

# KRISHNAPATNAM PORT COMPANY LTD.



Ref. No.: KPCL/MIS(H)-APPCB.EHS/349-2020

Date: 29/12/2020

To

**The Member Secretary**

Andhra Pradesh Pollution Control Board  
D.N.33-26-14 D/2,  
Chelamavari Street, Kasturibai pet,  
Vijayawada – 520010.

Sub: Krishnapatnam Port –Submission of Half Yearly Compliance Reports on conditions of CFE & CFO for the period of **April 2020 to September 2020** – Reg

Ref: 1. Consent & Authorization Order No: APPCB/VJA/NLR/11344/CFO/HO/2018- dated 29.07.2018 and its amendment dated 10.02.2020.  
2. Consent for Establishment for Phase-I Order No: APPCB/VJA/NLR/633/HO/2004/9-469 dated 25.05.2004 and its amendment dated 04.01.2017  
3. Consent for Establishment for Phase-II Order No: 633/PCB/CFE/RO-NLR/HO/2010-390 dated 8<sup>th</sup> May, 2010 and its amendment dt 02.07.2015 and 04.01.2017

Dear Sir,

In compliance with the condition No 41 of Schedule – B of the CFO first cited and Condition No. 3 and 1 of Schedule – A of the CFE second and third cited, please find herewith enclosed condition wise Half Yearly Compliance Reports of Krishnapatnam Port for the period **April 2020 to September 2020** along with the Half yearly Environmental Monitoring Report of Krishnapatnam Port (Appendix-I) for the same period.

Thanking you,

Yours faithfully,

For **KRISHNAPATNAM PORT CO. LTD.,**

G VENUGOPAL REDDY  
DGM-EHS

Encl: 1. Half Yearly Compliance Reports of conditions of CFO & CFE by Krishnapatnam Port for the period October 19 to March 2020.  
2. Half Yearly Environmental Monitoring Report of Krishnapatnam Port.

Copy to: The Environmental Engineer, APPCB Regional Office, Nellore.

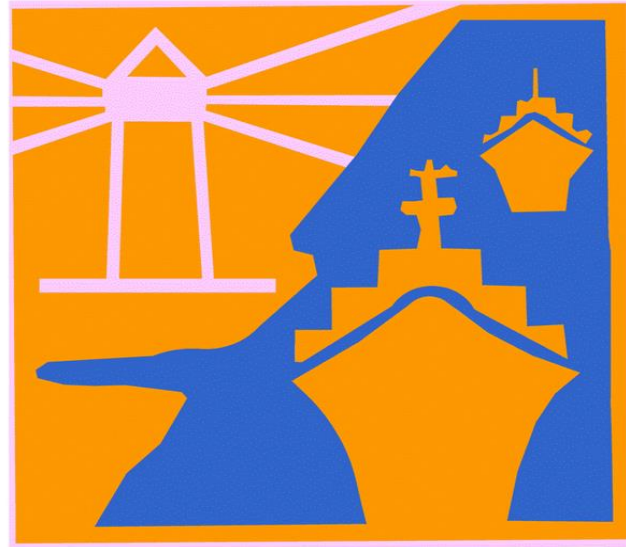
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# KRISHNAPATNAM PORT COMPANY LIMITED



COMPLIANCE REPORT OF  
CONSENT FOR ESTABLISHMENT PHASE - I PHASE -II ORDER OF APPCB  
DEVELOPMENT OF KRISHANAPTNAM PORT  
FOR THE PERIOD  
APRIL, 2020 TO SEPTEMBER, 2020

**Krishnapatnam Port Company Limited**

**Compliance Report of**

**Consent for Establishment (CFE) Order of APPCB  
Dt. 25-05-2004 for Phase -I Development**

**Period of Reporting  
April, 2020 to September, 2020**

**Krishnapatnam Port Company Limited**  
**Compliance Report on Consent for Establishment (CFE) Order of APPCB dated: 25.05.2004 for**  
**Phase – I Development**  
**Reporting period – April, 2020 to September, 2020**

S. No	Condition	Compliance Status
<b>Schedule-A</b>		
1.	There shall not be any perceptible odour outside the industry's premises	<b>Noted</b>  No perceptible odours are generated in the Port.
2.	Environmental statement in form-V as per the provisions under Rule-14 of E (P) Act, 1996 and its amendments there of shall be submitted by 30 <sup>th</sup> September of every year and this should also form a part of their annual report.	<b>Noted.</b>  Environmental Statement in Form – V is being submitting annually. Form-V Environment Statement for the FY 2019-2020 is submitted on 28.09.2020. We are also uploading in our web site.
3.	Progress on implementation of the project shall be reported to Board Office, Zonal Office and Regional Office, A.P. Pollution Control Board regularly.	<b>Complied.</b>  Construction of Krishnapatnam Port Phase-I is completed.
4.	Suitable automatic flow measuring devices and monitoring equipment shall be installed at appropriate points. Separate energy meters shall be provided for ETP and Air pollution control equipments to record energy consumed.	<b>Complied.</b>

		Separate Energy meter is provided for STP and the readings are recorded.
5.	All the rules and regulations notified by Ministry of Environment and Forests, Govt. Of India in respect of noise pollution control measures shall be followed to avoid nuisance to public.	<b>Noted</b>
6.	Consents for operation regularly from APPCB, as required Under Sec. 25/26 of the Water (P&C of P) Act, 1974 and under sec. 21/22 of the Air (P&C of P) Act, 1981, for operation of the activity, before starting trial production. The consent for Operation will be accorded only after ensuring compliance of all the conditions stipulated in this order.	<b>Complied.</b> CFO for Phase-I is obtained from APPCB on 08.06.2009 before commencement of operations and is being periodically renewed. The latest CFO renewal order No: APPCB/VJA/NLR/11344/CFO/HO/ 2018 obtained on dated 29.07.2018 is valid till 31.10.2023 and CFO is amended on 30.08.2018 and 10.02.2020.
7.	Conditions issued by the Board in the consent order scrupulously be complied with and carried out. Legal action will be initiated as per the provisions of the relevant Acts in case of non-compliance of any conditions of the consent order.	<b>Noted</b> All directions/ orders issued by the Board are being complied scrupulously. Compliance Reports are being regularly submitted to APPCB.
8.	Notwithstanding anything contained in this conditional letter or consent, the Board hereby reserves its right and power Under Sec. 27(2) of Water (Prevention and Control of Pollution) Act, 1974 and Under Sec.21(4) of Air (Prevention and Control of Pollution) Act, 1981 to review any or all the conditions imposed herein and to make such alternation as deemed fit and stipulate any additional conditions for the purpose of the Act by the Board.	<b>Noted.</b>
9.	The consent of the Board shall be exhibited in the factory premises at a conspicuous place for the information of the inspecting officers of different departments	<b>Complied</b>
10.	Compensation is to paid for any environmental damage caused by it, as fixed by the Collector and District Magistrate as civil liability	<b>Noted.</b>
11.	Appropriate Rain Water Harvesting (RWH) structure(s) shall be established on the available up-stream portion of the plant site. The applicant can approach the	<b>Complied</b>

	State Ground Water Authority, local Municipal / Urban Development Authorities and even private consultants to procure suitable design for these structures. If there is no land available in the industry premises, RWH structures must be raised on the roofs of Administrative Blocks or such buildings where sudden leakages or moisture in the air would not affect the quality of the process or product.	Rain water percolation/harvesting pits are developed for buildings and other general areas.
<b>Schedule-B</b>		
<b>I</b>	<b>Construction Phase:</b>	
	<b>1. Road Development</b>	
	<p>a. Proposed road development in the area, both in the Port area as well as area outside Port limits upto the National Highway. This should include construction of new roads and widening of existing roads the number of traffic lanes proposed on the roads, and their adequacy to accommodate increased traffic density on the roads on account of the construction activity in the Port area and consequential operational and developmental activities in the neighbourhood.</p>	<p><b>Complied</b></p> <p>Government of Andhra Pradesh has developed a dedicated four-lane road connecting Venkatachalam on National Highway (NH) 16 and Port.</p> <p>Presently 6 lane work is under progress.</p> <p>Well-designed internal road network within the port is developed to facilitate inward and outward movement of cargo to/from the port.</p>
	<p>b. Spaces shall be allotted along the roads and below the roads for infrastructure facilities, such as sewer lines water means, storm water drains, telephone cables, electrical cables, and likely liquid cargo, such as fuel oil pipelines etc., these should be indicated on the road maps and sections to facilitate orderly development of infrastructure avoiding frequent digging of roads, subsequent to development.</p>	<p><b>Complied</b></p>
	<p>c. Avenue plantation and facilities for sprinkling water to mitigate dust generation on roads shall be planned and provided in the port area.</p>	<p><b>Complied</b></p> <p>Along the median shrubs and both sides of road avenue plantation has been developed. Mechanical sweeping machines and Mobile</p>

		truck mounted sprinklers are deployed to mitigate the dust generation on roads among others.
	<b>2. Break Waters, Other marine structures and Railway lines:</b>	
	a. Stone quarries shall be identified for extraction of stone and ballast for the construction of break waters and railway lines etc., and environmental management programme for these quarries is to be drawn up to mitigate dust pollution to avoid water stagnation in the pits formed, resulting in mosquito breeding and for mitigating noise pollution. After completing the work, the quarry area shall be restored providing greenery with proper landscape design.	<b>Complied.</b>  Stone for construction of breakwaters are sourced from Government approved quarries. Environmental management programme has been adopted for Quarry operations.
	b. The vessels and barges and other construction equipment used in the construction of break waters and other marine structures shall ensure that no oil spills, sewage / sullage, solid waste is allowed to be discharged into the sea. Such wastes shall be carefully collected and kept on Board and finally transported to the shore, in the Port area and disposed as follows:	<b>Complied.</b>  It is ensured that the barges/workboats have appropriate system (slop tanks) for collection of liquid/solid waste generated on board and it is transferred on shore for disposal through approved vendors regularly. No wastes are discharged into the sea
	i Oils and other hazardous solid waste shall be disposed duly following Hazardous Waste Rules.	<b>Noted</b>  Hazardous wastes are disposed through authorized vendor by following HW Rules.
	ii Sewage / sullage to be disposed into a well designed septic tank taking into consideration, the quantum of waste generated and the effluent from the septic tank shall be disposed in a well designed absorption trenches, with loose jointed earthen ware pipe surrounded by broken stone.	<b>Complied.</b>
	iii Organic solid waste shall be disposed by land fill	<b>Complied.</b>  Bio-degradable wastes are composted and used for green belt.

	<b>3. Dredging:</b>	
	<p>a. The project involves substantial dredging. The disposal of dredged material for reclamation is a small fraction of the total quantity of dredged material anticipated to be obtained. Moreover dredging may be required during operations phase. This material should be analysed and carefully studied to find the possibilities of its use as a building material along with admixtures such as cement, as may be necessary. For this purpose, a proper institution such as Central Building Research Institute of Rorkee and the National Council for Cement and Building Material of Faridabad may be approached. From the environment angle, it is very important because the contemplated discharge of surplus dredged material into the sea is in no way environmental friendly.</p>	<p><b>Complied</b></p> <p>Dredged material suitable for reclamation is used for reclamation and balance disposed off in disposal area identified by undertaking Mathematical Model Studies duly following the EMP.</p>
	<p>b. The need for construction of suitable groynes/connected to a bulk heads @ intervals along the beaches projecting into the sea and on to land on beaches likely to be affected by erosion shall be examined and provided wherever necessary. The design of the groynes and bulk-heads shall be based on model studies.</p>	<p><b>Noted.</b></p>
	<p><b>4. Dust:</b></p> <p>Identify all dust generation sources, during the construction period and provide water sprinkling facility at all such places.</p>	<p><b>Complied</b></p> <p>Areas prone to dust generation have been identified and measures such as sprinkling of water to suppress the dust levels are being implemented.</p>
	<p><b>5. Vehicular emissions:</b></p> <p>On account of increased volume of vehicular traffic in the area vehicular emission also will increase resulting in deterioration of ambient air quality. This situation has to be evaluated with reasonably accurate estimates of traffic volume on different roads and measures shall be taken to control the emission, to comply with PCB norms. A mobile task force shall be created in co-ordination with the RTA to check the vehicles periodically to ensure that they comply with the emission standards.</p>	<p><b>Complied</b></p> <p>Traffic density studies are carried out along the access roads to port i.e. MDR 2 from Nellore and MDR 20 from Venkatachalam to Muthukur and Port Road connectivity to National Highway is formed to reduce congestion as well as the risk of accidents.</p> <p>The Pollution Under Control Certificate is insisted for all vehicles deployed equipment/vehicles by in-house task force. The mobile</p>



		vehicle pollution checking equipment is procured and vehicles are being checked for compliance.
	<p><b>6. Noise and Protection of workman:</b></p> <p>All equipment used for the construction activity shall be properly maintained to ensure least generation of noise, and also workers shall be protected with ear muffs. The moving parts of the machines shall be properly oiled and greased to reduce noise generation. The workmen with loose fitting garments shall not be permitted and all workers shall be provided with protective clothing, helmets, protective goggles and appropriate shoes and gloves etc., wherever required.</p>	<p><b>Noted</b></p> <p>All equipments used for construction are being regularly maintained. Low noise equipments and mufflers/ enclosures are used to limit the excess noise limit.</p> <p>Use of protective gears/PPE such as earplugs and rotation of personnel are adopted to mitigate the impacts on operating personnel from exposure to noise levels beyond threshold limits.</p>
	<p><b>7. Campus for construction workers:</b></p> <p>These shall be provided in the port area. These camps shall have water supply and sanitary facilities and canteen. The liquid waste shall be treated in septic tanks followed by a tile field of absorption trenches properly designed. The canteen waste water shall be treated for removal of oil. The garbage generated shall be disposed by sanitary landfill. Where it is unavoidable to locate a camp, outside the port area prior permission shall be obtained from the local authority. All shelters provided shall be temporary nature and shall be dismantled after the construction work is completed and the same shall be restored to original state</p>	<p><b>Complied.</b></p> <p>Worker camps are provided for the construction personnel. Worker camps are self-sufficient with all basic amenities and not rely on any local resource. These camps are located away from the coast and habitations. After completion of construction work these camps have been dismantled.</p>
	<p><b>8. Fuel oil storages:</b></p> <p>The construction equipment vessels and vehicles used in construction work and for transport of material require fuel oils. There shall be a storage facility for such fuel oils, well designed, and protected against fire hazards and provided with a compound wall, to prevent access to unauthorized elements. All surface run off from such storage areas shall pass through oil water separator, before it finds access to any storm water drainage course or sea</p>	<p><b>Complied.</b></p>
	<p><b>9. Fire fighting facilities:</b></p>	

	All fire prone areas during the construction phase shall be provided with fire detection and fire fighting facilities with adequate water storage in consultation with the Directorate of Fire fighting / Regional Offices of the Department	<b>Complied</b>  Fire-fighting system along with adequate water storage is being ensured. Dedicated Fire-fighting equipment and trained personnel are available. Port Tugs are also having fire-fighting capability
	<b>10. Greenbelt:</b> Planting of saplings for greenbelt proposed shall start during the construction period itself. 1 meter height saplings shall be used for free plantation. The greenbelt shall be at least 50 meter width. In addition to the general greenbelt alround the Port area, separate greenbelts shall be provided for atleast 20 meters width around the Iron Ore and Coal Stockyards.	<b>Complied.</b>  Green belt development is completed as per the requirement.
	<b>11. Malaria control and health facilities:</b>	
	a. Blood samples of all imported labour should be checked for Malarial parasite infection and they shall be immediately treated for Malaria. Health centers with proper medical facilities and Doctors shall be provided in the Port area to take care of the Health of the workers and staff, and for immediate medical attention to injured workers without delay	<b>Complied.</b>  Regularly medical& health camps are carried out in consultation with the District Medical Officer, Nellore to identify the Malaria parasite in blood samples of the labourers. No Malaria parasite has been reported so far.  First Aid facilities are being provided with in the port site with registrar medical doctor.
	b. Malaria control programme and Health facilities shall be continued in the operation phase. Vector control programmes shall be taken up in the operation phase, which should cover larval counts of Anaphlous mosquito in all the Saline water bodies created on account of harbour construction. Control of all breeding ground by the use of larvicides in addition to control of adult mosquitoes. The health team should include a trained entomolgest	<b>Complied.</b>  Malaria control programmes and health facilities are being followed under EHS & CSR by engaging reputed doctors.

	<b>12. The water requirement submitted by the proponent shall clarify</b>	
	<p>a. The quality of water required for day to day operation of the harbour and quantity required to be supplied to ships for replenishment in accordance with the demand and requirements of staff colony.</p>	<p>For day to day needs water quality meets the standards of portable drinking water standards as prescribed by CPCB i.e. IS10500. GoAP issued orders for release of 1MLD water to KPCL from Muthukur Irrigation Water Tank.</p> <p>In the meantime, Domestic water requirement is about 400 KLD being procured from authorized vendors.</p>
	<p>b. Since no local water source is indicated in the harbour area, proponent will have to obtain either through surface source or through ground water. The proponent informed that the GoAP will supply water requirement to the project. The proponent shall submit the agreements made with the Government and availability of surface water from the concerned authorities. For emergency use only, the industry can use ground water, duly obtaining permission from Ground Water Department. The same shall be reported to the Board.</p>	<p><b>Complied.</b></p> <p>s permitted by GoAP water from irrigation drain 'Nakkalakalava' is being utilized for dust suppression, Green Belt development &amp; firefighting needs.</p>
<b>II</b>	<b>Operation Phase:</b>	
	<p><b>1. Maintenance Dredging</b> The project proponent shall prepare a plan of action based on detailed studies</p>	<b>Noted.</b>
	<b>2. Loading &amp; Unloading Operations of Cargo</b>	
	<b>a. Bulk Cargo:</b>	
	<p>i. Handling, loading, unloading of bulk cargo, such as coal, iron ore, fertilizer and dry chemicals generate dust with health and environmental impacts in the neighbourhood. These need to be controlled at planning stage. Therefore Mechanical handling Equipment shall be used and the equipment shall be designed to minimize dust generation.</p>	<p><b>Complied.</b></p> <p>Following measures are being implemented to control fugitive emissions:</p>

		<ul style="list-style-type: none"> <li>a. Installed and operating 248 nos of Fixed and Portable sprinklers for dust suppression of coal stacking areas and railway yards.</li> <li>b. Deployed 10 nos of Mobile Water Tankers for Dust Suppression on roads and other areas.</li> <li>c. Deployed hoppers for unloading cargoes.</li> <li>d. Covering trucks and railway wagons with tarpaulins.</li> <li>e. Covering trucks deployed on inter carting with mechanical covers &amp; water curtains.</li> <li>f. Undertaking PUC checks for vehicles plying in the port</li> <li>g. Developed paved roads and pavements.</li> <li>h. Deployed mechanical road sweeping machines.</li> <li>i. Developed Truck Wash Area and effluent recycled for Dust Suppression.</li> <li>j. Developed wind shield for Chalivendra village</li> </ul>
	<p>ii. Proper washing facilities shall be provided for the berth handling cargo, to eliminate between hazardous and non-hazardous cargo.</p>	<p><b>Complied.</b></p> <p>Quay wall is sloped towards land and runoff routed through settlement pits.</p>
	<p><b>3. Firefighting Facilities:</b> The coal storages should be provided with the sprinklers and yard hydrants to control and manage the incidence of spontaneous ignition of the coal stock piles. All fire prone areas during the construction phase shall be provided with fire detecting and fire fighting facilities.</p>	<p><b>Complied.</b></p> <p>Fire-fighting system along with adequate water storage is being ensured. Dedicated Fire-fighting equipment and trained personnel are available. Port Tugs are also having fire-fighting capability.</p>
	<p><b>4. Cargo Transport to Storage Areas:</b></p>	
	<p>a. The proposed port will handle cargo which is mostly dust producing. Therefore extra care is needed in handling the cargo especially at the transfer points. The proposed stated in EIA are in broad and generic terms in this regard. It will be desirable that a supplementary report</p>	<p><b>Complied.</b></p>

	giving specific details of the type of equipment proposed for loading, handling, transport, storage and general handling is submitted for approval of the Board.	<p>Krishnapatnam Port is undertaking a large number of measures for fugitive emission control. Following are significant among them:</p> <ul style="list-style-type: none"> <li>(a) Installation and operation of MDSS with <b>248</b>nos of sprinklers at coal stacking and wagon loading areas.</li> <li>(b) Deploying 10 nos of Truck mounted sprinklers for roads and transit areas.</li> <li>(c) Deploying Hoppers for unloading</li> <li>(d) Mechanised coal handling at 2 berths within the land so far transferred on lease by GoAP. Conveyors are designed for covering with hood.</li> <li>(e) Developed paved roads and resorted to mechanical sweeping of roads.</li> <li>(f) Covering of coal transport vehicles and wagons with Tarpaulin/mechanical covers.</li> <li>(g) Developed wind breaking shield for Chalivendra Village.</li> <li>(h) Developed Greenbelt along the port boundary, all-around the cargo staking areas, block plantation, median and avenue plantations.</li> <li>(i) Monitoring AAQ at 7 locations through NABL accredited &amp; MoEF approved agency.</li> <li>(j) Commissioned three CAAQM stations &amp; linked to APPCB website</li> <li>(k) We are committed to implement measures as required to ensure compliance of AAQ norms</li> </ul>
	<b>b. The conveyor belt:</b> Shall be of the totally enclosed type preferably working under negative pressure. All dust generating areas in the cargo transport system shall be identified and facilities for dust mitigation with water sprinkling shall be provided.	
	<p><b>This condition has been amended vide CFE order No: APPCB/VJA/NLR/633/HO/2004/9/46 dated 04.01.2017</b></p> <p><b>c. Cargo storage Areas:</b> Facilities for water sprinkler system and facilities for the drainage's of sprinkler water / rain water shall be provided. The cargo storage areas shall have their own greenbelt of 20 meters width.</p>	
	<b>d. Loading cargo into wagons and trucks:</b> Dust suppression measures shall be provided in these areas.	
	<p><b>5. Road System in the Port Area:</b></p> <p>The road system in the Port area shall be built of Bituminous concrete, so that they will be dust proof. The Avenue plantation of two rows shall be provided along the roads on both sides.</p>	<p><b>Complied.</b></p> <p>Roads within port are constructed with Bituminous concrete or concrete block pavements. Mechanical road sweeping machines are deployed.</p>

		Avenue plantation has been developed along the roads on both sides.
	<b>6. Handling of Hazardous Cargo:</b> The proponent has informed that there will not be any programme to set up storage facilities for petro products or for any other hazardous materials.	<b>Complied.</b>
	7. Fire fighting facilities shall be provided in all berth and coal storages and other fire prone areas. A network of water mains hydrants, water storage tanks, Jockey pump and fire tenders and foam trolleys shall be provided in the Port area to fight any accidental fire.	<b>Complied.</b>  ‘Light Hazard Category’ Firefighting system is designed and provided as per Tariff Advisory Committee (TAC), India.  It consists of three (2 Main + 1 Standby) horizontal Centrifugal Split casing type diesel engine driven fire water pumps of capacity 273 m <sup>3</sup> /hr @ 88 MWC head. Two (1 Main + 1 Standby) horizontal end suction type diesel engine driven jockey pump of capacity 25 m <sup>3</sup> /hr @ 88 MWC head.  Port Tugs are provided with Firefighting Equipment.
	8. Vehicular emissions due to transport of cargo to and from the port:- A task force shall be constituted to check vehicle emissions to, enforce standards in co-ordination with the RTA and maintained on a permanent basis.	<b>Complied.</b>  Task force is constituted. License to check vehicular pollutions obtained. PUC checks are being undertaken.
	9. Cleaning facilities to berth: all berths shall have cleaning facilities with water under pressure, to ensure non-contamination of one type of cargo with another type.	<b>Complied.</b>  Utmost care is being taken to ensure the non-contamination of one type of cargo with another type.
	10. Sewage treatment: A site shall be selected for building a STP for sewage generated in the Port area and sewage after tertiary treatment should be used for washing purpose / flushing sewers, greenbelt development, fire fighting, sprinkling for dust suppression and for industrial use within the	<b>Complied.</b>

	Port area, other than domestic use. Treated sewage shall not be disposed off into the sea. The STP shall be provided with a separate greenbelt.	300 KLD capacity STP is in operation and the treated effluent is recycled for Green Belt Development.
	11. Greenbelt alround port area: a greenbelt of 50 mtrs width shall be developed and maintained around the port area.	<b>Complied.</b>
	12. A scavenging ship shall be provided in the Harbour to clean up the harbour waters periodically. This ship should be specifically designed to clean up oil spills.	<b>Complied.</b>  It is ensured that the barges/workboats have appropriate system (slop tanks) for collection of liquid/solid waste generated on board and it is transferred on shore for treatment and disposal regularly. No wastes are discharged into the sea. Port is geared to handle Tier-1 oil Spills.
<b>III</b>	<b>Environmental Management &amp; Monitoring Programme:</b>	
	These programmes shall be both for construction phase and operation phase and should include:	<b>Noted</b>
	1. Conservation of beaches and prevention of erosion due to literal drift under the environmental management programme.	Hydrodynamic studies carried out by M/s. HR Wallingford UK, revealed that the beaches are unaffected by the port development.
	2. Sand movement (quantification) and erosion of beaches caused by littoral drift, during the construction period as well as operation period under the environmental monitoring programme / (EMP).	Shore line monitoring being carried out through INCOIS also did not indicate any erosion. Studies are being continued.
	3. Pollution parameters in Waste water streams entering the sea in the area.	<b>Complied.</b>  Harbour water Quality is monitored among others through an agency having NABL accreditation and approved by MoEF. Results of Monitoring are being submitted regularly to APPCB.

	<p>4. General: The Environmental Manager Programme shall be reviewed from time to time against the back drop of results of Monitoring programme and modified in consultation with the PCB to achieve the desired objectives.</p>	<p><b>Complied.</b></p>
	<p>5. They should have a environment management cell with qualified and trained staff as appropriate for the port area.</p>	<p><b>Complied.</b></p> <p>Environmental Cell headed by a COO with Qualified and Trained Staff is established in the Port.</p>
IV	<p><b>This condition has been amended vide CFE order No: APPCB/VJA/NLR/633/HO/2004/9/46 dated 04.01.2017</b></p> <p>Once the port is established, Onsite Emergency action plan has to be prepared after carrying out Risk Analysis and Hazop studies.</p>	<p><b>Complied.</b></p> <p>Disaster Management Plan is prepared with onsite emergency preparedness plans and submitted to APPCB. Same is being updated and followed.</p>
V	<p><b>Master Plan:</b></p> <p>In view of the critical issue of appropriate development of the surrounding area to protect health and environment, it is recommended that the proponent should take up the task of proper master plan for the area with the District authority for areas surrounding the Port, to ensure that no slum development and unauthorized construction occur in the area. The project proponent shall take up with District Authorities about the Krishnapatnam Port development and relevant notifications regarding development control in the region as reported in REIA.</p>	<p><b>Noted.</b></p> <p>Master plan for port development has been prepared and got approved by GoAP. Master plan for areas surrounding the port is outside the domain of port.</p> <p>District Administration is being requested to take up master plan of the surrounding area.</p>
VI	<p>The population projections in the areas around the Port area are to be worked out and shall take up with district authorities for preparation of Master plan and Land use plan for the area to accommodate the population with all infrastructure facilities like domestic water supply, storm water drainage, sewerage system and STP, road network, transport facilities, telephone facilities, power supply, lung space and greenbelts and parks, lung spaces etc. The plan should indicate industrial areas, commercial areas and residential areas recreational zones and shall include educational facilities and medical and health facilities.</p>	<p><b>Complied.</b></p> <p>The planning authorities of the region developed the controls to regulate the land-use changes in the vicinity of the port to ensure sustainable development of the region.</p>



	Conservation programmes shall be taken up for all the water bodies in the area and no room shall be given for slum growth.	
<b>VII</b>	The ambient noise level shall not exceed 75 dB (A) during day time and 70 dB (A) during night time	<p><b>Complied.</b></p> <p>Ambient Noise level monitoring is carried out during day time and night time at 7 locations as a part of Environmental Monitoring. Monitoring Reports are regularly being submitted to APPCB. The noise levels are within prescribed limits.</p>
<b>VIII</b>	The following rules and regulations notified by the MoEF, GOI shall be implemented.	
	a. Hazardous waste (Management and Handling), Rules, 1989	<b>Noted.</b>
	b. Manufacture, storage and import of hazardous chemicals Rules, 1989	<b>Noted.</b>
	c. Rules for manufacture, use, import, export and storage of Hazardous micro-organisms/genetically engineered organisms or cells, 1989.	<p><b>Noted.</b></p> <p>To date no such type of Hazardous micro-organisms/genetically engineered organisms or cells are handled. In the event of handling such type of Hazardous cargoes, due procedure will be followed in accordance with statutory requirement.</p>
<b>IX</b>	The port shall establish adequate no. of ground water monitoring locations on scientific basis, and the same shall be monitored once in 6 months.	<p><b>Complied.</b></p> <p>Ground water is being monitored at 4 locations and six monthly reports are being regularly submitted to APPCB.</p>
<b>X</b>	The port shall implement all the environmental measures proposed in the EIA and shall initiate all the studies mentioned in the EIA.	<p><b>Complied.</b></p> <p>Environmental Monitoring Reports are being submitted regularly to the APPCB authorities.</p>

<b>XI</b>	The port shall take permissions from the Board, before handling any Hazardous chemicals. Because as per the present proposal, the port is not planning to handle any hazardous chemicals.	<b>Noted.</b>
<b>XII</b>	The industry shall obtain necessary permission as required under CRZ regulations under E (P) Act, 1986	<b>Complied.</b>  Environmental & CRZ Clearance for phase – I has been accorded by MoEF Delhi, vide letter no. 10-22/2005-IA-III dated 26 <sup>th</sup> July 2006.
<b>XIII</b>	The various rules and regulation notified under E (P) Act, 1986 by MoEF, GOI from time to time shall be followed.	<b>Noted</b>
<b>XIV</b>	The rules and regulations notified by Ministry of Law and Justice, GOI regarding the Public liability insurance Act, 1991 shall be followed.	<b>Noted.</b>
<b>XV</b>	This Order is valid for a period of five years from the date of issue.	<b>Noted.</b>

**Krishnapatnam Port Company Limited**  
**Compliance Report on Consent for Establishment (CFE) Order of APPCB dated: 08.05.2010 for**  
**Phase - II Development**  
**Reporting period – April, 2020 to September, 2020**

S. No	Condition	Compliance Status
<b>SCHEDULE-A</b>		
1.	Progress on implementation of the project shall be reported to the concerned Regional Office, A.P. Pollution Control Board once in six months.	<p><b>Complied</b></p> <p>Progress of implementation of Phase-II Development of Krishnapatnam Port is being reported regularly. Up to date progress is as under:</p> <p><b>Physical Progress:</b></p> <p>Broad details are as follows:</p> <ul style="list-style-type: none"> <li>• <b>Berths</b></li> </ul> <p>All 3 berths of Phase –I proposed facilities are completed, commissioned and being operated.</p> <p>Out of 14 Berths approved in Phase-II, 9 berths are completed along with associated infrastructure, commissioned and being operated as per the CFO renewal Order of the APPCB dated 29.07.2018 and subsequent amendment orders dated 30.08.2018 and 10.02.2020.</p> <p><b>Dredging and Reclamation</b></p> <p>43.31 Million Cum of dredging out of 52.00 Million Cum and 8.15 Million Cum of Reclamation out of 9.00 Million Cum of Phase II have been carried out.</p>

		<ul style="list-style-type: none"> <li>• <b>Storage area</b> Cargo storage areas Coal – 11,00,000 sq.m Container – 2,50,000,sq.m, General Cargo – 300,000 sq.m has been developed</li> <li>• <b>Bulk Material Handling System</b></li> <li>• Coal Conveyor System from berths up to Coal Stack Tubes and transfer point for the Northern Power Plants viz., APGENCO. TPCIL, NCC are completed within Port boundary.</li> <li>• Coal Conveyor System for Hinterland users connecting FTP-1: Completed in the lands made available by GoAP as per the Concession Agreement on lease.</li> <li>• Container Yard development behind Berths 1 &amp; 2 completed.</li> <li>• <b>Ware Houses</b> Construction of 1,76,000 sqm warehouses completed.</li> <li>• <b>Buildings</b> Construction of Administrative and operational buildings, workers amenities buildings, Control Houses and Traffic &amp; Transport Terminal Building have been completed.</li> <li>• <b>Electrical and Mechanical Works</b></li> <li>• 4 ship un-loaders and conveyor for Coal to stack tubes, APGENCO and TPCIL Power plants’ transfer points are commissioned.</li> <li>• Five electrical substations constructed and commissioned.</li> <li>• APSPDCL is providing power supply.</li> <li>• <b>Roads, Railway lines and Surface Drainage</b> External port road connectivity has been formed by the GoAP. External port rail connectivity has been formed by the SPV KRCL. The internal road and rail network and bridges developed so far at the Krishnapatnam Port are as under:</li> </ul>
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		<ul style="list-style-type: none"> <li>• 4 Lane Roads – 41.21 km, 2 Lane Roads–14.47 km and Single Lane Road – 2.3 km</li> <li>• Railway line- 52.8 km equated track with 12 Nos of along with doubling as required.</li> <li>• Traction 35 km completed.</li> <li>• Railway Locos (Diesel): 6 Nos</li> <li>• Rail Bridges : 11 Nos</li> <li>• Alongside Surface Drains : 33 kms</li> <li>• Guard ponds with silt Collection Chambers: 4 Nos</li> </ul> <ul style="list-style-type: none"> <li>• <b>Other Infrastructure</b></li> <li>• Raw Water Distribution System-completed.</li> <li>• Control House with helipad– 1 No completed</li> <li>• Helipad – 2 Nos completed</li> <li>• Loco Parking Bay -1 No completed.</li> <li>• Service building completed.</li> <li>• Container Stockyard (CY2) completed.</li> <li>• Trailer parking yard completed.</li> <li>• 02 Nos. Wagon Loading System (WLS) have been commissioned for dust free cargo loading.</li> </ul> <ul style="list-style-type: none"> <li>• <b>Environmental Protection</b></li> </ul> <p>Following environmental protection measures are being implemented:</p> <ul style="list-style-type: none"> <li>• Installation and operation of Mechanical Dust Suppression System with 248 Nos of long through sprinklers at coal stacking and wagon loading areas.</li> <li>• 10 Nos of Truck mounted sprinklers for roads and transit areas.</li> <li>• 13 Nos of heavy duty Atomized sprayers.</li> </ul>
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		<ul style="list-style-type: none"> <li>• Developed paved roads and deployed Vacuum road sweeping machines.</li> <li>• Developed closed warehouses for fertilizers, food grains and agri-products.</li> <li>• Developed Drains, Collection Pits and Guard Ponds for runoff from coal stack yards with facility to recycle for dust suppression.</li> <li>• Developed 300 KLD STP and treated water is being recycled for plantation and dust suppression.</li> <li>• Developed truck-wash areas with silt collection pits and oil separators. Treated water is being recycled for dust suppression.</li> <li>• Developed wind breaking wall and warehouses of 12 m height, down wind direction of FTP -1 Coal Stock yard.</li> <li>• Trucks deployed for inter carting of coal within port are provided with water dousing.</li> <li>• Trucks and railway wagons transporting coal destined to hinterland are being covered with tarpaulins.</li> <li>• Commissioned 3 Nos Continuous AAQ Monitoring Stations in the port area and linked the same to APPCB web site.</li> <li>• As required entire 191.5 Ha of Greenbelt has been developed along port boundary, around coal yards, avenue &amp; median plantations.</li> <li>• Existing Mangroves in the port area are being protected by barricading, erecting suitable display boards and ensuring tidal exchange by constructing pipe culvert.</li> <li>• 50 Ha of mangroves are developed in the identified area in the port as stipulated.</li> <li>• Developed 12 Nos of rain water harvesting ponds.</li> <li>• Undertaking Environmental Monitoring of AAQ, Ambient Noise, Marine Water Quality, Marine Sediment Quality, Ground water Quality and Soil Quality as per EMP through an</li> </ul>
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		<p>agency accredited by NABL &amp; approved by MoEF&amp;CC. The results of monitoring confirm to norms. Periodical Environmental Monitoring reports are regularly being submitted to APPCB.</p> <ul style="list-style-type: none"> <li>• <b>Constraints</b></li> </ul> <p>As per the Concession Agreement, GoAP shall make available entire land for the Port development on lease basis. Reference is invited to letter. No. 916/P.I/2012-2, dated 28.03.2013 of the Principal Secretary, I&amp;I (Ports) GoAP addressed to the Member Secretary, APPCB on the status of land, among others.</p> <p>Therefore, developmental activities planned in the said designated lands could not be progressed as envisaged. In order to utilize the land made available by GoAP and to put the infrastructure developed at a considerable cost into effective use, certain adjustments have become necessary in the layout viz., relocation of berthing front, stock yards and develop certain mandatory infrastructure. Accordingly, as recommended by the GoAP vide letters dated 17.05.2013 &amp; 05.09.2014 and NOC accorded by the APCZMA vide letters dated 02.02.2013 &amp; 14.08.2014, the MoEF&amp;CC have accorded the amendment to the Phase-II EC vide order dated 16.03.2016.</p> <p>Further, changes to the configuration of 3 berths to cater to port user needs has been submitted to the MoEF&amp;CC vide our letter dated 05.01.2018 and copy thereof was also submitted to APPCB.</p> <p>Changes to Cargo mix to cater to port user needs without change in the approved port capacity was approved by the APPCB vide amendment to CFE Order dt 22.02.2018. As directed by the APPCB, copy of the CFE amendment Order has been submitted to the MoEF&amp;CC vide our letter dated 11.04.2018.</p> <p>Configuration of one berth changed as required in terms of MoEF&amp;CC Gazette Notification No S.(O).3518(E) dated</p>
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		<p>23.11.2016 and MoEF&amp;CC has been informed vide our letter dt 25.05.2019.</p> <p>Out of the 4 berths for which configuration change has been informed to MoEF&amp;CC, construction of two berths (NW-2, NW-3) along with required shore infrastructure have been completed.</p>
2.	<p><b>Condition modified in CFE amendment</b> Order No. APPCB/VJA/NLR/633/HO/2004/9/46 dated 04.01.2017 is as under</p> <p><b>“Separate energy meters shall be provided for the STP and MDSS pump Houses i.e., air pollution control equipment to record energy consumed”</b></p>	<p><b>Complied.</b></p> <p>Separate energy meters are provided for STP and MDSS pump houses to record energy consumption.</p>
3.	<p>The proponent shall obtain Consents for Operation (CFO) from APPCB, as required Under Sec.25/26 of the Water (P&amp;C of P) Act, 1974 and under sec. 21/22 of the Air (P&amp;C of P) Act, 1981, before commencement of the activity.</p>	<p><b>Complied.</b></p> <p>CFO is obtained from APPCB on 02.02.2011 before commencement of operations and is being periodically renewed. The latest CFO renewal order No: APPCB/VJA/NLR/11344/CFO/HO/ 2018 obtained on dated 29.07.2018 is valid till 31.10.2023 and CFO is amended on 30.08.2018 and 10.02.2020.</p>
4.	<p>Notwithstanding anything contained in this conditional letter or consent, the Board hereby reserves its right and power Under Sec.27(2) of Water (Prevention and Control of Pollution) Act, 1974 and Under Sec.21(4) of Air (Prevention and Control of Pollution) Act, 1981 to review any or all the conditions imposed herein and to make such alternation as deemed fit and stipulate any additional conditions by the Board.</p>	<p><b>Noted.</b></p> <p>All directives of the APPCB are being complied scrupulously.</p>
5.	<p>The consent of the Board shall be exhibited in the factory premises at a conspicuous place for the information of the inspecting officers of different departments.</p>	<p><b>Complied.</b></p>
6.	<p>Compensation is to be paid for any environmental damage caused by it, as fixed by the Collector and District Magistrate as civil liability.</p>	<p><b>Noted.</b></p>
7.	<p>Floor washing shall be admitted into the effluent collection system only and shall not be allowed to find their way in storm drains or open areas. The industry shall maintain a</p>	<p><b>Complied.</b></p> <p>a) Quay wall is sloped towards land and runoff routed through settlement pits.</p>



	good housekeeping. All pipe valves, sewers, drains shall be leak proof. Dyke walls shall be constructed around storage of chemicals.	b) Fertilizers are stored in warehouses and swept dry. c) Peripheral drains, collection pits and guard ponds have been developed for coal storage yards with facility to recycle effluent for dust suppression. d) Good house-keeping measures are being adopted in the Port.
8.	Rain Water Harvesting (RWH) structure(s) shall be established on the plant site. The proponent shall ensure that effluent shall not enter the Rain Water harvesting structure.	<b>Complied.</b> Rain water harvesting pits are developed for buildings. For the general area, rain water harvesting ponds are also developed at 12 locations in the port to charge the aquifer. <b>Ensuring that waste water shall not mix in the Rain Water harvesting structures.</b>
9.	The rules and regulations notified by Ministry of Law and Justice, GOI, regarding the Public Liability Insurance Act, 1991 shall be followed.	<b>Noted.</b>
10.	This order is valid for a period of 5 years from the date of issue.	<b>Noted.</b>

## SCHEDULE-B

### Water:

1.	The source of water is Nakkalakaluva, Muthukur irrigation tank, Desalination Plant Kandaleru Creek (water supply for Fire protection system). The maximum permitted water consumption after expansion is 2500 KLD Vide CFO Order dt 14.05.2015.				<b>Complied</b> It is being ensured.  The average total water consumption during the period April, 2020 – September, 2020 is <b>1806 KLD</b> .
	<b>S. No.</b>	<b>Purpose</b>	<b>Existing (KLD)</b>	<b>After Expansion (KLD)</b>	
	(a).	Dust Suppression	950.0	1050.0	
	(b).	Domestic	50.0	400.0	
	(c).	Gardening / Irrigation	-	400.0	
	(d).	Miscellaneous (Fire protection services)	-	650.0	
		Total	1000.0	2500.0	
2.	The maximum Waste Water Generation (KLD) shall not exceed the following:				<b>Complied</b> 300 KLD STP is commissioned and is in operation.
	<b>S. No.</b>	<b>Purpose</b>	<b>Existing (KLD)</b>	<b>After Expansion (KLD)</b>	
	(a)	Domestic	40.0	300.0	

	<u>Treatment &amp; Disposal:</u>		
	<u>Existing (consented):</u>		
	<b>Effluent Source</b>	<b>Treatment</b>	<b>Disposal</b>
	Domestic	STP	Washing / flushing sewers / greenbelt development within port area
	<u>After Expansion:</u>		
	<b>Effluent Source</b>	<b>Treatment</b>	<b>Disposal</b>
	1.Washwater from cargo handling areas / berths	Settling pits along the drainage	After settlement of solids, the water shall be used for dust suppression.
	*2.Storm water runoff from port area	Settling pits along the drainage	After settlement of solids, the water shall be used for dust suppression. Surplus water will be discharged into sea.
	3. Oily waste water generated from central canteen	Oil & Grease tank	Water shall be used for dust suppression
	4. Domestic	**Sewage Treatment Plant	Treated water shall be used for plantation
	* Storm water runoff from fuel oil storage area shall pass through oil & water separator before joining settling pits. ** STP shall be provided in accordance to CRZ notification.		
3.	The Effluent Treatment Plant (ETP) and Sewage Treatment Plant (STP) shall be constructed and commissioned along with the commissioning of the activity. All the units of the ETP & STP shall be impervious to prevent ground water pollution.		
4.	The effluents shall be treated to the on land for irrigation / marine water standards as applicable, stipulated under Environment (Protection) Rules, 1986, notified and published by Ministry of Environment and Forests, Government of India as specified in Schedule VI vide G.S.R.422 (E), dt. 19.05.1993 and its amendments thereof, and additional standards / conditions stipulated by APPCB.		

<b>Complied.</b> Treated waste water is being recycled for Green Belt development.
<b>Complied</b> Wash water from berths is being routed through collection pits with facility to recycle for dust suppression.
<b>Complied.</b> Runoff from coal yards is being routed through Garland drains, collection pits with facility to recycle for dust suppression.
<b>Complied.</b> The oil & water separators have been commissioned and waste water recycled for dust suppression.
<b>Complied.</b> 300 KLD STP developed at the Amenities Complex is operational and treated effluent is recycled for dust suppression and green belt.
<b>Complied.</b> RCC Concrete structure which is impervious has been built for STP.
<b>Complied.</b>  Treated water from STP conforms to the standards

5.	There should not be any withdrawal of ground water in the CRZ area and ground water monitoring stations shall be provided on scientific basis and reports of the same shall be submitted for every six months.	<b>Noted.</b> Ground water is not being drawn in the CRZ area. Ground water quality is being monitored at 4 locations as per EMP and six monthly reports are being regularly submitted to APPCB.						
6.	The industry shall prepare oil spill contingency plan as approved by concerned department and shall recover the spill in case of any accidents.	<b>Complied</b> Oil Spills, if any, shall be managed as per the approved Oil Spill Contingency Plan. Oil Boom, Skimmer and chemicals required have been procured and trained professional are deployed to cater to Tier-I Oil spills. As per Disaster Management Plan Indian Coast Guard will be alerted to Coordinate.						
7.	The cargo ships shall be prohibited from discharging waste water, bilge/oil waste in the port area.	<b>Complied.</b>						
8.	The impact on the drawl of the water from the Kandaleru Creek shall be regularly monitored and report shall be submitted to the concerned Regional Officer.	<b>Complied.</b> No water is drawn from Kandaleru Creek except for firefighting contingency. Surface water quality is being monitored periodically and the reports are being submitted regularly.						
9.	Separate meters with necessary pipeline shall be provided for assessing the quantity of water used for each of the purposes mentioned below.	<b>Complied.</b>						
	(a). Industrial cooling, boiler feed.							
	(b). Domestic purposes.	<b>Complied.</b>						
	(c). Processing, whereby water gets polluted and pollutants are easily bio-degradable.	<b>Complied.</b>						
	(d). Processing, whereby water gets polluted and the pollutants are not easily bio-degradable.	<b>Not Applicable.</b>						
<b><u>Air:</u></b>								
10.	The proponent shall comply with the following for controlling air pollution.							
	<table><tr><td>S. No.</td><td>Details of stack</td><td>Stack 01</td></tr><tr><td>(a).</td><td>Attached to</td><td>D.G. Sets</td></tr></table>		S. No.	Details of stack	Stack 01	(a).	Attached to	D.G. Sets
	S. No.	Details of stack	Stack 01					
(a).	Attached to	D.G. Sets						
		<b>Noted.</b> DG sets are provided only as back-up for safety and emergency lighting during power failures and these sets comply with the guidelines of CPCB.						

	(b).	Capacity	1 x 320 KVA, 1 x 250 KVA, 1 x 180 KVA, 1 x 160 KVA, 1 x 125 KVA & 1 x 62.5 KVA		
	(c).	Fuel	Diesel		
	(d).	Stack height	As per CPCB norms		
	(e).	Control equipment	Acoustic enclosures & silencers		
11.	The proponent shall comply with the following for controlling fugitive emissions. This Condition is modified in CFE amendment <b>Order No. APPCB/VJA/NLR/633/HO/2004/9/46 dated 04.01.2017 is as under.</b>				
	* Fully mechanized handling equipment for loading & unloading operations.				Complied. ship unloaders have been commissioned for 2 berths for coal handling
	* Closed conveyor belt with water sprinkling arrangement for suppression of dust while conveying dusty cargos like Coal & Iron Ore. Specially designed Iron Ore ship loader necessary precautions to reduce drop height of Iron Ore into the ship.				Conveyor has been commissioned from berths to i. Stack tubes in NEC Yards ii. To Port Boundary for APGENCO dispatch iii. To Port Boundary for TPCIL and NCC power Dispatch
	* All outgoing vehicles involved in transportation of cargo shall be covered with tarpaulin.				<b>Being Complied</b> Tarpaulin cover is being ensured in respect of vehicles/wagons carrying coal destined to locations beyond port.
	* Vehicles shall be managed to avoid traffic congestions and shall provide empty dusting vehicle washings / dry cleaning system to clean the cargo vehicles.				<b>Being Complied</b> a) Vehicle identification and tracking system is implemented to avoid traffic congestion. b) Vehicle washing system with silt collection pits and oil separator is being implemented with facility to recycle effluent for dust suppression.
	* Based on traffic density / vehicular movements anticipated from the port, parking facilities will be provided.				<b>Being Complied</b>  Adequate vehicle parking facilities have been provided.
	* Mechanical water sprinkling shall be provided on roads and at dusty cargo storage areas, for suppression of dust.				<b>Being complied</b> (a) Installation and operation of MDSS with 248 Nos of sprinklers at coal stacking and wagon loading areas. (b) 10 Nos of Truck mounted sprinklers for roads and transit areas. (c) 13 Nos of Heavy duty Atomizers sprayers. (d) Deploying Hoppers for unloading.

		<p>(e) Mechanized coal handling at 2 berths within the land so far transferred on lease by GoAP. Conveyors are covered with hood.</p> <p>(f) Developed paved roads and resorted to sweeping of roads by vacuum sweeping machines.</p> <p>(g) Covering vehicles and wagons of coal transport to destinations outside the port with Tarpaulins.</p> <p>(h) Trucks deployed for inter carting of coal are being doused with water spray.</p> <p>(i) Developed wind breaking shield and warehouses of 12 m height on west side of the FTP-1 coal yard.</p>
12.	The industry shall install and commission continuous Ambient air monitoring stations (AAQM) within the plant as per the specifications of CPCB for online monitoring of SO <sub>2</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> , PM <sub>10</sub> with networking to Head Office by April, 2012 as committed.	<p><b>Complied</b></p> <p>Commissioned 3 Nos CAAQM stations &amp; linked it to APPCB website.</p>
13.	<p>Sprinklers / Nozzles shall be provided to control dust emissions at various points / areas.</p> <p>i. <u>Ship unloader</u> – Fixed cone nozzles shall be placed at receiving hoppers.</p> <p>ii. <u>Belt Transfer Points (in Transfer Towers)</u> –fixed nozzles at regular intervals, shall be mounted on skirt area and provide on discharge hoods of conveyors.</p> <p>iii. <u>Stock yard</u> – Water sprinkling system at high pressure with swiveling type nozzles shall be installed to cover entire stockpile. Nozzles shall be installed along stockpile at regular intervals to cover stockpile height and width. In other areas of stockpiles, two sprinklers at a time shall be operated sequentially to control dust generation due to winds.</p> <p>iv. <u>Rapid loading system</u> – fixed cone nozzles shall be installed, at regular intervals, at discharge point of shuttles conveyor on Rapid loading system.</p>	<p><b>Noted.</b></p> <p>(i), (ii) &amp; (iv) being implemented as part of mechanization of cargo operations.</p> <p>(iii) Being complied.</p> <p>248 Nos of Fixed water sprinklers are commissioned and operated at different coal yards and wagon loading areas.</p> <p>10 Nos of truck mounted mobile sprinklers are being deployed for dust suppression on roads and other areas.</p> <p>13 Nos of Heavy duty atomized sprayers are also deployed to augment dust suppression measures.</p>
14.	For Iron Ore, a fully mechanized handling system comprising of Ship loader, covered conveyors, stackers and reclaimers, wagon tippler etc., shall be provided.	<p><b>Noted</b></p> <p>Iron ore handling is intermittently taking place. Mechanization of iron ore handling shall be resorted to once exports exceed 6 MTPA. Dust suppression measure by means of regular water sprinklers is being followed.</p>
15.	Greenbelt shall be developed around the coal and iron ore stockyards to prevent fugitive dust of 100m width as proposed by the industry.	<p><b>Noted.</b></p>

		<ul style="list-style-type: none"><li>a) Total Greenbelt required for Phase-I &amp; II i.e.,191.5 Ha. has been developed.</li><li>b) Lands are being handed over by GoAP in Phases for development.</li><li>c) Green Belt being developed progressively in the lands transferred by GoAP on lease.</li><li>d) As required entire 191.5 Ha of Greenbelt has been developed along port boundary, around coal yards and block plantation, avenue &amp; median plantations.</li><li>e) Causalities replacement of existing plantation areas is also in progress.</li><li>f) Further Greenbelt is being taken up on a continuous basis on the lands being handed over by GoAP from time to time. GoAP is holding regular inter departmental meetings to resolve the land availability.</li></ul>												
16.	A sampling port with removable dummy of not less than 15 cm diameter shall be provided in the stack at a distance of 8 times the diameter of the stack from the nearest constraint such as bends etc. A platform with suitable ladder shall be provided below 1 meter of sampling port to accommodate three persons with instruments. A 15 AMP 250 V plug point shall be provided on the platform.	<b>Not Applicable.</b>												
17.	The generator shall be installed in a closed area with a silencer and suitable noise absorption systems. The ambient noise level shall not exceed 75 dB(A) during day time and 70 dB(A) during night time.	<b>Complied.</b> Ambient Noise level monitoring is carried out as per EMP during day time and night time at 7 locations and the noise levels are within prescribed limits. Periodical Environmental Monitoring Reports with results of monitoring are regularly being submitted to APPCB.												
18.	<div>The proponent shall comply with the following:<table><tr><th>S. No.</th><th>Solid Waste</th><th>Quantity</th><th>Method of Disposal</th></tr><tr><td>1.</td><td>Domestic use</td><td>250 Kgs/day</td><td>After composting, Biodegradable waste is proposed to be used as manure. Non-Biodegradable waste will be disposed to approved vendors.</td></tr><tr><td>2.</td><td>STP sludge</td><td>-</td><td>To be used as manure.</td></tr></table></div>	S. No.	Solid Waste	Quantity	Method of Disposal	1.	Domestic use	250 Kgs/day	After composting, Biodegradable waste is proposed to be used as manure. Non-Biodegradable waste will be disposed to approved vendors.	2.	STP sludge	-	To be used as manure.	<b>Complied.</b> <ul style="list-style-type: none"><li>a) Composting of domestic waste and using as manure.</li><li>b) Non-biodegradable wastes are being disposed to approved vendors.</li><li>c) STP sludge is being used as manure for Green belt development.</li></ul>
S. No.	Solid Waste	Quantity	Method of Disposal											
1.	Domestic use	250 Kgs/day	After composting, Biodegradable waste is proposed to be used as manure. Non-Biodegradable waste will be disposed to approved vendors.											
2.	STP sludge	-	To be used as manure.											

19.	<p>The following rules and regulations notified by the MOE&amp;F, GOI shall be implemented.</p> <p>(a) Hazardous waste (Management, Handling and Trans boundary Movement), Rules, 2008.</p> <p>(b) Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989.</p> <p>(c) Coastal Regulatory Zone (CRZ) Notification, 1991.</p> <p>(d) Municipal Solid Waste (Management &amp; Handling) Rules, 2000 &amp; amendments thereof.</p>	<b>Noted and being complied.</b>
20.	The storage facilities of fuel oils shall be made in well designated area where risk is minimum to storage facilities to prevent fire hazard and unauthorized access to unauthorized elements.	<b>Noted.</b>
21.	Fire detection and fire- fighting facilities with adequate water storage facility shall be provided in fire prone area in consultation with Directorate of Fire Firefighting.	<b>Complied</b> Fire-fighting system along with adequate water storage is being ensured. Dedicated Fire-fighting equipment and trained personnel are available. Port Tugs are also having fire-fighting capability.
22.	<p>This Condition modified in CFE amendment <b>Order No. APPCB/VJA/NLR/633/HO/2004/9/46 dated 04.01.2017 is as under.</b></p> <p>Onsite Disaster Management Plan shall be prepared to meet any eventuality in case of any accident. Mock drills shall be conducted at least twice a year and modifications required if any shall be incorporated in Disaster Management Plan.</p>	<b>Complied.</b> a) On-Site emergency plan is prepared and submitted to District authorities for integration with Off-Site emergency plan. b) Disaster management Plan is prepared and is being updated as required. c) Mock drills are being conducted.
23.	In case of any leakage container of hazardous cargo is found, permission shall be obtained from the Board for disposal after establishing type and quantity of the waste.	<b>Noted.</b> Same shall be complied on such situations.
<b><u>Other Conditions:</u></b>		
24.	Greenbelt of width 100m shall be developed along the boundary of the industry as committed by the proponent. The greenbelt shall be undertaken in an area of 167.5 ha in Phase-II. Greenbelt development shall be started along with the construction activity.	<b>Complied.</b> a) Total Greenbelt required for Phase-I & II i.e., 191.5 Ha. has been completed. b) Lands are being handed over by GoAP in phases for development. c) As required entire 191.5 Ha of Greenbelt has been developed along port boundary, around coal yards and block plantation, avenue& median plantations. d) Causalities replacement of existing plantation areas is also in progress.

		e) Further Greenbelt is being taken up on a continuous basis on the lands being handed over by GoAP from time to time. GoAP is holding regular inter departmental meetings to resolve the land availability.
25.	The industry shall implement the commitment given in action plan submitted vide Letter dated 19.04.2010 within the scheduled time period and shall submit compliance to the concerned Regional Officer.	<b>Noted.</b>
26.	Dedicated 3 line road shall be laid as proposed by the proponent to avoid conjunction vehicular pollution to the villagers.	<b>Complied.</b> Four lane port connectivity road has been formed, by GoAP as per terms of the Concession agreement. Hence no congestion or vehicular pollution to villagers.
27.	The hydro-dynamic studies shall be undertaken to ascertain the impact to the shoreline in the stretch and ecologically sensitive areas and the report shall be submitted to the concerned Regional Officer.	<b>Complied.</b> a) The hydro-dynamic studies to ascertain the impact of port development on the shoreline in the stretch have been carried out through M/s.HR Wallingford, UK. No long term impact is noticed due to minimal net drift along the coast. b) However, as recommended in their report dated October, 2007, 7 Km of coastline both North and South of the port entrance is being monitored through M/s. Indian National Centre for Ocean Information Services (INCOIS), Hyderabad using satellite imagery. From the INCOIS reports for the period October, 2008 to January, 2010, the coastline is found to be stable. c) Shoreline monitoring being carried out monthly in-house also revealed that the coast line is reasonably unaffected except for seasonal variations. Further monitoring is being continued.
28.	The plantation of mangroves shall be undertaken in an area of 50 ha as the Phase-II of the project spreads over 800 ha and existing mangroves shall not be disturbed.	<b>Complied.</b> 1. The mangroves are highly sensitive to the soil conditions and mangroves grow only in specific areas. Therefore, GoAP has been approached to allot suitable additional land. 2. We raised Mangroves in 50 Ha in the port in the areas suggested by GoAP. 3. Due to low survival rate, replanting of casualties and damages on account of human interference is being undertaken where needed.



29.	The industry shall comply with all the conditions stipulated in the Environmental Clearance and CRZ Clearance issued vide Order dated 13.11.2009 issued by MOE&F, GOI.	Complied. Compliance reports are being regularly submitted.
<b>Conditions vide order No. 633/APP/CB/CFE/RO-NLR/HO/2010 dated 10.02.2016</b>		
6.	M/s Krishnapatnam Port Company LTD., shall comply with the following	
	<p><b>a)</b> The mechanical dust suppression system (sprinklers and fogging) of adequate capacity shall be provided at the coal handling points such as loading and unloading from ship, stacking and reclaiming processed in the stack yard to control dust generation and air emissions.</p>	<p><b>Complied.</b></p> <p>a) To control dust generation and air emissions, Mechanical dust suppression system is provided and operated for coal storage yards and transfer houses of conveyor system.</p> <p>b) Water Sprinkling system has been installed for the ship un loaders and conveyer systems.</p> <p>c) 248 Nos sprinklers have been installed and operating for dust suppression in storage yards.</p> <p>d) 10 Nos tankers have been deployed for dust suppression of pavements and roads.</p> <p>e) 13 Nos Heavy duty atomizer sprayers are deployed.</p>
	<p><b>b)</b> Wind breaking wall / sheets shall be provided all along the Coal/ Iron ore stacks yards towards villages viz., Chalivendra, Gopalapuram and Krishnapatnam taking into consideration the meteorological characteristics of the location within 3 months as committed vide Ir.dt.01.02.2016.</p>	<p>Wind Shield / screen along the Coal stacks yards has been erected for Chalivendra, Gopalapuram and Krishnapatnam villages are completed.</p>
7.	The port authorities shall submit a copy of the orders issued by the Board to the MoEF&CC, GoI, New Delhi for record.	<p><b>Complied:</b></p> <p>A copy of the CFE amendment Order was submitted to MoEF&amp;CC vide letter No. KP/MoEF/21 dated 13.02.2016.</p>
<b>Conditions vide order No. 633/APP/CB/CFE/RO-NLR/HO/2010 dated 22.02.2018</b>		
1	The port authorities shall submit a copy of the order to the MoEF&CC, GoI, New Delhi for record.	A copy of the CFE amendment Order is submitted to MoEF&CC vide letter No. KP/MoEF/40 dated 11.04.2018.



# KRISHNAPATNAM PORT COMPANY LIMITED



COMPLIANCE REPORT OF  
CONDITIONS STIPULATED IN THE  
CONSENT FOR OPERATIONS CFO ORDER OF APPCB  
FOR KRISHANAPTAM PORT  
PERIOD: APRIL, 2020 TO SEPTEMBER, 2020

**Krishnapatnam Port Company Limited**

**Compliance Report of Conditions Of**

**Consent for Operation CFO Order of APPCB  
Dt. 29-07-2018 and Amendment dated 10.02.2020**

**Period: April, 2020 to September, 2020**

## Krishnapatnam Port Company Limited

### Compliance Report of conditions of Consent For Operation (CFO) Order of APPCB Dt. 29.07.2018 and Amendment dated 10.02.2020 Period of Reporting – April, 2020 to September, 2020

S.No.	Stipulation	Status
	<b>Schedule-A</b>	
1.	Any up-set condition in any industrial plant / activity of the industry, which result in, increased effluent / emission discharge and/ or violation of standards stipulated in this order shall be informed to this Board, under intimation to the Collector and District Magistrate and take immediate action to bring down the discharge / emission below the limits.	<b>Noted.</b>
2.	The industry shall carryout analysis of waste water discharges or emissions through chimneys for the parameters mentioned in this order on quarterly basis and submit to the Board.	<b>Complied.</b> Periodical Monitoring including STP outlet quality and emissions through DG set are being carried out at KPCL and reports being submitted to statutory authorities regularly. Six Monthly Environmental Monitoring Report April, 2020 to September, 2020 is attached as <b>Appendix-I</b>
3.	All the rules & regulations notified by Ministry of Law and Justice, Government of India regarding Public Liability Insurance Act, 1991 should be followed as applicable.	<b>Noted.</b>
4.	The industry shall put up two sign boards (6x4 ft. each) at publicly visible places at the main gate indicating the products, effluent discharge standards, air emission standards, hazardous waste quantities and validity of CFO and exhibit the CFO order at a prominent place in the factory premises.	<b>Complied.</b> Sign Boards have been put up near the main entrance of the Port and details are also being updated. Regularly updating the details of products, effluent discharge standards, air emission standards, hazardous waste quantities and validity of CFO and exhibited the CFO order.
5.	Notwithstanding anything contained in this consent order, the Board hereby reserves the right and powers to review / revoke any and/or all the conditions imposed herein above	<b>Noted.</b>

	and to make such variations as deemed fit for the purpose of the Acts by the Board.	
6.	The industry shall file the water cess returns in Form-I as required under section (5) of Water (Prevention and Control of Pollution) Cess Act, 1977 on or before the 5 <sup>th</sup> of every calendar month, showing the quantity of water consumed in the previous month along with water meter readings. The industry shall remit water cess as per the assessment orders as and when issued by Board.	<b>Noted.</b>
7.	The applicant shall submit Environment statement in Form V before 30 <sup>th</sup> September every year as per Rule No.14 of E (P) Rules, 1986 & amendments thereof	<b>Complied.</b> Environmental Statement (Form V) for the year 2019-20 has been submitted vide our letter No. KPCL/MIS(A)-APPCB/EHS/282-2020 dated 28.09.2020.
8.	The applicant shall make applications through Online for renewal of Consent (under Water and Air Acts) and Authorization under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts and detailed compliance of CFO conditions for obtaining Consent & HW Authorization of the Board. The industry should immediately submit the revised application for consent to this Board in the event of any change in the raw material used, processes employed, quantity of trade effluents & quantity of emissions. Any change in the management shall be informed to the Board. The person authorized shall not let out the premises / lend / sell / transfer their industrial premises without obtaining prior permission of the State Pollution Control Board.	<b>Complied.</b> CFO renewed by the APPCB vide order No APPCB/VJA/NLR/11344/CFO/HO/2018 dated 29.07.2018 and subsequent amendments vide letters dated 30.08.2018 and 10.02.2020 is valid up to 31 <sup>st</sup> October, 2023.
9.	Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air	<b>Noted.</b>

	Rules 1982, to Appellate authority constituted under Section 28 of the Water(Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air(Prevention and Control of Pollution) Act, 1981.																			
	<b>Schedule-B</b>																			
	<b>Water Pollution:</b>																			
1.	<p>The industry shall comply the following effluent standards based on the disposal points permitted:</p> <table> <tr> <th>Out let</th><th>Parameter</th><th>Concentration</th></tr> <tr> <td rowspan="6">1</td><td>pH</td><td>5.5 - 9.0</td></tr> <tr> <td>Total Suspended Solids (TSS) 1000 mg/l</td><td>1000 mg/l</td></tr> <tr> <td>Total Dissolved Solids (TDS) 2100 mg/l</td><td>2100 mg/l</td></tr> <tr> <td>Oil and Grease 10.0 mg/l</td><td>10.0 mg/l</td></tr> <tr> <td>COD 250 mg/l</td><td>250 mg/</td></tr> <tr> <td>BOD</td><td>100 mg/l</td></tr> </table>	Out let	Parameter	Concentration	1	pH	5.5 - 9.0	Total Suspended Solids (TSS) 1000 mg/l	1000 mg/l	Total Dissolved Solids (TDS) 2100 mg/l	2100 mg/l	Oil and Grease 10.0 mg/l	10.0 mg/l	COD 250 mg/l	250 mg/	BOD	100 mg/l	<p><b>Noted and complying</b>  <b>Last Six monthly monitoring reports are enclosed as Appendix-I</b></p>		
Out let	Parameter	Concentration																		
1	pH	5.5 - 9.0																		
	Total Suspended Solids (TSS) 1000 mg/l	1000 mg/l																		
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	Oil and Grease 10.0 mg/l	10.0 mg/l																		
	COD 250 mg/l	250 mg/																		
	BOD	100 mg/l																		
2.	<p>The industry shall take steps to reduce water consumption to the extent possible and consumption shall NOT exceed the quantities mentioned below:</p> <table> <tr> <th>S.No</th><th>Purpose</th><th>Quantity</th></tr> <tr> <td>1</td><td>Dust suppression</td><td>1050.0 KLD</td></tr> <tr> <td>2</td><td>Domestic</td><td>400.0 KLD</td></tr> <tr> <td>3</td><td>Gardening / Irrigation</td><td>400.0 KLD</td></tr> <tr> <td>4</td><td>Miscellaneous (Fire protection services)</td><td>650.0 KLD</td></tr> <tr> <td></td><td><b>Total</b></td><td><b>2,500.0 KLD</b></td></tr> </table> <p>Separate meters with necessary pipe-line shall be maintained for assessing the quantity of water used for each of the purposes mentioned above for Cess assessment purpose.</p>	S.No	Purpose	Quantity	1	Dust suppression	1050.0 KLD	2	Domestic	400.0 KLD	3	Gardening / Irrigation	400.0 KLD	4	Miscellaneous (Fire protection services)	650.0 KLD		<b>Total</b>	<b>2,500.0 KLD</b>	<p><b>Being Complied</b>  The average total water consumption during the period April, 2020 – September, 2020 is <b>1806 KLD</b>.</p>
S.No	Purpose	Quantity																		
1	Dust suppression	1050.0 KLD																		
2	Domestic	400.0 KLD																		
3	Gardening / Irrigation	400.0 KLD																		
4	Miscellaneous (Fire protection services)	650.0 KLD																		
	<b>Total</b>	<b>2,500.0 KLD</b>																		

3.	The additional water quantity of 500 KLD shall be used for dust suppression measures only, as committed by the Port in the CFO meeting held on 13.08.2015.	<b>Noted.</b>
4.	The Krishnapatnam Port shall comply with emission limits for DG sets upto 800 KW as per the Notification G.S.R.520 (E), dated 01.07.2003 under the Environment (Protection) Amendment Rules, 2003 and G.S.R.448(E), dated 12.07.2004 under the Environment (Protection) Second Amendment Rules, 2004. In case of DG sets more than 800 KW shall comply with emission limits as per the Notification G.S.R.489 (E), dated 09.07.2002 at serial no.96, under the Environment (Protection) Act, 1986.	<b>Complied</b>
<b>Air Pollution:</b>		
5.	<p>The industry shall comply with ambient air quality standards of PM<sub>10</sub> (Particulate Matter size less than 10mm) - 100 mg/m<sup>3</sup>; PM<sub>2.5</sub> (Particulate Matter size less than 2.5 mm) - 60 mg/m<sup>3</sup>; SO<sub>2</sub> - 80 mg/m<sup>3</sup>; NO<sub>x</sub> - 80 mg/m<sup>3</sup>, outside the factory premises at the periphery of the industry.</p> <p>Standards for other parameters as mentioned in the National Ambient Air Quality Standards CPCB Notification No.B-29016/20/90/PCI-I, dated 18.11.2009.</p> <p>Noise Levels: Day time (6 AM to 10 PM) - 75 dB (A) Night time (10 PM to 6 AM) - 70 dB (A)</p>	<p>i) AAQ and Ambient Noise levels are being monitored through an agency accredited by NABL and approved by MoEF&amp;CC at the following 7 Locations along the periphery of the port:</p> <ul style="list-style-type: none"> <li>• Krishnapatnam Village</li> <li>• New Light House (North west side)</li> <li>• Gopalapuram village</li> <li>• Chalivendra Village</li> <li>• Amenities Complex</li> <li>• Port Entrance (Zero Point)</li> <li>• South Port</li> </ul> <p>ii) The results comply with the NAAQ standards. Periodic Monitoring reports are being submitted to APPCB regularly.</p> <p>iii) The AAQ and ambient noise monitoring results during April 2020 to September 2020 are presented in the Six Monthly Environmental Monitoring Report enclosed as <b>Appendix- I</b></p>
6.	The Port shall take all measures including latest available technologies to comply with above ambient air quality standards.	<p><b>Complied.</b></p> <p>Krishnapatnam Port is undertaking considerable number of measures for emission control. Significant among them are as follows:</p> <p>(a) Installation and operation of Mechanical Dust Suppression</p>



		<p>System (MDSS with 248 Nos. of sprinklers at coal stacking and wagon loading areas.</p> <p>(b) 10 Nos. of Truck mounted sprinklers for roads and transit areas.</p> <p>(c) 13 Nos. of heavy duty Atomized Sprayers</p> <p>(d) Deploying Hoppers for cargo unloading.</p> <p>(e) Mechanized coal handling at 2 berths within the land so far transferred on lease by GoAP. Conveyors are designed with covering hood.</p> <p>(f) Developed paved roads and deployed road sweeping machines.</p> <p>(g) Covering of coal transport vehicles destined beyond port and wagons with Tarpaulins.</p> <p>(h) Trucks carrying coal for inter carting are doused with water spray.</p> <p>(i) Developed wind breaking shield on western side of FTP 1 coal storage yard. Construction of wind shield at two more locations is completed.</p> <p>(j) So far in an area of more than 191.5 Ha of Green belt has been developed along port boundary, around coal yards, avenue&amp; median plantations.</p> <p>(k) Monitoring of AAQ at 7 locations through NABL accredited &amp; MoEF&amp;CC approved agency.</p> <p>(l) Commissioned 3 Nos. CAAQM equipment &amp; linked to APPCB website.</p> <p>We are committed to implement measures as required to ensure compliance of AAQ norms.</p>
7.	The Krishnapatnam Port shall not increase the capacity beyond the permitted capacity mentioned in this order, without obtaining CFE & CFO of the Board.	<b>Noted.</b>
8.	Coal stack heights in all coal yards shall not be more than 12 mts.	<b>Complied.</b>
9.	The industry shall ensure required wetness all the time on the surface of stock piles to avoid the dust emissions from	<b>Complied.</b>

	the stock piles.	
10.	The industry shall install sufficient number of CAAQM stations in between the villages and the port area. The stations shall be located at the periphery of the villages to monitor all the parameters given in the consent order.	<b>Complied.</b> Commissioned 3 Nos. of CAAQM Stations at the periphery of Gopalapuram, Tamminapatnam and Krishnapatnam Villages and the same is linked to APPCB website.
11.	The Port shall link the 2 <sup>nd</sup> CAAQM station to Board website within one month.	<b>Complied.</b> The second CAAQM Station is installed, commissioned at Tamminapatnam and connected to APPCB and same is informed to APPCB vide ltr. No. KPCL/APPCB/25/2015-16, dated 19.09.2015. Third CAAQM Station at Krishnapatnam village is installed, commissioned and linked to APPCB website.
12.	Unloading of iron ore from the railway wagons house should be carried out with wagon tippers only, in case, handling of iron ore is more than 6 MTPA. As and when iron ore handling is to be done intermittently, it should be handled with water sprinkling system at high pressure with swiveling type nozzles operated regularly to cover entire stockpile. Nozzles shall be operated along stockpile at regular Intervals to cover stockpile height and width.	<b>Noted.</b> Iron ore handling is intermittently taking place. Mechanization of iron ore handling shall be resorted to once exports exceed 6 MTPA. Dust suppression measure by means of regular water sprinklers is being followed.
	<b>General:</b>	
13.	The MDSS system shall be in operation wherever the stock of any bulk material (Dusty cargo) is piled in a way to ensure wetness on the surface of stock piles.	<b>Complied.</b> <ul style="list-style-type: none"> <li>a) MDSS with 248 Nos. of water sprinklers is being operated at coal yards viz., FTP 1 yard, NEC coal yard &amp; Inner coal yards and wagon loading areas at regular intervals, as required, ensuring wetness on the surface of stock piles.</li> <li>b) 10 Nos. of truck mounted mobile water sprinklers are also deployed as and when necessary for effective control of fugitive emissions.</li> <li>c) 13 Nos. of heavy duty Atomized sprayers</li> <li>d) Height of the stock piles and sprinkler coverage is regularly being</li> </ul>

		monitored. Water throughput is being regulated by avoiding voltage drop. Depending on wind direction (unfavorable), water velocity at the nozzles is also being regulated. Further measures to improve the height of throw and water throughput for effectively covering the stock piles shall be continued.
14.	As regards to deviation in location of facilities such as stock piles and other facilities, from the originally envisaged plan, amendments for the EC and CFE have to be obtained immediately.	<b>Noted.</b>
15.	<p><b>This Condition is modified in CFO amendment</b> Order No. APPCB/VJA/NLR/11344/CFO/HO/2018 dated 30.08.2018 is as under</p> <p>In no case the Hazardous chemicals shall be handled openly either from or into the ship. The storage and handling (including container stuffing and de-stuffing) of hazardous chemicals / cargo shall be carried non CRZ area of the port area.</p>	<p><b>Noted.</b></p> <p>The storage and handling (including container stuffing and de-stuffing) of hazardous chemicals / cargo shall be carried only in non CRZ area of the port area.</p>
16.	The port shall maintain the existing green belt with adequate width and density and in vacant places.	<p><b>Complied.</b></p> <p>a) As required entire Greenbelt area of 191.5 Ha has been developed along port boundary, around coal yards, avenue &amp; median plantations.</p>
17.	The Krishnapatnam Port shall use road sweeping machines to clean all port internal roads regularly.	<b>Complied.</b>
18.	The Krishnapatnam Port shall ensure that the trucks transporting cargos to outside the port shall be covered with tarpaulin to avoid fugitive emissions / spillages.	<b>Complied.</b>
19.	All conveyor belts and other transfer points shall be covered with GI sheets to mitigate fugitive emissions generated during conveying of dusty cargos.	<p><b>Complied.</b></p> <p>Transfer tower points have been covered using GI sheets with openings as required for access and sprinklers have been installed for dust suppression.</p>

		Fixing hoods to the conveyor cover is completed.
20.	The Krishnapatnam Port shall maintain water sprinklers for effective control of fugitive emissions generated during handling of cargo and increased volume of vehicular traffic.	<b>Complied.</b> <ul style="list-style-type: none"> <li>a) 248 Nos sprinklers have been installed and operating for dust suppression in storage yards.</li> <li>b) 10 Nos mobile water tankers have been deployed for dust suppression of pavements including roads.</li> <li>c) 13 Nos Heavy duty atomizer sprayers are being deployed</li> </ul>
21.	The industry shall maintain Mechanical Dust Suppression System (MDSS) for stock yards, dusty cargo berths and conveyor belts.	<b>Complied.</b> <ul style="list-style-type: none"> <li>a) Operation of Mechanical Dust Suppression System (MDSS) is being maintained for coal storage yards and transfer houses of conveyor system.</li> <li>b) Sprinkling system has been installed in ship unloaders and conveyer systems.</li> </ul>
22.	The Port shall develop and maintain 100 m width greenbelt along the periphery & 20 m width around coal & iron ore stack yards.	<b>Complied.</b> <ul style="list-style-type: none"> <li>a) As required entire Greenbelt area of 191.5 Ha has been developed along port boundary, around coal yards and block plantation, avenue &amp; median plantations.</li> <li>b) Causalities replacement of existing plantation areas also in progress</li> <li>c) Upon transfer of salt land by GoAP, Green belt development along boundary near Krishnapatnam and Gopalapuram villages will be undertaken on priority.</li> <li>d) Near Chalivendra village due to site limitation green belt has been developed both along the boundary and also on opposite side along the road, pending transfer of forest lands.</li> </ul>
23.	The Krishnapatnam Port shall maintain empty dusty cargo vehicles washing system to clean dusty cargo empty vehicles.	<b>Complied.</b> <p>Truck washing system with silt collection and oil &amp; grease separation chambers has been provided for cleaning empty vehicles, with facility to recycle effluent for dust suppression.</p>
24.	The Krishnapatnam Port shall record the energy consumption for the energy meters provided for Sewage Treatment Plant (STP), pump houses to water sprinklers /	<b>Complied.</b> <p>Energy meters have been provided for STP and MDSS pump houses.</p>

	dust suppression measures and Air Pollution Control Equipments (APCE).	
25.	The Krishnapatnam Port shall not allow any hazardous wastes through the port other than waste oil / used oil generated in the Port without prior permission of Board and shall comply with EC conditions. The Krishnapatnam Port shall not store any hazardous waste within the premises a per the time frame mentioned in HWM Rules.	<b>Noted and being complied.</b>
26.	In case a leaky container of hazardous cargo is found, a separate permission of the Board may be obtained after establishing the quality and the type of waste for disposal.	<b>Noted.</b>
27.	All types of the fertilizers should be stored in the closed warehouses only. The Port should ensure that there should not be any open storage of urea or any other fertilizer materials. There shall not be any effluent generation.	<b>Complied.</b> a) Closed warehouses are being used for storing all fertilizers and these warehouses are swept dry to avoid generation of effluent. b) Only rock phosphate and MOP being naturally occurring materials are being stored in open yards as per practice in vogue at other ports.
28.	The Krishnapatnam Port shall store fuel oils used for construction equipment, vessels and vehicles in a well-designed manner and protect them against fire hazards by construction of compound wall to prevent access to unauthorized elements. The surface run off from storage area shall pass through oil water separator before being discharged.	<b>Complied.</b> Dedicated fuel storage has been provided and waste oil storage and runoff from these areas shall passes through oil/water separator chambers.
29.	The Krishnapatnam Port shall provide fire detection and firefighting facilities with adequate water storage in fire prone areas in consultation with Directorate of firefighting.	<b>Complied.</b> Fire-fighting system along with adequate water storage is being ensured. Dedicated equipment and trained personnel are available for fire detection and Fire-fighting.
30.	The Krishnapatnam Port shall comply latest technologies for controlling fugitive emissions including the following:	<b>Noted.</b>
	a. Fully mechanized handling equipment for loading and	Coal ship unloaders and conveyer system has been provided for two (2)

	unloading operations	berths.
	b. Closed conveyor belt with water sprinkling arrangement for suppression of dust while conveying dusty cargoes like coal, iron ore etc.,	Water sprinkler system has been providing in ship unloaders and conveyer system for dust suppression. GI sheet covering has been provided for all transfer towers and Conveyor.
	c. Specially designed iron ore ship loader with necessary precautions to reduce drop height of iron ore into the ship.	Iron ore handling is intermittently taking place. Mechanization of iron ore handling shall be resorted to once exports exceed 6 MTPA. Dust suppression measure by means of regular water sprinklers is being followed.
	d. Mechanical water sprinkling shall be provided on roads and at dusty cargo storage areas for suppression of dust.	248 Nos mechanized sprinklers are being operated in coal storage yards and 10 Nos mobile tankers and 13 Nos heavy duty atomizer sprayers are being deployed.
31.	The Krishnapatnam port shall maintain adequate number of ground water monitoring location on scientific basis and the same shall be monitored every six months.	<b>Complied.</b> Ground water monitoring is being carried out at 4 locations envisaged in the EMP and six monthly reports are being regularly submitted to APPCB.
32.	The Krishnapatnam port shall construct the storm water drains to avoid the contamination of runoff with other effluents.	<b>Complied.</b>
33.	The Krishnapatnam port shall regularly clean the drains to avoid siltation.	<b>Complied.</b>
34.	The Krishnapatnam port shall operate Sewerage Treatment Plant (STP) and after treatment wastewater should be used for washing purposes/flushing of sewers /green belt development etc, treated sewage should not be disposed into the sea.	<b>Complied.</b> 300 KLD STP developed near amenities building complex is operational and treated water is being recycled for green belt development and dust suppression etc.
35.	The Krishnapatnam port shall monitor compliance through Environment Management Cell with qualifies and trained staff.	<b>Complied.</b>
36.	The Krishnapatnam Port shall maintain onsite emergency action plan after carrying out risk analysis and hazop studies.	<b>Complied.</b> a) Onsite emergency plan has been prepared and submitted to District Collector for incorporating with Offsite emergency plan of District magistrate

		b) HIRA (Hazard Identification and Risk Assessment) has been done for all operations in the port.
37.	The Krishnapatnam Port shall comply with the conditions of CFE order dated 08.05.2010.	<b>Complied.</b> Six Monthly Compliance Report thereon is being submitted separately
38.	The Krishnapatnam Port shall submit monthly monitoring reports to RO: Nellore.	<b>Complied.</b> Monthly monitoring reports are being submitted to APPCB Nellore regularly.
39.	The Krishnapatnam Port shall follow the directions issued by the Board from time to time.	<b>Noted</b> All directions issued by APPCB are being scrupulously followed.
40.	The Port shall comply with standards and directions issued by CPCB / MoEF&CC as and when notifications are issued.	<b>Noted</b> All standards and directions issued by CPCB / MoEF&CC as and when notifications issued are being scrupulously followed.
41.	The Port shall submit compliance report on the conditions mentioned in the consent order every six months i.e., on 1st of January and July of every year to the Regional Office/ Zonal Office.	<b>Complied.</b>
	<b>SCHEDULE – C [See rule 6 (2)]</b>	
	<b>[CONDITIONS OF AUTHORISATION FOR OCCUPIER OR OPERATOR HANDLING HAZARDOUS WASTES]</b>	
1.	All the rules and regulations notified by Ministry of Environment and Forests, Government of India under the E (P) Act, 1986 in respect of management, handling, transportation and storage of the Hazardous wastes should be followed.	<b>Noted</b> All the rules and regulations notified by Ministry of Environment and Forests, Government of India under the E (P) Act, 1986 in respect of management, handling, transportation and storage of the Hazardous wastes are being scrupulously followed.
2.	The industry shall not store hazardous waste for more than 90 days as per the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.	<b>Complied.</b>
3.	The industry shall store Used / Waste Oil and Used Lead Acid Batteries in a secured way in their premises till its disposal to the manufacturers / dealers on buyback basis.	<b>Complied.</b>
4.	The industry shall maintain 7 copy manifest system for transportation of waste generated and a copy shall be submitted to concerned Regional Office of APPCB. The	<b>Complied.</b> Waste oil generating from Krishnapatnam port is being disposed through APPCB authorized vendors duly maintaining 7 copies of manifest system

	driver who transports Hazardous Waste should be well acquainted about the procedure to be followed in case of an emergency during transit. The transporter should carry a Transport Emergency (TREM) Card.	for transportation and a copy is being submitted to RO, APPCB, Nellore.
5.	The industry shall maintain proper records for Hazardous and Other Wastes stated in Authorisation in FORM-3 i.e., quantity of Incinerable waste, land disposal waste, recyclable waste etc., and file annual returns in Form- 4 as per Rule 20 (2) of the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.	<b>Complied.</b>
<b>CFO Amendment Order No. APPCB/VJA/NLR/11344/CFO/HO/2019 dated 10.02.2020</b>		
1	The port shall take adequate air pollution control measures with respect to the enhanced dusty materials handling capacities.	<b>Complied.</b> Krishnapatnam Port has developed adequate MDSS (Mechanical Dust Suppression System) and other air pollution control measures to minimize the air pollution generated with respect to the enhanced dusty materials handling.
2	The port shall stock all the dusty materials within the designated storage yards only.	<b>Noted.</b>
3	The port activities are concentrating in north quay by construction of 12 <sup>th</sup> berth, hence the stocking of dusty materials shall not be extended towards the residential areas around the port area.	<b>Noted &amp; Complied.</b>
4	The dusty materials transporting vehicles shall be closed in all respects/covered with tarpaulin for controlling fugitive emissions.	<b>Complied.</b>
5	The port shall provide wheel washing facility near the dusty cargo stocking area, to the freighted vehicles going outside the port.	Wheel washing facility near the dusty cargo stocking area, to the freighted vehicles going outside the port is under progress.
6	The port shall inform the modifications made in port infrastructure developments to the MoEF&CC and to the Board time to time.	<b>Noted &amp; Complied.</b>
7	The port shall obtain EC for any change of scope of the	<b>Noted.</b>



	project and shall restrict the port activities as permitted vide EC orders Dt. 26.07.2006 for Phase I, 13.11.2009 for Phase II and Amendments issued on 16.03.2016.	
8	The Port shall continuously operate the 3 CAAQM stations installed in between villages and port area to monitor all the parameters given in the consent order and upload the data continuously to the APPCB/CPCB websites.	<b>Being Complied.</b> Third CAAQM Station at Krishnapatnam village is installed, commissioned and linked to APPCB website.

## Appendix – I

# Krishnapatnam Port Company Limited



## Environmental Monitoring Report for the Period April, 2020-September, 2020

**CHAPTER – 1**

**INTRODUCTION**

## 1.0 Introduction:

Krishnapatnam Port is located at Krishnapatnam in Muthukuru Mandal, “Sri Potti Sri Ramulu” Nellore District, Andhra Pradesh on the East Coast of India at Latitude 14°15'10" N and Longitude 80° 08' 05" E on the Northern bank of Khandaleru (Upputeru). Krishnapatnam Port is situated at about 180 Km North of Chennai (Madras) Port.

The Environmental Clearance (EC) was accorded for the Phase – I development of this Port by the MoEF, GoI vide Ir no. 10-22/2005-IA-III dated: 26<sup>th</sup> July, 2006 and the CFE was accorded by the APPCB vide Order No. APPCB/VJA/NLR/633/HO/2004/9 - 467 dt. 25.05.2004. The Phase - I facility was commissioned during the year 2009.

For the Phase II development of this Port, the Environmental Clearance has been accorded by the MoEF, GoI vide F. No. 11 – 62 / 2009 – IA.III dated: 13<sup>th</sup> November, 2009 and MoEF&CC extended vide Order even No. dated 18.08.2015 & 16.04.2018 and amended by MoEF&CC vide order dt 16.3.2016. The CFE accorded by the APPCB vide Order No. 633/PCB/CFE/RO-NLR/HO/2010-390 dt. 08.05.2010 is extended vide APPCB Order dt 02.07.2015 and amended vide APPCB's Orders dt. 14.03.2014, 02.07.2015, 10.02.2016, 04.01.2017 & 22.02.2018. The EC and CFE accorded for Phases I & II Development of Krishnapatnam Port caters to 17 berths and necessary infrastructure with a capacity to handle 72.3 MTPA of non-container cargo and 3.3 MTEUsPA of container cargo.

The CFO has been accorded by the APPCB vide Order No. APPCB/VSP/VJA/NLR/633/CFO/HO/2009-582 dt. 08.06.2009 and same is being periodically renewed. The APPCB has accorded latest CFO renewal Order, vide APPCB's Order No. APPCB/VJA/NLR/11344/CFO/HO/2018 dt. 29.07.2018 & 30.08.2018 which is valid till 31<sup>st</sup> October, 2023. Further, it is amended for additional one berth and increased coal cargo capacity from 46.5 MTPA to 51 MTPA. As of now, 12 berths with necessary infrastructure with capacity to handle 68 MTPA of non-container cargo and 2.0 MTEUsPA of container cargo are commissioned and being operated.

The general Layout plan of the Krishnapatnam Port Phases I & II development is given in Figure–II.

The Environmental Management Plan (EMP) envisaged in the Environmental Impact Assessment (EIA) Report is being scrupulously implemented and augmented as needed. Monitoring of Environmental parameters viz., Ambient Air, Ambient Noise, Water Quality (Ground, Surface & Marine), Marine Ecology and Soil as envisaged is being undertaken regularly through an agency having NABL accreditation and approved by MoEF&CC. The results of monitoring comply with the statutory standards. Periodical Reports with results of

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monitoring thereof are being regularly submitted regularly to the APPCB and the MoEF&CC, RO as stipulated in the EC/CFE/CFO accorded.

### 1.1 SCOPE OF WORK

The scope of the baseline studies include monitoring of the following environmental components

1. Ambient Air Quality
2. Marine Water
3. Marine Sediment
4. Noise Level Intensity
5. STP Inlet & Outlet
6. DG Set Emission Quality
7. Ground Water Quality Monitoring
8. Soil Quality

The parameters covered under the scope for each of the above attributes are given below:

#### SCOPE OF WORK

S.No	Attribute	Scope	Frequency
1.	Ambient Air Quality	Sampling of ambient air at 07 stations for analyzing the following parameters: <ul style="list-style-type: none"> <li>• PM10</li> <li>• PM2.5</li> <li>• SO2</li> <li>• NO2</li> <li>• NH<sub>3</sub></li> </ul>	Monthly Once at each location
2.	Marine Water	Collected at four locations and analyzed the following parameters : <ul style="list-style-type: none"> <li>• pH</li> <li>• Temperature</li> <li>• Salinity</li> <li>• Density</li> <li>• Turbidity</li> <li>• Total Dissolved solids</li> <li>• Total Suspended solids</li> <li>• Potassium</li> <li>• COD</li> <li>• BOD</li> <li>• Oil &amp; Grease</li> <li>• D.O</li> <li>• Nitrates</li> <li>• Nitrites</li> <li>• Ammonia</li> <li>• Phosphates</li> <li>• Chlorides</li> <li>• Sodium</li> </ul>	Weekly Once at each location

		<ul style="list-style-type: none"> <li>• Sulphates</li> <li>• Silicates</li> <li>• Reactive Silica</li> <li>• Total Phosphorus</li> <li>• Total Nitrogen</li> <li>• Primary Productivity</li> <li>• Chlorophyll</li> <li>• Phytoplankton</li> <li>• Zooplankton</li> <li>• Heavy Metals</li> </ul>	
3.	Marine Sediment	Collected at four locations and analyzed for <ul style="list-style-type: none"> <li>• Sediment Compositions</li> <li>• pH</li> <li>• Nitrogen</li> <li>• Phosphorus</li> <li>• Potassium</li> <li>• Sodium</li> <li>• Benthos Communities</li> <li>• Heavy Metals</li> </ul>	Weekly Once at each location
4.	Noise Level Monitoring	Collected at seven locations <ul style="list-style-type: none"> <li>• Day Leq in dB(A)</li> <li>• Night Leq in dB(A)</li> </ul>	Once in a month
5.	STP Inlet and Outlet	<ul style="list-style-type: none"> <li>• pH</li> <li>• Total Solids</li> <li>• Total Suspended Solids</li> <li>• COD</li> <li>• BOD</li> <li>• Oil &amp; Grease</li> </ul>	Once in a month
6.	DG Set Emission Quality	<ul style="list-style-type: none"> <li>• PM</li> <li>• NOx</li> <li>• HC</li> <li>• CO</li> </ul>	Once in six months
7.	Ground Water Quality Monitoring	Collected at Four locations <ul style="list-style-type: none"> <li>• pH</li> <li>• Electrical Conductivity</li> <li>• Total Dissolved solids</li> <li>• Total alkalinity</li> <li>• Chlorides</li> <li>• Sodium</li> <li>• Potassium</li> <li>• Fluorides</li> <li>• Nitrates</li> </ul>	Once in six months

		<ul style="list-style-type: none"> <li>• Cyanide</li> <li>• Total Hardness</li> <li>• Salinity</li> <li>• Sulphates</li> <li>• COD</li> <li>• Mercury</li> <li>• Cadmium</li> <li>• Arsenic</li> <li>• Selenium</li> <li>• Iron</li> <li>• Lead</li> <li>• Zink</li> <li>• Chromium</li> <li>• Total Coliforms</li> <li>• Fecal coliforms</li> </ul>	
8.	Soil Quality Monitoring	<p>Collected at Four locations</p> <ul style="list-style-type: none"> <li>• pH</li> <li>• EC</li> <li>• Texture</li> <li>• Available Nitrogen</li> <li>• Available Phosphorous</li> <li>• Available Potassium</li> <li>• Exchangeable Sodium</li> <li>• Exchangeable calcium</li> <li>• Exchangeable Magnesium</li> <li>• SAR</li> <li>• Water Soluble Chlorides</li> <li>• Organic Carbon</li> <li>• Lead</li> <li>• Cadmium</li> <li>• Copper</li> <li>• Zinc</li> </ul>	Once in six months

**Figure:1**

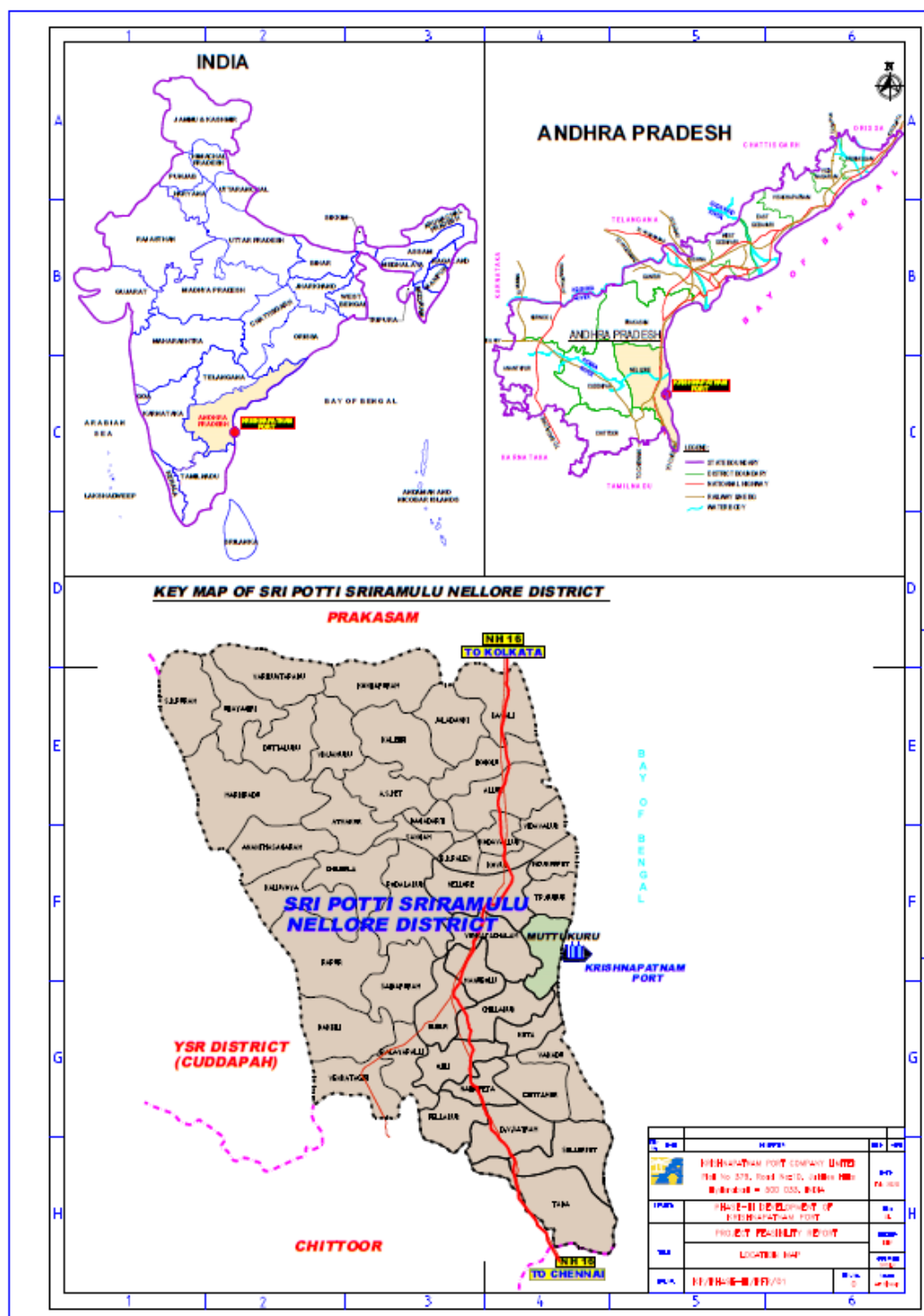
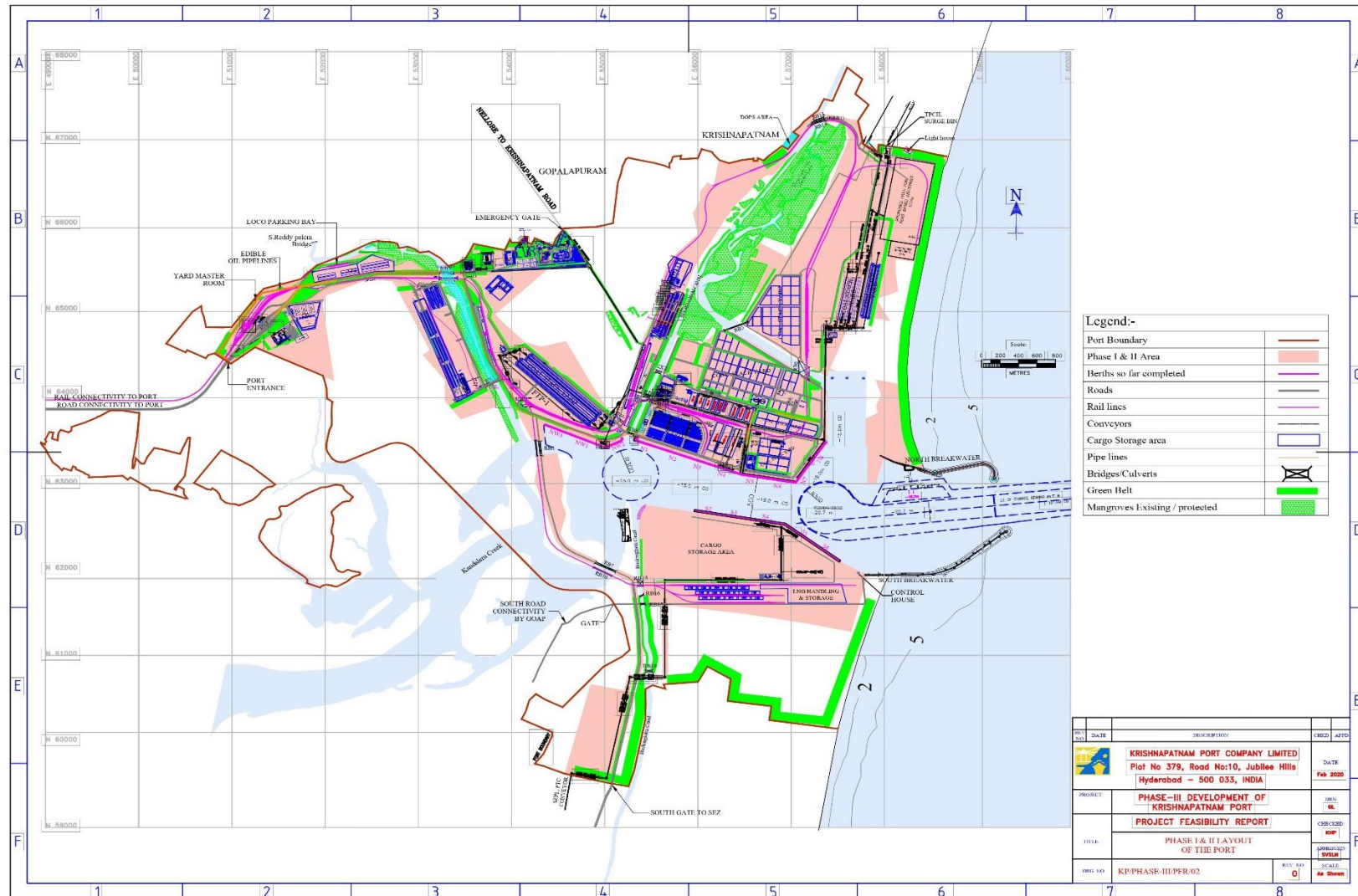




Figure:2



**CHAPTER – 2**

**METHODOLOGY**

## 2.0 METHODOLOGY

Methodologies adopted for sampling and analysis for each of the above parameters are detailed below

**Table :1**  
**Methods of monitoring and analysis for various parameters**

S.No	Attributes	Measurement Technique		
1.	Ambient Air Quality	PM <sub>10</sub>	Respirable Dust Sampler (Gravimetric method)	IS-5182 (Part-XXIII)
		PM <sub>2.5</sub>	Fine Particulate Sampler (Gravimetric method)	40 CFR USEPA
		Sulphur dioxide	Modified West and Gaeke	IS-5182 (Part-II)
		Oxides of Nitrogen	Jacob & Hochheiser	IS-5182 (Part-VI)
		NH <sub>3</sub>	Indophenol Blue Method	-
2.	Marine Water	APHA Methods 23 <sup>rd</sup> Edition, 2017		
3.	Marine Sediment	ASTM Method		
4.	STP Inlet and Outlet	APHA Methods 23 <sup>rd</sup> Edition, 2017		
5.	Noise Level Intensity	Digital Noise Level Meter – SL Lutron 4001		
6.	DG Set Emission Quality	IS : 11255 Measurement of Emission from Stationary Sources		
7.	Ground Water Quality	APHA Methods 23 <sup>rd</sup> Edition, 2017		
8.	Soil Quality	IS:2720 & methods of soil analysis, part-1, 2 <sup>nd</sup> edition, 1986 (American Society for Agronomy and Soil Science Society of America).		

**CHAPTER – 3**  
***ENVIRONMENTAL MONITORING STUDIES***

**3.0 ENVIRONMENTAL MONITORING STUDIES – April'20 to Sep'2020**

S.No	ATTRIBUTE	SCOPE	STUDIES CARRIED OUT
1.	Ambient Air Quality	Collection of ambient air at Seven locations in and outside of port premises	Ambient Air samples collected at 7 locations for PM10, PM2.5, SO2, NO2 & NH3 (monthly once) for the period of 01.04.2020 to 30.09.2020.
2.	Marine Water and Surface Water Quality	Collection of Marine Water at six locations. <ul style="list-style-type: none"> <li>• Port Entrance (Approach Channel)</li> <li>• Turning Circle</li> <li>• Coal Berth</li> <li>• Reclamation Area (Mutable)</li> <li>• Buckingham Canal</li> <li>• Khandaleru Creek</li> </ul>	Marine Water samples from Port Entrance, Turning Circle, Coal Berth and Reclamation Area are collection weekly once. Samples for Buckingham Canal and Khandaleru Creek are collected monthly once. All the samples are tested for Physical, Chemical and Microbiological parameters Collected for the period of 01.04.2020 to 30.09.2020.
3.	Marine Water Quality for Turbidity	Collection of Marine Water at seven locations. <ul style="list-style-type: none"> <li>• Port Entrance (Approach Channel)</li> <li>• Turning Circle</li> <li>• Coal Berth</li> <li>• Reclamation Area (Mutable)</li> <li>• 14°19'26"N &amp; 80°15'43"E</li> <li>• 14°16'52"N</li> </ul>	Marine Water samples from Port Entrance, Turning Circle, Coal Berth and Reclamation Area are collection weekly once. Deep Sea water Samples are collected monthly once. Collected for the period of 01.04.2020 to 30.09.2020.

		&80°17'40"E • 14°16'11"N & 80°17'40"E	
4.	Marine Sediment	Collected at • Port Entrance (Approach Channel) • Turning Circle • Coal Berth • Reclamation Area (Mutable)	Collected at four locations and analyzed for the hereunder weekly once. • Sediment Compositions • pH • Nitrogen • Phosphorus • Potassium • Sodium • Benthos Communities • Heavy Metals Collected for the period of 01.04.2020 to 30.09.2020.
5.	Noise Level Intensity	Noise levels were noted at Seven locations inside and outside port premises.	Day and Night Noise levels were noted at • Zero Point • Thamminapatnam • CVR Building • Gopalpuram • Chalivendram • Krishnapatnam • Light House Siding Collected Noise Levels at seven locations for day and night periods once in the month from 01.04.2020 to 30.09.2020.

6.	DG Set Emission Quality	Emission Quality was conducted to DG Sets of port premises	Emission Quality was conducted to DG Sets of port premises, ie PM, NOx, HC & CO (Six months once) for the period of 01.04.2020 to 30.09.2020.
7.	Ground Water Quality Monitoring	Collected at <ul style="list-style-type: none"> <li>• Port Site</li> <li>• Krishnapatnam village</li> <li>• South side of the port</li> <li>• Gopalapuram village</li> </ul>	Ground Water samples from Port site, Krishnapatnam village, South side of the port, Gopalapuram village Bore wells water samples are collected half yearly once. All the samples are tested for Physical, Chemical and Microbiological parameters Collected for the period of 01.04.2020 to 30.09.2020.
8.	STP Inlet and Outlet	Inlet and Outlet samples are collected from STP at Port	STP Inlet and Outlet samples are collected monthly once. Collected for the period of 01.04.2020 to 30.09.2020.
9.	Soil Quality	Collection of Soil sample at Two locations. <ul style="list-style-type: none"> <li>• Storage area towards west Buckingham canal</li> <li>• Storage area at Port</li> </ul>	Soil samples from Storage area towards west, Storage area at Port Area are collection half yearly once. All the samples are tested for Physical, Chemical parameters. Collected for the period of 01.04.2020 to 30.09.2020.

### 3.1 AMBIENT AIR QUALITY MONITORING

The ambient air quality was assessed through a network of 07 AAQM stations within 10 Km radius of project site (5 stations in buffer zone & 2 location inside plant area).

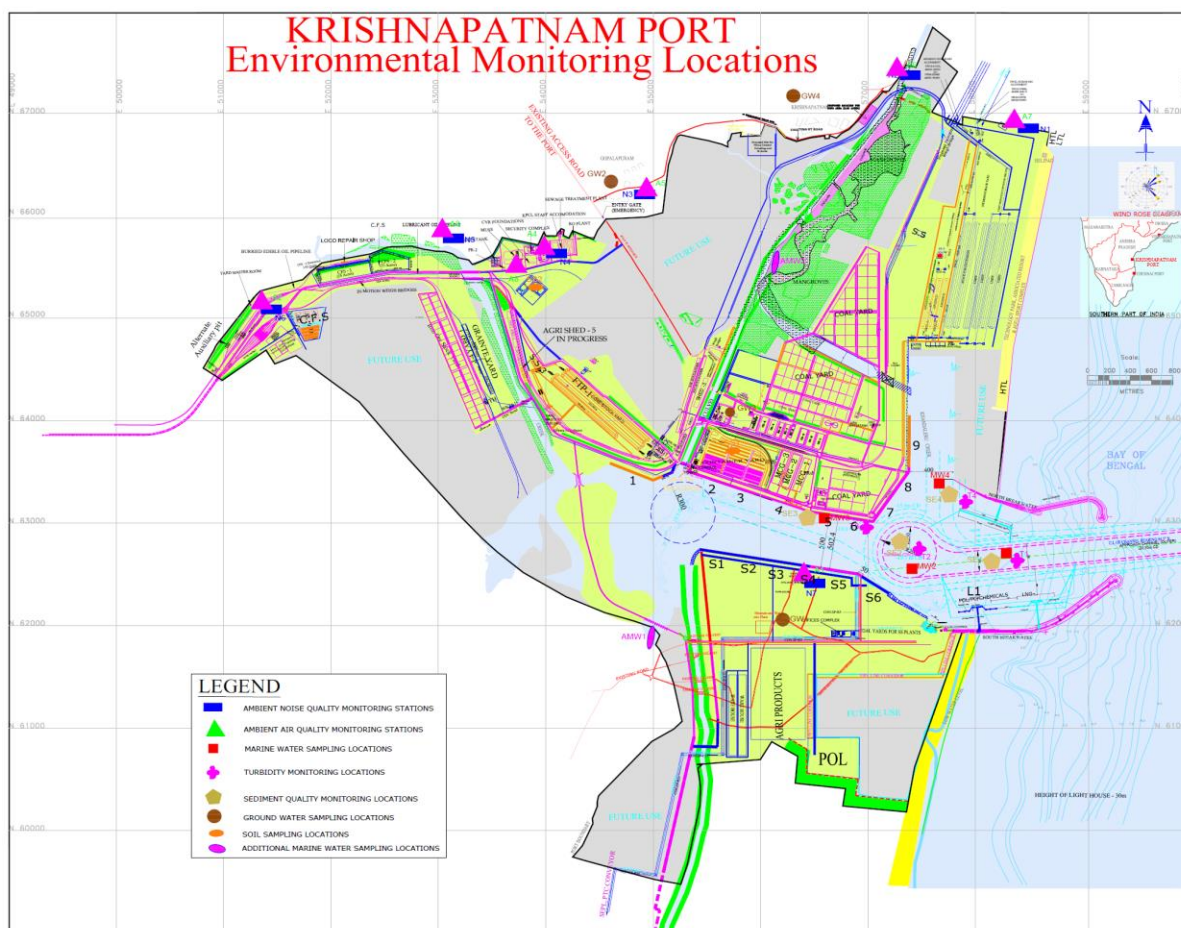
The locations of ambient air quality stations are shown in Figure – 3 is given below:

**Table No: 2**

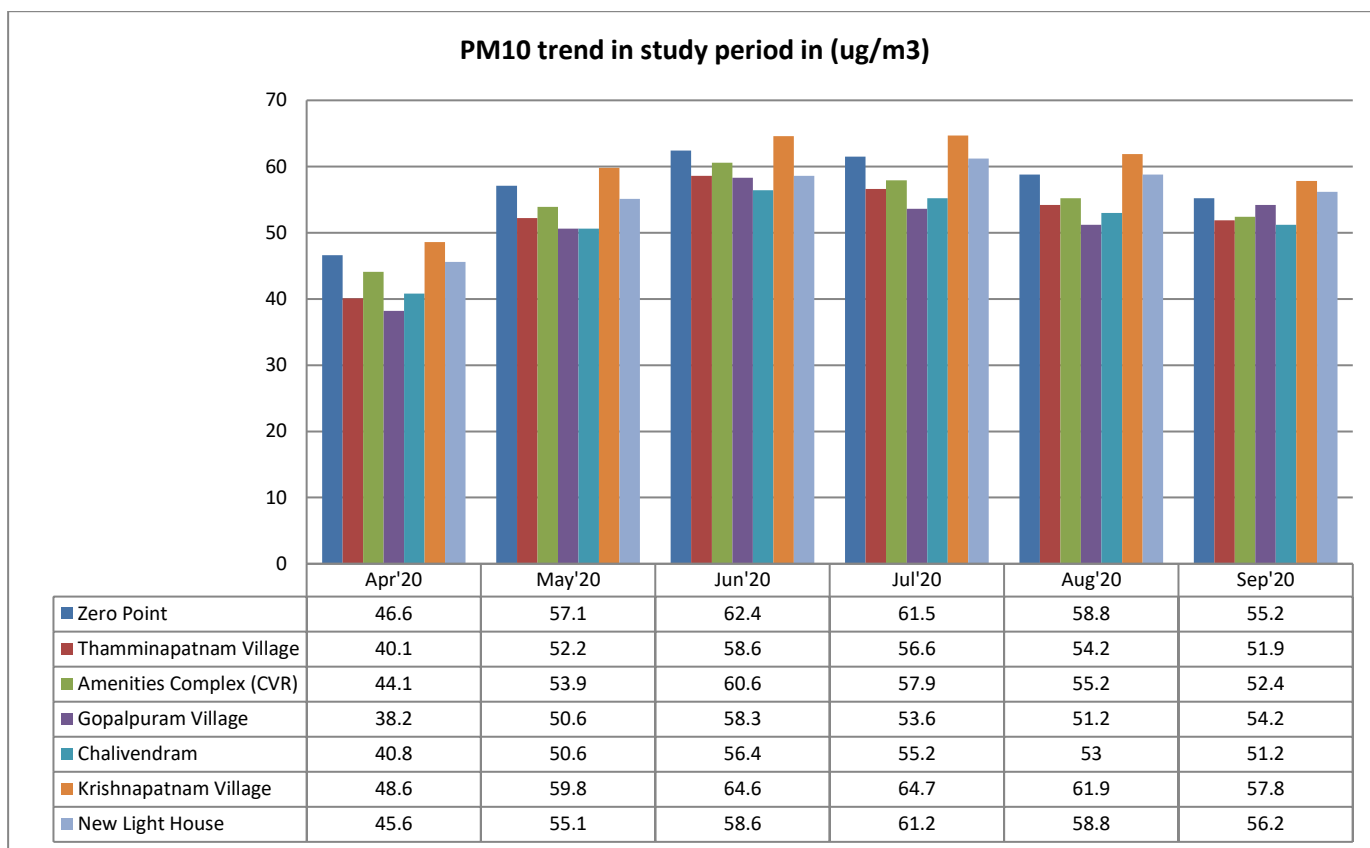
#### **DETAILS OF AMBIENT AIR QUALITY MONITORING LOCATIONS**

<b>Station code</b>	<b>Location</b>	<b>Direction w.r.t. Project site</b>	<b>Environmental setting</b>
A1	At Zero Point	W	Industrial
A2	At Thamminapatnam Village	S	Industrial
A3	At CVR Building	WNW	Residential
A4	At Gopalpuram Village	NW	Residential
A5	At Chalivendram	WNW	Residential
A6	At Krishnapatnam	NNW	Residential
A7	At Light House	SW	Residential



**Figure 4- AMBIENT AIR SAMPLING STATIONS LOCATION MAP**

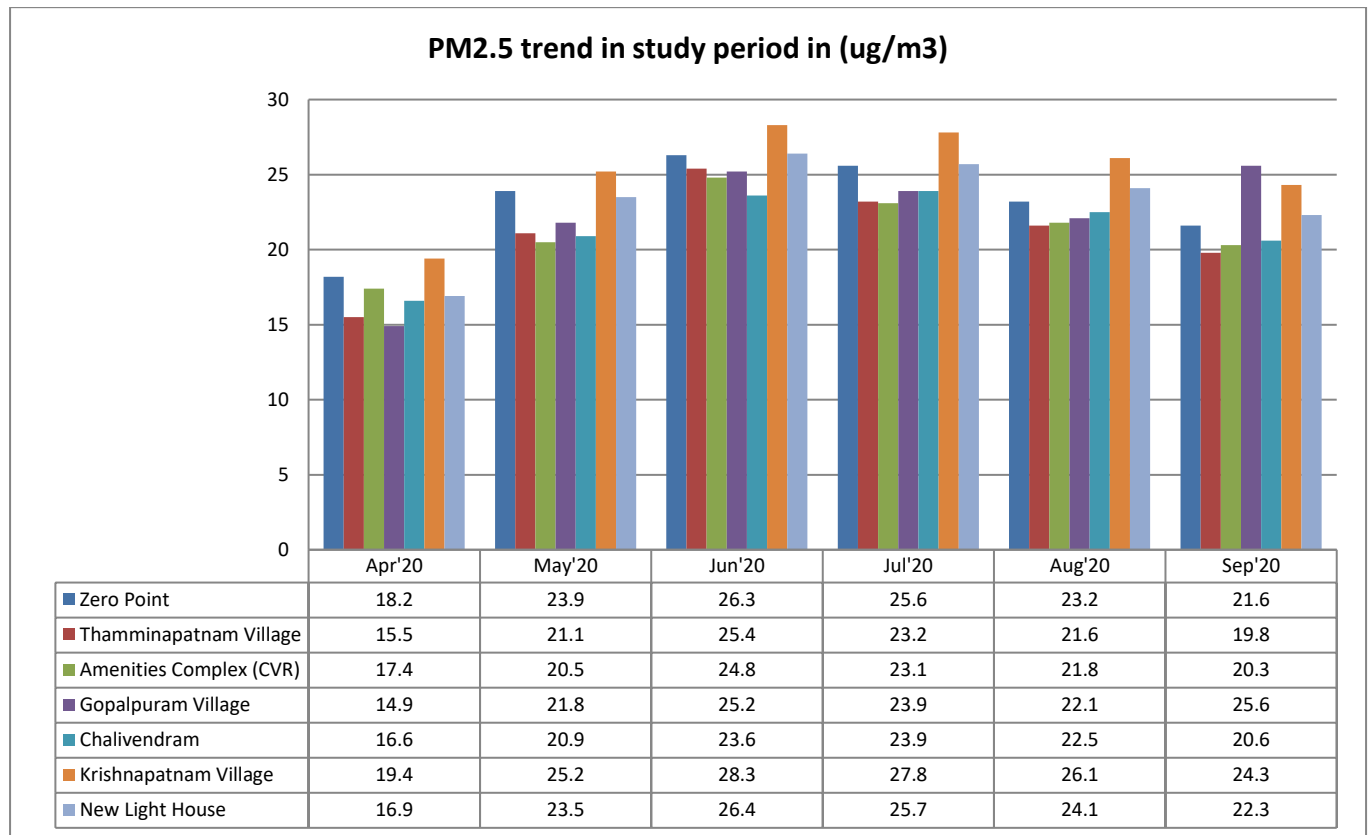
### Summary of Analysis of Ambient Air Quality in the Study Area – PM10 for Apr'20 to Sep'20



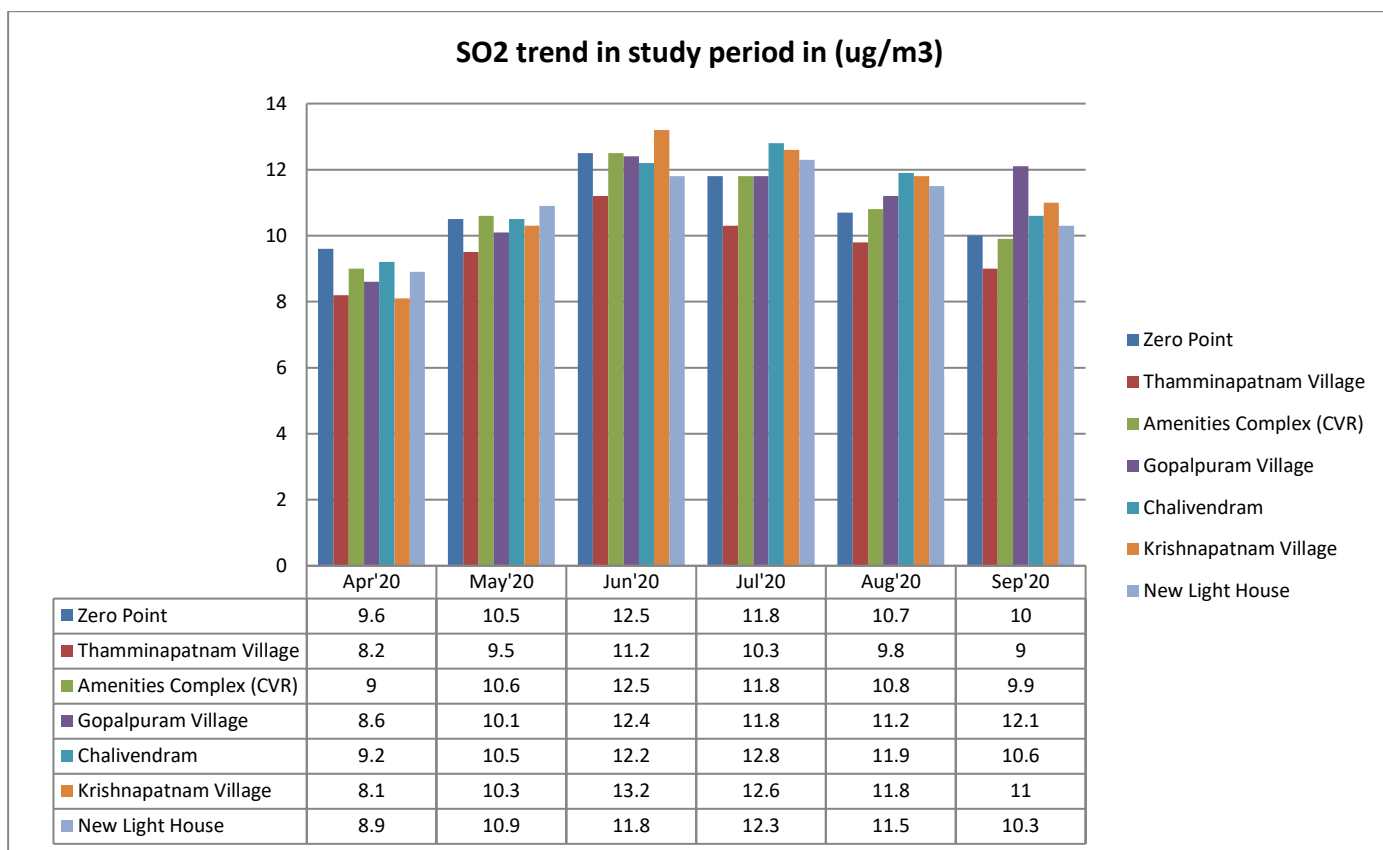
❖ *PM10 varied between 38.2 to 64.7 µg/m<sup>3</sup> Minimum: Gopalapuram village*

❖ *Maximum: Krishnapatnam village, NAAQ Standard: 100µg/m<sup>3</sup>*

### Summary of Analysis of Ambient Air Quality in the Study Area – PM<sub>2.5</sub> for Apr'20 to Sep'20

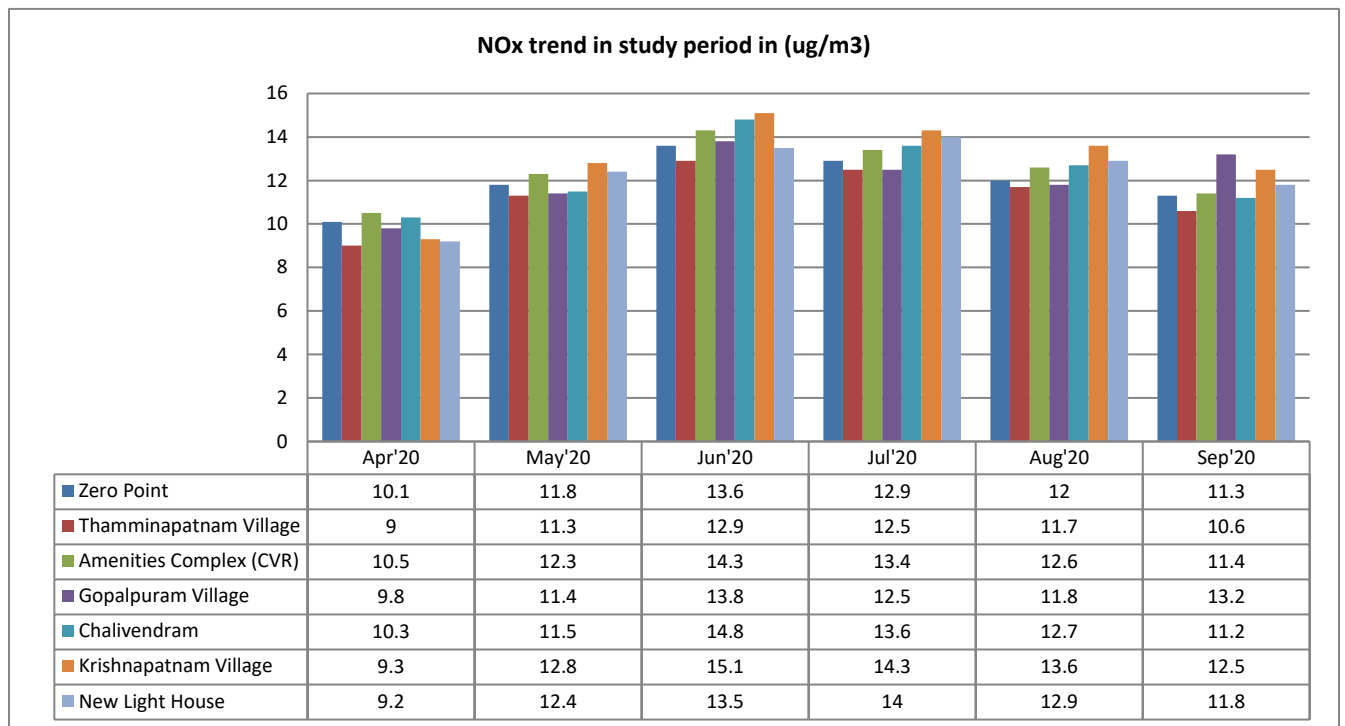


- ❖ *PM<sub>2.5</sub> Varied between 14.9 to 28.3 µg/m<sup>3</sup>, Minimum: Gopalapuram village*
- ❖ *Maximum ; Krishnapatnam village , NAAQ Standard : 60 µg/m<sup>3</sup>*

Summary of Analysis of Ambient Air Quality in the Study Area – SO<sub>2</sub> for Apr'20 to Sep'20

❖ SO<sub>2</sub> Varied between 8.1 to 13.2 µg/m<sup>3</sup>. Minimum : Krishnapatnam village

❖ Maximum : Krishnapatnam village, NAAQ Standard : 80 µg/m<sup>3</sup>

Summary of Analysis of Ambient Air Quality in the Study Area – NO<sub>x</sub> for Apr'20 to Sep'20

❖ *NO<sub>x</sub> Varied between 9.0 to 15.1 µg/m<sup>3</sup>, Minimum : Thamminapatnam village*

❖ *Maximum : Krishnapatnam village, NAAQ Standards : 80 µg/m<sup>3</sup>*

### 4.3 AMBIENT NOISE LEVEL INTENSITY

Collection of ambient noise levels at six locations (5 locations at nearby villages & 1 location near plant). Spot noise levels were measured with a precalibrated Noise Level Meter – SL Lutron 4001 for day and night periods.

**Table No-3**

#### **DETAILS OF NOISE MONITORING LOCATIONS**

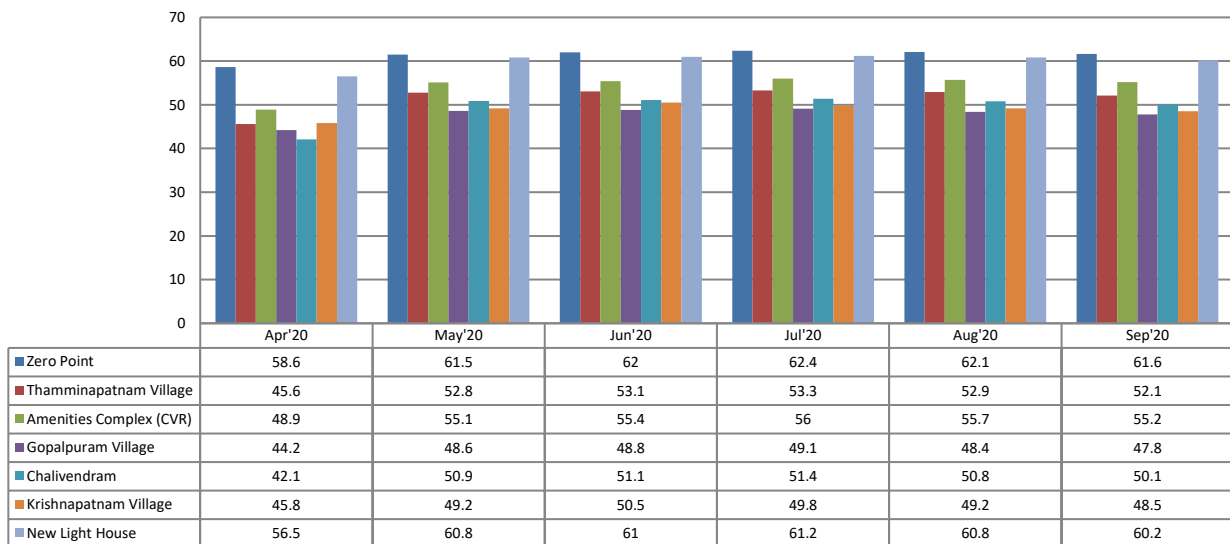
<b>STATION CODE</b>	<b>LOCATIONS</b>	<b>DIRECTION w.r.t PROJECT SITE</b>
N1	At Zero Point	W
N2	At Thamminapatnam Village	S
N3	At CVR Building	WNW
N4	At Gopalpuram Village	NW
N5	At Chalivendram	WNW
N6	At Krishnapatnam	NNW
N7	At Light House	SW

The noise monitoring locations are depicted in **Fig – 5**

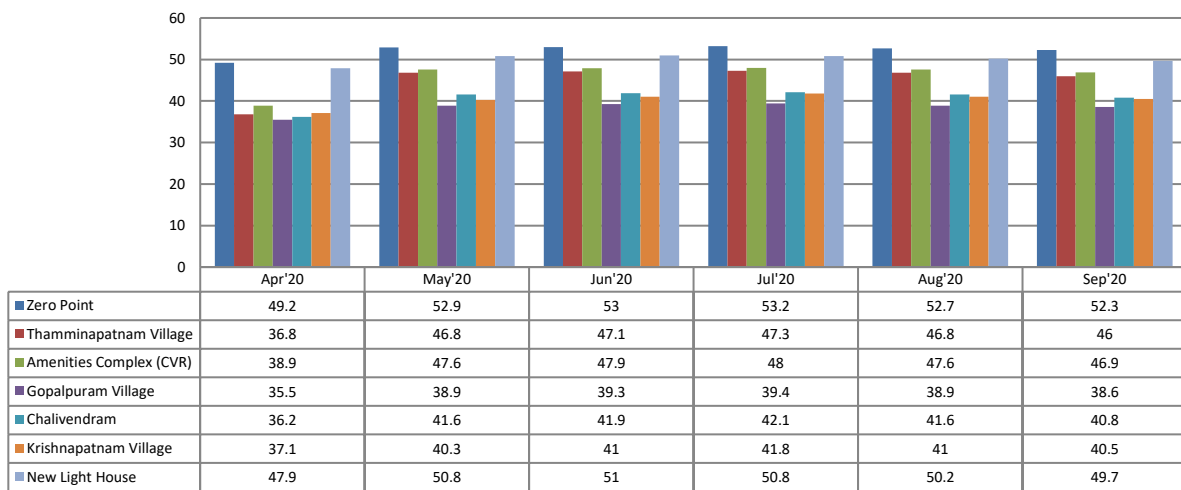
The noise levels monitored during the study period are given hereunder in form of Leq day, Leq night compared with CPCB Standards.

<b>Location Code</b>	<b>Environmental Setting</b>	<b>CPCB norms Leq (Dba)</b>	
		<b>Day</b>	<b>Night</b>
N1	Industrial	75	70
N2	Industrial	75	70
N3	Residential	55	45
N4	Residential	55	45
N5	Residential	55	45
N6	Residential	55	45
N7	Residential	55	45

Noise Level Data for the above locations are enclosed as Table - 4.5.1&4.5.2

**Noise Level Day time trend in dB(A)**

- ❖ *Industrial Day time noise level varied between 45.6 to 62.4 dB(A)*
- ❖ *Residential Day time noise level varied between 42.1 to 51.4 dB(A)*
- ❖ *NAAQ Standard: Industrial -75 Db( A):Residential –55dB(A)*

**Noise Level Night time trend in dB(A)**

- ❖ *Industrial Night time noise level varied between 36.8 to 53.2 dB(A)*
- ❖ *Residential Night time noise level varied between 35.5 to 42.1 db(A)*
- ❖ *NAAQ Standard: Industrial -70 Db(A) , Residential-45 dB(A)*

#### 4.4 Marine Water and Surface Water Quality

##### 4.4.1 Sampling Locations

Marine water sampling is carried out once in every week at Four sampling locations in the port. In addition to marine quality sampling, surface water quality sampling is also carried out at two locations in the creek once in every month. The marine water and surface water sampling locations are given in **Table-4** and **Figure-4**.

**Table No- 4**  
**MARINE WATER QUALITY AND**  
**SURFACE WATER MONITORING LOCATIONS**

<b>Location Code</b>	<b>Location</b>
<b>Marine Water Quality Sampling Location</b>	
MW1	Coal Berth
MW2	Turning Circle
MW3	Approach Channel
MW4	Reclamation Area (Mutable)
<b>Surface Water Sampling Location</b>	
SW1	Kandaluru Creek
SW2	Buckingham Canal

- Analysis results of the water samples collected from the above locations are enclosed



The methodology for sample collection and preservation techniques was followed as per the Standard Operating Procedures (SOP) mentioned in table hereunder:

**Table No- 5**  
**Standard Operating Procedures (SOP) For Water Sampling**

Parameter	Sample Collection	Sample Size	Storage/ Preservation
pH	Grab sampling Plastic /glass container	50 ml	Refrigeration, can be stored for 7 days
Electrical Conductivity	Grab sampling Plastic /glass container	50 ml	Refrigeration, can be stored for 7 days
Total suspended solids	Grab sampling Plastic /glass container	100 ml	Refrigeration, can be stored for 7 days
Total Dissolved Solids	Grab sampling Plastic /glass container	100 ml	Refrigeration, can be stored for 7 days
BOD	Grab sampling Plastic /glass container	500 ml	Refrigeration, 48 hrs
Hardness	Grab sampling Plastic /glass container	100 ml	Add HNO <sub>3</sub> to pH<2, refrigeration; 6 months
Chlorides	Grab sampling Plastic /glass container	50 ml	Not required; 28 days
Sulphates	Grab sampling Plastic /glass container	100 ml	Refrigeration; 28 days
Nitrates	Plastic containers	100 ml	Refrigeration; 48 hrs
Fluorides	Plastic containers only	100 ml	Not required; 28 days
Alkalinity	Plastic/ glass containers	100 ml	Refrigeration; 14 days
Ammonia	Plastic/ glass containers	100 ml	Add H <sub>2</sub> SO <sub>4</sub> to pH>2, refrigeration, 28 days
Heavy Metals (Ar, Cd, Mn, Cu, Fe, Zn, Pb etc.)	Plastic/ Glass rinse with 1+1 HNO <sub>3</sub>	500 ml	Filter, add HNO <sub>3</sub> to pH>2; Grab sample; 6 months

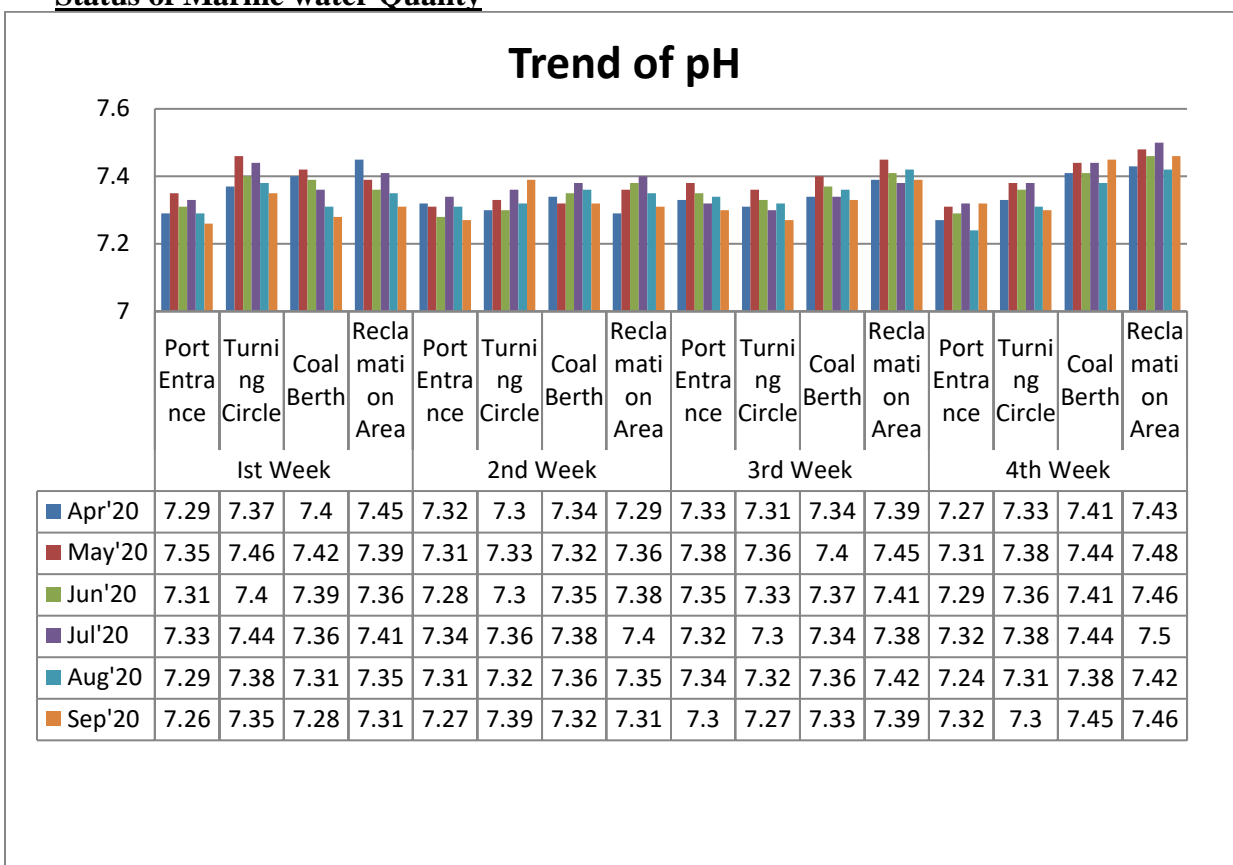
*Source: Standard Methods for the Examination of Water and Wastewater, Published By APHA, 27nd Edition, 2017*

The analytical techniques used for water analysis is given in the table hereunder:

**Table No- 6**  
Analytical Techniques for Water Analysis

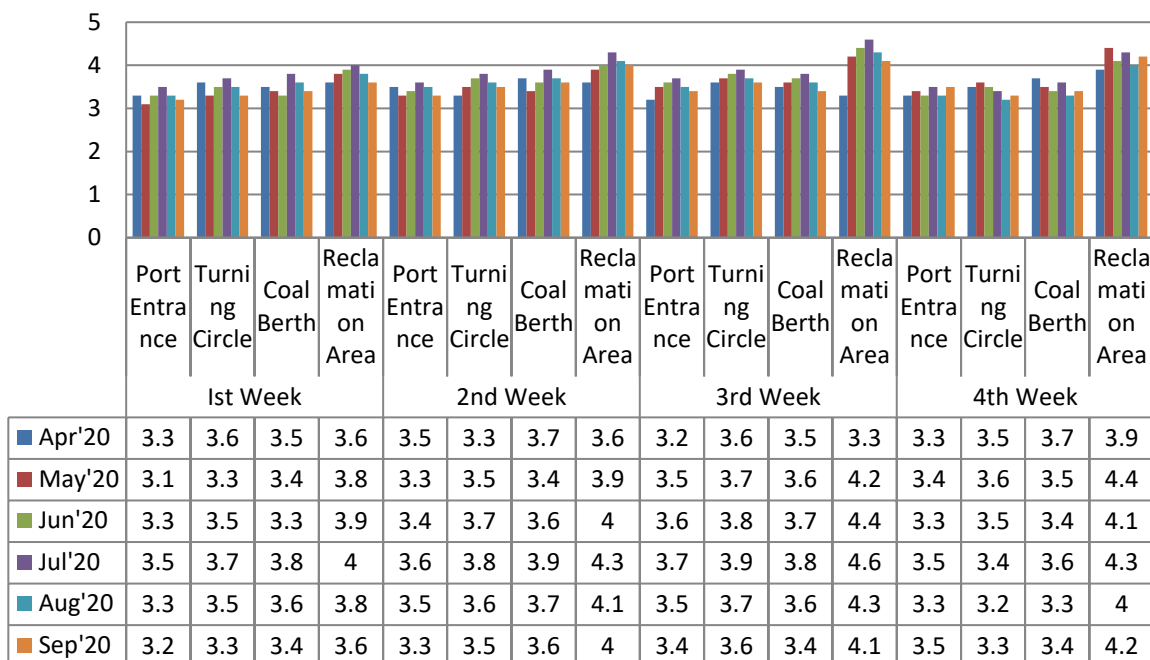
S.No	Parameter	Method
1.	pH	APHA, 4500-H+B, 23rd Ed., 2017
2.	Colour	APHA, 2120-C/2120-B, 23rd Ed., 2017
3.	Odour	APHA, 2150, 23rd Ed., 2017
4.	Temperature	APHA, 2550-A+B, 23rd Ed., 2017
5.	Oil & Grease	APHA, 5520-D, 23rd Ed., 2017
6.	Total Suspended Solids	APHA, 2540-D, 23rd Ed., 2017
7.	Total Dissolved Solids	APHA, 2540-C, 23rd Ed., 2017
8.	Total Residual Chlorine	APHA, 4500-Cl B, 23rd Ed., 2017
9.	Biochemical Oxygen Demand	APHA, 5210-B, 23rd Ed., 2017 4500-OC, 23rd Ed.,
10.	Chemical Oxygen Demand	APHA, 5220-B, 23rd Ed., 2017
11.	Free Ammonia	IS 3025
12.	Ammonical Nitrogen	APHA, 4500-NH <sub>3</sub> B, 23rd Ed., 2017
13.	Total Kjeldhal Nitrogen	APHA, 4500-Norg B, 23rd Ed., 2017
14.	Zinc	APHA, 3111-B, 23rd Ed., 2017
15.	Lead	APHA, 3111-B, 23rd Ed., 2017
16.	Cadmium	APHA, 3111-B, 23rd Ed., 2017
17.	Mercury	APHA, 3112-B, 23rd Ed., 2017
18.	Arsenic	APHA, 3114-B, 23rd Ed., 2017
19.	Copper	APHA, 3111-B, 23rd Ed., 2017
20.	Nickel	APHA, 3111-B, 23rd Ed., 2017
21.	Cyanide	APHA, 4500-CNB, 23rd Ed., 20172
22.	Fluoride	APHA, 4500-FD, 23rd Ed., 2017 (SPANDS Methods)
23.	Phosphates	APHA, 4500-PD, 23rd Ed., 2017
24.	Sulphates	APHA, 4500-SO <sub>4</sub> <sup>2-</sup> E, 23rd Ed., 2017
25.	Sulphide	APHA, 4500-S <sup>2-</sup> , 23rd Ed., 2017
26.	Manganese	APHA, 3111-B, 23rd Ed., 2017
27.	Iron	APHA, 3111-B, 23rd Ed., 2017
28.	Phenolic Compounds	APHA, 5530-B, 23rd Ed., 2017
29.	Bio Assay Test	IS 6582

Marine water samples have been collected in the port and the results of the same are shown below in **Table**.

**Status of Marine water Quality**

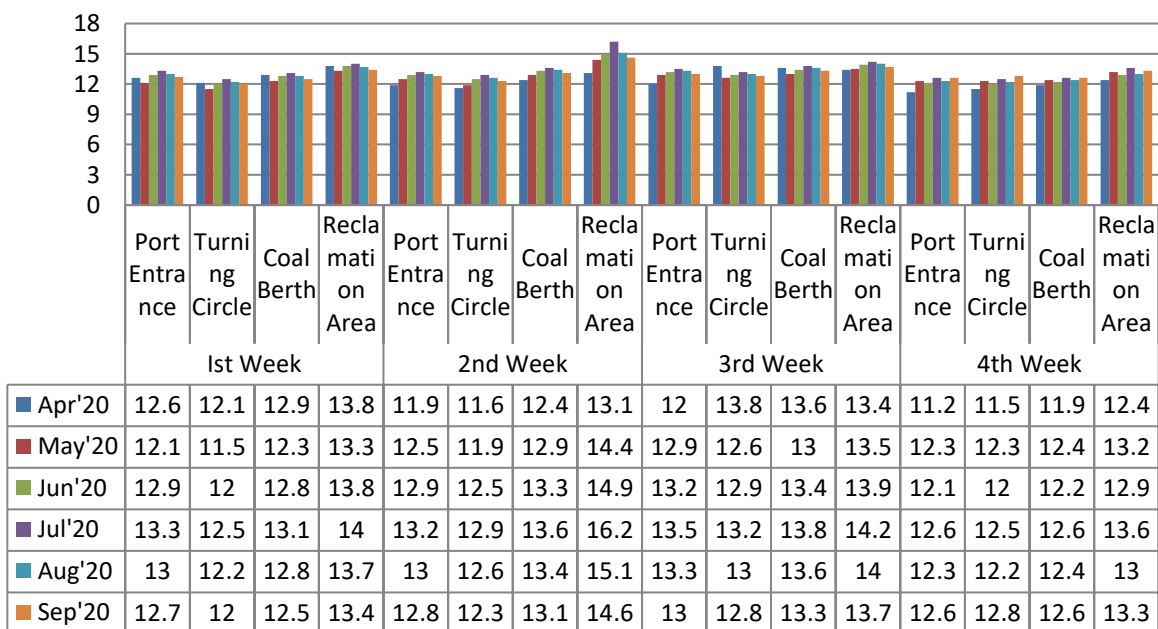
**pH of Marine water varied between 7.24 to 7.50**

### Trend of BOD in mg/l



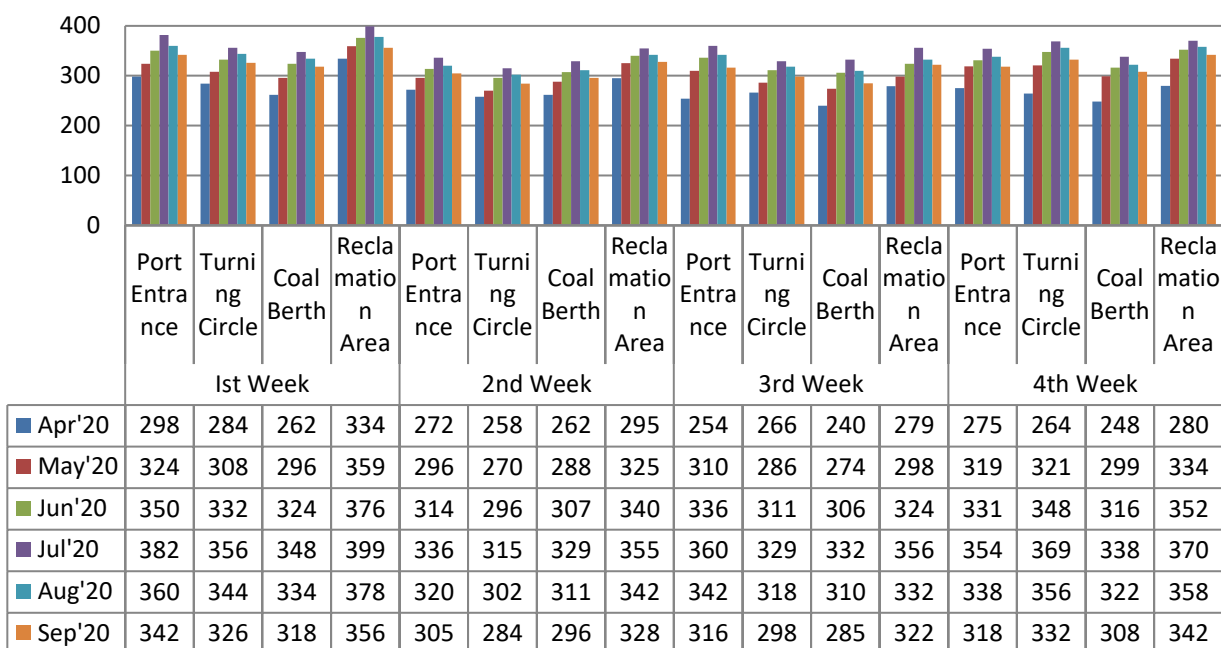
❖ BOD of Marine Water varied between 3.1 to 4.6 mg/l

### Trend of COD in mg/l



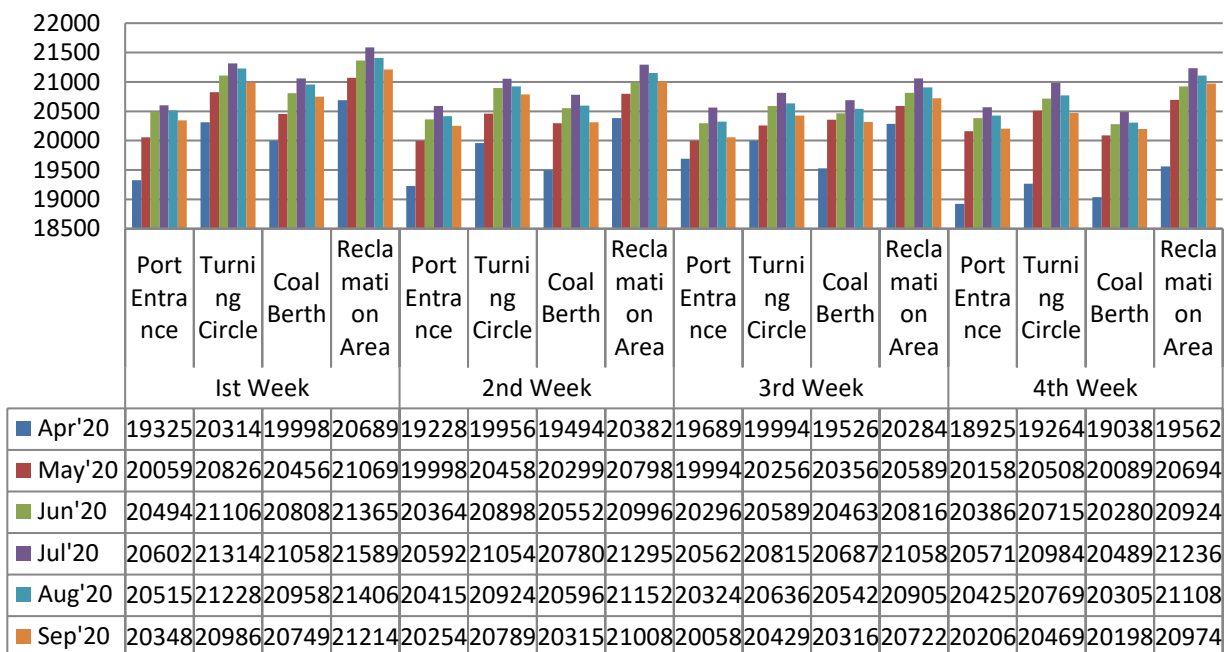
❖ COD of Marine Water varied between 11.2 to 16.2 mg/l

### Trend of Potassium in mg/l



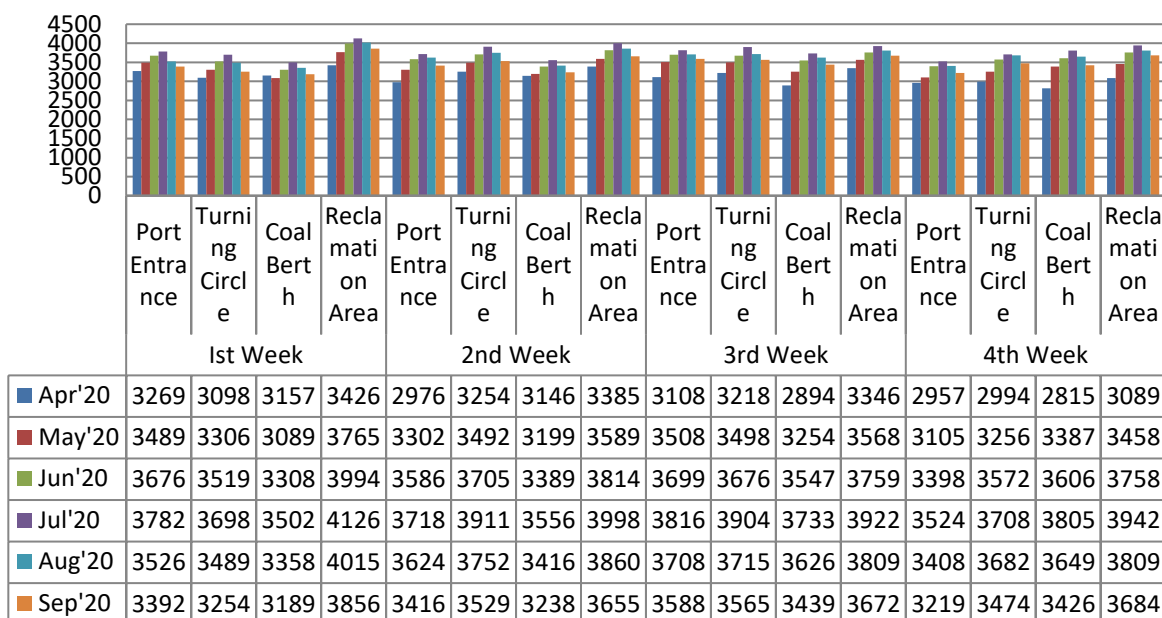
❖ Potassium Concentration in Marine water varied between 240 to 399 mg/l

### Trend of Chloride in mg/l



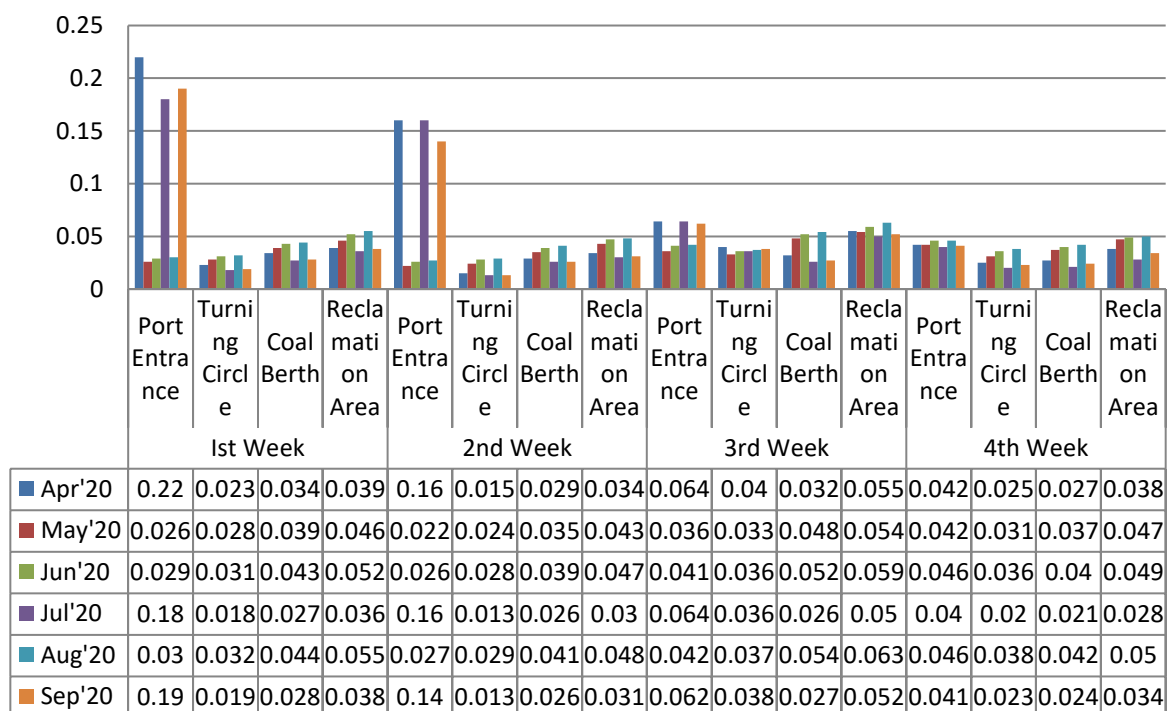
❖ Chloride concentration in Marine water varied between 18925 to 21589 mg/l

### Trend of Sulphate in mg/l



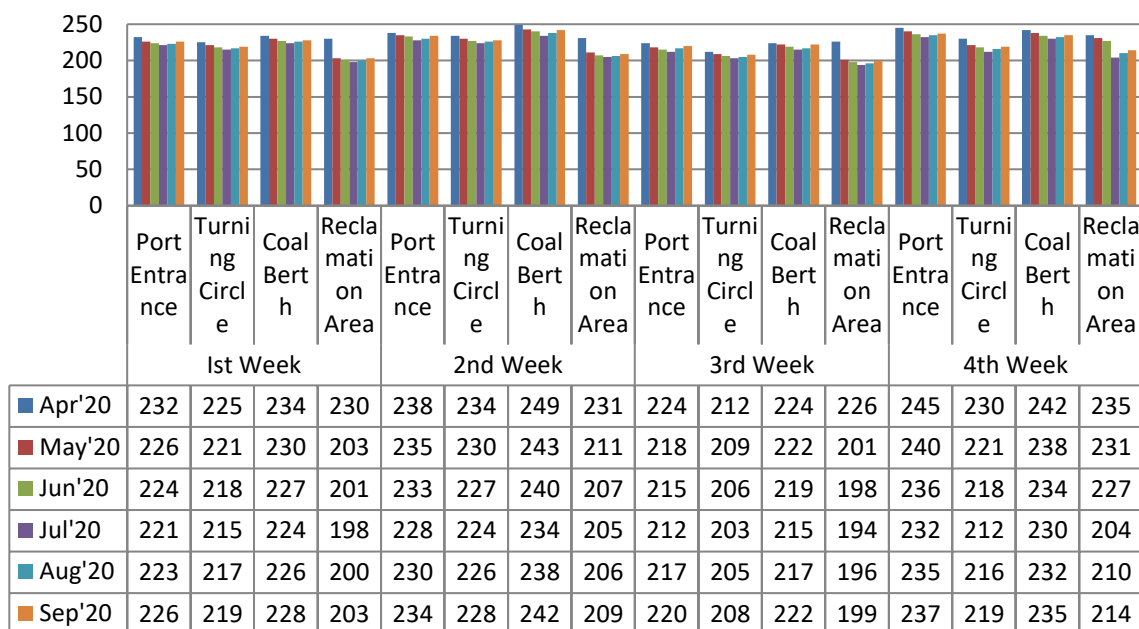
❖ Sulphate concentration in Marine water varied between 2815 to 4126 mg/l

### Trend of Zinc in mg/l



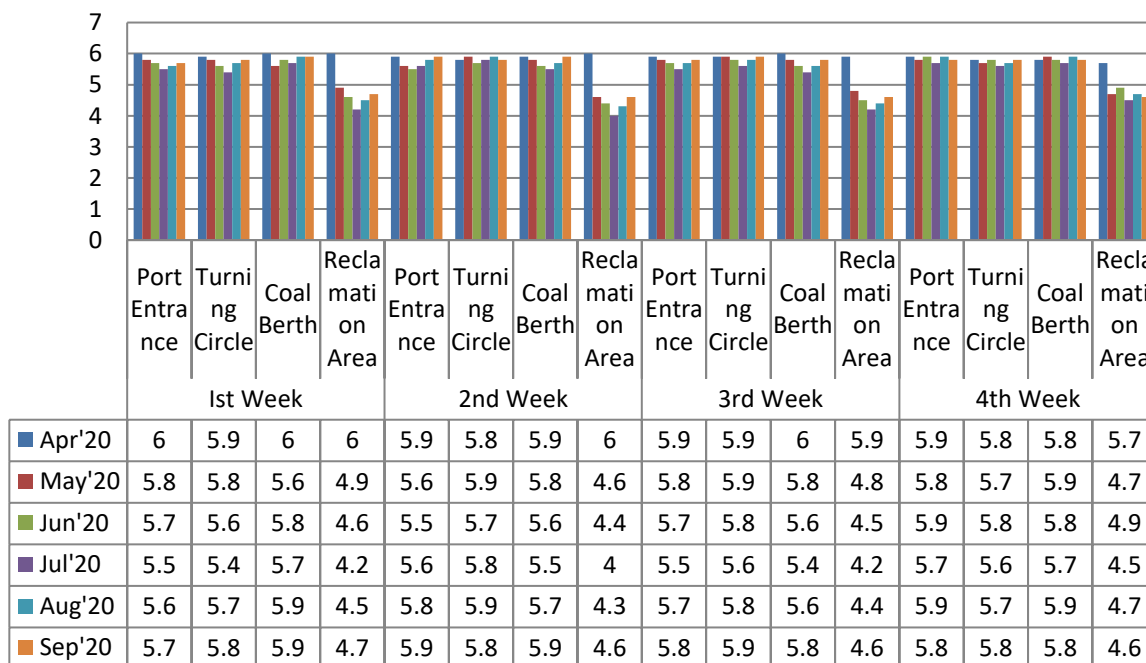
❖ Zinc concentration in Marine water varied between 0.013 to 0.220 mg/l

### Trend of Phytoplankton in Nos/ml



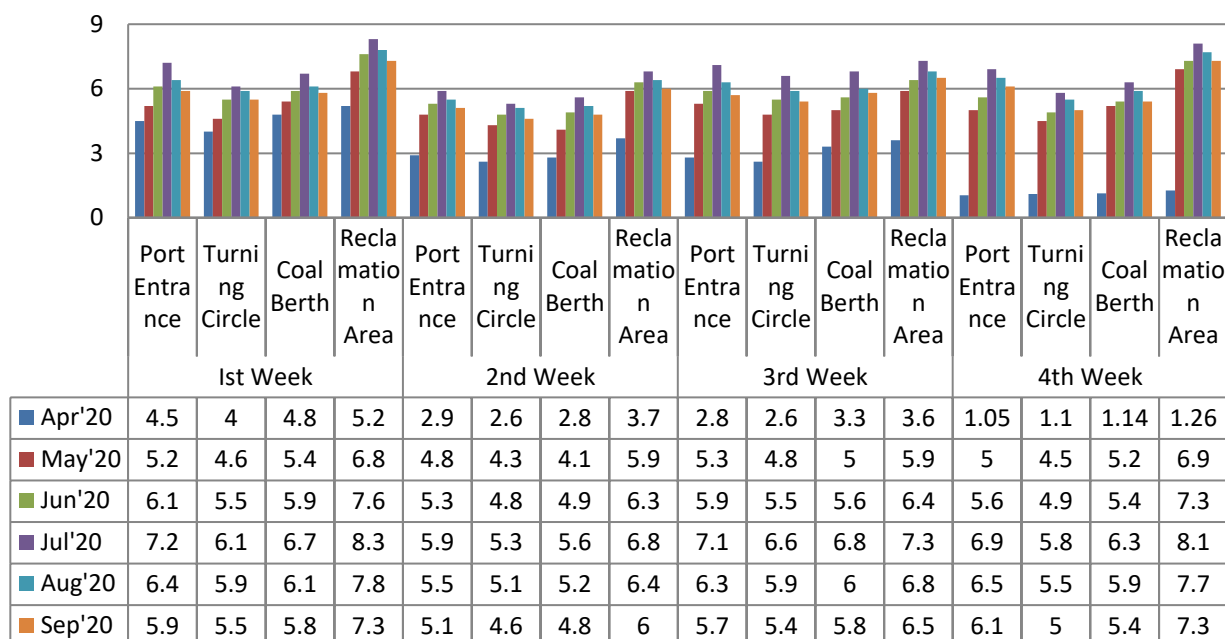
❖ Phytoplankton in Marine water varied between 194 to 249 No./ml

### Trend of DO in mg/l



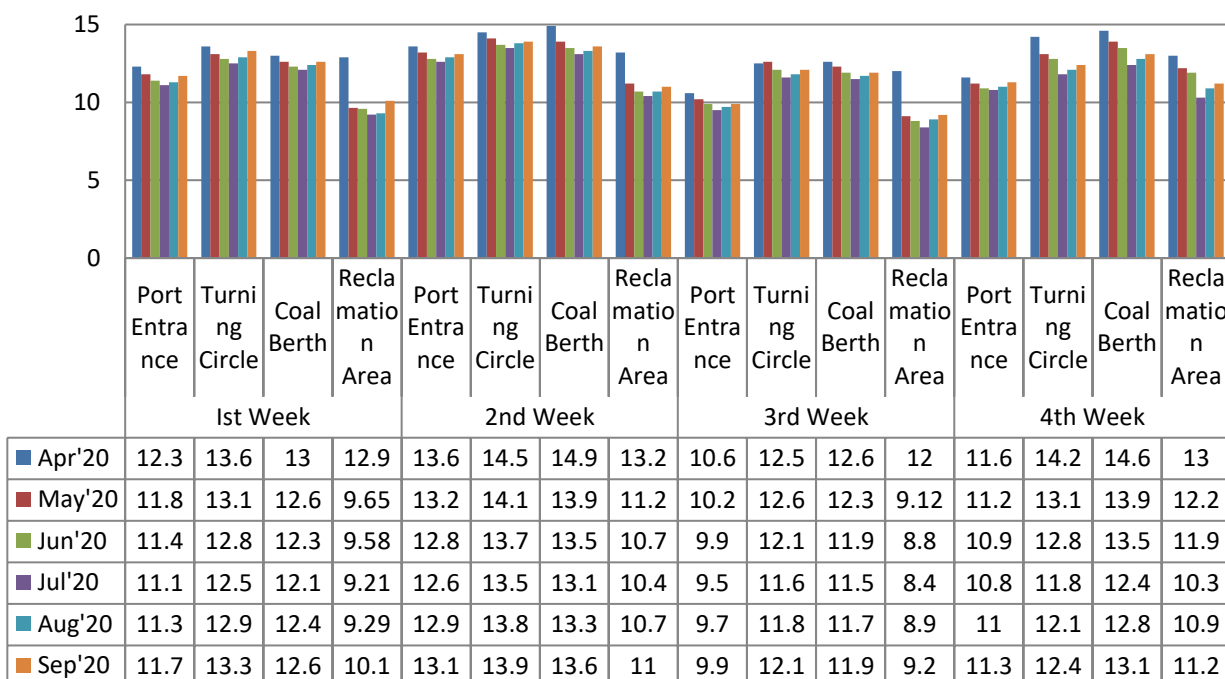
❖ DO in Marine water varied between 4.0 to 6.0 mg/l

### Trend of Nitrates in mg/l



❖ Nitrates in Marine water varied between 1.05 to 8.3 mg/l

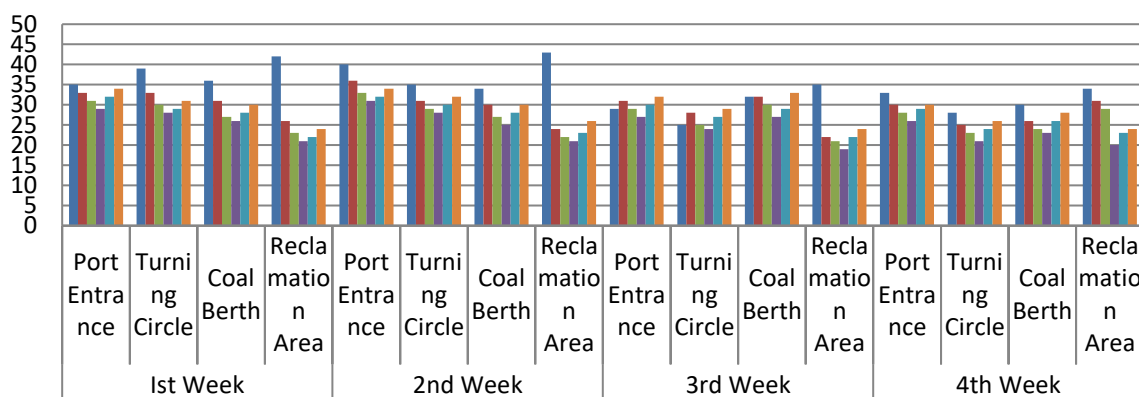
### Trend of Zooplankton in ml/100m<sup>3</sup>



❖ Zoo plankton in Marine water varied between 8.4 to 14.9 ml/100m<sup>3</sup>

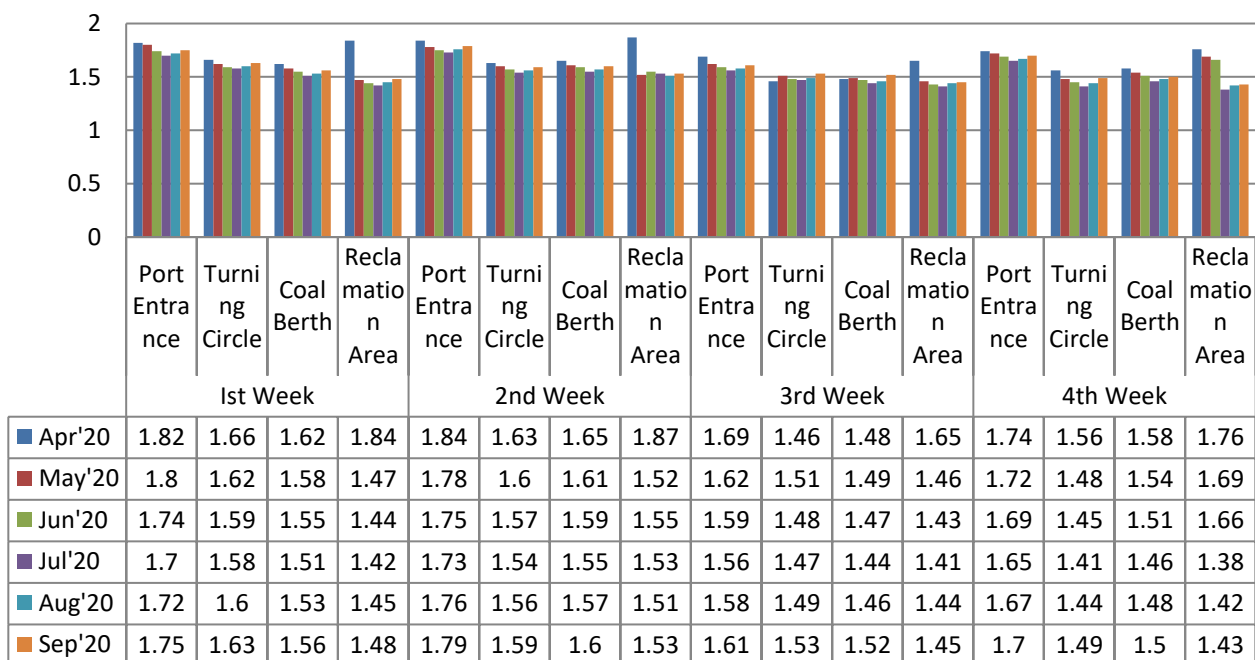


### Trend of Primary Productivity in $\text{mgC m}^{-2}\text{d}^{-1}$



❖ Primary Productivity in Marine water varied between 19 to 43  $\text{mgC m}^{-2}\text{d}^{-1}$

### Trend of Chlorophyll in $\text{mg/m}^3$



❖ Chlorophyll in Marine water varied between 1.38 to 1.87  $\text{mg/m}^3$

**Summary of Marine water quality results for six months of period Apr'20 – Sep'20**

- pH - values are in the range 7.24 to 7.5
- BOD - values are in the range 3.1 to 4.6 mg/l
- COD - values are in the range 11.2 to 16.2 mg/l
- Potassium - values are in the range 240 to 399 mg/l
- Chloride - values are in the range 18925 to 21589 mg/l
- Sulphates - values are in the range 2815 to 4126 mg/l
- Zinc - values are in the range 0.013 to 0.220 mg/l
- Phytoplankton - values are in the range 194 to 249 No./ml
- DO - values are in the range 4.0 to 6.0 mg/l
- Nitrates - values are in the range 1.05 to 8.3 mg/l
- Zoo plankton - values are in the range 8.4 to 14.9 ml/100m<sup>3</sup>
- Primary productivity - values are in the range 19 to 43.0 mgC m<sup>-2</sup>d<sup>-1</sup>
- Chlorophyll - values are in the range 1.38 to 1.87 mg/m<sup>3</sup>

## 4.5 Marine Water Turbidity

Marine water turbidity is carried out on one day every week at each of the four locations of Marine Water quality sampling (MT1, MT2 ,MT3 and MT4). Turbidity levels are monitored during Low Tide, Medium Tide and High Tide.

### **MARINE TURBIDITY MONITORING LOCATIONS**

<b>Sampling Code</b>	<b>Name of the Location</b>
<b>MT1</b>	Coal Berth
<b>MT2</b>	Turning circle
<b>MT3</b>	Approach channel
<b>MT4</b>	Reclamation Area (Mutable)

### 4.5.1 Marine Deep Sea Turbidity

Marine water turbidity is carried out in the deep water i.e., at the dredged material disposal area on one day every month at three locations.

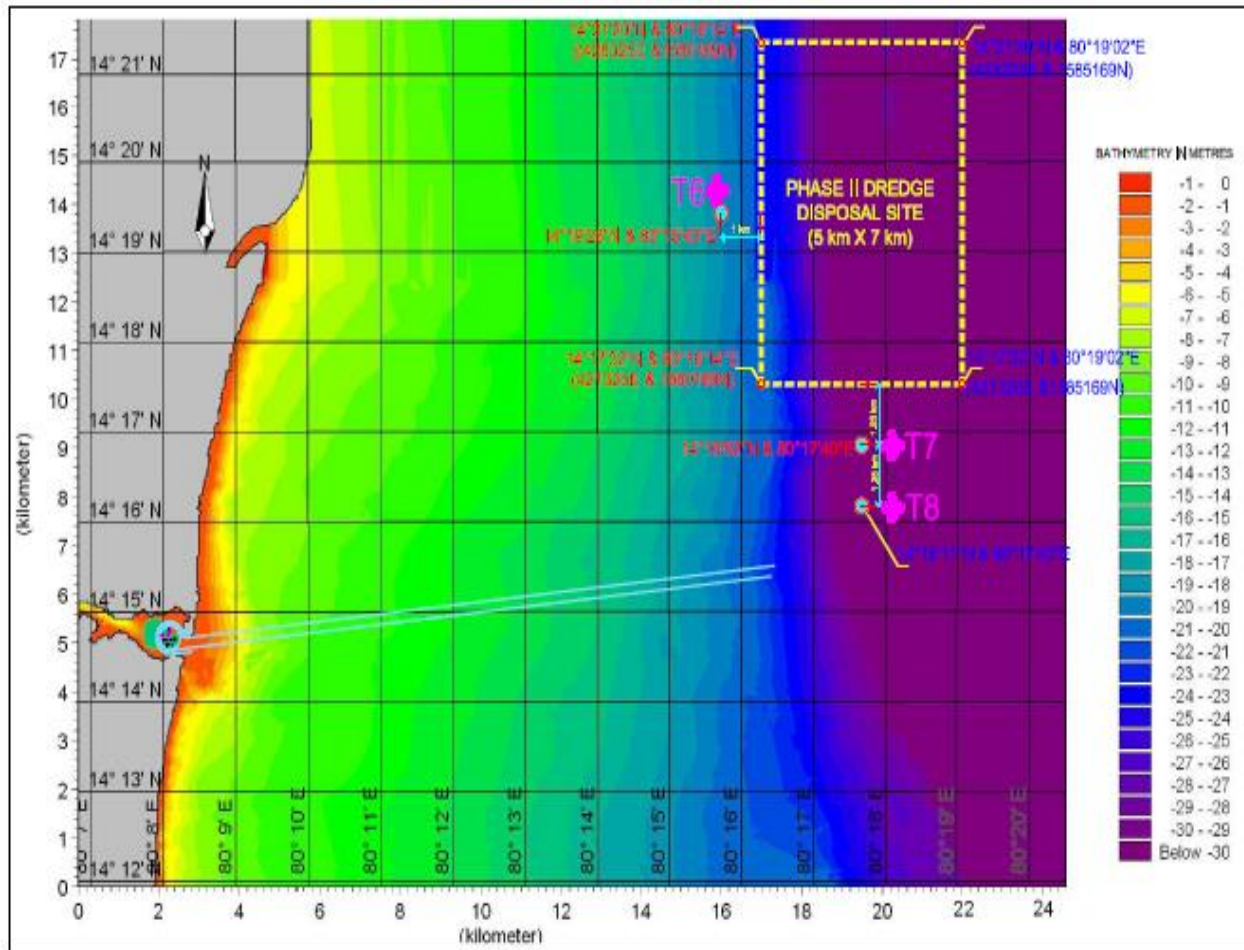
### 4.5.2 Sampling Locations

Turbidity levels are monitored during Low Tide, Medium Tide and High Tide. Monitoring locations listed below and **Figure–5**.

### **MARINE DEEP SEA TURBIDITY MONITORING LOCATIONS**

<b>Location Code</b>	<b>Geographical Co-ordinates</b>
<b>DS1</b>	14 <sup>0</sup> 19'26"N ; 80 <sup>0</sup> 15'43"E
<b>DS2</b>	14 <sup>0</sup> 16'52"N ; 80 <sup>0</sup> 17'40"E
<b>DS3</b>	14 <sup>0</sup> 16'11"N ; 80 <sup>0</sup> 17'40"E

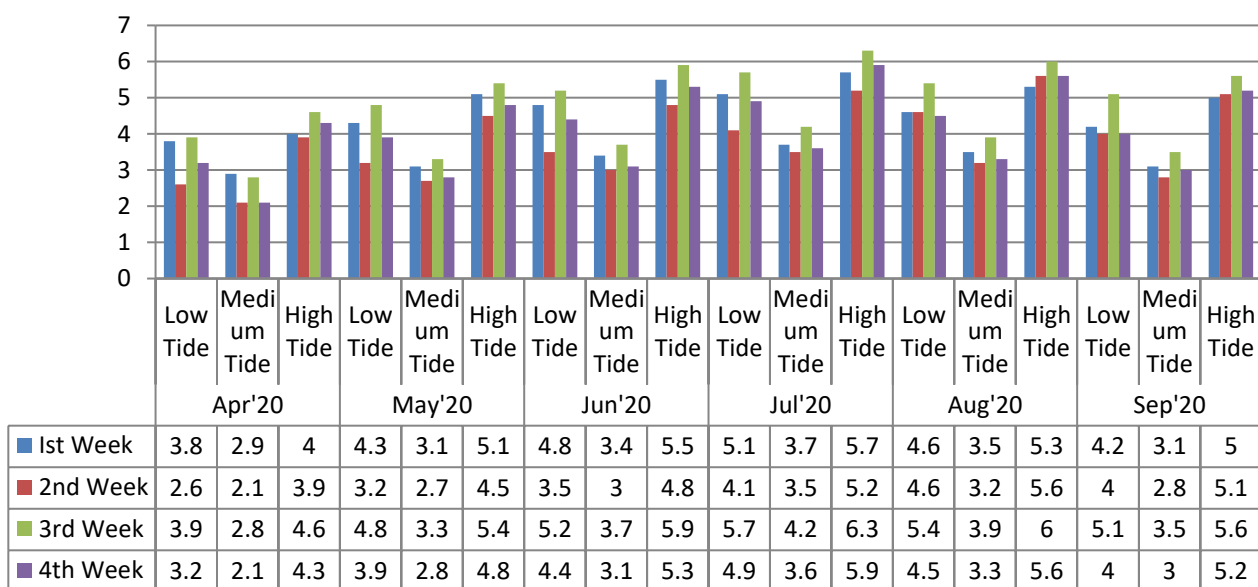
**FIGURE-4**  
**KRISHNAPATNAM PORT DEEP SEA MONITORING LOCATIONS**



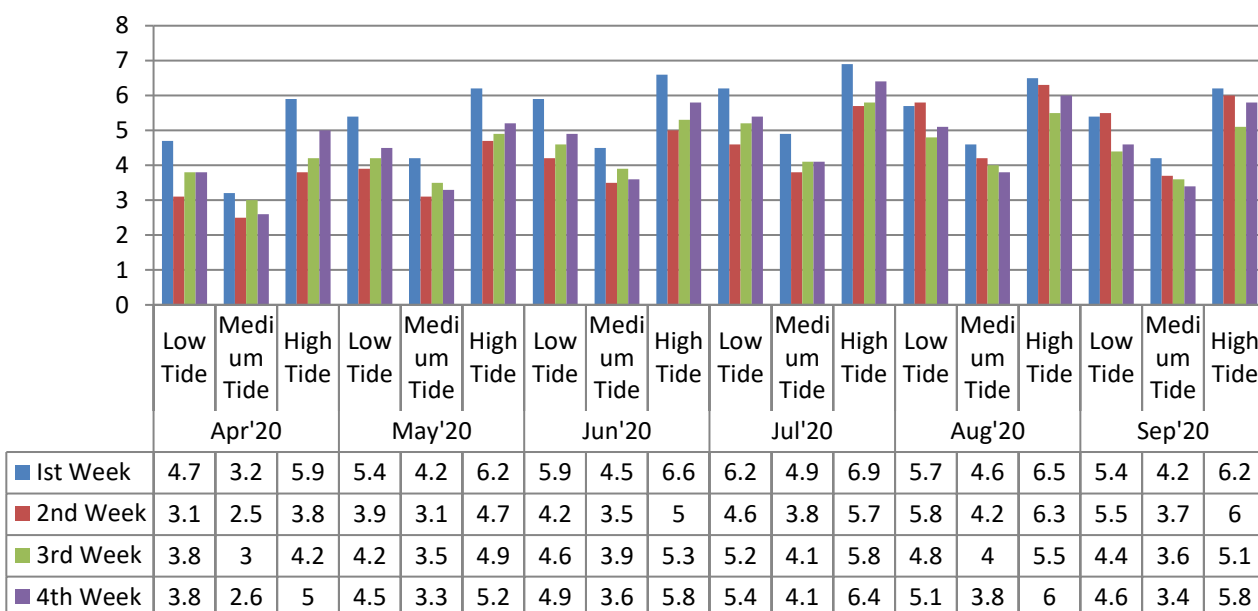
CODE	PARAMETERS	CO-ORDINATES OF MONITORING STATION
✚	Turbidity Monitoring	
T6		14°19'26"N & 80°15'43"E
T7		14°16'52"N & 80°17'40"E
T8		14°16'11"N & 80°17'40"E

## Status of Turbidity in Marine Water

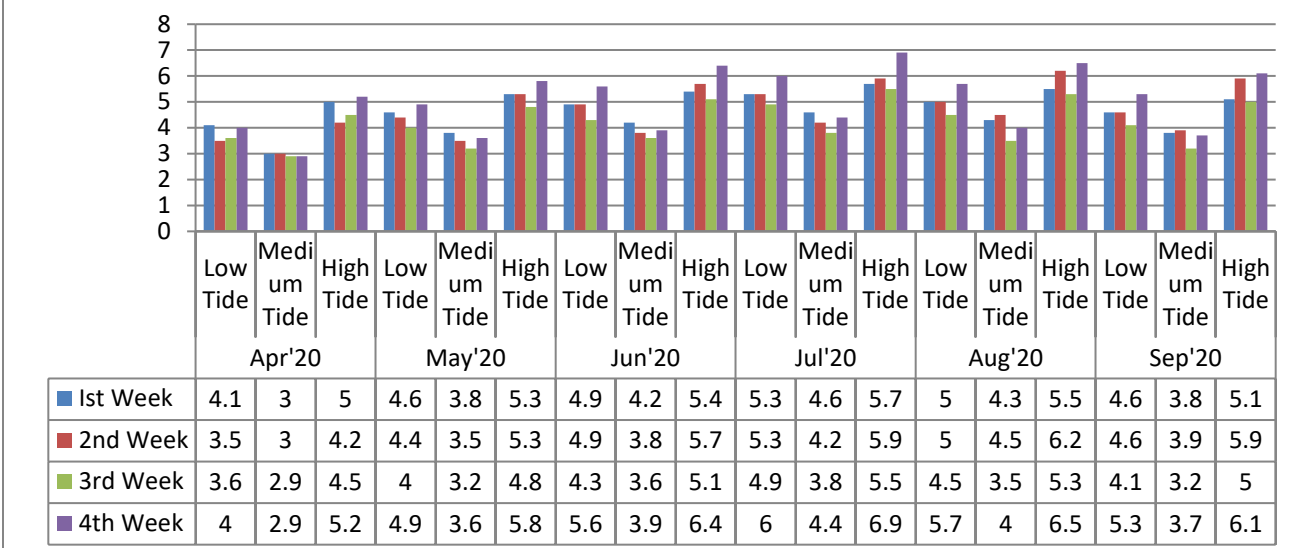
## Trend of Turbidity at Port Entrance in NTU



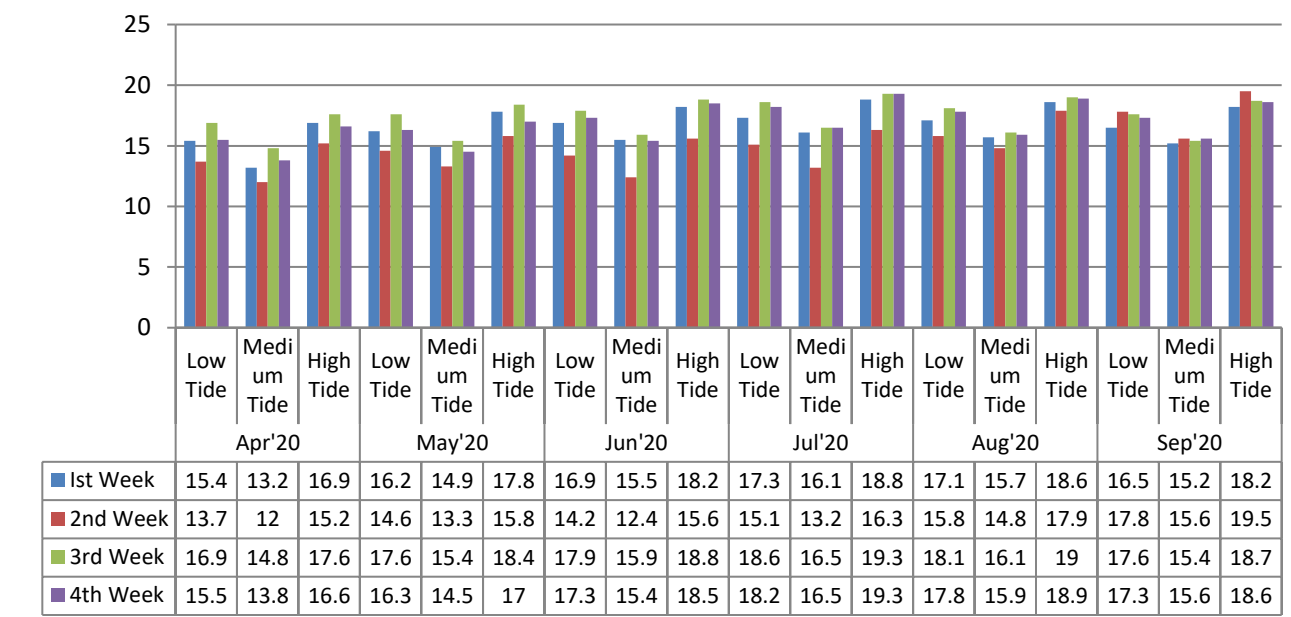
## Trend for Turbidity at Turning Circle in NTU



### Trend of Turbidity at Coal Berth in NTU



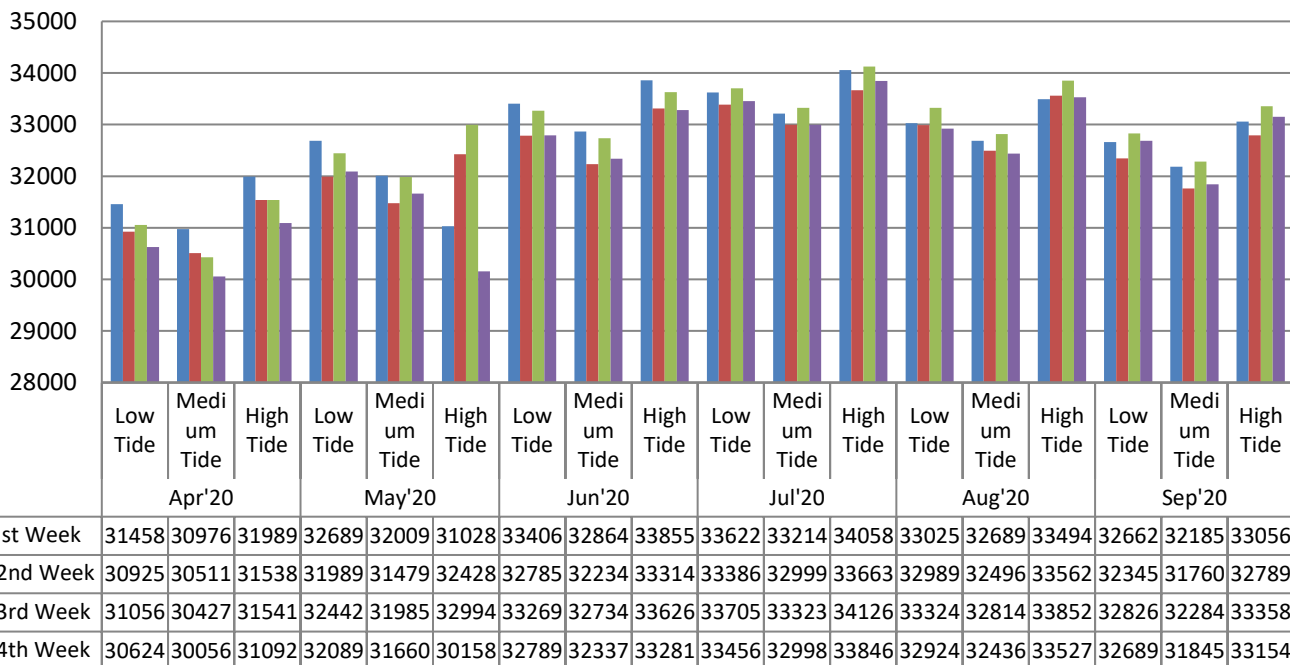
### Trend of Turbidity at Reclamation Area in NTU



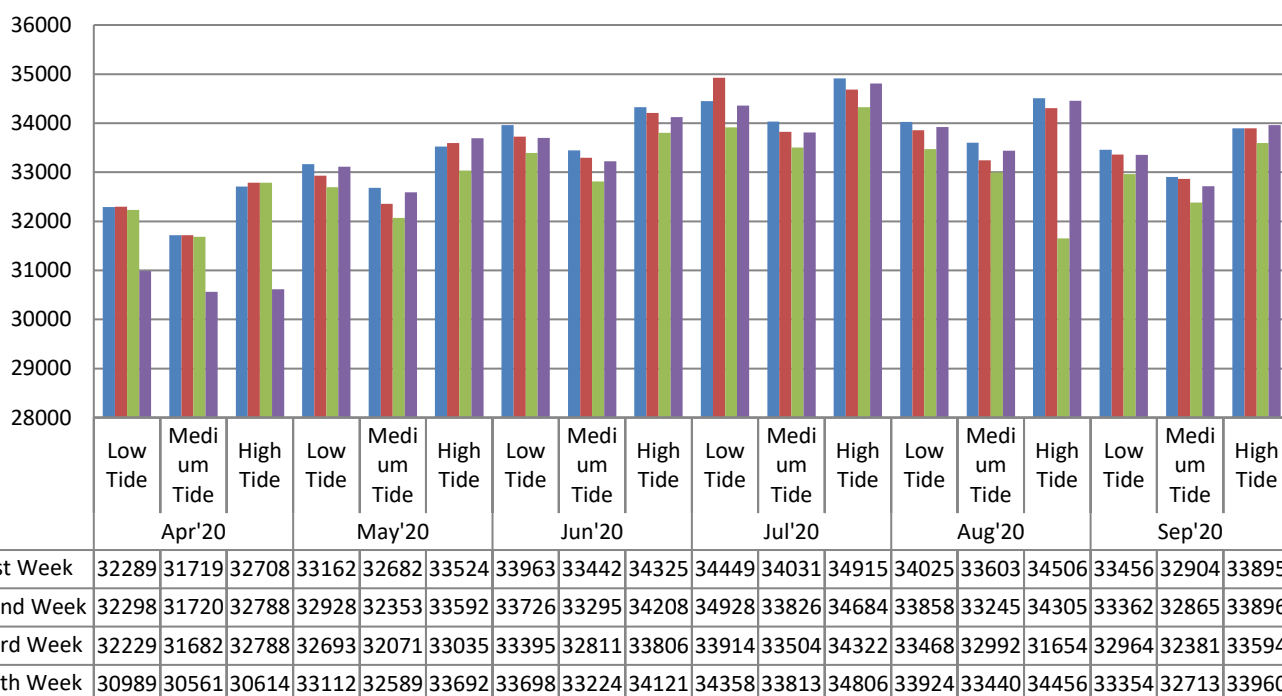
**Summary of Turbidity:** Coal berth varied between 2.9 TO 6.9NTU: Turning circle varied between 2.5 TO 6.9 NTU and Approach channel varied between 2.1 TO 6.3 NTU: Reclamation Area varied between 12.0 to 19.5 NTU

## Status of Total Dissolved Solids in Marine Water

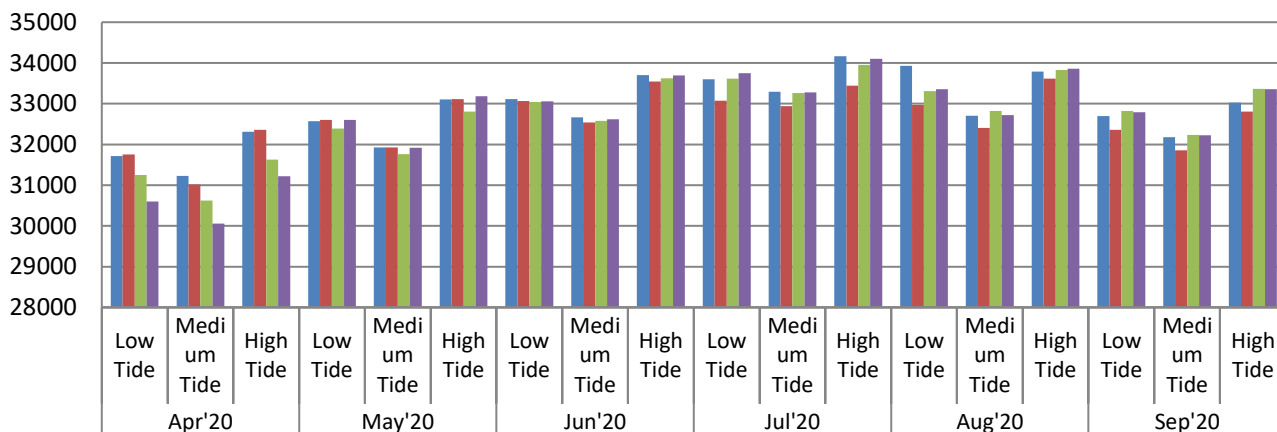
## Trend of TDS at Port Entrance in mg/l



## Trend of TDS at Turning Circle in mg/l

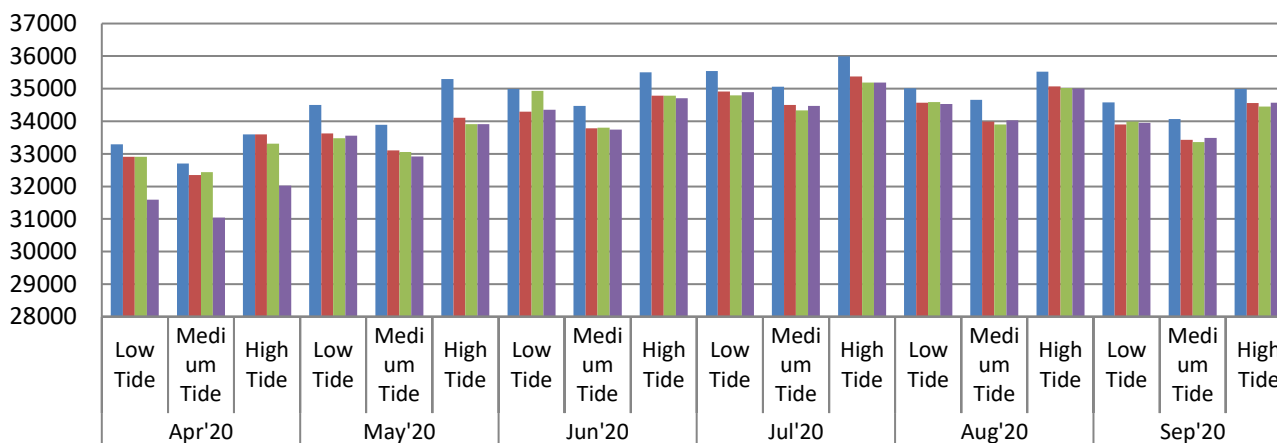


### Trend for TDS at Coal Berth in mg/l



Ist Week	31712	31228	32314	32568	31924	33108	33114	32665	33698	33602	33292	34161	33928	32705	33789	32698	32179	33025
2nd Week	31756	31018	32362	32599	31927	33112	33065	32536	33542	33069	32942	33445	32967	32408	33611	32358	31858	32806
3rd Week	31247	30622	31625	32391	31760	32809	33042	32576	33624	33611	33265	33954	33305	32820	33824	32819	32236	33366
4th Week	30602	30058	31217	32604	31915	33185	33056	32619	33692	33745	33277	34099	33352	32723	33859	32789	32227	33356

### Trend for TDS at Reclamation Area in mg/l



Ist Week	33295	32703	33601	34502	33894	35298	34989	34474	35505	35546	35058	35990	35009	34655	35524	34582	34073	34989
2nd Week	32905	32352	33593	33626	33108	34111	34295	33782	34788	34917	34502	35379	34568	33989	35066	33906	33425	34560
3rd Week	32909	32438	33315	33482	33058	33911	34928	33799	34789	34793	34332	35187	34590	33902	35026	33988	33360	34456
4th Week	31597	31039	32026	33557	32918	33916	34356	33749	34706	34896	34475	35192	34529	34030	35006	33954	33488	34569

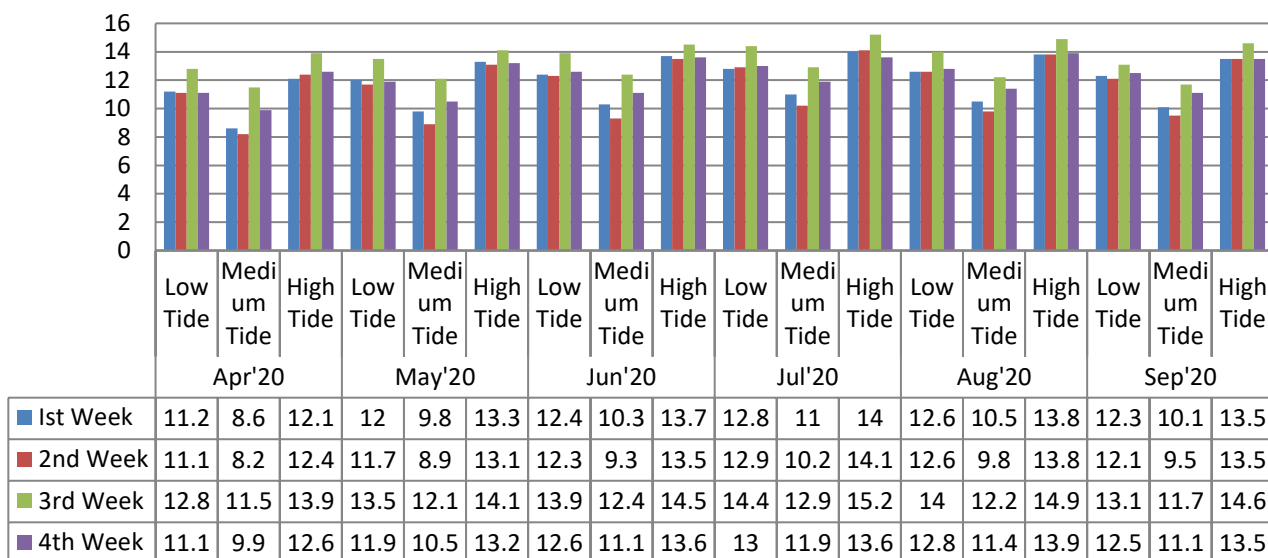
#### Summary of TDS of Marine water quality results

- ❖ **TDS** - Values are in the range of 30056 to 34126 mg/l at Port Entrance (Approach Channel).
- Values are in the range of 30561 to 34928 mg/l at Turning Circle
- Values are in the range of 30058 to 34161 mg/l at Coal Berth
- Values are in range of 31039 to 35990 at Reclamation Area

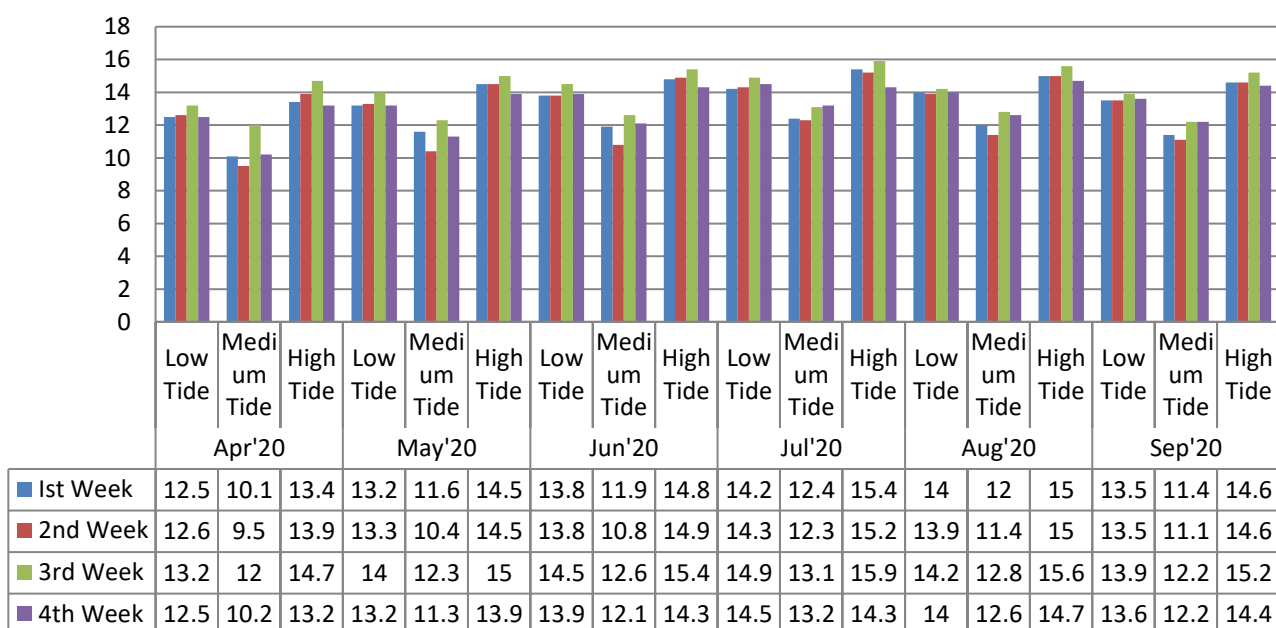


## Status of Total Suspended Solids in Marine Water

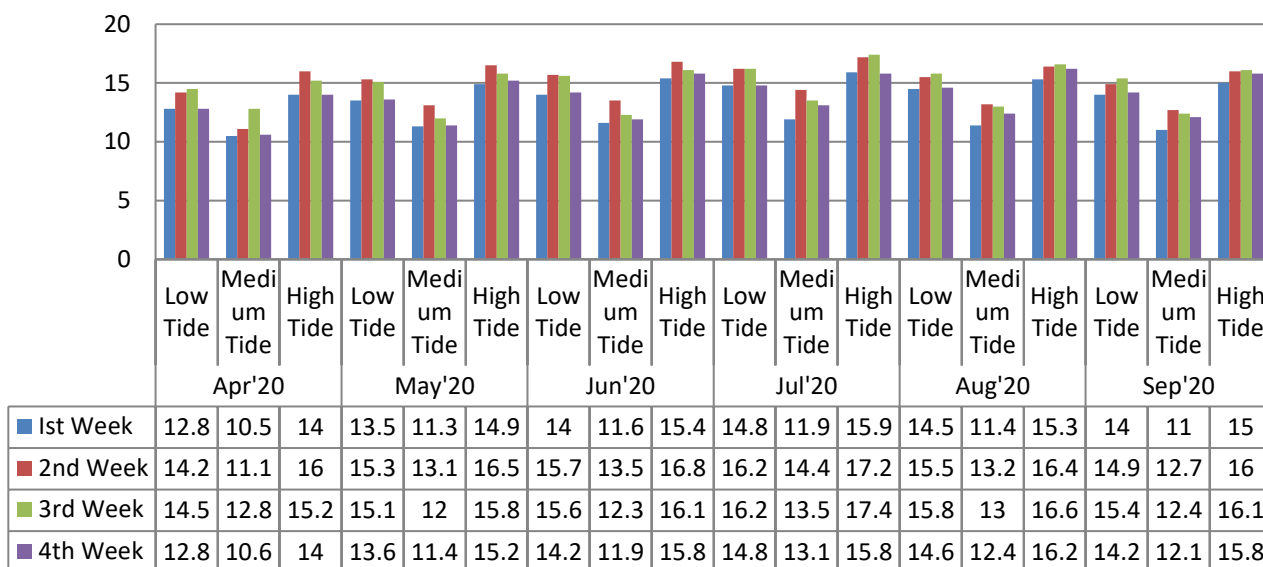
## Trend of TSS at Port Entrance in mg/l



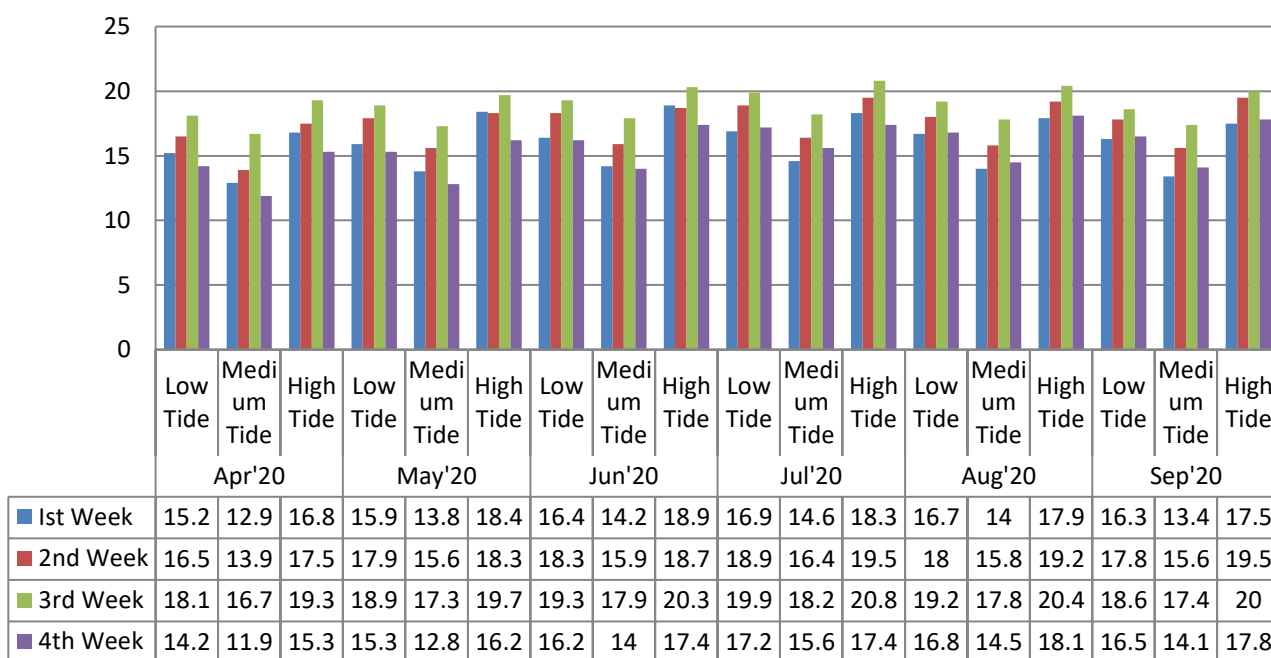
## Trend of TSS at Turning Circle in mg/l



### Trend for TSS at Coal Berth in mg/l

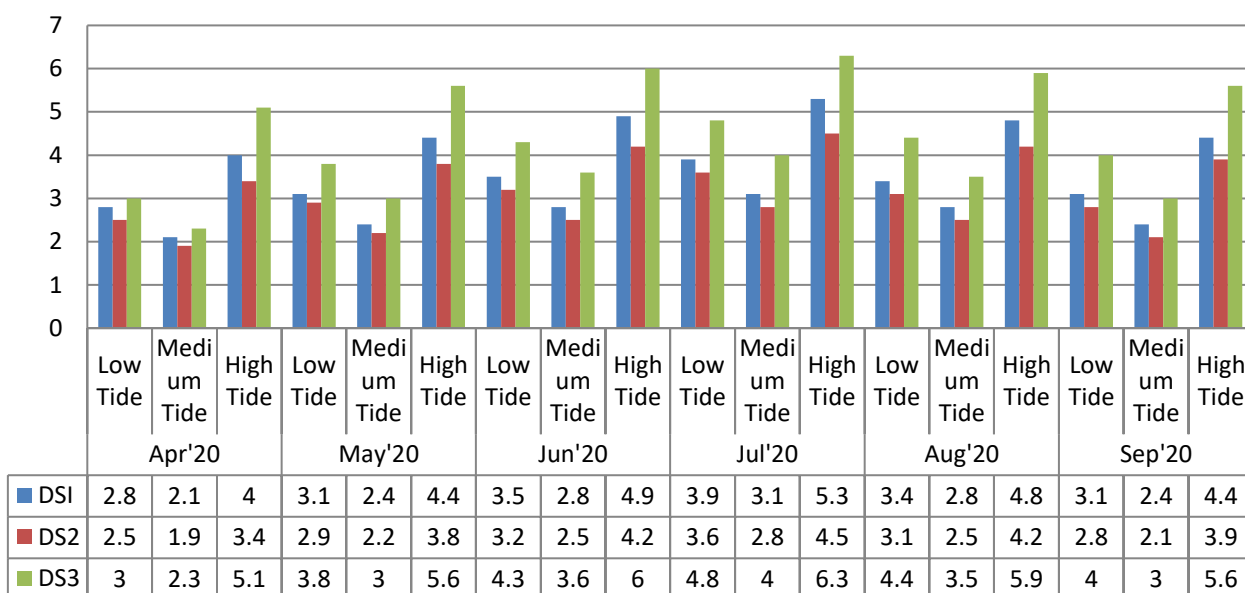


### Trend for TSS at Reclamation Area in mg/l

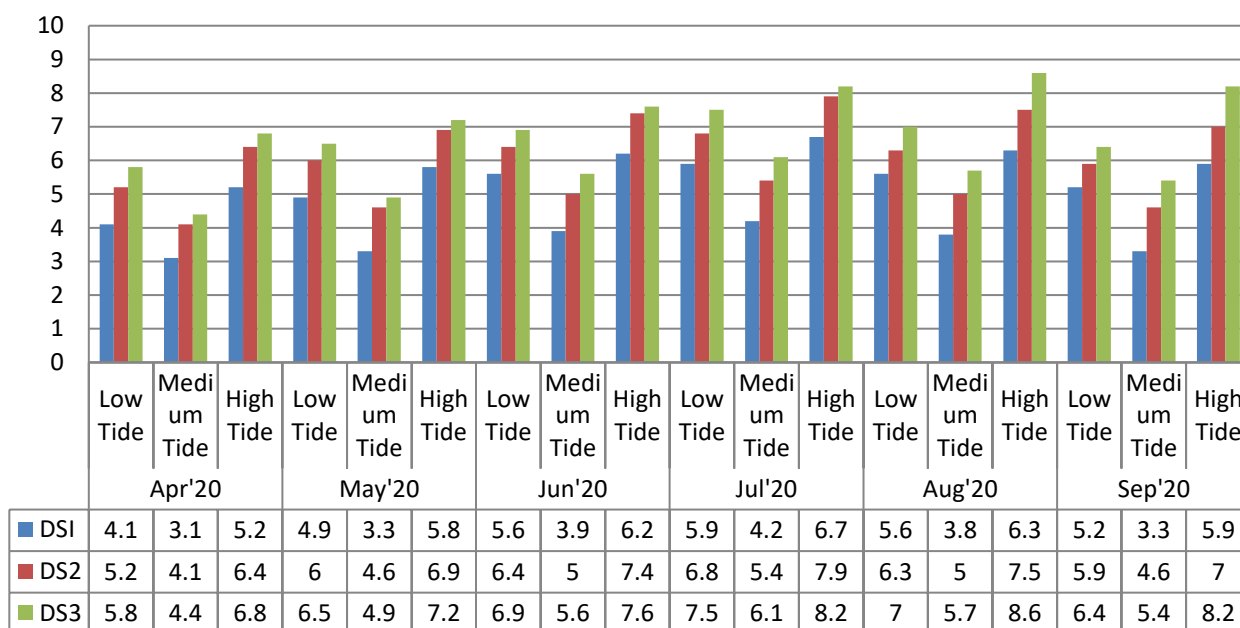


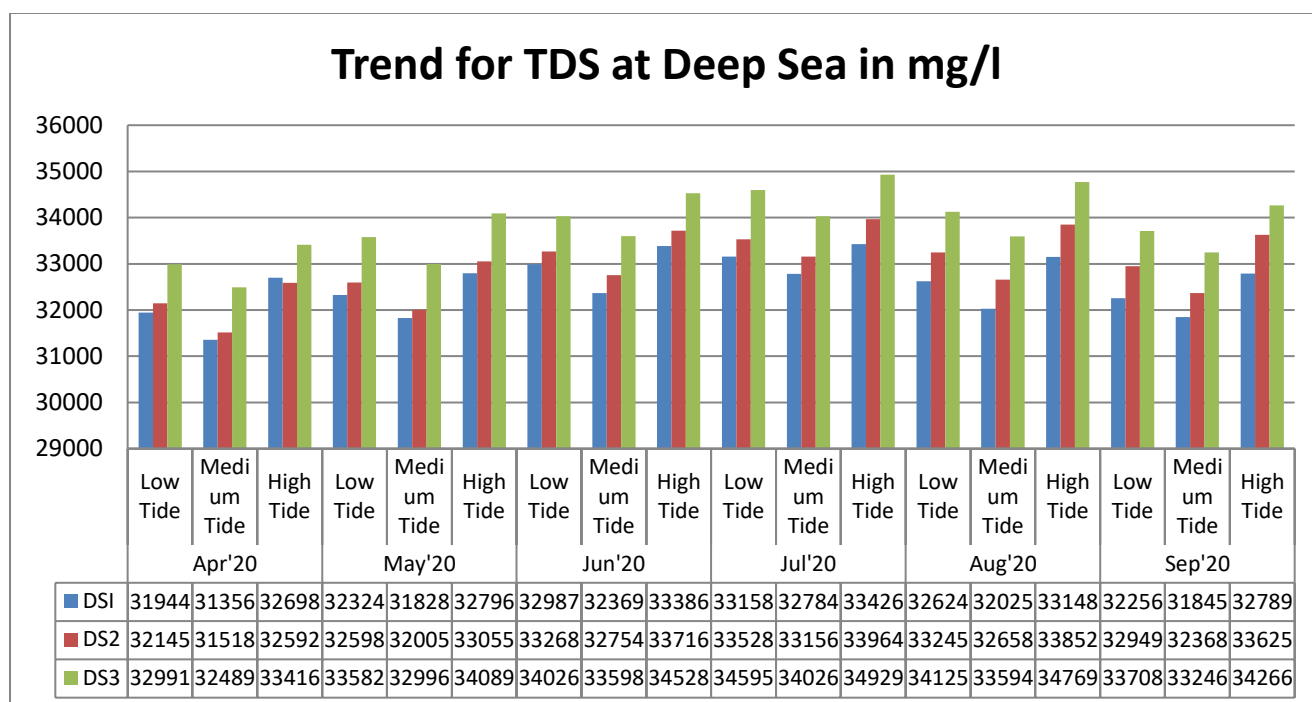
## Status of Deep Sea Water Quality

## Trend of Turbidity at Deep Sea in NTU



## Trend of TSS at Deep Sea in mg/l





## 4.6 Marine Sediment Quality

### 4.6.1 Sampling Locations

The Marine sediment sampling is carried out once in every week at four locations in the port listed below.

#### MARINE SEDIMENT MONITORING LOCATIONS

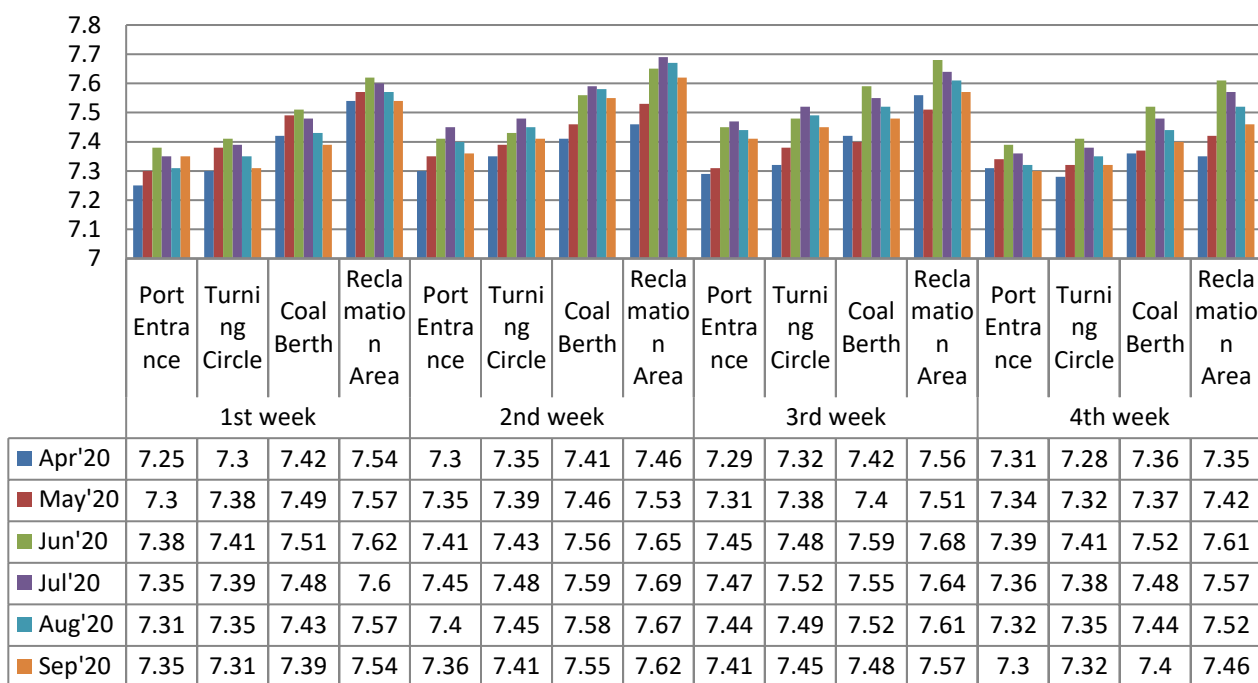
Sl.No	Location
1	Port Entrance
2	Turning Circle
3	Coal Berth
4	Reclamations Area

### 4.6.2 Method of Sampling

Marine sediment samples are collected using Van Veen Grab Sampler for analyzing Physical, Chemical and Biological parameters and presence of Heavy metals.

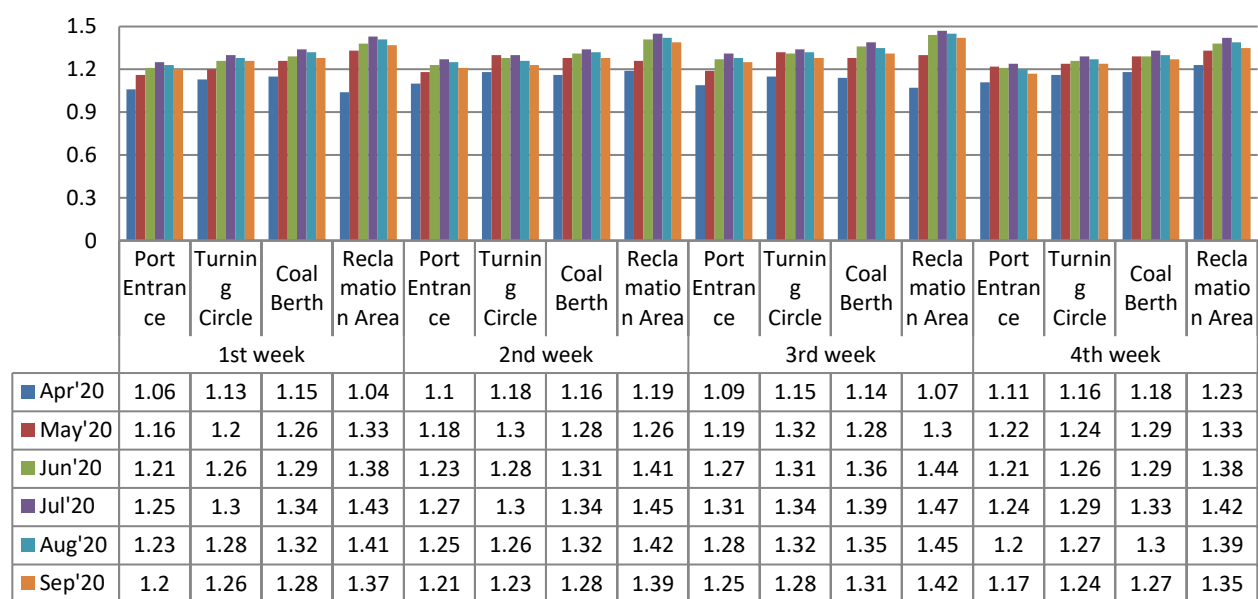
## Status of Marine Sediments Quality

## Trend of pH



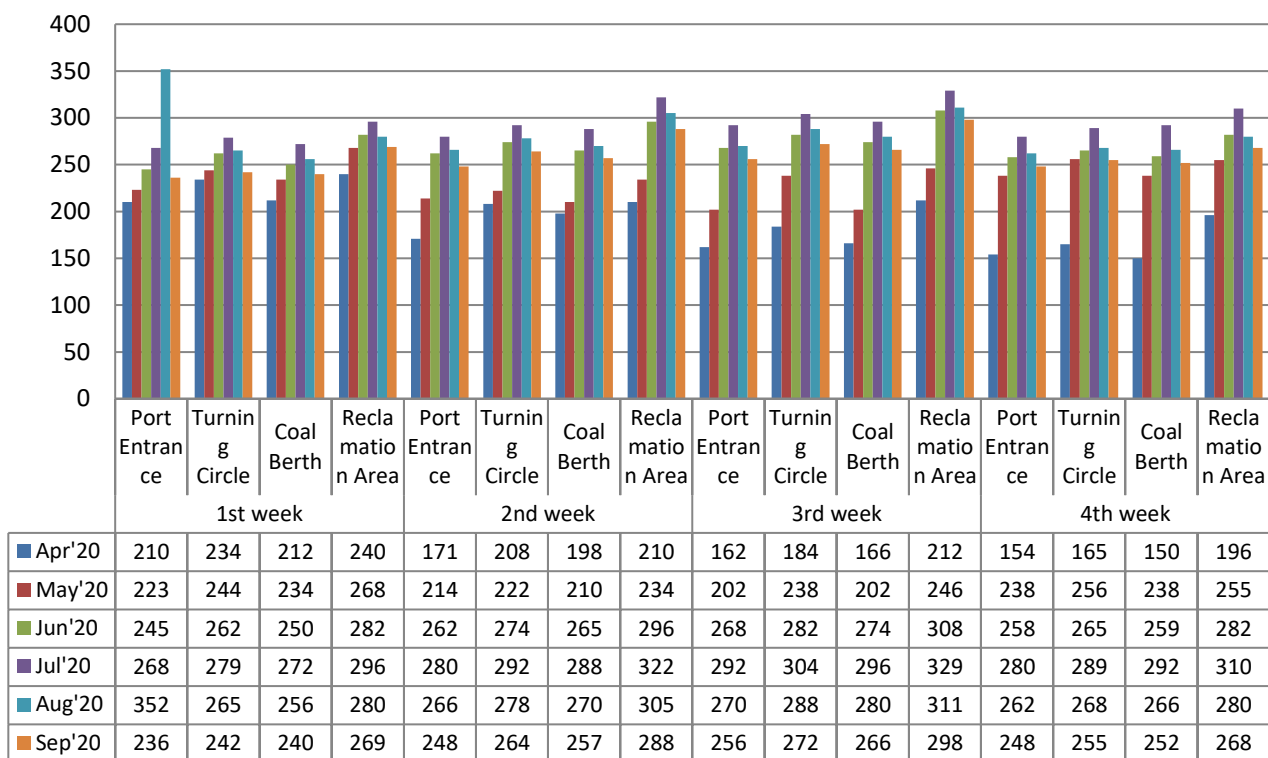
pH in Marine sediment varied between 7.25 to 7.69

## Trend of Organic Matter in %



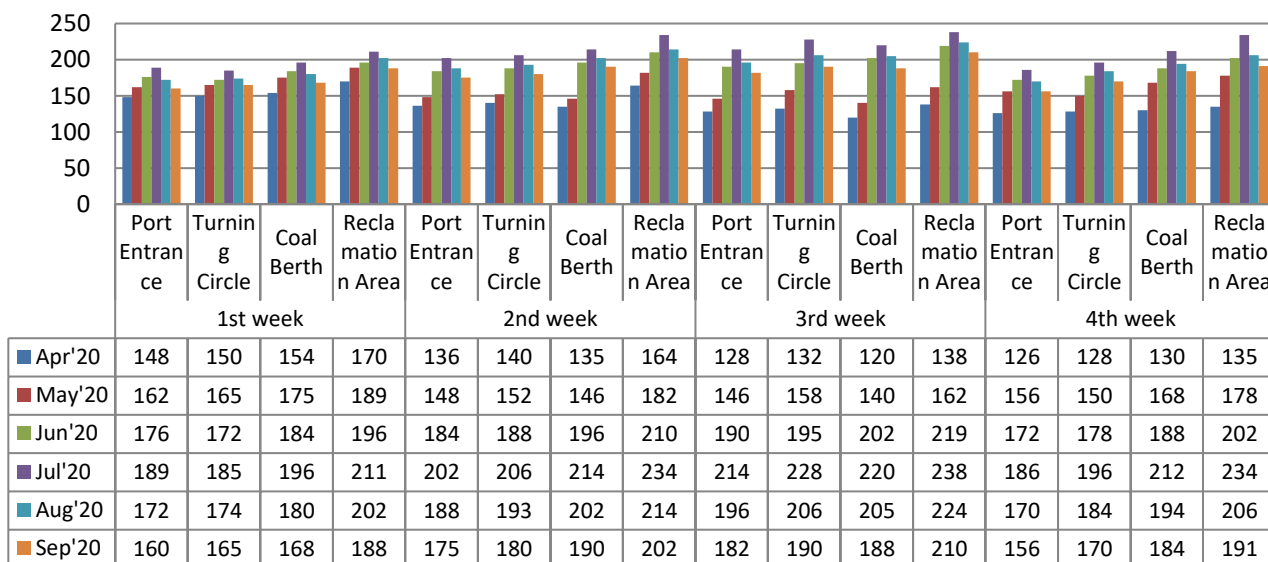
Organic Matter in Marine sediment varied between 1.04 to 1.47 %

### Trend of Nitrogen in mg/kg



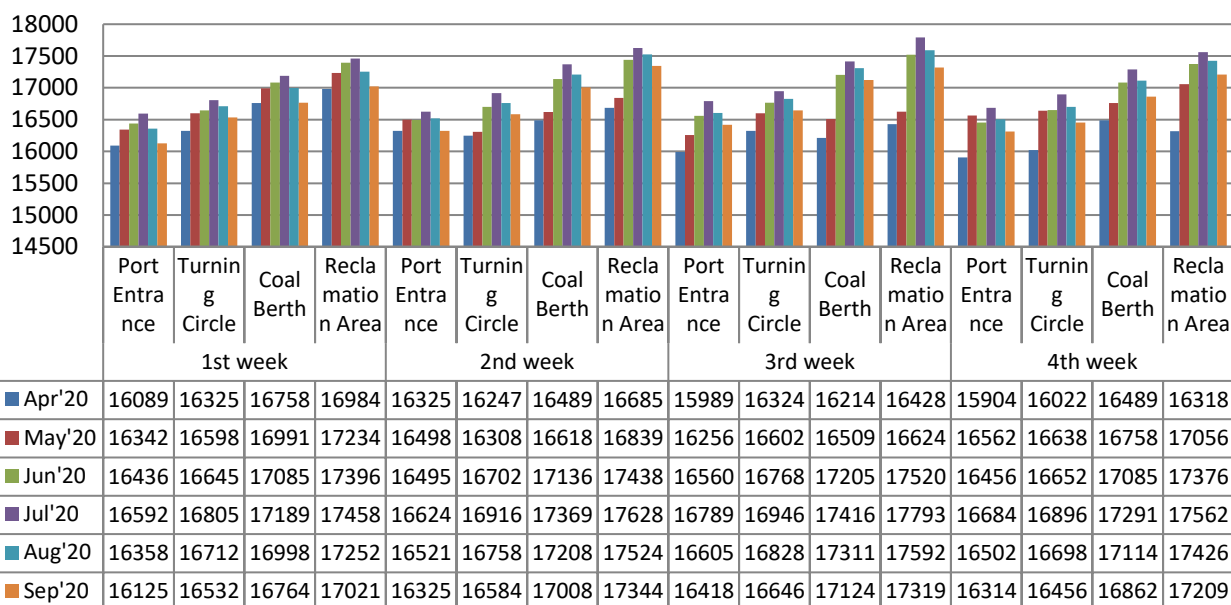
Nitrogen in Marine sediment varied between 150 to 352 mg/kg

### Trend of Phosphorus in mg/kg



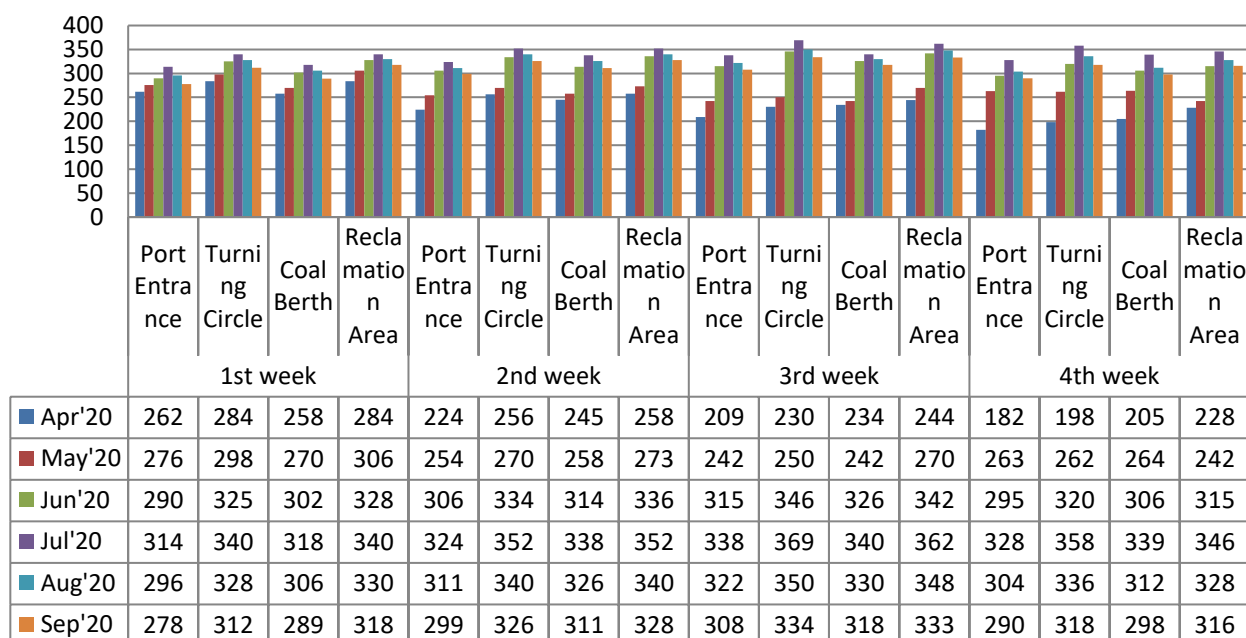
Phosphorous in Marine sediment varied between 120 to 238 mg/kg

### Trend for Sodium in mg/kg



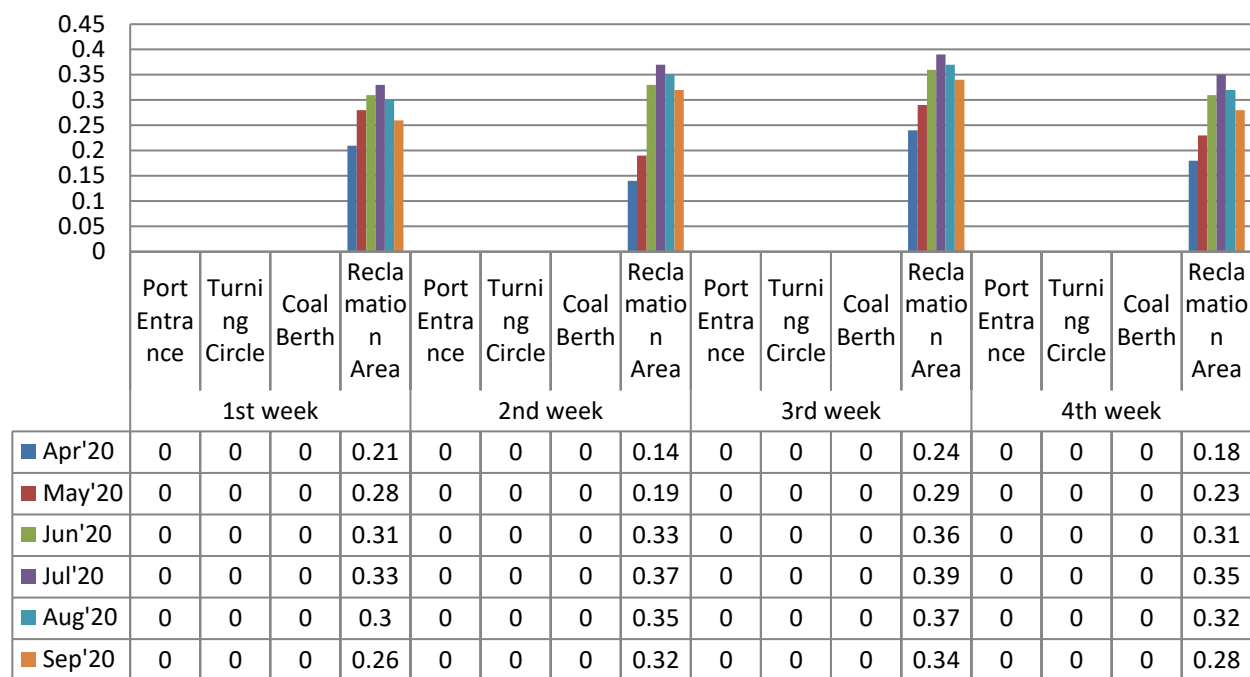
Sodium in Marine sediment varied between 15904 to 17793 mg/kg

### Trend for Potassium in mg/kg



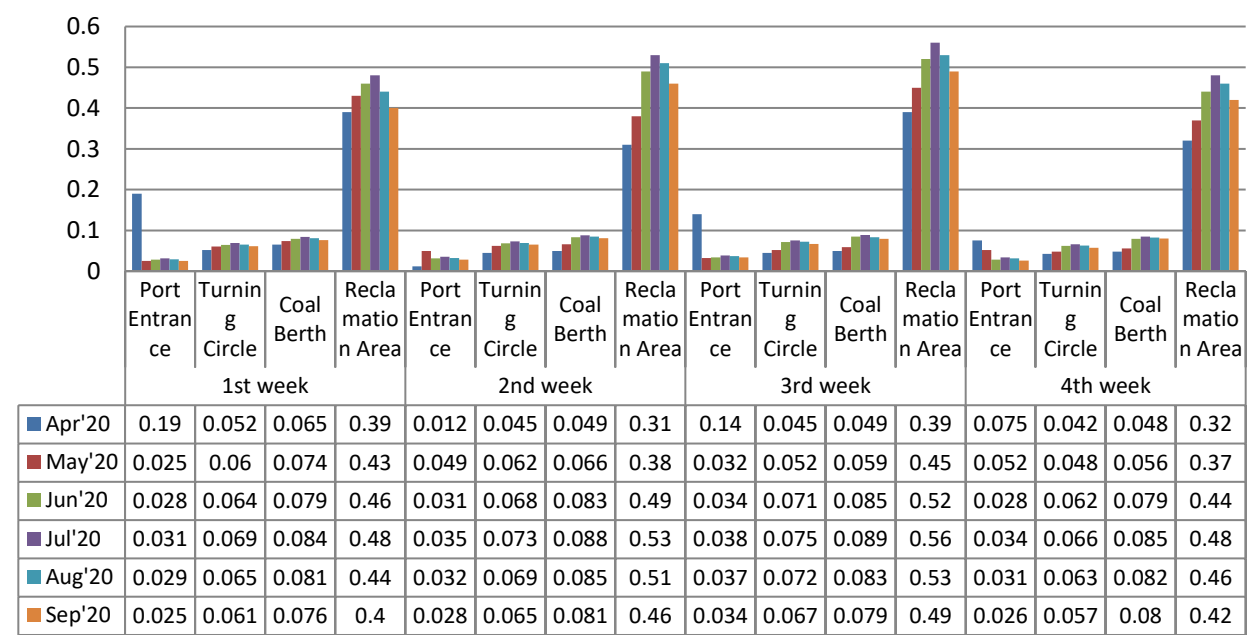
Potassium in Marine sediment varied between 182 to 369 mg/kg

### Trend for Copper in mg/kg



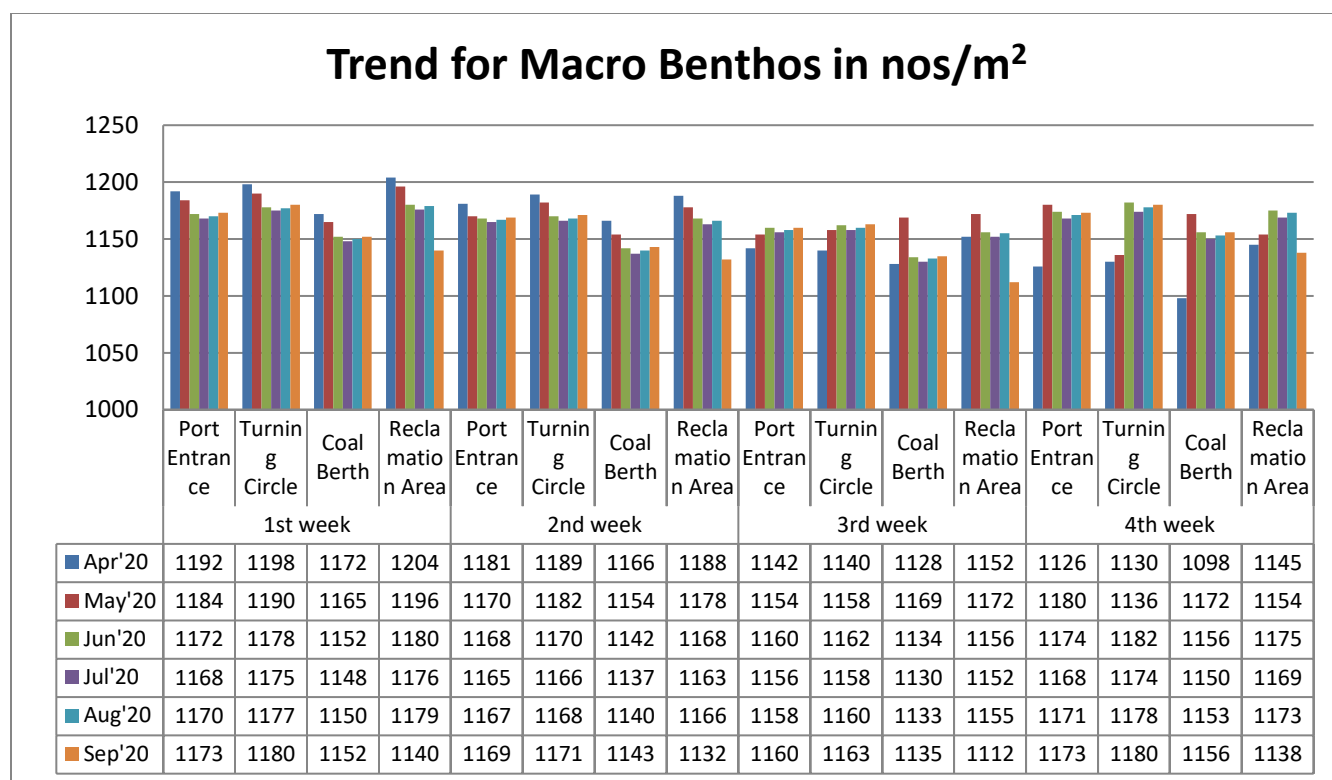
Copper in Marine Sediment varied between 0.14 to 0.39 mg/kg. At Port Entrance, Turning circle & Coal berth, the result found to be <0.01

### Trend of Zinc in mg/kg



Zinc in Marine sediment varied between 0.012 to 0.56 mg/kg





**Macro Benthos in Marine Sediment varied between 1098 to 1204 nos/m<sup>2</sup>**

### **Summary of marine sediments quality results for Six months of Apr'20 - Sep'20**

- Organic matter - value are in the range 1.04 to 1.47 %
- Nitrogen -value are in the range 150 to 352 mg/kg
- Phosphorous - value are in the range 120 to 238 mg/kg
- Sodium - value are in the range 15904 to 17793 mg/kg
- Potassium - value are in the range 182 to 369 mg/kg
- Copper - value are in the range 0.14 to 0.39 mg/kg
- Zinc -value are in the range 0.012 to 0.56 mg/kg
- Macro Benthos - value are in the range 1098 to 1204 nos/m<sup>2</sup>

## 4.7 GROUND WATER QUALITY

### 4.7.1 Sampling Locations

Ground Water sampling is carried out once in six months at four locations in and around the Port. The Ground water sampling locations are listed below.

#### **GROUND WATER QUALITY MONITORING LOCATIONS**

<b>Location Code</b>	<b>Location</b>
GW1	Port Site
GW2	South Side of the Port
GW3	Gopalapuram Village
GW4	Krishnapatnam Village

**TEST REPORT OF GROUND WATER SAMPLES**

S. No.	Parameter	Unit	Port Site (Bore Well)	Krishnapatnam Village	South Side of the Port	Gopalpuram Village	IS: 10500-2012 Specification
1.	pH	--	7.32	7.58	7.70	7.45	6.5 – 8.5
2	Electrical Conductivity	μmhos	1626	969	1536	1059	-
3	TDS	mg/l	1026	601	968	669	500
4	Total Alkalinity as CaCO <sub>3</sub>	mg/l	274	214	369	205	200
5	Chlorides as Cl <sup>-</sup>	mg/l	432	198	362	303	250
6	Sodium	mg/l	174	92.6	189	105	-
7	Potassium	mg/l	46	18	42	21	
8	Fluorides as F <sup>-</sup>	mg/l	0.66	0.51	0.78	0.48	1.0
9	Nitrates as NO <sub>3</sub> <sup>-</sup>	mg/l	7.05	6.84	5.31	5.36	45
10	Cyanide as CN	mg/l	< 0.01	< 0.01	< 0.01	< 0.01	0.05
11	Total Hardness as CaCO <sub>3</sub>	mg/l	148	90.2	124	103	200
12	Salinity	ppt	0.078	0.035	0.065	0.054	
13	Sulphates as SO <sub>4</sub> <sup>-2</sup>	mg/l	126	69.2	79.4	89.9	200
14	COD	mg/l	< 10.0	< 10.0	< 10.0	< 10.0	
15	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	< 0.001	0.001
16	Cadmium as Cd	mg/l	< 0.001	< 0.001	< 0.001	< 0.001	0.003
17	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01
18	Selenium	mg/l	< 0.05	< 0.05	< 0.05	< 0.05	
19	Iron as Fe	mg/l	0.08	0.09	0.16	0.08	0.3
20	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01
21	Zinc as Zn	mg/l	0.12	0.06	0.09	0.14	5.0
22	Chromium as Cr <sup>6+</sup>	mg/l	< 0.01	< 0.01	< 0.01	< 0.01	0.05
23	Total Coliforms	CFU/ml	Not Detected	Not Detected	Not Detected	Not Detected	Shall not be detected in 100ml
24	Fecal Coliforms	CFU/ml	Not Detected	Not Detected	Not Detected	Not Detected	Shall not be detected in 100ml

**Note:** . All the above parameters have been tested as per APHA 23<sup>rd</sup> Edition, 2017.

## 4.8 SOIL QUALITY

For studying soil profile of the region, sampling locations are selected to assess the existing soil characteristics in and around the port area representing various land use conditions.

### 4.8.1 Sampling Locations

A total two number of samples collected from the sampling sites. The details of the soil sampling locations are given below.

The soil samples are collected and analyzed once in six months.

#### **SOIL QUALITY MONITORING LOCATIONS**

Location Code	Name of the Location
S1	Storage area towards west Buckingham Canal
S2	Storage Area at Port

**TEST REPORT OF SOIL SAMPLES**

S. NO.	PARAMETER	UNIT	S1	S2
1.	pH(1:5)	--	7.38	7.43
2.	EC(1:5)	µmhos	696	722
3.	Texture			
	a. Sand	%	75.9	74.6
	b. Silt	%	13.2	14.2
	c. Clay	%	10.9	11.2
4	Available Nitrogen	kg/ha	236	251
5	Available Phosphorus	kg/ha	13	15
6	Available Potassium	kg/ha	510	526
7	Exchangeable Sodium	mg/kg	201	212
8	Exchangeable Calcium	mg/kg	132	165
9	Exchangeable Magnesium	mg/kg	36	44
10	SAR (SAR)	-	1.6	1.9
11	Water Soluble Chlorides	mg/kg	162	174
12	Organic Carbon	%	0.41	0.49
13	Lead	mg/kg	7.9	6.4
14	Cadmium	mg/kg	0.17	0.14
15	Copper	mg/kg	6.9	7.2
16	Zinc	mg/kg	7.3	7.9

#### 4.9 STP INLET AND OUTLET ANALYSIS

##### TEST REPORT OF STP INLET

S.No	Parameter	Unit	Apr'20	May'20	Jun'20	Jul'20	Aug'20	Sep'20
1	pH	-	6.80	6.86	6.92	7.03	6.89	6.99
2	Total Solids	mg/l	1866	1977	2051	2125	2025	2174
3	Total Dissolved Solids	mg/l	1692	1789	1855	1921	1811	1946
4	Total Suspended Solids	mg/l	174	188	196	204	214	228
5	COD	mg/l	262	256	268	289	272	286
6	BOD 3day 27°C	mg/l	101	98.2	102	106	101	104
7	Oil & Grease	mg/l	5.2	4.9	5.3	5.5	5.2	5.4

##### TEST REPORT OF STP OUTLET

S.No	Parameter	Unit	Apr'20	May'20	Jun'20	Jul'20	Aug'20	Sep'20
1	pH	-	7.15	7.10	7.21	7.24	7.16	7.26
2	Total Solids	mg/l	1023	1100	1154	1225	1176	1255
3	Total Dissolved Solids	mg/l	985	1054	1100	1172	1148	1210
4	Total Suspended Solids	mg/l	38	46	54	53	28	45
5	COD	mg/l	71.8	82.1	90.6	96.3	82.4	90.6
6	BOD 3day 27°C	mg/l	21.2	24.6	28.5	28.2	26.8	27.0
7	Oil & Grease	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

## 5.0 STACK EMISSION MONITORING

Sampling of Flue gas emissions of DG Sets was done and their emissions were determined. The Detailed report has been enclosed here.

S. No	DG Capacity (kVA)	Location	S. No	DG Capacity (kVA)	Location
1	380	Admin building	14	250	Dredger
2	250	SS-2	15	250	MCG
3	320	Admin Block	16	250	Garage
4	82.5	Sea Shell	17	250	CG-1
5	250	Dredger	18	500	CT Yard
6	250	South Port	19	250	CT Yard
7	125	CV Block	20	125	DSS1
8	250	R Block	21	160	Batching Plant
9	160	SSI	22	160	NPS
10	125	MUSS	23	100	KPCT Scanner
11	320	South Port	24	500	CT Yard
12	250	Batching Plant	25	125	DSS14
13	250	TTT			

### EMISSION RATE

S.NO.	PARAMETER	UNIT	METHOD	RESULT				
				1	2	3	4	5
1.	Particulate Matter – PM	g/kw-hr	IS:11255-P-1	0.11	0.13	0.12	0.12	0.11
2.	Oxides of Nitrogen – NOx	g/kw-hr	IS:11255-P-2	1.27	1.60	1.28	1.15	0.68
3.	Carbon Monoxide – CO	g/kw-hr	IS:11255-P-7	0.58	0.69	0.60	0.49	0.34
4.	Hydrocarbons - HC	g/kw-hr	IS:11255	0.21	0.11	0.13	0.14	0.10

S.NO.	PARAMETER	UNIT	METHOD	RESULT				
				6	7	8	9	10
1.	Particulate Matter – PM	g/kw-hr	IS:11255-P-1	0.14	0.13	0.14	0.08	0.12
2.	Oxides of Nitrogen – NOx	g/kw-hr	IS:11255-P-2	1.08	1.14	1.32	1.27	1.14
3.	Carbon Monoxide – CO	g/kw-hr	IS:11255-P-7	0.50	0.42	0.66	0.52	0.38
4.	Hydrocarbons - HC	g/kw-hr	IS:11255	0.12	0.10	0.18	0.09	0.10

S.NO.	PARAMETER	UNIT	METHOD	RESULT				
				11	12	13	14	15
1.	Particulate Matter – PM	g/kw-hr	IS:11255-P-1	0.16	0.14	0.13	0.10	0.12
2.	Oxides of Nitrogen – NOx	g/kw-hr	IS:11255-P-2	1.15	1.25	1.29	1.16	1.20
3.	Carbon Monoxide – CO	g/kw-hr	IS:11255-P-7	0.54	0.47	0.52	0.47	0.44
4.	Hydrocarbons - HC	g/kw-hr	IS:11255	0.07	0.12	0.08	0.13	0.15

S.NO.	PARAMETER	UNIT	METHOD	RESULT				
				16	17	18	19	20
1.	Particulate Matter – PM	g/kw-hr	IS:11255-P-1	0.13	0.14	0.14	0.10	0.08
2.	Oxides of Nitrogen – NOx	g/kw-hr	IS:11255-P-2	1.56	1.18	1.43	1.24	1.14
3.	Carbon Monoxide – CO	g/kw-hr	IS:11255-P-7	0.54	0.47	0.55	0.42	0.55
4.	Hydrocarbons - HC	g/kw-hr	IS:11255	0.09	0.11	0.13	0.07	0.08

S.NO.	PARAMETER	UNIT	METHOD	RESULT				
				21	22	23	24	25
1.	Particulate Matter – PM	g/kw-hr	IS:11255-P-1	0.11	0.10	0.16	0.12	0.15
2.	Oxides of Nitrogen – NOx	g/kw-hr	IS:11255-P-2	1.38	1.21	1.29	1.63	1.34
3.	Carbon Monoxide – CO	g/kw-hr	IS:11255-P-7	0.50	0.47	0.52	0.48	0.55
4.	Hydrocarbons - HC	g/kw-hr	IS:11255	0.08	0.09	0.14	0.10	0.06