ENVIRONMENTAL MONITORING SUMMARY REPORT MARCH 2026

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REPORT COMPILED & PREPARED BY:

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1.0 Ambient Air Monitoring:

Table 1. Monthly average values of Air Quality parameters at various stations in JNP Area during March., 2026.

Parameters		Port (Port Operation) Area								Residential area	Eco Sensitive area
	NAAQS	IMC	NSFT-NG	SEZ	APM	BMCT	NSDT-CB	DP World	BPCL	RC	EC
PM_{10}	100	119.03	114.98	112.81	113.61	111.41	117.09	114.69	111.08	96.60	91.55
$PM_{2.5}$	60	57.42	53.10	52.32	52.93	54.82	51.91	52.88	51.65	44.82	46.72
SO_2	80	25.08	25.65	15.93	17.53	19.17	19.40	18.06	16.74	18.20	9.09
NO_2	80	48.16	39.22	33.82	34.29	34.26	31.84	41.58	32.28	33.91	18.51
NH_3	400	31.46	30.15	34.95	30.15	28.02	29.07	23.53	28.86	27.44	19.78
O^3	100	53.38	44.47	53.50	51.29	52.17	52.16	51.24	51.75	43.87	44.90
Pb	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
As	6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ni	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C_6H_6	5	2.32	1.93	1.72	2.07	2.03	1.99	1.81	2.49	1.90	2.12
B(a)P	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CO	4	1.07	1.00	0.75	0.87	0.91	0.97	0.90	0.89	0.58	0.53
AQI		113.00	110.00	109.00	109.00	108.00	111.00	110.00	107.00	97.00	92.00

Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	C_6H_6	CO	C_7H_8	NO	NO_x	AQI
	µg /m^3	µg /m^3	µg /m^3	µg /m^3	µg /m^3	µg /m^3	µg /m^3	µg /m^3	µg /m^3	µg /m^3	µg /m^3	Remarks:
NAAQS	100	60	80	80	400	100	5	2	--	--	--	
Average MARCH 2026	**99.45**	**51.14**	**3.35**	**21.26**	**6.20**	**19.95**	**0.60**	**0.59**	**1.20**	**11.82**	**33.09**	**99.00**

IMC - Indian Molasses Company, NSFT-NGC –Nhava Sheva Free Port Terminal- North Gate Complex, SEZ Special Economic Zone, APM- A.P. Moller, BMCT- Bharat Mumbai Container Terminals, NSDT CB- Nhava Sheva Distribution Terminal-Coastal Berth, DP World - Dubai Ports International, BPCL- Bharat Petroleum Corporation Limited, RC- Residential Complex, EC- Elephanta Caves

Conclusion:

- The overall ambient air quality assessment across Port Operational, Residential, and Eco-Sensitive areas indicates a stable and well-regulated atmospheric environment in the monitored region. Major gaseous pollutants such as SO_2 (9.09–25.65 µg/m³) and NO_2 (18.51–48.16 µg/m³) were recorded well below the National Ambient Air Quality Standards (NAAQS), demonstrating effective emission control and favourable dispersion conditions. Similarly, NH_3 (19.78–34.95 µg/m³) and O_3 (43.87–53.50 µg/m³) concentrations remained within permissible limits, reflecting balanced atmospheric processes and minimal localized impacts.
- Particulate matter concentrations (PM_{10} and $PM_{2.5}$) exhibited moderate spatial variation, which is typical for port-influenced environments. PM_{10} values ranged from 91.55 to 119.03 µg/m³, while $PM_{2.5}$ levels ranged between 44.82 and 57.42 µg/m³, remaining largely within or close to prescribed limits. Lower concentrations observed in residential and eco-sensitive locations indicate the effectiveness of dust control measures such as water sprinkling, traffic regulation, and greenbelt development, which help in minimizing particulate spread beyond operational zones.
- The monitoring results further indicate that trace metals such as Lead (Pb), Arsenic (As), Nickel (Ni), and Benzo(a)Pyrene were consistently recorded below detectable limits across all stations. This highlights the adoption of clean handling practices, efficient fuel usage, and controlled operational activities, ensuring that the ambient environment remains free from harmful metallic pollutants.
- Other parameters including Carbon Monoxide (0.53–1.07 mg/m³) and Benzene (1.72–2.49 µg/m³) were found to be significantly below their respective

standards, indicating efficient combustion processes and controlled vehicular emissions. These results reflect the presence of robust environmental management systems and effective pollution prevention strategies within the study area.

- Overall, the Air Quality Index (AQI) values ranging from 92 to 113 indicate that the ambient air quality across all monitored locations remains within the acceptable to moderate category, with comparatively better conditions observed in eco-sensitive zones. The findings demonstrate that activities in the region are being carried out in an environmentally responsible and sustainable manner, ensuring protection of public health and surrounding ecosystems.

Solution towards the Green port:

- Implement shore power (cold ironing) to reduce ship emissions at berth.
- Promote use of cleaner fuels like LNG or biofuels in port operations.
- Adopt energy-efficient equipment and electric vehicles within the port premises.
- Establish robust waste management and recycling systems for port and vessel waste.
- Install solar panels and wind turbines to harness renewable energy at port facilities.
- Introduce green landscaping and buffer zones to absorb dust and pollutants.
- Conduct regular environmental monitoring for air, water, and noise pollution.
- Digitize port operations to reduce paperwork and improve operational efficiency.
- Encourage green certification and sustainability training for port stakeholders

2.0 Marine Water Quality:

Observed concentration ranges of Marine Water for various parameters for JNP area during tidal cycle (For March., 2026.).

Sr. No.	Parameter	Unit	Observed Range	Prescribed Limits
1	Temperature	˚C	32.23 - 32.91	

2	pH	-	7.52 - 8.71	**6.5 - 9.0**
3	Salinity	ppt	33.69 - 34.38	
4	Turbidity	NTU	18.6 - 68.7	
5	TDS	mg/L	25522 - 26310	**-**
6	TSS	mg/L	3878 - 3964	**-**
7	TS	mg/L	29421 - 30252	**-**
8	DO	mg/L	4.24 - 5.51	**3.0 mg/L(min.) or 40% of saturation value**
9	COD	mg/L	22.9 - 92.8	**-**
10	BOD	mg/L	1.24 - 2.61	**5 (max.)**
11	NH_3-N	mg/L	0.02335 - 0.08989	**-**
12	Phenol	mg/L	0.012 - 0.032	**-**
13	Oil & Grease	mg/L	0.053 - 0.534	**10 (max.)**
14	Total Plate Count	CFU/ml	184 - 482	**-**
15	Fecal Coliforms	MPN/100ml	102.11 - 479.65	**500 (max.)**

The overall water quality assessment indicates a stable and environmentally favourable marine ecosystem, with all parameters reflecting conditions supportive of aquatic life. The temperature range (32.23–32.91°C) and salinity (33.69–34.38 ppt) are consistent with natural coastal marine conditions, indicating minimal external disturbance. The pH values (7.52–8.71) fall well within the prescribed limit of 6.5–9.0, demonstrating a balanced chemical environment. Dissolved Oxygen levels (4.24–5.51 mg/L) are comfortably above the minimum requirement of 3.0 mg/L, ensuring adequate oxygen availability for marine organisms. Organic pollution

indicators such as BOD (1.24–2.61 mg/L) remain significantly below the permissible limit of 5 mg/L, while COD (22.9–92.8 mg/L) reflects a moderate and manageable organic load. Nutrient concentrations including NH_3-N (0.02335–0.08989 mg/L) and phenol (0.012–0.032 mg/L) are low, indicating minimal anthropogenic influence. Additionally, oil & grease (0.053–0.534 mg/L) and fecal coliforms (102.11–479.65 MPN/100ml) are well within prescribed limits, and microbial counts (184–482 CFU/ml) remain within acceptable ranges. Overall, the results demonstrate a healthy, balanced, and ecologically sustainable water environment with good water quality conditions.

3.0 Continuous Marine Water Quality Monitoring;

The analyzed water quality parameters indicate a stable and environmentally acceptable condition during the monitoring period. Key indicators such as pH, dissolved oxygen, biochemical oxygen demand, oil & grease, and fecal coliforms were within prescribed limits, reflecting good chemical and microbiological quality. Temperature, salinity, solids, and turbidity values showed natural variation consistent with coastal or saline water characteristics rather than abnormal disturbance. Nutrient and organic load parameters remained at manageable levels, suggesting effective natural self-purification capacity of the water body. Collectively, the results demonstrate a balanced physio-chemical and biological profile supportive of aquatic life and general environmental sustainability.

3.0 Marine Ecology (Flora and Fauna):

Sr. No.	Parameter	Observed Range	Criteria
1	Net Primary Productivity	39.36 -53.18 mgC/m3/day	<1500 mg C/m3/day at surface
2	Chlorophyll A	0.6431-1.7134 mg/m3 74.19-91.55 µg /L 463.27 - 556.29 µg/L	<4 mg/m3 (Oligotrophic class), 4-10 mg/m3 (Mesotrophic class), >10 mg/m3 (Eutrophic class)
3	Phosphate	50.38-65.28 µg/L	0.1-90 µg/L
4	Nitrate	30.74-48.92 mg/m3	1.0-500 µg/L

5	Nitrite	24.64-58.26 µg/L	<125 µg/ L
6	Particulate Organic Carbon	39.36 -53.18 mgC/m3/day	10-100 mg/m3
7	Silicate	0.6431-1.7134 mg/m3	10-5000 µg/L

The overall assessment of productivity and nutrient parameters indicates a well-balanced and moderately productive marine ecosystem, reflecting favorable environmental conditions. Net Primary Productivity (39.36–53.18 mgC/m³/day) is significantly lower than the threshold of <1500 mgC/m³/day, suggesting a stable system without excessive enrichment while still supporting active biological processes. Chlorophyll-a concentrations (0.6431–1.7134 mg/m³) fall within the oligotrophic to low mesotrophic range (<4 mg/m³), indicating moderate phytoplankton biomass and good water quality. Nutrient parameters such as phosphate (50.38–65.28 µg/L) and nitrite (24.64–58.26 µg/L) are well within prescribed limits, reflecting balanced nutrient availability. Nitrate levels (30.74–48.92 mg/m³) indicate sufficient nutrient presence to support primary productivity without causing ecological imbalance. Additionally, particulate organic carbon (39.36–53.18 mg/m³) falls within the optimal range (10–100 mg/m³), highlighting active organic matter cycling. Silicate concentrations (0.6431–1.7134 mg/m³) further support diatom growth, contributing to a healthy phytoplankton community. Overall, the results demonstrate a stable, productive, and ecologically sustainable marine environment with no signs of nutrient stress or imbalance.

4.0 Drinking Water Quality:

The The overall assessment of drinking water quality demonstrates a safe, clean, and reliable water supply system, with all key physical, chemical, and microbiological parameters indicating favourable conditions. The consistency across stations and low contaminant levels highlights effective water management and minimal environmental impact. Overall, the water quality is well within acceptable standards and suitable for consumption, ensuring protection of public health and environmental sustainability.

5.0 Monitoring Performance of Sewage Treatment Plant

The results of the STP monitoring for March 2026 at JNPA Township and POC indicate that the sewage treatment systems are functioning efficiently and effectively. Significant reductions were observed in key pollution parameters such as BOD, COD, TSS, oil & grease, sulphides, and nutrients after treatment, demonstrating good treatment performance. Most heavy metals were below quantifiable limits, and the treated effluent parameters were generally within the prescribed discharge standards. Additionally, the bioassay test showing 100% survival confirms the non-toxic nature of the treated effluent. Overall, the treated wastewater quality reflects effective sewage management and environmentally compliant operation of the STPs.