ENVIRONMENTAL MONITORING SUMMARY REPORT APRIL 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 April., 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	116.45	110.17	108.10	111.42	109.64	106.04	110.32	110.60	102.83	91.30
$PM_{2.5}$	60	51.25	49.77	48.85	48.71	50.01	48.43	49.32	53.25	46.41	45.26
SO_2	80	20.93	19.21	16.96	20.22	21.89	20.87	19.94	20.46	14.84	15.25
NO_2	80	37.93	41.31	38.10	37.88	35.94	36.60	37.42	32.93	31.34	28.00
NH_3	400	46.06	31.06	47.39	32.59	27.62	38.47	41.48	36.63	35.19	38.60
O^3	100	65.13	66.57	68.46	66.61	62.52	58.58	63.34	58.28	54.97	52.77
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	2.47	1.79	1.90	1.70	1.02	1.89	2.07	2.51	1.73	0.97
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	1.10	0.91	0.60	0.98	0.96	1.49	0.99	1.03	0.63	0.57
AQI		111.00	107.00	105.00	108.00	106.00	104.00	107.00	107.00	102.00	91.00

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 APRIL, 2026	94.02	42.92	1.56	23.02	8.72	12.34	0.57	0.33	0.75	9.08	31.97	94.02

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 stable atmospheric conditions and satisfactory environmental quality throughout the monitored region. Major gaseous pollutants such as SO_2 (14.84–21.89 µg/m³) and NO_2 (28.00–41.31 µg/m³) were recorded well below the National Ambient Air Quality Standards (NAAQS), demonstrating effective emission management and favourable atmospheric dispersion conditions. Similarly, NH_3 concentrations ranged from 27.62 to 47.39 µg/m³, while O_3 levels varied between 52.77 and 68.46 µg/m³, remaining within prescribed standards and indicating balanced atmospheric conditions with minimal environmental stress.
- Particulate matter concentrations showed moderate spatial variation typically associated with port operational activities and urban movement. PM_{10} values ranged from 91.30 to 116.45 µg/m³, while $PM_{2.5}$ concentrations varied between 45.26 and 53.25 µg/m³. Lower particulate concentrations observed in residential and eco-sensitive areas indicate the effectiveness of environmental management practices such as water sprinkling, paved road maintenance, traffic control, and greenbelt development, which help in minimizing dust dispersion beyond operational zones. The overall particulate matter trend reflects controlled emission conditions and stable ambient air quality within the study area.
- The monitoring results further revealed that trace pollutants such as Lead (Pb), Arsenic (As), Nickel (Ni), and Benzo(a)Pyrene [B(a)P] were consistently recorded below detectable limits across all monitoring stations. This indicates efficient operational controls, clean fuel usage, and environmentally responsible industrial and transportation activities within the region. The absence of

significant trace metal contamination reflects good environmental stewardship and effective pollution prevention measures in the monitored areas.

- Other important air quality parameters including Carbon Monoxide (CO) and Benzene (C_6H_6) were observed significantly below their respective standards. CO concentrations ranged from 0.57 to 1.49 mg/m³, while Benzene concentrations varied between 0.97 and 2.51 µg/m³, indicating efficient combustion processes, regulated vehicular movement, and controlled industrial emissions. These observations reflect the implementation of robust environmental management systems and continuous pollution mitigation practices across the port and surrounding regions.
- Overall, the Air Quality Index (AQI) values ranged from 91 to 111 across the monitored stations, indicating air quality conditions within the acceptable to moderate category. Comparatively better AQI values were observed in eco-sensitive and residential areas, demonstrating reduced pollutant influence away from core operational zones. The overall ambient air quality status confirms that port-related and associated activities are being carried out in an environmentally sustainable and well-regulated manner, ensuring protection of public health, ecological balance, and surrounding environmental quality.

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 April., 2026.).

Sr. No.	Parameter	Unit	Observed Range	Prescribed Limits
1	Temperature	˚C	30.02 – 30.71	
2	pH	-	7.16 – 7.69	**6.5 - 9.0**
3	Salinity	ppt	34.67 – 36.28	
4	Turbidity	NTU	76.4 – 195.3	
5	TDS	mg/L	24811 – 26347	**-**
6	TSS	mg/L	3729 – 3992	**-**
7	TS	mg/L	28621 – 30271	**-**
8	DO	mg/L	4.293 – 5.097	**3.0 mg/L(min.) or 40% of saturation value**
9	COD	mg/L	24.6 – 86.7	**-**
10	BOD	mg/L	1.22 – 2.58	**5 (max.)**
11	NH_3-N	mg/L	0.0233 – 0.0866	**-**
12	Phenol	mg/L	0.015 – 0.032	**-**
13	Oil & Grease	mg/L	0.076 – 0.534	**10 (max.)**
14	Total Plate Count	CFU/ml	198 – 392	**-**
15	Fecal Coliforms	MPN/100ml	103.15 – 386.56	**500 (max.)**

The marine water quality assessment indicates stable and environmentally favorable conditions throughout the monitored area, with most parameters observed within acceptable limits and reflecting good ecological health of the coastal environment. The temperature ranged from 30.02°C to 30.71°C, while pH values varied between 7.16 and 7.69, remaining well within the prescribed limit of 6.5–9.0, indicating balanced seawater conditions. Salinity values of 34.67–36.28 ppt and Dissolved Oxygen (DO) concentrations of 4.293–5.097 mg/L further confirm healthy marine characteristics and adequate oxygen availability for aquatic life. Organic pollution indicators such as BOD (1.22–2.58 mg/L) and Oil & Grease (0.076–0.534 mg/L) were significantly below the prescribed standards of 5 mg/L and 10 mg/L respectively, indicating minimal organic contamination in the marine waters. Nutrient and chemical parameters including COD, NH3-N, and Phenol were observed at moderate and environmentally acceptable levels, reflecting stable ecological processes. The microbiological analysis showed Total Plate Count ranging from 198–392 CFU/ml and Fecal Coliform concentrations between 103.15 and 386.56 MPN/100ml, which remained within the prescribed limit of 500 MPN/100ml, indicating satisfactory sanitary quality of the marine environment. Overall, the monitoring results demonstrate good marine water quality, balanced ecological conditions, and minimal pollution impact in the study area.

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 marine productivity assessment results indicate healthy and balanced ecological conditions in the monitored coastal environment with all observed parameters remaining within environmentally acceptable ranges. Net Primary Productivity (NPP) values ranged from 39.36 to 53.18 mgC/m³/day, which are significantly below the criterion value of 1500 mg C/m³/day, indicating stable biological productivity without excessive algal growth. Chlorophyll-A concentrations varied between 0.6431 and 1.7134 mg/m³, reflecting oligotrophic marine conditions as per the prescribed classification of less than 4 mg/m³, suggesting good water quality and low nutrient stress in the ecosystem. Nutrient concentrations including phosphate (50.38–65.28 µg/L), nitrate (30.74–48.92 mg/m³), and nitrite (24.64–58.26 µg/L) were observed within acceptable environmental ranges, indicating balanced nutrient availability supporting marine biological activity. Particulate Organic Carbon (POC) values ranged from 39.36 to 53.18 mgC/m³/day, remaining within the standard range of 10–100 mg/m³, which reflects stable organic productivity and active carbon cycling in the marine environment. Silicate concentrations ranging from 0.6431 to 1.7134 mg/m³ also indicate favorable conditions for phytoplankton growth and ecological

stability. Overall, the observed marine productivity and nutrient characteristics demonstrate healthy coastal water quality, balanced trophic conditions, and environmentally stable marine ecosystem conditions throughout the monitored area.

4.0 Drinking Water Quality:

Summary Table for JNPA Drinking Water Locations.

Sr. No.	Parameter	Unit	Observed Range (DW1–DW22)
1	Colour	Hazen	Colourless
2	Odour	-	Odourless
3	pH	pH unit	6.57 – 7.59
4	Turbidity	NTU	0.1 – 0.9
5	Total Dissolved Solids	mg/l	18 – 93
6	Aluminium as Al	mg/l	0.002 – 0.007
7	NH3-N	mg/l	0.0007 – 0.0028
8	Barium as Ba	mg/l	0.012 – 0.252
9	Calcium as Ca	mg/l	1.01 – 18.91
10	Chloride as Cl	mg/l	11 – 19
11	Copper as Cu	mg/l	0.0008 – 0.0069
12	Free Residual Chlorine	mg/l	<0.1
13	Iron as Fe	mg/l	0.0003 – 0.0054
14	Magnesium as Mg	mg/l	1.9 – 13.72
15	Manganese as Mn	mg/l	0.0005 – 0.0063
16	Oil & Grease	mg/l	0.002 – 0.014
17	Nitrate as NO3	mg/l	0.46 – 2.00
18	Selenium as Se	mg/l	0.0001 – 0.0007
19	Silver as Ag	mg/l	0.0005 – 0.0031
20	Sulphate as SO4	mg/l	3.05 – 5.38
21	Total Alkalinity as CaCO3	mg/l	26 – 46
22	Total Hardness as CaCO3	mg/l	26 – 42
23	Fluoride	mg/l	0.489 – 0.685
24	Phenolic Compounds	mg/l	0.003 – 0.009
25	Zinc as Zn	mg/l	0.002 – 0.027
26	Lead as Pb	mg/l	0.001 – 0.018
27	Mercury as Hg	mg/l	0.0001 – 0.0009
28	Molybdenum	mg/l	0.027 – 0.108
29	Nickel as Ni	mg/l	0.0003 – 0.0021
30	Total Arsenic as As	mg/l	0.0008 – 0.0407
31	Total Chromium as Cr	mg/l	0.0002 – 0.0018
32	Total Coliform	-	Absent
33	E-coli	-	Absent

The overall drinking water quality assessment indicates that the monitored water sources are environmentally stable, hygienically safe, and suitable for drinking purposes. The physio-chemical characteristics demonstrate balanced water quality conditions with minimal contamination and good groundwater integrity throughout the study area. Trace metals, nutrients, and organic contaminants were observed at negligible levels, reflecting limited anthropogenic influence and satisfactory environmental management practices. The absence of microbiological contamination further confirms the bacteriological safety and good sanitary condition of the drinking water sources. Overall, the monitoring results demonstrate good water quality status, effective natural protection of groundwater resources, and environmentally favorable conditions across all monitored locations.

5.0 Monitoring Performance of Sewage Treatment Plant

The monitoring results of STP samples collected from JNPA Township and POC during April 2026 indicate that the sewage treatment plants are functioning efficiently and effectively reducing the pollution load in the wastewater before discharge. Significant reductions in TSS, COD, BOD, oil & grease, sulphide, phenolic compounds, and heavy metal concentrations were observed after treatment, with most treated effluent parameters complying with the prescribed environmental standards. The treated sewage samples were found to be colourless, odourless, and non-toxic, as confirmed by the 100% survival observed during the bio-assay tests. The majority of toxic metals and hazardous parameters remained below quantifiable limits in the treated effluent, reflecting good operational control and treatment performance. Overall, the analytical results demonstrate satisfactory STP efficiency, environmentally safe treated effluent quality, and effective wastewater management practices at both monitored locations.