

Executive Summary

**ENVIRONMENT IMPACT ASSESSMENT REPORT
FOR IMPROVING THE CAPACITY UTILIZATION OF
OR 1 AND OR 2 BERTHS
AT VISAKHAPATANAM PORT TRUST**



Prepared for

VISAKHAPATNAM PORT TRUST

Prepared by



Environmental Consultancy and Laboratory

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1.0 PROJECT DESCRIPTION

The Visakhapatnam Port, one among the thirteen Major Ports of India, is an all weather natural Port and the fastest growing maritime gateway to the peninsular India. The Port is located on the East Coast of India in between Chennai and Kolkata at a latitude of 17 0 42' 00" North and longitude of 83 0 23' 00" East Visakhapatnam Port, a premier port of our country situated in the state of Andhra Pradesh India has been handling large volumes of cargoes and has been in the first position among all the major port of our country successively during the year's 2001 to 2007.

The Port comprises of Inner harbour (a natural harbour within Mehadri Gedda River), Outer Harbour (an artificial harbour at the mouth of the Mehadri Gedda River) and Fishing Harbour (an artificial harbour catering exclusively to fishing vessels). Outer Harbour with a water spread of 200 hectares (ha) has 6 berths is capable of handling ships up to 200,000 DWT and draft up to 18.1 meters. Inner Harbour, with a water spread of 100 ha has 18 berths capable of accommodating fully laden Panamax vessels with draft up to 14.5 meters, with tide advantage. At present Inner Harbour is capable of handling vessels of up to 12.5 m draft. In order to meet the requirements of cargo carriers and increase the cargo handling capacity of Visakhapatnam Port, the approach channel and turning circle of Inner Harbour are being deepened to cater to fully loaded Panamax Vessels with a draft of up to 14.0 m.

The existing OR I – OR II berths, located in the Western part of Inner Harbour, were constructed in 1957 and are of monolithic construction. The available draft at these berths is 10.5 m at present. They have outlived their useful life (fixed as 50 years by the Ministry of Shipping, Govt. of India). It is proposed to construct a additional oil berth of length 180 m in between fertilizer berth and OR-II.

The existing berths will be demolished and reconstruction of new OR-I and OR-II with facilities. Construction of protection wall with length of 30m shall be constructed at end of OR-I berth on seas side.

Widening of western arm channel by 12 m along the alignment of the proposed new development. Increase the dredge depth from (-)10.70m to (-) 16.10m. The project will be implemented in two phases, each phase The construction of additional berth between the OR-II and fertilizer berth shall be executed in stage 1, After completion of the new additional berth,

the dismantling and reconstruction of OR-I commences with additional berth length of 60 m which is followed by OR-II.

OR-II will be decommissioned and dismantled after completion of additional berth and new OR-I. The new development will have a dredge depth of -16.1 m to handle higher capacity vessels of upto 85,000 DWT with maximum draft of -14.5m. The proposed project does not envisage any land acquisition. The existing berths have hardly any vegetation and hence the proposed project shall not involve any tree felling. At present the existing berths are handling Naphtha,MS,SRO,AIT,HSD,LDO,FO,LSHS,MS,HSD.

<p>Proposal</p>	<ul style="list-style-type: none"> • The construction of additional berth between the OR-II and fertilizer berth shall be executed in stage 1 of development plan as desired by VPT management. • After completion of the new additional berth, the dismantling and reconstruction of OR-I commences with additional berth length of 60 m which is followed by OR-II. • OR-II will be decommissioned and dismantled after completion of additional berth and new OR-I. • Protection wall with length of 30m shall be constructed at end of OR-I berth on east side. • The proposed development is planned to operate one handymax and one Panamax vessel as per the suggestion of Joint Director. So the length of additional berth is required as 180m. Overall length of proposed berth is 606m. • [OR-I + Extension of OR-I + OR-II + Additional berth (ie.183+60+183+180=606m)] • The new development will have a dredge depth of -16.1 m to handle higher capacity vessels of upto 85,000 DWT with maximum draft of -14.5m.
<p>Location of Project</p>	<p>Inner Harbour of Visakhapatnam Port located within Visakhapatnam city, Andhra Pradesh (on western shore of Bay of Bengal)</p>

Latitude	Visakhapatnam Port: 17° 40' 44" N (southernmost point of the outer breakwater) to 17° 43' 35" N (northern-most point of the port's railway R & D Yard) Proposed Project : 17° 41' 39.4" N
Longitude	Visakhapatnam Port: 83° 18' 41.5" E (eastern-most part of the outer breakwater) to 83° 15' 45" E (westernmost part of the Naval Dockyard). Proposed Project : 83° 16' 27.2" E
Land Use	Existing concrete quays within active major port
Capacity	The proposed OR-I&OR-II , when fully operational, is expected to handle 9.81 MTPA (Mt/yr) of cargo throughput able to handle one panamax size and one handymax size vessel at a time retaining the cargo share of western arm
Type of Construction	T Diaphragm Wall with Rectangular Anchor Pile and One Row of Bored Cast-In-Situ Piles (designed by Department of Ocean Engineering, I.I.T., Chennai)
Waste Generation	Berth demolition wastes (comprising blocks of steel reinforced concrete) and dredge spoils. Sludge, garbage and other solid & other liquid wastes may be discharged from ships
Waste Disposal	Berth demolition wastes will be dumped in low lying area in western part of the port. Dredge spoils will be dumped far offshore in area identified by Central Water and Power Research Station, Khadakvasla. Wastes discharged from ships will be handed over to the port's licensed contractors who have appropriate waste handling and disposal facilities
Proposed Investment	Rs.193.3 Crores

2.0 DESCRIPTION OF THE ENVIRONMENT

The study area lies in tropical region where climate is characterised by very hot summers and mild winters. During the Summer Season months the predominant wind directions are South-west, south and West, prevailing for 49.2%, 20.1%, 10% and of the time respectively whereas Calm prevailed 8.3% of the time.

Baseline environmental data generation was carried out during full summer season, 2017 covering March, April and May. Primary data was also augmented by data from secondary sources. The baseline environmental data generation covered micro-meteorology, land use, air quality, water quality, noise levels, soil quality, ecology, traffic density and socio-economic environment. Information on physical oceanographic conditions, climate and population were collected from secondary sources.

Micro-Meteorology

The mean annual rainfall is 968.8 mm (average of 52.0 rainy days per year). The South-west monsoon lasts from June to October and the area gets ~78.5% during this period. October is wettest month (mean monthly rainfall of 204.3 mm; 8.7 rainy days), followed by September (174.8 mm, 9.9 rainy days) and August (141.2 mm; 9.3 rainy days).

The humidity is comparatively high and fairly uniform throughout the year. The mean daily relative humidity over a year is about 76% at 0800 hrs and 72% at 1700 hrs. The highest recorded value is 81% and lowest recorded value is 64%.

The predominant direction of wind is south-west or north-east depending on the monsoon season. The south-west monsoon winds are relatively stronger than the north-east winds.

The annual mean maximum temperature is 30°C and the annual mean minimum temperature is 24.3°C.

Land Use

Mapping of land use and land cover was carried out for the proposed site using remote sensing satellite data. LANDSAT-8 cloud free data has been used for land use / land cover of the study area (10 km radius from the proposed site).

The overall land use of 10 km radius area shows that water bodies dominate with the Bay of Bengal which constituting 35.3% of the total. Visakhapatnam is a highly populated place hence the built-up land occupies 19.83% in the study region. Other land uses include open scrub (18.45%), vegetation (12.13%), open land (9.27%), Current Fallow (4.43%), sandy region and rocky region (0.36% and 0.23%) respectively.

Air Quality

Ambient air quality was monitored at Ten locations (Old Post Office, Fishing Harbour, Poorna Market, MVP Colony, Kailasapuram, Kakaninagar, Mindi, Sriharipuram, pedagantyada and

project site). Samples were collected for Particulate Matter (PM10& PM2.5), Sulphur-di-oxide (SO₂) and Oxides of Nitrogen (NO_x) 24 hours continuously twice a week for twelve weeks at each location. Samples of Carbon Monoxide (CO) collected for at each location. The results were compared with the National Ambient Air Quality Standards, 2009 for “Industrial, Residential, Rural and Other Areas”. All the values are within norms .

Water Quality

Water quality monitoring was carried out at 9 locations in which Surface water (3 locations Air port channel, Dockyard canal, Mudasarlova Lake) and ground water covered (6 locations Old post office, poorna market, Port staff colony, Kailasapuram, Kakani nagar and Sriharipuram). The results of surface and ground water analysis were compared with the standards for drinking water [IS:10500 (as amended in 2012)].

Noise levels

Ambient noise levels were monitored for 24 hours at 10 locations (10 locations where ambient air quality monitoring was carried out). Day time noise levels at the locations where ambient air quality had also been monitored, were within the norms for Industrial Areas. It is to be noted that Visakhapatnam is a major city with a lot of commercial and industrial activities and people are active from early morning to late night Work zone noise was monitored at three locations at hourly intervals for eight hours. The noise exposure levels did not exceed the limits

Ecology

The project site is operating berth within the port. The only plants growing at the project site are few saplings subabul trees (*Leucaena leucocephala*) Peepal (*Ficus religiosa*) and banyan (*Ficus bengalensis*).

Most of the study area is urban (Visakhapatnam city). However there are some forested hills within the study area. The southern boundary of the Kambalakonda Wildlife Sanctuary is located about 9 km northeast of the project site.

Most of the flora are of tropical type with wide range of distribution. Endemic species were not encountered so far. A good number of exotics were also naturalized in the local flora. In general most of the cultivated species were not included in the checklist. They were listed under agriculture. A separate list of medical plants is also given.

Socio-Economics

The total population of the Visakhapatnam District as per 2011 census is about 43 lakhs and Density of population is 384 persons per square Kilometer, of which about 4.45% comprises of children below the age of 6 years.

Socio-economic study was carried out by studying Census (2011) Records and by sample survey in nearby residential areas. The population within the study area is about 15.84 lakhs. The sex ratio is ~977.5 females per 1000 males. The literacy rate is about 74%. Majority of the people directly or indirectly derive their income from industries, services, commerce and allied activities. From a sample survey amongst the local residents, it was indicated that the major portion of consumption (30.3%) goes to meet the need for food items. This is followed by educational expenses (10.4%) other expenditures (8.5%). Average expenditure on education is found to be quite high compared many other Indian states (10.4%). About 34.1% of the income is saved.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS

Impacts on Air

The major impacts on ambient air will be during demolition and construction phases. During demolition phase considerable amount of dust will arise from the site. Dust arising from the construction activities as well as gaseous pollutants from vehicles used for transportation of construction materials and emission from the equipment used during construction phase.

The impacts on the environment generated during construction phase will be limited to the construction tenure and will be local.

The predicted average PM10 concentrations with baseline BAU from the project will be slightly above the standards. The excess will be controlled through water spraying and sight barricading. There will be minimal impact during construction phase of the said project. Whereas negligible impacts have to be maintained so as to control shock load and intern to keep the air quality pollutant free.

Impacts on Noise Levels

The major Impact on noise level of the proposed project, during the construction phase, is envisaged due to the noise generation by the operation of the machineries, equipment and some

mechanical works. There are many equipments and machineries likely to be used during the construction. These would be mainly Dozers, Cranes, Trailers, Trucks, and Generators etc. It is envisaged that noise level due to these equipments will be 70-85 dB (A) at receptor point at associated work/construction area. The impacts due to noise of these equipments will be confined to project site and construction period only.

Impacts on Seawater

The proposed berth development does not involve excavations, however, driving of piles and construction of jetty will create disturbance of bed sediment and dispersion of fine sediment in the water column. Impacts envisaged on marine water quality due to construction activities will be localized and reversible.

Construction activities will pose impact on the biota in the pile-footprint areas of berth. Project site does not sustain seaweeds or mangroves. Hence, no further impacts on marine macrophytes are envisaged. Primary production in this region is moderate and reduction in productivity will be confined to a small segment of the marine zone due to construction activities. There is possibility of biota getting exposed to pollutants released from sediment as dredging will be carried out at the berth site. Dredged spoil will be disposed at pre-designated site of Visakhapatnam Port.

Considering the size of the project, the construction material and machinery movement to the site would be limited. However, increased traffic may create some congestion during the construction phase. Pressure on public amenities like drinking water and sanitation is also envisaged to be limited during construction. This project being defense-related the interaction with the social bodies would be minor during the operation phase.

Solid and liquid waste generation

The wastes generated on account of demolition of the existing berths will be primarily steel reinforced concrete. These wastes will be dumped in a low lying area located in the western region of the port premises, which has been specially earmarked for dumping of construction wastes. Maintenance dredging is also carried out to maintain the necessary draft.

Dredge spoils are dumped ~4 km offshore over a 2.6 km² area. The dredge spoil dumping area has been identified by Central Water and Power Research Station, Pune. The dredge spoil

dumping area is 1.45 km from the approach channel to the Port. Studies have indicated that the dumped spoil are likely to move south west. The bathymetry of the spoil dumping area is unlikely to be affected. Municipal solid waste generated during construction and operational phases shall be segregated on site and disposed according to standard regulations. Waste water generated during operational phase, shall be treated in STP and treated water shall be used for green cover. Accidental spillage of fuel oil and lubricants, if occurs, shall be collected and disposed to authorized recyclers.

Fishing activity and likely impact on the Fishing

The nearest fishing activity is fairly away from the port site. Terminal Facility construction will not disrupt fishing in the vicinity in which they are being carried out but these operations are for a short duration and only affect a small part of the long coast available to fishermen at any one time.

4.0 ADDITIONAL STUDIES

CRZ Demarcation

Coastal Regulation Zone (CRZ) demarcation was carried out by Institute of Remote Sensing, Anna University, Chennai which is one of the eight agencies authorized by MoEFCC for undertaking such studies.

Sediment Transport Modeling

The investigation at Vishakhapatnam Port was carried out by Bhabha Atomic Research Center to investigate the suitability of a proposed disposal site for dredged sediment. The investigation showed that the general direction of movement of sediment is predominantly towards south-west direction.

Oil Spill Contingency Response Plan

Oil Spill contingency response plan for combating oil pollution is prepared by Process Safety Centre (PROSAC) IICT, Hyderabad, which is yet to be finalized.

Oil spill though rare is a possibility during bunkering and ship accidents such as collision and grounding of vessels. Hence, the oil spill scenario will be considered as Tier 1 (less than 700

tons). Proposed jetty location falls within the port limit of the Visakhapatnam Port Trust hence, oil spill at OR1&OR2 if occurs, will be combated as per the prevailing Oil Spill Contingency Response Plan of the Visakhapatnam Port Trust. The operationalisation of the Contingency plan for combating oil pollution off the coast of Visakhapatnam is the responsibility of Deputy Conservator (Alternate Harbour Master) - VPT acts as Chairman of Pollution Management Cell (PMC) / Crisis Management Group (CMG) and On-Scene Commander (OSC), of Visakhapatnam Port Trust.

Risk Assessment

The possible risks during operation of a port are accidents during berthing or unberthing of ships, accidents involving other marine craft, fire (oil, LPG, natural gas) & explosion, spillage of oil & other hazardous chemicals (including gases such as ammonia), exposure to fumes /gases (spilled cargo or generated from fire), accidents during material handling and natural disasters.

National Environmental Engineering Research Institute (NEERI), Nagpur – laboratory under the Council for Scientific and Industrial Research (CSIR) was assigned the task of “Preparation and Updation of Crisis / Disaster Management Plan for Visakhapatnam Port Trust”. NEERI submitted their final report in July, 2014.

All necessary precautionary measures are undertaken during various operations to prevent accidents. In case of any accidents or disasters (either man-made or natural), the port’s disaster control organisation takes charge. If necessary, help is sought from the civil administration, Indian Navy, Indian Coast Guard and other nearby industries. Mock drills are periodically conducted to inculcate port personnel about their roles in case of any accidents / disasters.

5.0 ENVIRONMENTAL MONITORING AND MANAGEMENT

VPT has a dedicated Environmental Department at its Head Office. It is headed by the Executive Engineer (Environment), who reports to the Dy. Chief Engineer, who in turn reports to the Chief Engineer. There are five sub-divisions under the Executive Engineer (Environment). Each Sub-Division has one Assistant Engineer and two Junior Engineers. One Manager (Env) is recruited specially to look after all the environment issue in the port. All the Asst. Engineers and the Junior Engineers are either civil engineers or environmental engineers.

There is also an Officer on Special Duty (OSD), Agriculture for planning and implementation of green belt and plantation development works

The Chief Engineer's Department is responsible. The Materials Management Department is responsible for dust suppression operations and collection of iron ore spilled at the material transfer points on the conveyors (the collected ore put back into the system), disposal of oil sludge, unusable oil & lubricants and unserviceable equipment & scrap. The Deputy Conservator's Office is responsible for prevention & tackling of marine pollution and safety during various operations at the port.

In addition VPT has an Environmental Task Force headed by the Deputy Traffic Manager to monitor environmental performance. The Environmental Task Force has 10 members whose duty is to patrol the port area round the clock. The Environmental Task Force submits daily reports to the Chairman and the Deputy Chairman of VPT as well as to all Department Heads for necessary immediate corrective action as required.

An Environmental Monitoring Committee (EMC) headed by Prof. P.V.V. Prasada Rao, Deptt. of Environmental Sciences, Andhra University is in place with members representing Citizen Welfare Associations, NGOs, Academic Institutions, Industries/Defense, Trade, Observers from APPCB, Government Organisations and Senior Officers of the Port. The Committee reviews the implementation of long term and short term directives issued by APPCB and environmental activities to be implemented by the Port. The Committee also inspects various operational areas of the Port and advises improvements on the environmental activities carried out and gives suggestions for additional pollution mitigation measures as may be necessary from time to time. Three Sub-Committees have been constituted to review and monitor Ambient Air Quality, Green Belt Development and Hazard Management. The EMC reviews the findings of the Sub-Committees and advises suitably.

For successful implementation of the environmental management plan other agencies of the State may also be involved by the port if required (for regulatory requirement or technical support).

6.0 BENEFITS OF THE PROJECT

The existing OR I&OR II berths were constructed during the early 1957 s and have outlived their designed lives. Industrial development in Visakhapatnam Port's hinterland has also increased the quantum and diversity of cargo being handled at the port. Hence it has become necessary to replace the existing berths and associated cargo handling infrastructure to efficiently handle bigger ships and greater diversity of cargo ensuring maximum possible utilisation of all facilities.

The availability of channel width is inadequate to handle higher capacity vessels and therefore the berthing line of the proposed new structure has been offset by 12m towards the pipeline. The existing OR-I & OR-II are to be completely dismantled and new structure of width 15m will be constructed.

The current share of western arm POL handling facility (OR-1& OR-II) is about 26% of the total POL volumes of 14.6 MTPA handled at VPT. The improvement in the capacity utilization of OR-I & OR-II will result a new 606 m facility with 9.81 MTPA throughput able to handle one panamax size and one handymax size vessel at a time retaining the cargo share of western arm.

Because the proposed project is being designed to handle a greater capacity ships , utilization of the facilities will be more, leading to higher efficiency of the port. Pre-berthing delays and turn-around time of ships are likely to decrease.

The proposed project will reduce release of pollutants to the environment on account of change and deployment of modern capacity cargo handling equipment with lower specific resource consumption and improved pollution control systems.

Visakhapatnam Port Trust (VPT) will continue undertaking peripheral development as part of its CSR programme, which will benefit Visakhapatnam's residents.