

PORT AUTHORITY, KARNATAKA

COMPREHENSIVE ENVIRONMENTAL MONITORING REPORT

(April 22- September 2022)

Name of Contractor

M/S. NETYA ENGINEERING

Contract No.

NETYA/2021/001

Location of Job

Older Jetty, Old Jetty

For



NEW MANGALORE PORT AUTHORITY
Panambur, Mangalore, Karnataka

**SIX MONTHLY ENVIRONMENTAL MONITORING COMPLIANCE REPORT FOR M/s NEW MANGALORE
PORT AUTHORITY, KARNATAKA, INDIA**

Name of Client:	M/s. NEW MANGALORE PORT AUTHORITY, KARNATAKA, INDIA
Name of Contractor:	M/s. NITYA LABORATORIES
Work Order No:	No.3/12/EMMP/CE/2020-21/TS
Nature of Job:	Monitoring of Environmental Parameters on Air, Marine, Water, STP Water, Drinking Water, Noise, DG Stack as per KSPCB/CPCB Standards for the Years 2020-21 and 2021-22



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1.0 INTRODUCTION

The New Mangalore Port was declared as the 9th major port on 4th May 1974 and was formally inaugurated on 11th January 1975. The provisions of major port trusts act, 1963 were extended to the new Mangalore port and a port trust board was formed with effective from 1.4.1980 over the years the port has grown from the level of handling less than a lakh tones' of cargo to 42.05 million tonnes handled during the years 2017-18. The port area is of 2032 acres. The port facilities provided are to face the growing challenges and emerging needs of the 21st century. Lying south, the Indian ocean provided major sea routes connecting the middle East Africa, East Asia with Europe and the USA.

The major commodities exporting through the port are Iron ore fines, coffee, Granite, stones, fish meal and oil, iron ore pellets by containerized cargo. The major imports of the port are crude petroleum products, LPG raw cashew other liquid chemicals containerized cargo, coal, limestone, fertilizer, edible oil and cement.

1.1 Environmental Management Plan

1.1.1 Environmental Policy

NMPA is an Iso 9001:2015; 14001-2015 & ISPS Compliant Port. NMPA is prepared to protect the environment by minimizing the pollution impacts of the port activities and follows the sustainable development through environmental management performance. Prevent and control pollution and maintain eco-friendly environment. Organize environment awareness among staff, user and visitors. Team up shop floor personnel, service providers and other stake holders to work towards pollution free environment.

Being concerned towards environmental protection, NMPA has prepared an extensive environmental management plan for port operations. The field environmental monitoring studies were carried out for ambient air, noise level, stack emission, marine and drinking water quality, sludge and waste water quality, and half yearly complied data are presented here.



2.2 Air Environment

2.2.1 Ambient Air Quality

2.2.1.1 Monitoring Stations

14. All air quality monitoring stations are in compliance with Guidelines in Annexure 1. Number of monitoring stations: As per Annexure 1, an ambient air quality monitoring station is located at the following locations during the period from April 2022 to 31 September 2022.

Location of Air Quality Monitoring Stations

Sl. No.	Location of Station
1	US Major Gate
2	Q1 Jetty area Near L&C Terminal
3	STAD Post Office
4	Old Customs Guard Office
5	NMPA House

AMBIENT AIR QUALITY MONITORING

2.2.2 Frequency and Parameters

On each sampling day, 1 set of 24 hour 24 hour average ambient air quality data is measured by sampling during the sampling period.

1. Particulate matter (PM₁₀)
2. Particulate matter (PM_{2.5})
3. Sulphur dioxide (SO₂)
4. Oxides of nitrogen (NO_x)
5. Benzene
6. Toluene
7. Carbon monoxide
8. Arsenic
9. Ozone
10. Hexa
11. Arsenic
12. Lead

2.2.3 Sampling and Analytical Procedures

A brief description of the sampling and analytical procedures follows below:

Particulate Matter (PM₁₀)

The sampling of ambient air for monitoring PM₁₀ levels was performed using a gravimetric method. All samplers are equipped with a high-volume flow rate of 28 m³/min. The concentration of PM₁₀ was computed from the weight loss of particulate matter collected over the filter surface.

Particulate Matter (PM_{2.5})

PM_{2.5} is determined as per USEPA Method 104: Enhanced Particulate Matter Method (FPM). Ambient air is drawn through a 2.5 µm cyclone filter and a 37 mm diameter filter paper. Particulate matter is then



2.0 Air Environment

2.1 Ambient Air Quality

2.1.1 Monitoring Stations

M/s Nitya Laboratories team in consultation with Engineer In-charge of New Mangalore Port Authority fixed the frequency and number of sampling stations. Accordingly, an ambient air quality monitoring was conducted at 05 locations during the period of 1st April 2022 to 31st September 2022.

Table - 1
Location of Air Quality Monitoring Stations

Sr. No.	Location of Station	Direction w.r.t. centre of New Mangalore Port Authority
1.	US Malya Gate	Once in a Month
2.	Oil Jetty area Near I.M.C. Terminal	Once in a Month
3.	VTMS Port Control	Once in a Month
4.	Old Coastal Guard Office	Once in a Month
5.	NMPA Hospital	Once in a Month

2.1.2 Frequency and Parameters

On each sampling day, 1 set of 24 hour / 8 hour average samples was collected. The following air pollution parameters were measured by sampling during the sampling period.

1. Particulate matter (PM₁₀)
2. Particulate matter (PM_{2.5})
3. Sulphur dioxide (SO₂)
4. Oxides of nitrogen (NO_x)
5. Benzo (α) pyrene
6. Benzene
7. Carbon monoxide
8. Ammonia
9. Ozone
10. Nickel
11. Arsenic
12. Lead

2.1.3 Sampling and Analytical Procedure

A brief description of the sampling and analytical procedures followed during the ambient air quality survey is as follows:

Particulate Matter (PM₁₀)

The sampling of ambient air for evaluating PM₁₀ levels were performed with a RDS Sampler fitted with a cyclone separator. Air exiting the separator is drawn at a measured rate through pre-weighed glass fiber filter sheets of 20 cm x 25 cm sizes. The concentration of PM₁₀ were computed from the average air flow rate, sampling period and the mass of particulate matter collected over the filter surface.

Particulate Matter (PM_{2.5})

PM_{2.5} is determined as per USEPA (United State Environment Protection Agency) guidelines with the help of Fine Dust Sampler (FDS). Ambient air @ 16.67 lpm is allowed to pass through Louvered inlet and WINS Impactor assembly having a 37mm dia. filter paper. Particulate matter of size <2.5 microns is deposited on 46.2mm dia. PTFE



filter. The difference of final weight and initial weight of filter paper gives the weight of particulate matter of size <2.5 microns. The concentration of PM_{2.5} is computed as the weight of dust deposited on the filter divided by volume of air sampled.

Sulphur Dioxide (SO₂)

The sampling of ambient air for evaluating the gaseous pollutants were performed with a Multigas Sampler, using the vacuum created by the FDS Sampler for drawing the air samples through the impingers. For SO₂, air was drawn at a measured and controlled rate of 400 to 500 ml/min & passed through a solution of potassium tetrachloromercurate (TCM). After sampling, the absorbing reagent was treated with dilute solutions of sulfamic acid, formaldehyde and para-rosaniline hydrochloride. The absorbance of the intensely coloured para-rosaniline methyl sulphonic acid was measured at the wavelength of 560 nm using spectrophotometer and the amount of SO₂ in the sample was computed. The ambient SO₂ concentrations were computed from the amount of SO₂ collected and the volume of air sampled.

Oxides of Nitrogen

Air was drawn at a measured and controlled rate of about 200 ml/minute through an orifice-tipped impinger containing solutions of sodium hydroxide and sodium arsenite. After completion of the sampling, an aliquot of the used absorbing solution was treated with solutions of H₂O₂, sulphanimide and NEDA. The nitrite ion present in the impinger was calculated from the absorbance of the resulting solution measured at 540 nm using spectrophotometer. The ambient NO_x concentrations were computed from the total nitrite ion present in the impingers, overall efficiency of the impinger and the procedure, and the volume of air sampled.

Benzene

Air was drawn through a glass tube containing 5 -15 gm of silica gel (300-600 µm size) at the rate not exceeding 1.5 litre/minute for a period of 20-30 minutes to get representative volume of sample. Transfer the silica gel into a 50 ml bottle. Add 20 ml iso-propyl alcohol, shake for 2 minutes and allowed to settle for at least 5 minute. Analyze alcohol layer on gas-liquid chromatography over polypropylene glycol using flame ionization detector.

Benzo (α) Pyrene

Ambient air samples were collected for Benzo (α) pyrene in cellulose 8' x 10' membrane filters exposed for 24 h using RDS, at the average flow rate of 1.1 m³/min for particulate phase. These filter papers were extracted and analysed by GC.

Carbon Monoxide

Rubber Bladder and Aspirators have been used to collect the 8 hourly samples for carbon monoxide. The CO levels were analysed through Gas Chromatography with Methanizer.

Ammonia

The ambient air is collected through FDS fitted with two Midget impingers containing 10 ml absorbing solution i.e. dilute Sulphuric acid in each (one for blank) at the rate of 1.0 l/min for a period of 10-15 minutes. Ammonium sulphate solution thus formed is treated with Nessler reagent to produce yellow-brown colour complex. The Ammonia concentration is determined by spectrophotometer at 440 nm and comparing it with a standard curve.

Ozone

Air is drawn through a midget impinger containing potassium iodide in a neutral buffer in between 0.2 lpm to 2.0 lpm for a period of 30 minutes. The Iodine liberated in the absorbing reagent is determined by spectrophotometer at 352 nm.

Heavy Metals (Nickel, Arsenic & Lead)

Dust sample was collected on EPM 2000 filter paper with the help of Respirable Dust Sampler & dried at 105°C for removal of moisture. Appropriate weight of sample was subjected for digestion with aqua-regia. Silica was separated by precipitation & filtration of digested sample. Filtrate was used for determination of heavy metals by using Atomic Absorption Spectrophotometer as per standard method given in APHA, 23rd edition.



2.1.4 Techniques for Measurement

The techniques used for measurement of pollutants may be summarized as under:

TABLE - 2

Measurement Techniques

Sr.No.	Parameters	Code of Practice	Sampler	Instruments used for Analysis
1.	PM ₁₀	IS: 5182(Part-IV)	RDS Sampler with Cyclone Separator	Balance, Desiccator
2.	PM _{2.5}	USEPA's Quality Assurance Guideline Documents 2.12	FDS Sampler with Wins impactor	Balance, Desiccator
3.	SO ₂	IS: 5182(Part-V)	RDS Sampler	Spectrophotometer
4.	NO _x	IS: 5182(Part-V)	RDS Sampler	Spectrophotometer
5.	Benzene	IS:5182(Part -11)	Handy Sampler	Gas Chromatograph with FID Detector
6.	Benzo (α) pyrene	-	RDS Sampler	Gas Chromatograph
7.	Carbon Monoxide	IS: 5182(Part-X)	Bladder & Aspirator	Gas Chromatograph
8.	Ammonia	APHA	RDS Sampler	Spectrophotometer
9.	Ozone	IS: 5182 (Part-XVIII)	RDS Sampler	Spectrophotometer
10.	Heavy Metal (Ni & As)	-	RDS Sampler (EPM-2000)	Atomic Absorption Spectrophotometer
11.	Heavy Metal (Pb)	IS: 5182(Part 22)	RDS Sampler (EPM-2000)	Atomic Absorption Spectrophotometer



2.1.5 Results

The observations made on air quality parameters at 05 locations have been presented in the test reports. Minimum and maximum values, arithmetic mean values of the 24 hour / 8 hour average concentrations have also been computed and presented.

[The table content is extremely faint and illegible due to low contrast and scan quality. It appears to be a large grid with multiple columns and rows, likely containing air quality data.]



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Air Pollution

Sample Drawn By: Nitya Laboratories

AMBIENT AIR MONITORING FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr.NO.	Locations			US Malya gate	Oil Jetty area Near I.M.C. Terminal	VTMS Port Control	Old Coastal Guard Office	NMPA Hospital	CISF ADMN OFFICE
1	PM10	$\mu\text{g}/\text{m}^3$	Min.	72.43 (Sept. 2022)	78.26 (Sept. 2022)	68.46 (Sept. 2022)	81.44 (Aug. 2022)	86.24 (Apr. 2022)	86.37 (Aug. 2022)
			Max.	84.40 (Apr. 2022)	92.12 (May. 2022)	86.48 (July. 2022)	92.24 (Apr. 2022)	86.24 (Apr. 2022)	75.18 (May. 2022)
			Avg.	78.76	85.83	81.14	85.39	86.24	81.89
2	PM2.5	$\mu\text{g}/\text{m}^3$	Min.	26.82 (June. 2022)	22.10 (Aug. 2022)	28.44 (May. 2022)	30.04 (Sep. 2021)	28.16 (Apr. 2022)	25.28 (May. 2022)
			Max.	34.22 (Apr. 2022)	32.84 (Apr. 2022)	38.46 (Aug. 2022)	38.12 (May. 2022)	28.16 (Apr. 2022)	44.68 (May. 2022)
			Avg.	29.80	28.30	33.44	34.73	28.16	30.93
3	SO2	$\mu\text{g}/\text{m}^3$	Min.	10.18 (June. 2022)	12.63 (Sep. 2022)	11.54 (May. 2022)	14.82 (JUNE. 2022)	12.46 (Apr. 2022)	25.68 (Sep. 2022)
			Max.	21.82 (Sep. 2022)	20.64 (Aug. 2022)	16.18 (July. 2022)	23.20 (Sep. 2022)	12.46 (Apr. 2022)	10.24 (May. 2022)
			Avg.	13.74	15.16	14.12	18.06	12.46	16.17
4	NO2	$\mu\text{g}/\text{m}^3$	Min.	20.42 (June 2022)	27.97 (Sep 2022)	21.28 (Sep 2022)	28.46 (July 2022)	22.20 (Apr 2022)	32.41 (Sep 2022)
			Max.	34.30 (Sep 2022)	32.44 (June 2022)	30.48 (Apr 2022)	38.64 (Sep 2022)	22.20 (Apr 2022)	22.18 (July 2022)
			Avg.	26.45	29.86	25.40	31.77	22.2	26.33
5	CO	mg/m^3	Min.	0.18 (Oct. 2022)	0.32 (Apr. 2022)	0.28 (Apr. 2021)	0.14 (Apr. 2022)	0.12 (Apr. 2022)	0.25 (Sep. 2022)
			Max.	0.95 (Aug. 2022)	1.14 (Sep. 2022)	1.1 (Sep. 2022)	1.14 (Sep. 2022)	0.12 (Apr. 2022)	0.14 (May. 2022)
			Avg.	0.7	0.72	0.76	0.63	0.12	0.19
6	NH3	$\mu\text{g}/\text{m}^3$	Min.	34.68 (Sep 2022)	34.28 (June 2022)	40.82 (Apr 2022)	34.62 (July 2022)	38.46 (Apr 2022)	44.11 (Sep 2022)
			Max.	44.62 (Apr 2022)	40.96 (May 2022)	54.28 (Sep 2022)	49.63 (Sep 2022)	38.46 (Apr 2022)	34.40 (July 2022)
			Avg.	40.83	38.56	44.53	41.21	38.46	38.77
7	O3	$\mu\text{g}/\text{m}^3$	Min.	14.28 (Apr 2022)	12.26 (Apr 2022)	15.62 (Apr 2022)	18.28 (Apr 2022)	11.18 (Apr 2022)	27.71 (Sep 2022)
			Max.	22.75 (Sep 2022)	29.96 (Sep 2022)	24.99 (Aug 2022)	24.15 (Aug 2022)	11.18 (Apr 2022)	13.64 (May 2022)
			Avg.	19.18	20.67	20.27	21.50	11.18	19.88
8	Pb	$\mu\text{g}/\text{m}^3$		ND	ND	ND	ND	ND	ND
9	C6H6			ND	ND	ND	ND	ND	ND
10	BAP			ND	ND	ND	ND	ND	ND
11	As	mg/m^3		ND	ND	ND	ND	ND	ND
12	Ni			ND	ND	ND	ND	ND	ND



2.1.6 Air Quality Standards

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 16th November, 2009

G.S.R. 826(E) – In exercise of the power conferred by section 6 and section 25 of the Environment (Protection) Act 1986, the Central Government hereby makes the following rules further to amend the Environment (Protection) Rules, 1986 namely :

1. (i) These rules may be called the Environment (Protection) Seventh Amendment Rules, 2009
(ii) They shall come into force on the date of their publication in the official gazette.
2. In the Environment (Protection) Rules, 1986 thereafter referred to as the said rules, in rule 3, in sub-rule (3B), for the words, brackets, figures and letters, "in columns (3) to (5) of Schedule VII", the words, brackets, figures and letters "in columns (4) and (5) of Schedule-VII" shall be substituted.
3. For Schedule VII to the said rules and entries relating thereto, the following schedule and entries shall be substituted namely:

TABLE - 8

ENVIRONMENT (PROTECTION) SEVENTH AMENDMENT RULES, 2009

NATIONAL AMBIENT AIR QUALITY STANDARDS

"[SCHEDULE VII]"

[See Rule 3 (3B)]

NATIONAL AMBIENT AIR QUALITY STANDARDS

Sr. No.	Pollutants	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
			Industrial, Residential, Rural & Other Areas	Ecologically Sensitive Area (notified by Central Govt.)	
(1)	(2)	(3)	(4)	(5)	(6)
1.	Sulphur Dioxide (SO ₂), µg/m ³	Annual*	50	20	-Improved West &Gaeke
		24-hours**	80	80	-Ultraviolet Fluorescence
2.	Nitrogen Dioxide (NO ₂), µg/m ³	Annual*	40	30	-Modified Jacob &Hochheiser (Na-Arsenite)
		24-hours**	80	80	-Chemiluminescence
3.	Particulate Matter (Size less than 10µm) or PM ₁₀ , µg/m ³	Annual*	60	60	-Gravimetric -TOEM
		24-hours**	100	100	-Beta attenuation
4.	Particulate Matter (Size less than	Annual*	40	40	-Gravimetric -TOEM

	2.5µm) or PM _{2.5} µg/m ³	24-hours**	60	60	-Beta attenuation
5.	Ozone (O ₃), µg/m ³	8-hours*	100	100	-UV Photometric - Chemiluminescence
		1-hour**	180	180	-Chemical Method
6.	Lead (Pb), µg/m ³	Annual*	0.50	0.50	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
		24-hours**	1.0	1.0	-ED-XRI using Teflon filter
7.	Carbon Monoxide (CO), mg/m ³	8-hours*	02	02	-NDIR Spectroscopy
		1-hour**	04	04	
8.	Ammonia (NH ₃), µg/m ³	Annual*	100	100	-Chemiluminescence -Indophenol Blue Method
		24-hours**	400	400	
9.	Benzene (C ₆ H ₆), µg/m ³	Annual*	05	05	- Gas Chromatography based continuous Analyzer -Adsorption and Desorption followed by GC Analysis
10.	Benzo(α)Pyrene (BAP)- particulate phase only, ng/m ³	Annual*	01	01	-Solvent Extraction followed by HPLC/GC Analysis
11.	Arsenic (As), ng/m ³	Annual*	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
12.	Nickel (Ni), ng/m ³	Annual*	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24-hourly at uniform intervals.

** 24-hourly or 08-hourly or 01-hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note: Whenever and wherever monitoring result on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.



2.1.7 Results & Discussion on Observations

2.1.7.1 Particulate Matter (PM₁₀)

During the study period, the PM₁₀ concentrations were observed in the range of **68.46 to 92.24** $\mu\text{g}/\text{m}^3$, with the average value ranged between of **78.6 to 92.24** $\mu\text{g}/\text{m}^3$. It can be observed that the average value is within the limits specified in the ambient air quality standards. It is, therefore, concluded that PM₁₀ concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.2 Particulate Matter (PM_{2.5})

During the study period, the PM_{2.5} concentrations were observed in the range of **22.10 to 44.68** $\mu\text{g}/\text{m}^3$, with the average value ranged between of **28.16 to 34.73** $\mu\text{g}/\text{m}^3$. It can be observed that the average value is within the limits specified in the ambient air quality standards. It is, therefore, concluded that PM_{2.5} concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.3 Sulphur Dioxide (SO₂)

During the study period, the SO₂ concentrations were observed in the range of **10.18 to 23.20** $\mu\text{g}/\text{m}^3$, with the average value ranged between of **12.46 to 18.06** $\mu\text{g}/\text{m}^3$. It can be observed that the average value is within the limits specified in the ambient air quality standards. It is, therefore, concluded that SO₂ concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.4 Oxides of Nitrogen (NO_x)

During the study period, the NO_x concentrations were observed in the range of **20.42 to 38.64** $\mu\text{g}/\text{m}^3$, with the average value ranged between of **22.2 to 31.77** $\mu\text{g}/\text{m}^3$. It can be observed that the average value is within the limits specified in the ambient air quality standards. It is, therefore, concluded that NO_x concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.5 Benzene (C₆H₆)

During the study period, the Benzene concentrations were found below detection level. The concentration of Benzene cannot be compared with National Ambient Air Quality Standard as there is no standard for 24-hrs average in NAAQS.

2.1.7.6 Benzo (a) pyrene

During the study period, the Benzo (a) pyrene concentrations were found below detection level

2.1.7.7 Carbon monoxide (CO)

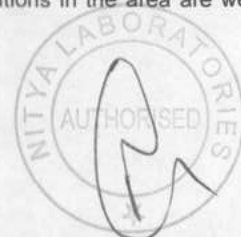
During the study period, the CO concentrations were observed in the range of **0.12 to 1.14** mg/m^3 , with the average value ranged between of **0.12 to 0.76** mg/m^3 . Thus, the average values of CO concentrations are within the limits specified in the ambient air quality. It is, therefore, concluded that CO concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.8 Ammonia (NH₃)

During the study period, the ammonia concentrations were observed in the range of **34.28 to 54.28** $\mu\text{g}/\text{m}^3$, with the average value ranged between of **38.46 to 44.53** $\mu\text{g}/\text{m}^3$. Thus, the average values of ammonia concentrations are within the limits specified in the ambient air quality. It is, therefore, concluded that ammonia concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.9 Ozone (O₃)

During the study period, the O₃ concentrations were observed in the range of **11.18 to 29.96** $\mu\text{g}/\text{m}^3$, with the average value ranged between of **11.18 to 19.18** $\mu\text{g}/\text{m}^3$. Thus, the average values of O₃ concentrations are within the limits specified in the ambient air quality. It is, therefore, concluded that O₃ concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.



2.1.7.10 Nickel (Ni)

During the study period, the Nickel concentrations were found below detection level. The concentration of nickel cannot be compared with National Ambient Air Quality Standard as there is no standard for 24-hrs average in NAAQS.

2.1.7.11 Arsenic (As)

During the study period, the Arsenic concentrations were found below detection level. The concentration of arsenic cannot be compared with National Ambient Air Quality Standard as there is no standard for 24-hrs average in NAAQS.

2.1.7.12 Lead (Pb)

During the study period, the Lead concentrations were found below detection level.



9.1 NOISE MONITORING

9.1.1 Monitoring Stations

The Nitya Laboratories have been appointed to monitor the noise levels and number of hours of the day during the period from April 2022 to September 2022.

Sr. No.	Location of Station
1.	Moyn's Gate
2.	Main Road
3.	Wharf Road (Junction)
4.	Administrative Office Building
5.	J.N.C. Hall in the campus
6.	Wharf Cantonment
7.	Container Yard

9.1.2 Results

The observations made in terms of number of loud sound events and whether or not they are in compliance with the standards.

NOISE MONITORING



3.0 NOISE MONITORING

3.1 Monitoring Stations

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, a Noise monitoring was conducted at 06 locations during the period from April 2022 to September 2022.

Table - 3
Location of Noise Monitoring Stations

Sr. No.	Location of Station	Frequency
1.	Malya Gate (Main Gate)	Once in a Month
2.	Wharf Berth (Inside)	Once in a Month
3.	Administrative Office Building	Once in a Month
4.	J.N.C. Hall in the campus	Once in a Month
5.	Wharf Canteen	Once in a Month
6.	Container Yard	Once in a Month

3.2 Results

The observations made on Noise Monitoring at 06 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Noise Monitoring

Sample Drawn By: Nitya Laboratories

Ambient Noise Monitoring for Six Months APRIL 2022 to September 2022 Summary

Sr. No.	Location	Noise Level in dB(A)							
		Day Time				Night Time			
		Min.	Max.	Average	CPCB Limit	Min.	Max.	Average	CPCB Limit
1	Malya Gate (Main Gate)	72.4 (June 2022)	73.8 (Aug. 2022)	72.98	Industrial Area Day Time Avg. 75 dB(A)	65.3 (Sep. 2022)	67.3 (Aug. 2022)	64.43	Industrial Area Day Time Avg. 70 dB(A)
2	Wharf Berth (Inside)	65.6 (May. 2022)	72.6 (July 2022)	70.18		57.6 (June 2022)	63.2 (Sep 2022)	60.2	
3	Administrative Office Building	70.3 (Sep 2022)	73.6 (April 2022)	72.55		61.8 (Sep. 2022)	68.9 (April 2022)	65.25	
4	J.N.C. Hall in the campus	70.2 (April 2022)	73.6 (June 2022)	71.65		57.9 (May 2022)	63.2 (Aug. 2022)	61.06	
5	Wharf Canteen	69.7 (Sep. 2022)	73.5 (Aug. 2022)	72.08		62.5 (Sep. 2022)	66.2 (Aug. 2022)	64.25	
6	Container Yard	71.08 (April 2022)	75 (Aug. 2022)	73.11		62.7 (June 2022)	65.3 (Aug. 2022)	64.13	



3.3 Sampling and Analytical Procedure

The ambient Noise Level in four cardinal directions were carried out using anLutron sound level meter with windscreen during the daytime as well as night-time. Noise measurements were made at 1.5 meter above the ground level and about 3 m away from the walls, buildings or other sound reflecting sources. The measurements were carried out in such a way that 1 meter away from the sources and 1 meter away from the edge of the roads. In order to reduce the disturbance from standing waves, the noise level measured were averaged over +0.5m each of at less three positions.The mean values were taken for reporting.

DRINKING WATER QUALITY



4.1 Monitoring Water Sampling

4.1.1 Sampling Locations

The New Mangalore Port Authority is responsible for the water and drinking water quality monitoring and sampling at various locations in the port area.

No.	Location
1	Water Treatment Plant
2	Water supply to DWS
3	Water supply to DWS
4	Water supply to DWS
5	Water supply to DWS
6	Water supply to DWS
7	Water supply to DWS
8	Water supply to DWS
9	Water supply to DWS
10	Water supply to DWS

DRINKING WATER QUALITY MONITORING

1	Water Treatment Plant
2	Water supply to DWS
3	Water supply to DWS
4	Water supply to DWS
5	Water supply to DWS
6	Water supply to DWS
7	Water supply to DWS
8	Water supply to DWS
9	Water supply to DWS
10	Water supply to DWS

4.2 Results

The monitoring results of drinking water sampling at various locations in the port area are as follows:

4.2.1 Microbiology

The results of drinking water quality monitoring at various locations in the port area are as follows:



4.0 Drinking Water Sampling

4.1 Sampling Location

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, an Water sampling was conducted at 19 locations during the period from April 2022 to September 2022.

Table - 4
Location of Drinking Water Sampling Stations

Sr. No.	Location of Station	Frequency
1.	Administration Building as DW1	Once in a Month
2.	NMPA School as DW2	Once in a Month
3.	NMPA Canteen as DW3	Once in a Month
4.	Hospital as DW4	Once in a Month
5.	NMPA Any Water Inlet Inside Wharf as DW5	Once in a Month
6.	Wharf Canteen (Inside the Port Area) as DW6	Once in a Month
7.	Traffic Building (Inside the Port Area) as DW7	Once in a Month
8.	Berth No.14 (Inside the Port Area) as DW8	Once in a Month
9.	Berth No.9 (Inside The Port Area) as DW9	Once in a Month
10.	NMPA Guest House as DW10	Once in a Month
11.	Marshalling Yard as DW11	Once in a Month
12.	Fifth Avenue Open Well as S1	Once in a Month
13.	RCHW Colony Open Well as S2	Once in a Month
14.	RCHW Colony New Open Well as S3	Once in a Month
15.	Sump Tank (Pump House) as S4	Once in a Month
16.	New UGR Open Well as S5	Once in a Month
17.	Timber Yard as S6	Once in a Month
18.	Thimmappayya Well as S7	Once in a Month
19.	MCC Water at New UGR as S8	Once in a Month

4.2 Results

The observations made on drinking water sampling at 19 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.

4.3 Methodology

The samples for drinking water quality characterization were collected and analysed as per the procedures specified in "Standard Method for the Examination of Water & Wastewater published by "American Public Health Association" (APHA: 23rd edition) and IS 3025. All the parameters except Heavy metals and Bacteriological were analysed at the site i.e., at Panambur. Samples of heavy metals and bacteriological parameters have been sent to our Laboratory. Samples for chemical analysis were collected in polyethylene containers. Samples collected for metal content were acidified with 1 ml. HNO₃.



4.4 Results & Discussion on Observations

4.4.1 Administration Building as DW1

During the study period, at this location, pH was found between **6.64 to 6.85**. Total Hardness was found between **42 to 50 mg/l**. Chlorides and Sulphates were found between **16.9 to 45.99 mg/l** and **0.58 to 0.82 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.06 to 0.083 mg/l** and **0.02 to 0.09 mg/l** respectively. Standard Plate Count is between **48 to 58 cfu/ml** and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.2 NMPA School as DW2

During the study period, at this location, pH was found between **6.28 to 6.81**. Total Hardness was found between **58 to 66 mg/l**. Chlorides and Sulphates were found between **31.99 to 35.99 mg/l** and **6.42 to 8.76 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.05 to 0.08 mg/l** and **0.05 to 0.16 mg/l** respectively. Standard Plate Count is between **1 to 64 cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.3 NMPA Canteen as DW3

During the study period, at this location, pH was found between **6.78 to 6.95**. Total Hardness was found between **42 to 56 mg/l**. Chlorides and Sulphates were found between **21.90 to 44.99 mg/l** and **4.8 to 7.5 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.04 to 0.08 mg/l** and **0.05 to 0.12 mg/l** respectively. Standard Plate Count is between **60 to 78 cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.4 Hospital as DW4

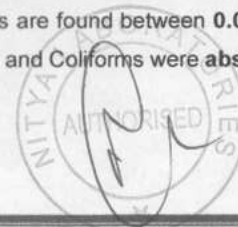
During the study period, at this location, pH was found between **6.76 to 6.88**. Total Hardness and Total Dissolved Solids were found between **36 to 50 mg/l** and **112 to 160**. Chlorides and Sulphates were found between **12.39 to 32.99 mg/l** and **8.62 to 12.71 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.049 to 0.06 mg/l** and **0.02 to 0.08 mg/l** respectively. Standard Plate Count is between **34 to 56 cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.5 NMPA any Water Inlet Inside Wharf as DW5

During the study period, at this location, pH was found between **6.74 to 6.82**. Total Hardness and Total Dissolved Solids were found between **8 to 124 mg/l** and **132 to 232**. Chlorides and Sulphates were found between **8.99 to 49 mg/l** and **4.14 to 7.41 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.077 to 0.13 mg/l** and **0.06 to 0.12 mg/l** respectively. Standard Plate Count is between **1 to 62 cfu/ml** and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.6 Wharf Canteen (Inside the Port Area) as DW6

During the study period, at this location, pH was found between **6.72 to 6.78**. Total Hardness and Total Dissolved Solids were found between **10 to 48 mg/l** and **24 to 84**. Chlorides and Sulphates were found between **11.99 to 22.99 mg/l** and **1.83 to 3.03 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.06 to 0.09 mg/l** and **0.04 to 0.09 mg/l** respectively. Standard Plate Count is between **1 to 62 cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.



4.4.7 Traffic Building (Inside the Port Area) as DW7

During the study period, at this location, pH was found between **6.48 to 6.95**. Total Hardness and Total Dissolved Solids were found between **10 to 80 mg/l** and **42 to 106**. Chlorides and Sulphates were found between **13.9 to 24.99 mg/l** and **2.46 to 3.66 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.06 to 0.11 mg/l** and **0.05 to 0.16 mg/l** respectively. Standard Plate Count is between **1 to 56cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.8 Berth No.14 (Inside the Port Area) as DW8

During the study period, at this location, pH was found between **6.79 to 7.64**. Total Hardness and Total Dissolved Solids were found between **16 to 180 mg/l** and **110 to 396**. Chlorides and Sulphates were found between **14.99 to 64.9 mg/l** and **23.84 to 32.74 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.08 to 0.12 mg/l** and **0.05 to 0.09 mg/l** respectively. Standard Plate Count is between **46 to 52 cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.9 Berth No.9 (Inside the Port Area) as DW9

During the study period, at this location, pH was found between **6.48 to 7.12**. Total Hardness and Total Dissolved Solids were found between **118 to 206 mg/l** and **322 to 406**. Chlorides and Sulphates were found between **54.99 to 89.97 mg/l** and **89.97 to 36.12 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.097 to 0.17 mg/l** and **0.08 to 0.17 mg/l** respectively. Standard Plate Count is between **52 to 68 cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.10 NMPA Guest House as DW10

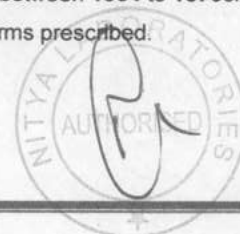
During the study period, at this location, pH was found between **6.46 to 6.84**. Total Hardness and Total Dissolved Solids were found between **12 to 76 mg/l** and **112 to 148**. Chlorides and Sulphates were found between **12 to 36.9 mg/l** and **4.14 to 7.08 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.01 to 0.08 mg/l** and **0.06 to 0.13 mg/l** respectively. Standard Plate Count is between **1 to 62cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.11 Marshalling Yard as DW11

During the study period, at this location, pH was found between **6.62 to 6.91**. Total Hardness and Total Dissolved Solids were found between **30 to 60 mg/l** and **102 to 132.0**. Chlorides and Sulphates were found between **21.9 to 26.99 mg/l** and **3.62 to 5.32 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.05 to 0.09 mg/l** and **0.06 to 0.12 mg/l** respectively. Standard Plate Count is between **1 to 64cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.12 Fifth Avenue Open Well as S1

During the study period, at this location, pH was found between **6.43 to 6.72**. Total Hardness and Total Dissolved Solids were found between **27.36 to 42.00 mg/l** and **67.37 to 124.0**. Chlorides and Sulphates were found between **17.9 to 21.99 mg/l** and **3.75 to 31.77 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.10 to 0.15 mg/l** and **0.04 to 0.12 mg/l** respectively. Standard Plate Count is between **1564 to 1670cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.



4.4.13 RCHW Colony Open Well as S2

During the study period, at this location, pH was found between **6.68** to **6.84**. Total Hardness and Total Dissolved Solids were found between **48** to **124** mg/l and **134** to **280**. Chlorides and Sulphates were found between **29.99** to **35.9** mg/l and **4.26** to **7.16** mg/l respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.09** to **0.14** mg/l and **0.02** to **0.07** mg/l respectively. Standard Plate Count is between **110** to **1624** cfu/ml and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.14 RCHW Colony New Open Well as S3

During the study period, at this location, pH was found between **6.65** to **6.93**. Total Hardness and Total Dissolved Solids were found between **50** to **140** mg/l and **124** to **254**. Chlorides and Sulphates were found between **24.99** to **30.99** mg/l and **2.24** to **6.80** mg/l respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.11** to **0.20** mg/l and **0.08** to **0.21** mg/l respectively. Standard Plate Count is between **72** to **1695** cfu/ml and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.15 Sump Tank (Pump House) as S4

During the study period, at this location, pH was found between **6.72** to **6.89**. Total Hardness and Total Dissolved Solids were found between **38** to **152** mg/l and **150** to **276** mg/L. Chlorides and Sulphates were found between **32.99** to **66.99** mg/l and **11.12** to **12.8** mg/l respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.16** to **0.26** mg/l and **0.12** to **0.28** mg/l respectively. Standard Plate Count is between **31** to **1529** cfu/ml and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.3.16 New UGR Open Well as S5

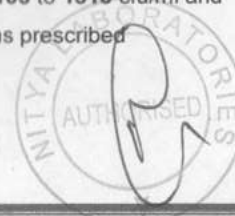
During the study period, at this location, pH was found between **6.71** to **6.90**. Total Hardness and Total Dissolved Solids were found between **16** to **114** mg/l and **54** to **262**. Chlorides and Sulphates were found between **16.9** to **43.98** mg/l and **1.45** to **5.2** mg/l respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.08** to **0.14** mg/l and **0.05** to **0.13** mg/l respectively. Standard Plate Count is between **210** to **1536** cfu/ml and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.17 Timber Yard as S6

During the study period, at this location, pH was found between **6.58** to **6.94**. Total Hardness and Total Dissolved Solids were found between **52** to **160** mg/l and **154** to **310**. Chlorides and Sulphates were found between **23.9** to **44.99** mg/l and **14.60** to **20.51** mg/l respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.07** to **1.13** mg/l and **0.07** to **0.14** mg/l respectively. Standard Plate Count is between **90** to **1597** cfu/ml and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.18 Thimmappayya Well as S7

During the study period, at this location, pH was found between **6.42** to **6.99**. Total Hardness and Total Dissolved Solids were found between **16** to **72.00** mg/l and **52** to **202**. Chlorides and Sulphates were found between **13** to **19.99** mg/l and **2.64** to **5.9** mg/l respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.048** to **0.15** mg/l and **0.16** to **0.14** mg/l respectively. Standard Plate Count is between **103** to **1518** cfu/ml and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed.



4.4.19TMCC Water at New UGR as S8

During the study period, at this location, pH was found between **6.676** to **6.84**. Total Hardness and Total Dissolved Solids were found between **60** to **108 mg/l** and **108** to **124 mg/l**. Chlorides and Sulphates were found between **13.9** to **18 mg/l** and **2.68** to **5.4 mg/l** respectively. Iron is found **ND**. The Ammonical Nitrogen and Phosphates are found between **0.16** to **0.18 mg/l** and **0.08** to **0.14mg/l** respectively. Standard Plate Count is between **214** to **234cfu/ml** and Coliforms were **absent**. All these values were found well within the IS: 10500-2012 norms prescribed

Sl. No.	Parameter	Value	IS: 10500-2012 Norm
1	pH	6.676 to 6.84	6.5 to 8.5
2	Total Hardness	60 to 108 mg/l	500 mg/l
3	Total Dissolved Solids	108 to 124 mg/l	500 mg/l
4	Chlorides	13.9 to 18 mg/l	250 mg/l
5	Sulphates	2.68 to 5.4 mg/l	400 mg/l
6	Iron	ND	0.3 mg/l
7	Ammonical Nitrogen	0.16 to 0.18 mg/l	0.5 mg/l
8	Phosphates	0.08 to 0.14 mg/l	0.1 mg/l
9	Standard Plate Count	214 to 234 cfu/ml	500 cfu/ml
10	Coliforms	absent	1000 cfu/ml



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Administration Building as DW1			Requirement IS:10500	Protocol
			Minimum	Maximum	Average		
1	pH	-	6.64 (Apr. 2022)	6.85 (Sep. 2022)	6.79	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	174 (May 2022)	261.6 (July 2022)	227.18	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	108 (May 2022)	170 (July 2022)	141	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	42 (June 2022)	50 (Sep. 2022)	46	200	IS:3025 (P-21)
8	Chlorides as Cl ⁻	mg/l	16.9 (April 2022)	45.99 (Aug. 2022)	36.30	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	0.58 (Aug. 2022)	0.82 (April 2022)	0.73	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.06 (May 2022)	0.083 (Sep. 2022)	0.072	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.02 (April 2022)	0.09 (Aug. 2022)	0.063	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	48 (Aug. 2022)	58 (Sep. 2022)	52	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No	Parameters	Unit	Test Results NMPA School as DW2			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.28 (April 2022)	6.81 (Sep. 2022)	6.67	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	212 (June 2022)	256.2 (Sep. 2022)	232.3	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	152 (April. 2022)	204 (May 2022)	171	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	58 (April 2022)	66 (April 2022)	61.33	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	31.99 (July 2022)	35.99 (Sep. 2022)	33.64	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	6.42 (April 2022)	8.76 (Sep. 2022)	7.50	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.05 (April 2022)	0.08 (July 2022)	0.06	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.05 (May 2022)	0.16 (Aug. 2022)	0.10	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	1 (May 2022)	64 (Sep. 2022)	30.5	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No	Parameters	Unit	Test Results NMPT Canteen as DW3			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.78 (May 2022)	6.95 (Sep. 2022)	6.85	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	186 (April 2022)	203 (May 2022)	197.83	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	120 (April 2022)	168 (Sep. 2022)	149	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	42 (June 2022)	56 (May 2022)	50	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	21.90 (April 2022)	44.99 (Sep. 2022)	28.64	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	4.8 (April 2022)	7.5 (Sep. 2022)	6.23	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.04 (April 2022)	0.08 (July 2022)	0.60	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.05 (Sep. 2022)	0.12 (Aug. 2022)	0.08	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	60 (Sep. 2022)	78 (May 2022)	68	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Hospital as DW4			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.76 (Apr. 2022)	6.88 (Sep. 2022)	6.80	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	130.4 (June 2022)	179.3 (Sep. 2022)	161.8	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	112 (July 2022)	160 (May 2022)	140.6	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	36 (Jun 2022)	50 (Apr 2022)	44	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	12.99 (June 2022)	32.99 (Sep. 2022)	25.14	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	8.62 (Apr. 2022)	12.71 (Sep. 2022)	11.51	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.049 (May 2022)	0.06 (Apr. 2022)	0.056	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻³	mg/l	0.02 (Sep. 2022)	0.08 (Apr. 2022)	0.038	-	IS:3025 (P-3i)
13	Standard Plate Count	Cfu/ml	34 (Apr. 2022)	56 (Sep. 2022)	45.33	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results NMPA Any Water Inlet Inside Wharf as DW5			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.74 (May 2022)	6.82 (Apr 2022)	6.78	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	63.3 (June 2022)	261.6 (Aug. 2022)	162.45	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	132 (Apr. 2022)	232 (Sep. 2022)	182	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	8 (June 2022)	124 (July 2022)	66	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	8.99 (June 2022)	49 (Apr. 2022)	28.99	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	4.14 (Apr. 2022)	7.41 (Sep. 2022)	5.76	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.077 (May 2022)	0.13 (July 2022)	0.103	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.06 (Apr. 2022)	0.12 (Aug. 2022)	0.09	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	1 (Sep 2022)	62 (Sep 2022)	29.8	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Wharf Canteen (Inside the Port Area) as DW6			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.72 (Apr. 2022)	6.78 (Sep. 2022)	6.75	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	38.4 (Apr. 2022)	151.3 (Sep. 2022)	94.05	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	24 (Aug. 2022)	84 (July 2022)	54	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	10 (May 2022)	48 (July 2022)	29	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	11.99 (Apr. 2022)	22.99 (July 2022)	17.49	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	1.83 (Sep. 2022)	3.03 (May 2022)	2.43	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.06 (May 2022)	0.09 (Sep 2022)	0.075	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.04 (June 2022)	0.09 (May 2022)	0.07	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	1 (June 2022)	62 (Sep 2022)	29.33	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Traffic Building (Inside the Port Area) as DW7			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.48 (Apr. 2022)	6.95 (Sep. 2022)	6.71	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	64.8 (Apr. 2022)	129.8 (Sep. 2022)	97.3	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	42 (May 2022)	106 (Sep. 2022)	74	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	10 (May 2022)	80 (July 2022)	45	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	13.9 (Apr. 2022)	24.99 (June 2022)	19.44	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	2.46 (July 2022)	3.66 (Sep. 2022)	3.06	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.06 (May 2022)	0.11 (Sep. 2022)	0.09	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.05 (Sep. 2022)	0.16 (July 2022)	0.10	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	1 (May 2022)	56 (Aug 2022)	26.3	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Berth No.14 (Inside the Port Area) as DW8			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.79 (Aug. 2022)	7.64 (May 2022)	7.21	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	63.4 (Aug. 2022)	468.4 (Sep. 2022)	265.9	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	110 (July 2022)	396 (May 2022)	253	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	16 (June 2022)	180 (Apr. 2022)	98	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	14.99 (June 2022)	64.9 (Apr. 2022)	39.94	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	23.84 (July 2022)	32.74 (Sep. 2022)	28.29	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.08 (Apr. 2022)	0.12 (Sep. 2022)	0.10	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.05 (Apr. 2022)	0.09 (July 2022)	0.07	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	46 (Aug. 2022)	52 (Apr. 2022)	49	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS April 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Berth No.9 (Inside the Port Area) as DW9			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.48 (May 2022)	7.12 (Apr. 2022)	6.81	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	492.2 (Apr. 2022)	733 (Aug. 2022)	612	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	322 (Apr. 2022)	406 (Sep. 2022)	364	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	118 (Sep. 2022)	206 (July 2022)	162	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	54.99 (May 2022)	89.97 (June 2022)	72.48	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	30.8 (Apr. 2022)	36.12 (July 2022)	33.46	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.097 (May 2022)	0.17 (July 2022)	0.13	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.08 (Apr. 2022)	0.017 (Sep. 2022)	0.13	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	52 (July 2022)	68 (Apr. 2022)	59	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

RESULT OF DRINKING WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results NMPA Guest House as DW10			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.46 (Apr. 2022)	6.84 (July 2022)	6.65	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	32.4 (June 2021)	148 (Sep. 2022)	112.5	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	112 (June 2022)	148 (Sep. 2022)	130	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	12 (Aug. 2022)	76 (July 2022)	44	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	12 (July 2022)	36.9 (Apr. 2022)	24.45	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	4.14 (Apr. 2022)	7.08 (July 2022)	5.61	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.01 (Sep. 2022)	0.08 (Apr. 2022)	0.045	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.06 (Apr 2022)	0.13 (Aug 2022)	0.095	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	1 (Apr 2022)	62 (Aug. 2021)	28.33	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS April 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results NMPA Guest House as Wharf open well			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.76 (Apr. 2022)	7.24 (July 2022)	7.0	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	469.2 (May 2022)	542 (July 2022)	505.6	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	316 (June 2022)	366 (May 2022)	341	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	120 (Sep 2022)	228 (July 2022)	174	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	53.98 (July 2022)	59.93 (Sep. 2022)	56.98	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	6.72 (July 2022)	8.09 (Sep 2022)	7.41	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.12 (Apr. 2022)	0.14 (July 2022)	0.13	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.06 (Apr. 2022)	0.14 (Sep. 2022)	0.1	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	60 (May 2022)	1582 (Aug 2022)	821	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS April 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Marshalling Yard as DW11			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.62 (Apr 2022)	6.91 (Sep 2022)	6.76	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	85.9 (Sep. 2022)	206 (July 2022)	145.9	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	102 (Apr. 2022)	132 (July 2022)	117	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	30 (Aug. 2022)	60 (July 2022)	45	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	21.9 (Apr. 2022)	26.99 (Sep. 2022)	24.45	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	3.62 (Apr. 2022)	5.32 (July 2022)	4.47	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.05 (June 2022)	0.09 (Sep. 2022)	0.07	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.06 (May 2022)	0.12 (Sep. 2022)	0.09	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	1 (May 2022)	64 (Aug. 2022)	28.66	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS April 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Fifth Avenue Open Well as S1			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.48 (Apr. 2022)	6.81 (July 2022)	6.65	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	142.4 (Apr. 2022)	298.3 (July 2022)	220	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	90 (Apr. 2022)	356 (Sep. 2022)	223	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	30 (May 2022)	172 (July 2022)	101	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	21.9 (Apr. 2022)	48.98 (Sep. 2022)	35	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	2.64 (Apr. 2022)	731 (Sep. 2022)	4.9	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.11 (Aug. 2022)	0.17 (May 2011)	0.14	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.04 (Aug 2022)	0.12 (Sep. 2022)	0.08	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	1564 (Apr 2022)	1670 (May 2022)	1617	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results RCHW Colony Open Well as S2			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.68 (May 2022)	6.84 (July 2022)	6.76	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	187.8 (June 2022)	210.8 (Apr. 2022)	199	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	134 (July 2022)	280 (Sep. 2022)	207	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	48 (June 2022)	124 (July 2022)	86	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	29.99 (June 2022)	35.9 (Apr. 2022)	33	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	4.26 (Apr 2022)	7.16 (May 2022)	5.7	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.09 (Sep. 2022)	0.14 (Apr. 2022)	0.12	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.02 (Aug. 2022)	0.07 (Sep. 2022)	0.05	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	110 (May 2022)	1624 (Sep. 2022)	867	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results RCHW Colony New Open Well as S3			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.65 May 2022	6.93 July 2022	6.79	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	168 May 2022	201 Aug. 2022	184.95	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	124 Apr. 2022	254 Sep. 2022	189	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	50 May 2022	140 July 2022	95	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	24.99 July 2022	30.99 Sep. 2022	28	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	2.24 Apr. 2022	6.80 Sep. 2022	4.52	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.11 Sep. 2022	0.20 July 2022	0.11	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.08 Apr 2022	0.21 May 2022	0.15	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	72 May 2022	1695 July 2022	1207	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Sump Tank (Pump House) as S4			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.72 Apr. 2022	6.89 Aug. 2022	6.81	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	199.9 June 2022	342.2 Apr. 2022	271	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	150 June 2022	276 Sep. 2022	213	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	38 May 2022	152 July 2022	95	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	32.99 June 2022	66.99 Apr. 2022	49.99	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	11.12 May 2022	12.8 Apr. 2022	11.96	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.16 May 2022	0.26 July 2022	0.21	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.12 Apr. 2022	0.28 Sep. 2022	0.20	-	IS:3025 (P-31)
13	Standard Plate Count.	Cfu/ml	31 May 2022	1529 Sep 2022	780	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results New UGR Open Well as S5			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.71 May	6.90 Aug.	6.81	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	70.3 May	231.1 Sep.	150.7	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	54 May	262 Sep.	158	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	16 May	114 July	65	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	16.9 Apr.	43.98 Aug.	30.44	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	1.45 Apr.	5.2 Sep.	3.33	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.08 May	0.14 Apr.	0.11	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.05 June	0.13 May	0.09	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	210 May	1586 Aug.	898	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Timber Yard as S6			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.58 Apr.	6.94 Sep.	6.76	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	228 Apr.	302.8 July	265.4	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	154 Apr.	310 Sep.	232	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	52 Aug.	160 July	106	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	23.9 Apr.	44.99 Sep.	34.44	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	14.60 Apr.	20.51 Sep.	17.10	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.07 May	0.13 Aug.	0.11	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.07 June	0.14 Sep.	0.11	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	90 May	1597 Aug.	830.5	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

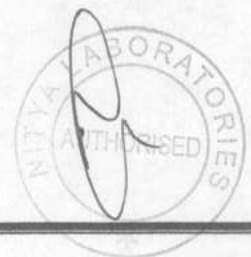
Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Thimmappayya Well as S7			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.42 Apr.	6.99 Sep.	6.71	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	75.3 May	166.5 July	120.9	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	52 May	202 Aug.	127	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	16 Apr.	72 Aug.	44	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	13 Apr.	19.99 Sep.	16.30	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	2.64 May	59 Sep.	3.98	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.08 Apr.	0.15 Aug.	0.11	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.16 Apr.	0.14 Aug.	0.09	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	103 July	1518 Sep.	810	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results MCC Water At New UGR as S8			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.76 Apr.	6.84 May	6.80	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	156 May	184.6 Apr.	170.7	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	108 May	124 Apr.	116	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	60 Apr.	108 May	84	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	13.9 May	18 Apr.	15.95	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	2.68 Apr.	5.4 May	4.04	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.16 May	0.18 Apr.	0.17	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻	mg/l	0.08 May	0.14 Apr.	0.11	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	214 Apr.	234 May	224	-	IS:1622
14	Total Coliform	Absent/Present	Absent	Absent	Absent	-	IS:1622



1.1. Waste Water Quality
The waste water quality monitoring is carried out as per the requirement of the Environmental Protection Act, 1986 and the Water Quality Control Act, 1987. The monitoring is carried out at the following locations:
1. Effluent Treatment Plant (ETP)
2. Sewage Treatment Plant (STP)
3. Fresh Water
4. Rain Water

1.2. Results
The results of the monitoring are as follows:
1. ETP: All parameters are within the permissible limits.
2. STP: All parameters are within the permissible limits.
3. Fresh Water: All parameters are within the permissible limits.
4. Rain Water: All parameters are within the permissible limits.

1.3. Methodology
The methodology for monitoring is as follows:
1. Sampling: Samples are collected at the specified locations.
2. Analysis: Samples are analyzed in the laboratory.
3. Reporting: Results are reported to the concerned authorities.

WASTE WATER QUALITY MONITORING



5.0 Wastewater Sampling

5.1 Sampling Location

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, a Water sampling was conducted at 4 locations during the period from April 2022 to September 2022.

Table -5
Location of Wastewater Sampling Stations

Sr. No.	Location of Station	Frequency
1.	Treated Water	Once in a Month
2.	Sewage Collection Water	Once in a Month
3.	UF Field Tank	Once in a Month
4.	SBR TANK	Once in a Month

5.2 Results

The observations made on drinking water sampling at 4 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.

5.3 Methodology

The samples for wastewater quality characterization were collected and analyzed as per the procedures specified in "Standard Method for the Examination of Water & Wastewater published by "American Public Health Association" (APHA: 23rd edition) and IS 3025. All the parameters except Heavy metals and Bacteriological were analyzed at the site i.e., at Panambur. Samples of heavy metals and bacteriological parameters have been sent to our Laboratory. Samples for chemical analysis were collected in polyethylene containers. Samples collected for metal content were acidified with 1 ml. HNO₃.



5.4 Results & Discussion on Observations

5.4.1 Treated Water

During the study period, at this location, pH was found between 6.91 to 7.48. Oil & Grease was found between 2.0 to 6.8 mg/l. BOD and COD were found between 4 to 6 mg/l and 16 to 24 mg/l respectively. The Mix Liquid Suspended Solids and Dissolved Oxygen were found between 140 to 188.0 mg/l and 44.1 to 5.4mg/l. The Total Suspended Solids and Ammonical Nitrogen are found between 208 to 232.0 mg/l and 0.012 to 0.74 mg/l respectively. The Total Dissolved Solids and Total Nitrogen were found between 340 to 486 mg/l and 3.8 to 4.8mg/l. The Faecal Coliform is found 78.5 MPN/100 ml only. The Phenolic Compound is not detected during the analysis.

5.4.2 Sewage Collection Water

During the study period, at this location, pH was found between 7.02 to 7.20. Oil & Grease was found between 8 to 24 mg/l. BOD and COD were found between 30 to 78 mg/l and 132 to 306 mg/l respectively. The Mix Liquid Suspended Solids and Dissolved Oxygen were found between 348.0 to 420 mg/l and 0.5 to 0.9mg/l. The Total Suspended Solids and Ammonical Nitrogen are found between 478.0 to 560.0 mg/l and 0.57 to 0.78 mg/l respectively. The Total Dissolved Solids and Total Nitrogen were found between 400 to 524mg/l and 6.2 to 8.2mg/l. The Faecal Coliform is found 1600 MPN/100 ml only. The Phenolic Compound is not detected during the analysis.

5.4.3 UF Field Tank

During the study period, at this location, pH was found between 7.38 to 7.72. Oil & Grease was found between 6.0 to 14.0 mg/l. BOD and COD were found between 4.0 to 7.00 mg/l and 22.0 to 34.0 mg/l respectively. The Mix Liquid Suspended Solids and Dissolved Oxygen were found between 98 to 178 mg/l and 4.08 to 5.9mg/l. The Total Suspended Solids and Ammonical Nitrogen are found between 138 to 192 mg/l and 0.08 to 0.38 mg/l respectively. The Total Dissolved Solids and Total Nitrogen were found between 488 to 632 mg/l and 3.95 to 5.2mg/l. The Faecal Coliform is found 354 MPN/100 ml only. The Phenolic Compound is not detected during the analysis.

5.4.4 SBR Tank

During the study period, at this location, pH was found between 7.12 to 7.48. Oil & Grease was found between 8.0 to 26.0 mg/l. BOD and COD were found between 68.0 to 75.0 mg/l and 252.0 to 294.0 mg/l respectively. The Mix Liquid Suspended Solids and Dissolved Oxygen were found between 1886 to 2448 mg/l and 0.5 to 4.1mg/l. The Total Suspended Solids and Ammonical Nitrogen are found between 2994 to 3802 mg/l and 0.29 to 0.66 mg/l respectively. The Total Dissolved Solids and Total Nitrogen were found between 324 to 484 mg/l and 6.2 to 7.41mg/l. The Faecal Coliform is found 1600 MPN/100 ml only. The Phenolic Compound is not detected during the analysis.



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur ,Mangalore -575010

Sample Description: Wastewater (STP)

Sample Drawn By: NITYA LABORATORIES

RESULT OF WASTEWATER (STP) FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Treated Water			Tolerance Limit as per KSPCB	Protocol
			Minimum	Maximum	Average		
1	pH	..	6.91 (May 2022)	7.48 (July 2022)	7.21	6.5-9.0	IS:3025 (P-11)
2	Colour	Hazen	10 (Apr 2022)	16 (July 2022)	13	-	IS:3025 (P-4)
3	Odour	-	Objectionable	Objectionable	Objectionable	-	IS:3025 (P-6)
4	Oil & Grease	mg/L	2.0 (July 2022)	6.8 (Apr.2022)	5.3	10	IS:3025 (P-39)
5	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	4 (Apr. 2022)	6 (June 2022)	4.5	≤10	IS:3025 (P-44)
6	Chemical Oxygen Demand as COD	NTU	16 (Apr. 2022)	24 (Sep. 2022)	18	≤50	IS:3025 (P-58)
7	Sludge Volume Index	mg/L	ND	ND	ND	-	APHA 23 rd ED.
8	Mix Liquid Suspended Solids	mg/L	140 (Sep. 2022)	188 (May 2022)	156	-	APHA 23 rd ED.
9	Phenolic Compound	mg/L	ND	ND	ND	1.0	IS:3025 (P-43)
10	Dissolved Oxygen	mg/L	4.1 (June. 2022)	5.4 (Apr. 2022)	4.9	Min of 3	IS:3025 (P-38)
11	Total Suspended Solids	mg/L	208 (May. 2022)	232 (July. 2022)	219	≤20	IS:3025 (P-17)
12	Ammonical Nitrogen	mg/L	0.12 (Apr. 2022)	0.74 (July. 2022)	0.42	≤5	IS:3025 (P-34)
13	Electrical Conductivity	uS/cm	492 (Apr. 2022)	583 (July 2022)	526	-	IS:3025 (P-14)
14	Total Dissolved Solids	mg/L	340 (May 2022)	486 (Apr. 2022)	377	2100	IS:3025 (P-16)
15	Total Nitrogen	mg/L	3.8 (Aug. 2022)	4.8 (Apr. 2022)	4.2	≤10	IS:3025 (P-34)
16	Faecal Coliform	MPN/100 ml	68	89	78.5	<100	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client : Panambur, Mangalore -575010

Sample Description: Wastewater (STP)

Sample Drawn By: Nitya Laboratories

RESULT OF WASTEWATER (STP) FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results Sewage Collection Water			Tolerance Limit as per KSPCB	Protocol
			Minimum	Maximum	Average		
1	pH	-	7.02 (June 2022)	7.20 (Sep. 2022)	7.09	6.5-9.0	IS:3025 (P-11)
2	Colour	Hazen	32 (July 2022)	38 (June 2022)	34.33	-	IS:3025 (P-4)
3	Odour	-	Objectionable	Objectionable	Objectionable	-	IS:3025 (P-6)
4	Oil & Grease	mg/L	8 (Aug. 2022)	24 (June 2022)	14.83	10	IS:3025 (P-39)
5	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	30 (May 2022)	78 (Sep. 2022)	57.83	≤10	IS:3025 (P-44)
6	Chemical Oxygen Demand as COD	NTU	132 (May 2022)	306 (Sep. 2022)	231.66	≤50	IS:3025 (P-58)
7	Sludge Volume Index	mg/L	ND	ND	ND	-	APHA 23 rd ED.
8	Mix Liquid Suspended Solids	mg/L	348 (Apr. 2022)	420 (Sep. 2022)	365.66	-	APHA 23 rd ED.
9	Phenolic Compound	mg/L	ND	ND	ND	1.0	IS:3025 (P-43)
10	Dissolved Oxygen	mg/L	0.5 (June 2022)	0.9 (Sep. 2022)	0.7	Min of 3	IS:3025 (P-38)
11	Total Suspended Solids	mg/L	478 (May 2022)	560 (Sep 2022)	512	≤20	IS:3025 (P-17)
12	Ammonical Nitrogen	mg/L	0.57 (Apr. 2022)	0.78 (May 2022)	0.693	≤5	IS:3025 (P-34)
13	Electrical Conductivity	uS/cm	616.8 (July 2022)	842 (Apr. 2022)	695.63	-	IS:3025 (P-14)
14	Total Dissolved Solids	mg/L	400 (Aug. 2022)	524 (May 2022)	436.83	2100	IS:3025 (P-16)
15	Total Nitrogen	mg/L	6.2 (June 2022)	8.2 (Sep. 2022)	6.7	≤10	IS:3025 (P-34)
16	Faecal Coliform	MPN/100 ml	1600	1600	1600	<100	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Waste Water (STP)

Sample Drawn By: Nitya Laboratories

RESULT OF WASTEWATER (STP) FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results UF Field Tank			Tolerance Limit as per KSPCB	Protocol
			Minimum	Maximum	Average		
1	pH	-	7.38 (May. 2022)	7.72 (July 2022)	7.50	6.5-9.0	IS:3025 (P-11)
2	Colour	Hazen	16 (Apr. 2022)	18 (July 2022)	17	-	IS:3025 (P-4)
3	Odour	-	Objectionable	Objectionable	Objectionable	-	IS:3025 (P-6)
4	Oil & Grease	mg/L	6 (July 2022)	14 (June 2022)	10.83	10	IS:3025 (P-39)
5	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	04 (July 2022)	7 (Sep. 2022)	5.5	≤10	IS:3025 (P-44)
6	Chemical Oxygen Demand as COD	NTU	22 (Apr. 2022)	34 (Sep. 2022)	23.33	≤50	IS:3025 (P-58)
7	Sludge Volume Index	mg/L	-	-	-	-	APHA 23 rd ED.
8	Mix Liquid Suspended Solids	mg/L	98 (June 2022)	178 (May 2022)	120.33	-	APHA 23 rd ED.
9	Phenolic Compound	mg/L	ND	ND	ND	1.0	IS:3025 (P-43)
10	Dissolved Oxygen	mg/L	4.8 (May 2022)	5.9 (June 2022)	5.48	Min of 3	IS:3025 (P-38)
11	Total Suspended Solids	mg/L	138 (June 2022)	192 (May 2022)	152	≤20	IS:3025 (P-17)
12	Ammonical Nitrogen	mg/L	0.08 (Apr. 2022)	0.38 (July 2022)	0.22	≤5	IS:3025 (P-34)
13	Electrical Conductivity	uS/cm	729 (Apr. 2022)	958 (July 2022)	829	-	IS:3025 (P-14)
14	Total Dissolved Solids	mg/L	488 (Apr. 2022)	632 (Aug. 2022)	563.83	2100	IS:3025 (P-16)
15	Total Nitrogen	mg/L	3.95 (Sep. 2022)	5.2 (Aug. 2022)	4.45	≤10	IS:3025 (P-34)
16	Faecal Coliform	MPN/100 ml	352	356	354	<100	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of the Client: Panambur, Mangalore -575010

Sample Description: Wastewater (STP)

Sample Drawn By: Nitya Laboratories

RESULT OF WASTEWATER (STP) FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Parameters	Unit	Test Results SBR TANK			Tolerance Limit as per KSPCB	Protocol
			Minimum	Maximum	Average		
1	pH	..	7.12 (Aug. 2022)	7.48 (Sep. 2022)	7.27	6.5-9.0	IS:3025 (P-11)
2	Colour	Hazen	40 (Apr 2022)	48 (June 2022)	44.33	-	IS:3025 (P-4)
3	Odour	-	Objectionable	Objectionable	Objectionable	-	IS:3025 (P-6)
4	Oil & Grease	mg/L	8 (Apr. 2022)	26 (Aug. 2022)	16.63	10	IS:3025 (P-39)
5	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	68 (Apr. 2022)	75 (May. 2022)	70.16	≤10	IS:3025 (P-44)
6	Chemical Oxygen Demand as COD	NTU	252 (July 2022)	294 (Sep. 2022)	268.66	≤50	IS:3025 (P-58)
7	Sludge Volume Index	mg/L	33.3 (Apr. 2022)	49.0 (Sep. 2022)	36.9	-	APHA 23 rd ED.
8	Mix Liquid Suspended Solids	mg/L	1886 (July 2022)	2448 (Sep. 2022)	2113.33	-	APHA 23 rd ED.
9	Phenolic Compound	mg/L	ND	ND	ND	1.0	IS:3025 (P-43)
10	Dissolved Oxygen	mg/L	0.5 (Apr. 2022)	4.1 (Sep. 2022)	2.81	Min of 3	IS:3025 (P-38)
11	Total Suspended Solids	mg/L	2994 (June 2022)	3802 (May 2022)	3245.33	≤20	IS:3025 (P-17)
12	Ammonical Nitrogen	mg/L	0.29 (Sep. 2022)	0.66 (June 2022)	0.48	≤5	IS:3025 (P-34)
13	Electrical Conductivity	uS/cm	498 (June 2022)	716 (May 2022)	593.21	-	IS:3025 (P-14)
14	Total Dissolved Solids	mg/L	324 (June 2022)	484 (Apr. 2022)	404.16	2100	IS:3025 (P-16)
15	Total Nitrogen	mg/L	6.2 (Apr. 2022)	7.41 (Sep. 2022)	6.615	≤10	IS:3025 (P-34)
16	Faecal Coliform	MPN/100 ml	1600	1600	1600	<100	IS:1622



3.2 Marine Water Sampling

3.2.1 Sampling Locations

The Marine water sampling is conducted at various locations in the port area to monitor the water quality and to ensure compliance with the requirements of the Marine Water Quality Monitoring Scheme.

No.	Location of Sampling Station
1	Location 1: Offshore of the Port Area
2	Location 2: Offshore of the Port Area
3	Location 3: Offshore of the Port Area
4	Location 4: Offshore of the Port Area
5	Location 5: Offshore of the Port Area
6	Location 6: Offshore of the Port Area
7	Location 7: Offshore of the Port Area
8	Location 8: Offshore of the Port Area
9	Location 9: Offshore of the Port Area
10	Location 10: Offshore of the Port Area
11	Location 11: Offshore of the Port Area
12	Location 12: Offshore of the Port Area
13	Location 13: Offshore of the Port Area
14	Location 14: Offshore of the Port Area
15	Location 15: Offshore of the Port Area

MARINE WATER QUALITY MONITORING

3.2.2 Objectives

The objective of the Marine Water Quality Monitoring Scheme is to monitor the water quality in the port area and to ensure compliance with the requirements of the Marine Water Quality Monitoring Scheme. The scheme is designed to monitor the water quality at various locations in the port area and to ensure compliance with the requirements of the Marine Water Quality Monitoring Scheme.

3.2.3 Results

The results of the Marine Water Quality Monitoring Scheme are as follows: The water quality in the port area is generally good and complies with the requirements of the Marine Water Quality Monitoring Scheme. The results of the monitoring are as follows: The water quality in the port area is generally good and complies with the requirements of the Marine Water Quality Monitoring Scheme.



6.0 Marine Water Sampling

6.1 Sampling Location

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, a Marine Water sampling was conducted at 5 locations of each three depth during the period from April 2022 to September 2022.

Table - 6
Location of Marine Water Sampling Stations

Sr. No.	Location of Station	Frequency
1.	Eastern Dock Arm (Marine)-1m Below Surface	Once in a Month
2.	Eastern Dock Arm (Marine)-10 m Below Surface	Once in a Month
3.	Eastern Dock Arm (Marine)-20 m Below Surface	Once in a Month
4.	Baseline (Up to 800-meter west)-1m Below Surface	Once in a Month
5.	Baseline (Up to 800-meter west)-10 m Below Surface	Once in a Month
6.	Baseline (Up to 800-meter west)-20 m Below Surface	Once in a Month
7.	Western Dock Arm -1m Below Surface	Once in a Month
8.	Western Dock Arm -10 m Below Surface	Once in a Month
9.	Western Dock Arm -20 m Below Surface	Once in a Month
10.	Oil Dock Arm (Diaphragm Jetty)-1m Below Surface	Once in a Month
11.	Oil Dock Arm (Diaphragm Jetty)-10 m Below Surface	Once in a Month
12.	Oil Dock Arm (Diaphragm Jetty)-20 m Below Surface	Once in a Month
13.	Lagoon Area (Turning Circle)-1m Below Surface	Once in a Month
14.	Lagoon Area (Turning Circle)-10 m Below Surface	Once in a Month
15.	Lagoon Area (Turning Circle)-20 m Below Surface	Once in a Month

6.2 Methodology

The samples for surface water quality characterization were collected and analyzed as per the procedures specified in "Standard Method for the Examination of Water & Wastewater published by "American Public Health Association" (APHA: 23rd edition) and IS 3025. All the parameters except Heavy metals and Bacteriological were analyzed at the site i.e., at Panambur. Samples of heavy metals and bacteriological parameters have been sent to our Laboratory. Samples for chemical analysis were collected in polyethylene containers. Samples collected for metal content were acidified with 1 ml. HNO₃.

6.3 Results

The observations made on drinking water sampling at 5 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.



6.4 Results & Discussion on Observations

6.4.1 Eastern Dock Arm

Surface: At this location pH was found between 7.28 to 7.90. The TSS and TDS were found between 1702 to 2520 mg/l and 40132.0 to 44802.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.115 to 0.42 mg/l, 1372.45 to 1430 mg/l and 586.71 to 655 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.1 to 2.6 mg/l. The value of Calcium, Sodium and Potassium were found between 312 to 360 mg/l, 10090 to 10246 mg/l and 380 to 425 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.016 to 0.28 mg/l, 0.041 to 0.07 mg/l and 42652.0 to 47824.0 mg/l. The Faecal Coliform was found between 212 to 253 MPN/100 ml.

Middle: At this location pH was found between 7.84 to 8.01. The TSS and TDS were found between 1784 to 2536 mg/l and 40368 to 46084 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.12 to 0.46 mg/l, 140.25 to 1432 mg/l and 599 to 661 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 1.8 to 2.8 mg/l. The value of Calcium, Sodium and Potassium were found between 336 to 368 mg/l, 100198.0 to 11048.0 mg/l and 412 to 435 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.021 to 0.32 mg/l, 0.04 to 0.09 mg/l and 42904.0 to 49126.0 mg/l. The Faecal Coliform was found between 248 to 287 MPN/100 ml.

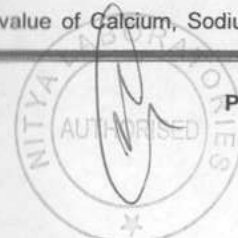
Bottom: At this location pH was found between 7.84 to 8.13. The TSS and TDS were found between 176.0 to 2660.0 mg/l and 408098 to 46284.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.13 to 0.48 mg/l, 1400 to 1459.0 mg/l and 605 to 677.1 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 1.2 to 2.1 mg/l. The value of Calcium, Sodium and Potassium were found between 336 to 390 mg/l, 10196 to 10308.0 mg/l and 418.0 to 454.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.2 to 0.4 mg/l, 0.05 to 0.12 mg/l and 43420.0 to 48070.0 mg/l. The Faecal Coliform was found 221-345 MPN/100 ml.

6.4.2 Eastern Baseline (Up to 800-meter west)

Surface: At this location pH was found between 7.86 to 8.13. The TSS and TDS were found between 1812 to 2678.0 mg/l and 41896.0 to 44520.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.11 to 0.52 mg/l, 1243 to 1443 mg/l and 601 to 629 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 1.8 to 2.4 mg/l. The value of Calcium, Sodium and Potassium were found between 328 to 368 mg/l, 10096.0 to 10135.0 mg/l and 316.0 to 342.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.10 to 0.28 mg/l, 0.05 to 0.08 mg/l and 44180.0 to 47954.0 mg/l. The Faecal Coliform was found between 228 to 248 MPN/100 ml.

Middle: At this location pH was found between 7.80 to 8.33. The TSS and TDS were found between 1820.0 to 2680.0 mg/l and 42187.0 to 46012.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.12 to 0.58 mg/l, 1252 to 1486 mg/l and 601 to 645 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 1.4 to 2.1 mg/l. The value of Calcium, Sodium and Potassium were found between 336 to 376 mg/l, 10116.0 to 10155.0 mg/l and 337.0 to 362.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.16 to 3.30 mg/l, 0.062 to 0.85 mg/l and 44395.0 to 49208.0 mg/l. The Faecal Coliform was found between 254 to 260 MPN/100 ml.

Bottom: At this location pH was found between 7.91 to 8.28. The TSS and TDS were found between 1838 to 2714.0 mg/l and 42412.0 to 46048.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.13 to 0.64 mg/l, 1257.0 to 1542.0 mg/l and 595 to 697 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 1.00 to 2.1 mg/l. The value of Calcium, Sodium and



Potassium were found between 336 to 376 mg/l, 10416.0 to 10170.0 mg/l and 354.0 to 380.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.024 to 0.38 mg/l, 0.068 to 0.11 mg/l and 44606.0 to 47980.0 mg/l. The Faecal Coliform was found between 312 to 346 MPN/100 ml.

6.4.3 Western Dock Arm

Surface: At this location pH was found between 7.86 to 8.0. The TSS and TDS were found between 1686.0 to 2736.0 mg/l and 41064.0 to 45706.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.13 to 0.42 mg/l, 1374.0 to 1452.0 mg/l and 592 to 666 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 1.6 to 2.8 mg/l. The value of Calcium, Sodium and Potassium were found between 286 to 344 mg/l, 10096.0 to 10180.0 mg/l and 312.0 to 346.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.11 to 0.2 mg/l, 0.06 to 0.084 mg/l and 43260.0 to 48482.0 mg/l. The Faecal Coliform was found between 238 to 240 MPN/100 ml.

Middle: At this location pH was found between 7.85 to 8.10. The TSS and TDS were found between 1720.0 to 2879.0 mg/l and 41154.0 to 45812.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.12 to 0.46 mg/l, 1397 to 1464 mg/l and 594 to 658 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 1.4 to 2.2 mg/l and 0.025 to 0.041 mg/l. The value of Calcium, Sodium and Potassium were found between 316 to 360 mg/l, 10112.0 to 10196.0 mg/l and 334 to 462 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.016 to 0.32 mg/l, 0.073 to 0.084 mg/l and 43366 to 47918 mg/l. The Faecal Coliform was found between 256 -278 MPN/100 ml.

Bottom: At this location pH was found between 7.83 to 8.08. The TSS and TDS were found between 1736.0 to 2954.0 mg/l and 41296.0 to 45916.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.14 to 0.15 mg/l, 1402 to 1489 mg/l and 616 to 644 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 1.0 to 2.0 mg/l and 0.023 to 0.046 mg/l. The value of Calcium, Sodium and Potassium were found between 328 to 372 mg/l, 10124.0 to 10216.0 mg/l and 342.0 to 382.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.024 to 0.40 mg/l, 0.07 to 0.096 mg/l and 43424.0 to 49216.0 mg/l. The Faecal Coliform was found between 341 to 348 MPN/100 ml.

6.4.4 Oil Dock Arm (Diaphragm Jetty)

Surface: At this location pH was found between 7.83 to 7.91. The TSS and TDS were found between 1726 to 2650.0 mg/l and 41183.0 to 44274.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.12 to 0.47 mg/l, 1402 to 1445 mg/l and 591 to 623 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.0 to 2.06 mg/l. The value of Calcium, Sodium and Potassium were found between 332 to 368 mg/l, 10095.0 to 10140.0 mg/l and 346.0 to 465.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.012 to 0.21 mg/l, 0.057 to 0.071 mg/l and 43277.0 to 49024.0 mg/l. The Faecal Coliform was found between 253 to 354 MPN/100 ml.

Middle: At this location pH was found between 7.87 to 8.12. The TSS and TDS were found between 1754.0 to 2662.0 mg/l and 41254.0 to 44970.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.13 to 0.50 mg/l, 1404 to 1466 mg/l and 160.42 to 658 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 1.6 to 2.2 mg/l and 0.026 to 0.042 mg/l. The value of Calcium, Sodium and Potassium were found between 344 to 364 mg/l, 10120 to 10168.0 mg/l and 376.0 to 486.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.016 to 0.26 mg/l, 0.066 to 0.072 mg/l and 43366.0 to 48324.0 mg/l. The Faecal Coliform was found between 240 to 245 MPN/100 ml.

Bottom: At this location pH was found between 7.89 to 8.10. The TSS and TDS were found between 1790.0 to 2684.0 mg/l and 41296.0 to 44792.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.12



to 0.66mg/l, 1397 to 1481 mg/l and 606 to 662 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 1.1 to 2.1 mg/l and 0.032 to 0.062mg/l. The value of Calcium, Sodium and Potassium were found between 344 to 376 mg/l, 10136.0 to 10204.0 mg/l and 394.0 to 492.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.022 to 0.34 mg/l, 0.068 to 0.080 mg/l and 43424 to 46608.0 mg/l. The Faecal Coliform was found between 240 to 345 MPN/100 ml.

6.4.5 Lagoon Area (Turning Circle)

Surface: At this location pH was found between 7.83 to 8.12. The TSS and TDS were found between 1792 to 2706.0 mg/l and 41314.0 to 44146.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.11 to 0.14 mg/l, 1390 to 1432 mg/l and 594 to 662 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 1.1 to 2.3 mg/l and 0.015 to 0.034mg/l. The value of Calcium, Sodium and Potassium were found between 316.0 to 376 mg/l, 10114.0 to 10182.0 mg/l and 310.0 to 382.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.010 to 0.18 mg/l, 0.041 to 0.073 mg/l and 43430.0 to 48032.0 mg/l. The Faecal Coliform was found between 240 to 245 MPN/100 ml.

Middle: At this location pH was found between 7.83 to 8.10. The TSS and TDS were found between 1806.0 to 2716.0 mg/l and 41568.0 to 45638.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.13 to 0.58 mg/l, 1407 to 1440 mg/l and 594 to 662 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 1.1 to 2.3 mg/l and 0.020 to 0.041 mg/l. The value of Calcium, Sodium and Potassium were found between 336 to 368 mg/l, 10132.0 to 10220.0 mg/l and 324.0 to 394.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.020 to 0.28 mg/l, 0.061 to 0.080 mg/l and 43752.0 to 48536.0 mg/l. The Faecal Coliform was found between 240 to 278 MPN/100 ml.

Bottom: At this location pH was found between 7.83 to 8.10. The TSS and TDS were found between 1826.0 to 2768.0 mg/l and 41684.0 to 45754.0 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.12 to 0.64 mg/l, 1405 to 1496 mg/l and 603 to 680 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 1.1 to 2.1 mg/l and 0.03 to 0.048mg/l. The value of Calcium, Sodium and Potassium were found between 352 to 376 mg/l, 10146.0 to 10286.0 mg/l and 360.0 to 460.0 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.026 to 0.36 mg/l, 0.07 to 0.10 mg/l and 43976 to 48864.0 mg/l. The Faecal Coliform was found between 345 to 348 MPN/100 ml.



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of the Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Eastern Dock Arm (Marine)-1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.28 (Aprl. 2022)	7.90 (Sep. 2022)	7.69	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1702 (June. 2022)	2520 (Aprl. 2022)	1877	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	40132 (Aprl. 2022)	44802 (Sep. 2022)	42019	IS:3025 (P-16)
4	Turbidity	NTU	5.4 (June. 2022)	6.3 (July. 2022)	5.88	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.115 (Aug. 2022)	0.42 (May. 2022)	0.176	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1372.45 (June. 2022)	1430 (Aug. 2022)	1409.98	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	586.71 (June. 2022)	655 (May. 2022)	612.06	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.1 (June. 2022)	2.6 (Aprl. 2022)	2.25	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.019 (Aug. 2022)	0.03 (Aprl. 2022)	0.019	APHA 23rd Ed.
11	Calcium As Ca	mg/L	312 (Aprl. 2022)	360 (Sep. 2022)	341.66	IS:3025 (P-40)
12	Sodium As Na	mg/L	10090 (Aug. 2022)	10246 (Aprl. 2022)	10163	IS:3025 (P-45)
13	Potassium As K	mg/L	380 (Sep. 2022)	425 (Aug. 2022)	403.5	IS:3025 (P-45)
14	Nitrite	mg/L	0.16 (May. 2022)	0.28 (Aprl. 2022)	0.18	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.04 (June. 2022)	0.07 (May. 2022)	0.059	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	42652 (may. 2022)	47824 (Sep. 2022)	44816	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	212 (Sep. 2022)	253 (Aug. 2022)	238	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of the Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Eastern Dock Arm (Marine)-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		7.84 May	8.01 Sep	7.94	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1784 June	2536 Apr	2284	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	40368 Apr	46084 June	43052	IS:3025 (P-16)
4	Turbidity	NTU	5.7 June	6.8 July	6.13	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.12 Apr	0.46 May	0.19	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1402.5 June	1432 Aug	1418	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	599.6 Aug	661.5 May	625.7	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.8 Apr	2.8 May	2.1	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.025 Aug	0.034 Apr	0.027	APHA 23rd Ed.
11	Calcium As Ca	mg/L	336 May	368 July	353.1	IS:3025 (P-40)
12	Sodium As Na	mg/L	10198 Aug	11048 Sep	10378	IS:3025 (P-45)
13	Potassium As K	mg/L	412 June	435 Aug	420	IS:3025 (P-45)
14	Nitrite	mg/L	0.21 May	0.32 Apr	0.25	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.04 June	0.09 May	0.07	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	42904 Apr	49126 Sep	45773	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	248 Sep	287 Aug	271	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Eastern Dock Arm (Marine)-20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.84 May	8.13 Sep	7.99	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1786 June	2660 Apr	2322	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	40898 Apr	46284 June	43528	IS:3025 (P-16)
4	Turbidity	NTU	5.7 Aug	6.9 July	6.33	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.13 Aug	0.48 May	0.20	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1400 Sep	1459 July	1435	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	605.6 Sep	677.9 May	633.9	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.2 Apr	2.1 Aug	1.8	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.038 Aug	0.052 May	0.044	APHA 23rd Ed.
11	Calcium As Ca	mg/L	336 Aug	390 June	363	IS:3025 (P-40)
12	Sodium As Na	mg/L	10196 Sep	10308 Apr	10278	IS:3025 (P-45)
13	Potassium As K	mg/L	418 June	454 Apr	433	IS:3025 (P-45)
14	Nitrite	mg/L	0.2 May	0.4 June	0.29	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.056 Aug	0.12 May	0.19	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43420 May	48070 June	45810	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	221 July	345 Aug	272	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Baseline (Up to 800-meter west)-1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.86 Apr	8.31 July	8.06	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1812 June	2678 Apr	2325	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41896 July	44520 Sep	42722	IS:3025 (P-16)
4	Turbidity	NTU	5.0 Apr	6.1 July	5.5	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.11 Apr	0.52 May	0.18	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1243 Apr	1443 July	1381	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	601.7 Apr	629 May	610.3	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.8 May	2.4 Apr	2.06	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.014 aug	0.024 Apr	0.020	APHA 23rd Ed.
11	Calcium As Ca	mg/L	328 May	368 Sep	344	IS:3025 (P-40)
12	Sodium As Na	mg/L	10096 Sep	10135 Aug	10112	IS:3025 (P-45)
13	Potassium As K	mg/L	316 Aug	342 May	329	IS:3025 (P-45)
14	Nitrite	mg/L	0.10 Aug	0.28 Apr	0.17	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.055 Aug	0.08 June	0.066	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	44180 May	47954 Sep	45676	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	228 Aug	248 July	232	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Baseline (Up to 800-meter west)-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		7.80 Apr	8.33 July	8.03	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1820 June	2680 Apr	2310	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	42187 May	46012 June	43629	IS:3025 (P-16)
4	Turbidity	NTU	5.3 May	6.7 July	5.88	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.12 Aug	0.58 May	0.213	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1252.4 apr	1486.5 June	1390.2	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	601.2 Sep	645.5 may	620.3	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.4 May	2.1 Apr	1.85	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.020 Aug	0.029 Sep	0.025	APHA 23rd Ed.
11	Calcium As Ca	mg/L	336 May	376 Sep	350	IS:3025 (P-40)
12	Sodium As Na	mg/L	10116 Apr	10155 Aug	10130	IS:3025 (P-45)
13	Potassium As K	mg/L	337 Sep	362 May	345	IS:3025 (P-45)
14	Nitrite	mg/L	0.16 Aug	3.30 Apr	0.21	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.062 Apr	0.085 June	0.073	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	44395 May	49208 Sep	46520	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	254 Sep	260 July	257	IS:1622

Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Baseline (Up to 800-meter west)-20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.91 May	8.28 July	8.08	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1838 June	2714 Apr	2390	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	42412 Apr	46048 June	43650	IS:3025 (P-16)
4	Turbidity	NTU	5.7 Aug	7.20 July	6.01	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.13 Aug	0.64 May	0.28	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1257 Apr	1542 June	1398	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	595 Sep	697 June	645	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.0 May	2.1 Aug	1.55	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.035 Sep	0.048 Aug	0.04	APHA 23rd Ed.
11	Calcium As Ca	mg/L	336 Aug	376 sep	350	IS:3025 (P-40)
12	Sodium As Na	mg/L	10416 July	10170 Sep	10154	IS:3025 (P-45)
13	Potassium As K	mg/L	354 Apr	380 May	369	IS:3025 (P-45)
14	Nitrite	mg/L	0.024 July	0.38 Apr	0.31	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.068 Apr	0.11 July	0.89	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	44606 May	47980 Sep	46585	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	312 Sep	346 July	330	IS:1622

Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Western Dock Arm -1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.86 May	8.03 July	7.97	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1686 June	2736 Apr	2339.6	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41064 May	45706 June	43094.6	IS:3025 (P-16)
4	Turbidity	NTU	5.6 Apr	6.6 July	6.03	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.13 Apr	0.42 May	0.18	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1374.24 June	1452 Apr	1418	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	592 Apr	666.26 May	613	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.6 May	2.8 Apr	2.2	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.21 July	0.03 Apr	0.024	APHA 23rd Ed.
11	Calcium As Ca	mg/L	286 Apr	344 May	333	IS:3025 (P-40)
12	Sodium As Na	mg/L	10096 June	10180 Aug	10139.5	IS:3025 (P-45)
13	Potassium As K	mg/L	312 July	346 Apr	329.6	IS:3025 (P-45)
14	Nitrite	mg/L	0.11 Aug	0.20 Sep	0.15	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.06 May	0.84 Sep	0.069	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43260 May	48482 Sep	46090	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	238 Aug	240 July	238	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Western Dock Arm-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.85 May	8.10 Aug	8.02	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1720 June	2879 Apr	2370	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41154 May	45812 June	43468	IS:3025 (P-16)
4	Turbidity	NTU	5.4 May	6.9 July	6.11	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.12 Aug	0.46 may	0.196	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1397.74 Sep	1464.4 Apr	1431.97	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	594.04 Aug	658.55 May	616	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.4 May	2.2 Apr	1.96	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.025 July	0.041 Apr	0.031	APHA 23rd Ed.
11	Calcium As Ca	mg/L	316 Apr	360 Aug	349	IS:3025 (P-40)
12	Sodium As Na	mg/L	10112 June	10196 Aug	10156	IS:3025 (P-45)
13	Potassium As K	mg/L	334 July	362 Apr	349	IS:3025 (P-45)
14	Nitrite	mg/L	0.16 Apr	0.32 Sep	0.22	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.073 Sep	0.084 June	0.075	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43366 May	47918 Sep	45741	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	256 Aug	278 JULY	261.6	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Western Dock Arm -20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.83 May	8.08 Apr	8	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1736 June	2954 Apr	2386	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41296 May	45916 June	43444	IS:3025 (P-16)
4	Turbidity	NTU	5.7 Aug	7.6 July	6.5	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.14 Aug	0.15 May	0.22	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1402 Sep	1489.6 Apr	1446.05	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	616.67 Apr	644.11 May	626	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.0 May	2.0 Aug	1.6	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.023 May	0.046 Apr	0.037	APHA 23rd Ed.
11	Calcium As Ca	mg/L	328 Apr	372 June	354	IS:3025 (P-40)
12	Sodium As Na	mg/L	10124 June	10216 Aug	10179.33	IS:3025 (P-45)
13	Potassium As K	mg/L	342 July	382 May	365	IS:3025 (P-45)
14	Nitrite	mg/L	0.24 April	0.40 Sep	0.30	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.07 May	0.096 June	0.08	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43424 May	49216 SEP	46551	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	341 Sep	348 July	344.6	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Oil Dock Arm (Diaphragm Jetty)-1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		7.83 Apr	7.91 Sep	7.8	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1726 June	2650 Apr	2186	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41183 May	44274 June	43193	IS:3025 (P-16)
4	Turbidity	NTU	5.1 May	6.4 June	5.9	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.12 Apr	0.47 May	0.18	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1402.6 Sep	1445.3 July	1424.8	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	591 Apr	623 May	606	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 June	2.6 July	2.1	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.014 July	0.035 Apr	0.024	APHA 23rd Ed.
11	Calcium As Ca	mg/L	332 May	368 Sep	347	IS:3025 (P-40)
12	Sodium As Na	mg/L	10095 Sep	10140 Aug	10118	IS:3025 (P-45)
13	Potassium As K	mg/L	346 Aug	465 Apr	398	IS:3025 (P-45)
14	Nitrite	mg/L	0.12 June	0.21 Apr	0.15	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.057 Apr	0.071 Sep	0.063	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43277 May	49024 Aug	46033	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	253 July	354 Aug	290	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Oil Dock Arm (Diaphragm Jetty)-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.87 May	8.12 Aug	7.98	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1754 June	2662 Apr	2198	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41254 May	44970 Aug	43590	IS:3025 (P-16)
4	Turbidity	NTU	5.4 May	6.8 June	6.2	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.13 June	0.50 May	0.21	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1404.5 Sep	1466.9 July	1432.9	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	10.42 Sep	658 May	519	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.6 Apr	2.2 July	1.91	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.026 July	0.042 May	0.32	APHA 23rd Ed.
11	Calcium As Ca	mg/L	344 June	364 Apr	350	IS:3025 (P-40)
12	Sodium As Na	mg/L	10120 July	10168 Aug	10142	IS:3025 (P-45)
13	Potassium As K	mg/L	376 Aug	486 Apr	418	IS:3025 (P-45)
14	Nitrite	mg/L	0.16 June	0.26 Apr	0.20	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.066 Apr	0.072 June	0.068	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43366 May	48324 Sep	45092	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	240 Aug	345 July	285	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Oil Dock Arm (Diaphragm Jetty)-20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.89	8.10	7.99	IS:3025 (P-11)
			May	Sep		
2	Total Suspended Solids	mg/L	1790	2684	2206	IS:3025 (P-17)
			June	Apr		
3	Total Dissolved Solids	mg/L	41296	44792	43404	IS:3025 (P-16)
			June	July		
4	Turbidity	NTU	5.6	6.9	6.30	IS:3025 (P-10)
			May	Apr		
5	Nitrate As NO ₃	mg/L	0.12	0.66	0.24	IS:3025 (P-34)
			Aug	June		
6	Magnesium As Mg	mg/L	1397.7	1481	1443.6	IS:3025 (P-46)
			Sep	July		
7	Sulphates As SO ₄	mg/L	606	662.3	630	IS:3025 (P-24)
			Aug	June		
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.1	2.1	1.5	IS:3025 (P-38)
			Apr	Aug		
10	Iron As Fe	mg/L	0.032	0.062	0.046	APHA 23rd Ed.
			July	Apr		
11	Calcium As Ca	mg/L	344	376	360	IS:3025 (P-40)
			Aug	Apr		
12	Sodium As Na	mg/L	10136	10204	10162	IS:3025 (P-45)
			Sep	Aug		
13	Potassium As K	mg/L	394	492	422	IS:3025 (P-45)
			July	apr		
14	Nitrite	mg/L	0.22	0.34	0.22	IS:3025 (P-34)
			July	Sep		
15	Phosphate As P	mg/L	0.068	0.080	0.074	IS:3025 (P-31)
			Apr	June		
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43424	46608	45302	IS:3025 (P-15)
			May	Aug		
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	240	345	285	IS:1622
			July	Aug		



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Lagoon Area (Turning Circle)-1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		7.83 May	8.12 July	7.99	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1792 June	2706 Apr	2337	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41314 May	44146 June	42884	IS:3025 (P-16)
4	Turbidity	NTU	5.2 Apr	6.1 Sep	5.5	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.11 Apr	0.14 Sep	0.186	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1390.44 June	1432.73 Apr	1418	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	594.04 Apr	662.85 May	614.63	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.1 May	2.3 JULY	1.93	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.015 Aug	0.034 Apr	0.024	APHA 23rd Ed.
11	Calcium As Ca	mg/L	316 May	376 Sep	340	IS:3025 (P-40)
12	Sodium As Na	mg/L	10114 July	10182 May	10138	IS:3025 (P-45)
13	Potassium As K	mg/L	310 July	382 Apr	329	IS:3025 (P-45)
14	Nitrite	mg/L	0.10 Aug	0.18 Apr	0.14	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.041 June	0.73 Sep	0.05	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43430 May	48032 Sep	45562	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	240 Aug	345 July	299	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Lagoon Area (Turning Circle)-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	...	7.83 Apr	8.10 July	7.97	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1806 June	2716 Apr	2341	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41568 May	45638 June	43316	IS:3025 (P-16)
4	Turbidity	NTU	5.4 Apr	6.2 July	5.8	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.13 Aug	0.58 May	0.21	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1407.46 Sep	1440 Apr	1422.44	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	594.04 Apr	662.85 May	614.63	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.1 May	2.3 July	1.93	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.020 Aug	0.041 Apr	0.031	APHA 23rd Ed.
11	Calcium As Ca	mg/L	336 Aug	368 Sep	348	IS:3025 (P-40)
12	Sodium As Na	mg/L	10132 July	1022 May	10162	IS:3025 (P-45)
13	Potassium As K	mg/L	324 July	394 Apr	351	IS:3025 (P-45)
14	Nitrite	mg/L	0.20 Aug	0.28 Sep	0.22	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.061 Apr	0.080 May	0.068	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43752 May	48536 Sep	45990	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	240 July	278 Aug	253	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS April 2022 TO September 2022 SUMMARY

Sr. No.	Parameters	Unit	Lagoon Area (Turning Circle)-20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	..	7.83 May	8.16 July	8	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	1826 June	2768 Apr	2398	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	41684 May	45754 June	43484	IS:3025 (P-16)
4	Turbidity	NTU	5.8 Apr	6.5 July	6	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.12 Aug	0.64 May	0.24	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	1405.51 Sep	1496.76 June	1444	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	603.1 Aug	680.5 May	627	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	1.1 May	2.1 Aug	1.6	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.03 Aug	0.048 Apr	0.039	APHA 23rd Ed.
11	Calcium As Ca	mg/L	352 June	376 Sep	358	IS:3025 (P-40)
12	Sodium As Na	mg/L	10146 July	10286 May	10187	IS:3025 (P-45)
13	Potassium As K	mg/L	360 July	460 May	395	IS:3025 (P-45)
14	Nitrite	mg/L	0.026 June	0.36 Sep	0.28	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.07 Aug	0.10 May	0.08	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	43976 May	48864 Sep	46444	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	345 July	348 Sep	347	IS:1622



6.8 Stack Emission Monitoring

7.1 Sampling Location

The table below provides details of sampling locations for the Engines and for sequence and number of sampling locations. The sampling being conducted from April 2022 to September 2022.

Sl. No.	Engine	Location of Stack
1.	CG 1000 HP at Diesel	
2.	CG 1000 HP at Diesel	
3.	CG 1000 HP at Diesel	
4.	CG 1000 HP at Diesel	
5.	CG 1000 HP at Diesel	
6.	CG 1000 HP at Diesel	
7.	CG 1000 HP at Diesel	
8.	CG 1000 HP at Diesel	
9.	CG 1000 HP at Diesel	
10.	CG 1000 HP at Diesel	
11.	CG 1000 HP at Diesel	
12.	CG 1000 HP at Diesel	

STACK EMISSION MONITORING

7.2 Details

The details of the monitoring system installed at the location of the engine and the details of the monitoring system are given below.

7.3 Methodology

The methodology for the monitoring system is as follows. The details of the methodology are given below.

7.4 Instrument / Accessories

- 1) Analytical instrument
- 2) Analytical instrument
- 3) Analytical instrument
- 4) Analytical instrument
- 5) Analytical instrument
- 6) Analytical instrument
- 7) Analytical instrument
- 8) Analytical instrument
- 9) Analytical instrument
- 10) Analytical instrument
- 11) Analytical instrument
- 12) Analytical instrument



7.0 Stack Emission Monitoring**7.1 Sampling Location**

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, a flue gas monitoring was conducted at 12 locations during the period from April 2022 to September 2022.

Table - 7
Location of Stack Emission Stations

Sr. No.	Location of Station	Frequency
1.	DG Set of Signal Station	Once in a Month
2.	DG Set of 500 KVA of Electrical Substation DG-1	Once in a Month
3.	DG-1 Set of 33 KVA Main of Capacity 1000 KVA	Once in a Month
4.	DG-2 Set of 33 KVA Main of Capacity 1000 KVA	Once in a Month
5.	DG Set of 500 KVA of Electrical Substation DG-2	Once in a Month
6.	DG Set of 160 KVA at Hospital	Once in a Month
7.	DG Set of 50 KVA of ADM Building	Once in a Month
8.	Oily Jetty Pump-2 of Capacity 890 HP	Once in a Month
9.	Oily Jetty Pump-1 of Capacity 890 HP	Once in a Month
10.	Oily Jetty Pump-3 of Capacity 890 HP	Once in a Month
11.	Hydrant Pump of Capacity 450HP	Once in a Month
12.	Monitor Pump	Once in a Month

7.2 Results

The observations made on drinking water sampling at 12 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.

7.3 Methodology

Day to day increasing industrialization in creating most critical global problem i.e., Air pollution. Many type of industries including thermal power station, cement plant, refineries, pulp and paper industries etc emitted so many types of pollutant in atmosphere monitor flue gas emission form stationary source. Monitoring of stack and vent emission is now becoming a routine requirement not only for large but even the medium and small industrial units.

7.4 Instrument / Accessories:

- 1) Panel Box Assembly
- 2) Vacuum pump
- 3) Dry gas meter
- 4) Cold box assembly
- 5) Pitot tube
- 6) Impingers
- 7) Nozzels
- 8) Sampling pobe
- 9) Inter connection tubings
- 10) Thimble holder
- 11) Pre-weighted Thimble
- 12) Red oil



- 13) Distilled water
- 14) Extension cord
- 15) Thermocouple
- 16) Syringes
- 17) Tool kit
- 18) Instruction manual or SOP
- 19) Filled date sheet
- 20) Hand globs

7.4.1 Preparation

Sampling port and port hole should be at specified height as specified by Central Pollution Control Board Height of sampling port should be less than the length of vacuum hose if required increase length of vacuum hose (maximum 40 meter recommended by manufacturer). Thimble must be pre-weighted according. Depending upon the parameter required absorbing solution.

7.4.2 Assembling

Before attempting stack monitoring it is necessary to assemble all parts of stack monitoring unit that should be properly assembled as per manufacture instruction.

7.4.3 Procedure

7.4.3.1 Temperature measurement

1. Connect the thermocouple lead to panel box assemble by inserting the dual plug.
2. Switch on the pyrometer to note down the ambient temperature
3. Insert thermocouple sensor into the stack through the hole provided on the stack.
4. Allow temperature to stabilize for 10 minutes then read the on the pyrometer.
5. Remover the thermocouple from the stack hole.

7.4.3.2 Velocity Measurement

Digital manometer to measure the velocity of air – stream inside the chimney or duct. The Pitot tube inserted into a stack develops a differential pressure proportional to the kinetic head of the smoke-stream.

$$\text{Velocity of Gases } V = K \sqrt{H X T_s}$$

7.4.3.3. Sampling for SPM and Gaseous Pollutant

Loading of thimble in thimble holder Open the thimble holder by unscrewing the front end Push the thimble (open end) on the conical surface. Slip the thimble slightly inverse Tighten the screw keeping the thimble straight. Keep on tightening till the edge of thimble strikes against back surface.

$$\text{Isokinetic Flow Rate } Q_s = \frac{V * A_n * 60 * 1000 * (273 + 25)}{T_s}$$

Isokinetic Flow Rate Q_s

Q_s = Isokinetic Flow Rate

V = Velocity of stack gas

A_n = Area of nozzle

T_s = Stack Temperature

There are three nozzles of ¼ and ½" and 3/8". The nozzle is to be selected in such a way so that Q_s false within the range of 60 LPM rotameter. Connect the filter holder nozzle and probe pipe in such a way that handle provided on the probe pipe must be oriented so that it indicates the direction, nozzle is facing in the same direction. Connect the vacuum pump to panel box assembly and switch on.

Set an appropriate flow for gaseous sampling on the 3 LPM flow meter. Gaseous sampling rate should be between 1 to 2 LPM. Subtract the gaseous sampling rate from the iso-kinetic sampling rate and the balance set on 30 LPM flow meter. Flow for PM should always be adjusted after the flow adjusted for gaseous sampling.

Pressure switch knob can be use for determination of pressure drop at the metering point by turning the knob towards PM and gas side. The corresponding redoubt is given on the vacuum gauge.

Calculation

$$\text{Volume of air sampled } Q_m \text{ (lit)} = \frac{Q_s * (740 - P_m)}{760} \times \frac{298 * t}{273 + T_a}$$

PM (mg/Nm³) = 7.5



Results & Discussion on Observations**DG Set of Signal Station**

At this location Particulate Matter as PM was found between 0.134 to 0.287 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 0.120 to 1.213 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DG Set of 500 KVA of Electrical Substation DG-1

At this location Particulate Matter as PM was found between 0.201 to 0.238 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 0.321 to 1.324 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DG-1 Set of 33 KVA Main of Capacity 1000 KVA

At this location Particulate Matter as PM was found between 0.131 to 0.819 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 0.821 to 1.894 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DG-2 Set of 33 KVA Main of Capacity 1000 KVA

At this location Particulate Matter as PM was found between 0.194 to 0.272 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 1.124 to 2.01 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DGSet of 500 KVA of Electrical Substation DG-2

At this location Particulate Matter as PM was found between 0.197 to 0.301 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 0.933 to 1.104 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DGSet of 160 KVA at Hospital

At this location Particulate Matter as PM was found between 0.131 to 0.819 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 0.419 to 0.978 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DGSet of 50 KVA ADM Building

At this location Particulate Matter as PM was found ND. The Value of Oxide of Nitrogen as NO_x was found between 0.687 to 0.876 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Oily Jetty Pump-2 of Capacity 890 HP

At this location Particulate Matter as PM was found between 34 to 72.8mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 123 to 138 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Oily Jetty Pump-1 of Capacity 890 HP

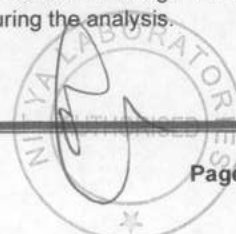
At this location Particulate Matter as PM was found between 35 to 43.2 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 127 to 139 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Oily Jetty Pump-3 of Capacity 890 HP

At this location Particulate Matter as PM was found between 41 to 56.8 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 128 to 143 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Hydrant Pump of Capacity 450 HP

At this location Particulate Matter as PM was found between 76 to 89 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 85 to 98 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Monitor Pump

At this location Particulate Matter as PM was found between 35 to 60.2 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 82 to 94.2 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

SLACK RECORDS MONITORING FOR SPECIFIC AIR POLLUTANTS

Sr. No.	Particulate Matter, PM ₁₀ (mg/Nm ³)	Maximum	Remarks
1	Particulate Matter, PM ₁₀ (mg/Nm ³)	60.2 (April 2022)	OK
2	Oxide of Nitrogen (as NO _x) (mg/Nm ³)	94.2 (May 2022)	OK
	Oxide of Sulphur (as SO _x) (mg/Nm ³)	ND	OK



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	DG Set of Signal Station	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.134 (Aprl. 2022)	0.287 (July. 2022)	0.217
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	0.120 (May. 2022)	1.213 (June. 2022)	0.98
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	DG Set of 500 KVA of Electrical Substation DG-1	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.201 (Aprl. 2022)	0.238 (Aug. 2022)	0.214
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	0.321 (Aprl. 2022)	1.324 (July. 2022)	0.99
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	DG-1 Set of 33 KVA Main of Capacity 1000 KVA	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.131 (June. 2022)	0.819 (May. 2022)	0.284
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	0.821 (May. 2022)	1.894 (June. 2022)	1.237
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	DG-2 Set of 33 KVA Main of Capacity 1000 KVA	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.194 (Aug. 2022)	0.272 (July. 2022)	0.217
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	1.124 (Aprl. 2022)	2.019 (Sep. 2022)	1.615
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	DG Set of 500 KVA of Electrical Substation DG-2	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.197 (Aprl. 2022)	0.301 (Aug. 2022)	0.238
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	0.933 (June. 2022)	1.104 (Aug. 2022)	1.09
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	DG Set of 160 KVA at Hospital	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.131 (June. 2022)	0.819 (May. 2022)	0.284
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	0.419 (Aprl. 2022)	0.978 (Sep. 2022)	0.71
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	DG Set of 50 KVA of ADM Building	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	ND	ND	ND
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	0.687 (Aprl. 2022)	0.876 (Sep. 2022)	0.78
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Oily Jetty Pump-2 of Capacity 890 HP	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	34 (May. 2022)	72.8 (Aug. 2022)	54.18
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	123.0 (Aug. 2022)	138.0 (July. 2022)	128.0
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Oily Jetty Pump-1 of Capacity 890 HP	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	35 (Aprl. 2022)	43.2 (Sep. 2022)	37.08
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	127.0 (Aprl. 2022)	139.0 (Sep. 2022)	131.6
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Hydrant Pump of Capacity 450HP	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	76 (June. 2022)	89.0 (Sep. 2022)	83.28
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	85.0 (Aprl. 2022)	98.0 (july. 2022)	94.6
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Oily Jetty Pump-3 of Capacity 890 HP	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	41 (Aprl. 2022)	56.8 (Sep. 2022)	46.68
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	128.0 (June. 2022)	143.0 (Aug. 2022)	135.1
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS APRIL 2022 TO SEPTEMBER 2022 SUMMARY

Sr. No.	Monitor Pump	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	35 (June. 2022)	60.2 (Sep. 2022)	41.93
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	82.0 (Sep. 2022)	94.2 (July. 2022)	88.2
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND

