Project No: AESPL/INF-E/19-20/EIA/005

Safety. Performance. Result

Executive Summary of
Draft Environmental Impact Assessment Report

Baseline Monitoring: Summer 2022

Expansion of Existing Facility at village Rohini, Taluka Mhasala, District Raigad

ROHINI YARD

by

DAS Offshore Ltd.

November - 2022

Environmental Consultant: Aditya Environmental Services Pvt. Ltd., Mumbai

www.aespl.co.in

QCI-NABET Accredited, Certificate no. NABET/EIA/2225/RA 0262; Valid up to 01st May 2025

1. Introduction

DAS Offshore Ltd. (DOL) was established as an engineering and construction company mainly for fabrication of offshore structures in 1992. With passage of time, the company has diversified into various areas and presently serves sectors such as Offshore installation and offshore modular fabrication (Rohini Yard), Electrical and instrumentation works, designing engineering, marine assistance, infrastructure, logistics etc. The core service area however continues to be fabrication of offshore oil rig & components thereof.

The company is managed by hard core technocrats with over 30 years of industry experience supported by senior officers and staff having vast Experience.

DOL has three divisions viz, Oil & Gas Division, Infrastructure Division & Rohini Yard. These divisions are independently operating in their core fields.

The name of company has been changes from DAS Offshore Engineering Pvt. Ltd to DAS Offshore Ltd.

The company then named as 'DAS Offshore Engineering Pvt Ltd.' obtained environmental clearance under Sector 7(e) – Port, Harbour, Breakwaters, and dredging (Category B) for fabrication yard catering to fabrication of components of offshore oil and gas exploration rig. Various recommendations/clearances/consents/correspondence for the same are listed below:

Sr. no.	Clearance/ Recommendation/Extension obtained	Remarks
1.	MCZMA Recommendation letter no. CRZ 2010 CR 26/ TC 3 dated 23rd June 2010	MCZMA recommendation obtained
2.	Clarification to MCZMA Recommendation letter (No. CRZ 2010 CR 26/ TC 3 dated 23rd June 2010) vide letter no. 18th October 2010	Clarification is given that reclamation is only permissible for waterfront activities
3.	Consent to establishment, consent no. BO/RO-Raigad/AS(T)/EIC-RD-1082/E/CC-201dated 17th October 2011	Consent to establish is granted for period up to commissioning of the unit or five year whichever is early.
4.	Environmental Clearance Letter from SEIAA - File No. SEAC-2011/CR.698/TC.2 dated 17th January 2012	Environmental Clearance obtained
5.	Clarification to Environmental Clearance (File No. SEAC-2011/CR.698/TC.2 dated 17th January 2012) vide letter dated 31st January 2012	Clarification to Environmental Clearance. where point no. 3 (iv) "No land reclamation will be carried out" of term and condition was deleted.

6.	Consent to Operate order no. BO/CAC-cell/CO/CAC-10620 dated 29th November 2016.	1st consent to operate was obtained for period up to 30th September 2017
7.	Renewal of consent to operate order no. 1.0/BO/CAC-cell/UAN No.-0000031501-17/CAC-1807000186 dated 06/07/2018	Consent is granted for period from 01st October 2017 to 30th September 2018
8.	Revalidation of consent to establish Consent Order no. -BO/CAC-cell/CE-Reval/CAC-1703001528 dated 22/03/2017	Revalidation of Consent to establish valid up to commissioning of project or up to 17th October 2021, whichever is early.
9.	Renewal of consent to operate order no. 1.0/BO/CAC-Cell/UAN No: - 0000053537-18/11th CAC-1905000046 dated 02/05/2019	Consent of operate is grated for period from 01st October 2018 to 20th September 2023
10.	Extension of validity of Environmental Clearance letter no. SEIAA-2018/CR-176/SEIAA dated 22nd January 2019, the validity of EC extended up to 15th July 2026	The validity of Environmental clearance extended up to 15th July 2026
11.	Correspondence with commissioner of Kokan Bhavan regarding forest land situated at Project site dated 31/10/2022	Forest clearance is at advanced stage.

1.1 Regulatory Framework

The project needs Environment Clearance under EIA notification dated 14th September 2006 and its subsequent amendments. It is covered in CRZ notification dated 06th January 2011 and its subsequent amendments, require prior CRZ clearance. CZMP of Raigad District as per CRZ Notification 2019 are at draft stage, hence CRZ Notification 2019 is not applicable for this project. This project will require consent to Establishment and Operate. As proposed greenbelt is in buffer zone of mangroves (CRZ IA), DOL need remarks from Mangrove cell, Forest department, permission from Hon'ble High Court and other Local governing bodies.

2. Project Description

The proposed project is expansion (addition of ship building and ship repair yard, referred herein after as shipyard) of Existing Facility (Fabrication yard) at village Rohini by DAS Offshore, admeasuring 495773.82 m^2 area from total plot area 521411.14 m^2 of DOL. Remaining 25637.32 m^2 area kept unutilised.

The details of ownership of plot area are as below:

Sr. No.	Part	Aera (m^2)
1.	Govt. owned Land	4097.385
2.	Forest Land	12039.23
3.	Land having Power of Attorney	40629.87
4.	Land applied for acquisition	20486.93
5.	DOL owned Land	110556.6
6.	MMB Leased area	333500
	Total	521312.6

495773.82 m^2 area will be utilized for proposed project activity and their land breakup is given below.

Sr. No.	Facility	Area (m^2)
1.	Fabrication Yard	131019
2.	Shipyard	137774
3.	Common facilities	226980.82
Total		495773.82

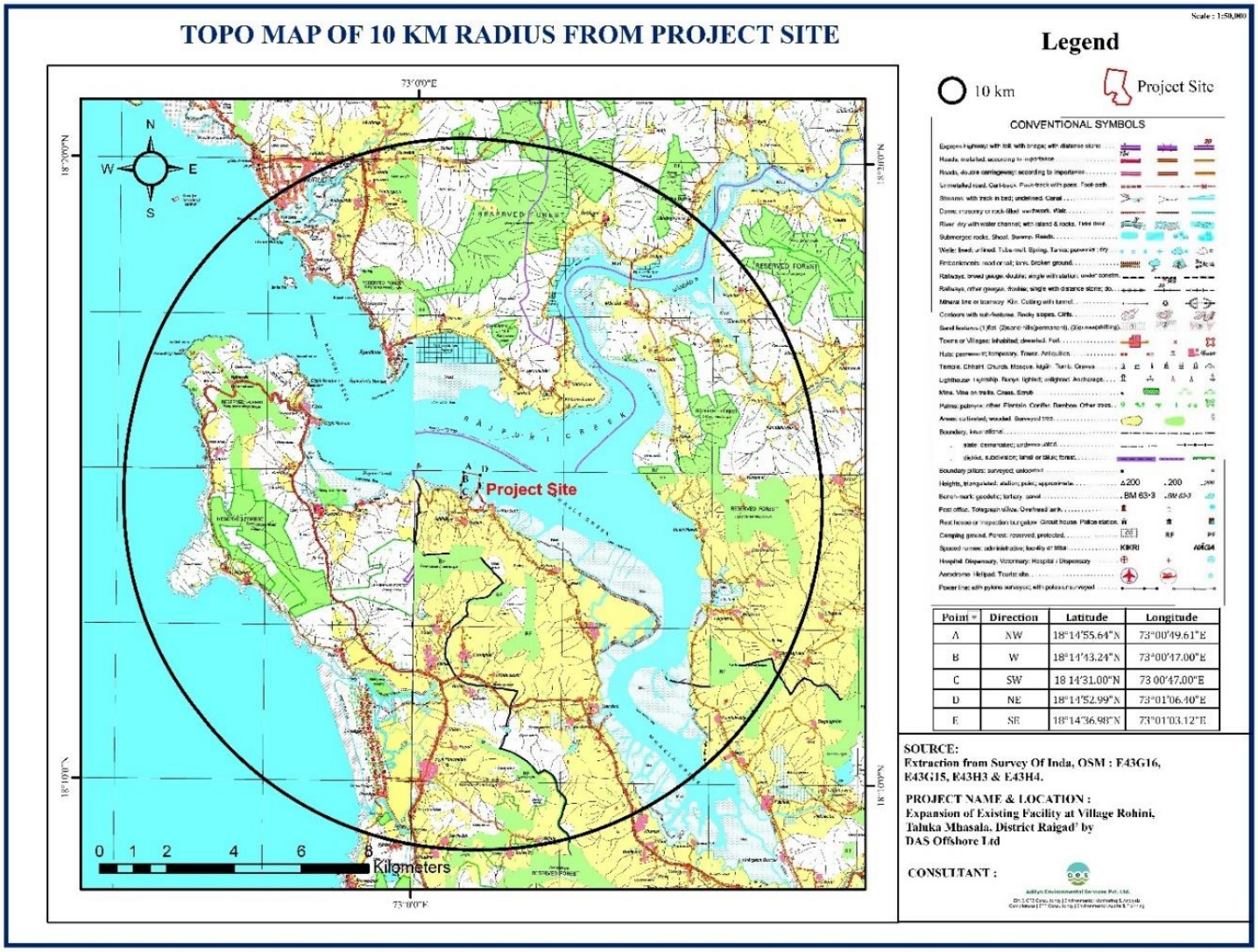
Source: DOL

The project site situated on southern bank of Rajpuri Creek and towards North of Rohini Village in Gut no. 70 to 83 and 96. The land of plot 76 and 78 belongs to Forest department. Turumbadi, Kalsuri, Adi Thakur and Harvit are other villages in surrounding.

Project site and entire 10 km study area is covered in Open Series Map (OSM published by Survey of India) No. E43G15, E43G16, E43H3 and E43H4, the same are depicted below; Site Layout map showing proposed facilities is enclosed overleaf.

Reference coordinates of plot under consideration are as follows:

Point	Direction	Latitude	Longitude
A	NW	18°14’55.64” N	73°00’49.61” E
B	W	18°14’43.24” N	73°00’47.00” E
C	SW	18 14’31.00” N	73 00’47.00” E
D	NE	18°14’52.99” N	73°01’06.40” E
E	SE	18°14’36.98” N	73°01’03.12” E



Point	Direction	Latitude	Longitude
A	NW	18°14'55.64"N	73°00'49.61"E
B	W	18°14'43.24"N	73°00'47.00"E
C	SW	18 14'31.00"N	73 00'47.00"E
D	NE	18°14'52.99"N	73°01'06.40"E
E	SE	18°14'36.98"N	73°01'03.12"E

Figure 2.1 Open Series Map showing Site & Study Area

Details of CRZ Demarcation

CRZ Map is prepared as per 2011 CRZ notification by Indian Remote Sensing (IRS), Anna University, Chennai. This reveals that the project activities fall under CRZ IA (mangrove buffer zone), IB (Intertidal Area), III (undeveloped area), IVB (Rajpuri Creek). Details of CRZ classification is given below:

Sr. No.	CRZ Classification	Area (m^2)
1.	CRZ IA (50 m Mangrove Buffer Zone)	19400.26
2.	CRZ IB	168162.62
3.	NDZ (CRZ III)	144967.14
4.	CRZ IV B	43695.48
5.	Non-CRZ	119548.32
	Total	495773.82

2.1 Layout of shipyard

The salient features of the layout consist of the provision for reclamation of waterfront, construction of Syncrolift with Wet basin, Slipways, warehouse, approach road. At the central portion of the layout there is space for circulation, adequate area is given for storage and fabrication shops, cranes and towing facilities, administrative office along with staff colony, dispensary, canteen, security system, firefighting system etc.

For preparing the initial shipyard layout concept, the approximate area requirements for the major production work areas have been established by using the First Marine International (FMI) shipbuilding production area computer model. This model has been developed from the analysis of several international shipyards engaged in building and repairing vessels. The area calculations are based upon the shipyard achieving an internationally competitive level of performance in terms of steel assembly throughput in tonnes/square-metre/shift/annum.

It should be noted that the production areas calculated for the initial layout concept are provisional and will need to be refined as the product analysis and rate of throughput is further developed in the subsequent stages of the project. However, the areas given are considered generous to ensure adequate area allocation within the boundary of the site.

At this time, only the major production areas are considered, and it is acknowledged that there are several minor workshops, offices and ancillary buildings that have not been included. These will be included when an agreed layout concept is developed during subsequent stages of the project.

It is also proposed to construct a dam at a suitable location in the vicinity of the site to provide enough potable water as well as industrial water. A filtration system to provide better quality drinking water is also contemplated in the layout. Electrical power supply is also proposed to be harnessed through non-conventional energy resources like solar power. This will be effective in controlling pollution and preservation of environments.

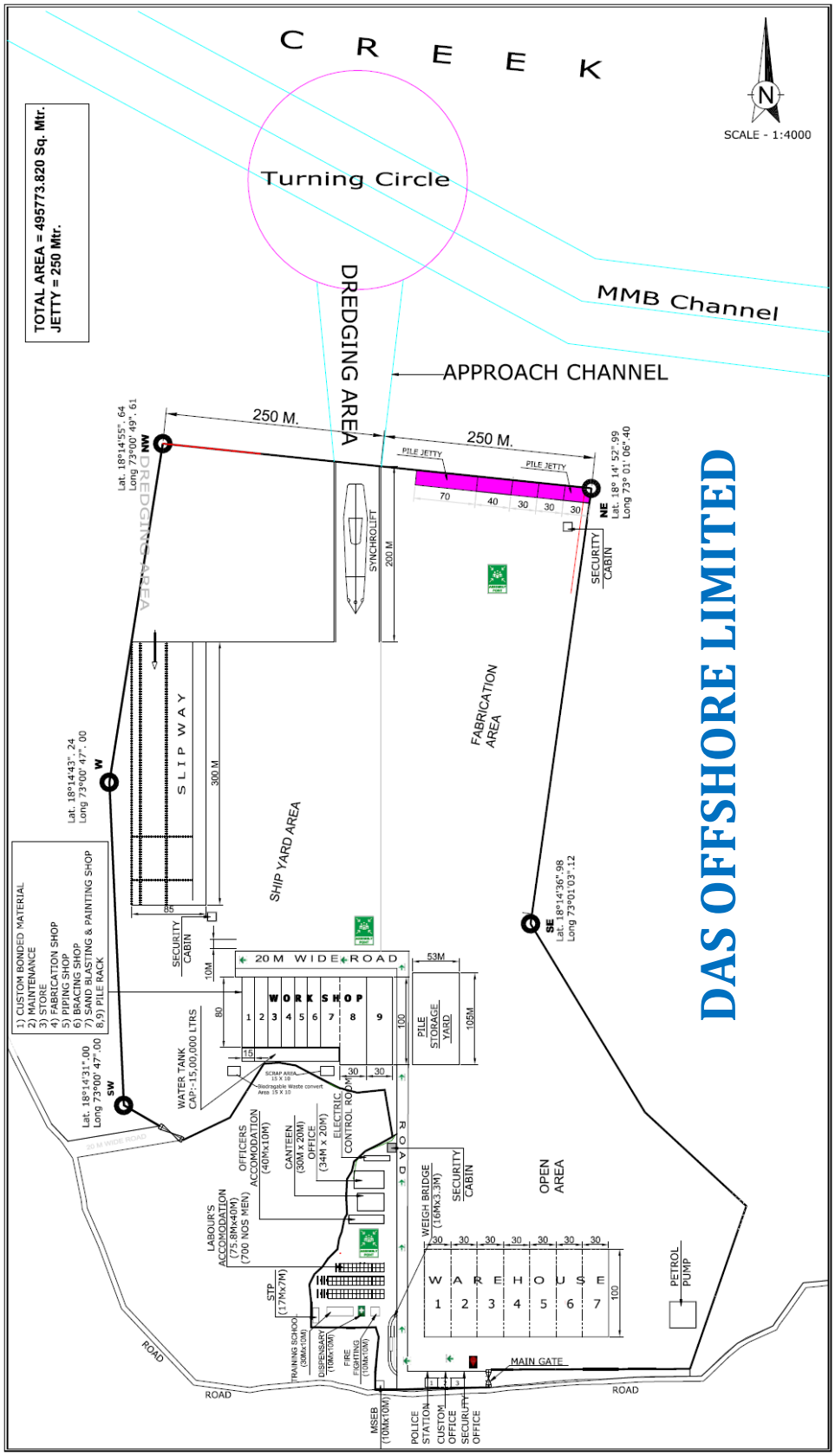


Figure 2.2 Layout of proposed Shipyard

2.2 Proposed Activity

Construction of shipyard will involve dredging of about 146742.41 m^3 and reclamation of 250 m waterfront. Construction of shipyard requires reclamation volume about 499793.3 m^3. The excavation about 336290 m^3 (231530 m^3 for slipways + 104760 m^3 for Syncrolift) will be done. The dredge material generated from dredging and excavation will be used for construction purposes within site.

The dimension of ships to be constructed and repaired at shipyard are given below:

Table 2.1: Details of ship sizes for construction and repair at shipyard

Size of ship	Max size	Min. Size
DWT (T)	10000	6000
LOA (m)	125	100
Draft (m)	7.80	6.30
Beam (m)	19	17

Magnitude of infrastructure facilities at Rohini Yard is presented below:

Table 2.2: Magnitude of Project

Sr. No.	Proposed Activity/Facility	Volume
1.	Dredging	146742.41 m^3
2.	Reclamation	499793.3 m^3
3.	Excavation	336290 m^3

Sr. No.	Proposed Facility	Length (m)	Width (m)
1.	Synchrolift with Wet basin	200	45
2.	Slipway	300	85
3.	Warehouse	210	100
4.	Watch tower/Security cabin	20	20

2.3 Water Requirements

- Water requirement for construction phase is given in table below:

Table Error! No text of specified style in document.**.3: Project based water requirement during construction phase**

Sr. No.	Use	Quantity (CMD)
1	Mixing	8
2	Curing	1
3	Drinking	0.5
4	Other uses	1
	Total	**10.5**

The water will be sourced from nearby wells.

- Water requirement during operation phase is given below:

Table Error! No text of specified style in document.**.4: Project based water requirement during operation phase**

Total water requirement	79 CMD
Domestic (fresh)	62 CMD
Flushing (recycled)	17 CMD
Green belt (62549.27 Sq. m)	313 (250 CMD fresh + 63 CMD Recycled)
Sewage Generation (Total)	63 CMD
Proposed STP capacity (total)	70 CMD

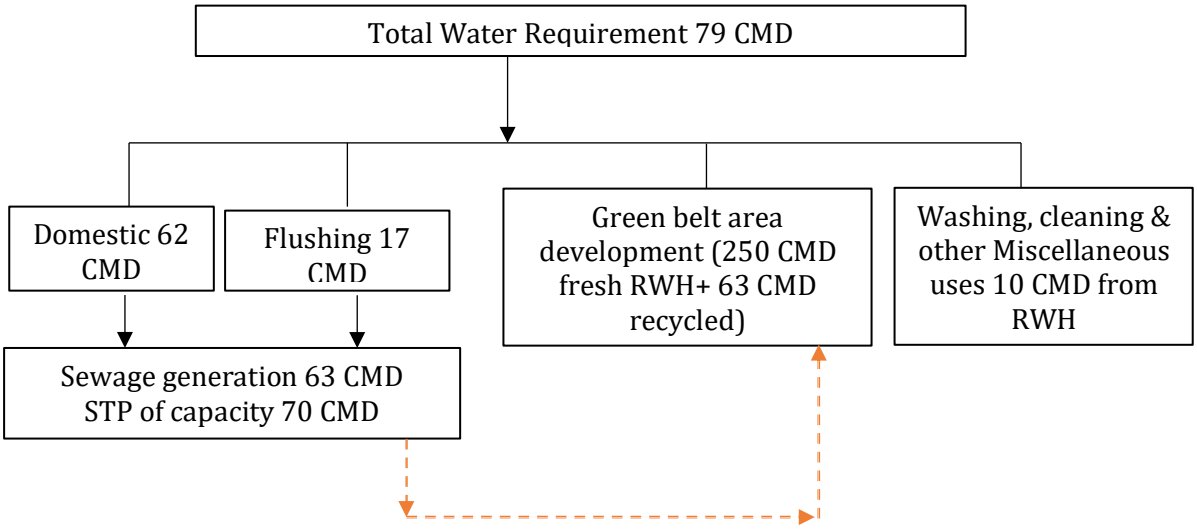


Figure Error! No text of specified style in document.**.3: Water Balance Chart during operation phase**

Table 2.5: Rainwater Harvesting (RWH) Calculations

RWH	**Length**	**Width**	**Area (m2)**
Roof area of Workshop	210	100	21000
Roof area of warehouse	165	80	13200
Total rooftop area			34200
Annual average rainfall intensity (mm) of Raigad			3029
Rainfall coefficient			0.8
Rainfall harvesting (CMD)			82873.44

The rainwater will be stored at project site in tank with 1500000 Liter capacity, which will be used by person working during operation of shipyard.

After construction of shipyard the total 63 CMD sewage will be generated, the exiting capacity of STP is 60 CMD, which will be increased by 10 CMD up to 70 CMD to handle sewage of existing unit and after shipyard construction.

2.4 Power Requirement

Power requirements of the proposed project is 10000 kVA per day (1000 kVA Existing and 9000 kVA Expansion). The source of electricity will be MSDCL and DG set of 500 kVA during power failure.

2.5 Work Shift and Manpower

2.5.1 During Construction Phase –

Total 106 no. of persons will be employed for proposed project activity during construction phase. The work execution (Dredging, Reclamation and Excavation) will be influenced by the tidal condition hence work will be carried out in day and night shift. Manpower required for proper execution during construction phase is depicted in below table.

Table 2.6: Project based manpower

Sr. No.	Designation	Numbers
1	Operator	6
2	Supervisor	5
3	Mechanic	5
4	Electrician	5
5	Mazdoor	80
6	Driver	5
	Total	**106**

2.5.2 During Operation Phase -

The Manpower of existing fabrication yard is 70. Employment for 700 people will be generate during operation phase after expansion. Local people from nearby villages will be hired to work in operation phase. Operation phase will have general shift.

2.6 Solid & Hazardous Waste Generation and Disposal

2.6.1 Construction Phase -

Construction activity includes Dredging, Reclamation, and Excavation. Details of Solid and hazardous waste generated during construction phase is mentioned below.

- Solid Waste

Quantity of cement bag: 235890 numbers (Reuse)

Excavation from reclaimed area: 336290 m^3 (Utilized within site)

Quantity of dredged material from clearing of approach channel and turning Circle: 146742.41 m^3 (Utilized for Reclamation within site)

- Hazardous Waste

Metal surface treatment spent abrasive: 1 kg /day (TSDF)

The designated place (150 m^2) will be created for solid and hazardous waste material storage within site with impervious flooring. Where waste will be store, segregated, and disposed according to the hazardous and other waste rules (Management and transboundary movement) Rules, 2016 (amended).

2.6.2 Operational Phase -

Proposed activity includes Ship building and Ship repair process. Details of Solid and hazardous waste generated during operation phase is mentioned below.

- Solid Waste

Iron scrap: 5 MT /annum (scrap dealers)

Reinforced fibre panels: 10 Kg. /Annum (reuse in project site)

- Hazardous Waste

Waste Oil: 100 L/month (Recycler)

Paint residue: 5 kg/day (TSDF)

Blige wastewater from ships under repair. (Blige water treated in oil separator and mixed with the wastewater stream for further treatment at STP and oil sewage is sent to TSDF site).

3. Description of the Environment

3.1 Land use Land Cover

Study area of 10 km area around site is taken as to establish baseline environment. Study area consists of the total area 313.15 Km^2, major portion of Land cover is water bodies (Rajpuri, Mandad and Mhasla creeks, dams etc.) having 104.82 Km^2, area under the class Barren/ Unculturable wasteland/ Scrub land is about 53.76 Km^2, area under the open /dense scrub is about 44.14 Km^2, area of forest is 36.89 Km^2, land under plantation is about 31.38 km^2, agriculture crop land is about 20.84 Km^2, Mangrove land is about 13.21 Km^2, built up land is 4.31Km^2, agriculture follow land is 2.88 km^2, and aqua pond is 1.92 Km^2.

3.2 Soil

Soil quality reflects how well a soil performs the functions of maintaining biodiversity and productivity, partitioning water and solute flow, filtering and buffering, nutrient cycling, and providing support for plants and other structures. Soil management has a major impact on soil quality. Representative soil samples were collected from Ambolikhar, Rajpuri, Agardanda, Tokeghar, Navalvali, Dighi, Adgaon, Kudaki, and Location between Kalsuri and Waral to assess the quality of soil. For studying the soil types and the soil characteristics, different sampling locations were selected to assess the existing soil condition representing various land use condition and geological features. Soil within study area is neutral, has less organic carbon, phosphorus content is medium to sufficient, potassium is very less, soil is moderate fertility.

3.3 Air Quality

The prime objective of AAQ study is to establish existing quality of air within study area. Air samples from representative locations were collected from Dighi, Sarve, Adgaon, Rohini, Agardanda, Rajpuri, Ambolikhar, Tokekhar and Gondkhar villages. There are no major air polluting industries/ activities in study area. Miscellaneous sources were identified as burning of minor fuels and dust from movement of traffic along rural roads. Concentration of PM_{10}, $PM_{2.5}$ and gaseous pollutants (SO_2, NO_x & CO) are below the CPCB norms. Thus, it can be concluded that ambient air quality is not polluted.

3.4 Noise

Sources of noise in study area include miscellaneous noises from nearby villages, boat movement in Rajpuri Creek, Vehicle movement on road. Noise levels were monitored at 10 locations viz Ambolikhar, Agardanda, Tokekhar, Rajpuri, Rovala, Adgaon, Rohini, Nanivali, Kudki and Dighi villages to know existing noise levels. Noise levels at Rohini and Nanivali were found to be within limit specified under schedule II of EP Act 1986, Noise levels at Kudki were found within limit during daytime while exceed in night-time. Noise

levels at Ambolikhar, Agardanda, Tokekhar, Rajpuri, Rovala, Adgaon and Dighi were found exceeding during day as in night-time.

3.5 Water Quality

Sources of water supply in the study area are dams/ impoundments supplying water in nearby localized area. Other sources of water are pipeline/ ground/ bore well water as water supply source. There are no major water pollution industries in the study area. Water pollution activity in the study area is sewage discharge from nearby villages located along Rajpuri, Mhasala and Mandad creek.

3.5.1 Ground water-

Ground water samples collected from Dighi (Borewell), Agardanda (well), Nandale (well), Rajpuri (well), Nanivali (well), Kudgaon (well), Rohini and Kalsuri (Borewell). Ground water quality is exceeded desirable limit of turbidity (1 NTU) and under permissible limit (5 NTU), TDS of water exceeds desirable limit (100 mg/l) at Agardanda and Rajpuri only. Free residual chlorine exceeds its desirable limit (0.2 mg/l) at all stations and under permissible limit (1.0 mg/l). Iron exceeds desirable limit (1.0 mg/l) at Nandale and Rohini. The presence of Coliforms and E. Coli also recorded at all locations.

3.5.2 Surface water-

Surface water samples were collected from Kudaki (Dam water), Ambolikhar (Dam water), Nandale (Dam water) and Shighre (River water). Based on analysis (as compared to Designated Best Use Water Quality Criteria by CPCB), surface water analysis mainly falls under 'Class C' (Drinking water source with conventional treatment followed by disinfection) and 'Class E' (Irrigation, industrial cooling, or controlled waste disposal).

3.6 Biological Environment

District Raigad is one of the costal districts of Konkan region of Maharashtra, spread over an area of 7152 km^2. It shows variation in topography from high altitudinal Sahyadri hill ranges to coastal plains. The soils of the district are formed from the predominating rock formation i.e., Deccan Trap. According to the topographical situation and location, soils in Raigad district are grouped as Forest, Varkas, Rice, Khar or Salt, Coastal Alluvial and Laterite soils. District receives average 3029 mm annual rainfall mostly contributed by south-westerly monsoon. These climatic and edaphic conditions support different types of forests. As per Champion and Seth's classification, following forest types are generally found in the district.

Moist Mixed Deciduous Forests: These are found on the hill slopes and valleys, dominant species in this type are *Pterocarpus marsupium* (Bija), *Salmalia malabaricum* (Semal), *Terminalaia bellarica* (Behada), *Dalbergia latifolia* (Shishum), *Syzigium cumini* (Jambul), *Terminalia tomentosa* (Ain), *Lagerstremia parviflora* (Bondara) etc.

Southern Tropical Semi-Evergreen Forests: Forests of this type occur mostly on upper hill slope from 450 meters to 1050 meters above the MSL. In Western Ghats dominant species are *Terminalia paniculata* (Kinjal), *Memocylon umbellatum* (Anjani), *Terminalia chebula* (Hirda), *Syzigium cumini* (Jambul), *Olea diocea* (Parjamun), *Mangifera indica* (Mango), *Actinodaphne hookeri* (Pisa), etc.

Littoral and Swamp Forests: These are found along the creeks and estuaries. Vegetation here is adapted for saline environment. Although comparatively area under cover is

marginal, these forests are important for protection of seacoast and marine life. Prominent species are *Avicennia* sp., *Rhizophora mucronata* and *Sonneratia sp.* Some associated species are also found.

Total 16 locations (4 locations for each habitat) were visited for phyto-sociological study within study area. Study area has undulating terrain as commonly seen in Konkan region. Besides dense vegetation on hills /Reserved Forest, study area possesses habitats like Hilly terrains, water bodies, agricultural fields, and human settlements. These habitats have different characteristic which supports typical composition of flora and fauna within them.

Within study area there are 3 villages of Roha Taluka namely Kandane Khurd, Khajanwadi and Bhalgaon are listed as Eco-Sensitive Areas (ESA) vide Order under section 5 of EP Act 1986 dated 13th November 2013, series of draft Notifications dated 10th March 2014, 4th September 2015, 27th February 2017, 03rd October 2018 and 6th July 2022 issued by Ministry of Environment, Forest & Climate Change (MoEF&CC) (Western Ghats Notification).

3.7 Marine Environment

Rajpuri Creek mouth has Murud, a small historical town on north & village Dighi in south, a private port viz. Dighi Port is under development. About 25 Km long creek is bordered by hills with about 3.2 Km wide opening to the sea. Part of Dighi Port (all-weather) is situated at the foot of hillocks on the southern and northern shore of the creek. The Rajpuri Creek also extends south-eastward joining the Mhasala creek - about 15 Km long shallow and narrow water body strewn with mud flats. Rajpuri Creek which is 7 to 8 m deep and rocky at the mouth becomes substantially shallower in the upstream. Dighi is the important centre for fish landing, passenger traffic and for tourists. Aquaculture is also prominent along the bay shores in the upstream.

Samples collected from 9 Subtidal and 8 Intertidal locations to analyzed marine water and marine sediment quality of study area. The physico-chem values doesn't show any specific trend, other than optimum salinity. Dissolved Oxygen & Biological Oxygen Demand supports balanced aquatic life, which is evident from biotic components studies ahead. Comparatively nutrients are low except for Nitrate values, while overall water quality results indicate water quality isn't under stress or degraded.

The texture in estuary was majorly muddy, often in-combination with silt & at intertidal area it was sandy & coarse gravels in open shores & muddy-silty with gravels in creek banks. Rest all parameters seemed of similar trend when looked over historic data of the region. The sediment supports good biomass of biotic components with average diversity.

3.8 Socio Economic Environment

The socio-economic data was collected & generated through both sources i.e., primarily by field survey in sampling locations & it has been substantiated with relevant socio-economic data from secondary sources i.e., concerned office's documented records. The latest available primary & secondary data have been complied & amalgamated to delineate the existing baseline scenario of socio-economic environment in study area.

The Socio-economic study spans a radius of 10 km around the proposed project site, which covers major parts of Shrivardhan, Murud & Mhasla, talukas and minor part of Roha taluka of Raigad District.

There are 62 villages & 2 towns namely Murud Janjira (MCL) & Borli-Panchtan town are falling under the study area. Among them 37% area covered under Shrivardhan taluka, 30% covered under Murud taluka & 17% covered under Mhasla Taluka, 11% covered under Tala taluka & 5% comes under Roha taluka.

4. Anticipated Environmental Impacts & Mitigation Measures

The proposed project is expansion of existing facility at Rohini, Taluka Mhasala, District Raigad will have various impacts on environmental parameters like marine sediment, marine water quality, air quality of surrounding area due to various operations.

Table 4.1: Environmental Impacts and Mitigation Measures

Environment	Cause	Impact	Mitigation measure
Land	Improper disposal of solid waste and hazardous waste produced during construction.	Unhygienic conditions and hazards to nearby populace and marine life	Construction team will be trained for collection of solid/ hazardous waste, safe storage, and recycling/reuse of these wastes
Air	Operation of concrete mixer, D.G. set, use of excavators, trucks	Localized temporary air emissions	Wherever possible, ready-mix concrete will be used instead of concrete mixers. In addition, construction machineries will have a valid PUC certificate, and will be well maintained, lubricated, and cleaned periodically
Noise	Transportation and actual construction activities	Temporary increase in noise levels	Adequate PPE (earmuffs/ ear plugs) will be provided for construction workers and their duty hours will be scheduled such that recipients will not be exposed to noise for continuous durations
Marine Water (Rajpuri Creek)	Dredging and Excavation activity.	Temporary increase in turbidity and suspended matter in creek	The entire construction activity will be carried out in non-monsoon season during low tide period.
Marine Sediment (Rajpuri Creek)	Dredging activity and Reclamation.	Benthic organisms will be permanently lost. Benthic loss was calculated to be 2051 kg	
Biological (Rajpuri Creek)	Dredging and Excavation activity.	Increase turbidity in water column which results in less penetration of light	

		and a decrease in primary productivity which overall hampers the marine ecosystem	
Mangrove	Construction activity.	Sediment can aggregate on pneumatophores of mangroves present near project site.	Slit curtain will place during construction.

5. Environmental Monitoring Program

For tracking of the effectiveness of mitigation measures, regular monitoring of necessary environmental parameters is required. An environment monitoring program is prepared with due consideration of the baseline status of the site, various components of project & environmental attributes likely to be affected.

Major objectives of the Environmental Monitoring Program are mentioned below:

To comply with the statutory requirements of monitoring conditions of Environmental Clearance, CRZ Clearance, Consent to operate and provisions under Environmental Protection Act, 1986.

Assessment of the changes in environmental conditions, if any, during the project operation/ activities.

Monitoring & tracking effectiveness of Environment Management Plan & implementation of mitigation measures planned.

Identification of any significant adverse transformation in environmental condition to plan additional mitigation measures, if & as required.

DOL will implement the environment monitoring programs in line with the planned schedule will ensure that the necessary requisite facilities are made available and budgetary provision is made as & when required to ensure regular efficient environmental monitoring activities.

5.1 Budgetary Provisions for EMP

Project cost of proposed activities is estimated as Rs. 108 Crores. Environment Cell of DOL Has made budgetary provision which includes budget for environmental management. The same is presented below:

Table 5.1: Budgetary Provisions for EMP

Environmental Controlling Measure	Capital Investment (Rs. In Lakhs)	O & M Cost/Annum (Rs. In Lakhs)
Air Pollution Control	15	5

Environmental Controlling Measure	**Capital Investment (Rs. In Lakhs)**	**O & M Cost/Annum (Rs. In Lakhs)**
Noise Pollution Control	20	2
Environmental Monitoring	30	4.5
Green Belt Development	41	9
Green Initiative (Installation & Maintenance of Solar Power System (200kW))	25	10
Rainwater Harvesting	29	4.5
Occupational Health &Safety (Establishment of OHC, PPE, Safety awareness & Training)	40	5
Total	**200**	**40**

6. Additional Studies

Proposed project does attract EIA notification and obtained environmental Clearance earlier from SEIAA. Public hearing will be conducted as per terms of reference issued through Maharashtra Pollution Control Board.

Additional studies include Disaster management plan, Risk assessment and Preparedness to respond heath emergency.

6.1 Disaster Management Plan

Emergencies can occur due to natural causes like earthquake, cyclone, flood etc. or manmade due to malfunction of standards of working systems or practices, and accidental hazards, fire, and shocks.

Improved communications and better data collection more disasters can be known well in advance before occurring. Impact of disaster can be reduced through attempts at preparedness, mitigation, and post event rehabilitation work. Based on hazard identification in the proposed shipyard, an onsite emergency plan has been prepared to manage damage to shipyard, property, and employees in general.

DOL has their own response plan, arrangements required for emergency response on site during execution of project work to handle emergency, minimise the potential escalation of an incident, provide suitable information to personnel as appropriate and provide suitable safe means of access, means of escape and evacuation.

The main objective of hazard assessment is to discern hazard prone locations and suggest appropriate measures as follows:

- To identify the location which will be source of Hazards and determine the likely effects away from source
- To mitigate the degree of damage in and around the shipyard yard premises
- To ensure that all the ships are at safer place

- To ensure that all the workers and staff of affected areas are evacuated to appropriate assembly points
- To provide adequate medical facility at earliest
- To ensure the prompt safe rehabilitation of affected areas

6.2 Risk Assessment

It is careful examination of consequences resulting from the undesired events that could cause harm to people and property, so that sufficient precautions can be taken.

Objectives of Risk Assessment

- To identify and assess fire and electric shock hazard arising due to various activities in existing fabrication and proposed shipyard.
- To eliminate or reduce the risk to human health, injury, damage to shipyard, equipment, and working environment, business interruption or loss etc.

6.3 Preparedness to response Health Emergency

- The victims will be hospitalized as early as possible
- First aid services at workplace must provide for injury caused to affected person before proper medical care is available
- Compulsory First Aid Training will be given to prevent fatalities, illness, and injuries at work site.
- There will be interaction with local emergency medical services (EMS) system
- Maintaining current list of emergency numbers (Indian Navy, Coast Guard, Police, Fire brigade, ambulance, Hospitals etc.)

6.4 Key Personnel Role and Responsibility

6.4.1 The Project Manager

The project manager at site will directs all response team to be ready and render help to combat any kind of hazard and disaster occurred at site. He/ She shall be communicated with chairman and project head of site during emergency. If the situation is out of control of DOL emergency response team present at site, then it shall coordinate with crisis management team which include Coast guard, Police, Fire Brigade, Ambulance, etc.

6.4.2 Plant and Equipment Manager

Plant and Equipment Manager will maintain log of events, take all the necessary precautions to avoid damage occurred at project site. Provide all technical aids to combat

emergency by providing equipment to handle the emergency including access and egress of personnel.

6.4.3 Safety Manager

Coordinate with site in charge during evacuation of personnel, checking of area, roll call in event of missing person. Liaise with project manager and give regular update on emergency and maintain log of events. Coordinate with medical team, help in evacuation of personnel from site under direction of medic team. Identify deficiency observed during emergency and reflects this in emergency report and suggest improvements.

6.4.4 Doctor and Medic Team

This team will respond immediately to medical emergencies and provide stabilization and support to injured personnel. Participate for rescue of injured personnel and inform site manager to arrange ambulance to transport injured person to hospital. Regular liaising and support to site in charge to combat with emergency.

6.4.5 Administration and Human Resource

They will response immediately to emergency and report to local authorities like police, ambulance, fire brigade etc. They ensure medical treatment, communication and conveyance facilities for injured person and sending information to their kith and kin in the event of illness and injury.

6.4.6 All personnel and subcontractor

They will stop working during time of emergency situations and sound the alarm system present at site to intimate emergency has occurred. They will all aggregate at assembly site and leave the project site.

7. Project Benefits

7.1 Construction of Shipyard

Location of proposed shipyard (ship building and repairing) falls close to main maritime route in the Arabian Sea. The location offers sheltered, navigable approach and suitable surrounding infrastructure which creates possibility of reducing operational cost of shipyard resultantly, ship building and ship repairing can be done more competitively.

7.2 Employment Potential

The proposed peak manpower requirement during construction will be 106 persons and 700 persons during operation (ship building and ship repairing) at Rohini Yard.

Most of the recruitments will be done from local area which will be the considerable benefit to locals considering demography of the region. Further, the indirect employment, local economic activities will also add in the employment potential of the proposed project. Thus, the potential of employment will be greatly beneficial to the local people.

7.3 Social Commitment

DOL has following schemes under consideration of social welfare commitment:

- The project will generate direct and indirect job opportunities in order of 700-1800 persons. It is proposed to open a school from 1st to 10th standards for surrounding population. A college devoted for civil, mechanical, and electrical engineering alone will be established in which special emphasis will be on subjects like piping, fabrication, welding etc. Facilities for specialization in ship building, ship repairs, naval architecture etc. may be developed. Surrounding villages will be provided with medical facilities viz. ambulance and annual health check-up camp for 2 days.
- A community hall will be constructed for surrounding villages.
- Rainwater is stored in dedicated tank of 15 Lakh litres. This water will be supplied for irrigation in surrounding agriculture fields free of cost.

7.4 Other Tangible & Intangible Benefits

Revenue of state will increase from operations of shipyard.

8. Environmental Cost Benefit Analysis

All the required Environmental protection measures will be implemented appropriately to ensure compliance with the norms.

The project will create facility to build new and make existing vessels fit to continue to provide water transport services. This will partially help to contribute more or maintain existing market share of 90% of country's goods transportation which reduces traffic footprint on road, helping to reduce overall emissions.

Mariners in tern get the ship repair facility close to maritime route which saves time and fuel to reach to other such facilities in middle east, saving emissions in sea.

As per the survey, shipyards are in high demand as they are in very few numbers as compared to number of ships plying in sea. Indian market provides labour and material in much competitive rates so, ship building/ repairing estimated to be on lower side as compared with global scenario. This situation increases opportunities to get the orders from other countries which will help to increase foreign currency to our nation.

Additionally, this project will result in overall development in the surrounding, provide employment and self-employment opportunities, develop indigenous skilled workforce which contributes to societal upliftment.

The overall project cost is estimated at Rs 108 crore.

The DOL has made a budgetary allocation for environmental protection measures at a capital cost of Rs. 200 lakhs and an annual budget of Rs. 40 Lakhs.

□□□□□□□□