REPLIES TO ESSENTIAL DETAILS SOUGHT Dt. 27.06.2022

S.No	Subject	Remarks
1	Detailed note on the project	Detailed note on the project is attached as Annexure-I
2	Statement showing the details of forest area involved i.e.,Division,Range, Beat, Forest Block & Compartament No.wise	Details sought are already provided in Part-I of Form-A. However, the said details are as given below: Total forest area involved is 0.99 Ha. It is situated in Compt. No. 4 of Nizampatnam RF, Nizampatnam Beat & Section, Repalle Range of Guntur Forest Division.
3	Item wise breakup of the forest area proposed for diversion,if any.	The details are already provided @ Sl. No. B-2.4 in Part-I of Form-A. However, the said details are as given below: Extension of Quay / Jetty - 0.99 Ha (One item only)
4	Detailed scheme for rehabilitation of project affected persons, wherever required.	The details are already provided @ Sl. No. 'F' in Part-I of Form-A as Nil. There is no displacement of people due to the Project. Hence not applicable.
5	Minimum distance of the proposed site from Wildlife Sanctuary and / or National Park, if any.	The proposed project site is 18.8 km from the nearest Wildlife sanctuary i.e. Krishna Wildlife Sanctuary. Map enclosed as Annexure-II.
6	To show the existing Water body / water channel of road, which should be identifiable.	The existing water bodies viz., Tungabhadra canal & Nizampatnam Creek, which are adjacent to the proposed site are shown in the layout map, which was enclosed along with proposal.
7	To show the newly proposed bridge / culvert / underground pass / tunnel etc., to be identifieble.	Not applicable.
8	To enclose the cross section plan / Map indicating demension of (length / width / Hight / depth etc.,) clearly.	Layout map with all dimensions was submitted in the proposal at Sl. No. 1 of additional information. A cross-section of the layout map is attached as Annexure-III.

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MANAGING DIRECTOR
APMIDCL, VIJAYAWADA

9	To show the additional impacted area clearly, which may be impacted temporarly by the proposed construction.	Environmental Impact Assessment (EIA) studies were conducted through an accredited consultant and submitted to the State Environmental Impact Assessment Authority, Andhra Pradesh. The authority reviewed the Environmental Impact Assessment Report submitted, and based on the said EIA report, Environmental Clearance to the project was accorded in SEIAA, AP order no. SEIAA/AP/GNT/INF/02/2018/515-14, Dt. 03.05.2019. An extract of Chapter -IV Anticipated Environmental Impacts and Mitigation Measures of EIA report is attached as Annexure-IV.
10	To show the diversity of the ecology which is likely to be impacted by the proposed construction.	Impact on flora and fauna due to the proposed project was mentioned in the EIA report, which is also covered in Annexure-IV.
11	In Part -II, the Divisional Forest Officer,Guntur has furnished a certificate at page no. 87 captioned under " Scheme for Compensatory Afforestation" it was made a mention that, this is to certify that as per guidelines issued under "Left wing Extremism Division, vide MoHA, F.no.11 .18015/68/2014 -LWE-III, dt.14.04.2018, no compensatory Afforestation shall be insisted on in respect of proposals involving diversion of forest land up to 5 ha,. Hence the Compensatory afforestation does not arise.	An undertaking to pay the "Compensatory afforestation charges" already enclosed along with the proposal. However, an undertaking, as per 2.6 (i) of Handbook of Forest (Conservation) Act, 1980 & Forest Conservation Rules, 2003 (Guidelines & Clarifications) issued by MoEF&CC, towards cost of plantation (including ten years maintenance) of ten times the number of trees likely to be felled or specified number of trees as may be specified in the order for diversion of forest land (subject to a minimum no. of 100 plants)" is enclosed as Annexure-V.

Managing Director, APMIDCL

CHIEF EXECUTIVE OFFICER
A.P. MARITIME BOARD

MANAGING DIRECTOR
APMIDCL, VIJAYAWADA

ANNEXURE - I

Andhra Pradesh Maritime Infrastructure Development Corporation Limited (APMIDCL)

Development Of Fishing Harbour at Nizampatnam in Guntur District, Andhra Pradesh

EXECUTIVE SUMMARY

Submitted by:

ANDHRA PRADESH URBAN INFRASTRUCTURE ASSET MANAGEMENT LTD.

4th Floor, NTR Administrative Block, Pandit Nehru Bus Station, Vijayawada – 520013, Andhra Pradesh

Phone: 0866 2527701

INTRODUCTION

General

Proposed Nizampatnam fishing harbour Phase II has been visited during the first week of April 2016, during economic investigations detailed information havebeen collected regarding fishing vessel type, size, operational schedule, landings etc. and they were analysed after scrutiny. The proposed Nizampatnam fishery harbour Phase II site is located at Nizampatnam Mandal in Guntur district of Andhra Pradesh. Nizampatnam fishery harbour is situated about 30 kms from Repalle, the nearest town and also the nearest railway station and 90 kms from Guntur, the district headquarters. Machilipatnam fishery harbour is situated 120 kms North of Nizampatnam. No fishery harbour facilities are available in Guntur district other than Nizampatnam.

Guntur District wherein the proposed Nizampatnam FH Phase II is located is in Andhra Pradesh along the east coast of Bay of Bengal. The district has a coastline of around 100 kilometers. Guntur City is the largest city in the district and administrative center of Guntur District. The Krishna River forms the northeastern and eastern boundary of the district, separating Guntur District from Krishna District. The district is bounded on the southeast by the Bay of Bengal, on the south by Prakasam District, on the west by Mahbubnagar District and on the northwest by Nalgonda District. Guntur District is located at 16.20°N 80.27°E and the city is located around 64 km to the west of the Bay of Bengal on the east coast of India. The Krishna Delta lies partly in Guntur district. Rain storms and hurricanes are common in the region during the rainy season, which starts with the monsoons in early June. The hurricanes could occur any time of the year, but commonly between May and November.

Conducting of Economic Investigations

The detailed economic investigation at the project site provided information an actual fleet size operating at the proposed project area and also fishing boats belonging to nearby area which can make use of the proposed project facilities. Fishing Boat details available from various sources have also been verified to arrive actual information on fleet size and their vessel economics at the proposed project area.

Based on the field study, statistics furnished by Department of Fisheries and further discussion with Stakeholders, design fleet size for the proposed Nizampatnam Phase II fishery harbor has been arrived and also based on future projection based on the growth of the fishing boats and also socio economic conditions of the fisher folk and the capability of active fishermen at the project area.

Socio- economic schemes for the welfare of fishermen community

Andhra Pradesh is undertaking every effort for the Socio-economic developmentof the poor fishermen community and the following are the few schemes.

- Subsidy for the motorisation of the traditional craft & Tax free dieselto mechanised boats and country craft.
- National Savings-cum-relief scheme for fishermen.
- Fishing ban period relief for fishermen family & Bio-matric ID cards.
- Insuring the life of the fishermen under group accident scheme and insurance coverage for the individual fishermen.

Need to Develop Fishery Harbour at Nizampatnam

There is a need develop fishery harbour Phase II due to overcrowding at the harbour and increase in the size of the fleet as well as number of MFVs and non- availability of full-fledged fishery harbour infrastructure facilities for all the fishing vessels. Development of a Phase II fishery harbour at Nizampatnam is sureto generate additional employment opportunities for the local unemployed people and the fishermen community. A large number of workers in the fishery harbour are from the fisher community comprising of boat crew, head-load and ice workers, women fish vendors, fish merchants etc.

Design Fleet Size

The fishing harbour could be designed for a total fishing fleet of 1600 fishing boats comprising 1000 numbers of10 metre motorised boats, 500 number of 15 m and 100 numbers of 24 M tuna Long Liners. It is projected based on the discussion with fishing boatoperators/owners and projection for next 50 years and subsequent analysis that 10 m OBM goes for 100 trips of 2 days duration in a fishing season spread nine months and lands about 250 kg per trip and 25 tonne per season. 15 m lands about 2000 kg per trip and goes for 25 trips in a season while each trip has got 8 days duration. It is projected

that there will be 50 numbers of 24 metre Tuna Long Line (TLL) and each vessel unertakes 20 trips in a fishing season of 9 months in the 10 days duration of each trip and it lands about 6000 kg in a trip and 120 tonne in a year.

The details of the fleet using the harbour such as number of boats, their overall length, annual average landing, duration of each fishing trip etc. are given inTable.

Fishing Vessel, Duration of trips and Landings in respect of the proposed NIZAMPATNAM FH PHASE II

1	Type & Size of the Vessel	Motorised	Trawler cum Gill Netter	Tuna Long Line
		9 Metre	**15 Metre**	**24 Metre**
2	Days per Trip	2	8	10
3	Total Number of Trips	100	25	20

1	Type & Size of the Vessel	Motorised	Trawler cum Gill Netter	Tuna Long Line
		9 Metre	**15 Metre**	**24 Metre**
4	Total fishing Days	200	200	200
5	Rest Days	70	70	70
6	Fishing Season Days	270	270	270
7	Landings per Trip (Qty. in kg)	250	2,000	6,000
8	Landings per Season (Qty.in ton)	25	50	120
9	Total Number of Vessels	**1000**	**500**	**100**
10	Total Landings in Tonnes	25,000	25,000	12,000

Transport

The fishery harbour development project outlined in this report does not include any capital investment on trucks to move fish products to inland markets. To do so, would result in unused capacity during off-season or poor fishing season. It is assumed that road transport will be hired and further supplemented by rail service.

Marketing

Market	Percentage raw material intake	Percentage product weight sold	Percentage total product sales
Export	29.68	26.57	54.74
Local	14.12	14.76	8.48
Inland	27.72	28.86	17.05
Howrah/Chennai	28.48	29.81	18.73
Total	100.00	100.00	100.00

The price range and the weighted average price per kilogram for prawn and fish products are given in Table 4-9.

Product	Price range (Rs./kg)	Weighted average price (Rs/kg) Retail or FOB
Prawns		
Frozen	245 – 847	548.30
Fresh	104 – 321	173.26
Fish		
Frozen	175 - 221	201.45
Fresh	32 – 109	64.89
Dried/Cured	105-109	107.80

Ownership and Management

Fishery Harbour

It is assumed that the Department of Fisheries (DOF), Govt. of Andhra Pradesh(GOAP) will be responsible for:

a) the control of fishing vessels using the harbour to ensure maximum benefit from the space available; and

b) the overall supervision and maintenance of facilities and amenities provided at the fishery harbour.

Department of Ports. Other officers shall, be as decided by the DOF,GOAP.

- The DOF, GOAP, will ensure the efficient operational conditions of the fishery harbour in accordance with the hygienic standards/specifications in force from time to time. The Chairman or the Engineer of the DOF, GOAP, will review the maintenance, management and operation of the fishery harbour annually.

Fishing Vessels

All the 9 m, 12 m, 15 m and 24 m fishing vessels are owned and operated by individual, family or cooperative basis. The range of investment for these vessels is shown in Table 4 -10.

(Rupees)

Item	10 M	15 M	24 M
Fishing vessel	2,00,000	40,00,000	80,00,000
Fishing gear	1,50,000	10,00,000	20,00,000
Total Investment	**3,50,000**	**50,00,000**	**100,00,000**

Fish Auction hall, Net mending shed, Gear shed, Rest shed, Iceplant and Cold storage

It is envisaged that an FTO will operate and manage the fish auction hall, net mending shed, gear sheds, rest sheds etc. As regards the other shore-establishments, they could also be well run by fishing boat owners' co- operative societies. As the range of industrial activities recommended in this report is not sophisticated and in fact, all are currently being, or have been, undertaken somewhere along the coastline, the suggestion is not unrealistic.

ECONOMIC EVALUATION

Sensitivity Analysis of the Project

The fishery development proposal for Nizampatnam Phase II fishing harbour project. Appendix 11 which reconciles cash inflows and cash outflows, provides the base for calculating Financial Internal Rate of Return (FIRR) on investment for integrated project operations. The Financial Internal Rate of Return (FIRR) on the basic statement works out to 10 - 11%.

Status of Fishing Harbours under CSS-BR, FIDF & NIDA

S. No.	Project	Source of Funds	Project Cost (Rs in Cr.)	Proposed Source of Funding (Rs in Cr.)			
				CSS-BR	FIDF	NIDA	GoAP
1	Nizampatnam (Guntur)	FIDF/NIDA/ State	451.00		150	270.90	30.10

Project Current Status w.r.t Land Handover & NABARD Loan

- 2.5 ac yet to be handed over to APMIDCL by Forest Dept. 78 Acres of land for harbour infrastructure is identified and a layout is prepared, further submitted to the Forest Dept. for clearance.

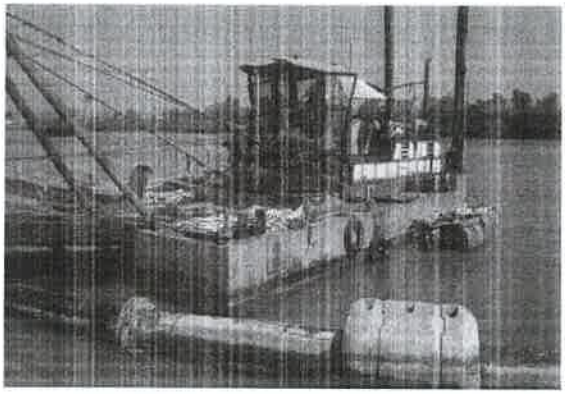
NABARD LOAN STATUS:

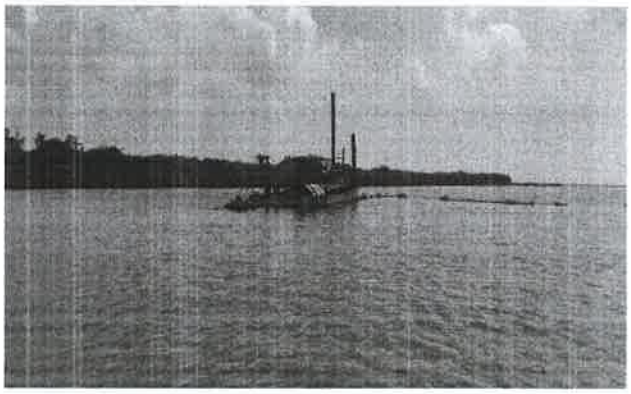
- FRBM certification submitted to NABARD by the Finance Dept. for loan disbursal of Rs. 450 Cr FIDF loan and NIDA loan of Rs. 693.00 Cr on 23.03.2022
- NABARD Hyderabad Regional Office will send for loan sanction & disbursal to Mumbai HQ by this 18.04.2022

Key components to be built in this contract

Designs & Drawings : Completed for Break Water
Dredging : 2.48 Lakh Cum out of 7.46 Lakh Cum
Quay Piling Works : Yet to be Started
Breakwater Works : Yet to be Started
Concrete Armour : Yet to be Started

Project Current Status at Nizampatnam





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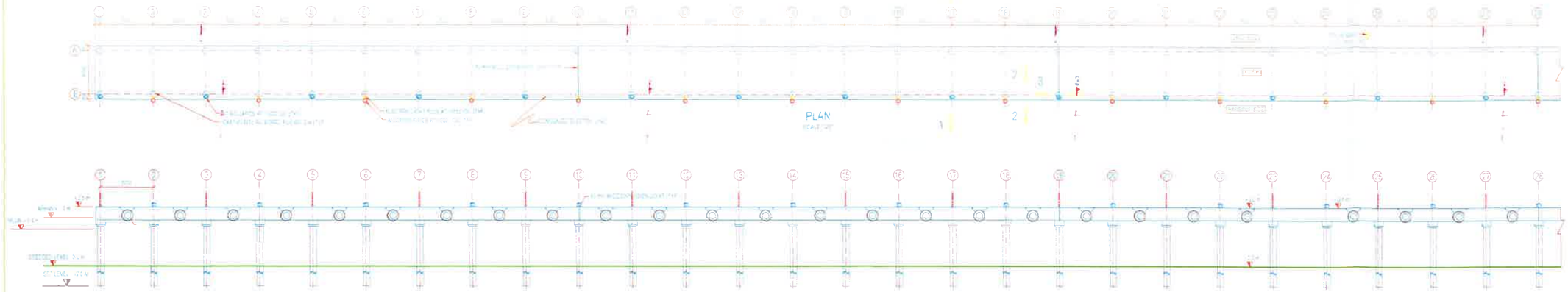
ANNEXURE – II

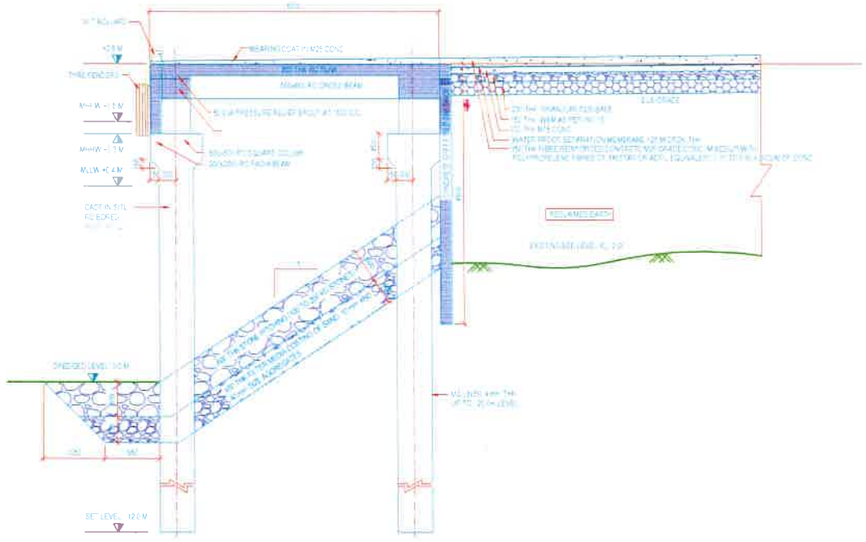
MAP SHOWING THE DISTANCE OF THE PROPOSED PROJECT FROM NEAREST WILDLIFE SANCTUARY OR NATIONAL PARK

ANNEXURE — III

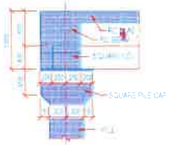


PLAN
SCALE 1:200

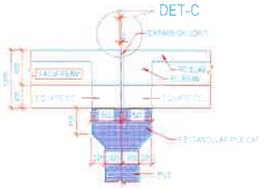
FRONT ELEVATION
SCALE 1:200



SECTION 1-1



SECTIONAL ELEVATION OF
PILE CAP AT EDGE
(SECTION 2-2)



SECTIONAL ELEVATION OF
PILE CAP AT EXPANSION JOINT
(SECTION 3-3)

DET-C

TIDE LEVELS (W.R.T. CHART DATUM)

MHHW	+ 1.50 m
MLHW	+ 0.70 m
MHLW	+1.10 m
MLLW	+ 0.40 m
MSL	+ 0.90 m

NOTE
1. ALL DIMENSIONS ARE IN MILLIMETRES
2. FOLLOW WRITTEN DIMENSION. DO NOT SCALE THE DRAWING

CLIENT
GOVERNMENT OF ANDHRA PRADESH
DEPARTMENT OF FISHERIES

TITLE
QUAY PLAN, SECTIONS AND ELEVATION

REV	DATE	DESCRIPTION	APP'D	DATE

DRAWN | DATE | CHECKED | APP'D | SCALE | DATE | SHEET SIZE | REV

वाप्कोस लिमिटेड
WAPCOS LIMITED

PROJECT: DEVELOPMENT OF PROPOSED FISHERY HARBOUR AT NIZAMPATNAM, ANDHRA PRADESH

ANNEXURE – IV

CHAPTER – 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 IDENTIFICATION OF IMPACTS

The infrastructure components for Phase-II development of the fishing harbour at Nizampatnam consists of foreshore and shore based facilities for augmenting fishing activities. All the major project components will be within the proposed fishing harbour complex. Training walls will be constructed at the Tungabhadra channel mouth. Environmental impacts will be caused during ***construction phase*** due to construction activities viz. training walls, dredging of harbour basin and approach channel, land reclamation, revetment protection, quay, site preparation and creation of other facilities in the harbour complex as well as operation of construction machinery and equipments. During the ***operation phase*** environmental impacts will be caused by activities like movement of MFVs, fish handling, washing and cleaning, movement of vehicular traffic, generation and disposal of sewage and solid wastes, etc. Proper planning of activities at the ***pre-construction phase*** adhering extant environmental, situational and construction guidelines / standards form the basis of alleviating environmental impacts and formulating appropriate mitigation measures.

Like any other engineering interventions, the aforesaid construction will interfere with the ambient environmental quality and, depending upon the nature and intensity of the activities during both construction and operation phases, there will be impacts on the environmental attributes to different degrees. Against the backdrop of the project details and the baseline environmental status, potential impacts have been identified. The assessment exercise for most of the disciplines is subjective because the impacts are intangible in nature, and only qualitative assessment is possible. This Chapter identifies the anticipated impacts, both positive and negative, due to construction and operation of the proposed expansion activities of the harbour and suggests mitigation measures.

4.2 IMPACTS ON LAND ENVIRONMENT

a) Construction phase

Impacts due to quarrying operation

The construction and filling materials required include cement, blasted rubble, course and fine aggregates and TMT steel. Fine and coarse aggregates and blasted rubble materials are

proposed to be availed from nearby approved quarries, while cement and steel will be purchased from distributors.

The quantity of construction and filling materials required are given in Table-4.1. The approximate distance of quarries from the project site is given in Table-4.2.

Table-4.1: Construction and Filling Materials

Sl. No.	Material	Unit	Quantity
1.	Cement	tonne	27713.63
2.	Blasted rubble	Cum	11201.66
3.	Course aggregate	Cum	105266.51
4.	Fine aggregate	Cum	53715.24
5.	TMT steel	tonne	1445.12

Table-4.2: Distance of quarries from project site

Sl. No.	Material	Distance (km)
1.	Fine Aggregate/ Sand for filling	29
2.	Coarse Sand	53
3.	Hand Broken Aggregate	53
4.	Crushed Stone Aggregate	86
5.	Brick Aggregate	86
6.	Rubble	86
7.	Quarry Spall	86
8.	White Bella Stone	86
9.	Gravel	52
10.	Murrum / Blindage materials	35
11.	Hard Murrum	35
12.	Stones	90

No new quarry will be opened. Hence, no impact is likely to occur due to quarry activity in the project area.

Impacts due to construction activities

Damage to environment due to pre-construction activities is generally not significant. Preparatory activities like increased use of existing access road, would have no significant impact. Land / soil dispalcement due to earthwork as well as civil construction is likely to occur in the construction area. Clearing, stripping and leveling of sites, construction of bunds for protection from flooding, earth filling and excavation for foundations will result in generation of dust and sound. Such activities are not likely to cause any significant adverse impact as those will be restricted to the construction period, and as a major construction activities will be done within suitable enclosure with dust suppression measures. Construction of temporary workers quarters, public toilets, godowns, etc. will be on the vacant spaces in the project area. The project area is free from agriculture or allied activities. Sewage generated during the construction period will not be discharged directly to the sea but will be disposed into septic tank – soak pit system.

The drainage from the quays will be connected to existing surface drainage system. As the natural drainage of the site is towards the creek this could lead to marginal increase in the turbicity level. Based on experience in similar projects, the impact is not expected to be signif cant and long term. As per the DPR, effluent collected from the fish handling and auction hall would be treated in the Effluent Treatment Plant (ETP). The details are given in Chapter-7 (EMP) of the report.

Impacts due to Reclamation

Reclamation would be required for an area of 12.168 ha for which 1.247 lakh m^3 of earth will be required. It is proposed to use 0.915 lakh m^3 of dredged material for reclamation. The balance reclamation material of about 0.332 lakh m^3 will be brought from outside sources / nearby existing quarries. Remaining dredged material 0.795 lakh m^3 will be utilized for shoreline protection and beach nourishment. As the dredged material is expected to be non-toxic no adverse impact on marine water quality is likely.

b) Operation phase

Generation of garbage

Collection and disposal of garbage will be given due attention. The garbage is likely to contain paper, polythene, metal scarp, glass or plastic materials. It could be generated from harbor facilities and fishing vessels. A system for segregated collection and disposal of garbage has been envisaged in the EMP. It is proposed to treat the bio-degradable fraction in a bio-digester and to handover recyclable material to appropriate vendors. Inert materials will be used/made available for use for landfill.

Impacts on land use pattern

The land required for the project belongs to the government of Andhra Pradesh. The backup area of the proposed harbour falls under the administrative control of the District Collector / State Revenue Department. The construction and operation of the project will provide facilities for fish storage, packing, ice plant, harbour management office, dormitory for fish merchants, etc., providing an impetus to development in the entire project zone. Moreover, the fishing activities will trigger development of ancillaries like shops, eateries /restaurant, repair shops, etc. This will lead to conversion of barren land into commercial use resulting in some land use change for greater economic gain. Such activities within the project area will be regulated to be environmentally compatible. The contribution of such activities to the economy will be significant.

4.3 IMPACTS ON WATER ENVIRONMENT

a) Construction phase

i) Impacts due to effluents from labour camps

The average and peak labour strength likely to be deployed for the project will be about 150 and 300 respectively. Most of the labour force will come from Nizampatnam and nearby villages. The specialized and skilled labour force to be engaged by the implementing agency / contractor could come partially from outside areas. It is expected that the labour force procured locally would go back to their village after each shift, while the balance labour population is likely to stay in labour camps close to the project site. Accordingly, it is assumed that about 50% of peak labour force, i.e. 150 laborers will stay at the temporary labour camps. The total water requirement for the labour force staying in the labour camp is given in Table – 4.3.

Table – 4.3 : Water requirement for Labour Force

Sl. No.	Particulars	Population (Nos)
1.	Peak Labour Strength	300
2.	Labours likely to stay in camp (50%)	150
3.	Family members	60
4.	Total number	210
5.	Water Requirement, lpcd	70
6.	Total Water Requirement, m^3/day	15

About 150 labourers would stay at the construction site, only during working hours. The water requirement for such labor shall be 6.75 m^3/day@ 45lpcd. Thus, total water requirement works out to (15 + 6.75) about 21.75m^3/day or 22m^3/day. Water requirement for construction purpose is estimated to be 50.0m^3/day. The source of domestic water will be ULB supply. The source for construction water will be bore wells and tanker supply.

The sewage generated is taken as 80% of the total water requirement i.e. (0.8 x 22) or 17.6 m^3/day. The typical composition of untreated sewage is given in Table-4.4.

Table-4.4: Typical composition of untreated sewage

Parameters	Value
Total Solids(mg/l)	720
Dissolved Solids(mg/l)	500
Fixed (mg/l)	300
Volatile (mg/l)	200
Suspended Solids(mg/l)	220
Fixed (mg/l)	55
Volatile (mg/l)	165
Settleable solids (ml/l)	10
Biochemical oxygen demand (BOD) (mg/l) 3 day, 27°C (BOD_3)	220
Total organic carbon (TOC) (mg/l)	160
Chemical oxygen demand (COD) (mg/l)	500
Nitrogen (total as N)	40
Organic (mg/l)	15
Free ammonia (mg/l)	25
Nitrites (mg/l)	0
Nitrates (mg/l)	0
Phosphorus (total as P) mg/l	8
Organic	3
Inorganic	5
Chlorides (mg/l)	50
Sulphate (mg/l)	30
Alkalinity ($CaCO_3$) (mg/l)	100
Grease (mg/l)	100
Total coliform (no/100 ml)	10^7-10^8
Volatile organic compounds (VOC) (microgram/litre)	100-400

Source: Wastewater Engineering - Treatment, Disposal, and Reuse, Metcalf & Eddy, Inc.: Third edition

Sewage will be treated and disposed through septic tank – soak pit system. The details are outlined in the EMP.

ii) Impacts due to dredging

Dredging and other construction activities would cause increase in turbidity in recipient water body. The total quantity of material to be dredged is 1.71 lakh m^3. The increase in turbidity level in the water column due to dredging will be of short-term and restricted to actual dredging period. Turbidity level will return to the pre-project level after disposal of the dredged material is complete. The time required for the turbidity level to return to its original turbidity level increases with the increase in clay content. The turbidity level also depends on the type of dredging method adopted. Normally dredging in similar type of projects is done by a 'Cutter Suction Dredger' (CSD). The method is preferred because the dredged material is sucked before it gets an opportunity to spread. The sediments near the construction sites have high amount of fine

portion. Due to the operation by CSD, the major part of clayey sediments would be sucked by the suction pipe. However, a small quantity of clay particles is likely to escape the cutter-suction head which may enter the aquatic environment in the immediate vicinity of the dredging site. Since, the clay particles are in the range of 2 to 10μ, it would take about a week to settle down. The increased turbidity level is likely to subside over a period of 10 to 15 days after the dredging activities are complete.

The other impact of dredging on water quality is chemical in nature. Sediments take up various cations from water through the process of sorption. The cations and anions in sediments are weakly bonded and are generally released back to the water when there are changes in the physico-chemical characteristics of the aquatic environment. In the marine environment, due to prolonged residence time between water and sediments, cations and anions sorbed by the sediments are in equilibrium with the elemental concentration in water. When the sediments are removed, the concentration gradient between the liquid and the solid phase changes and there could be elemental transfer between the two phases. Use of CSD will have an advantage, as it does not provide adequate time for the elemental transfer between the sediments and the water phase. Thus, no major change in marine water quality due to transfer of ions from sediments to water is anticipated. The change in the drainage system due to construction of the training wall and dredging at the channel entrance with respect to tide, current and circulation will be temporary in nature and subsequent better flushing of the channel will offset any negative impact.

iii) Impacts due to disposal of dredged material

About 0.915 lakh m^3 out of 1.71 lakh m^3 of the material obtained from dredging in the harbour basin will be utilised for reclamation of land to RL +2.70 m level. Balance dredged spoil of about 0.795 lakh m^3 would be utilized for shore protection and beach nourishment. Maintenance dredging to remove subsequent silt deposit is expected to be required once in 2 years. The dredged material, amounting to 36000 cum therefrom, will be utilized for the continued shoreline protection and beach nourishment. Thus, no impact on the marine water quality due to disposal of dredged material is envisaged.

iv) Impacts due to reclamation

Of the total quantum of 1.247 lakh cum of earth required for reclamation, 0.915 lakh cum will be sourced from dredged materials and the balance 0.332 lakh cu m will be availed from nearby quarries. The chemical impacts due to the disposal or backfilling are dependent on the redox potential and pH. Normally, if pH remains around 8, heavy metals like zinc, copper and mercury will remain bound to the solid phase. Baseline investigation in the project area shows that pH of

marine / coastal water and sediments are slightly alkaline. In the post-project phase, after the reclamation of land, pH and redox potential in the adjacent water is not expected to change and hence heavy metals are likely to remain bound to the sediments. Thus, no impact on the marine water quality is anticipated due to reclamation. As sediments are of non-problematic nature in-situ, they will not become so even after the disposal. Hence adverse impact on marine environment is not anticipated.

b) Operation phase

During the operation period, water would be required for domestic uses, fish washing, cleaning, Ice Plant, Fire Fighting and other uses. The total water requirement during operation phase is 274.76m^3/day of which 120.5m^3/day is fresh water and 154.26m^3/day is sea water. The details are given in Table-4.5.

Table-4.5: Water requirement during operation phase

Sl. No.	Use	Water requirement (litre per day)
Fresh water requirement		
1.	Motorized Crafts	15,000
2.	Fishing vessel during trip / voyage	10,500
3.	Ice Plant – preparation of ice	20,000
4.	For fishermen, workers and fishery industry personnel working in the harbour complex	75,000
	Total	**1,20,500**
Sea water requirement		
1.	Fish washing	1,26,900
2.	Cleaning of fish auction hall	3,895
3.	Washing of fish box, accessories, etc	23,500
	Total	**1,54,295**

Pollution during project operation phase

Pollution potential during the operation phase can be that of water, air and sound. Oily wastes / used engine oil from the mechanized vessels, left over residues and junk items from vessels, deck and fish hold washings, toilet wastes, junk metal parts, plastic items / containers, fish waste, garbage and leaching of anti-fouling paints used during repair and maintenance of vessels, solid waste decay and vehicular transport can contribute to pollution. Fish from the landed vessels will be transported in plastic containers to the auction hall where they will be washed and sorted. The auction hall is washed with sea water and the entire wash water passes through bar screen chamber, oil trap, settling tank and clarified water tank prior to discharge into the sea through the creek. In addition, solid wastes from boat yard, dormitory,

Inspection bungalow, Harbour management office, restaurant, administrative building, etc. will be collected regularly and disposed as outlined in chapter-7.

4.4 IMPACTS ON BIOLOGICAL ENVIRONMENT (Coastal and Marine)

a) Impacts on terrestrial flora

The impact of construction activity will be limited within the vicinity of the construction site. The only significant vegetation in the project are the pockets of mangroves, which will be retained and strengthened. Hence, no significant impacts are envisaged on terrestrial flora during construction and operation.

b) Impacts on marine environment

The coastal environment is a significant component for planktonic and other organism biodiversity and is ecologically important.

Impacts due to dredging

For creating smooth navigation facilities, the approach channel at the creek mouth and the harbour basin will be dredged. As stated in 4.3.a.(iii), the entire dredged material will be utilized in the project area itself. And hence there won't be any environmental impact from the disposal of the material. The temporary upset of coastal/marine environment during the dredging process will be reversed and the dredging sites will get re-colonized in short duration after the cessation of the dredging activities. As the impacts of dredging will be confined to the activity period only no major impacts are anticipated on coastal / marine ecology in the long run due to construction and operation of the project.

Impacts due to reclamation

Out of the total quantum of 1.247 lakh cum of earth required for reclamation, 0.915 lakh cum will be sourced from dredged materials. Consolidation and rolling for achieving the desired degree of density is envisaged by in-situ vibratory rollers. The existing marine ecology in the area proposed to be reclaimed shall be disturbed on account of disposal of dredged material for land reclamation. However, based on the survey and review of existing scenario, the area to be reclaimed does not exhibit to be significant in primary productivity. Hence, no significant impact on marine ecology is anticipated due to reclamation of land.

Impacts on benthic organisms

During dredging operations, removal of silt from the sea bed will also remove the living organisms in the sediments. With the exception of some deep burrowing animals or mobile surface animals that may survive a dredging activity through avoidance, dredging in general, may initially result in the complete removal of the benthic community from the excavation site. In areas to be covered under maintenance dredging well-developed benthic communities are not

expected to occur in or around the area. None of macro-and meio-faunal species occurring in the study area are rare, endangered or threatened species and are common benthic organisms. Since significant macro-and meio-fauna is not developed in the area, dredging is not expected to lead to significant adverse impacts.

Impact on phytoplankton and primary productivity

Biomass of phytoplankton depends mainly on the availability of light in nutrient rich waters. Dredging and disposal may lead to increased turbidity and consequent reduction of light penetration for short periods. This may affect primary productivity and plankton biomass. However, turbidity due to dredging will occur in a localised area and only for a very short duration. Hence impacts due to dredging are expected to be marginal in nature which will be offset over a period of time.

Impact on fisheries / nektons

The high turbidity due to heavy suspended solid load during dredging and reclamation can result in clogging of gills of fishes, thereby causing asphyxiation. But since fishes / nektons in the water column are free swimming in nature, they will tend to avoid turbid areas and move to safer zones. Once the turbidity increase gets reversed due to sedimentation and dispersion by current and wave influences, the fishes / nektons are expected to come back. Hence there will be virtually no impact on fishes due to dredging in the long term. As the area does not have any breeding grounds for fisheries, no significant impact on marine ecology is anticipated during operation phase.

4.5 IMPACTS ON AIR ENVIRONMENT

a) Construction phase

Impacts due to fugitive emissions

The major pollutant in the construction phase is Suspended Particulate Matter (SPM) due to various construction activities. The SPM is intended to be controlled through containment and suppression measures. Vehicular movement generates pollutants such as NOx, CO and HC besides causing lift off of dust settled on roads. Pollution under control certificate will be insisted on vehicles plying in the project area. Periodic water spraying will be done on roads to suppress dust. The fugitive emissions generated are not expected to travel beyond a distance of 200 to 300 m. The impact on air environment during construction phase is not expected to be significant as there are no habitations within the vicinity of the site.

Impacts due to construction equipment

The combustion of diesel in construction equipments may cause generation of air pollution. The fuel utilization rates of various equipments expected to be in operation during construction phase is given in Table-4.3.

Table-4.6: Fuel combustion during construction phase

Equipment	Fuel consumption rate (lph)	No. of Units	Total fuel consumption (lph)
Dumpers	30	2	60
Generators	30	1	30
Batching plant	40	1	40
Dumpers	20	1	20
Loaders and unloaders	25	2	50
Excavators	25	1	25
Water tanker	8	3	24
Total			259

The major pollutant likely to be emitted due to combustion of diesel in construction equipment will be SO_2. The short-term increase in SO_2 concentration has been predicted using Gaussian plume dispersion model. The results are summarized in Table-4.7.

Table-4.7:Short-term (24 h) increase in concentration of SO_2 ($\mu g/m^3$)

Wind Speed (m/s)	Distance (km)			
	0.1	0.2	0.3	0.4
0.2	$1.63x10^{-34}$	$0.8x10^{-10}$	$4.3x10^{-6}$	$3.27x10^{-4}$
0.85	$0.98x10^{-7}$	$1.83x10^{-4}$	$1.49x10^{-4}$	$1.45x10^{-4}$
1.53	$2.55x10^{-4}$	$6.07x10^{-4}$	$1.46x10^{-4}$	$1.62x10^{-4}$
2.78	$3.80x10^{-4}$	$4.29x10^{-4}$	$0.91x10^{-4}$	$0.75x10^{-5}$
4.30	$3.24x10^{-4}$	$4.25x10^{-4}$	$0.89x10^{-4}$	$2.81x10^{-5}$
5.98	$2.42x10^{-4}$	$2.24x10^{-4}$	$4.44x10^{-5}$	$2.02x10^{-4}$
7.00	$2.38x10^{-4}$	$1.91x10^{-4}$	$3.9x10^{-5}$	$1.74x10^{-5}$

The maximum short-term increase in SO_2 ($0.00162\mu g/m^3$) will be at a distance of 200 m from the emission source. The incremental concentration is quite low and does not require any specific control measure. Thus, the operation of construction equipment is not expected to have any major impact on the ambient air quality.

b) Post operation phase

The major source of air pollution in the post-project phase is the vehicular movement for transportation of fish catch to different destinations of markets. On an average about 35 to 40

trucks per day will move in the area. The pollution levels due to those are not expected to be significant to cause adverse impact on ambient air quality.

4.6 IMPACTS ON NOISE ENVIRONMENT

a) Construction phase

Noise during construction phase will involve movement and operation of machinery and equipment as well as handling, loading and unloading of materials. Operation of mixer machines, cranes, winch machine, dumpers, pile drivers, etc., as well as movement of trucks will generate noise. The noise levels of construction equipments are given in Table-4.8.

Table-4.8: Noise levels of construction equipments

Equipment	Noise [dB(A)] level
Floating pontoon with mixer machine and crane	70
Winch	80
Transit mixer	75
Dumpers	75
Generators	85
Batching plant	90
Air compressors	90
Pile drivers	115

There will be more noise when the machines / equipments operate at the same time. The other source of noise during construction phase will be due to loading, unloading of materials, movement of trucks, etc. The increase in noise level due to vehicular movement is not expected to be significant during construction phase. There are no residential areas within the vicinity and the nearest settlement is at Nizampatnam village 3 km away. The vegetation in the nearby areas along the creek will help in attenuation of the increased noise levels as a natural barrier. The adverse impact of noise during construction will have negligible impact and will be confined to the construction period. Persons working very near highly noisy equipments will be provided with protective gear.

b) Operation phase

During the operation phase, noise will be generated from movement of MFVs, increased plying of transportation vehicles, vehicular horns, loading and unloading of fish and other merchandise. Though there will be some adverse impact on ambient noise level, in general, noise levels get attenuated due to various factors. As the nearest habitation is about 3 km away, the impact due to increase in vehicular and vessel movements during operation phase is not expected to be significant. These will not be heavy and continuous and will not cause any undue disturbances to the local habitation. There will be prohibition on sounding of air horn, except during emergencies, in the project zone.

Impacts of Noise on coastal / marine ecology

There are very few studies on the impact of aquatic noise on the marine animals. The marine animals can sense the noise in the infrasonic range between 5 and 35 cycles/ second which is much different from the human audible range (20-20,000 cycles/second). Most of the work on noise pollution has been done in the audible frequencies of humans. However, US Navy is known to have done some work on the detection of impact of submarines noise on the movement of dolphins and fish species. There are indications that some aquatic animals, especially dolphins, communicate amongst themselves in infrasonic range. Fish species generally move away from the high noise areas and return once the noise subsides or the source of noise moves away. In the proposed project only fishing vessels viz. MFVs and trawlers will operate. The impact of noise generated due to these vessels will not be significant to cause any adverse impact on coastal / marine life.

4.7 IMPACTS OF SOLID WASTES

Generation of solid wastes is inevitable during both construction and operation phases. Solid generated during construction period will consist of debris, construction wastes, discarded metal items of construction utilities, spares and equipments, tire, dry cell / batteries, etc. in addition, domestic wastes will be generated from the temporary labour camps at project site. Proposal for segregated collection, utilization and disposal of solid waste is given in chapter -7 .The impacts during construction phase will be temporary in nature and confined to the project site.

During the operation phase, solid waste will consist of fish wastes, fish offal, discarded fish boxes, utility and plastic items, ropes, nets, etc., in addition, domestic municipal waste will be generated at the eatery, dormitory, etc., within the harbour complex. It has been estimated that a total of 377.29 TPA of municipal solid waste comprising 142 tonne of MSW and 235 tonne of fish wastes will be generated during operation of the harbor. Management plan for segregated collection recycle, treatment and disposal has been provided in chapter-7.

4.8 IMPACTS OF SEDIMENTATION AND SHORELINE CHANGE

The coast line at the port site can be taken to be aligned approximately in NNE-SSW. In the project, reclamation will be done in the inter-tidal area.

In order to determine the impact of the Phase-II development two training walls at the inlet mouth of the creek, following model studies were conducted (i) 2-D Numerical model studies using Delft 3D modeling package (developed at Delft Hydraulics) to assess the tidal hydrodynamics and sedimentation modelling. The two main objectives of the study are (a) Assessment of Hydrodynamics and Sedimentation under existing conditions and (b)

Assessment of Hydrodynamics and Sedimentation under proposed development conditions. In addition, Wave Flume studies for design of breakwaters were carried out. The tests were conducted by CWPRS, Pune. Numerical simulations were carried out by means of Delft 3D software which consists of several modules to compute the flow (FLOW), wave (WAVE) and morphology (MOR) in coastal rivers and estuaries. The modules used were Delft 3D Flow Model, Delft 3D Wave Model and Delft 3D Sediment Transport Model. A model computational grid was developed for the project site through interpolation of present bathymetry to the computational grid. For areas not covered by bathymetry, Elevation Level from MIKE C-Map was utilized. Chart datum (C.D) was taken as reference model and sea level elevations were corrected to the C.D.

Impacts under existing condition

Flow simulation was carried out under existing condition with three open boundaries: east, north and south directions for a period of one month. Effect of waves was accounted for by using SWAN model in model simulation based on off-shore wave climate (height, period and direction) as boundary conditions. Thus wave transformation was performed from off shore to near shore. Sediment Transport Model was run for a period of one month to assess possible accretion/erosion at the proposed site. An average grain size (D 50) of 0.280 mm comprising 95% sand was adopted. The calibrated hydrodynamic model with sediment characteristics was applied to simulate the long shore sedimentation and erosion under prevailing condition at site. Model results show insignificant sedimentation on the south of the creek mouth and at the mouth entrance. Erosion was observed on the north of the creek mouth.

Impacts under proposed conditions

Coupled flow-wave and sediment transport model simulations were repeated with the proposed / recommended layout plan of the fishery harbour at Nizampatnam. The training walls were incorporated into the model bathymetry. Experimentation with hydrodynamic and sediment transport model for assessing hydrodynamic change and prediction of long-shore transport under proposed condition were carried out for a period of 30 days under the same boundary conditions as adopted during verification stage of the model.

Impact on shoreline change

1D shoreline change modelling was conducted to determine the change in shoreline due to expansion activities / construction of the harbour including the training walls. The study was conducted using the numerical shoreline evaluation model GenCade using 12 year transformed near shore wave climate at near shore location. The mean net sediment transport was observed towards northerly direction. Based on shoreline model simulations for the

Nizampatnam harbour entrance training walls, sedimentation on the south and erosion on the north of the proposed harbour entrance breakwaters are observed. The trunk section of the training walls were tested under wave flume studies at CWPRS, Pune for evolving cross sections at different bed levels and thereafter the trunk section of training walls was tested under normal attack of waves in wave flume. Based on the study, the design cross-sections of training walls at various bed levels were evolved and recommended by CWPRS, Pune as being stable under the design wave conditions for the construction at the project site. No significant change in the shore line due to accretion/erosion is expected on the basis of past history, in the project area.

The detailed numerical model study and wave flume study reports received form CWPRS, Government of India, Pune and Hindustan University, Chennai are attached as Annexure-11 & Annexure-12 respectively.

4.9 STATUS OF EROSION IN GUNTUR COAST

As per a study on shoreline changes in Andhra Pradesh coast conducted by National Institute of Ocean Technology (NIOT), Chennai using Remote Sensing and GIS techniques about 275 km of coastline out of total 974 km has been subjected to erosion over the years. From Kakinada to Machilipatnam, both erosion and accretion was observed in many places which are largely influenced by Godavari and Krishna river course. However, the entire coastal stretch of 32 km of Guntur district falls under accretion category.

4.10 IMPACTS ON MARINE ENVIRONMENT

a) Construction Phase

Proposed phase –II development of the fishery harbour at Nizampatnam will be made in the intertidal area. The major structures like training walls at the mouth of the Tungabhadra channel will be constructed on waterfront area. The soil adjoining the project area is sandy and saline with low nutrient and soil fertility. It is devoid of any vegetation of significance. As such during site preparation, only wild shrubs over the project area will be removed. Hence there will not be significant impact on ecology due to development activities for the proposed project. The project site also does not have any significant faunal presence, for which no major impacts on the floral and faunal communities are envisaged due to movement of construction workers and machinery.

Impacts on marine environment may arise due to dispersion of impurities in the runoff water going from the construction site to the creek. The impact is expected to be low as runoff from site to marine environment will be prevented by providing adequate drainage system. Another, potential impact on marine environment during construction phase may be due to

contamination of creek / sea water by dumping/fall/spill of construction materials and debris, fuel and wastes like garbage, municipal solid wastes, littering, etc. This can be contained through proper training of the construction workers and providing facilities for handling the wastes.

b) Operation Phase

On the marine environment potential sources of impacts essentially arise during the operation phase. The major quantity of liquid waste likely to be generated in day to day operations includes sewage, washing run off from domestic activities, fish box and floor washing in auction hall, etc. These wastewaters have potential to pollute the marine water if not disposed with proper treatment. Sewage will be collected through localized sewers and treated and disposed through septic tank – soak pit systems. Wash water from bathrooms, eateries, washbasins, etc will be collected through drainage lines and treated in an Effluent Treatment Plant prior to discharge into marine environment. The wastewater generated in fish auction hall from washing with sea water will be taken through separate drainage lines to another Effluent Treatment Plant prior to discharge into marine environment. Spillage and leakage of fuel in the harbour area during the movement, outfitting of the vessels etc will be prevented to the maximum extent. Accidental spillage of lubricants and fuel into the aquatic phase will be contained and removed. Littering /dumping of the wastes into the harbour water will be prohibited. Adequate boat parking area and loading and unloading facility shall be provided and a Traffic Management Plan will be put in place for better management of sea going vessels. Thus no major adverse impacts on the marine environment due to the project are envisaged.

4.11 IMPACTS DUE TO TRAFFIC AND TRANSPORTATION

Traffic and Transportation

Existing Traffic Network

The project area is well connected by bituminous road from Nizampatnam village. Nizampatnam village is well connected with the nearest town Repalle at about 25 km by the Repalle – Nizampatnam State Highway. The nearest railway station is Repalle which is a branch line. The major railway station on the South Central Main line at Bapatla which is about 33 km from the existing harbour. The fishing harbour at Nizampatnam is at a distance of about 3 km from Nizampatnam village which is connected by the Nizampatnam Fishing Harbour road. Apart from Repalle, Nizampatnam is well connected with other towns viz. Pittalavanipalem Bapatla, etc, via National Highway 214A as well as with the district Headquarters Guntur. There are bus services plying along this road and the nearest access is the bus stop at Nizampatnam village. Daily bus

service of APSRTC connects the fishing harbour with Repalle. Two daily bus services (morning and evening) operate from Nizampatnam to Bapatla. All the 17 villages in the PIA are connected with bus service. In addition auto-rickshaw which is a major intermediary transportation mode connects the harbour area with nearby villages.

Traffic and Transportation Study

A three day study of vehicular movement both cargo and passenger, to and from the existing fishing harbour at Nizampatnam was conducted. Analysis has been made on the basis of the number of vehicles during peak fish landing period for assessing the likely movement of vehicles along the main corridor which connects Nizampatnam with the rest of the district / State, during project construction and operation periods. The same is summarized in the following Table.

Table – 4.9 : Vehicle movement per day during peak fishing season and projected traffic

Sl. No.	Type of Vehicle	Existing	During Project Construction	During Operation / Post Project
1.	Car	8	25	35
2.	Trucks	35	40	55
3.	Bus	-	-	4
4.	Motor Cycle / Scooter	30	50	110
5.	Tractor	7	10	12
6.	Mini Van	15	20	30
7.	Auto Rickshaw	12	20	30

At present, the types of vehicles that operate from and to the harbour area are cars, trucks, motor cycles/scooters, tractors, mini vans and auto rickshaws. As of now, buses operate from Nizampatnam village and it is expected that after implementation of the project bus services will be introduced based on local demand emanating from increasing economic activities and livelihood options.

During construction phase movement of vehicular traffic will increase to some extent. Trucks and tractors will carry / transport different construction materials, including construction aggregates, etc. Moreover, there will be disposal of both construction debris and solid wastes generated at labour camps for which apart from trucks, mini vans will also be put to service. During construction period movement of cars and two wheelers is expected to increase due to daily requirement of management, supervision and monitoring of construction activities.

During operation phase there will be further increase in vehicular traffic on the Nizampatnam Fishing Harbour road. The plying of the number of commercial heavy vehicles will increase for transportation of fish and ice for export and intra-state supply. Similarly, there will be rise in the movement of mini vans for local supply of fishes. Moreover, trucks, tractors and mini vans will also operate to carry domestic consumables and harbour wastes for disposal. These apart, movement of cars, motor cycles, and auto rickshaws will also rise on account of augmentation of harbour activities.

4.12 IMPACTS ON SOCIO-ECONOMIC ENVIRONMENT

a) Construction phase

The average and peak labour strength likely to be deployed for the project will be about 150 and 300 respectively. During peak construction phase it is assumed that about 50% of peak labour force, i.e. 150 labourers along with some 60 dependents will stay at the temporary labour camps near the construction site. Sanitary facilities will be provided for them. There being no oustees, the project proponent will not be required to provide with any rehabilitation/compensation.

On Community Resources

As the labourers including some with families will stay near the construction site, this can lead to competing demand on the locally available infrastructure and resources. The temporary residence/camps of the migrant workers in the project site will not require any large settlement colony, thereby precluding any significant social stress. With adequate infrastructure support in the form of water, sanitation and civic amenities for the construction workers who will mostly be from the nearby villages, there will be no long term negative impact on the competing uses of water, power, transportation, communication, education and community health during the construction phase. As there is no settlement in the project site there will be no displacement of people or loss of land or livelihood of the local population resulting in alterations in the socio-economic scenario.

On the positive side, improvement of infrastructure facilities will upgrade the living standards and livelihoods of the fishing communities and will help in maintenance of the quality of harvest for fetching higher returns in the market. This will not only ensure sustainability of the livelihoods of the fishing community but will also create employment opportunities for both skilled and un-skilled workforce.

Cultural Environment

The project site is free of any historical landmarks / archaeological sites. It will have no negative impact on the cultural assets and attributes of the local communities. Uplift in the socio-economic conditions will enrich the cultural environment of the region.

Aesthetics

The proposed project will not have any adverse impact on the aesthetic quality of the area. On the contrary, the aesthetic ambience of the site will rather improve after construction of the harbour facilities which will redress the existing unorganized activities to a large extent and improve the prevalent unhygienic sanitary conditions.

Human Health

Occupational hazards and accidents can occur during construction phase. Occupational as well as communicable diseases may occur during construction phase which can be controlled through proper sanitation and health care.

b) Operation Phase

The establishment of the fishery harbour provides for removal of silt from the channel mouth which at present is hindering fishing activities leading to sub-optimal utilization of fishing capability. The proposed development construction would address the long standing demand of the fishing community. The project will have significant positive impact on the fish production and income generation, employments. Once the harbour becomes operational, the local fishermen will be benefited by way of infrastructure support that will help in the improvement of their livelihood practices. Increased fish harvest will create employment opportunities which will improve the socio-economic condition of the local inhabitants. Auction facilities, ice plant and chilled storage will prevent putrefaction of the landed harvest and distress sale and will enable the fishermen to take the price advantage at the auctions through collective bargaining. Better return from sale of fish will improve the earnings of fishermen and thereby the quality of life of the fishing community. Repairing facilities for fishing boats at the harbour, particularly during peak season will be a boon for the fishermen. Apart from some occupational hazards and accidents this phase may also give rise to occupational as well as communicable diseases. However, with the improvement in the sanitary conditions and in health care, much of the health hazards including water borne diseases are expected to be contained. The project will have positive impact on the quality of life of the local fishermen with the improvement in the operational facilities.

4.13 MITIGATION MEASURES

Based on the foregoing analysis of the anticipated impacts, the suggested mitigation measures are discussed in the following paragraphs.

1. Land Environment :

Pre-Construction stage

- Site clearance by the implementing agency shall be carried out in such a way that the recyclable materials are handed over to approved recyclers and inerts are utilized for land fill purposes within and outside the project area.

- The implementing agency shall provide necessary living accommodation with basic sanitation and infrastructure to the labourers as per the requirements of Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.

Construction Phase

- Foreshore and inter-tidal facilities to be set up as per MoEF's CRZ Notification, 2011 and Coastal Zone Management Plan of Andhra Pradesh.
- Earthquake resistant designs to be adapted for construction of structures.
- High rise structures shall be designed to withstand wind speeds upto 250 km/h.
- Minimum land clearance to minimize soil erosion.
- Hazardous materials to be stored following safety standards.
- No new quarry is proposed to be established.
- Levelling of the spoil area shall be made after reclamation.
- Provision of garland drain around spoil area should be made.
- After completion of construction activities, adequate clean-up of the project area including the inter-tidal areas will be undertaken and all discharged/discarded materials will be removed from the site.
- The sub-tidal, inter-tidal, and supra-tidal areas should be restored to their original contours and the aesthetic quality of the surroundings should be restored / improved.

2. Water and Inter-tidal Environment :

Ground Water:

Construction Phase

- Adequate caution while undertaking digging activities to avoid degradation of water bodies and water quality.
- Ground water not to be drawn from deep borewell within the CRZ.
- Rainwater harvesting and recharge will be introduced wherever desirable.

Surface Water

Construction Phase

- Avoidance of activities beyond the specified area of implementation. Various activities should be well coordinated and optimized to avoid time and cost over-run.
- Run-off of fuel / engine oil and lubricants from construction sites will be controlled.
- Temporary colonies of construction workers will be established with adequate sanitation facilities sufficiently away from the HTL.
- Disposal of sewage from the labour colonies shall be through septic tank – soak pit system.

- Contamination of water by dumping/fall/spill of construction materials and debris, fuel and wastes like garbage, municipal solid wastes, littering, shall be prevented through awareness and training programs.
- Dredging shall be carried out using cutter suction dredger. Vessels shall be provided with spill response kits.
- Dredging and construction activities are to be scheduled and executed to minimise disturbance of existing livelihood practices of fishermen.
- Dredged material, other than that used for reclamation, shall be disposed by suction and pumping through pipeline to the sites identified for shore protection and beach nourishment.

Operation Phase

- Sewage generated at different locations will be treated in septic tank – soak pit systems.
- Regular monitoring of the water parameters will be made for review and further control measures, if found necessary.
- Monitoring reports are to be submitted to the statutory authorities at the periodicity specified by them.
- Oil spills from fishing vessels shall be contained and removed/dispersed with appropriate facilities.
- Wash-off from oil handling areas will be directed or conveyed into the effluent treatment plant consisting of bar screen chamber, oil trap, settling unit and clarified water tank.
- Sediment deposition at the training wall shall be cleared at least once in two years.
- Wash-water from auction hall will be sent to the effluent treatment plant consisting of bar screen chamber, oil trap, settling unit and clarified water tank.
- Washed water from the fish auction area will be connected to Effluent Treatment Plant consisting of bar screen chamber, oil trap, settling unit and clarified water tank.
- Surface water, ground water, marine water and discharge effluent quality shall be analysed regularly as detailed in the EMP.

3. Biological Environment

Construction Phase

- Aquatic environment shall be protected during construction phase through waste management and use of minimum disturbance techniques.
- Landscaping and contouring.
- Toilets shall be connected to septic tanks - soak pit system.
- Dredging methodology causing least loss of sediments into the water shall be adopted.
- Dredging shall be avoided during fish breeding season.

Operation Phase

- No untreated discharge of wastes shall be made into the aquatic environment.
- Differently colored and labeled covered vats (100 litre capacity) shall be provided for biodegradable, recyclable and inert waste. Biodegradable waste shall be processed in bio digester, recycle waste shall be handed over to recyclers and inert waste shall be utilized or made available for use as land fill within and outside the project area.

- Wash water from the fish handling and auction areas shall be treated in an Effluent Treatment plant consisting of bar screen chamber, oil trap, settling unit and clarified water tank.
- Spent engine oil and lubricants from the vessels / quays / landing / berthing areas shall be collected and stored in leak proof containers placed inside a roofed shed.
- Accidental catch of endangered marine species, if any, during voyage shall be released under guidance of the Fisheries Department.
- Programmes on awareness for conservation of marine biodiversity shall be organized in association with experts.
- For avoiding trapping of marine turtles in the nets of the trawling MFVs, Turtle Excluder Device (TED) should be installed in them.

4. Air Environment

Construction Phase

- Construction sites shall be enclosed with impermeable sheets or garden nets to prevent dust carry off. Water sprinkling shall be done at vulnerable areas.
- Pollution under control certificate shall be insisted for motor vehicles and relevant machinery.
- Earth and bulk filling materials shall be covered during transportation.
- Persons working close to sources of high emission shall be provided with protective gear such as mask and caps.
- All the DG sets used for construction shall have valid consents from Andhra Pradesh Pollution Control Board and shall have stacks of adequate height.

Operation Phase

- Periodic sprinkling of water on roads shall be done to prevent dust carry off during vehicle movements.
- Air quality monitoring to be done as specified by APPCB.

5. Noise Environment

Construction Phase

- Appropriate measures for minimizing noise from use of mechanical devices will be taken by the implementing agencies /contractors by adopting damping, absorption, dissipation and deflection methods and provision of acoustic enclosures, mufflers, noise sources on isolators, etc.
- DG sets be provided with acoustic enclosures and silencers as per statutory requirements.
- Persons working close to equipments generating high level of noise (85 dB (A)) shall be provided with personal protective equipment such as ear plugs.

Operation Phase

- Air horns Shall be prohibited in the project area. Sounding of horns shall be allowed only in emergency.

- Sound level monitoring shall be done as specified by APPCB.

6. Solid Waste

Construction Phase

- The management measures suggested with reference to biological environment shall be followed.

Operation Phase

- The management measures suggested with reference to biological environment shall be followed.

7. Health and Safety

First aid kits, oil spill response kits, fire extinguishers and fire hydrants shall be provided at requisite locations. Availability of ambulance in case of emergencies shall be ensured.

8. Socio-economic Environment

The project will address the long standing demand of the fishing community. It will have significant positive impact on the fish catch leading to increased income, generation of employment and overall improvement in the economy and environmental health of the region. There will be no displacement of people or loss of land or livelihood of the local population. The project site is free of any historical landmarks / archaeological sites.

9. Harbour Administration

The harbour authorities shall monitor the operational performance of the various mitigation measures implemented in the project. This shall include overall hygiene practices of the fishing harbour, performance of wastewater treatment plant, impacts due to dredging material dumping, maintenance of greenery, quality of creek and sea water and sediment quality. In addition to the above, measures such as the following shall be taken at the stage of Detailed Tendering Process.

- Use of lead free paints in the fishing harbour area
- Maximum use of renewable energy (like solar lights etc.)
- Use of Eco-friendly material for construction (eg. RMC)

CHAPTER – V

RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

ANNEXURE – V

Full title of the Project: Proposal for diversion of 0.99 Ha. Forest land in Compt. No. 4 of Nizampatnam RF, Repalle Range, Guntur Division & District of Andhra Pradesh for extension of Quay / Jetty of existing Nizampatnam Fishery Harbour during Phase-II development.

UNDERTAKING FOR PAYMENT OF

COST OF PLANTATION

I, **Sri. S. Shan Mohan, IAS., Managing Director, APMIDCL,** hereby undertake on behalf of the AP Maritime Infrastructure Development Corporation Limited, Government of Andhra Pradesh to pay the entire amount towards **"Cost of plantation (including ten years maintenance) of ten times the number of trees likely to be felled or specified number of trees as may be specified in the order for diversion of forest land (subject to a minimum no. of 100 plants)",** in lieu of the diversion of 0.99 Ha. Forest land in Compt. No. 4 of Nizampatnam RF of Guntur Forest Division for extension of Quay / Jetty of existing Nizampatnam Fishery Harbour, as per the prevailing wage rates at the time of undertaking the plantation activities.

Signature of the User Agency

28/6/22

Place: Vijayawada

Designation

MANAGING DIRECTOR
APMIDCL, VIJAYAWADA.

Date: 28.06.2022

Seal

ANDHRA PRADESH MARITIME INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. ★ VIJAYAWADA