



ನವ ಮಂಗಳೂರು ಬಂದರು ಮಂಡಳಿ

ನವ ಮಂಗಳೂರು ಪತ್ತನ ನ್ಯಾಸ

NEW MANGALORE PORT TRUST

ಭಾರತ ಸರಕಾರ (ಪತ್ತನ, ಪಾತ ಪರಿವಹನ ಔರ ಜಲಮಾರ್ಗ ಮಂಜಾಲಯ")

Govt of India (Ministry of Ports, Shipping and Waterways)
ಪಣಿಂಬಾರು ಪಣಿಂಬಾರು Panambur / ಮಂಗಳೂರು ಮಂಗಳೂರು Mangalore - 575 010



3/11/EMP/CE(C)/2020-21/TS/04

14-12-2021

To:

K.P.SINGH
Regional Officer
Ministry of Environment & Forests,
Regional Office (South Zone), 4th Floor, E&F Wings,
KendriyaSadan, 17th Main Road, II Block,
Koramangala,
BANGALORE – 560 034.

Sir,

Sub: Submission of half yearly Compliance report from April 2021 to September2021 -Environmental Clearance issued by the Ministry of Environment Forests & Climate-intimation -reg

Ref: 1. Your Letter No: EP/12.1/2011-12/14/KAR/954dtd:09-11-21
2. EC No: PD/26017/11//98-PDZ(CRZ) issued on 13-05-1999.
3. EC No. PD/26018/12//98-PDZ(CRZ) issued on 19-05-1999

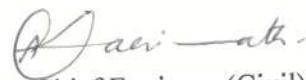
With reference to the subject cited above, please find enclosed here with the revised half yearly Compliance report on stipulated environmental clearance terms and conditions along with tabulated test results on Air samples, Drinking water samples, Waste Water (STP), Noise level ,DG stack emission from April 2021 to September2021 for information.

The compliance report is submitted for the EC No: PD/26017/11//98-PDZ(CRZ) issued on 13-05-1999& EC No. PD/26018/12//98-PDZ(CRZ) issued on 19-05-1999. The soft copy of same information is mailed to rosz.bng-mef@nic.in and roszmon@yahoo.in on 20-12-2021. The half yearly Compliance report from April 2021 to September2021 is uploaded in Port website www.newmangaloreport.gov.in

Thanking you,

Yours faithfully,

Encl: As above

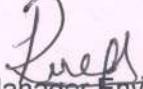

Chief Engineer (Civil)

Stipulated Environmental Clearances Report as per as per EC No: PD/26017/11/98-PDZ(CRZ) issued on 13-05-1999 and EC No. PD/26018/12/98-PDZ(CRZ) issued on 19-05-1999

SI. No	EC Conditions:	Remarks
1	All construction design/drawings relating to construction activities must have the approval of the concerned State Govt. Departments/Agencies. Ground water should not be tapped for construction activities.	Statutory approval were obtained and work completed
2	Adequate provision for all infrastructural facilities such as water supply, fuel, sanitation etc. must be extended for labourers during the construction period in order to avoid damage to the environment.	During the project work provision for all infra structural facilities like water supply, Sanitation etc., was provided.
3	Dredging operations, if any, should be undertaken in consultation with either the Central Water and Power Research Station, Pune or the National Institute of Oceanography, Goa to ensure that dredging operations do not cause adverse impact on water quality and marine productivity in the vicinity. Dredging operation as far as possible should be kept to the minimum for avoiding any adverse impact on marine life.	Capital dredging operations conducted during the project work in consultation with CWPRS, Pune and all necessary precautions were taken to avoid any adverse impact on marine life
4	Disposal sites for excavated material should be so designed that the revised land use after dumping and changes in the land use pattern do not interfere with the natural damage.	The excavated material of the project work was used for Reclamation of Tannirbhavi beach and didn't interfere with natural damage
5	To meet any emergency situation, adequate foam containers should be kept ready with supporting fire fighting system and water pipeline.	Fire fighting system & water pipeline was provided at construction area Annexure-I
6	The staff posted in sensitive areas should be trained in implementation of the Crisis Management Plan already drawn by the authorities. Mock drill(s) for this purpose should be conducted on a regular basis. Provisions of Dock Safety Act and the guidelines issued by the DG,FASLI/CLI, Bombay for the safety and health of the dock workers should be followed.	During the project work safety and health of the dock workers was considered. In-house Medical facility was provided and regularly Mock drills for different situations was provided
7	For development of green buffer including mangroves wherever feasible, the authorities should start growing large nursery of multipurpose species such as Eucalyptus, Casurine, Dalbergia, Terminalia etc. The norm of about 2000-2500 trees per hectare maybe adopted for raising of green belt.	The Port developed 250 acre land near kudupu and Bondel quarry area for plantation Port has developed its own Nursery and many species such as Eucalyptus, Casurine, Dalbergia, Terminalia etc were

		planted near beach side Port has developed 30% Green belt area
8	To prevent discharge of sewage and other liquid wastes including ballast into marine environment, adequate system for collection, treatment and disposal of liquid wastes must be provided to the satisfaction of Karnataka Pollution Control Board.	Annexure-II Sewage Treatment Plant with 1.2 MLD capacity was constructed to treat the sewage and other liquid waste including ballast as per the KSPCB Annexure-III
9	Adequate noise control measures must be provided to maintain noise level at various workplaces within the standard prescribed by the competent authorities. If need be, ear plugs and ear muffs should be provided to the workers in the port area.	Acoustic DG sets were used for the project work and the Noise level was maintained within the standard as per KSPCB
10	The quality of treated effluents, solid wastes and emissions must conform to the standards laid down by the competent authority including Central/State Pollution Control Boards.	Environmental Monitoring was conducted regularly through Third party and the reports were submitted to KSPCB& MOEF&CC
11	An Environmental Cell should be immediately made operational with adequate laboratory facilities, equipments and a mobile van for collecting air samples. The record and the data should be submitted with proper analysis and corrective measures required, if any, for maintaining the levels within the prescribed limits to the Regional Office of the ministry of Environment & Forests at Bangalore, which shall be monitoring these conditions stipulated for according the Environment approval. The Environmental Cell should coordinate and monitor environmental mitigative measures executed in the New Mangalore Port area.	An Environmental cell is functioning effectively to mitigate the Environmental pollution. Port is submitting the air and water quality reports to MOEF&CC and KSPCB half yearly & annually regularly. Port is under the process of implementation of CAAQMS Annexure-IV
12	Necessary leakage detection devices with early warning system must be provided at strategic locations.	Complied
13	Standby DG sets must be provided to ensure uninterrupted power supply to the pump house and the fire fighting system.	Accousted DG sets were used for the project work to supply power
14	Third party inspection should be ensured during construction and operation phases with adequate insurance cover. The project authorities should confirm on regular intervals of six months to the Ministry about the implementation of the suggested safeguard measures and the data/report should be opened for inspection by the Team which would be constituted by the Ministry, if found necessary.	KSPCB and Director, MOEF&CC, Bangalore inspected the Port and verified the compliance reports maintained by the Ports From 26-11-2021 to 30-11-2020 a performance audit on conservation of Marine Ecosystems was conducted by Mr. Bala Ravi Senior audit

		officer, Accountant General AMG-I, Bangalore & Verifies MOEF&CC compliance report
15	Full support should be extended to the Regional Office of the Ministry of Environment & Forests at Bangalore during inspection of the project monitoring purposes by the project proponents by furnishing full details and action plans including action taken report on mitigative measures.	Complied
16	Adequate funding provisions, year-wise and item-wise, must be made for implementation of the above mentioned safeguard measures.	Complied
17	No other chemical product save those mentioned in the Annex III appended to Govt. of India Notification in the Ministry of Environment & Forests, S.O: No.494 (E) dated July 9, 1997 will be allowed to handle/store in any port area.	Complied
18	The project authorities would ensure that safety regulations and guidelines issued by Oil Safety Directorate in the Govt. of India, Ministry of Petroleum & Natural Gas are implemented.	Complying with all the stipulations
19	The approval of the Chief Controller of Explosives (CCO & E) shall be obtained for operational purpose before undertaking any storage/handling activity.	Complying with all the stipulations


Dy. Manager Environment

FIRE FIGHTING SYSTEM DETAILS AT OIL BERTHS AT NMPT					
Description	OISD Requirement	Berth 10	Berth 11	Berth 12	Berth 13
Fire water design requirement	600 m3/ hrs for water/ foam monitors (2 tower monitors X 5000 lpm)	Tower monitors (2 nos. x 5000 LPM) provided. 900 m3/hr pump is provided which is adequate and meets the OISD 156 requirement	Tower monitors (2 nos. X 6000 LPM) provided. 900 m3/hr pump is provided which is adequate and meets the OISD 156 requirement	Tower monitors (2 nos. X 6000 LPM) provided. 900 m3/hr pump is provided which is adequate and meets the OISD 156 requirement	Tower monitors (4 nos. X 6000 LPM) provided. 820 m3/hr pump is provided which is adequate and meets the OISD 156 requirement
	600 m3/ hrs for hydrant & water curtains (2 Jumbo nozzles X 5000 lpm)	8 x 1.5" (690 LPM each) and 9 x 1" (362 LPM each) 8778 LPM in all 900 m3/hr pump is provided which is adequate but the nozzle output is lesser by 1222 lpm as per the OISD 156 requirement	18 x 1" (362 LPM each) 6516 LPM in all.	16 x 1" (362 LPM each) 5792 LPM in all	64 X 1" (362 LPM) 820 m3/hr pump is provided which is adequate as per the OISD 156 requirement
Jockey pump capacity		25 m3/ hr	54 cu.m/hr	54 cu.m/hr	54 cu.m/hr
Foam System	2 X 5000 lpm Tower foam monitor + 2 X 2400 lpm base foam monitor Foam calculation = 14800 X .03X 60 = 26640 litre	Tower monitors (2 nos. x 5000 LPM) Ground monitor (1 No.x5000 LPM) As per calculation requirement is (15000 X .03 X 60) =27000 litre Available = 15 cu.m tank which is lesser by 12 cu.m as per OISD 156	Tower monitors (2 nos. X 6000 LPM) Ground monitor (1 No.x 3000 LPM). As per calculation requirement is (15000 X .06 X 60) =54000 litre(since 6% foam is available) Available = 30 cu.m tank which meets OISD 156 requirement	Tower monitors (2 nos. X 6000 LPM) Ground monitor (1 No.x 3000 LPM). As per calculation requirement is (15000 X .06 X 60) =54000 litre(since 6% foam is available) Available = 2 X 30 cu.m tank which meets OISD 156 requirement	Tower monitors (4 nos. X 6000 LPM) Ground monitor (2 No.x 3000 LPM) As per calculation requirement is (18000 X .03 X 60) =32400 litre. Available = 35 cu.m tank which meets OISD 156 requirement
Foam Pump Capacity		54 Cu.m /hr @ 18 kg/cm2 X 2 nos pumps available Adequate	27 Cu.m /hr @ 17 kg/cm2 X 2 nos pumps available Adequate	54 Cu.m /hr @ 17 kg/cm2 X 2 nos pumps available Adequate	28 Cu.m /hr @ 17 kg/cm2 X 2 nos pumps available Adequate
Extinguishers	6x10 kg. DCP extinguisher 4x75 wheeled DCP	1 X 5 kg, 2 X 10 kg, 2 X 20 Kg 4 X 25 kg, 2 X 50 Kg	2 X 10 Kg, 2 X 20 Kg 4 X 25 Kg, 2 X 50 kg	4 X 10 kg, 2 X 20 4 X 25 Kg, 5 X 75 kg	12 X 10 Kg, 4 X 5 Kg 4 X 75 Kg
Jockey pumps / Booster Pumps		2	2	2	2
International shore connection	minimum 1 per berth	1 No.	1 No.	1 No.	1 No
Hydrant	Single headed Double headed	2 16	3 16	3 12	9 16
Fixed water spray system	To be provided for all jetties handling more than 20,000 DWT		2 No.	2 No.	2 no.
Gas Detectors	as per requirement	4	4	4	4
Flame Detectors	as per requirement	10	10	10	10

Green Belt at NMPT

Port in its Endeavour to develop Green Belt has already provided a green cover of more than 33% with 95% survival of plants. Even though the Port is categorized as a service oriented organization, it has complied with the stipulations of an industry. The initiative for the greenery in the estate, include the operational and non operational area within the Port limits to control pollution mitigate emission of dust , air and water contamination. The Port, in its Endeavour has planted more than 2lakhs saplings of both endemic and non-endemic species .

The Ports are generally associated with cargo. It is unbelievable that New Mangalore Port Trust apart from its thriving business is also a natural heaven for the bird population. The species existing in the Port varies from Peacocks to Plovers and Pythons to Flower Peckers, Jackals, Mongoose, Jungle Fowls etc. At present, the bird population has increased to nearly 100 varities. The relentless efforts taken by the Management has ushered the growth of butterflies also. Butterflies are the indicators of best ecological system. New Mangalore Port Trust houses immovable butterflies. At present, New Mangalore Port Trust is the only Port in the country that maintain the best ecological balance in the midst of its business activity without compromising its Environment.

The presence of beautiful garden and parks indicate the maturity of civilized society. They are not only provide soothness to the eyes , but act as bio-diversity engines. New Mangalore Port Trust has more than 10 beautiful parks, three inside the colony area and rest inside the wharf. Each park is distinct in supporting the environment with endemic species and exotic saplings. These parks are under 24/7 supervision and they are well maintained. All the parks exhibit different hue during the spring time to invoke the colours of rainbow.

Green Belt at NMPT



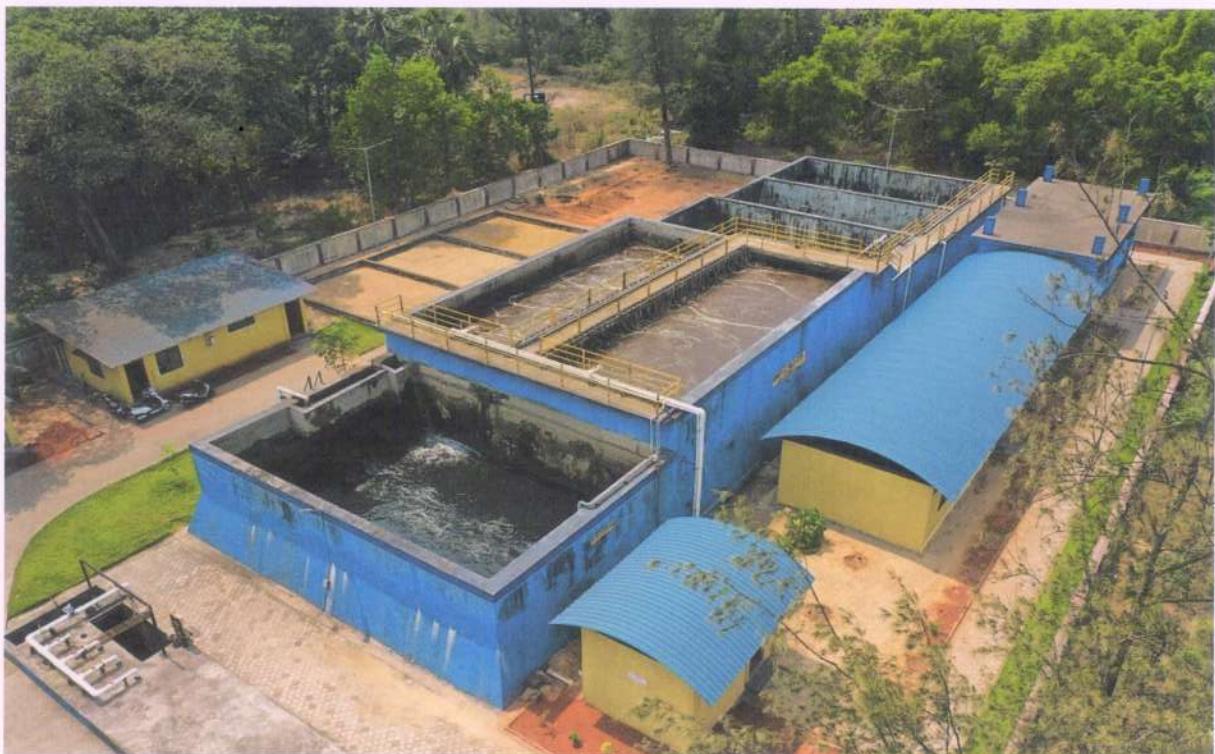
1.2 MLD Sewage Treatment Plant at NMPT

New Mangalore Port Trust has commissioned 1.2 MLD Sewage Treatment Plant with SBR Technology, it consumes 329 KW power/day for treating 0.75 MLD water/day.

The domestic sewage emanated from the NMPT township containing floating matter and solids both inorganic and organic matter will be treated in the STP and reused for irrigating the Green Belt after ensuring its suitability Periodic inspection and maintenance is carried out by Engineers and monitored by the Environment Cell of the Port.

NMPT has achieved the Zero Discharge as NMPT is reusing the entire quantity of treated water for **green belts** created inside the Port in order to reduce the burden on water resources. Besides, it is also used for sprinkling inside the wharf to suppress the dust emanating out of cargo handling.

There is a scientific monitoring system in place in the Port. The monitoring process is carried out through established NABL and MOEF&CC certified laboratory regularly and taken both preventive and corrective actions which results in very low BOD and Zero Turbidity. The Port has been fully complying with the statutory requirements.



Annexure-IV

Environmental Monitoring System: There is a scientific monitoring system in place in the Port. The monitoring process is carried out through NABL aggregated established laboratories having resources and spare capacity. NMPT monitors air and water qualities through third party authorised from KSPCB, MOEF&CC, regularly and taken both preventive and corrective actions. This Environmental Management System improves the environmental conditions in general and public health of its employees in particular. The treated water out of Sewage Treatment Plant is used for the green belts created inside the Port in order to reduce the burden on water resources. Besides, it is also used for sprinkling inside the wharf to suppress the dust emanating out of cargo handling. The Port is an ISO 14001:2015 certified since 2011 and it demands various Compliances to predict the Environment. The Port has successfully complied the standards

CONTINUOUS AMBIENT AIR QUALITY MONITORING SYSTEM

- a. New Mangalore Port has approached many companies for the supply of CAAQMS since from the beginning of 2020, but because of COVID-19 pandemic situation companies have not sent any details with respect to CAAQMS
- b. With the repetitive approach with many companies for CAAQMS, recently Port has received conventional method and Optical spectroscopy principled quotations. Since these methods were different and Cost of Implementation of CAAQMS is also different.
- c. To understand the methodology and to check the efficiency of two different methods of CAAQMS operations, many field visits were conducted to the industries which have installed CAAQMS and analysed the operation.
- d. To get more clarity in this regard, a request email for specification was sent to the Scientist -E /Additional Director, MOEF&CC, Kendriya sadan, Bangalore
- e. Finally Port has decided the spectroscopy methodology and shortly is under the process of implementation of CAAQMS

Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



Laboratory Services Division

(Chemical & Biological Testing)

Recognized by MoEF, BIS

FSSAI Notified Laboratory

ISO 9001, 14001 & OHSAS 18001 Certified.

TEST REPORT

Page 1 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	CONTAINER YARD – PROJECT SITE										
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.05.2021										
Report No	HECS/A/001-009/070521										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³				mg/m ³	μg/m ³				ng/m ³		
01.04.2021	15.9	21.8	48.7	24.3	0.18	BDL	12.4	BDL	BDL	BDL	BDL	BDL
05.04.2021	15.8	20.9	47.5	23.8	0.19	BDL	11.6	BDL	BDL	BDL	BDL	BDL
08.04.2021	16.9	22.1	48.6	23.4	0.25	BDL	11.8	BDL	BDL	BDL	BDL	BDL
12.04.2021	16.4	23.8	49.1	22.9	0.22	BDL	12.3	BDL	BDL	BDL	BDL	BDL
15.04.2021	16.3	24.4	48.2	24.5	0.26	BDL	12.2	BDL	BDL	BDL	BDL	BDL
19.04.2021	17.2	23.7	47.3	25.1	0.31	BDL	12.9	BDL	BDL	BDL	BDL	BDL
22.04.2021	16.7	22.8	48.2	24.8	0.34	BDL	13.2	BDL	BDL	BDL	BDL	BDL
26.04.2021	15.5	23.1	47.6	23.9	0.36	BDL	13.4	BDL	BDL	BDL	BDL	BDL
29.04.2021	16.1	23.4	48.4	23.7	0.29	BDL	12.5	BDL	BDL	BDL	BDL	BDL
Min.	15.5	20.9	47.3	22.9	0.18	BDL	11.6	BDL	BDL	BDL	BDL	BDL
Max.	17.2	24.4	49.1	25.1	0.36	BDL	13.4	BDL	BDL	BDL	BDL	BDL
Avg.	16.3	22.9	48.2	24.0	0.30	BDL	12.5	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80	80	100	60	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)

PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)

NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)

O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)

CO : IS 5182 (Pt 10): 1999 (RA 2013)

Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)

C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)

B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit: PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager - Authorized Signatory



(Dr K GANESAN)

- The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization
- Samples are not drawn by HECS unless or otherwise mentioned
- Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report.
- Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report.
- The test results relate only to the test items.

Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

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TC-5786

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TEST REPORT

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Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 UP STREAM										
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.05.2021										
Report No	HECS/A/010-018/070521										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
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NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: * 24 hours average; ** 8 hours average; *** Annual average

Test Methods Followed:

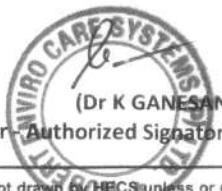
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- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 $\mu\text{g}/\text{m}^3$); NH₃-Ammonia (DL 5 $\mu\text{g}/\text{m}^3$); Pb-Lead (DL 0.05 $\mu\text{g}/\text{m}^3$); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 $\mu\text{g}/\text{m}^3$); B(α)P- Benzo - α -pyrene(DL0.1 ng/m³); ng/m³: nanogram per cubic meter; $\mu\text{g}/\text{m}^3$ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager- Authorized Signatory



Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 DOWN STREAM										
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.05.2021										
Report No	HECS/A/019-027/070521										
Instruments Used	Envirotech APM 460 brushless RDS. & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³				mg/m ³	μg/m ³				ng/m ³		
01.04.2021	13.9	16.4	43.7	23.8	0.21	BDL	12.8	BDL	BDL	BDL	BDL	BDL
05.04.2021	13.8	17.4	44.6	25.2	0.23	BDL	12.9	BDL	BDL	BDL	BDL	BDL
08.04.2021	14.5	16.9	42.9	24.9	0.19	BDL	13.2	BDL	BDL	BDL	BDL	BDL
12.04.2021	14.2	17.7	44.3	23.7	0.24	BDL	14.0	BDL	BDL	BDL	BDL	BDL
15.04.2021	13.7	19.2	45.1	25.4	0.22	BDL	13.5	BDL	BDL	BDL	BDL	BDL
19.04.2021	13.5	18.4	45.8	26.2	0.31	BDL	13.4	BDL	BDL	BDL	BDL	BDL
22.04.2021	14.8	19.1	43.8	24.6	0.28	BDL	14.1	BDL	BDL	BDL	BDL	BDL
26.04.2021	12.9	18.7	44.6	25.1	0.25	BDL	13.7	BDL	BDL	BDL	BDL	BDL
29.04.2021	13.4	17.3	45.4	26.2	0.32	BDL	13.1	BDL	BDL	BDL	BDL	BDL
Min.	12.9	16.4	42.9	23.7	0.19	BDL	12.8	BDL	BDL	BDL	BDL	BDL
Max.	14.8	19.2	45.8	26.2	0.32	BDL	14.1	BDL	BDL	BDL	BDL	BDL
Avg.	13.9	17.9	44.5	25.0	0.25	BDL	13.4	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)

PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)

NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)

O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)

CO : IS 5182 (Pt 10): 1999 (RA 2013)

Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)

C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)

B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****


(Dr K GANESAN)
Laboratory and Quality Manager Authorized Signatory

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H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

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TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	21-22.04.2021
Report Date	26.04.2021
Report No	HECS/NM/001-005/260421

RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	60.9	59.8	57.6	60.9	57.6
07.00	61.5	60.2	58.4	61.2	58.8
08.00	62.5	61.2	59.3	63.8	59.1
09.00	63.3	62.3	60.4	64.5	60.3
10.00	64.8	63.6	61.5	65.3	61.5
11.00	65.7	64.5	62.6	66.6	62.5
12.00	66.9	65.8	63.8	67.2	63.6
13.00	67.8	66.9	64.9	68.9	65.8
14.00	68.2	67.8	65.5	69.3	66.9
15.00	69.2	68.9	67.8	70.9	67.2
16.00	70.5	69.5	69.2	71.5	68.8
17.00	71.6	70.2	70.2	72.9	70.9
18.00	72.9	71.8	70.9	73.9	72.1
19.00	71.4	70.3	69.8	72.4	71.8
20.00	70.8	68.4	69.1	70.6	70.3
21.00	68.5	67.2	68.3	69.5	68.9
22.00	67.3	66.9	67.2	68.2	66.1
23.00	66.9	65.4	66.2	67.8	65.5
00.00	65.5	64.3	64.1	65.5	64.7
01.00	64.6	63.8	62.9	63.1	63.8
02.00	63.8	62.5	62.1	62.3	62.9
03.00	62.1	61.9	60.8	60.6	60.2
04.00	61.2	59.4	58.3	60.2	58.2
05.00	59.8	58.2	57.2	59.4	57.1
MIN	59.8	58.2	57.2	59.4	57.1
MAX	72.9	71.8	70.9	73.9	72.1
Day dB (A)	67.3	66.2	65.1	68.1	65.4
Night dB (A)	63.4	62.2	61.7	62.7	61.8

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00 am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.



Authorized Signatory
(Dr K Ganesan – Laboratory and Quality Manager)

Hubert Enviro Care Systems (P) Ltd.

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Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	21.04.2021
Analysis Commenced On	21.04.2021
Analysis Completed On	07.05.2021
Report Date	07.05.2021
Report No	HECS/M/002/210421

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.74	7.68	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	30	29	Not Provided
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	40000	40000	Not Provided
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	25500	26000	Not Provided
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	4.3	3.8	Not Provided
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	4.2	3.4	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Provided
11.	Floating materials, Oil, grease and scum (including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	5.5	3.2	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.42	0.32	Not Provided
13.	Nitrates as N	ASTM: (Part 31)1978	mg/L	0.52	0.63	Not Provided
14.	Sulphates as SO ₄	IS 3025(Part - 24):1986	mg/L	2465	2386	Not Provided
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	16200	16200	Not Provided
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL(DL 0.001)	Not Provided
18.	Hexavalent Chromium as Cr ⁺⁶	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
19.	Escherichia coli (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	231	289	500/100 mL (MPN)
20.	Intestinal Enterococci (Streptococci)	IS1622:1981 (RA 2009)	MPN/100mL	98	112	500/100 mL (MPN)

Note:- BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;

MPN - Most Probable Number

(Dr K GANESAN)
Laboratory and Quality Manager - Authorized Signatory

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization 2. Samples are not drawn by HECS unless or otherwise mentioned 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items.

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Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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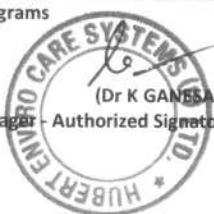
Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	21.04.2021
Analysis Commenced on	24.04.2021
Analysis Completed on	07.05.2021
Report Date	07.05.2021
Report No	HECS/S/002/240421

S.No.	Parameters	Units	Results	Test Method
1	Total Phosphorous	mg/kg	0.21	IS 10158 : 1982
2	Oil & Grease	mg/kg	3.2	USEPA Method
3	Nitrates	mg/kg	0.58	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.92	USEPA Method
5	Lead as Pb	mg/kg	0.375	USEPA Method
6	Cadmium as Cd	mg/kg	0.32	USEPA Method
7	Mercury as Hg	mg/kg	BDL (DL 0.1)	USEPA Method
8	PAH	mg/kg	0.27	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.02	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.056	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.03	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.04	USEPA Method 525.2: 1995
viii.	α -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ix.	β -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.074	USEPA Method 525.2: 1995
xi.	α - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xii.	β - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xiii.	γ -HCH	mg/kg	0.18	USEPA Method 525.2: 1995
xiv.	δ -HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.02	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995

Note:- BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

Laboratory and Quality Manager - Authorized Signatory

(Dr K GANESAN)



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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	21.04.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.05.2021
Report No	HECS/BC/001/210421

RESULTS

Distribution of Phytoplankton (Nos./m³) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
DIATOMS	
<i>Coscinodiscus granii</i>	3564
<i>Coscinodiscus centralis</i>	2012
<i>Coscinodisdis marginatus</i>	1284
<i>Thalassiosira nitzschiooides</i>	2354
<i>Thalassiosira sp.</i>	987
<i>Thalassionema frauenfeldii</i>	95
<i>Thalassionema nitzschiooides</i>	224
<i>Thalassiothoursix sp.</i>	758
<i>Biddulphia mobilensis</i>	902
<i>Bacillaria spp.</i>	581
<i>Hemiaulus spp.</i>	6
<i>Chaetoceros affinis</i>	556
<i>Chaetoceros breve</i>	448
<i>Chaetoceros curvisetus</i>	281
<i>Ditylum spp.</i>	395
<i>Planktoniella sol</i>	302
<i>Leptocylindrus spp.</i>	89
<i>Melosira spp.</i>	4
<i>Rhizosolenia styliformis</i>	154
<i>Rhizosolenia alata</i>	25
<i>Rhizosolenia robusta</i>	20
<i>Skeletonema spp.</i>	7
<i>Nitzchia spp.</i>	356
<i>Fragillaria oceanica</i>	978
<i>Navicula spp.</i>	3021
<i>Pleurosigma spp.</i>	1125
<i>Stephanaphysis spp.</i>	128
<i>Schoursoederella spp.</i>	4
<i>Odontella mobilensis</i>	145
<i>Odontella spp.</i>	238

Authorized Signatory
(Dr K Ganesan - Laboratory and Quality Manager)



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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	21.04.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.05.2021
Report No	HECS/BC/001/210421

RESULTS

DINOFLAGELLATES	
<i>Ceratium tripos</i>	921
<i>Ceratium furca</i>	508
<i>Ceratium fusus</i>	156
<i>Ceratium lunula</i>	197
<i>Peridinium depressum</i>	268
<i>Dinophysis spp.</i>	4
<i>Noctiluca spp.</i>	158
<i>Protoperdinium granii</i>	1465
<i>Protoperdinium sp.</i>	568
NANOPLANKTERS	
<i>Chlorella spp.</i>	1
Total biomass (cc/m ³)	0.457

Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
	40	25289	3.56	0.87	4.18

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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(Dr K Ganesan - Laboratory and Quality Manager)



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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	21.04.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.05.2021
Report No	HECS/BC/001/210421

RESULTS

Distribution of Zooplankton (Nos/m³) in the Berth No. 14

	Berth No. 14
Dinoflagellates	
Noctiluca spp	125
Ciliates	
Tintinopsis	2365
Protozoa	
Radiolarians	1698
Bryozoa	
Bryozoan larvae	1715
Cnidaria	
Medusae	420
Annelid	
Polychaete larvae	305
Urochordata (Tunicates)	
Oikopleura	1254
Brachiopoda	
Brachiopod larvae	170
Cladocera	2231
Crustacea	
Alima Larvae	198
Crustacean eggs	3001
Decapod	25624
Cypris larvae	6
Crab larvae	8
Lucifer	2564
Protozoa	321
Copepod	17521
Copepod Nauplius	19128
Nauplius	4
Barnacle Nauplius	4
PISCES	
Fish Egg	79
HEXAPODA	
Insect	3
Total biomass (cc/m ³)	1.45

Authorized Signatory

(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

Page 4 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,				
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.				
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14				
Sampling date & Receipt	21.04.2021				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	10.05.2021				
Report No	HECS/BC/001/210421				

RESULTS

Zooplankton community structure variability in the berth No. 14

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	78744	2.09	0.70	2.94

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signatory
(Dr K Ganesan - Laboratory and Quality Manager)



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TEST REPORT

Page 5 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	21.04.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.05.2021
Report No	HECS/BC/001/210421

RESULTS

Distribution of benthos (Nos/m²) in the identified Berth No. 14

	Berth No. 14
CRUSTACEA	
Amphipod	2
Isopods	4
Cumacea	100
Crustacean eggs	1456
Crustacean	4
Mysids	5
Egg mass	218
Brachyuran crabs	1387
MOLLUSCA	
Bivalves	285
Gastropods	274
SCAPHOPODA	
Dentalium	180
FORAMINIFERA	
Foraminifera	230
CNIDARIA	
Medusa	1
ANNELIDA	
Nereidae	218
Polychaetes	257
Spionidae	1587
HYDROZOA	
Hydrozoans	295
Total biomass (g/m²)	143.5

(Dr K Ganesan - Laboratory and Quality Manager)



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ert Enviro Care Systems (P) Ltd.

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TEST REPORT

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,				
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.				
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14				
Sampling date & Receipt	21.04.2021				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	10.05.2021				
Report No	HECS/BC/001/210421				

RESULTS

Benthos community structure variability in the Berth No. 14

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	17	6503	2.38	0.88	3.15

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signatory
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TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	DISCHARGE OF TREATED SURFACE RUNOFF
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	21.05.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	21.05.2021
Analysis Commenced On	21.05.2021
Completed On	28.05.2021
Report No	HECSM/WW/001/210521
Report Date	29.05.2021

RESULTS – MAY 2021

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	7.02	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 rd Edn., 2017	mg/L	6.4	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O ₂	IS:3025 (Pt 44)1993(RA 2009)	mg/L	2.9	≤ 10
5.	Chemical Oxygen Demand as O ₂	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	14.5	≤ 50
6.	Phenolic content as C ₆ H ₅ OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
-----------	---

End of Report

Authorized Signatory
(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

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TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	DISCHARGE OF TREATED SURFACE RUNOFF
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	21.06.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	21.06.2021
Analysis Commenced On	21.06.2021
Completed On	28.06.2021
Report No	HECSM/WW/002/210621
Report Date	29.06.2021

RESULTS – JUNE 2021

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	6.87	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 rd Edn., 2017	mg/L	7.2	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O ₂	IS:3025 (Pt 44)1993(RA 2009)	mg/L	5.7	≤ 10
5.	Chemical Oxygen Demand as O ₂	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	21.8	≤ 50
6.	Phenolic content as C ₆ H ₆ OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
-----------	---

End of Report

Authorized Signatory
(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	DISCHARGE OF TREATED SURFACE RUNOFF
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	21.07.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	21.07.2021
Analysis Commenced On	21.07.2021
Completed On	28.07.2021
Report No	HECSM/WW/005/210721
Report Date	29.07.2021

RESULTS – JULY 2021

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	6.85	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 rd Edn., 2017	mg/L	5.9	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O ₂	IS:3025 (Pt 44)1993(RA 2009)	mg/L	3.1	≤ 10
5.	Chemical Oxygen Demand as O ₂	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	14.2	≤ 50
6.	Phenolic content as C ₆ H ₅ OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
-----------	---

End of Report

Authorized Signatory
(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	DISCHARGE OF TREATED SURFACE RUNOFF
Sample Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	21.08.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	21.08.2021
Analysis Commenced On	21.08.2021
Completed On	28.08.2021
Report No	HECSM/WW/003/210821
Report Date	29.08.2021

RESULTS – AUGUST 2021

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	7.23	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 rd Edn., 2017	mg/L	6.8	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O ₂	IS:3025 (Pt 44)1993(RA 2009)	mg/L	6.9	≤ 10
5.	Chemical Oxygen Demand as O ₂	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	21.3	≤ 50
6.	Phenolic content as C ₆ H ₆ OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
-----------	---

End of Report

Authorized Signatory
(Dr K Ganesan - Laboratory and Quality Manager)

Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C 45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sampling Location	BERTH NO. 14 UP STREAM
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Report Date	07.06.2021
Report No	HECS/A/002/070621
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	µg/m ³				mg/m ³	µg/m ³				ng/m ³		
10.05.2021	11.6	16.4	45.6	23.6	0.12	BDL	10.6	BDL	BDL	BDL	BDL	BDL
14.05.2021	10.1	15.2	40.3	20.4	0.11	BDL	10.1	BDL	BDL	BDL	BDL	BDL
17.05.2021	10.9	15.9	42.3	21.3	0.13	BDL	10.7	BDL	BDL	BDL	BDL	BDL
21.05.2021	13.4	18.6	46.3	25.6	0.19	BDL	12.6	BDL	BDL	BDL	BDL	BDL
24.05.2021	14.3	19.7	45.9	26.1	0.17	BDL	13.1	BDL	BDL	BDL	BDL	BDL
28.05.2021	13.9	19.1	46.9	24.9	0.16	BDL	12.8	BDL	BDL	BDL	BDL	BDL
Min.	10.1	15.2	40.3	20.4	0.11	BDL	10.1	BDL	BDL	BDL	BDL	BDL
Max.	14.3	19.7	46.9	26.1	0.19	BDL	13.1	BDL	BDL	BDL	BDL	BDL
Avg.	12.4	17.5	44.5	23.7	0.15	BDL	11.7	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C₆H₆ : GC FID / GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager



Hubert Enviro Care Systems (P) Ltd.

18, 92nd Street, Ashok Nagar, Chennai - 600 083.
42985555 Fax : 42985500 E-mail : labsales@hecs.in

45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sampling Location	BERTH NO. 14 DOWN STREAM
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Report Date	07.06.2021
Report No	HECS/A/003/070621
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³				mg/m ³		μg/m ³				ng/m ³	
10.05.2021	13.7	18.6	47.8	26.3	0.14	BDL	10.9	BDL	BDL	BDL	BDL	BDL
14.05.2021	11.2	16.4	42.1	21.5	0.12	BDL	10.2	BDL	BDL	BDL	BDL	BDL
17.05.2021	11.6	17.3	43.8	23.1	0.16	BDL	11.3	BDL	BDL	BDL	BDL	BDL
21.05.2021	14.9	20.2	45.9	26.7	0.24	BDL	13.8	BDL	BDL	BDL	BDL	BDL
24.05.2021	15.6	19.7	46.7	27.2	0.26	BDL	13.1	BDL	BDL	BDL	BDL	BDL
28.05.2021	15.2	19.1	48.2	27.3	0.23	BDL	13.5	BDL	BDL	BDL	BDL	BDL
Min.	11.2	16.4	42.1	21.5	0.12	BDL	10.2	BDL	BDL	BDL	BDL	BDL
Max.	15.6	20.2	48.2	27.3	0.26	BDL	13.8	BDL	BDL	BDL	BDL	BDL
Avg.	13.7	18.6	45.8	25.4	0.19	BDL	12.1	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: * 24 hours average; ** 8 hours average; *** Annual average

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C₆H₆ : GC FID / GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager



Hubert Enviro Care Systems (P) Ltd.

18, 92nd Street, Ashok Nagar, Chennai - 600 083.
42985555 Fax : 42985500 E-mail : labsales@hecs.in



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TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	21-22.05.2021
Report Date	24.05.2021
Report No	HECS/NM/001-005/220521

RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site- North Side	Project Site- South Side	Project Site- East Side	Project Site- West Side
06.00	60.3	57.8	59.1	61.3	55.8
07.00	61.5	58.9	60.6	62.4	56.4
08.00	62.3	59.6	61.3	63.4	57.9
09.00	63.4	60.3	62.3	64.5	58.6
10.00	64.5	61.5	63.5	65.1	60.8
11.00	66.5	62.6	64.5	66.7	61.3
12.00	67.1	63.7	65.8	68.9	62.4
13.00	68.3	64.9	66.9	69.4	63.5
14.00	69.5	65.6	70.3	70.3	64.5
15.00	70.6	66.8	71.3	71.2	66.9
16.00	71.3	67.8	72.6	72.1	68.4
17.00	72.3	69.8	73.6	72.3	69.1
18.00	73.4	70.2	74.2	73.9	70.2
19.00	72.1	69.5	72.1	71.3	69.7
20.00	71.6	68.1	71.3	70.9	68.1
21.00	70.6	67.2	70.6	69.5	67.8
22.00	69.5	66.3	69.8	68.4	66.9
23.00	68.4	65.5	68.4	67.3	65.2
00.00	67.2	64.2	67.5	66.5	64.3
01.00	66.9	63.8	66.9	64.5	63.2
02.00	65.1	62.3	65.3	63.2	62.6
03.00	64.3	60.2	63.2	62.3	61.7
04.00	62.1	58.4	62.1	60.2	58.4
05.00	61.8	57.1	60.8	59.8	56.3
MIN	60.3	57.1	59.1	59.8	55.8
MAX	73.4	70.2	74.2	73.9	70.2
Day dB (A)	67.9	64.7	67.6	68.3	64.0
Night dB (A)	65.1	61.6	64.9	63.4	61.7

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00 am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.


 Authorized Signatory
 (Dr K Ganesan – Laboratory Head and Quality Manager)

Hubert Enviro Care Systems (P) Ltd.

Office # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Mobile: 42985555 Fax : 42985500 E-mail : labsales@hecs.in
45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

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Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	17.05.2021
Analysis Commenced On	17.05.2021
Analysis Completed On	31.05.2021
Report Date	01.06.2021
Report No	HECS/M/001/170521

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.92	7.84	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	28	27	Not Provided
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	39000	39000	Not Provided
6.	TDS	IS 3025 (Pt 15): 1984 (RA 2017)	mg/L	24500	24480	Not Provided
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	3	2.5	Not Provided
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	4.3	4.1	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Provided
11.	Floating materials, Oil, grease and scum (including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	4.2	2.3	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.35	0.30	Not Provided
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.47	0.50	Not Provided
14.	Sulphates as SO ₄	IS 3025(Part - 24):1986	mg/L	2460	2395	Not Provided
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	16500	16500	Not Provided
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL(DL 0.001)	Not Provided
18.	Hexavalent Chromium as Cr ⁺⁶	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided

Note:- BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre

Laboratory and Quality Manager / Authorized Signatory



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Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

345, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	17.05.2021
Analysis Commenced on	20.05.2021
Analysis Completed on	31.05.2021
Report Date	01.06.2021
Report No	HECS/S/002/200521

S.No.	Parameters	Units	Results	Test Method
1	Total Phosphorous	mg/kg	0.21	IS 10158 : 1982
2	Oil & Grease	mg/kg	3.2	USEPA Method
3	Nitrates	mg/kg	0.47	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.93	USEPA Method
5	Lead as Pb	mg/kg	0.408	USEPA Method
6	Cadmium as Cd	mg/kg	0.45	USEPA Method
7	Mercury as Hg	mg/kg	BDL (DL 0.1)	USEPA Method
8	PAH	mg/kg	0.32	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ii.	o,p-DDT	mg/kg	0.05	USEPA Method 525.2: 1995
iii.	p,p'-DDT	mg/kg	0.082	USEPA Method 525.2: 1995
iv.	o,p-DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
v.	p,p'-DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
vi.	o,p-DDE	mg/kg	0.05	USEPA Method 525.2: 1995
vii.	p,p'-DDE	mg/kg	0.04	USEPA Method 525.2: 1995
viii.	Endosulphan alpha	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ix.	Endosulphan Beta	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.092	USEPA Method 525.2: 1995
xi.	Alpha HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xii.	Beta HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xiii.	Gamma HCH	mg/kg	0.21	USEPA Method 525.2: 1995
xiv.	Delta HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.05	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995

Note: - BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

For K GANESAN
Laboratory and Quality Manager / Authorized Signatory



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No. # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Phone: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
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TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	Soil Quality Monitoring
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd
Sampling Location	Berth No. 14, Container Yard – Project Site
Sampling / Receipt date	17.05.2021
Analysis Commenced on	20.05.2021
Analysis Completed on	31.05.2021
Report Date	01.06.2021
Report No	HECS/S/001/200521

RESULTS

S.No.	Parameters monitored	Units	Results	Test Method
I - Physical Properties				
1.	Sand %	%	58.33	Dinnes, 2004
2.	Silt %	%	10.32	Dinnes, 2004
3.	Clay %	%	31.35	Dinnes, 2004
II - Chemical Properties				
4.	pH at 25°C (10% solution)	-	7.64	IS : 2720(P-26,1987)
5.	Colour	-	Brown	Anon 1980
6.	Bulk Density	gm/cc	1.25	Anon 1980
7.	Moisture Content	%	6.54	IS 2720 : Part 9 : 1992
8.	Organic Carbon	%	0.74	Walkley and Black, 1934
9.	Exchangeable Calcium	Cmol(p+)/kg	320.8	Page et al., 1982
10.	Exchangeable Sodium	Cmol(p+)/kg	180.6	Jackson, 1973
11.	Exchangeable Magnesium	Cmol(p+)/kg	50.87	Jackson, 1973
12.	Cation Exchange capacity	Cmol(p+)/kg	4.65	Jackson, 1973
13.	Available Nitrogen	Kg/ha	480.74	Kjeldhal digestion- Distillation method
14.	Available phosphorous	Kg/ha	35.41	Jackson, 1973
15.	Available Potassium	Kg/ha	150.24	Page et al., 1982
16.	Available Zinc	mg/kg	5.87	Page et al., 1982
17.	Available Manganese	mg/kg	68.86	Mortvedt et al., 1991
18.	Available Copper	mg/kg	43.51	Mortvedt et al., 1991
19.	Available iron	mg/kg	3900.8	Mortvedt et al., 1991
20.	Lead	mg/kg	8.87	EPA 3050 B/EPA 7420
21.	Chromium	mg/kg	23.15	EPA 3050 B/EPA 7090

Note: gm/cc - Gram per cubic centimeter; mg/kg- Milligrams per kilogram; % - Percentage; DL - Detection Limit; BDL-Below detection limit; Cmol (p+)/kg - centimoles (charged) per kilogram; Kg/ha: Kilogram per hectare

End of Report

Laboratory and Quality Manager - Authorized Signatory



Hubert Enviro Care Systems (P) Ltd.

18, 92nd Street, Ashok Nagar, Chennai - 600 083.
42985555 Fax : 42985500 E-mail : labsales@hecs.in

45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

RESULTS

Distribution of Phytoplankton (Nos./m³) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
DIATOMS	
<i>Coscinodiscus granii</i>	3582
<i>Coscinodiscus centralis</i>	1845
<i>Coscinodisdis marginatus</i>	1054
<i>Thalassiosira nitzschiooides</i>	2642
<i>Thalassiosira sp.</i>	943
<i>Thalassionema frauenfeldii</i>	96
<i>Thalassionema nitzschiooides</i>	158
<i>Thalassiothoursix sp.</i>	738
<i>Biddulphia mobilensis</i>	867
<i>Bacillaria spp.</i>	583
<i>Hemicaulus spp.</i>	3
<i>Chaetoceros affinis</i>	482
<i>Chaetoceros breve</i>	410
<i>Chaetoceros curvisetus</i>	297
<i>Ditylum spp.</i>	422
<i>Planktoniella sol</i>	284
<i>Leptocylindrus spp.</i>	88
<i>Melosira spp.</i>	2
<i>Rhizosolenia styliformis</i>	123
<i>Rhizosolenia alata</i>	25
<i>Rhizosolenia robusta</i>	13
<i>Skeletonema spp.</i>	4
<i>Nitzchia spp.</i>	346
<i>Fragillaria oceanica</i>	946
<i>Navicula spp.</i>	2854
<i>Pleurosigma spp.</i>	1045
<i>Stephanaphysis spp.</i>	117
<i>Schoursoederella spp.</i>	2
<i>Odontella mobiliensis</i>	138
<i>Odontella spp.</i>	

(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

J.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

RESULTS

DINOFLAGELLATES	
<i>Ceratium tripos</i>	974
<i>Ceratium furca</i>	482
<i>Ceratium fusus</i>	133
<i>Ceratium lunula</i>	185
<i>Peridinium depressum</i>	251
<i>Dinophysis spp.</i>	2
<i>Noctiluca spp.</i>	143
<i>Protoperidinium granii</i>	1421
<i>Protoperidinium sp.</i>	528
NANOPLANKTERS	
<i>Chlorella spp.</i>	0
Total biomass (cc/m ³)	0.421

Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
	39	24442	3.14	0.77	3.98

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity Shannon-Wiener	bits/individual
High	>4
Good	3-4
Moderate	3-2
Poor	2-1
Bad	1-0

Authorized Signatory
(Dr K Ganesan - Laboratory and Quality Manager)



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Phone : 42985555 Fax : 42985500 E-mail : labsales@hecs.in

Plot No. 45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

RESULTS**Distribution of Zooplankton (Nos/m³) in the Berth No. 14**

	Berth No. 14
Dinoflagellates	
Noctiluca spp	95
Ciliates	
Tintinopsis	2150
Protozoa	
Radiolarians	1542
Bryozoa	
Bryozoan larvae	1730
Cnidaria	
Medusae	365
Annelid	
Polychaete larvae	304
Urochordata (Tunicates)	
Oikopleura	1083
Brachiopoda	
Brachiopod larvae	188
Cladocera	2260
Crustacea	
Alima Larvae	192
Crustacean eggs	2853
Decapod	25852
Cypris larvae	4
Crab larvae	5
Lucifer	2510
Protozoa	325
Copepod	17240
Copepod Nauplius	18725
Nauplius	2
Barnacle Nauplius	1
PISCES	
Fish Egg	65
HEXAPODA	
Insect	1
Total biomass (cc/m ³)	1.23

(Dr K Ganesan - Laboratory and Quality Manager)

Authorized Signatory



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18, 92nd Street, Ashok Nagar, Chennai - 600 083.
42985555 Fax : 42985500 E-mail : labsales@hecs.in

45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

RESULTS**Zooplankton community structure variability in the berth No. 14**

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	77492	1.35	0.49	2.31

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signature
(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

.. # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
42985555 Fax : 42985500 E-mail : labsales@hecs.in

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

RESULTS**Distribution of benthos (Nos/m²) in the identified Berth No. 14**

	Berth No. 14
CRUSTACEA	
Amphipod	0
Isopods	1
Cumacea	74
Crustacean eggs	1258
Crustacean	2
Mysids	3
Egg mass	210
Brachyuran crabs	1352
MOLLUSCA	
Bivalves	253
Gastropods	284
SCAPHOPODA	
Dentalium	196
FORAMINIFERA	
Foraminifera	214
CNIDARIA	
Medusa	0
ANNELIDA	
Nereidae	195
Polychaetes	245
Spionodae	1460
HYDROZOA	
Hydrozoans	243
Total biomass (g/m²)	127.48

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(Dr K Ganesan - Laboratory and Quality Manager)



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HECS/Q/FMT/50

Hubert Enviro Care Systems (P) Ltd.

∴ # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

∴ 42985555 Fax : 42985500 E-mail : labsales@hecs.in

∴ 45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

RESULTS

Benthos community structure variability in the Berth No. 14

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	15	5990	1.01	0.75	2.95

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signatory
(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



Jun. 21

Laboratory Services Division

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Certificate No. TC-5786

TEST REPORT

Page 1 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sampling Location	CONTAINER YARD – PROJECT SITE
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Report Date	07.07.2021
Report No	HECS/A/001-007/070721
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni	
	μg/m ³					mg/m ³				μg/m ³			
03.06.2021	13.8	19.2	42.9	22.4	0.10	BDL	11.5	BDL	BDL	BDL	BDL	BDL	BDL
07.06.2021	13.6	19.6	45.8	21.9	0.14	BDL	10.3	BDL	BDL	BDL	BDL	BDL	BDL
11.06.2021	13.1	18.3	44.6	22.1	0.12	BDL	10.8	BDL	BDL	BDL	BDL	BDL	BDL
14.06.2021	14.7	19.1	43.1	21.8	0.13	BDL	11.4	BDL	BDL	BDL	BDL	BDL	BDL
18.06.2021	13.9	20.3	45.9	22.6	0.16	BDL	12.1	BDL	BDL	BDL	BDL	BDL	BDL
21.06.2021	14.1	22.4	46.2	23.1	0.21	BDL	12.8	BDL	BDL	BDL	BDL	BDL	BDL
25.06.2021	15.1	21.8	47.1	23.8	0.26	BDL	11.9	BDL	BDL	BDL	BDL	BDL	BDL
28.06.2021	12.8	18.5	44.7	20.5	0.15	BDL	10.2	BDL	BDL	BDL	BDL	BDL	BDL
Min.	12.8	18.3	42.9	20.5	0.1	BDL	10.2	BDL	BDL	BDL	BDL	BDL	BDL
Max.	15.1	22.4	47.1	23.8	0.26	BDL	12.8	BDL	BDL	BDL	BDL	BDL	BDL
Avg.	13.9	19.9	45.0	22.3	0.2	BDL	11.4	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***	

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

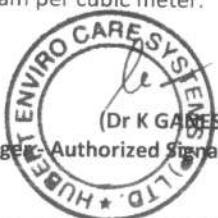
- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager Authorized Signatory



- The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization
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- The test results relate only to the test items.

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HECS Enviro Care Systems (P) Ltd.

18, 92nd Street, Ashok Nagar, Chennai - 600 083.
2985555 Fax : 42985500 E-mail : labsales@hecs.in

5, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
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Certificate No. TC-5786

TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 UP STREAM										
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.07.2021										
Report No	HECS/A/008-014/070721										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	µg/m ³				mg/m ³	µg/m ³				ng/m ³		
03.06.2021	11.7	16.5	45.3	23.4	0.12	BDL	11.4	BDL	BDL	BDL	BDL	BDL
07.06.2021	10.3	15.1	41.3	20.9	0.10	BDL	10.0	BDL	BDL	BDL	BDL	BDL
11.06.2021	9.9	14.8	41.9	19.4	0.12	BDL	10.4	BDL	BDL	BDL	BDL	BDL
14.06.2021	10.1	15.3	43.1	20.6	0.15	BDL	10.9	BDL	BDL	BDL	BDL	BDL
18.06.2021	11.3	16.4	42.9	21.8	0.16	BDL	11.6	BDL	BDL	BDL	BDL	BDL
21.06.2021	12.7	16.8	43.6	22.1	0.21	BDL	12.3	BDL	BDL	BDL	BDL	BDL
25.06.2021	12.3	17.6	44.8	22.7	0.23	BDL	11.9	BDL	BDL	BDL	BDL	BDL
28.06.2021	10.4	15.9	41.6	20.4	0.15	BDL	10.3	BDL	BDL	BDL	BDL	BDL
Min.	9.9	14.8	41.3	19.4	0.1	BDL	10	BDL	BDL	BDL	BDL	BDL
Max.	12.7	17.6	45.3	23.4	0.23	BDL	12.3	BDL	BDL	BDL	BDL	BDL
Avg.	11.1	16.1	43.1	21.4	0.2	BDL	11.1	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
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- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
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CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager: Authorized Signatory



Art Enviro Care Systems (P) Ltd.

18, 92nd Street, Ashok Nagar, Chennai - 600 083.

42985555 Fax : 42985500 E-mail : labsales@hecs.in

5, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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TEST REPORT

Page 3 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 DOWN STREAM										
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.07.2021										
Report No	HECS/A/015-021/070721										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³				mg/m ³	μg/m ³				ng/m ³		
03.06.2021	10.9	14.5	40.7	22.5	0.14	BDL	11.5	BDL	BDL	BDL	BDL	BDL
07.06.2021	12.3	17.3	43.2	24.1	0.13	BDL	10.3	BDL	BDL	BDL	BDL	BDL
11.06.2021	11.3	16.9	41.6	21.9	0.14	BDL	10.2	BDL	BDL	BDL	BDL	BDL
14.06.2021	12.1	17.1	42.1	22.6	0.12	BDL	11.6	BDL	BDL	BDL	BDL	BDL
18.06.2021	13.2	18.6	43.2	24.1	0.19	BDL	13.6	BDL	BDL	BDL	BDL	BDL
21.06.2021	13.4	17.9	44.6	24.8	0.21	BDL	12.3	BDL	BDL	BDL	BDL	BDL
25.06.2021	13.7	18.7	45.3	25.5	0.23	BDL	13.1	BDL	BDL	BDL	BDL	BDL
28.06.2021	12.1	17.4	43.8	22.2	0.14	BDL	10.5	BDL	BDL	BDL	BDL	BDL
Min.	10.9	14.5	40.7	21.9	0.12	BDL	10.2	BDL	BDL	BDL	BDL	BDL
Max.	13.7	18.7	45.3	25.5	0.23	BDL	13.6	BDL	BDL	BDL	BDL	BDL
Avg.	12.4	17.3	43.1	23.5	0.2	BDL	11.6	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

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- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
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- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
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BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager - Authorized Signatory



Hubert Enviro Care Systems (P) Ltd.

18, 92nd Street, Ashok Nagar, Chennai - 600 083.

2985555 Fax : 42985500 E-mail : labsales@hecs.in



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TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	25-26.06.2021
Report Date	29.06.2021
Report No	HECS/NM/001-005/260621

RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	61.3	58.6	58.1	60.3	56.8
07.00	62.1	59.1	59.3	61.8	57.8
08.00	63.1	60.3	60.7	62.9	58.6
09.00	64.2	61.3	61.8	63.3	59.4
10.00	65.5	62.7	64.3	64.6	60.9
11.00	66.7	63.1	65.3	65.8	62.3
12.00	67.8	64.3	66.7	66.1	63.1
13.00	68.9	65.1	67.4	67.8	64.6
14.00	69.6	66.8	68.3	68.9	65.3
15.00	70.9	67.4	69.4	70.6	66.8
16.00	72.3	68.8	70.6	71.9	69.1
17.00	73.3	70.3	71.9	72.1	70.2
18.00	74.1	71.5	72.9	73.1	71.6
19.00	72.8	69.1	70.6	70.3	70.3
20.00	70.1	67.3	69.9	69.4	69.4
21.00	69.3	66.8	68.4	68.4	67.4
22.00	68.4	65.4	67.4	67.7	65.9
23.00	67.8	64.3	66.3	66.9	64.3
00.00	66.3	63.8	65.1	65.5	63.8
01.00	65.1	62.1	64.3	64.9	62.6
02.00	64.3	61.3	63.8	63.8	61.8
03.00	63.2	60.6	62.3	61.3	60.9
04.00	62.9	59.9	61.8	59.1	59.4
05.00	60.8	56.8	59.4	60.8	58.7
MIN	60.8	56.8	58.1	59.1	56.8
MAX	74.1	71.5	72.9	73.1	71.6
Day dB (A)	68.3	65.2	66.6	67.4	64.7
Night dB (A)	64.3	61.3	63.3	63.2	61.6

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00 am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.

ENVIRO CARE SYSTEMS
Authorized Signatory
(Dr K Ganesan – Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

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TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	25.06.2021
Analysis Commenced On	25.06.2021
Analysis Completed On	09.07.2021
Report Date	10.07.2021
Report No	HECS/M/003/250621

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.85	7.77	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	27	26	Not Provided
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	38000	38000	Not Provided
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	23500	24300	Not Provided
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	3.9	3.1	Not Provided
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	4.9	4.3	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Provided
11.	Floating materials, Oil, grease and scum (including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	4.5	2.9	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.31	0.28	Not Provided
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.44	0.53	Not Provided
14.	Sulphates as SO ₄	IS 3025(Part - 24):1986	mg/L	2305	2285	Not Provided
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	15800	15800	Not Provided
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL(DL 0.001)	Not Provided
18.	Hexavalent Chromium as Cr ⁺⁶	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
19.	<i>Escherichia coli</i> (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	220	275	500/100 mL (MPN)
20.	Intestinal Enterococci (<i>Streptococci</i>)	IS1622:1981 (RA 2009)	MPN/100mL	91	104	500/100 mL (MPN)

Note:-BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;

MPN - Most Probable Number

Laboratory and Quality Manager



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TEST REPORT

Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	25.06.2021
Analysis Commenced on	28.06.2021
Analysis Completed on	09.07.2021
Report Date	10.07.2021
Report No	HECS/S/001/280621

S.No.	Parameters	Units	Results	Test Method
1	Total Phosphorous	mg/kg	0.18	IS 10158 : 1982
2	Oil & Grease	mg/kg	2.7	USEPA Method
3	Nitrates	mg/kg	0.51	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.81	USEPA Method
5	Lead as Pb	mg/kg	0.387	USEPA Method
6	Cadmium as Cd	mg/kg	0.48	USEPA Method
7	Mercury as Hg	mg/kg	BDL (DL 0.1)	USEPA Method
8	PAH	mg/kg	0.36	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.04	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.074	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.04	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.03	USEPA Method 525.2: 1995
viii.	α -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ix.	β -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.083	USEPA Method 525.2: 1995
xi.	α - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xii.	β - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xiii.	γ -HCH	mg/kg	0.20	USEPA Method 525.2: 1995
xiv.	δ -HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.04	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995

Note: - BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

Laboratory and Quality Manager - Authorized Signatory



(Dr K GANESAN)

Hubert Enviro Care Systems (P) Ltd.

18, 92nd Street, Ashok Nagar, Chennai - 600 083.

92985555 Fax : 42985500 E-mail : labsales@hecs.in

5, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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Certificate No. TC-5786

TEST REPORT

Page 1 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

RESULTS

Distribution of Phytoplankton (Nos./m³) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
DIATOMS	
<i>Coscinodiscus granii</i>	3462
<i>Coscinodiscus centralis</i>	1962
<i>Coscinodisdis marginatus</i>	1152
<i>Thalassiosira nitzschiooides</i>	2546
<i>Thalassiosira sp.</i>	997
<i>Thalassionema frauenfeldii</i>	100
<i>Thalassionema nitzschiooides</i>	160
<i>Thalassiothoursix sp.</i>	748
<i>Biddulphia mobilensis</i>	852
<i>Bacillaria spp.</i>	574
<i>Hemiaulus spp.</i>	5
<i>Chaetoceros affinis</i>	512
<i>Chaetoceros breve</i>	440
<i>Chaetoceros curvisetus</i>	284
<i>Ditylum spp.</i>	389
<i>Planktoniella sol</i>	310
<i>Leptocylindrus spp.</i>	92
<i>Melosira spp.</i>	3
<i>Rhizosolenia styliformis</i>	145
<i>Rhizosolenia alata</i>	21
<i>Rhizosolenia robusta</i>	19
<i>Skeletonema spp.</i>	6
<i>Nitzchia spp.</i>	334
<i>Fragillaria oceanica</i>	965
<i>Navicula spp.</i>	2912
<i>Pleurosigma spp.</i>	1012
<i>Stephanophysiss spp.</i>	123
<i>Schoursoederella spp.</i>	3
<i>Odontella mobilensis</i>	141
<i>Odontella spp.</i>	231

(Dr K Ganesan - Laboratory and Quality Manager)



**TEST REPORT**

Page 2 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

RESULTS

DINOFLAGELLATES	
Ceratium tripos	914
Ceratium furca	496
Ceratium fusus	144
Ceratium lunula	189
Peridinium depressum	263
Dinophysis spp.	3
Noctiluca spp.	151
Protoperidinium granii	1398
Protoperidinium sp.	546
NANOPLANKTERS	
Chlorella spp.	0
Total biomass (cc/m ³)	0.443

Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
.	39	24604	3.35	0.81	4.02

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory and Quality Manager)



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18, 92nd Street, Ashok Nagar, Chennai - 600 083.

42985555 Fax : 42985500 E-mail : labsales@hecs.in

45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

h: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

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TEST REPORT

Page 3 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

RESULTS**Distribution of Zooplankton (Nos/m³) in the Berth No. 14**

	Berth No. 14
Dinoflagellates	
Noctiluca spp	110
Ciliates	
Tintinopsis	2201
Protozoa	
Radiolarians	1798
Bryozoa	
Bryozoan larvae	1680
Cnidaria	
Medusae	410
Annelid	
Polychaete larvae	330
Urochordata (Tunicates)	
Oikopleura	1123
Brachiopoda	
Brachiopod larvae	168
Cladocera	
Cladocera	2189
Crustacea	
Alima Larvae	184
Crustacean eggs	2954
Decapod	25721
Cypris larvae	5
Crab larvae	6
Lucifer	2412
Protozoa	300
Copepod	17300
Copepod Nauplius	18628
Nauplius	3
Barnacle Nauplius	2
PISCES	
Fish Egg	75
HEXAPODA	
Insect	2
Total biomass (cc/m ³)	1.36

(Dr K Ganesan - Laboratory and Quality Manager)



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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

RESULTS**Zooplankton community structure variability in the berth No. 14**

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	77601	1.94	0.62	2.87

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

RESULTS

Distribution of benthos (Nos/m²) in the identified Berth No. 14

	Berth No. 14
CRUSTACEA	
Amphipod	1
Isopods	2
Cumacea	94
Crustacean eggs	1350
Crustacean	3
Mysids	2
Egg mass	200
Brachyuran crabs	1400
MOLLUSCA	
Bivalves	277
Gastropods	280
SCAPHOPODA	
Dentalium	179
FORAMINIFERA	
Foraminifera	225
CNIDARIA	
Medusa	0
ANNELIDA	
Nereidae	211
Polychaetes	230
Spionidae	1410
HYDROZOA	
Hydrozoans	285
Total biomass (g/m²)	140.2

(Dr K Ganesan - Laboratory and Quality Manager)



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TEST REPORT

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

RESULTS**Benthos community structure variability in the Berth No. 14**

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	16	6149	2.32	0.81	3.12

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
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(Dr K Ganesan - Laboratory and Quality Manager)


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TEST REPORT

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,	Page 1 of 3
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.	
Sampling Location	CONTAINER YARD – PROJECT SITE	
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)	
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,	
Report Date	07.06.2021	
Report No	HECS/A/001/070621	
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini	

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
			μg/m ³		mg/m ³			μg/m ³				
10.05.2021	14.6	21.3	51.3	25.6	0.18	BDL	11.3	BDL	BDL	BDL	BDL	BDL
14.05.2021	13.2	19.5	45.3	24.8	0.11	BDL	10.8	BDL	BDL	BDL	BDL	BDL
17.05.2021	15.4	20.6	46.8	25.2	0.16	BDL	11.6	BDL	BDL	BDL	BDL	BDL
21.05.2021	17.6	24.6	52.9	29.6	0.21	BDL	13.8	BDL	BDL	BDL	BDL	BDL
24.05.2021	18.4	25.8	53.4	30.1	0.29	BDL	14.6	BDL	BDL	BDL	BDL	BDL
28.05.2021	17.1	25.1	54.8	29.7	0.31	BDL	15.2	BDL	BDL	BDL	BDL	BDL
Min.	13.2	19.5	45.3	24.8	0.11	BDL	10.8	BDL	BDL	BDL	BDL	BDL
Max.	18.4	25.8	54.8	30.1	0.31	BDL	15.2	BDL	BDL	BDL	BDL	BDL
Avg.	16.1	22.8	50.8	27.5	0.20	BDL	12.9	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: * 24 hours average; ** 8 hours average; *** Annual average

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene- (DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS
*****End of Report *****

Laboratory and Quality Manager



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- Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report.
- Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after involving or issue of test report.
- The test results relate only to the test items.

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C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

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TEST REPORT

Page 1 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	CONTAINER YARD – PROJECT SITE										
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.08.2021										
Report No	HECS/A/001-009/070821										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³				mg/m ³	μg/m ³				ng/m ³		
01.07.2021	11.4	18.0	43.5	23.6	0.17	BDL	11.5	BDL	BDL	BDL	BDL	BDL
05.07.2021	12.8	18.3	42.1	20.1	0.15	BDL	10.6	BDL	BDL	BDL	BDL	BDL
08.07.2021	12.4	17.6	42.3	19.8	0.13	BDL	10.5	BDL	BDL	BDL	BDL	BDL
12.07.2021	12.6	17.8	41.8	20.3	0.12	BDL	10.3	BDL	BDL	BDL	BDL	BDL
15.07.2021	13.2	18.1	41.9	19.6	0.14	BDL	11.2	BDL	BDL	BDL	BDL	BDL
19.07.2021	13.6	19.6	42.3	21.6	0.22	BDL	12.5	BDL	BDL	BDL	BDL	BDL
22.07.2021	14.6	20.7	45.7	22.4	0.26	BDL	13.2	BDL	BDL	BDL	BDL	BDL
26.07.2021	15.2	21.4	46.5	23.4	0.31	BDL	13.5	BDL	BDL	BDL	BDL	BDL
29.07.2021	14.9	20.6	45.8	21.9	0.28	BDL	12.9	BDL	BDL	BDL	BDL	BDL
Min.	11.4	17.6	41.8	19.6	0.1	BDL	10.3	BDL	BDL	BDL	BDL	BDL
Max.	15.2	21.4	46.5	23.6	0.3	BDL	13.5	BDL	BDL	BDL	BDL	BDL
Avg.	13.4	19.1	43.5	21.4	0.2	BDL	11.8	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

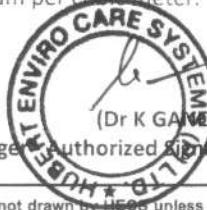
- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
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- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
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BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager Authorized Signatory



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Hubert Enviro Care Systems (P) Ltd.

45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in



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Certificate No. TC-7920

TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 UP STREAM										
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.08.2021										
Report No	HECS/A/010-018/070821										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	$\mu\text{g}/\text{m}^3$				mg/m ³	$\mu\text{g}/\text{m}^3$				ng/m^3		
01.07.2021	10.4	15.6	42.0	20.2	0.12	BDL	11.0	BDL	BDL	BDL	BDL	BDL
05.07.2021	10.1	15.3	42.8	20.6	0.11	BDL	10.9	BDL	BDL	BDL	BDL	BDL
08.07.2021	9.6	14.6	40.6	19.5	0.10	BDL	10.1	BDL	BDL	BDL	BDL	BDL
12.07.2021	10.2	14.9	40.9	20.1	0.13	BDL	11.3	BDL	BDL	BDL	BDL	BDL
15.07.2021	10.4	15.4	42.6	21.6	0.17	BDL	11.6	BDL	BDL	BDL	BDL	BDL
19.07.2021	12.3	16.5	43.5	22.1	0.19	BDL	11.5	BDL	BDL	BDL	BDL	BDL
22.07.2021	12.6	17.3	44.2	23.7	0.23	BDL	12.5	BDL	BDL	BDL	BDL	BDL
26.07.2021	12.1	16.8	44.9	22.9	0.28	BDL	11.7	BDL	BDL	BDL	BDL	BDL
29.07.2021	12.5	16.4	43.4	21.8	0.25	BDL	11.2	BDL	BDL	BDL	BDL	BDL
Min.	9.6	14.6	40.6	19.5	0.1	BDL	10.1	BDL	BDL	BDL	BDL	BDL
Max.	12.6	17.3	44.9	23.7	0.3	BDL	12.5	BDL	BDL	BDL	BDL	BDL
Avg.	11.1	15.9	42.8	21.4	0.2	BDL	11.3	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: * 24 hours average; ** 8 hours average; *** Annual average

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 $\mu\text{g}/\text{m}^3$); NH₃-Ammonia (DL 5 $\mu\text{g}/\text{m}^3$); Pb-Lead (DL 0.05 $\mu\text{g}/\text{m}^3$); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 $\mu\text{g}/\text{m}^3$); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; $\mu\text{g}/\text{m}^3$ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager - Authorized Signatory



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TEST REPORT

Page 3 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,											
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.											
Sampling Location	BERTH NO. 14 DOWN STREAM											
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)											
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,											
Report Date	07.08.2021											
Report No	HECS/A/019-027/070821											
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini											

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
$\mu\text{g}/\text{m}^3$												
01.07.2021	11.8	16.2	43.5	23.7	0.18	BDL	10.6	BDL	BDL	BDL	BDL	BDL
05.07.2021	11.3	15.6	41.2	22.1	0.13	BDL	11.2	BDL	BDL	BDL	BDL	BDL
08.07.2021	10.5	14.3	40.2	20.8	0.11	BDL	10.1	BDL	BDL	BDL	BDL	BDL
12.07.2021	11.2	14.9	39.4	21.1	0.12	BDL	10.6	BDL	BDL	BDL	BDL	BDL
15.07.2021	12.3	15.3	40.8	21.9	0.16	BDL	10.9	BDL	BDL	BDL	BDL	BDL
19.07.2021	12.9	16.8	41.3	22.3	0.18	BDL	11.6	BDL	BDL	BDL	BDL	BDL
22.07.2021	13.2	16.4	42.8	24.6	0.2	BDL	12.6	BDL	BDL	BDL	BDL	BDL
26.07.2021	12.8	17.1	43.5	24.1	0.22	BDL	12.1	BDL	BDL	BDL	BDL	BDL
29.07.2021	13.1	16.6	41.9	24.8	0.19	BDL	11.7	BDL	BDL	BDL	BDL	BDL
Min.	10.5	14.3	39.4	20.8	0.1	BDL	10.1	BDL	BDL	BDL	BDL	BDL
Max.	13.2	17.1	43.5	24.8	0.2	BDL	12.6	BDL	BDL	BDL	BDL	BDL
Avg.	12.1	15.9	41.6	22.8	0.2	BDL	11.3	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

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- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

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CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager / Authorized Signatory



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TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	22-23.07.2021
Report Date	26.07.2021
Report No	HECS/NM/001-005/230721

RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	62.6	62.7	63.1	63.8	61.4
07.00	63.1	63.2	64.3	64.3	61.7
08.00	63.9	63.6	65.1	65.5	62.2
09.00	64.9	64.3	65.6	66.3	63.2
10.00	65.2	64.8	66.2	67.4	64.3
11.00	65.9	65.1	66.8	68.2	66.5
12.00	66.4	65.5	67.3	68.7	67.6
13.00	67.8	66.1	67.9	69.8	68.5
14.00	68.2	66.9	68.1	70.6	69.9
15.00	69.1	67.8	68.7	71.7	70.6
16.00	71.6	69.8	69.9	72.6	71.1
17.00	72.3	71.3	71.1	73.8	71.8
18.00	73.8	72.5	70.6	74.6	72.3
19.00	73.1	72.1	69.4	73.6	71.4
20.00	72.6	71.3	69.1	72.5	70.8
21.00	72.3	70.6	68.8	72.1	68.4
22.00	71.6	70.2	68.3	70.5	67.5
23.00	71.2	69.7	67.3	69.4	65.3
00.00	69.8	67.8	66.8	68.8	64.5
01.00	68.4	65.3	66.3	66.7	63.6
02.00	66.4	64.3	65.5	65.4	62.8
03.00	65.3	62.8	64.8	63.3	61.7
04.00	63.8	62.1	64.3	62.6	60.3
05.00	61.8	61.5	62.8	62.1	59.6
MIN	61.8	61.5	62.8	62.1	59.6
MAX	73.8	72.5	71.1	74.6	72.3
Day dB (A)	68.5	67.5	67.7	69.8	67.6
Night dB (A)	66.7	64.8	65.4	65.5	62.5

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00 am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.

(Dr K Ganesan – Laboratory and Quality Manager)

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Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

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TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	22.07.2021
Analysis Commenced On	26.07.2021
Analysis Completed On	06.08.2021
Report Date	07.08.2021
Report No	HECS/M/003/260721

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.78	7.65	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	26	25	Not Specified
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	37500	37500	Not Specified
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	22600	23250	Not Specified
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	4.6	3.7	Not Specified
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	5.1	4.8	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Specified
11.	Floating materials, Oil, grease and scum (including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	5.2	3.1	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.35	0.30	Not Specified
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.48	0.61	Not Specified
14.	Sulphates as SO ₄	IS 3025(Part - 24):1986	mg/L	2209	2160	Not Specified
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	13980	13980	Not Specified
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL(DL 0.001)	Not Specified
18.	Hexavalent Chromium as Cr ⁺⁶	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
19.	<i>Escherichia coli</i> (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	210	267	500/100 mL (MPN)
20.	Intestinal Enterococci (Streptococci)	IS1622:1981 (RA 2009)	MPN/100mL	96	128	500/100 mL (MPN)

Note:-BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;

MPN - Most Probable Number

Laboratory and Quality Manager



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TEST REPORT

Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,			
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.			
Sample Description	Sediment Quality Monitoring			
Sampling Location	Berth No. 14, Container Yard			
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,			
Sampling / Receipt date	22.07.2021			
Analysis Commenced on	26.07.2021			
Analysis Completed on	05.08.2021			
Report Date	06.08.2021			
Report No	HECS/S/001/260721			

S.No.	Parameters	Units	Results	Test Method
1	Total Phosphorous	mg/kg	0.26	IS 10158 : 1982
2	Oil & Grease	mg/kg	3.2	USEPA Method
3	Nitrates	mg/kg	0.47	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.74	USEPA Method
5	Lead as Pb	mg/kg	0.394	USEPA Method
6	Cadmium as Cd	mg/kg	0.41	USEPA Method
7	Mercury as Hg	mg/kg	BDL (DL 0.1)	USEPA Method
8	PAH	mg/kg	0.41	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.06	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.081	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.02	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.04	USEPA Method 525.2: 1995
viii.	α -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ix.	β -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.076	USEPA Method 525.2: 1995
xi.	α - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xii.	β - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xiii.	γ -HCH	mg/kg	0.26	USEPA Method 525.2: 1995
xiv.	δ -HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.05	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995

Note: - BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

Laboratory and Quality Manager: Authorized Signature
(Dr K GANESAN)



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TEST REPORT

Page 1 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

RESULTS

Distribution of Phytoplankton (Nos./m³) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
DIATOMS	
<i>Coscinodiscus granii</i>	3591
<i>Coscinodiscus centralis</i>	2066
<i>Coscinodisdis marginatus</i>	1053
<i>Thalassiosira nitzschiooides</i>	2433
<i>Thalassiosira sp.</i>	1102
<i>Thalassionema frauenfeldii</i>	125
<i>Thalassionema nitzschiooides</i>	132
<i>Thalassiothoursix sp.</i>	687
<i>Biddulphia mobilensis</i>	840
<i>Bacillaria spp.</i>	600
<i>Hemiaulus spp.</i>	6
<i>Chaetoceros affinis</i>	608
<i>Chaetoceros breve</i>	400
<i>Chaetoceros curvisetus</i>	309
<i>Ditylum spp.</i>	412
<i>Planktoniella sol</i>	382
<i>Leptocylindrus spp.</i>	99
<i>Melosira spp.</i>	4
<i>Rhizosolenia styliformis</i>	153
<i>Rhizosolenia alata</i>	26
<i>Rhizosolenia robusta</i>	24
<i>Skeletonema spp.</i>	9
<i>Nitzchia spp.</i>	301
<i>Fragillaria oceanica</i>	1030
<i>Navicula spp.</i>	3052
<i>Pleurosigma spp.</i>	1152
<i>Stephanophysis spp.</i>	103
<i>Schoursoederella spp.</i>	4
<i>Odontella mobiliensis</i>	158
<i>Odontella spp.</i>	245

Authorized Signature
(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



Laboratory Services Division

(Chemical & Biological Testing)

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Certificate No. TC-5786

TEST REPORT

Page 2 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

RESULTS

DINOFLAGELLATES	
<i>Ceratium tripos</i>	926
<i>Ceratium furca</i>	517
<i>Ceratium fusus</i>	155
<i>Ceratium lunula</i>	187
<i>Peridinium depressum</i>	254
<i>Dinophysis spp.</i>	2
<i>Noctiluca spp.</i>	140
<i>Protoperidinium granii</i>	1288
<i>Protoperidinium sp.</i>	558
NANOPLANKTERS	
<i>Chlorella spp.</i>	1
Total biomass (cc/m ³)	0.671

Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
	40	25134	4.01	0.92	4.36

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		> 4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory and Quality Manager)



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TEST REPORT

Page 3 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

RESULTS

Distribution of Zooplankton (Nos/m³) in the Berth No. 14

	Berth No. 14
Dinoflagellates	
Noctiluca spp	132
Ciliates	
Tintinopsis	2174
Protozoa	
Radiolarians	1856
Bryozoa	
Bryozoan larvae	1584
Cnidaria	
Medusae	512
Annelid	
Polychaete larvae	345
Urochordata (Tunicates)	
Oikopleura	1085
Brachiopoda	
Brachiopod larvae	178
Cladocera	
Ciadocera	2261
Crustacea	
Alima Larvae	199
Crustacean eggs	3065
Decapod	25321
Cypris larvae	4
Crab larvae	7
Lucifer	2561
Protozoea	312
Copepod	17450
Copepod Nauplius	18947
Nauplius	4
Barnacle Nauplius	1
PISCES	
Fish Egg	66
HEXAPODA	
Insect	1
Total biomass (cc/m ³)	1.67

(Dr K Ganesan - Laboratory and Quality Manager)



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TEST REPORT

Page 4 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

RESULTS

Zooplankton community structure variability in the berth No. 14

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	78065	3.53	0.89	4.61

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory Head and Quality Manager)


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TEST REPORT

Page 5 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

RESULTS**Distribution of benthos (Nos/m²) in the identified Berth No. 14**

	Berth No. 14
CRUSTACEA	
Amphipod	2
Isopods	0
Cumacea	110
Crustacean eggs	1456
Crustacean	2
Mysids	4
Egg mass	210
Brachyuran crabs	1504
MOLLUSCA	
Bivalves	321
Gastropods	264
SCAPHOPODA	
Dentalium	189
FORAMINIFERA	
Foraminifera	260
CNIDARIA	
Medusa	0
ANNELIDA	
Nereidae	287
Polychaetes	2201
Spionidae	1354
HYDROZOA	
Hydrozoans	264
Total biomass (g/m²)	165.2

(Dr K Ganesan - Laboratory and Quality Manager)



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TEST REPORT

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

RESULTS**Benthos community structure variability in the Berth No. 14**

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	15	6428	3.75	0.95	4.14

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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TEST REPORT

Page 1 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	CONTAINER YARD – PROJECT SITE										
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.09.2021										
Report No	HECS/A/001-009/070921										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³				mg/m ³	μg/m ³				ng/m ³		
02.08.2021	11.1	17.7	42.1	22.1	0.15	BDL	10.7	BDL	BDL	BDL	BDL	BDL
05.08.2021	11.8	18.1	40.9	21.3	0.12	BDL	11.3	BDL	BDL	BDL	BDL	BDL
09.08.2021	11.6	17.2	41.6	19.5	0.10	BDL	11.6	BDL	BDL	BDL	BDL	BDL
12.08.2021	12.1	16.9	42.1	20.1	0.15	BDL	11.4	BDL	BDL	BDL	BDL	BDL
16.08.2021	12.8	17.9	40.4	20.6	0.13	BDL	12.6	BDL	BDL	BDL	BDL	BDL
19.08.2021	13.7	18.4	41.8	19.3	0.17	BDL	13.4	BDL	BDL	BDL	BDL	BDL
23.08.2021	14.3	18.9	42.3	20.7	0.21	BDL	13.2	BDL	BDL	BDL	BDL	BDL
26.08.2021	14.9	20.4	42.8	21.4	0.24	BDL	12.3	BDL	BDL	BDL	BDL	BDL
30.08.2021	15.1	20.9	43.9	20.4	0.27	BDL	12.2	BDL	BDL	BDL	BDL	BDL
Min.	11.1	16.9	40.4	19.3	0.1	BDL	10.7	BDL	BDL	BDL	BDL	BDL
Max.	15.1	20.9	43.9	22.1	0.27	BDL	13.4	BDL	BDL	BDL	BDL	BDL
Avg.	13.0	18.5	42.0	20.6	0.20	BDL	12.1	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter, μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report*****

(Dr K GANESAN)

Laboratory and Quality Manager - Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 UP STREAM										
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.09.2021										
Report No	HECS/A/010-018/070921										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³					mg/m ³				μg/m ³		
02.08.2021	11.2	14.6	41.2	19.7	0.13	BDL	11.1	BDL	BDL	BDL	BDL	BDL
05.08.2021	9.8	14.8	40.8	20.1	0.11	BDL	10.2	BDL	BDL	BDL	BDL	BDL
09.08.2021	9.4	13.9	39.7	19.6	0.12	BDL	10.1	BDL	BDL	BDL	BDL	BDL
12.08.2021	9.1	14.5	39.4	20.2	0.10	BDL	10.0	BDL	BDL	BDL	BDL	BDL
16.08.2021	10.3	15.1	40.3	19.3	0.15	BDL	10.3	BDL	BDL	BDL	BDL	BDL
19.08.2021	9.3	14.2	41.8	20.4	0.17	BDL	10.8	BDL	BDL	BDL	BDL	BDL
23.08.2021	11.7	15.8	42.6	22.1	0.21	BDL	11.5	BDL	BDL	BDL	BDL	BDL
26.08.2021	11.1	16.1	42.1	21.9	0.24	BDL	12.1	BDL	BDL	BDL	BDL	BDL
30.08.2021	12.1	15.9	42.8	21.8	0.22	BDL	11.9	BDL	BDL	BDL	BDL	BDL
Min.	9.1	13.9	39.4	19.3	0.10	BDL	10.0	BDL	BDL	BDL	BDL	BDL
Max.	12.1	16.1	42.8	22.1	0.24	BDL	12.1	BDL	BDL	BDL	BDL	BDL
Avg.	10.4	15.0	41.2	20.6	0.20	BDL	10.9	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

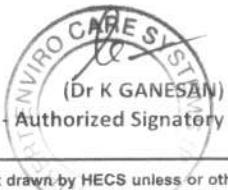
- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL = Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager - Authorized Signatory



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TEST REPORT

Page 3 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 DOWN STREAM										
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.09.2021										
Report No	HECS/A/019-027/070921										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³				mg/m ³	μg/m ³				ng/m ³		
02.08.2021	11.3	15.3	41.7	22.8	0.11	BDL	10.7	BDL	BDL	BDL	BDL	BDL
05.08.2021	10.9	14.8	39.7	20.4	0.13	BDL	10.6	BDL	BDL	BDL	BDL	BDL
09.08.2021	10.2	15.1	41.1	19.8	0.10	BDL	10.2	BDL	BDL	BDL	BDL	BDL
12.08.2021	10.1	14.7	39.8	19.4	0.12	BDL	10.4	BDL	BDL	BDL	BDL	BDL
16.08.2021	9.9	15.1	39.4	20.1	0.14	BDL	10.9	BDL	BDL	BDL	BDL	BDL
19.08.2021	10.5	15.9	40.5	22.1	0.18	BDL	11.4	BDL	BDL	BDL	BDL	BDL
23.08.2021	11.8	16.1	41.3	23.6	0.21	BDL	12.1	BDL	BDL	BDL	BDL	BDL
26.08.2021	12.1	15.8	42.1	22.7	0.19	BDL	12.3	BDL	BDL	BDL	BDL	BDL
30.08.2021	12.9	16.2	42.5	23.1	0.20	BDL	11.9	BDL	BDL	BDL	BDL	BDL
Min.	9.9	14.7	39.4	19.4	0.10	BDL	10.2	BDL	BDL	BDL	BDL	BDL
Max.	12.9	16.2	42.5	23.6	0.21	BDL	12.3	BDL	BDL	BDL	BDL	BDL
Avg.	11.1	15.4	40.9	21.6	0.20	BDL	11.2	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)

PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)

NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)

O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)

CO : IS 5182 (Pt 10): 1999 (RA 2013)

Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)

C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)

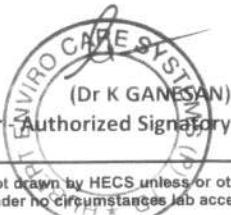
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager - Authorized Signatory



Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-MangaloreContainer Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	24-25.08.2021
Report Date	28.08.2021
Report No	HECS/NM/001-005/250821

RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	60.8	59.8	62.3	61.8	60.9
07.00	62.1	60.2	63.5	62.5	61.1
08.00	62.9	60.9	64.2	63.9	61.9
09.00	63.2	61.5	64.8	64.5	62.6
10.00	63.8	62.3	65.5	65.8	63.3
11.00	64.9	63.6	66.1	66.3	64.5
12.00	65.6	64.5	66.9	67.7	65.5
13.00	66.1	65.5	67.3	68.2	66.8
14.00	66.9	66.8	67.9	69.8	67.8
15.00	67.5	67.1	68.2	70.2	68.6
16.00	68.4	68.5	68.6	71.7	69.3
17.00	69.4	69.3	69.5	72.6	70.8
18.00	70.6	70.2	70.9	73.8	71.9
19.00	69.1	69.2	69.5	72.3	72.5
20.00	68.4	68.3	68.3	71.7	71.3
21.00	67.8	67.4	67.2	71.2	70.3
22.00	66.3	66.3	66.3	70.6	69.5
23.00	65.8	65.2	65.5	69.8	68.4
00.00	64.2	64.2	64.3	67.4	67.3
01.00	63.1	63.5	63.8	65.5	65.8
02.00	61.8	62.7	62.5	64.6	64.2
03.00	60.7	60.4	61.7	62.8	63.6
04.00	59.4	60.1	60.3	61.8	61.8
05.00	59.1	59.4	61.2	61.3	59.8
MIN	59.1	59.4	60.3	61.3	59.8
MAX	70.6	70.2	70.9	73.8	72.5
Day dB (A)	66.1	65.4	66.9	68.5	67.0
Night dB (A)	62.0	62.2	62.8	64.7	64.4

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.

Authorized Signatory
(Dr K Ganesan – Laboratory and Quality Manager)

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Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	24.08.2021
Analysis Commenced On	24.08.2021
Analysis Completed On	06.09.2021
Report Date	07.09.2021
Report No	HECS/M/001/240821

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.73	7.58	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	26	25	Not Specified
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	47000	47000	Not Specified
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	23000	23325	Not Specified
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	1.8	2.9	Not Specified
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	6.2	5.3	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Specified
11.	Floating materials, Oil, grease and scum(including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	6.4	4.3	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.46	0.41	Not Specified
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.53	0.73	Not Specified
14.	Sulphates as SO ₄	IS 3025(Part - 24):1986	mg/L	4047	3986	Not Specified
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	17920	17920	Not Specified
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL (DL 0.001)	Not Specified
18.	Hexavalent Chromium as Cr ⁺⁶	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
19.	Escherichia coli (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	208	257	500/100 mL (MPN)
20.	Intestinal Enterococci (Streptococci)	IS1622:1981 (RA 2009)	MPN/100mL	102	132	500/100 mL (MPN)

Note:- BDL - Below Detection Limit; DL- Detection Limit, µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;

MPN - Most Probable Number

Laboratory and Quality Manager - Authorized Signatory



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H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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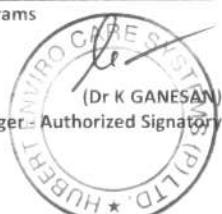
Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	24.08.2021
Analysis Commenced on	27.08.2021
Analysis Completed on	06.09.2021
Report Date	07.09.2021
Report No	HECS/S/001/240821

S.No.	Parameters	Units	Results	TestMethod
1	Total Phosphorous	mg/kg	0.20	IS 10158 : 1982
2	Oil & Grease	mg/kg	2.8	USEPA Method
3	Nitrates	mg/kg	0.51	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.65	USEPA Method
5	Lead as Pb	mg/kg	0.381	USEPA Method
6	Cadmium as Cd	mg/kg	0.36	USEPA Method
7	Mercury as Hg	mg/kg	BDL(DL 0.1)	USEPA Method
8	PAH	mg/kg	0.34	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.04	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.078	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.03	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.05	USEPA Method 525.2: 1995
viii.	α -Endosulphan	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
ix.	β -Endosulphan	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.071	USEPA Method 525.2: 1995
xi.	α -HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xii.	β -HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xiii.	γ -HCH	mg/kg	0.21	USEPA Method 525.2: 1995
xiv.	δ -HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.04	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995

Note: - BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

(Dr K GANESAN)
Laboratory and Quality Manager- Authorized Signatory



Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters -Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

RESULTS

Distribution of Phytoplankton (Nos./m³) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
DIATOMS	
<i>Coscinodiscus granii</i>	3626
<i>Coscinodiscus centralis</i>	2132
<i>Coscinodiscusmarginatus</i>	1023
<i>Thalassiosiranitzschiooides</i>	2354
<i>Thalassiosira sp.</i>	1098
<i>Thalassionemafrauenfeldii</i>	136
<i>Thalassionemanitzschiooides</i>	124
<i>Thalassiothoursix sp.</i>	702
<i>Biddulphiamobilensis</i>	789
<i>Bacillaria spp.</i>	621
<i>Hemiaulus spp.</i>	8
<i>Chaetocerosaffinis</i>	587
<i>Chaetoceros breve</i>	395
<i>Chaetoceroscurvisetus</i>	286
<i>Ditylum spp.</i>	400
<i>Planktoniella sol</i>	412
<i>Leptocylindrus spp.</i>	106
<i>Melosira spp.</i>	5
<i>Rhizosoleniastyliformis</i>	158
<i>Rhizosoleniaalata</i>	32
<i>Rhizosoleniarobusta</i>	29
<i>Skeletonema spp.</i>	12
<i>Nitzchia spp.</i>	321
<i>Fragillaria oceanica</i>	1054
<i>Navicula spp.</i>	3125
<i>Pleurosigma spp.</i>	1056
<i>Stephanophysisspp.</i>	128
<i>Schoursoederella spp.</i>	6
<i>Odontellamobiliensis</i>	150
<i>Odontella spp.</i>	231

(Dr K Ganesan - Laboratory and Quality Manager)



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Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



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TEST REPORT

Page 2 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

RESULTS

DINOFLAGELLATES		
Ceratiumtripos		931
Ceratiumfurca		526
Ceratiumfusus		143
Ceratiumlunula		182
Peridiniumdepressum		247
Dinophysis spp.		3
Noctiluca spp.		156
Protoperidiniumgranii		1157
Protoperidinium sp.		560
NANOPLANKTERS		
Chlorella spp.		2
Total biomass (cc/m ³)		0.702

Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
	40	25013	3.95	0.84	4.20

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signatory
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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

RESULTS

Distribution of Zooplankton (Nos/m³) in the Berth No. 14

	Berth No. 14
Dinoflagellates	
Noctilucaspp	146
Ciliates	
Tintinopsis	2089
Protozoa	
Radiolarians	1945
Bryozoa	
Bryozoan larvae	1623
Cnidaria	
Medusae	602
Annelid	
Polychaete larvae	356
Urochordata (Tunicates)	
Oikopleura	1152
Brachiopoda	
Brachiopod larvae	208
Cladocera	2146
Crustacea	
Alima Larvae	187
Crustacean eggs	2988
Decapod	25698
Cypris larvae	3
Crab larvae	6
Lucifer	2468
Protozoea	300
Copepod	16890
Copepod Nauplius	18967
Nauplius	8
Barnacle Nauplius	4
PISCES	
Fish Egg	89
HEXAPODA	
Insect	3
Total biomass (cc/m ³)	1.56

Authorized Signatory
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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

RESULTS

Zooplankton community structure variability in the berth No. 14

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	77878	3.52	0.79	4.45

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

RESULTS

Distribution of benthos (Nos/m²) in the identified Berth No. 14

	Berth No. 14
CRUSTACEA	
Amphipod	3
Isopods	4
Cumacea	107
Crustacean eggs	1398
Crustacean	3
Mysids	8
Egg mass	225
Brachyuran crabs	1623
MOLLUSCA	
Bivalves	300
Gastropods	254
SCAPHOPODA	
Dentalium	170
FORAMINIFERA	
Foraminifera	218
CNIDARIA	
Medusa	0
ANNELIDA	
Nereidae	217
Polychaetes	197
Spionidae	1389
HYDROZOA	
Hydrozoans	298
Total biomass (g/m²)	170.4

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(Chemical & Biological Testing)

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TEST REPORT

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

RESULTS

Benthos community structure variability in the Berth No. 14

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	16	6414	3.63	0.80	3.97

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signatory

(Dr K Ganesan - Laboratory and Quality Manager)



Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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TEST REPORT

Page 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	CONTAINER YARD – PROJECT SITE										
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	11.10.2021										
Report No	HECS/A/001-009/111021										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³					mg/m ³	μg/m ³				ng/m ³	
02.09.2021	12.6	18.9	43.6	23.6	0.12	BDL	13.8	BDL	BDL	BDL	BDL	BDL
06.09.2021	12.9	19.4	42.5	22.5	0.18	BDL	11.8	BDL	BDL	BDL	BDL	BDL
09.09.2021	13.2	19.3	42.6	20.9	0.11	BDL	12.3	BDL	BDL	BDL	BDL	BDL
13.09.2021	13.1	20.5	43.2	21.6	0.21	BDL	12.6	BDL	BDL	BDL	BDL	BDL
16.09.2021	13.7	19.3	42.2	22.5	0.23	BDL	12.4	BDL	BDL	BDL	BDL	BDL
20.09.2021	14.5	18.7	42.1	21.4	0.28	BDL	13.9	BDL	BDL	BDL	BDL	BDL
23.09.2021	14.4	20.6	44.2	23.8	0.22	BDL	13.6	BDL	BDL	BDL	BDL	BDL
27.09.2021	15.6	21.1	43.7	24.1	0.19	BDL	12.8	BDL	BDL	BDL	BDL	BDL
30.09.2021	15.4	20.8	42.8	23.3	0.27	BDL	14.1	BDL	BDL	BDL	BDL	BDL
Min.	12.6	18.7	42.1	20.9	0.11	BDL	11.8	BDL	BDL	BDL	BDL	BDL
Max.	15.6	21.1	44.2	24.1	0.28	BDL	14.1	BDL	BDL	BDL	BDL	BDL
Avg.	13.9	19.8	43.0	22.6	0.20	BDL	13.0	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)

PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)

NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)

O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)

CO : IS 5182 (Pt 10): 1999 (RA 2013)

Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)

C₆H₆ : GC FID / GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)

B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂-Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager - Authorized Signatory



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HECS/Q/FMT/50

Hubert Enviro Care Systems (P) Ltd.

100 # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Tel: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

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TEST REPORT

Page 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,											
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.											
Sampling Location	BERTH NO. 14 UP STREAM											
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)											
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,											
Report Date	11.10.2021											
Report No	HECS/A/010-018/111021											
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini											

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	μg/m ³				mg/m ³	μg/m ³				ng/m ³		
02.09.2021	12.3	15.2	42.6	20.6	0.16	BDL	12.3	BDL	BDL	BDL	BDL	BDL
06.09.2021	11.6	15.9	42.1	19.6	0.18	BDL	11.6	BDL	BDL	BDL	BDL	BDL
09.09.2021	12.7	14.6	42.4	20.9	0.15	BDL	12.4	BDL	BDL	BDL	BDL	BDL
13.09.2021	12.3	14.2	43.2	21.3	0.19	BDL	11.3	BDL	BDL	BDL	BDL	BDL
16.09.2021	12.9	15.4	42.8	20.8	0.21	BDL	10.9	BDL	BDL	BDL	BDL	BDL
20.09.2021	13.2	14.1	43.6	21.3	0.24	BDL	11.8	BDL	BDL	BDL	BDL	BDL
23.09.2021	13.6	16.1	43.1	23.1	0.28	BDL	12.1	BDL	BDL	BDL	BDL	BDL
27.09.2021	12.5	16.2	42.8	22.9	0.22	BDL	11.6	BDL	BDL	BDL	BDL	BDL
30.09.2021	13.4	15.8	41.9	22.6	0.17	BDL	12.5	BDL	BDL	BDL	BDL	BDL
Min.	11.6	14.1	41.9	19.6	0.15	BDL	10.9	BDL	BDL	BDL	BDL	BDL
Max.	13.6	16.2	43.6	23.1	0.28	BDL	12.5	BDL	BDL	BDL	BDL	BDL
Avg.	12.7	15.3	42.7	21.5	0.20	BDL	11.8	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 μg/m³); NH₃-Ammonia (DL 5 μg/m³); Pb-Lead (DL 0.05 μg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 μg/m³); B(α)P- Benzo- α-pyrene(DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; μg/m³ - microgram per cubic meter.

CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Laboratory and Quality Manager - Authorized Signatory

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TEST REPORT

Page 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 DOWN STREAM										
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	11.10.2021										
Report No	HECS/A/019-027/111021										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

RESULTS

Date of Sampling	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO	Pb	O ₃	NH ₃	C ₆ H ₆	B(α)P	As	Ni
	µg/m³				mg/m³	µg/m³				ng/m³		
02.09.2021	13.2	16.3	42.9	23.1	0.20	BDL	11.3	BDL	BDL	BDL	BDL	BDL
06.09.2021	12.6	15.4	43.3	21.6	0.18	BDL	12.1	BDL	BDL	BDL	BDL	BDL
09.09.2021	11.8	16.1	42.6	23.2	0.12	BDL	11.6	BDL	BDL	BDL	BDL	BDL
13.09.2021	12.4	15.7	42.4	20.9	0.21	BDL	12.3	BDL	BDL	BDL	BDL	BDL
16.09.2021	13.1	15.5	43.1	21.5	0.19	BDL	12.8	BDL	BDL	BDL	BDL	BDL
20.09.2021	11.6	15.3	41.8	22.7	0.23	BDL	11.6	BDL	BDL	BDL	BDL	BDL
23.09.2021	12.2	16.2	42.9	23.9	0.17	BDL	12.4	BDL	BDL	BDL	BDL	BDL
27.09.2021	11.9	15.2	42.2	22.4	0.25	BDL	12.9	BDL	BDL	BDL	BDL	BDL
30.09.2021	12.5	15.1	43.4	22.9	0.22	BDL	12.1	BDL	BDL	BDL	BDL	BDL
Min.	11.6	15.1	41.8	20.9	0.12	BDL	11.3	BDL	BDL	BDL	BDL	BDL
Max.	13.2	16.3	43.4	23.9	0.25	BDL	12.9	BDL	BDL	BDL	BDL	BDL
Avg.	12.4	15.6	42.7	22.5	0.20	BDL	12.1	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: *: 24 hours average; **: 8 hours average; ***: Annual average

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
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- NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
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- NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
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CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

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HECS/Q/FMT/50

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TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-MangaloreContainer Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	24-25.09.2021
Report Date	28.09.2021
Report No	HECS/NM/001-005/250921

RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	61.9	58.9	61.9	62.3	61.2
07.00	62.3	59.6	62.9	63.6	62.3
08.00	63.6	60.6	63.1	64.5	63.5
09.00	64.8	61.2	64.5	65.5	64.5
10.00	65.2	62.8	65.6	66.9	64.9
11.00	66.3	63.2	66.8	67.7	65.5
12.00	67.4	64.6	67.5	68.2	66.8
13.00	68.5	65.5	68.9	69.1	67.9
14.00	69.1	67.8	69.5	70.2	68.8
15.00	70.2	68.3	70.2	71.3	69.2
16.00	71.2	69.8	70.9	72.4	70.2
17.00	71.9	70.3	71.5	73.1	71.6
18.00	72.1	71.9	72.3	74.2	72.5
19.00	71.1	70.1	71.2	72.4	70.6
20.00	70.6	68.9	70.6	71.8	69.5
21.00	69.5	66.5	69.3	70.2	68.3
22.00	68.2	64.3	68.4	68.4	67.3
23.00	67.2	64.1	67.5	66.2	66.9
00.00	66.3	63.2	66.3	64.3	65.5
01.00	65.1	62.8	65.4	63.4	64.3
02.00	64.8	61.9	64.3	62.9	63.8
03.00	63.2	60.1	62.8	62.1	62.6
04.00	61.8	59.4	61.3	61.8	60.3
05.00	60.3	58.6	60.9	60.8	59.2
MIN	60.3	58.6	60.9	60.8	59.2
MAX	72.1	71.9	72.3	74.2	72.5
Day dB (A)	67.9	65.5	67.9	68.9	67.3
Night dB (A)	64.1	61.4	64.1	63.1	63.2

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.


 * Authorized Signatory
 (Dr K Ganesan – Laboratory and Quality Manager)

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TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	24.09.2021
Analysis Commenced On	24.09.2021
Analysis Completed On	11.10.2021
Report Date	12.10.2021
Report No	HECS/M/001/240921

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.65	7.43	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	27	26	Not Specified
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	48000	48000	Not Specified
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	24000	24800	Not Specified
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	1.9	3.2	Not Specified
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	6.1	5.2	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Specified
11.	Floating materials, Oil, grease and scum(including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	7.1	3.9	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.52	0.48	Not Specified
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.62	0.76	Not Specified
14.	Sulphates as SO ₄	IS 3025(Part - 24):1986	mg/L	4232	4011	Not Specified
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	18241	18241	Not Specified
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	Not Specified
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL(DL 0.001)	BDL(DL 0.001)	Not Specified
18.	Hexavalent Chromium as Cr ⁺⁶	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
19.	Escherichia coli (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	203	241	500/100 mL (MPN)
20.	Intestinal Enterococci (Streptococci)	IS1622:1981 (RA 2009)	MPN/100mL	108	128	500/100 mL (MPN)

Note:- BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;
MPN - Most Probable Number

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Office # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Phone: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

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TEST REPORT

Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	24.09.2021
Analysis Commenced on	27.09.2021
Analysis Completed on	11.10.2021
Report Date	12.10.2021
Report No	HECS/S/001/240921

S.No.	Parameters	Units	Results	TestMethod
1	Total Phosphorous	mg/kg	0.23	IS 10158 : 1982
2	Oil & Grease	mg/kg	3.2	USEPA Method
3	Nitrates	mg/kg	0.59	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.53	USEPA Method
5	Lead as Pb	mg/kg	0.412	USEPA Method
6	Cadmium as Cd	mg/kg	0.32	USEPA Method
7	Mercury as Hg	mg/kg	BDL(DL 0.1)	USEPA Method
8	PAH	mg/kg	0.33	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.03	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.082	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.04	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.06	USEPA Method 525.2: 1995
viii.	α -Endosulphan	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
ix.	β -Endosulphan	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.065	USEPA Method 525.2: 1995
xi.	α - HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xii.	β - HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xiii.	γ -HCH	mg/kg	0.29	USEPA Method 525.2: 1995
xiv.	δ -HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.05	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995

Note:- BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

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Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.inC-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
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TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters -Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

RESULTS**Distribution of Phytoplankton (Nos./m³) in the sampled Berth No. 14**

Phytoplankton	At Berth No. 14
DIATOMS	
<i>Coscinodiscus granii</i>	3725
<i>Coscinodiscus centralis</i>	2215
<i>Coscinodiscus marginatus</i>	986
<i>Thalassiosira nitzschioides</i>	2452
<i>Thalassiosira sp.</i>	1111
<i>Thalassionema frauenfeldii</i>	125
<i>Thalassionema nitzschioides</i>	114
<i>Thalassiothrix sp.</i>	803
<i>Biddulphia mobilensis</i>	805
<i>Bacillaria spp.</i>	625
<i>Hemiaulus spp.</i>	10
<i>Chaetoceros affinis</i>	600
<i>Chaetoceros breve</i>	400
<i>Chaetoceros curvisetus</i>	302
<i>Ditylum spp.</i>	408
<i>Planktoniella sol</i>	425
<i>Leptocylindrus spp.</i>	110
<i>Melosira spp.</i>	8
<i>Rhizosolenia styliformis</i>	160
<i>Rhizosolenia alata</i>	36
<i>Rhizosolenia robusta</i>	32
<i>Skeletanema spp.</i>	13
<i>Nitzchia spp.</i>	325
<i>Fragillaria oceanica</i>	1056
<i>Navicula spp.</i>	3225
<i>Pleurosigma spp.</i>	1152
<i>Stephanophysis spp.</i>	142
<i>Schoursoederella spp.</i>	10
<i>Odontella mobiliensis</i>	158
<i>Odontella spp.</i>	239

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

RESULTS

DINOFLAGELLATES	
<i>Ceratiumtripos</i>	1002
<i>Ceratiumfurca</i>	625
<i>Ceratiumfusus</i>	136
<i>Ceratiumlunula</i>	190
<i>Peridiniumdepressum</i>	269
<i>Dinophysis spp.</i>	2
<i>Noctiluca spp.</i>	111
<i>Protoperidiniumgranii</i>	1121
<i>Protoperidinium sp.</i>	594
NANOPLANKTERS	
<i>Chlorella spp.</i>	3
Total biomass (cc/m ³)	0.734

Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
	40	25825	4.23	0.96	4.51

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory and Quality Manager)



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D.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

RESULTS

Distribution of Zooplankton (Nos/m³) in the Berth No. 14

	Berth No. 14
Dinoflagellates	
Noctilucaspp	162
Ciliates	
Tintinopsis	2185
Protozoa	
Radiolarians	1963
Bryozoa	
Bryozoan larvae	1685
Cnidaria	
Medusae	632
Annelid	
Polychaete larvae	344
Urochordata (Tunicates)	
Oikopleura	1121
Brachiopoda	
Brachiopod larvae	218
Cladocera	2256
Crustacea	
Alima Larvae	139
Crustacean eggs	2925
Decapod	25789
Cypris larvae	6
Crab larvae	10
Lucifer	2563
Protozoea	398
Copepod	16952
Copepod Nauplius	18856
Nauplius	10
Barnacle Nauplius	6
PISCES	
Fish Egg	95
HEXAPODA	
Insect	6
Total biomass (cc/m ³)	1.83

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J: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
M: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

RESULTS**Zooplankton community structure variability in the berth No. 14**

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	78321	3.85	0.92	4.87

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
- Poor		2-1
Bad		1-0

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h: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

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Page 5 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

RESULTS

Distribution of benthos (Nos/m²) in the identified Berth No. 14

	Berth No. 14
CRUSTACEA	
Amphipod	5
Isopods	8
Cumacea	123
Crustacean eggs	1456
Crustacean	2
Mysids	10
Egg mass	236
Brachyuran crabs	1689
MOLLUSCA	
Bivalves	369
Gastropods	263
SCAPHOPODA	
Dentalium	178
FORAMINIFERA	
Foraminifera	285
CNIDARIA	
Medusa	0
ANNELIDA	
Nereidae	225
Polychaetes	212
Spionidae	1456
HYDROZOA	
Hydrozoans	321
Total biomass (g/m²)	170.5

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

RESULTS**Benthos community structure variability in the Berth No. 14**

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	16	6838	3.93	0.90	4.36

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	DISCHARGE OF TREATED SURFACE RUNOFF
Sample Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	24.09.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	24.09.2021
Analysis Commenced On	24.09.2021
Completed On	01.10.2021
Report No	HECSM/WW/002/240921
Report Date	04.10.2021

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std.
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	7.56	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 rd Edn., 2017	mg/L	5.9	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O ₂	IS:3025 (Pt 44)1993(RA 2009)	mg/L	4.8	≤ 10
5.	Chemical Oxygen Demand	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	20.1	≤ 50
6.	Phenolic content as C ₆ H ₆ OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
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End of Report

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