

# **EC COMPLIANCE REPORT-5**

(October 2018 to March 2019)

## **NEW DRY DOCK PROJECT AT COCHIN SHIPYARD LIMITED, KOCHI**



## Enclosure-1

## MONITORING REPORT – PROFORMA – PART I

File No: INFRA/NDD/812/15


Ref Letter No: INFRA/NDD/812/15

Date: May 2019

1	Name of the project	New Dry Dock Facility by Cochin Shipyard Ltd.
2	Clearance letter No. & date	Environmental Clearance (EC) letter No.10-9/2015-IA-III dated 09 Nov 2016.
3	Location : District & State / UT	Ernakulam, Kerala Latitude : 09° 57' 37.0488" N Longitude : 76° 17' 05.4458" E
4	Address for correspondence:	Shri. A N Neelakandhan Occupier-Environment (Protection) Act 1986 Cochin Shipyard Limited, Perumanoor P O ,Kochi-682015 Ph: +91 484 2501360 Fax: +91 484 2370897 Email: <a href="mailto:gmmat@cochinshipyard.com">gmmat@cochinshipyard.com</a>
5	Contact No. of Office with name of responsible official	Shri. Eldho John General Manager (Infra Projects) Infra Projects Department, Cochin Shipyard Limited, Perumanoor P O ,Kochi-682015 Ph: +91 484 2501913 Fax: +91 484 2370897 Email: <a href="mailto:eldho.john@cochinshipyard.com">eldho.john@cochinshipyard.com</a>
6	Mobile No. of concerned officials associated with monitoring	1. Shri. Mohammed Gazel P A Senior Manager (Infra Projects) Infra Projects Department Cochin Shipyard Limited, Mob: +91 9895705124 Email: <a href="mailto:m.gazel@cochinshipyard.com">m.gazel@cochinshipyard.com</a>  2. Shri. Vulli Haranath DGM (Infra Projects) Infra Projects Department Cochin Shipyard Limited, Mob: +91 8138001150 Email: <a href="mailto:vulli.haranath@cochinshipyard.com">vulli.haranath@cochinshipyard.com</a>
7	a) Project cost as originally planned and subsequent revised estimates and the years of price reference	Cost Estimate ( DPR stage)- 1799 Crores, year 2016
	b) Allocations made for environmental management plans, with item wise and year wise breakup	Contaminated Water Treatment Plant- 15.406 Crores Green Belt Development- 13.93 lakhs



8	a) Actual expenditure incurred on the project so far	Rs. 296.66 Crores as on 31 March 2019
	b) Actual expenditure incurred on the environmental management plans so far.	Rs. 4,64,333/- as on 30 Sep 2018 ( paid to Social Forestry Division of Kerala Forest Department for green belt development)
9	Date of commencement (actual and/or planned)	Planned & Actual: June 2018
10	Date of completion (actual and/or planned)	Planned: June 2021
11	Validity of CFO	Consent to Establish from Kerala State Pollution Control Board (Consent No.PCB/HO/ EKM-1/ICE/ 24/2016 dated 19/12/2016) valid up to 17 May 2019.
12	Reasons for the delay if the project is yet to start	
13	Present status of the project:	Construction contract awarded to M/s Larsen & Toubro Ltd, Construction, Heavy Civil Infrastructure, Chennai on 27 April 2018. Construction works commenced on 01 June 2018. Ground improvement works and RCC piling in progress. Physical progress of the works is 8.5 %.  Purchase order for 600T Gantry issued to M/s Hyundai Samho Heavy Industries Co., Ltd., South Korea on 14 March 2019.
14	E-mail ID of the contact person to whom communications to be sent	<a href="mailto:gmmat@cochinshipyard.com">gmmat@cochinshipyard.com</a> with copy to: 1) <a href="mailto:eldho.john@cochinshipyard.com">eldho.john@cochinshipyard.com</a> 2) <a href="mailto:m.gazel@cochinshipyard.com">m.gazel@cochinshipyard.com</a>
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 General Manager (Infra Projects)  
 Cochin Shipyard Limited





## NEW DRY DOCK PROJECT AT COCHIN SHIPYARD LTD.

## EC COMPLIANCE STATUS – October 2018 to March 2019

SL No.	Conditions	Compliance Status as on 31 March 2019
<b>A. SPECIFIC CONDITIONS</b>		
i	Consent for Establishment shall be obtained from State Pollution Control Board under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.	<b>Complied.</b> KSPCB had issued Consent to Establish (ConsentNo.PCB/HO/EKM-1/ICE/24/2016 dated 19/12/2016) for dry dock project.
ii	Construction activity shall be carried out strictly according to the provisions of CRZ Notification, 2011. No construction work other than those permitted in Coastal Regulation Zone Notification shall be carried out in Coastal Regulation Zone area.	CSL ensures that no construction work other than those mentioned in approved layout will be carried out.
iii	The environmental clearance is subject to obtaining prior clearance for Wildlife from the Standing Committee of the National Board for Wildlife.	<b>Complied.</b> Standing Committee of NBWL has cleared the project in its meeting held on 02 Mar 2017.
iv	All the recommendations and conditions specified by Kerala Coastal Zone Management Authority vide letter no.4232/A2/KCZMA/S&TD dated 18th August, 2016 shall be complied with.	<b>Complied.</b> Kerala Coastal Zone Management Authority (KCZMA) has recommended the project without any specific conditions. All requirements as per CRZ Notification will be complied during construction and Operation.
v	The project proponent shall ensure that there shall be no damage to the existing mangroves patches near site and also ensure the free flow of water to avoid damage to the mangroves.	<b>Complied.</b> There are no mangroves near site.
vi	The project proponents shall ensure that no creeks or rivers are blocked due to any activities at the project site and free flow of water is maintained.	<b>Complied.</b> Mathematical modeling study was conducted by CWPRS, Pune. CWPRS report states that the development of proposed new dry dock at CSL on north side of existing quay wall will not hamper functioning of various waterfront facilities in the Ernakulam channel and hence may be constructed."





vii	Shorelines should not be disturbed due to dumping. Periodical study on shore line changes shall be conducted and mitigation carried out, if necessary. The details shall be submitted along with the six monthly monitoring reports.	Noted and incorporated in the Environmental Management Plan for its compliance.
viii	Since Ernakulam Channel ultimately meets the sea and the discharge is planned to conform to marine quality standards, the project proponent shall get a marine biodiversity management plan prepared from the NIOS or any other marine biology specialist institution and implement the same. The plan should safeguard the biodiversity of the channel as also the biodiversity impacts as a result of confluence with the sea.	CSIR-NIO had prepared "Environmental and Biodiversity Management Plan for Conservation of Marine Ecology due to the proposed Dry Dock Facility at Cochin Shipyard Ltd" and submitted on 21 March 2017. CSL will strictly follow the Marine Biodiversity management plan prepared by NIO.
ix	The ground water shall not be tapped within CRZ areas by the PP to meet with the water requirement in any case.	Ground water will not be extracted for any construction activity.
x	Well designed drainage system shall be provided to dewater the dock while excavation. As proposed, extracted water will be released in to the sea after necessary treatment. CGWB permission shall be obtained for dewatering the dock during construction.	<b>Complied.</b> A joint team of CGWB and Ground Water Department, Kerala inspected the site on 01 April 2017 and submitted their report to State Ground Water Authority, Kerala. Secretary, Water Resource Department, Kerala has issued "No objection Certificate" for Construction of dry dock and dewatering vide letter No.GW1/296/2017-WRD dated 18 July 2017. Well designed drainage system will be provided to dewater the dock while excavation. Extracted water will be released in to the sea only after necessary treatment
xi	Shrouding shall be carried out in the work site enclosing the dock area. This will act as dust curtain as well achieving zero dust discharge from the site. These curtain or shroud will be immensely effective in restricting disturbance from wind in affecting the dry dock operations, preventing waste dispersion, improving working conditions through provision of shade for the workers.	Galvalume sheets erected upto height of 10 M in north and east boundaries. <b>Photo attached.</b>
xii	Dust collectors shall be deployed in all areas where blasting (surface cleaning ) and painting operations are to be carried out , supplemented by stacks for effective dispersion.	Will be implemented during operation of the dock as well as construction phase.



xiii	The work space shall be maintained as per international standards for occupational health and safety with provision of fresh air respirators, blowers, and fans to prevent any accumulation and inhalation of undesirable levels of pollutants including VOCs.	Noted and incorporated in the Environmental Management Plan for its compliance.
xiv	The diesel generators (of capacity 250 KVA) shall be used as back-up power supply and shall be run only during power cuts. Low sulphur content fuel will be used for the generators and will be subjected to periodical maintenance and servicing. This will cut down on emission volume to a considerable extent. Also, the DG sets will be provided with mufflers for pollutant emission control.	Noted and incorporated in the Environmental Management Plan for its compliance.
xv	Necessary arrangements for the treatments of the effluents and solid wastes must be made and it must be ensured that they conform to the standards laid down by the competent authorities including the Central or State Pollution Control Board and under the environment (protection) Act, 1986.	Will be ensured by the proposed Contaminated Water Treatment Plant.
xvi	All measures shall be taken during the excavation activity as deemed necessary from the geotechnical investigation of the soil and ground water profile.	Noted and will be complied.
xvii	Construction activity related wastes (C & D waste) shall be disposed off as per Solid waste management rule, 2016..	Noted and incorporated in the Environmental Management Plan for its compliance.
xviii	All such solid and hazardous wastes including onboard wastes (while ships dock at the site) will be handled as per the Hazardous and other wastes (Management and Trans boundary Movement) Rules , 2016	Will be ensured during operation phase.
xix	Silt curtains shall be used to contain the spreading of suspended sediment during dredging within the dredging area.	Noted and incorporated in the Environmental Management Plan for its compliance.





xx	The dredging schedule shall be so planned that the turbidity developed is dispersed soon enough to prevent any stress on the fish population.	Will be ensured during operation phase. During construction phase, Construction of Cofferdam will facilitate excavation rather than dredging in the area of dock protruded to channel. CSL will strictly follow the Bio Diversity management plan for the project prepared by CSIR-NIO.
xxi	Earth protection work shall be carried out to avoid erosion of soil from the shore line / boundary line from the land area into the marine water body.	Quay walls will be constructed in the whole area of project site.
xxii	No ships docking at the proposed project site will discharge its on-board waste water untreated into the estuary/channel. All such waste water load will be diverted to the proposed Contaminated Water Treatment Plant of the project site.	Will be ensured by the proposed Contaminated Water Treatment Plant during operation phase.
xxiii	All effluent generated in the dry dock shall be drained into the proposed on site contaminated water treatment plant (CWTP) having capacity 500 KLD and equipped to treat the effluent into dischargeable standards. The oil water separator of the CWTP shall remove any unwanted oil and grease content from the effluent. The CWTP shall be equipped to treat such effluent including the bilge water and other ship discharger to meet the general standards for discharge of effluent in marine coastal areas before disposal into the channel. Ballast water from ships shall be stored at the facility and will be used in refilling of same before release of ships back into water. Sewage shall be treated in the STP.	Will be ensured by the proposed Contaminated Water Treatment Plant and sewage treatment plant
xxiv	Through the proposed project will not use TBT containing paints yet the ships docking for repair may have existing TBT paint layer. So blasting operations (surface cleaning ) shall be extremely controlled and contained within the work site ensuring all accumulated solid waste and effluent are given standard treatments. The effluent / dock flow shall be drained to the CWTP while the solid/hazardous wastes shall be contained temporarily in the site and timely disposed of through the CTSDF.	Will be ensured by the proposed Contaminated Water Treatment Plant and collection system



xxv	Workers shall be strictly enforced to wear personal protective equipments like dust mask, ear muffs or ear plugs, whenever and whenever necessary/required. Special visco-elastic gloves will be used by labour exposed to hazards from vibrations.	CSL will ensure strict compliance. PPE's like safety helmets, safety harness, safety shoes, goggles, dust mask, ear muffs or ear plugs as applicable are strictly enforced for workers during construction.
xxvi	In case of repair of any old vessels, excessive care shall be taken while handling asbestos and freon gas. Besides, fully enclosed covering should be provided for the temporary storage of asbestos material at site before disposal to CTSDf.	Will be ensured during operation phase. Storage facility shall be installed before commissioning of the dock.
xxvii	Safety training shall be given to all workers specific to their work area and every worker and employee will be engaged in fire hazard awareness training and mock drills which will be conducted regularly. All standard safety and occupational hazard measure shall be implemented and monitored by the concerned officials to prevent the occurrence of untoward incidents/accidents.	Noted and incorporated in the Environmental Management Plan for its compliance.
xxviii	The commitments made during the Public Hearing and recorded in the minutes shall be complied with letter and spirit. A hard copy of the action taken shall be submitted to the Ministry.	Action being taken to fulfill the responses/ Commitments made during public hearing
xxviii.a	Unscientific Dredging activities in Ernakulam Channel by Naval Base, Vallarpadam Terminal and Cochin Shipyard Ltd. Results, Vembanad Lake near Thevara area filled with the alluvial soil which leads to the encroachment and decline of fish diversity	<b>Complied.</b> Fishing is prohibited in the Ernakulam Channel area near project site and there is no technical possibility that alluvial soil accumulation at Vembanad Lake due to the dredging activities by CSL, as depth of the backwater in the shipyard area is much more than that at Thevara area. Also CSL has conducted mathematical modelling for the sediment deposition and other necessary study for dredging activity at Ernakulam Channel. As per the CWPRS study, the new dry dock project does not introduce any changes in siltation/ deposition rate/water current strength at water front facilities nearby





xxviii.b	Construction of Public toilets outside Cochin Shipyard considering the number of labours	In line with public hearing, 3 toilets for public is being constructed as part of CSR activities. <b>Photo attached.</b>
xxviii.c	Widening of Old Thevara road by CSL	Feasibility of widening of old Thevara road will be explored. However beautification programme will be implemented in the applicable area of Old Thevara Road. Beautification of MG road along CSL boundary being done. <b>Photo attached.</b>
xxviii.d	Provision of parking facilities for employees	A receiving area is earmarked inside the project area, so as to avoid traffic issues in the approaching public road. Parking facility for 100 two wheelers parking and 10 Four wheelers. <b>Photos attached.</b>
xxviii.e	To be ensured of Greenbelt Development & septage disposal for the proposed project.	Work order for development of green belt has been awarded to Social Forestry Department, Kerala Government. Green belt development plan has been prepared in inline with EIA/EMP report, EC letter and conditions of CTE. Social forestry has commenced the planting of saplings at 3 locations in Ernakulam district for block planting of 1300 saplings .Planting of saplings in project boundary can be started only after the completion of civil works in that area.  Septage waste will be collected by Contractor hired by CSL. Disposal of waste in surrounding areas shall be strictly prohibited.
xxviii.f	Provision of LNG facilities to the nearby residents if LNG pipe line is provided to the Cochin Shipyard Ltd	<b>Complied</b> CSL had clarified that they had not mentioned about the LNG pipeline in the Public Hearing presentation, it is regarding the building of LNG carrier. There will not be any provision of LNG pipeline in the proposed new dry dock project.
xxviii.g	Employment and more job opportunities to the fishermen community.	People from local area shall be employed as far as possible during construction phase.
xxviii.h	Primary need of employees like emergency preparedness plan in case of any accident, etc.	On-site emergency plan has been prepared by contractor for the safety of the working employees. Contractor has provided Ambulance facility and availability of duty nurse at project site. Please see the <b>photos attached.</b>  Contractor has provided required number of toilets at project site. <b>Photos attached</b>





xxviii.i	To conduct scientific study for diverting the docking water to the canals/sewers in the city to reduce the mosquito in the Corporation Area.	Dock water shall be treated in CWTP and discharge into nearby surface water after proper treatment with approved standards. It is not technically feasible to divert treated water line to the canals/sewers in the city for reduction of mosquitoes.
xxix	The project proponent shall take up and earmark adequate fund for socio-economic development and welfare measures as proposed under the CSR Programme. This shall be taken upon priority.	In line with public hearing, 3 toilets for public is being constructed as part of CSR activities.
xxx	The project proponent shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.	A separate Environmental Management Cell (EMC) is constituted for dealing with Environmental issues and for ensuring compliance with the environmental clearance conditions for Dry dock project.
xxxi	The funds earmarked for environment management plan shall be included in the budget and this shall not be diverted for any other purposes.	Fund for EMP is included total project cost. CSL confirms that the budget as per EIA report will not be diverted for any other purposes.
xxxii	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.	Contractor's EHS Plan and Environment Management Plan are prepared in line with EIA/EMP report, EC letter and conditions of CTE. CSL will ensure strict compliance.
xxxiii	Company shall prepare operating manual in respect of all activities. It shall cover all safety and environment related issues and system. Measure to be taken for protection. One set of environmental manual shall be made available at the project site. Awareness shall be created at each level of the management. All the schedules and results of environmental monitoring shall be available at the project site office.	Dry dock project is extension of existing facilities. All the activities are similar to the activities in existing docks. So the SOPs for existing facilities will be extended for the new dry dock.
xxxiv	Corporate Social Responsibility :	
xxxiv.a	The company shall have a well laid down Environment Policy approved by the Board of Directors.	<b>Complied.</b> CSL has certified for ISO 9001:2008, ISO14001:2004 and OHSAS 18001:2007.





xxxiv.b	The Environment Policy shall prescribe for standard operating process / procedures to bring into focus any infringements/ deviation/ violation of the environmental or forest norms/ conditions.	<b>Complied.</b> CSL is an ISO 14001:2004 certified Company. CSL procedure for Environmental Damage Incident reporting was submitted to MoEFCC vide CSL letter dated 09 Aug 2017.
xxxiv.c	The hierarchical system of Administrative order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.	The organizational arrangement in CSL for the environmental management is included as para 1.9 of CSL EMS Common procedures. Copy of CSL EMS Common procedures was submitted to MoEFCC vide CSL letter dated 09 Aug 2017. A separate Environmental Management Cell (EMC) is constituted for dealing with Environmental issues and for ensuring compliance with the environmental clearance conditions.
xxxiv.d	To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and /or shareholders or stakeholders at large.	Management Representative reports the performance of the environmental management system to the management for review during the management review meeting. CMD/Director (operations) reviews the performance of the environmental management system once every three months to ensure continuing suitability, adequacy and effectiveness of the system. Copy of Environmental Management System Apex manual was submitted to MoEFCC vide CSL letter dated 09 Aug 2017. The communication to and from external interested parties is maintained by the Occupier - Environment (protection) Act 1986.
<b>B. GENERAL CONDITIONS</b>		
i	Appropriate measures must be taken while undertaking digging activities to avoid any likely degradation of water quality	Noted and being complied with.
ii	Full support shall be extended to the officers of this Ministry / Regional Office at Bhopal by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.	Noted. CSL confirms full support to the offices of MoEFCC



iii	A Six-Monthly monitoring shall need to be submitted by the project proponents to the Regional Office of this Ministry at Bangalore regarding the implementation of the stipulated conditions.	Noted and being complied with. Monitoring report for the period October 2018 to March 2019 is placed as <b>Annexure-1</b>
iv	Ministry of Environment, Forest and Climate Change or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the interest of environment and the same shall be complied with.	CSL confirms full support to the offices of MoEFCC
v	The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with the satisfaction of the Ministry.	Noted
vi	In the event of a change in project profile or change in the implementation agency, a fresh reference shall be made to the Ministry of Environment, Forest and Climate Change.	Noted
vii	The project proponents shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.	1. CCEA had approved the project in its meeting held on 20th July 2016. 2. Construction work commenced on 01 June 2018 and the same has been informed to MoEFCC and Regional office vide letter no. INFRA/ NDD/812/15 dated 22 June 2018.
viii	A copy of the clearance letter shall be marked to concerned Panchayat/ local NGO, if any, from whom any suggestion/ representation has been made received while processing the proposal.	<b>Complied.</b>
ix	A copy of the environmental clearance letter shall also be displayed of the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industries centre and Collector's Office/ Tehsildar's office for 30 days.	<b>Complied</b>



*[Handwritten signature]*






Para.13	These stipulations would be enforced among others under the provisions of Water ( Prevention and Control of Pollution ) Act 1974, the Air( Prevention and Control of Pollution) Act 1981, the Environment (Protection ) Act , 1986 , the Public Liability (Insurance) Act,1991 and EIA Notification 1994, including the amendments and rules made thereafter.	Noted
Para.14	All other statutory clearances such as the approvals of storage of diesel from Chief Controller of Explosives , Fire Department , Civil Aviation Department , Forest Conservation Act ,1980 and Wildlife (Protection ) Act , 1972 etc. shall be obtained, as applicable by project proponents from the respective competent authorities	<b>Complied</b> <ol style="list-style-type: none"> <li>1. Ministry of Defence had issued Clearance for the project on 20th Dec 2016.</li> <li>2. F&amp; B approval received for the project on 28 Oct 2016.</li> <li>3. CSL is having Petroleum and Explosives Safety Organisation (PESO) license for operational yard.</li> <li>4. Clearance from Chief control of explosives &amp; Fire department will be taken by the contractor before commencing activities.</li> <li>5. Forest Clearance not required as there is no forest land diversion as part of project.</li> <li>6. Standing Committee of NBWL has recommended Dry Dock project for Wildlife clearance it its meeting held on 02 Mar 2017.</li> </ol>
Para.15	The project proponent shall advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environmental and CRZ Clearance and copies of clearance letters are available with the State Pollution Control Board and may also be seen on the website of the Ministry of Environment, Forest and Climate Change at <a href="http://www.envfor.nic.in">http://www.envfor.nic.in</a> . The advertisement should be made within Seven days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at Bangalore.	<b>Complied</b> <ol style="list-style-type: none"> <li>1. Advertisement done on two leading dailies of the region namely Malayala Manorama and Mathrubhumi on 23 Nov 2016</li> <li>2. Copy of the Advertisements was forwarded to the regional Office of the MoEFCC at Bangalore on 17 Dec 2016.</li> </ol>
Para.16	The Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs Union of India in Writ Petition (Civil) No. 460 of 2004 as may be applicable to this project.	Noted



Para.17	Status of compliance to the various stipulated environmental conditions and environmental safeguards will be uploaded by the project proponent in its website.	Complied
Para.18	Any appeal against this Clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Noted
Para.19	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parishad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions /representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.	Complied
Para.20	The proponent shall upload the status of compliance of the stipulated EC conditions, including results of the monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEFCC, the respective Zonal Office of CPCB and the SPCB.	Noted and will be complied.
Para.21	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environmental (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Office of MoEFCC by e-mail.	Dry dock project is extension of existing facilities. Environment Statement (Form-V) for Cochin Shipyard for the year 2017-2018 is attached



  
 General Manager (Infra Projects)  
 Cochin Shipyard Limited



### Shrouding with Galvalume sheets



### Construction of Public Toilets



Beautification of MG road





**Entrance Gate- receiving area**



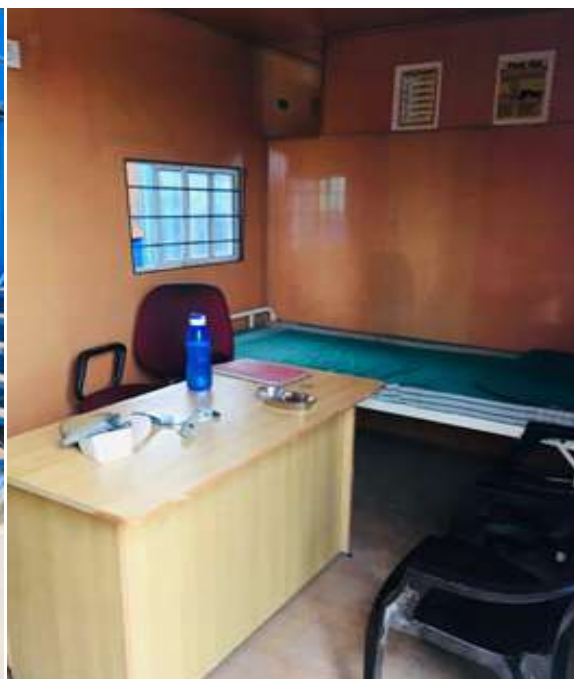
**Parking facility**



### Ambulance Facility



### First Aid Centre





Toilets for Construction Staff



## **REPORT OF ENVIRONMENTAL MONITORING DURING THE CONSTRUCTION STAGE OF NEW DRY DOCK PROJECT**

### **Introduction**

Cochin shipyard Limited (CSL) is a company under Ministry of Shipping specialized in shipbuilding and ship repairing. Since its integration in 1972, CSL has come a long way to become one of the leading shipyards to build ships up to 110000 DWT and repair up to 125000 DWT. It is located in the south west cost of India, in the 'port city' Kochi in the state of Kerala. The shipyard is equipped with state- of-the-art facilities and resources and caters to building and repairing diverse fleet of ships. CSL has secured shipbuilding contracts from international renowned companies from Europe & middle-east .CSL also presently constructing the first Indigenous Air craft carrier for Indian Navy.

As part of its growing requirement CSL is in the process of establishing a new dry dock facility in the Northern part of the existing shipyard. The project is capable to augment CSL's existing capacity in ship building and repair by targeting the LNG tankers, drilling rigs/ships, large naval vessels, larger carrier ships .

The project site is located in the Kochi city. It is surrounded by the residential as well as commercial establishment along with road and rail networks. Nearest railway station is Ernakulam which is 1 km from site and nearest Airport is Kochi Airport which is 25 km from project site.

CSL has appointed M/S ITL Labs Pvt. Ltd. for carrying out Environmental monitoring during the construction stage of New Dry Dock project Vide Work order No: INFRA/NDD/87/2018 dated 28/06/2018 for the period of Three years on monthly basis. The scope of work includes monitoring of Ambient Air quality, Noise, Ground water, soil & Marine water quality.

M/s ITL labs Pvt ltd is a state of art laboratory with well equipped in latest instruments and recognized by Ministry of Environment, Forests & Climate change (MoEFCC), Govt. of India. We are also accredited by NABL, BIS and GLP.

We have deputed our team with necessary equipments at the site of CSL for sample collection and data generation work. This is report of second half yearly report ending March '2019. The report was based on the sampling done from October '2018 to March '2019.





**Environmental Monitoring Report during Oct 2018- Mar 2019****01. AMBIENT AIR QUALITY MONITORING**

Ambient air quality was monitored weekly twice during non-monsoon seasons and monthly in monsoon season during the period October-2018 to March-2019. Sampling was carried out at four locations out of which three are at construction site and one station at nearby residential area. The locations are:

- 1) Near Main gate
- 2) Near DG Set Area
- 3) Near Excavation area
- 4) Neighboring Residential area.

The samples were collected and analyzed as per guide lines of Ambient Air quality monitoring CPCB, 2003. The Respirable dust sampler and fine particle samples equipment was placed at open space to collect the samples for the analysis of parameters such as  $PM_{10}$ ,  $PM_{2.5}$ ,  $SO_2$ ,  $NO_2$  & CO. The comprehensive monitoring results have been compiled as follows:

Compilation of Ambient Air Quality Monitoring Results for the half year: October 2018- March 2019																		
Sl. No	Location	Main gate				Near DG Sets				Excavation area				Residential area				NAAQ Limit
	Parameters	No. Of Samples	Max value	Min value	Avg. Value	No. Of Samples	Max value	Min value	Avg. Value	No. Of Samples	Max value	Min value	Avg. Value	No. Of Samples	Max value	Min value	Avg. Value	
1	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	45	54.1	47.8	50.44	45	56.7	50.2	53.89	45	52.4	40.1	45.36	45	41.1	34.2	37.64	100
2	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	45	25.3	22.2	23.75	45	27.0	23.9	25.31	45	24.3	18.1	20.26	45	19.6	16.2	18.22	60
2	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	45	7.1	5.2	6.1	45	7.8	5.9	6.86	45	6.8	4.9	5.74	45	4.3	3.1	3.81	80
4	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	45	13.8	8.6	11.48	45	15.3	12.1	13.42	45	13.1	6.8	8.48	45	7.5	5.6	6.37	80
5	Carbon Monoxide (CO), mg/m <sup>3</sup>	45	1.1	0.9	0.98	45	1.1	0.8	1.06	45	1.0	0.7	0.88	45	0.9	0.7	0.79	2.0

All the above parameters are within specified limit of National Ambient Air Quality (NAAQ) as per Environment protection act'1986.



**02. AMBIENT NOISE QUALITY**

As per contract, noise monitoring to be carried out at four locations viz. Near DG set, Near construction activity, at residential area and near dredging area. As dredging has not been commenced at the site, noise monitoring is carried out at following three locations during the period October 2018- March 2019:

- 1) Near DG set
- 2) Near Construction activity
- 3) Neighboring Residential area.

The noise was recorded by automatic noise meter. From the Results  $Leq$  (day) &  $Leq$  (night) calculated.

Average results were calculated on monthly basis and are compiled as given below:

Sr. No	LOCATION	SAMPLING PERIOD	Day Time					Night Time				
			No. of samples	Leq min	Leq max	Leq. mean	Limit	No. of samples	Leq min	Leq max	Leq. mean	Limit
1	Near DG set	October' 2018	4	64.4	65.2	64.8	75	4	53.1	54.0	53.5	70
		November' 2018	5	64.0	65.4	64.7	75	5	52.9	53.6	53.1	70
		December' 2018	2	63.3	63.8	63.6	75	2	52.5	52.8	52.7	70
		January' 2019	5	63.6	64.5	64.1	75	5	52.4	55.0	54.2	70
		February' 2019	4	63.6	64.4	64.0	75	4	54.2	54.9	54.5	70
		March' 2019	4	63.8	64.3	64.1	75	4	52.2	52.9	52.4	70
		<b>Average</b>	<b>24</b>	<b>63.3</b>	<b>65.4</b>	<b>64.2</b>	<b>75</b>	<b>24</b>	<b>52.2</b>	<b>55.0</b>	<b>53.4</b>	<b>70</b>
2	Near Constructi on area	October' 2018	4	66.8	67.2	67.0	75	4	61.4	62.2	61.8	70
		November' 2018	5	63.5	67.7	64.5	75	5	54.3	55.0	54.5	70
		December' 2018	2	63.9	64.0	64.0	75	2	52.1	52.4	52.2	70
		January' 2019	5	65.9	66.5	66.2	75	5	60.8	62.9	61.6	70
		February' 2019	4	65.7	66.5	66.1	75	4	61.0	61.8	61.5	70
		March' 2019	4	65.8	66.4	66.2	75	4	60.1	60.9	60.5	70
		<b>Average</b>	<b>24</b>	<b>63.5</b>	<b>67.7</b>	<b>65.7</b>	<b>75</b>	<b>24</b>	<b>52.1</b>	<b>62.9</b>	<b>58.7</b>	<b>70</b>
3	Residentia l area	October' 2018	4	53.1	53.6	53.4	55	4	43.7	44.7	44.2	45
		November' 2018	5	52.4	53.2	52.8	55	5	44.7	45.4	44.9	45
		December' 2018	2	52.6	52.9	52.7	55	2	43.0	43.6	43.3	45
		January' 2019	5	52.5	53.2	52.8	55	5	42.9	45.6	44.7	45
		February' 2019	4	52.6	53.3	52.9	55	4	44.8	45.5	45.2	45
		March' 2019	4	52.5	53.9	53.0	55	4	42.6	44.4	43.3	45
		<b>Average</b>	<b>24</b>	<b>52.4</b>	<b>53.9</b>	<b>52.9</b>	<b>55</b>	<b>24</b>	<b>42.6</b>	<b>45.6</b>	<b>44.4</b>	<b>45</b>

**AMBIENT NOISE STANDARDS AS PER THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000**

Area	Category of Area	Limits in dB(A) $Leq$	
		Day Time	Night Time
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence Zone	50	40

The noise levels of all locations are found within the permissible limit.





**03. GROUND WATER QUALITY**

Water sample were collected in each month from the existing bore well at new dry dock site and the samples collected are tested as per IS:10500

S.No.	Parameters	RESULT (Oct'18)	RESULT (Nov'18)	RESULT (Jan'19)	RESULT (Feb'19)	RESULT (Mar'19)	LIMIT AS PER IS:10500
1	Colour, Hazen units	<1.0	<1.0	<1.0	<1.0	<1.0	5.0
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH Value	7.2	7.5	6.9	7.1	7.1	6.5-8.5
4	Turbidity, NTU	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
5	Total Dissolved solids, mg/l	305	295	270	295	255	500
6	Calcium (as Ca), mg/l	46.0	45.1	42.2	26.2	38.5	75
7	Magnesium (as Mg), mg/l	14.5	13.8	12.4	15.9	11.2	30
8	Chloride (as Cl), mg/l	37.0	36.5	34.3	42	32.1	250
9	Iron (as Fe), mg/l	0.04	0.03	0.04	0.04	0.05	0.3
10	Sulphate (as SO <sub>4</sub> ), mg/l	28.0	27.0	25.0	28.0	22.0	200
11	Total Hardness (as CaCO <sub>3</sub> ), mg/l	136	130	125	130.6	118	200
12	Total Alkalinity (as CaCO <sub>3</sub> ), mg/l	58	56	53	118	49	200
13	Escherichia coli/100ml	Present	Present	Present	Present	Present	Should be absent



**04. MARINE WATER QUALITY**

Samples were collected on monthly basis from marine area of construction site and monitoring results are recorded as follows:

S.No.	Parameters	Unit	Results Oct'18	Results Nov'18	Results Dec'18	Results Jan'19	Results Feb'19	Results Mar'19	Detection limit
1	Temperature	°C	26.8	26.4	25.2	27.6	27.2	31	--
2	Salinity	psu	2.9	3.5	3.1	3.0	3.0	2.9	0.1
3	pH Value	--	7.19	6.9	6.8	7.2	7.2	7.1	--
4	Conductivity	mS/cm	3.7	4.6	3.9	4.1	3.8	4.2	0.1
5	Turbidity, NTU	NTU	4.0	3.4	3.9	3.8	4.0	3.6	1.0
6	Total Dissolved solids,	mg/l	2252	2350	2300	2288	2314	2100	1.0
7	Dissolved Oxygen	mg/l	6.1	7.1	6.7	6.7	5.9	6.5	0.5
8	Nitrate nitrogen	µmol/l	8.4	7.2	7.8	7.9	7.8	7.7	0.1
9	Nitrite Nitrogen	µmol/l	0.2	0.4	0.3	0.3	0.2	0.4	0.05
10	Anionic detergents (as MBAS)	µg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.1
11	Suspended Solid	mg/l	9	12	8	10	11	12	0.1
12	BOD	Mg/l	3.0	3.7	3.6	3.4	4.0	3.6	1.0
13	Silicate	mg/l	7.8	6.9	8.1	7.3	6.5	7.8	0.01
14	phosphate	mg/l	0.4	0.4	0.6	0.5	0.3	0.4	0.5
15	Total hardness as CaCO <sub>3</sub>	mg/l	998	1100	1000	1000	913	1100	0.5
16	Calcium hardness as CaCO <sub>3</sub>	mg/l	171	185	165	169	183.2	156	0.2
17	Oil & Grease	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.1
18	Total Chromium (as Cr), mg/l	mg/l	0.1	0.2	0.2	0.1	0.1	0.1	0.003
19	Copper (as Cu), mg/l	mg/l	0.5	0.5	0.4	0.4	0.4	0.3	0.003
20	Manganese (as Mn), mg/l	mg/l	0.2	0.4	0.3	0.3	0.2	0.2	0.003
21	Zinc (as Zn), mg/l	mg/l	0.3	0.2	0.2	0.2	0.2	0.1	0.025
22	Iron (as Fe), mg/l	mg/l	5.0	5.4	5.6	5.5	4.0	5.1	0.05
23	Cadmium (as Cd), mg/l	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.002
24	Nickel (as Ni)	mg/l	0.3	0.3	0.4	0.4	0.2	0.3	0.002
25	Cobalt(as Co)	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.002
26	Lead ( as Pb)	mg/l	0.2	0.3	0.1	0.2	0.1	0.1	0.002
27	Total Coliform/100ml	MPN/100M L	78000	77000	64000	78050	74000	76000	1
28	Faecal Coliform/100ml	MPN/100M L	4800	4550	4200	4750	5200	4650	1





## 05. SEDIMENT QUALITY

The sediments samples collected once every monthly by grab sampler.

Sl.No	Parameter	Units	Result (Oct'18)	Result (Nov'18)	Result (Dec'18)	Result (Jan'19)	Result (Feb'19)	Result (Mar'19)
1.	Texture							
	Gravel	%	1.9	1.7	2.0	1.8	2.0	1.6
	Sand	%	31.2	30.2	32.8	32.1	32.1	31.2
	Silt	%	20.5	23.0	21.6	21.1	19.8	22.1
	Clay	%	46.4	45.1	43.6	45.0	46.1	45.1
2	Nitrate Nitrogen	μmol/kg	4.2	5.1	3.9	4.6	4.3	4.8
3	Nitrite Nitrogen	μmol/kg	0.11	0.17	0.13	0.13	0.1	0.12
4	Phosphate	μmol/kg	0.7	0.5	0.6	0.6	0.8	0.5
5	Lead	mg/kg	8.2	7.9	7.9	8.7	7.9	8.2
6	Zinc	mg/kg	21.8	23.3	22.1	22.1	22.2	21.8
7	Iron	mg/kg	8100	7800	7950	8000	7850	7500
8	Copper	mg/kg	10.1	11.4	11.2	10.7	9.8	11.2
9	Total organic carbon	%	0.9	1.0	0.8	0.8	1.0	0.7

## 06. SOIL QUALITY

Soil samples were collected on monthly basis from project site at 60 cm depth and it was analyzed as per IS:2720. The details of results as follows:

Sl.No.	Parameter	Units	Oct'18	Feb'19
1.	Texture	-	Sandy clay	Sandy clay
2	pH	-	7.05	7.1
3	Particle Size	-	Less than 2.0 mm	Less than 2.0 mm
4	Nitrogen	mg/100 gm	1.20	1.1
5	Potassium	mg/Kg	135	128
6	Moisture	%	19.2	18.8
7	Sulphates	mg/Kg	78	82
8	Organic Carbon	%	0.68	0.7
9	Chlorides (as Cl)	mg/Kg	182	175
10	Conductivity(20 % slurry)	μS/cm	32.8	33.2
11	Sodium( as Na)	mg/Kg	129.4	134.6
12	Sodium absorption Ratio(SAR)	-	0.81	0.8
13	Calcium (as Ca)	mg/Kg	1520	1480
14	Magnesium(as Mg)	mg/Kg	40.2	39.8



**07. BIOLOGICAL PARAMETERS OF MARINE WATER**

Samples were collected on monthly basis from marine area of construction site and monitoring results are recorded as follows:

**PHYTOPLANKTON ANALYSIS**

Sl. No	Name of species	Quantity Present Oct'18	Quantity Present Nov'18	Quantity Present Dec'18	Quantity Present Jan'19	Quantity Present Feb'19	Quantity Present Mar'19
1.	<b>Cyanophyceae</b>						
	a) Oscillatoria species	5	6	5	4	4	5
	b) Spirulina species	0	0	0	0	0	0
	c) Nostoc species	0	0	0	0	0	0
2.	<b>BACILLARIOPHYCEAE</b>						
	a) Asterionellopsis glacialis	0	0	0	0	0	0
	b) Ceratulina species	0	0	0	0	0	0
	c) Chaetoceros species	0	0	0	0	0	0
	d) Coscinodiscus species	894	940	900	924	902	910
	e) Cyclotella species	15	25	16	21	12	23
	f) Ditylum brightwelli	19	16	18	14	22	16
	g) Lauderia species	0	0	0	0	0	0
	h) Leptocylindrus species	12	8	10	9	9	10
	i) Navicula species	0	0	0	0	0	0
	j) Nitzschia	82	94	87	90	78	95
	k) Odontella	40	36	38	35	38	32
	l) Pseudo -Nitzschia	9	12	10	11	11	12
	m) Pleurosigma species	58	65	60	61	62	63
	n) Rhizosolenia	2	4	3	3	1	4
	o) Surirella species	0	0	0	0	0	0
3.	<b>DINOPHYCEAE</b>						
	a) Alexandrium	0	0	0	0	0	0
	b) Prorocentrum	5	7	4	6	8	7
	c) Pyrophacus	12	16	10	15	15	16
	d) Pyrocystic	2	1	1	1	1	1
	e) Ceratium	1	1	2	1	2	1
	f) Protoperidinium	0	0	0	0	0	0
4.	<b>CHLOROPHYCEAE</b>						
	a) Pediastrum	1	1	1	1	2	1
5.	<b>DICTYOCOPHYCEAE</b>						
	a) Dictyocha	5	4	6	4	6	5
	<b>TOTAL:</b>	<b>1162</b>	<b>1236</b>	<b>1172</b>	<b>1162</b>	<b>1173</b>	<b>1201</b>





ZOO PLANKTON ANALYSIS

S. No	Name of Species	Abundance Oct'18	Abundance Nov'18	Abundance Dec'18	Abundance Jan'19	Abundance Feb'18	Abundance Mar'19
1	Calanoid copepod	88	94	84	92	95	90
2	Cycloid copepod	61	60	68	58	54	56
3	Cirripede Nauplii	1	3	1	2	2	3
4	Fish Egg	20	18	22	19	24	21
5	Fish Larva	9	7	8	8	11	7
6	Shrimp zoea	28	35	26	30	31	32
7	Gastropod veliger	0	0	0	0	0	0
8	Crab zoea	0	0	0	0	0	0
9	Lucifer Sp.	0	0	0	0	0	0
10	Codonellopsis sp.	0	0	0	0	0	0
11	Amphipod	0	0	0	0	0	0
12	Penilia avirostris	12	16	13	14	15	15
13	Crustacean Nauplii	14	14	16	13	11	12
14	Copepod Nauplii	10	10	8	9	8	10
15.	Planktonic polychaete	0	0	0	0	0	0
	<b>TOTAL:</b>	<b>243</b>	<b>257</b>	<b>246</b>	<b>243</b>	<b>251</b>	<b>246</b>

BENTHOS ANALYSIS

S.No	Name Of Species	Abundance Oct'18	Abundance Nov'18	Abundance Dec'18	Abundance Jan'19	Abundance Feb'18	Abundance Mar'19
<b>A) Meio Benthos</b>							
1	Nematodes	58	60	57	62	62	60
2	Poly chaetes	6	7	7	5	8	6
3	Ostracods	5	8	6	6	4	7
<b>TOTAL :</b>		<b>69</b>	<b>75</b>	<b>69</b>	<b>72</b>	<b>74</b>	<b>73</b>
<b>B) Micro Benthos</b>							
1	Polychaetes	415	424	422	420	398	428
2	Crustaceans	402	405	498	395	376	392
3	Molluscs	25	32	28	30	28	32
4	Others	212	205	208	196	196	199
		<b>1096</b>	<b>1066</b>	<b>1096</b>	<b>1041</b>	<b>998</b>	<b>1051</b>

SUMMARY

This report is summarization of report from October'18 to March'19 in which monsoon was included.

All the tested parameters of ambient air are within specified limit NAAQS. The noise level in all places is also within specified limit. All the other samples are normal and not found any major pollutants.

