li> <li>Management Plans will be prepared in full prior to construction (some plans will be prepared by the EPC). These plans will be provided to the ECD</li> </ul>	<ul style="list-style-type: none"> <li>To read the follow-up comment no.42 and 73.</li> <li>No additional comment.</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 42 and 73 (see Comment No. 31).</li> </ul>
80	8.5.2 (8-17)	Traffic Management Plan A traffic management plan will be prepared and submitted to ECD prior to operations commencing.	<ul style="list-style-type: none"> <li>There is no describe the plans in detail and that will be submitted to ECD.</li> <li>Need to submit to ECD before start working.</li> <li>To describe this fact in ECC.</li> </ul>	<ul style="list-style-type: none"> <li>As per Comment No. 79</li> </ul>	<ul style="list-style-type: none"> <li>To read the follow-up comment no.79.</li> <li>No additional comment.</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 42 and 73 (see Comment No. 31).</li> </ul>
81	8.5.3 (8-17)	Waste Management Plan A waste management plan will be prepared and submitted to ECD prior to operations commencing.	<ul style="list-style-type: none"> <li>There is no describe the plans in detail and that will be submitted to ECD.</li> <li>Waste Management Plan to be consistent with the objectives described in the report that need to submit to ECD before start working.</li> <li>To describe this fact in ECC.</li> </ul>	<ul style="list-style-type: none"> <li>As above</li> </ul>	<ul style="list-style-type: none"> <li>To read the follow up comment no.73.</li> <li>No additional comment.</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 73 (see Comment No. 31).</li> </ul>
82	Table 8.3 (8-20)	Summary of Reporting and Monitoring Requirements Air emissions will be measured at Zin Yaw Chaung once during construction and operation. If the levels are within the NEQ Guidelines, no further monitoring is required.	<ul style="list-style-type: none"> <li>There is not enough the description of the Air quality monitoring is no need to continue if the result is normal when monitored at once in construction phase and operation phase.</li> <li>Although the result is normal when monitored, need continue to monitor to keep the same result.</li> <li>To describe the location point of monitoring</li> </ul>	<ul style="list-style-type: none"> <li>The parameters and frequency for monitoring has been provided in Section 8.5.</li> </ul>	<ul style="list-style-type: none"> <li>EMP and monitoring are mentioned together in Table 8.1.</li> <li>The monitoring table need to mention separately.</li> <li>Other environment monitoring plan for monitoring period is two years. Instead of using stop, the monitoring result need to mention by evaluation analysis, review and revise at regular interval</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring is mentioned separately in each of the monitoring sub-plans. Another separate table (<b>Table 8.2</b>) has been included in the EIA for monitoring.</li> <li>Noted. The frequency of monitoring will be based on the monitoring results as specified in the EIA.</li> </ul>
83		Noise will be measured one daytime and one night time during the construction phase. If the levels are within the NEQ Guidelines, no further	<ul style="list-style-type: none"> <li>There is not enough the description of the Noise quality monitoring is no need to continue if the result is normal when</li> </ul>	<ul style="list-style-type: none"> <li>The parameters and frequency for monitoring has been provided in Section 8.5.</li> </ul>	<ul style="list-style-type: none"> <li>See follow up comment no.82.</li> <li>No additional comment</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 82.</li> </ul>



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		monitoring is required.	<ul style="list-style-type: none"> <li>monitored at day and night in construction phase.</li> <li>Although the result is normal when monitored, need continue to monitor to keep the same result.</li> <li>To describe the location point of monitoring</li> </ul>			
84		During construction and operational dredging, marine water quality should be monitored .....	<ul style="list-style-type: none"> <li>This fact is forced to do for monitoring</li> <li>To describe the time. For example- one time per month.</li> <li>To describe the location point of monitoring</li> </ul>	<ul style="list-style-type: none"> <li>The parameters and frequency for monitoring has been provided in Section 8.5.</li> </ul>	<ul style="list-style-type: none"> <li>See follow up comment no.40.</li> <li>No additional comment</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 40.</li> </ul>
85		..... The discharge domestic water from the construction and operation phase should be monitored every 6 months .....	<ul style="list-style-type: none"> <li>Although the description in Environmental Aspect is Groundwater, we noticed the monitoring is Discharge water (Surface water). This monitoring only can learn groundwater contamination due to runoff the discharge water and that cannot be learned about seeps the water into the ground.</li> <li>Need to monitor separately for groundwater.</li> <li>To describe the location point of monitoring</li> </ul>	<ul style="list-style-type: none"> <li>As discussed in Review Team meeting, the discharge location is to the marine environment and there is no onshore discharge to surface waters. This is clarified in Section 4.4.3.</li> </ul>	<ul style="list-style-type: none"> <li>Same as "Comments on Response No.38"</li> <li>No additional comment</li> </ul>	<ul style="list-style-type: none"> <li>As per Response to Comment No. 38.</li> </ul>
86			<ul style="list-style-type: none"> <li>To perform Ballast Water Management under the guideline</li> <li>To fill and submit of Natural Resource and Marine Biodiversity Management.</li> </ul>	<ul style="list-style-type: none"> <li>Ballast water will be managed in line with guidelines. This commitment is included in Table 8.1.</li> </ul>	<ul style="list-style-type: none"> <li>No response on Natural Resource and Marine Biodiversity Management</li> </ul>	<ul style="list-style-type: none"> <li>The Marine Biodiversity Management Plan is provided in <b>Section 8.5.5</b>. No plan for natural resources is provided as this is covered by commitments in <b>Table 8.1</b>.</li> </ul>
			<ul style="list-style-type: none"> <li>Need to describe completely the parameter, frequency, location, responsible and party as related with monitoring</li> </ul>	<ul style="list-style-type: none"> <li>The parameters and frequency for monitoring has been provided in Section 8.5.</li> </ul>		<ul style="list-style-type: none"> <li>No Response Required</li> </ul>
<b>9. Public consultation and Disclosure</b>						
87	9.2.1 (9-1)	Figure 5.21 shows the location of the village tract visited for the public consultation.	<ul style="list-style-type: none"> <li>Figure 5.21 from Page 5-64 mentioned that Representative sample of fish species caught in Nan Thar Pu, taken in February, 2017/</li> </ul>	<ul style="list-style-type: none"> <li>No discussion needed</li> </ul>	<ul style="list-style-type: none"> <li>The response did not cover the suggest comment.</li> <li>Figure 5.21 (Figure 5.28 in updated report) did not show locations of village tract visited for public consultation. Please update with relevant figure.</li> </ul>	<ul style="list-style-type: none"> <li>The Village Tract and Wards consulted are shown in <b>Figure 5.27</b>.</li> </ul>
88	9.2.3 (9-3 & 4)	....., a two page flyer was produced which contained Project information and details .....	<ul style="list-style-type: none"> <li>To describe two pages flyer</li> </ul>	<ul style="list-style-type: none"> <li>The flyer has been included in Appendix E</li> </ul>	<ul style="list-style-type: none"> <li>No additional comment</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
89	9.3.2 (9-9)	EIA Phase During EIA, one meeting with undertaken at the GAD office 50 household surveys were	<ul style="list-style-type: none"> <li>To correct spelling mistake</li> <li>To include educational related questions in questionnaire as it was described that locals will be recruited. Therefore, it can</li> </ul>	<ul style="list-style-type: none"> <li>The spelling mistake has been corrected.</li> <li>M&amp;A will undertake engagement prior to</li> </ul>	<ul style="list-style-type: none"> <li>No additional comment.</li> <li>To connect with CSR</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> <li>Noted for CSR.</li> </ul>

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		conducted .....	be checked whether the education of the local resident is relevant to the position required for the project.	construction to analyze the local education level and potential job opportunities. This commitment is included in Table 8.1.		
90	9.3.4 (9-15)	Community Grievance Mechanism M&AOSB will have a grievance mechanism for the Project that aims to.....	<ul style="list-style-type: none"> <li>● M&amp;A OSB Grievance Management Procedure was mentioned step by step. CGM process map was described there.</li> <li>● To publicize the Grievance Management Procedure initially as per IFC Addressing Grievances from Project - Affected Communities (2009)</li> <li>● IPIECA's Community Grievance Mechanisms in the Oil and Gas Industry Guidelines (2015) was described with six steps.</li> <li>● CGM management framework should include clear SOP. CLO's job description, detailed grievance management procedure and complaint tracker system should be initially informed and sent to concerned persons and potentially affected persons.</li> <li>● It is assumed that the facts related to CGM described in EIA report is weak to be implemented</li> </ul>	<ul style="list-style-type: none"> <li>● More detail on the grievance procedure has been updated in Section 9.3.4.</li> </ul>	<ul style="list-style-type: none"> <li>● When RT visited the field, it is observed that the local receive less information by different reason. it is advised that the current method of information distribution need to improve in line with international good practice and local context.</li> <li>● No additional comment.</li> </ul>	<ul style="list-style-type: none"> <li>● Noted. The future engagement plans for the Project are provided in <b>Section 9.3.5</b>.</li> </ul>
91	Figure 9.4 Figure 9.5		<ul style="list-style-type: none"> <li>● Cannot read the adverts. To replace with the clearer figure.</li> </ul>	<ul style="list-style-type: none"> <li>● Advert text has been included in Figure 9.4 and Figure 9.5.</li> </ul>	<ul style="list-style-type: none"> <li>● It is noted that Figure 9.4 and 9.5 are updated with clear figure and text.</li> </ul>	<ul style="list-style-type: none"> <li>● No Response Required</li> </ul>
92		<p>Meeting of Minutes (18th January 2017)</p> <p>Q1. There are fishing activities in the marine waters in front of the project area. I want to know if we can fish or not around in that area when vessels are coming to the jetty.</p> <p>A1. There will be an area excluded for fishing near the jetty and during construction. This area will be confirmed in the EIA Report...please provide us information on where and when you fish.</p>	<ul style="list-style-type: none"> <li>● It is described that there are fishing activities near by the project as per Q1 and A1, therefore the reserved fishing area will be described in EIA report. However, the detailed studies on fishing activities was not seen in the report. Moreover, reserved fishing area was not described.</li> </ul>	<ul style="list-style-type: none"> <li>● The restricted area has been included in the impact assessment in Section 6.4.12.</li> </ul>	<ul style="list-style-type: none"> <li>● Response did not cover all suggestions / comment under no 92.</li> <li>● According to information stated in meeting minutes (18<sup>th</sup> Jan 2017), ERM responded that there will be an area excluded for fishing near the jetty and during construction. This area will be confirmed in the EIA report.</li> <li>● However, there is no confirmed information related to excluded area in the report.</li> </ul>	<ul style="list-style-type: none"> <li>● The meeting minutes refer to the area excluded for safety, which will be clarified during detailed design of the Project. M&amp;AOSB will provide the safety zone to ECD via the Environmental Monitoring Report, once confirmed.</li> </ul>
93		Meeting of Minutes (3rd March 2017)	<ul style="list-style-type: none"> <li>● The community has a concern related to the impact from the drainage from the project to the nearby land as per Q4 and Q7. However, the answer did not include the impact and mitigation measure of from the drainage to the nearby land.</li> </ul>	<ul style="list-style-type: none"> <li>● The question and response is included in Section 9.3.2.</li> </ul>	<ul style="list-style-type: none"> <li>● Meeting of Minutes (3rd March 2017) had been updated with new information / Response to Q4 (A3 &amp; A4).</li> <li>● However, Response to Q7 is not related to the question.</li> </ul>	<ul style="list-style-type: none"> <li>● At the time of the meeting, the discharges are not confirmed. This has been confirmed in the EIA report (<b>Section 9.3.2</b>). There will be no discharge of effluent to the land so no impact on farmlands. Meeting minutes will not be updated retrospectively as these are a true record of what was discussed at the time.</li> </ul>



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<b>Appendix C - Engagement</b>						
94			<ul style="list-style-type: none"> <li>Fishermen records were not included in the meeting minutes.</li> <li>The location of the Gu Chaung village, SHM meeting for scoping phase of EIA study on 18th January, 2018 is not found on Google Earth. In describe it.</li> </ul>	<ul style="list-style-type: none"> <li>Gu Chaung village is included in Google Map in Figure 5.27.</li> <li>The Fishing FGDs have been included in Appendix E.</li> </ul>	<ul style="list-style-type: none"> <li>It is noted that Stakeholder Engagement, meeting minutes and materials are updated with more detail information in Appendix E.</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
95			<ul style="list-style-type: none"> <li>There were 58 attendance on the Stakeholder Meeting on 28th February, 2017 during EIA phase. They are (Alehone-14, Sikkan – 9, Gaing Lay-3, Zin Yaw Chaung-10, Kyauk Phywer-15 and Nantharpu-7).</li> <li>Section 9.3.2 mentioned that CSO were also present at the meeting but Attendee list in Nan Thar Pu was just mentioned as Company and written as Daw Myo Thuzar, President, Kan Chay Arr Man attended. To confirm the mentioned “company” refer for CSO or not.</li> </ul>	<ul style="list-style-type: none"> <li>The mention of company has been clarified in Appendix E</li> </ul>	<ul style="list-style-type: none"> <li>No additional comment.</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>

## Appendix

### Legislation Table:

Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
<b>The Constitution of the Union of Myanmar, 2008</b>	Article 37 (a)(b) , 42, 390	<p>M&amp;AOSB commits to comply as these three Articles in the Constitution provide a basis for legalizing and institutionalizing environmental health impact assessment and social impact assessment. There stipulated that</p> <ul style="list-style-type: none"> <li>The Union is the ultimate owner of all lands and all natural resources above and below the ground, above and beneath the water and in the atmosphere in the Union; The Union shall enact necessary law to supervise extraction and utilization of State owned natural resources by economics forces;</li> <li>The Union shall protect and conserve natural environment.</li> <li>Every citizen has the duty to assist the Union in carrying out the following matters: <ul style="list-style-type: none"> <li>(a)preservation and safeguarding of cultural heritage;</li> <li>(b)environmental conservation;</li> <li>(c) striving for development of human resources;</li> <li>(d)protection and preservation of public property.</li> </ul> </li> </ul>
<b>Environmental Conservation Law, 2012</b>	Clause 7(o), 14,15, 23, 24, 29	<p>M&amp;AOSB commits to comply as there prescribed</p> <ul style="list-style-type: none"> <li>That the Ministry (MONREC) has the right to manage a proponent to provide compensation for environmental impact and contribute funds and need for prior permission from the Ministry for the business that have been categorized for causing impact on the environmental quality and right to issuing permit with terms and conditions relating to environmental conservation after scrutinizing.</li> <li>That the emissions to the environment to meet stipulated environmental quality standards.</li> <li>To provide onsite controlling equipment to monitor, control, manage, reduce or eliminate pollutants, or if impracticable, arrange environmentally-sound disposal.</li> <li>Not to violate any prohibition contained in the rules, notifications, orders, directives and procedures under the Environmental Conservation Law.</li> </ul>
<b>Environmental Conservation Rules, 2014</b>	Rule 69	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>Not to emit, cause to emit, dispose, cause to dispose, pile and cause to pile, by any means, the pollutants and the hazardous waste or hazardous material stipulated by notification under the Law and any of these rules at any place which may affect the public directly or indirectly.</li> <li>Not to carry out to damage the ecosystem and the natural environment which is changing due to such system, except for carrying out with the permission of the Ministry for the interest of the people.</li> </ul>
<b>Environmental Impact Assessment Procedure, 2015</b>	Clause 102,103, 104, 105, 106, 107, 108, 110, 113, 115, 117	<p>M&amp;AOSB commits to take the responsibilities for adverse impacts, and</p> <ul style="list-style-type: none"> <li>To bear full legal and financial responsibility for actions and omissions and those of other related to the project proponents.</li> <li>To support programs for livelihood restoration and resettlement in consultation with all stakeholders.</li> </ul> <p><i>For EMP</i>, M&amp;AOSB commits to comply to implement the EMP, the requirements set forth in ECC, Project commitments and conditions when providing services to the Project and inform the Ministry with detailed information as to the propose project's potential adverse impacts.</p> <p><i>For the monitoring</i>, M&amp;AOSB commits to comply to implement;</p> <ul style="list-style-type: none"> <li>to undertake comprehensive self-monitoring</li> <li>to notify and identify in writing to the Ministry for any breaches of its obligations or other performance failures or violations of the ECC and EMP</li> <li>to submit monitoring reports to the Ministry</li> <li>to submit the monitoring report within ten (10) days of completing a monitoring report and the information to be included.</li> </ul> <p><i>For the purposes of monitoring and inspection, the event of emergency</i>, M&amp;AOSB commits to</p> <ul style="list-style-type: none"> <li>grant the ministry and/or its representatives;</li> <li>grant the Ministry access to any places relating to project activities;</li> </ul> <p>M&amp;AOSB commits to comply the NEQ guidelines and its setting out for emission standards for air, noise and effluent discharges for oil and gas operations. M&amp;AOSB considers this emissions standards in its environment impact assessment and environmental management plan.</p>
<b>National Environmental Quality (Emissions) Guidelines (2015)</b>		<p>M&amp;AOSB commits to comply</p> <ul style="list-style-type: none"> <li>The stipulation that the investor has to register the land lease contract at the office of Registry of Deeds in accordance with the Registration Act.</li> <li>The mentioning for appointment, replacement, providing for the employment of staff and workers, ensuring to comply the entitlements and rights in the labor laws and rules, settling dispute regarding HR issues.</li> </ul>
<b>Myanmar Investment Law, 2016</b>	Clause (50)(d), (51), (65),	

Sources of Related Laws, Rules and Relevant Articles Regulations		Commitments
		<ul style="list-style-type: none"> <li>Stipulation:               <ul style="list-style-type: none"> <li>(a). To respect and comply with the customs, traditions and traditional culture of the ethnic groups in the Union;</li> <li>(e). To inform to the Commission if it is found that natural mineral resources or antique objects and treasure trove are not related to the investment permitted;</li> <li>(f). Not to make any significant alteration of topography or elevation of the land on which is entitled to lease or to use, without the approval of the Commission;</li> <li>(g). To abide by applicable laws, rules, procedures and best standards practiced internationally for this investment so as not to cause damage, pollution, and loss to the natural and social environment and not to cause damage to cultural heritage;</li> <li>(h). To list and keep proper records of books of account and financial statement and necessary financial matters relating to the investments performed by permit or endorsement in accordance with internationally and locally recognized accounting standards;</li> <li>(j). To pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directive and so forth during the period of suspension of investment for a credible reason;</li> <li>(k). To pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease or death due to the work;</li> <li>(l). To supervise foreign experts, supervisors and their families, who employ in their investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar;</li> <li>(m). To respect and comply with the labor laws;</li> <li>(n). To have the right to sue and to be sued in accordance with the laws;</li> <li>(o). To pay effective compensation for loss incurred to the victim, if there are damage to the natural environment and socioeconomic losses caused by logging or extraction of natural resources which are not related to the scope of the permissible investment, except from carrying out the activities required to conduct investment in a permit or an endorsement;</li> <li>(p). To allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment;</li> <li>(q). To take in advance permit or endorsement of the Commission for the investments which need to obtain prior approval under the Environmental Conservation Law and the procedures of environmental impact assessment, before undertaking the assessment, and shall submit the situation of environmental and social impact assessment to the Commission along the period of activities of the investments which obtained permit or endorsement of the Commission.</li> </ul> </li> </ul>
Myanmar Investment Rules, 2017	Clause 202, 203, 206, 212,	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>To comply with all terms and conditions in the permit and other applicable laws when the investment is carried out.</li> <li>To fully assist while negotiating with the Authority for settling the grievances of the local community that have been effected due to Investments.</li> <li>To appoint expert foreigner as senior manager, technical and operational expert or advisor according to subsection (a) of the section 51 of the Law, he shall submit the application attached with passport, expertise evidence or degree certificate and summary of biography of such foreigner to the Commission and obtain the approval.</li> <li>To obtain the permit or tax exemption or relief to insure the relevant insurance out of the following types of the insurance at any insurance business entitled to carry out insurance business within the Union based on the nature of the business: Property and Business Interruption Insurance; Engineering Insurance; Professional Liability Insurance; Bodily Injury Insurance; Marine Insurance; or Workmen Compensation Insurance; Life Insurance; Fire Insurance.</li> </ul> <p>M&amp;AOSB commits to comply stipulation for a person who obtained any license not to violate the conditions contained in the license.</p> <p>The Forest Law is enacted by Pyihtaungsu Hluttaw in September, 2018. It empowers, to declare for the reserved forest for the maintaining a sustained yield of the forest produce, to manage the forest land.</p> <p>M&amp;AOSB commits to comply the stipulation</p> <ul style="list-style-type: none"> <li>(a). For requiring prior approval from the Ministry if desirous to implement the development work or economic project within a forest land and forest covered land.</li> <li>(c). Whoever desirous to undertake as in sub-section (a), has to comply the Environmental Conservation Law and the stipulations from respective Laws.</li> </ul> <p>M&amp;AOSB commits to comply prohibitions for the following activities:</p> <ul style="list-style-type: none"> <li>“No person shall anchor the vessels where vessels are prohibited from anchoring in the rivers and creeks.</li> <li>No person shall dispose of engine oil, chemical, poisonous material and other materials which may cause environmental damage, or dispose of explosives from the bank or from a vessel which is plying, vessel which has berthed, anchored, stranded or sunk.</li> <li>No one shall dispose of any substance into the river creek that may cause damage to waterway or change of watercourse from the bank or vessel.”</li> </ul>
The Import and Export Law, 2012	Clause 7	
The Forest Law (2018)	Clause12	
Conservation of Water Resources and Rivers Law (2006)	Clause (10), (11)(a), (19),	

Sources of Related Laws, Rules and Regulations	Commitments
<p><b>The Protection of Biodiversity and Conservation Areas Law 2018</b></p> <p><b>Law on Protecting New Species of Plants (2016)</b></p> <p><b>The Protection and Preservation of Cultural Heritage Regions Law, 1998</b></p>	<p>The empowerment of this Law is provided to the Ministry of Transport for controlling navigation of vessels in the rivers and creeks as well as communicating with local and foreign government and organizations for conservation of water resources, rivers and creeks. Also, to carry out conservation works for water resources, rivers and creeks, in accordance with the relevant international conventions, regional agreements and bilateral agreements for environmental conservation.</p> <p>M&amp;AOSB commits to comply the stipulation that there may be charge with fine or imprisonment or both if finds guilty of</p> <ul style="list-style-type: none"> <li>• using dynamite or explosive chemicals, electrolyzing, destroying water flow or poisoning water, intentionally pollutes the soil, water, air in the conservation area;</li> <li>• Disposing or handling chemical waste and poisoning materials in the conservation area.</li> </ul> <p>M&amp;AOSB commits to comply the stipulation for the right and protect the right of the new species growers for causing any impact to environment and biodiversity.</p> <p>The State Peace and Development Council Law enacted this law by Law No. 9/ 98 on the date of 10 September, 1998. The Ministry of Culture may, with the approval of the Government issue notification for the protection of cultural heritage areas are categorized as following kinds of zones / region:</p> <p>a) Ancient monumental zone;</p> <p>b) Ancient site zone.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That certain land-based construction works must apply for prior permission and must abide by provisions of existing laws.</li> <li>• For the person desirous of carrying out construction works to abide by the provisions of other existing laws and also apply in accordance with the stipulations to the Department to obtain prior permission under this law.</li> <li>• For Buildings in cultural heritage region to conform to conditions prescribed by the Ministry of Culture.</li> </ul> <p>M&amp;AOSB commits to comply the stipulation:</p> <ul style="list-style-type: none"> <li>• That person who finds any object which has no owner or custodian, needs to inform the relevant Ward or village-tract administrator if he knows or it seems reasonable to assume that the said object is an antique object.</li> <li>• For a procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That a person who finds an ancient monument over one hundred years old under the water or above ground shall promptly inform the relevant Ward or Village-Tract Administrative Office.</li> <li>• For procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation.</li> <li>• Requirement for prior permission to obtain from the Department before searching for and extracting oil and gas or constructing pipelines</li> <li>• For prohibitions not to damage ancient monuments including using machinery which causes vibration and discharging chemical substance.</li> </ul>
<p><b>The Protection and Preservation of Antique Objects Law (2015)</b></p>	<p>Clause 12, 13</p> <p>M&amp;AOSB commits to comply the stipulation:</p> <ul style="list-style-type: none"> <li>• That person who finds any object which has no owner or custodian, needs to inform the relevant Ward or village-tract administrator if he knows or it seems reasonable to assume that the said object is an antique object.</li> <li>• For a procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That a person who finds an ancient monument over one hundred years old under the water or above ground shall promptly inform the relevant Ward or Village-Tract Administrative Office.</li> <li>• For procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation.</li> <li>• Requirement for prior permission to obtain from the Department before searching for and extracting oil and gas or constructing pipelines</li> <li>• For prohibitions not to damage ancient monuments including using machinery which causes vibration and discharging chemical substance.</li> </ul>
<p><b>The Protection and Preservation of Ancient Monuments Law (2015)</b></p>	<p>Clause 12, 13, 15, 20</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That a person who finds an ancient monument over one hundred years old under the water or above ground shall promptly inform the relevant Ward or Village-Tract Administrative Office.</li> <li>• For procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation.</li> <li>• Requirement for prior permission to obtain from the Department before searching for and extracting oil and gas or constructing pipelines</li> <li>• For prohibitions not to damage ancient monuments including using machinery which causes vibration and discharging chemical substance.</li> </ul>
<p><b>Myanmar Fire Force Law, 2015</b></p>	<p>Clause 25</p> <p>M&amp;AOSB commits to comply for the stipulations:</p> <ul style="list-style-type: none"> <li>• For the requirement to obtain the opinion of the Fire Services Department for the purpose of fire precaution and prevention, when laying down plans for construction for town, village and downtown or village development plans.</li> <li>• For the requirements for the factory, workshop, highway bus, airport, jetty, hotel, motel, guest house, collective-owned building, market, work-site or business exposed to fire hazard of the owner or manager; <ul style="list-style-type: none"> <li>(a). Not fail to form the reserve fire brigade</li> <li>(b). Not fail to provide materials and apparatuses for fire safety; in conformity with the directive of the Fire Services Department.</li> </ul> </li> </ul>
<p><b>Prevention from Danger of Hazardous Chemical and Associated Material Law (Pyidaungsu Hluttaw Law No 28/2013)</b></p>	<p>Clause 8, 13, 20, 22, 15, 16, 17, 23, 27</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• For Any person, who wants to do the business of chemical and associated materials, to apply to the central body for the acquisition of the license, attached with the management plan for the environmental conservation in accord with the stipulations”.</li> <li>• For License holder to apply to the central supervising body in accord with the stipulation for the relevant chemicals and associated materials using for his chemicals and associated materials business” for a certificate.</li> <li>• For the registered certificate holder to abide by the regulations contained in the registered certificate and shall follow the order and directives issued from time to time by the central supervising body”.</li> <li>• For the duties and powers of the central supervising board.</li> <li>• For the requirements: <ul style="list-style-type: none"> <li>(a). before works, license holder to be inspected by the relevant supervising and inspection team for safety and machinery/equipment check and</li> <li>(b). The persons who are discharging the duty to be asked to attend foreign training or preventative trainings conducted by government departments and organizations.</li> </ul> </li> <li>• For license holders to</li> </ul>

Sources of Related Laws, Rules and Relevant Articles Regulations	Commitments
<p><b>Ayeyarwady Region Development Committees Law (regional hluttaw law no.3/2012),amended in (16.052013) and (07.10.2016)</b></p>	<p>(a). follow the license regulations,  (b). follow directives on safe handling and shall ask workers to strictly follow  (c). shall provide necessary safety equipment and issue free personal protective equipment to workers,  (d). provide training in occupational safety  (e). determine the hazard to the environment, people and animals  (f). provide fit for work medical check-up and keep records  (g). send permission letter to Department of Township Administration if the chemicals and associated material are permitted to store  (h). acquire in advance guidance and agreement from fire service department if using inflammable materials or explosives  (i). transport only the permitted amount of chemicals in accordance with prescriptive stipulations  (j). obtain approval of central supervising body if transporting chemical and associated material from the permitted region to any other region  (k). abide and operate in accordance with related environmental laws to avoid impacts and damage to the environment.</p> <ul style="list-style-type: none"> <li>For the license holder to have insurance in accordance with stipulations in case of compensation is required for losses related to people, animals and environment.</li> <li>For the registered certificate holder shall apply again for using chemical which are not in the registered list.</li> <li>For the license holder to <ul style="list-style-type: none"> <li>(a). classify the hazard level of chemicals and related substances in advance</li> <li>(b). show Material Safety Data Sheet and warning signage</li> <li>(c). provide safety equipment, personal protective equipment and training on their use</li> <li>(d). possess, transport, store, use and discharge chemicals and related materials in accordance with stipulations,</li> <li>(e). not import or export chemicals and related materials banned by the central supervising board.</li> </ul> </li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For the Committee to supervise the jobs and establishments that are potential to hazardous</li> <li>For the Committee to undertake the supportive work for protection of natural disasters, fire, floods.</li> <li>That the Committee with the approval of Ministry can issue permit and supervise to the private building construction at the out bond of city in the rural area by notifying the territory.</li> </ul>
<p><b>Ayeyarwady Region Development Committees Procedures Law related to Building Construction (notification no. 7/2016)</b></p> <p><b>Ayeyarwady Region Development Committees Procedures Law related to supervisions and revenues for Jobs and establishments causing potential hazardous to public. (notification no.6/2016)</b></p> <p><b>Underground Water Act, 1930</b></p>	<p>Clause 3, 15</p> <p>Clause 22</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>To apply the approval for building construction prior to the construction.</li> <li>To construct the building as per conditions with this procedures.</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For prohibitions not to operate the jobs and establishments causing potential hazardous to public in the township area and city area without license.</li> </ul> <p>The underground water act is enacted on the date of 21st June in 1930 whereas it is expedient to conserve and protect underground sources of water supply in the Union of Myanmar.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>for prohibition from sinking of a tube for the purpose of obtaining underground water except under and in accordance with the terms of a license granted by the water officer.</li> <li>For the powers of Township Officer or sub-divisional officer to close a license tube after exercising jurisdiction over the local area concerned and the expense of such closure shall be recoverable from the owner of the tube as if it were an arrear of land-revenue.</li> </ul>
<p><b>Myanmar Insurance Law (1993)</b></p>	<p>Clause 15, 16</p> <p>Myanmar Insurance is established under this Law as a legal entity having perpetual succession, capable of suing and being sued in its own name.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For compulsory requirement for owners of motor vehicles to have Third Party Liability Insurance with Myanma Insurance</li> <li>For compulsory requirement for organizations operating as an enterprise which may cause damage to life and property of the public or may pollute the environment to have General Liability Insurance with the Myanma Insurance.</li> </ul>
<p><b>The Law On Standardization (2014)</b></p>	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For the smoothness of technology transfer and invention, utilizes the standardization to reduce the technological barriers for the trade and supportive for the development international free trade zone and for the development of Myanmar economy and social,.</li> <li>For empowering to organize the council for setting up the policy, guideline and to implement to practice the national standard in respective production and service.</li> </ul>



Sources of Related Laws, Rules and Regulations	Relevant Articles	Commitments
Myanmar Port Authority Law 2015	Clause 19 (a)(b), 23 (a) to (c), 19, 59, 66 (f), 72 (a) to (c), 73, 80(a), 80 (b), 80 (d), The Law Amending the Ports Act promulgated (2008), Clause 11 (substituting for Sub-Clause 21 of the Ports Act), 53	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>That the Myanmar Port Authority can claim damages from the relevant organization and person if the pollution arises and losses to environmental resources occur within the port limit and right to retain the relevant vessels, from above and under water natural resource exploration rigs and structures before obtaining the compensations.</li> <li>That the Myanmar Port Authority, relating to environmental conservation, to carry out               <ol style="list-style-type: none"> <li>protection and prevention for non-existence of wastes;</li> <li>Distribution of information and technology, taking precautionary measures not cause oil spills from oil pipelines or from collision and grounding of vessels.</li> <li>For clearing and sanitation, not causing water pollution if oil and chemical spill occurs, charging the cost occurred from the responsible person.</li> </ol> </li> <li>That the Myanmar Port Authority may claim damages from the relevant organization if damage and losses to environmental resources occur within the port limit due to oil spill.</li> <li>For functions and duties to be carried out by the Myanmar Port Authority relating to the prevention of the infectious diseases and health of the sick within a port limit where sea-going vessels berth by itself or by delegating to the health officer appointed and assigned duty.</li> <li>That the port conservator can remove sewage of a vessel disposed or dumped not in conformity with the discipline so as not to affect the navigation channel and claim the expenses from the relevant master of a vessel and take action against the master of a vessel who disposed or dumped the sewage;</li> <li>For the requirement to apply a license from the Myanmar Port Authority for the building any kinds of wharf, shipyard, dry dock, slip way and require to pay license pay.</li> <li>That the Myanmar Port Authority can charge a fine to the person who has obtained an operation license and violates the prohibitions.</li> <li>Prohibition from causing oil spill or discharging of sludge from tankers navigated in port limit or from oil test wells, oil wells and oil pipelines and grounding of vessels</li> <li>Prohibition from discharging, disposing or causing to fall dangerous materials, toxic materials, garbage, sludge and waste from vessels and above or below water from exploration rigs and structures within a port limit.</li> <li>Prohibition from disposing or dropping materials that may slide into the port because of tide, storm or flood on land.</li> <li>Prohibition from removing or shifting rocks, stones, gravels, sand or materials protecting the bank from slide from the foreshore and shore area of any bank without permission of the port conservator.</li> <li>To comply with any order or directive by the assigned person on duty of the Myanmar Port Authority.</li> <li>For Any person who by himself or another so casts or throws any ballast or rubbish or any such other thing or so discharges any oil or water mixed with oil, or the master of any vessel from which the same is so cast, thrown or discharged, to be punishable with fine not exceeding fifty thousand kyats, and to pay any reasonable expenses which may be incurred in removing the same.</li> <li>For any pilot in charge of a vessel who disobeys, or abets disobedience to, any of the provisions of this Chapter, be punishable with fine not exceeding fifty thousand kyats for each instance of such disobedience or abetment, and, in addition, be liable to have his authority to act as a pilot withdrawn.</li> </ul> <p>This is enacted to implement the agreements which is relevant to water transport service concluded by regional countries or neighboring countries or regional organizations; enable to lay down the policies relating to water transport service; This empowers to organize and form Central Supervising Body.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For empowering the Central Supervising Body               <ol style="list-style-type: none"> <li>to specify the terms and conditions of service license;</li> <li>to inspect whether or not it is in conformity with the stipulations after halting the vessels if there is necessity and coordinating with the relevant department for securing and seizure of such necessary documents.</li> </ol> </li> <li>For prohibition from operating or causing to operate the service of water transport service without service license.</li> </ul>
The Myanmar Coastal and Inland Water Transport Service License Law (Pyidaungsu Hluttaw Law No.10.2015)	Clause 6, 23	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>for reducing environmental pollution caused by motor vehicles</li> <li>for the right of the Department to issue directives, the standards, guidelines for the purposes of importing, manufacturing, assembling, maintaining to be safe in accident and environment conservation.</li> </ul>
Motor Vehicle Law (2015)		<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>For the regulation of the air transport services, and the prohibition of the use of aircraft in such services except under the authority of and in accordance with a license authorizing the establishment of the services;</li> <li>For the registration and marking of aircraft;</li> <li>For the air-route by which and the conditions under which aircraft may enter or leave Myanmar or may fly over the Union of Myanmar and the places at which aircraft shall land;</li> </ul>
The Burma Aircraft Act (1934) Law Amending the Burma Aircraft Act(Pyidaungsu Hluttaw Law No.33 of 2013)	Clause 5	



Sources of Related Laws, Rules and Relevant Articles Regulations		Commitments
<b>The Farmland Act 2012</b>	Clause 30 (a) (b)	<ul style="list-style-type: none"> <li>For the prohibition of flight by aircraft over any specified area, either absolutely or at specified times, or subject to specified conditions and exceptions;</li> </ul> M&AOSB commits to comply the stipulations for empowering <ul style="list-style-type: none"> <li>In respect of the application to utilize the farmland for other purposes in the interest of the public:- <ol style="list-style-type: none"> <li>The Central Farmland Management Body to give permission to utilize the paddy land for other purposes, with the recommendation of the Region or State Farmland Management Body;</li> <li>The respective Region or State Government shall give permission to utilize the farmland for other purposes except paddy land, with the recommendation of the Region or State Farmland Management Body;</li> </ol> </li> </ul>
<b>Vacant, Fallow and Virgin Land Management Act 2012, (Pyidaungsu Hluttaw Law No.10 of 2012)</b>	Clause 16, 19	M&AOSB commits to comply the stipulation <ul style="list-style-type: none"> <li>for Person who is granted the right to use the vacant, fallow and virgin lands has to comply the conditions: <ol style="list-style-type: none"> <li>Land granted will use for the purpose granted and in relation to economic enterprise;</li> <li>To carry out to be completed within four years from the date of grant according to the purpose granted (can revise by the Central Committee for losing time due to natural disaster and unstable security conditions;</li> <li>Not to mortgaged, giving, sold, leasing or otherwise transferred or divided without the permission of the Cabinet of the Union Government;</li> <li>To fully pay the land revenue;</li> <li>To comply the conditions prescribed by the Central Committee</li> <li>Prohibit to explore other natural resources below and above ground except the purpose granted;</li> <li>To surrender the natural resources found in the authorized land and the Government being desirous of extracting the same on a commercial resumes the area required therefrom. <ul style="list-style-type: none"> <li>That the Central Committee can resume the area required in the authorized land, if one of the following situation arises:- <ol style="list-style-type: none"> <li>If ancient culture heritage are found in the authorized land;</li> <li>If infrastructure project or Special project are desired to be constructed on the authorized land, in the interest of the State;</li> <li>Except the permitted minerals , if other natural resources are found in the authorized land which are permitted for production of mining;</li> <li>If natural resources are found in the authorized land which are permitted for the purposes described in Section4, Sub-section (a),(b), and (d);</li> </ol> </li> </ul> </li> </ol> </li> </ul>
<b>Myanmar Territorial Sea and Maritime Zones Law (2017)</b>	Clause 10, 30, 31	M&AOSB commits to comply the stipulations: <ul style="list-style-type: none"> <li>For the route and necessary documents;</li> <li>The ships that carried the petroleum that operated by nuclear power or by mean of nuclear in any way that carried the hazardous materials, shall pass the route being set aside by the State.</li> <li>As per passage as (a), the ship shall carry the necessary documents and comply the plans being assigned by the precautionary management by international agreements. <ul style="list-style-type: none"> <li>For not to move antiques and historical items present on the sea bed without permission of the government.</li> <li>For anybody who cannot do the following without permission of the government in the exclusive economic zone;</li> </ul> </li> <li>Exploration</li> <li>Drilling or Production of natural resources</li> <li>Research</li> </ul>
<b>Union of Myanmar Marine Fisheries law (25 April 1990, amended 1993)</b>	Clause 39	M&AOSB commits to comply the stipulations: <ul style="list-style-type: none"> <li>For prohibition from disposing of living aquatic creatures or any material into the Myanmar Marine Fisheries Waters to cause pollution of water or to harass fishes and other marine organisms.</li> </ul>
<b>Freshwater Fisheries Law, 1991, Ayeyarwaddy Region Fresh Water Fisheries Law (2012),</b>	Clause 40, 34, 39, 41	M&AOSB commits to comply the stipulations: <ul style="list-style-type: none"> <li>For restriction to anyone from causing harassment of fish and other aquatic organisms or pollution of the water in a freshwater fisheries waters.</li> <li>For prohibition from clearing, firing the woods/forest that is habitat for fish.</li> <li>For not polluting, deterring the fish, aquatic creatures in the fresh water area.</li> </ul>
<b>The Law Relating to Aquaculture, 1989</b>	Clause 29(b)	M&AOSB commits to comply the stipulation: <ul style="list-style-type: none"> <li>For deterring transport by water and flow or pollution or mean to happen that at the territory of fishing area.</li> </ul>
<b>Public Health Law, 1972</b>	Clause 3, 5	M&AOSB commits to cooperate with the authorized person or organization in line with the stipulations <ul style="list-style-type: none"> <li>To abide by any instruction or stipulation for public health.</li> <li>To accept any inspection, anytime, anywhere if it is needed.</li> </ul>

Sources of Related Laws, Rules and Regulations	Commitments
<b>The Protection and Prevention of Communicable Disease Law, 1995</b>	<p>Clause 3(a), 9, 11</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>That the Department of Health will carry out immunizations and health education activities related to communicable diseases</li> <li>That all persons are responsible for reporting an outbreak of a communicable disease to the nearest Health Officer.</li> <li>That Health Officer may undertake investigations and medical examinations to prevent the control the spread of Principal Epidemic Disease.</li> </ul>
<b>The Control of Smoking and Consumption of Tobacco Product Law, 2006</b>	<p>Clause 9(a-d),</p> <p>M&amp;AOSB commits to comply the stipulation:</p> <ul style="list-style-type: none"> <li>For the person-in-charge <ul style="list-style-type: none"> <li>To keep the caption and mark referring that it is a non-smoking area,</li> <li>To arrange the specific place</li> <li>To supervise and carry out measures so that no one shall smoke at the non-smoking area</li> <li>To accept the inspection when the supervisory body comes to the place for which he is responsible.</li> </ul> </li> </ul>
<b>The Petroleum and Petroleum Product Law, 2017</b>	<p>Clause 7, 9, 10, 11</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <p>(a). That the Ministry of Commerce shall functions relating to:</p> <p>(e) (a)issuing licenses relating to import and export (c) determining procedures and conditions related to import and export</p> <p>(f) prohibition not to import or export from the other places except from the places stipulated for import or export;</p> <p>(g) determining procedures, and conditions relating to import or export;</p> <p>(b). That the Ministry of Transport and Communications shall carry out the following functions relating to any petroleum and petroleum product</p> <p>(a) issuing licenses relating to refining, transit, transport by pipeline, sale and distribution, inspection, and testing; issuing joint license or compound license for carrying out more than a type of business activities;</p> <p>(d) taking action, as necessary, in accordance with the existing laws if it occurs spill or accident in carrying out import, export, transport, and sale and distribution of petroleum and petroleum product by water;</p> <p>(e) determining standard and quality of receptacles for transport, and procedures and conditions for the pipelines;</p> <p>(c). That the Ministry of Transport and Communications shall carry out the following functions relating to any petroleum and petroleum product</p> <p>(a) issuing license for the right to store for the storage tanks and warehouses;</p> <p>(b) issuing transport permit for the vehicles, vessels and barges that shall carry any petroleum and petroleum product;</p> <p>(d) if it occurs environmental impacts in carrying out petroleum and petroleum product business activities, taking action, as necessary , in accordance with the existing laws of on-site inspection</p> <p>(d). For stating warning sign of danger or if not possible writing shall be displayed on all receptacles containing any dangerous petroleum and petroleum product.</p> <p>M&amp;AOSB commits to comply the stipulation</p> <p>(a). For the agreement, training and probation period as in :</p> <p>1. If the employer has appointed the employee to work for an employment, the employment agreement shall be made within 30 days. But it shall not be related with government department and organization for a permanent employment.</p> <p>2. If pre training period and probation period are stipulated before the appointment the said trainee shall not be related with the stipulation of sub-section (1).</p> <p>(b). For particulars to be included in the employment agreement:</p> <p>1. the type of employment;</p> <p>2. the probation period;</p> <p>3. wage, salary;</p> <p>4. location of the employment;</p> <p>5. the term of the agreement;</p> <p>6. working hour;</p> <p>7. day off, holiday and leave;</p> <p>8. overtime;</p> <p>9. meal arrangement during the work hour;</p> <p>10. accommodation;</p> <p>11. medical treatment;</p> <p>12. ferry arrangement to worksite and travelling;</p> <p>13. regulations to be followed by the employees;</p> <p>14. if the employee is sent to attend the training, the limited time agreed by the employee to continue to work after attending the training;</p> <p>15. resigning and termination of service;</p> <p>16. termination of agreement;</p> <p>17. the obligations in accord with the stipulation of the agreement;</p>
<b>Employment and Skill Development Law, 2013</b>	<p>Clause 5, 14, 15</p>

Sources of Related Laws, Rules and Relevant Articles Regulations		Commitments
		<p>18. the cancellation of employment agreement mutually made between employer and employee;</p> <p>19. other matters;</p> <p>20. specifying the regulation of the agreement, amending and supplementing;</p> <p>21. Miscellaneous.</p> <p>(c). For the worksite regulations contained in the employment agreement to be in compliance with any existing law and the benefits of the employee not to be less than those of the any existing law.</p> <p>(d). For the employment agreement, the Ministry shall issue the notification for paying the stipulated compensation to the employee by the employer, if the work is completed earlier than the stipulated period or the whole work or any part of it have to be terminated due to unexpected condition or the work has to be terminated due to various conditions.</p> <p>(e). For the employment agreement made under sub-section (a) to be related with daily wage workers, piece rate workers who are appointed temporarily in the government department and organization.</p> <p>(f). For the worksite regulations and benefits contained in the employment agreement mutually made between the employer and employee or among the employees to be amended as necessary, in accord with the existing law.</p> <p>(g). For the employer to send a copy of the employment agreement made between the employer and employee, to the relevant employment and labor exchange office within the stipulated period and to get the approval of it.</p> <p>(h). For the employment agreement made before the enforcement of this law has be confirmed up to the end of the term of the original agreement.</p> <p>(i). 14. The employer shall carry out the training program in accord with the work requirement in line with the policy of the skill development team to develop the skill relating to the employment for the workers who are proposed to appoint and working at present.</p> <ul style="list-style-type: none"> <li>• For the Employer:</li> </ul> <p>(a). to carry out the training for each work or compounding the work individually or group-wise by opening on-job training, training systematically at worksite, sending outside training and training by using information technology system, for arranging the training program to enhance the employment skill of the workers;</p> <p>(b). for appointing the youths of 16 years as apprentice, shall arrange the training for technology relating to the employment systematically in accord with the regulations prescribed by the skill development team.</p> <ul style="list-style-type: none"> <li>• (a) For the employer of the industry and service business to put in to the fund monthly as put in fees without fail for the total wages of the subordinates and the supervisors' salary for not less than 0.5%;</li> <li>• (b) To put in money paid under sub-section (a) not to be deducted from the wage and salary of the employees.</li> </ul> <p>The Pyidaungsu Hluttaw hereby had enacted this Law for safeguarding the right of workers or having good relationship between employer and workers and making peaceful workplace or obtaining the rights fairly, rightfully and quickly by settling the dispute of employer and worker justly.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• Not to fail to negotiate and coordinate in respect of a complaint within the prescribed period without sufficient cause</li> <li>• Not to alter the conditions of service of workers involved in disputes prior to investigation by tribunals</li> <li>• That no party shall strike or lock-out without negotiation, conciliation and arbitration by Arbitration Body.</li> <li>• For the employer if commits acts without sufficient cause, may be liable to pay full compensation to workers as determined by Arbitration Body or Tribunal.</li> </ul>
<b>The Settlement of Labour Dispute Law, 2012</b>	Clause 38, 39, 40, 51	<p>The Workmen's compensation act had been promulgated in 1923, amended in 2005,</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• For the payment by certain classes of employers to their workmen of compensation for injury by accident.</li> <li>• For the liability for compensation of employer's, amount of compensation, compensation to be paid when due and penalty for default, method of calculating wages, review, commutation of half-monthly payments, payment of a lump sum amount, distribution of compensation, compensation not to be assigned, attached or charged, notice and claim, power to require from employers statements regarding fatal accidents, reports of fatal accidents and serious bodily injuries, medical examination, contracting, remedies of employer against stranger, compensation to be first charge on assets transferred by employer, special provisions relating to masters and seamen.</li> <li>• In the amendment law for revising the monetary amount to update.</li> </ul>
<b>The Workmen Compensation Act, 1923 (amended 2005)</b>		<p>This Law was enacted, to protect the rights of the workers, to have good relations among the workers or between the employer and the worker, and to enable to form and carry out the labor organizations systematically and independently.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That Labor Organizations are free to organise and negotiate workers rights if not meeting labour laws.</li> <li>• That Labour Organisations may demand re-appointment of worker if cause of dismissal is related to labour organisation membership or activities or not conform with labour laws..</li> <li>• That Labour Organisations have the right to send representatives to conciliation tribunals.</li> <li>• That Labour Organisations have the right to participate and discuss workers rights and interests with government and employers</li> </ul>
<b>Labor Organization Law, 2011</b>	Clause 17, 18, 19, 20, 21, 22	

Sources of Related Laws, Rules and Relevant Articles Regulations	Commitments
<b>Minimum Wages Law, 2013</b>  Clause 12 (a-e), 13 (a-g)	<ul style="list-style-type: none"> <li>• That Labour Organisation have the right to participate in collective bargaining in accordance with labour laws.</li> <li>• That Labour Organisation may take collective actions in accordance with the relevant procedures, regulations and law.</li> </ul> <p>This Law was enacted to meet with the essential needs of the workers, and their families, who are working at the commercial, production and service, agricultural and livestock breeding businesses and with the purpose of increasing the capacity of the workers and for the development of competitiveness.</p> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That the employer not to pay wage less than the minimum wage stipulated, not have the right to deduct any other wage;</li> <li>• That the employer to inform rates of minimum wage relating to the business, allow the entry and inspection of the inspection officer, give the sick worker holiday for medical treatment in accord with stipulation and give holiday for the matter of funeral of the family of worker without deducting from the minimum wage.</li> </ul>
<b>Payment of Wages Law, 2016</b>  Clause 3, 4, 5, 9, 10, 14	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• That salaries are to be paid at the end of the month or, depending on the size of the employing enterprise, between 5-10 days before the end of the month. The employer is permitted and required to withhold income tax and social security payments. Other deductions, e.g. for absence, may only be withheld in accordance with the law.</li> <li>• For the employer (a) to pay for salary either Myanmar Kyats or Foreign Cash permitted by National Bank of Myanmar. When delivery the salary (b) If the employer needs to pay the other opportunities or advantages, he can pay cash together with other materials according employee's attitude.</li> <li>• For finishing the contract, employer need to pay the salary (not more than one month) to employees. For the permanent worker, need to pay per monthly. If more than 100 employees, need to pay within the 5 days from the end of month. If fire the employees, need to pay salary within two days after fire. When employee dies due to the accident, need to pay money as an insurance to employee's family within two days.</li> <li>• If the employer has difficulties to pay wages on time because of significant events (eg natural disaster), the employer must report to the Department with evidence of payment at later date agreed with the employee.</li> <li>• When cut the salary due to the employees' absence, total cut salary not more than 50 % of his salary.</li> <li>• For the Employer need to approval form the department as a penalty and cannot more than actual ravage rate when cut salary. No cut salary from the employees under 16 age.</li> <li>• If an Employee carries out overtime work, he/she must be allowed the presiding overtime rate as set by the Law.</li> </ul>
<b>Social Security Law, 2012</b>  Clause 11 (a)(b), 15(a), 18(b), 48(a), 49(a)(b), 51(a)(b), 53(a), 54(a)(b), 75	<p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• For compulsory registration for social security system and benefits, the following establishments can be applied if they employ minimum number of workers and above determined by the Ministry of Labor in co-ordination with the Social Security Board:               <ol style="list-style-type: none"> <li>i. production industries doing business whether or not they utilize mechanical power or a certain kind of power, works of production, repairing or services, or engineering works, mills, warehouses, establishments;</li> <li>ii. Government departments, Government organizations and regional administrative organizations doing business;</li> <li>iii. development organizations;</li> <li>iv. financial organizations,</li> <li>v. companies, associations, organizations and their subordinate departments and branch offices doing business;</li> <li>vi. shops, commercial establishments, public entertaining establishments;</li> <li>vii. Government departments and Government organizations doing business or transport businesses owned by regional administrative body, and transport businesses carried out with the permission of such department, body or in joint venture with such department or body;</li> <li>viii. construction works carried out for a period of one year and above under employment agreement;</li> <li>ix. works carried out with foreign investment or citizen investment or joint ventured businesses;</li> <li>x. works relating to mining and gemstone contained in any existing law;</li> <li>xi. works relating to petroleum and natural gas contained in any existing law;</li> <li>xii. ports and out-ports contained in any existing law;</li> <li>xiii. works and organizations carried out with freight handling workers;</li> <li>xiv. Ministry of Labor and its subordinate departments and organizations;</li> <li>xv. Establishments determined by the Ministry of Labor from time to time, in co-ordination with the Social Security Board and with the approval of the Union Government; that they shall be applied with the provisions of compulsory registration for Social Security System and benefits contained in this Law.</li> </ol> </li> <li>• For provisions of compulsory registration under sub-section (a) to continue to be applied by this Law even though any of the following situations occurs if it continues to carry out such work:               <ol style="list-style-type: none"> <li>i. carrying out work by employing under stipulated minimum number of workers but more than one worker;</li> <li>ii. Changing the employer or changing the type of business.</li> </ol> </li> <li>• For the Social security fund, to include the funds for health and social care, family assistant, invalidity benefit, superannuation benefit and survivors' benefit, unemployment benefit, other social security fund for social security system</li> </ul>

Sources of Related Laws, Rules and Relevant Articles	Commitments
	<p>of compulsory registration and contribution stipulated by the Ministry of labor, other social security fund and social security housing plan fund.</p> <ul style="list-style-type: none"> <li>• That the employer can deduct contributions to be paid by worker from his wages together with contribution to be paid by him and pay to the social security fund and in such case he can incur the expense.</li> <li>• For the employer to effect insurance by registering for employment injury benefit insurance system contained in section 45 at the relevant township social security office and pay contribution to employment injury benefit fund in accord with stipulations in order that workers applied to provisions of compulsory registration may obtain the employment injury benefits.</li> <li>• For the inapplicability to the Workmen's compensation act.</li> <li>• For the employer (a) to pay contribution monthly to Employment Injury Benefit Fund at the rates stipulated under section 50. Moreover he shall also bear the expenses for paying as such; (b) to pay defaulting fee stipulated under section 88, in addition to the contribution if fails to contribute after effecting insurance for employment injury benefit.</li> <li>• For the employers and workers (a) to co-ordinate with the Social Security Board or insurance agency in respect of keeping plans for safety and health in order to prevent employment injury, contracting disease and decease owing to occupation and in addition to safety and educational work of the workers and accident at the establishment;</li> <li>• For the employer (a) to report to the relevant township social security office immediately if a serious employment accident occurs to his insured worker. There shall not be any delay without sufficient cause to report as such. (b) A team of officers and other staff who inspect the establishments, if it is found out the employment injury, death, and contracting disease, shall report to the relevant township social security office in accord with the stipulations.</li> <li>• For keeping records of work and lists.</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• For the Equal right between the Ethnic living in Myanmar. It enacted that if an ethnic loose the right, he can complain to the Regional or State Government to get the equal chance and find the equal right.</li> <li>• That project matters shall be informed, coordinated and undertaken in consultation with ethnic groups if projects are in areas with ethnic groups.</li> </ul> <p>M&amp;AOSB commits to comply the stipulations:</p> <ul style="list-style-type: none"> <li>• For employee to be granted to pay public holidays as announced by the Government in the Myanmar Gazette. On average, Myanmar has 26 public holidays per year, depending on the date of the variable holidays.</li> <li>• For additional rules to apply in accordance with other laws, such as the Social Security Law (2012) for employees contributing to the Social Security Fund.</li> </ul>
<b>Law protecting Ethnic Right, 2015</b>	Clause 5
<b>Leaves and Holidays Act, 1951</b>	





ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ  
ပို့ဆောင်ရေး နှင့် ဆက်သွယ်ရေးဝန်ကြီးဌာန

**မြန်မာ့ဆိပ်ကမ်းအာဏာပိုင်**

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စာအမှတ်၊ဆက/မြို့ပြ(M&A)/၁၄၀၁/၂၀၁၈

ရက်စွဲ၊ ၂၀၁၈ ခုနှစ်၊ ဇွန်လ ၂၀ ရက်

အကြောင်းအရာ။ Myint & Associates Offshore Supply Base (M&AOSB)မှ  
တည်ဆောက်မည့် Jetty Layout Design အပေါ် အတည်ပြုချက်တောင်းခံ  
ထားခြင်းကိစ္စ။

ရည်ညွှန်းချက်။ Myint & Associates Offshore Supply Base Ltd ၏ ၇-၅-၂၀၁၈  
ရက်စွဲပါ စာအမှတ်၊ M&AOSB/LET-056/2018


၁။ ဧရာဝတီတိုင်းဒေသကြီး၊ ပုသိမ်ခရိုင်၊ ငပုတောမြို့နယ်၊ ငရုတ်ကောင်းမြို့နယ်ခွဲ၊ နံသာပု  
ကျေးရွာအနီးပင်လယ်ကမ်းနဖူးတွင် Myint & Associates Offshore Supply Base Ltd  
(M&AOSB)မှ ကမ်းလွန်ရေနံတွင်းများအတွက် လိုအပ်သောဝန်ဆောင်မှုများ ဆောင်ရွက်ရန်  
ကမ်းလွန်ထောက်ပံ့ရေးအခြေစိုက်စခန်းပါ ဆိပ်ခံတံတား၏ Jetty Layout Design ကို Royal  
Haskoning DHV Myanmar Company Limited မှ ရေးဆွဲထားပြီးဖြစ်ပါ၍ EPC Tender  
ခေါ်ယူရန် စီစဉ်ဆောင်ရွက်လျက်ရှိသည့်အတွက်ကြောင့် တည်ဆောက်မည့် Overall Layout  
Terminal နှင့် General Layout Port Design တို့အား စိစစ်အကြံပြုနိုင်ပါရန်နှင့် အတည်ပြု  
ချက်ပေးနိုင်ပါရန် ရည်ညွှန်းချက်ပါစာဖြင့် တင်ပြလာပါသည်။

၂။ Myint & Associates Offshore Supply Base Ltd (M&AOSB) မှ ကမ်းလွန်  
ထောက်ပံ့ရေး အခြေစိုက်စခန်းတွင် တည်ဆောက်မည့် ဆိပ်ခံတံတား၏ ပုံစံဒီဇိုင်းတည်နေရာပြပုံ  
(Jetty Layout Design) အပေါ် မြို့ပြအင်ဂျင်နီယာရှုထောင့်မှ အထူးမှတ်ချက်ပြုရန်မရှိပါ  
ကြောင်း စိစစ်တွေ့ရှိရပါသည်။

၃။ သို့ရာတွင် Royal Haskoning DHV Myanmar Company Limited မှ Design Site  
နှင့်ပတ်သက်၍ နောက်ဆက်တွဲ(က)ပါ တင်ပြထားမှုအပေါ် အောက်ပါအတိုင်း စိစစ်တွေ့ရှိရ  
ပါသည် -

- (က) Jetty နေရာတွင် Closed Structure ဖြစ်သောကြောင့် ရေစီးနှုန်းအလွန်နည်းပါးခြင်း၊  
လှိုင်းအမြင့်မှာလည်း 0.2 M ခန့်သာရှိနိုင်ခြင်း၊ မုတ်သုန်လေ တိုက်ခတ်ချိန်တွင်  
လည်း လေကွယ်ရရှိသည့်အနေအထားကြောင့် သင်္ဘောပေါ် လေတိုက်မှုသက်ရောက်  
အားနည်းပါးခြင်းများရှိကြောင်း တွေ့ရှိရပါသည်။



- (ခ) Jetty ပုံစံကို ကမ်းခြေမှရေထဲသို့ Causeway တည်ဆောက်ပြီး ၎င်းထိပ်တွင် Jetty များတည်ဆောက်ရန် လျာထားသည့်အတွက် တံတားပုံစံမှာ နောက်ဆက်တွဲ(ခ) ပါ ပုံအတိုင်း ရှိနေပါသည်။ သင်္ဘောကြီးများ ဆိုက်ကပ်သည့်တံတားနှင့် သင်္ဘောငယ် များဆိုက်ကပ်တံတားသည်  ပုံစံ ဖြစ်နေသောကြောင့် သင်္ဘောကြီး ဆိုက်ကပ် မည့်အတွင်းပိုင်း Jetty End သည် ကျဉ်းမြောင်းနေသည်ကို တွေ့ရှိရပါသည်။
- (ဂ) Approach Channel ကို နောက်ဆက်တွဲ(ခ)ပါပုံအရ အကွေ့များဖြင့် လျာထား သည်ကိုတွေ့ရှိရပါသည်။ ပတ်ဝန်းကျင်တွင်ရေအနက်လုံလောက်စွာရှိသဖြင့် Approach Channel ကို ဖြောင့်တန်းပေးပါက ရေယာဉ်ကိုင်တွယ်ရ ပိုမိုကောင်းမွန်ပြီး Turning Basin သို့ ဝင်ရောက်ရာတွင်လည်း ရေယာဉ်အရှိန်လျော့ချရပ်တန့်ရာတွင် ပို၍ ကိုင်တွယ်ရ ကောင်းမွန်လာနိုင်ပါသည်။
- ၄။ သို့ဖြစ်ပါ၍ မြန်မာ့ဆိပ်ကမ်းအာဏာပိုင်အနေဖြင့် Jetty Layout အပေါ် လက်ခံပေးနိုင် ပါသည်။ ရေယာဉ်များ ဆိုက်ကပ်ရာတွင်လည်း Tug Boat အကူအညီပါ ပေးမည်ဖြစ်သောကြောင့် အခက်အခဲမရှိနိုင်ပါကြောင်း၊ သင်္ဘောကြီးကပ်မည့်တံတား၏ အပြင်ဘက် Jetty End အနီးတွင် Mooring Dolphin တစ်ခုထပ်မံဖြည့်ဆည်းပေးပါက ဆိုက်ကပ်မည့် တံတားနှင့် Dolphin တို့ကို ကြိုတင်မှေး၍ ဆိုက်ကပ်ပြီး ကျဉ်းမြောင်းသည့် Jetty End ဘက်သို့တိုးယူဆိုက်ကပ်နိုင်မည် ဖြစ်ပါကြောင်း၊ Turning Basin သည်လည်း Design Ship LOA ၏ ၂ ဆ လျာထားသဖြင့် လုံလောက်မှုရှိပါကြောင်းနှင့် Approach Channel ကို ဖြောင့်တန်းစွာ လုပ်ဆောင်ပေးပါက ပို၍ ကောင်းမွန်ပါကြောင်း အကြံပြုပြန်ကြားအပ်ပါသည်။



ဦးဆောင်ညွှန်ကြားရေးမှူး(ကိုယ်စား)

စိုးသိန်း၊ အင်ဂျင်နီယာချုပ်(မြို့ပြ)

ဦးမျိုးတင်(ဒါရိုက်တာ)

Myint & Associates Offshore Supply Base Ltd

Myint & Associates Ltd (19-4-18)Co-3

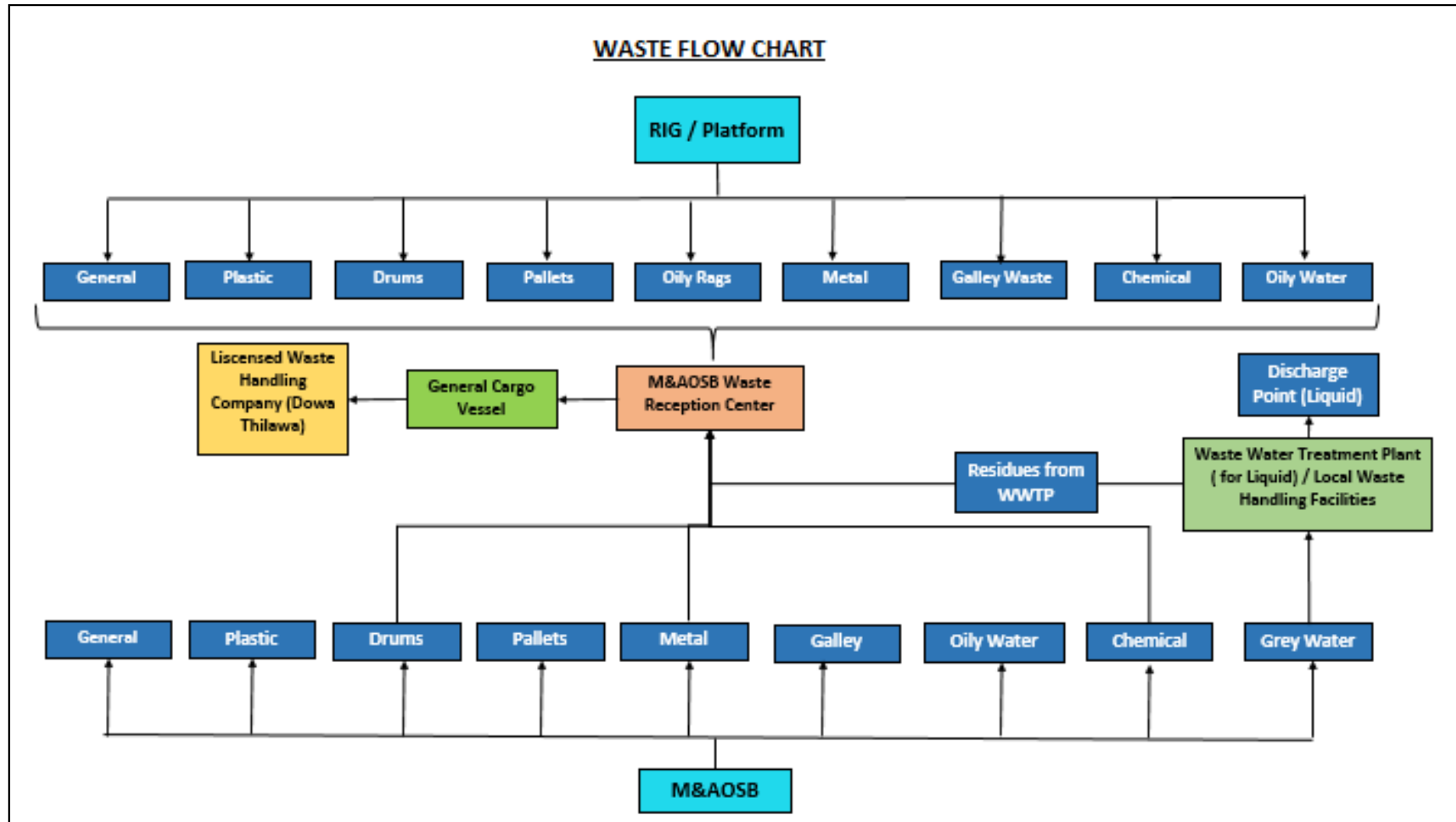
## Monitoring

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Construction Phase			
Air	Air emissions will be measured at Zin Yaw Chaung. Measurements will be for SO <sub>x</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> and PM <sub>10</sub> (closest sensitive receptor).	Monthly during construction, during site clearance. If the levels are within the NEG Guidelines, no further monitoring is required.	M&AOSB / Third Party
Noise	Noise levels (dB) will be measured one daytime and one nighttime at Zin Yaw Chaung (closest sensitive receptor).	Monthly during construction, during day and nighttime and during noisy activities. If the levels are within the NEG Guidelines, no further monitoring is required.	M&AOSB /Third Party
Marine Sediment	Sediment monitoring will be conducted to confirm no pollutants from construction dredging. The following parameters will be measured in line with WBG EHS Guidelines; <ul style="list-style-type: none"> <li>metals and metalloids</li> <li>organometallics</li> <li>organics.</li> </ul>	Monitoring will be conducted once after construction dredging is conducted. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring can cease.	M&AOSB /Third Party
Marine Flora & Fauna	During construction dredging, the amount of sediment accretion on the eastward side of the jetty should be studied given the presence of corals in the T2 transect (east of the jetty). This is measured to ensure no impacts on the coral species found during environmental surveys.	Monitoring will occur once during construction dredging.	M&AOSB /Third Party
Waste	The M&AOSB HSE team will review the Monthly Waste Reports (MWR) received by the contractor and report waste generation and disposal to MONREC.	Waste will be monitored monthly.	M&AOSB HSE Team
Incident and accident reporting	M&AOSB will report all spills and leaks to MONREC and MOGE as per the EIA Procedure. All incidents and non-compliances will be reported to MONREC.	Reporting of large spills within 24 hours (as per the EIA Procedure). A large spill is any spill not able to be cleaned by M&A team but needing external measures.	M&AOSB HSE Team

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
<b>Operational Phase</b>			
Air	Air emissions will be measured at Zin Yaw Chaung. Measurements will be for SO <sub>x</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> and PM <sub>10</sub> (closest sensitive receptor).	Six monthly during operation phase. If the noise is within NEQEG then monitoring can cease.	M&AOSB / Third Party
Noise	Noise levels (dB) will be measured one daytime and one nighttime at Zin Yaw Chaung (closest sensitive receptor).	Monthly during operation, during day and nighttime and during noisy activities. If the levels are within the NEQEG Guidelines, no further monitoring is required.	M&AOSB /Third Party
Effluent Discharges / Marine Water Quality	<p>Treated wastewater will be measured for the following parameters (in line with NEQEG and considering the WBG EHS Guidelines):</p> <ul style="list-style-type: none"> <li>• Dissolved oxygen</li> <li>• Temperature</li> <li>• pH</li> <li>• Turbidity</li> <li>• Secchi disk transparency</li> <li>• Conductivity/Salinity</li> <li>• Biological oxygen demand</li> <li>• Chemical oxygen demand</li> <li>• Oil and grease</li> <li>• Total coliform bacteria</li> <li>• Total nitrogen</li> <li>• Total phosphorus</li> <li>• Total suspended solids</li> <li>• Chlorophyll</li> <li>• Filterable reactive phosphate</li> <li>• Total nitrogen</li> <li>• Oxides of nitrogen</li> <li>• Ammonia</li> <li>• Metals and metalloids.</li> </ul>	Six monthly during operation phase. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring frequency can be reduced to annually.	M&AOSB /Third Party
Marine Sediment	<p>Sediment monitoring will be conducted to confirm no pollutants from operation dredging. The following parameters will be measured in line with WBG EHS Guidelines;</p> <ul style="list-style-type: none"> <li>• metals and metalloids</li> <li>• organometallics</li> <li>• organics.</li> </ul>	Monitoring will be conducted once after operational dredging is conducted. If levels are within permissible limits (as specified by the NEQEG and WBG EHS Guidelines), then monitoring can cease.	M&AOSB /Third Party

Project Activity/ Environmental Aspect	Monitoring Measures	Frequency	Responsibility
Marine Flora & Fauna	<p>During operational dredging, the amount of sediment accretion on the eastward side of the jetty should be studied given the presence of corals in the T2 transect (east of the jetty).</p> <p>This is measured to ensure no impacts on the coral species found during environmental surveys.</p>	Monitoring during operation should be conducted for up to two years from operation. If no changes detected, then monitoring can cease.	M&AOSB /Third Party
Waste	The M&AOSB HSE team will review the Monthly Waste Reports (MWR) received by the contractor and report waste generation and disposal to MONREC.	Waste will be monitored monthly.	M&AOSB HSE Team
Incident and accident reporting	M&AOSB will report all spills and leaks to MONREC and MOGE as per the EIA Procedure. All incidents and non-compliances will be reported to MONREC.	Reporting of large spills within 24 hours (as per the EIA Procedure). A large spill is any spill not able to be cleaned by M&A team but needing external measures.	M&AOSB HSE Team

Waste Flow Chart



**Comments of Review Team (RT) members for Environmental Impact Assessment Report for Offshore Supply Base in Nga Yoke Kaung Bay of Ayeyarwadddy region conducting by Myint & Associates**

No.	Particular	Comment	Response to Comments
1	Although described the making assessment for phase 2, it have only considered the project works of phase 1, and there has no describe in detail of project work for phase 2 of 50hac area.	As the clause 63(h) of EIA procedure, need to be describe the EMP for phase 2	The EIA Report covers both Phase 1 and 2 and as such, the EMP covers Phase 2. Refer to <b>Figure 4.2</b> for all facilities.
2	There described of the mixing zone, discharge point, and discharge volume that cannot be known definitely the discharge from the sanitary treatment system, the reverse osmosis plant and the wastewater treatment plant that discharge with that will be existed from the Palinchaing shore to the north of the project area and will be submitted to ECD in detail and performed with the EQEG guidelines.	To describe the monitoring plan for the waste are discharge from the sanitary treatment system, the reverse osmosis plant and the wastewater treatment plant that discharge with mixing zone, discharge point, discharge volume are under guideline of EQEG. To include in the project commitment	The monitoring plan for all effluent discharges is provided in <b>Table 8.2</b> . The commitment to monitor all effluent discharges in line with EQEG is included in <b>Table 8.1</b> .
3	Disposal site and Disposal Plan need to describe for the material discharge due to the annual maintenance dredging, will be discharged to the disposal area confirmed by MPA, did not confirm the disposal location in current, the locations will be chosen by the confirming of MPA and after that will be submitted to ECD in detail before the construction.	To include in the project commitment table for the disposal site and plan will be submitted before construction	The commitment to prepare a Disposal Plan is included in <b>Table 8.1 (C5.1)</b> .
4	To describe the mitigation measure for the fishery activities in rainy season to protect the impact on fishing boats and nets.		Measures to reduce the impacts to fishing are included in <b>Section 6.4.12 (pg. 6-54)</b> and <b>Table 8.1 (O.10.1)</b> . The Project will also aim to employ The M&AOSB CSR program for FY 19-20 will be implemented as a training center approach. Required skill sets for construction and operation



No.	Particular	Comment	Response to Comments
			of OSB had been mapped out and training resources had been locally identified. From these trainings, alternative livelihoods can be considered for the community. This is included in <b>Section 9.4.2 and Table 8.1 (G.5.1)</b> .
5	To send the information including notice to mariner, ship route (water depth and wide) and number of vessels in/out to local fishermen		The ship route and number of vessels will be included in Notice to Mariners, which will be issued to local fishermen prior to construction. This has been updated in <b>Table 8.1 (C10.1)</b> . During operation, local fishermen will be notified 6 hours prior to the passing of ships. See Response to Comment 10 below.
6	After confirming the EIA, need to perform the key findings, mitigation measures, EMPs, monitoring plans, consultation and disclosure plan to local people. Need to be include in the project commitments		Noted.
7	While transporting the oil and oil products, M&A need to provide signage that can be seen clearly to demonstrate the products are dangerous.		M&AOSB will install the required signage within the supply base facilities. The vessels, which are managed by others, will be in accordance with the local and international rules and regulations, and Classification requirements. M&AOSB will ensure vessels calling our port have valid certifications. This is included in <b>Table 8.1 (C.14.1 &amp; O.14.1)</b> .
8	Need to be described why/how choose the construction and locations of the project site, e.g., Weather conditions)		As per Comment 1 from First Review Team Meeting (above). The detailed description for choosing location D is provided in <b>Section 4.3 (pg. 4-18)</b> .
9	By employing local people during the construction phase, this can improve job opportunity for fishermen and locals. E.g., creating job employment by training on the project activities and motivate the local people who can be protected their loss of income. Need to be include the plan doe employment for local people.		The M&AOSB CSR program for FY 19-20 will be implemented as a training center approach. Required skill sets for construction and operation of OSB had been mapped out and training resources had been locally identified. From these trainings, alternative livelihoods can be considered for the community. This is included in <b>Section 9.4.2 and Table 8.1 (G.5.1)</b> .

No.	Particular	Comment	Response to Comments
10	To describe the pre-notice of the time for passing the ships which carried the oil and oil products. Is this pre-notice time of 6hours enough or not? To describe completely how they will be notified.		<p>The 6 hour notice period was discussed at a meeting with Kan Chae Ar Man (CSO) during the site visit led by MSDES and ECD, were they mentioned that the community would need an advanced notification period of 4 hours is required. Thus, 6 hours should be more than enough. In addition,</p> <ul style="list-style-type: none"> <li>• Navigation buoys and equipment along the approach channel to the jetty will be installed as per guidance by Myanmar Port Authority to prevent interaction with fishing boats.</li> <li>• Local community leaders and head of fishermen group will be informed six hours in advance before entering the supply vessels.</li> <li>• The fishing vessels along the approach channel in advance will be informed by using work boat.</li> </ul> <p>This is included in <b>Section 6.4.12 (pg. 6-56)</b> and <b>Table 8.1 (C10.1 and O10.1)</b>.</p>
11	The statement of community health and safety plan is quite needed. To include the public health statics data of the local people near the project area and the data to state and request to township hospital and rural clinic, to include the health impact and base on this health statics data		<p><b>Section 5.5.5 (pg. 5-89)</b> has been updated to include public health statistics collected from Nga Yoke Kaung hospital.</p> <p>The impacts to community health and safety are included in <b>Section 6.4.11 (pg 6-51)</b>. The workers contracts will include provisions to protect the local communities from worker influx risks (such as sexually transmitted diseases). Workers will also have regular health checkups. These commitments are provided in <b>Table 8.1 (O.9.1)</b>.</p>
12	As the occupational health & safety plan, need to describe; how patients will be transported during accidental events, plans for 6 monthly medical checking for labourers and treatment, need to plan design for the diseases that can be worker influence.		<p>The full OH&amp;S Plan that will be prepared prior to construction, will be updated to include procedures for evacuation in emergencies, checkups for workers and how to minimise diseases brought in</p>

No.	Particular	Comment	Response to Comments
			by workers in compliance with relevant national legislation. This commitment is included in <b>Table 8.1 (C.11.1)</b> .
13	Plan to discuss with the relevant businesses, hotels, and tourism.		M&AOSB will hold regular meetings prior to and during construction will land owners, businesses, local communities, and tourism operators to ensure they are aware of the Project activities. The grievance mechanism will also be in place for stakeholders to provide comments and suggestions as well as concerns and grievances. The future engagement for businesses, hotels and tourism operators is provided in <b>Section 9.3.5 (pg. 9-19)</b> .