

# **DEPARTMENT OF FISHERIES**

**Deputy Director of Fisheries**

**Fisheries Information Centre**

**Fisheries Harbour, South Wharf, Bunder, Mangaluru – 575001**

## **Executive Summary**

For

**Proposed Fishing Harbour Project**

Located at

**Vill: Kulai, Tal: Mangaluru, Dist: Dakshina Kannada**

Prepared By:

**Eco Chem Sales & Services**

A-wing, Ashoka Pavilion, Office Floor,

Opp, Kapadia Health Club, New Civil Road, Surat – 395 001

# Executive Summary

## 1.1 GENERAL

Fishing is the major primary occupation for people living in coastal areas. Karnataka state has 300 km length of coastline with three coastal districts of Dakshina Kannada, Udupi and Uttara Kannada. The Exclusive Economic Zone of Karnataka coast is estimated at 87,000 km<sup>2</sup> with a continental shelf area of 27,000 km<sup>2</sup>. The total fishermen population in the three coastal districts have been estimated as 2,33,624 of which 96,853 persons are actively engaged in fishing and fishery related activities. The marine fish production of Karnataka state during the year 2011-12 has been estimated at 3,40,570 tonne valued at Rs. 1,335.64 Crores. Also, there has been an increase in the exports of Indian fish products. Mangalore is the only fishing harbor in Dakshina Kannada district which produces about 90% of the district marine fish production and wherein majority of the mechanized fishing boats of the district operate.

## 1.2 PURPOSED AND JUSTIFICATION OF THE PROJECT

New Mangalore Port Trust (NMPT) is a major commercial port located at Panambur near Mangalore. Due to the construction of NMPT, the displaced Mechanised Fishing Vessels (MFVs) belonging to Kulai and nearby villages were required to operate from Mangalore fishing harbour which is at around distance of 10 km south of the NMPT. Hence, the main objective of developing fishing harbor at the proposed location i.e. near Govt. Ice Factory at Kulai village, Dakshina Kannada district of Karnataka state is to provide a nearby harbour to help the fishermen, who were required to travel upto Mangalore fishing harbour as a result of construction of NMPT.

## 1.3 JUSTIFICATION OF THE PROJECT SITE

- Back up land area is available.
- Infrastructure facilities like ice plant, freezing plant etc. available in the close vicinity of the site.
- Ideal location from the point of view of nearness to residing fishermen community.
- Availability of wide range of fish species at the northern breakwaters.
- Nearness to NMPT and Mangalore port for supply of export products as well as business related opportunities.
- Site is very well connected by road which shall help in transportation of raw materials and finished products.

- The site has been acquired as non-agricultural land. Hence, conversion approval for non-agricultural purpose is not required.
- All infrastructure facilities are easily available.
- Local Manpower is available for construction as well as operation phase.

## 1.4 DETAILS OF PRODUCT AND PROJECT LOCATION

The proposed fishing harbor shall be located near Govt. Ice Factory, Kulai village, Dakshina Kannada district of Karnataka state. The latitude and longitude of the proposed project site is 12°58'00.78"N and 74°47'52.93"E respectively.

**Table No. 1.1 – Details of Products**

Sr. No.	Product Name	Quantity (MTPA)
1.	Fish Handling	27,100

## 1.5 SALIENT FEATURES OF THE PROJECT SITE

**Table No. 1.2 – Salient Features of the Project site**

Sr. No.	Particulars	Name	Aerial distance from the Project Site
1.	Nearest village	Kulai	@ 1.60 km in E direction.
2.	Nearest city	Mangalore	@ 8.5 km in SE direction.
3.	Nearest Lake	Baggundi	@ 1.65 km in SE direction.
4.	Nearest River	Gurupura	@ 4.75 km in SE direction.
5.	Nearest State Highway	S. H. No. 101	@ 2.60 km in NE direction.
6.	Nearest National Highway	N. H. No. 17	@ 0.80 km in E direction.
7.	Nearest Railway station	Panambur Marshalling Yard	@ 2.50 km in SSE direction.
		Surathkal	@ 2.60 km in NNE direction.
8.	Nearest Airport	Mangalore	@ 8.30 km in SE direction.
9.	Nearest Port	New Mangalore Port Trust	@ 4.65 km in SSE direction.
10.	Nearest National park, Reserve Forest, Wildlife Sanctuaries	---	Not present within 10 km radius

## 1.6 RESOURCE REQUIREMENTS

**Table No. 1.3 – Details of Resources**

Sr. No.	RESOURCES	REQUIREMENT/SOURCE
1.	Land	45,000 m <sup>2</sup>
2.	Water	During Construction Phase: 5 KLD for domestic and 2 KLD for construction During Operation Phase: 420 KLD Source of Water: Sea water and Fresh water from Mangalore city water supply.
3.	Power	300 KVA from Mangalore Electricity Supply company
4.	Back up power (in case of emergency or power failure)	D. G. Set 150 KVA
5.	Fuel	HSD – 300 Lit/Day
6.	Manpower	500 Nos.
7.	Raw Material	Ice – 200 TPD

## 1.7 BASELINE ENVIRONMENTAL STATUS

The study was conducted for the period October 2014 to May 2015.

**Table No. 1.4 – Frequency of Environmental Monitoring**

Attributes	Sampling		
	Locations	Parameters	Frequency
<b>A. Air Environment</b>			
Meteorological	Nr. Project Site	Temperature, Relative Humidity, Precipitation Wind direction, Wind Speed	Hourly data from October 2014 to May 2015
Ambient Air Quality	06 locations in the study area of 10 km radius from the project site.	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> , CO, HC	24 hourly, twice a week during study period
<b>B. Noise</b>	06 locations in the study area of 10 km radius from the project site.	Noise Levels in dB(A)	Once in Study Period
<b>C. Water</b>			
Ground Water	Grab samples of 06 Locations within 10 km radius from the project site.	Physical, Chemical, Microbiological and Heavy Metal	Twice in a Month during Study Period
Surface Water	Grab samples of 03 Locations within 10 km radius study region as well	Physical, Chemical, Microbiological and Heavy Metal	Once in a Month during Study Period

Attributes	Sampling		
	Locations	Parameters	Frequency
	as Marine Water Samples		
<b>D. Soil Quality</b>	06 locations in the study area of 10 km radius from the project site.	Physical, Chemical Characteristics, Soil Texture	Once in a Month during Study Period
<b>E. Ecological Data</b>	Within 10 km radius of study area	Existing Flora & Fauna	Once in Study Period
<b>F. Socio economic Data</b>	Within 10 km radius of study area	Socio-economic characteristics of the affected area	Once in Study Period

**Table No. 1.5 – Baseline Environmental Status**

1.	Ambient Air Quality	<ul style="list-style-type: none"> <li>• During the study PM<sub>2.5</sub> was observed between 22.0 – 42.0 µg/m<sup>3</sup>. Maximum concentration of PM<sub>2.5</sub> was found near Project Site. 98 percentile values for PM<sub>2.5</sub> for all locations are well within the CPCB norms.</li> <li>• PM<sub>10</sub> was observed in the range of 32.0 – 78.7 µg/m<sup>3</sup>. Results found during the study period for PM<sub>10</sub> were well within the limit given by Ministry of Environment, Forests and Climate Change.</li> <li>• SO<sub>2</sub> concentration was observed in the range of 8.2 to 23.5 µg/m<sup>3</sup>, which is well within the standard limit.</li> <li>• NO<sub>x</sub> concentration in Ambient Air quality was between 12.8-28.5 µg/m<sup>3</sup>, which is well within the standard limit.</li> <li>• Monitoring and analysis was also carried out for CO and HC. Maximum concentration of CO was found 580 µg/m<sup>3</sup> and maximum concentration of HC was found 90 µg/m<sup>3</sup>.</li> <li>• On the basis of test results found during the survey it can be concluded that the ambient air quality of the study region is quite good as all the results are well within the limit.</li> </ul>
2.	Meteorology	<ul style="list-style-type: none"> <li>• Temperature: min. 13.1<sup>0</sup>C in the month of December, 2014 and max. 33.9<sup>0</sup>C in the month of May, 2015.</li> <li>• Humidity: 32.0 % to 71.0 %.</li> <li>• The wind speed was in the range of 0 to 7.7 m/s during study period.</li> </ul>
3.	Noise level	<ul style="list-style-type: none"> <li>• Day time: 50.3 to 55.1 dB(A)</li> <li>• Night time: 41.8 to 46.3 dB(A)</li> </ul>
4.	Ground Water	<ul style="list-style-type: none"> <li>• pH range was observed between 7.00 – 7.37. It is well within the specified limit.</li> <li>• Average Total dissolved solids were recorded in the range of 153 - 204 mg/L. Total Dissolved solids concentration was found within the desirable limit for all the locations.</li> <li>• Average Total Hardness was in the range of 78 - 112 mg/L with minimum at Mangalore city &amp; maximum at Baikampady. Hardness results were found within the desirable limit for all the locations.</li> <li>• Results of Alkalinity, Calcium and Magnesium were also found within the desirable limit.</li> <li>• All the heavy metals were found well within the range of prescribed standards. Any of toxic metals were not found in any village during analysis.</li> </ul>

		<p>Fluoride concentration was found at higher side which was ranging between 0.5-12.1. High concentration of fluoride was observed in the water samples of Panambur and Project Site.</p> <ul style="list-style-type: none"> <li>• As microbiological parameters MPN analysis was also carried out and it was found NIL.</li> <li>• On the basis of test results it is summarized that water quality for studied locations is as per IS: 10500 – 2012 except Panambur and Project Site. Water containing the high concentration can be used in drinking purpose. Water quality for the rest of the locations was found quite goods and it can be used for drinking purpose as well as for domestic purposes.</li> </ul>
5.	Surface Water	<ul style="list-style-type: none"> <li>• During the analysis pH of the samples was found ranging from 7.21 to 7.96.</li> <li>• TDS analysis was also carried out for surface water sample of the various locations. Minimum TDS was found 190 mg/L in the sample of Gurukrupa River &amp; maximum TDS was found 540 mg/L for the sample of Baggundi Lake.</li> <li>• Turbidity was found between 0.2 to 13.5 NTU with minimum for Gurukrupa river and maximum for Baggundi lake.</li> <li>• DO measured during analysis was ranging between 3.8 to 6.5 mg/L. DO level was found more than 4.0 mg/L for the samples of Gurukrupa River, it means condition of the river is favourable to aquatic lives . D.O level in Baggundi lake was found &lt;4.0 mg/L which indicates towards the organic pollution in the lake.</li> <li>• It was found that Total Hardness in the samples of Gurukrupa river was minimum i.e. 106 mg/L &amp; it was maximum i.e. 226 mg/L in the samples of Baggundi Lake.</li> <li>• Test results comparison study with Inland Surface Water Classification (CPCB Standards) reveals that water cannot be used directly for drinking purpose as MPN test is positive for almost all the locations. Surface water for these locations can be used for various domestic purposes but it cannot be used for drinking purpose. Before taking it for drinking purpose it should be passed through various stages of conventional treatment. Water from Baggundi River is not potable.</li> </ul>
6.	Marine Water	<ul style="list-style-type: none"> <li>• Temperature is an important parameter, which affects the living organisms. The temperature of the water was less than ambient temperature.</li> <li>• The pH variation was observed in a narrow range of 7.92 to 8.15. pH range is maintained due to buffering action of <math>\text{CO}_2</math>, <math>\text{CO}_3^{2-}</math> and <math>\text{HCO}_3^{-2}</math>.</li> <li>• Salinity was observed in the range of 34,000 to 36,400 mg/L which is near to the expected value.</li> <li>• DO is an essential parameter which affects the biotic component of the water. DO levels affect the aerobic bacterial population as well as chlorophyllous Phytoplankton. During study period maximum DO level was recorded up to 5.6 mg/L which is as per expected value.</li> <li>• BOD is also an important parameter to define the environmental scenario of marine ecosystem as it affects the DO level. BOD was found to be ranging from 2 to 5 mg/L.</li> <li>• Chromium was found below the detection limit in most of samples. Iron was found in the range of 0.15 to 0.30 mg/L. Copper was found in the range of 0.05 to 0.08 mg/L and Boron was found in the range of 0.12 to 0.20 mg/L.</li> <li>• Microbiological and biological analysis shows presence of Fecal Coliform, E.coli and Streptococci and abundance of phytoplankton, zooplankton and</li> </ul>

		benthos in the marine water.
7.	Soil	<ul style="list-style-type: none"> <li>• Results of pH were varying in narrow range for one location to other location from 6.80 to 7.60 during the study period .Overall the pH of all the soil samples were found almost neutral.</li> <li>• Loss on ignition test was also carried out to know the probability of Organic matter in the soil samples. Concentration of organic matter was found in the range of 0.13 to 0.37 %. Minimum value was observed in the samples of Mangalore.</li> <li>• During analysis average concentration of total Nitrogen was found in the range of 10-12 mg/100g. Minimum value was observed in the soil sample of Surathkal and Mangalore.</li> <li>• Average Total Phosphorous content was found in the range of 5.8 to 8.3 mg/100 g. Minimum value was observed in the soil sample of Mangalore.</li> <li>• Average Calcium content ranged from 6.5 to 9.2 meq/100 g and magnesium content ranged from 3.4 to 5.5 meq/100 g.</li> <li>• Texture class analysis was also carried out for the soil samples collected from different locations. Mainly the soil texture is sandy loam for all locations.</li> </ul>

## 1.8 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Anticipated Environmental Impacts	Mitigation Measures
<b>Air Environment</b>	
Potential source of the pollution will fugitive emission from the equipments and gaseous emission from Transport vehicles. Temporary Impacts on air quality of area due to emission from DG set operated as standby power source.	Proper facilities / infrastructure (like enclosed/closed conveyor, DG set with stack of adequate height & diameter etc.) shall be provided.
	Greenbelt area shall be developed in and around the proposed site to minimize the generation of fugitive dust.
<b>Noise Environment</b>	
Operation of DG set for emergency power supply will also increase the noise level.	Periodic monitoring of sound level at suggested places shall be carried out, Machines with low sound pitch shall be used and vehicles with noise level shall not be operated at night
	Transport vehicles shall be set in operation only at day time & shall be equipped with low noise engine & silencers
<b>Water Environment</b>	
Movement & cleaning of the ships in the marine area will cause spillage of the fuels or other such materials in the marine resources which may contaminate marine water.	Regular monitoring of water quality will be carried out at the site and in nearby surface bodies to keep track of adverse environmental changes
	The waste generated from the ships will also be treated & disposed off as per MARPOL convention
Runoff of untreated sewage & effluent & other operational activity may also pose significant adverse impacts on the surface water quality	Wastewater generated will be treated in adequate size Effluent Treatment Plant (300 KLD-Constructed outside the CRZ boundary) & the

<b>Anticipated Environmental Impacts</b>	<b>Mitigation Measures</b>
	treated wastewater will be reused for gardening purpose, washing and flashing.
	Adequate design and procedural mechanisms have been proposed to ensure that the terrestrial groundwater or surface water bodies are not impacted by the harbour operations.
<b>Land Environment</b>	
Land pollution may take place during the operation phase due to accidental spillage of the fuel on land.	Operational area of concern for soil contamination by spillage/leakage of materials or fuel shall be lined to prevent entering of contaminating materials in the soil under the area.
	The used oil & discarded drums / empty containers shall be sold to the approved recycler/scrap dealers. ETP Sludge shall be used as manure
Land pollution may take place during the operation phase due to Hazardous waste	Dumping of solid wastes on land shall be strictly prohibited. The entire Hazardous waste generated shall be disposed adhering to the Hazardous Waste Management Rules 1989 & 2003.
	A designated solid/hazardous storage area designed as per guidelines of CPCB shall be provided with proper floor lining.
<b>Marine Environment</b>	
During the operation phase adverse impact on marine ecology will be due to runoff of untreated domestic wastewater, water from washing & sprinkling etc. The jetty operations would also produce solid waste such as garbage; debris etc which if not properly disposed might influence the near shore areas. This includes waste and wastewater discharges, accidents and spillage containing oil, etc.	Disposal of sewage shall not be made in to the nearby/adjacent marine or other ecological habitat to prevent impacts on the ecological structure & marine habitat.
	Any kind of solid wastes shall not be dumped in to the marine environment as well as on land of premises /surrounding area.
	Regular monitoring of the local area shall be done to inspect any residual impacts.
<b>Ecology</b>	
Damage to the ecology of the muddy terrain as well as the aquatic resources due to Turbidity in the water resources and disturbance of the muddy terrain (mainly by ship movement)	Any activities causing impact on marine environment especially navigation channel area & surrounding coastal area shall be prohibited to ensure that the operation of the proposed project does not affects the marine & ecological environment of the area.
<b>Socio-Economic Environment</b>	
Proponent shall give priority to appointment of local people to maximum extent during the employment process for proposed project.	Emergency response plan and DMP shall also be placed to take care of adverse impact in case of any incident of accident. Such plans shall also be helpful to the local villagers/area during the incidence of Natural Disaster
	Safety training shall be provided to all the workers.



Anticipated Environmental Impacts	Mitigation Measures
	The industry shall carry out welfare activities and provide basic amenities to employees and surrounding villagers.

## 1.9 ADDITIONAL STUDIES

### 1.9.1 Risk Assessment

A detailed Risk Assessment (RA) study was carried out for the proposed project. The following processes/units have been covered for the RA study of the proposed project:

- Harboru operation
- D. G. Set
- Material handling/transportation/storage
- Personnel safety measures
- Noise environment

### 1.9.2 Disaster Management System

The project proponent will be developed an emergency management system to tackle the emergency situation. The roles of the following personnel are described to tackle any such emergency situations;

- Site Main Controllers
- Incident Controllers and Deputy Incident Controllers
- Key Personnel
- Essential Workers

The other important elements addressed as a part of Disaster Management Plan are:

- Assembly points
- Emergency control center
- Fire control arrangements
- Medical arrangements
- Other arrangements

### **1.9.3 Hydrodynamic study**

- The site near Kulai about 4 km north of north breakwater of New Mangalore Port is suitable for the proposed development or fisheries harbour. Since the net littoral drift prevails from north to south. layout with entrance facing south-southwest was found to be suitable. Hence, the layout was optimized for the alignment and length of the breakwater for the critical southwesterly waves. Due care is required to be taken to construct the entire lengths or breakwater as recommended.
- Adequate phasing of construction of breakwaters by simultaneous construction of both the breakwaters would be essential to avoid adverse shoreline changes like erosion, ensuring adequate foundation stability. providing adequate- tranquility for Construction of jetties, wharfs, reclamation etc.

### **1.10 GREENBELT DEVELOPMENT PLAN**

The proponent has planned to develop green belt within premises all along factory periphery consisting of at least three rows of trees of local species. However, if the adequate land is not available within premises, unit shall tie up with local agencies like gram panchayat, school, social forestry office etc. for the plantation at suitable open land in nearby locality. Total 1,000 m<sup>2</sup> area shall be allocated for green belt. Further, avenue plantation will be undertaken along the road side of the plant. Extensive afforestation at plant area will be undertaken which will not only act as lung space in the area but will also improve aesthetics. Multi-layered plantation comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt. Moreover, in future creepers will be planted along the boundary wall to enhance its insulation capacity. The landscapes are colourfully developed by planting decorative plants & trees and the right plant species shall be selected in consultation with expert Horticulturist & forest department. The land shall be chosen timely with permission of relevant concerned authority for land utilization for forestry/greenbelt.

### **1.11 SOCIAL WELFARE AND UPLIFTMENT PLAN**

The proponent is actively involved in the improvement of society through its contribution in social welfare activities & programs. It directly organizes various programs for social welfare & upliftment or indirectly contributes in such activities conducted by other organizations by providing financial & other aid. Owing to the approximate cost for demand of infrastructure and service support, the management of KFDC shall conduct a need based survey for identifying the required services in the surrounding area and allocate a specific budget to be implemented with an action plan of five years.

## **1.12 BUDGETARY PROVISION FOR EMS**

The total project cost for proposed project will be Rs. 230.00 Crores. The capital cost of environmental control measures, solid waste management facilities and greenbelt development would be Rs. 35,00,000 Lakhs. The ETP, greenbelt, safety measures and other components of the EMP shall be implemented along with the commissioning of the proposed project. The annual recurring cost of environmental control for the proposed project has been estimated to be 10% of the total EMS cost.

## **1.13 CONCLUSION**

The proposed project of fishery harbour envisages the activity of fish handling at Vill: Kulai, Tal: Mangaluru, Dist. Dakshina Kannada.

The EIA study has been carried out with respect to the TORs awarded by SEAC, Karnataka. All the impacts likely to have an effect on the environment have been identified and efficient/adequate mitigation measures have been proposed for the same. Considering the probability of likely impacts, the proponent has planned adequate mitigation measures and EMP. Further, the proponent also undertakes CSR activities which shall have beneficial impacts on the socio-economic environment. Employment generation due to the proposed project is also considered positive impact on the socio-economic environment. Measures like energy conservation and greenbelt development are also noteworthy. Looking to the overall project scenario, employment potential and allied development plans; it has been noticed that the proposed project would significantly help in the improvement of the society and nation at large.

All the relevant safety norms with latest technology have been incorporated in the proposed project. Hazards and associated risks, safety and security provision associated with the project activities appear to be acceptable. Hence the project in totality may be considered environmentally safe.