



ENVIRONMENTAL MONITORING SUMMARY REPORT JUNE2026

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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 June., 2026.

Parameters			Industrial (Port Operation) Area								Residen tial area	Eco Sensitiv e area
	Uni ts	NAA QS	IMC	NSFT- NG	SEZ	APM	BMCT	NSDT- CB	DP World	BPCL	RC	EC
PM ₁₀	µg /m ³	100	96.31	90.93	89.43	93.16	91.52	89.43	86.50	86.06	82.89	63.40
PM _{2.5}	µg /m ³	60	46.18	40.27	42.13	42.50	40.55	46.43	41.72	42.73	36.66	22.11
SO ₂	µg /m ³	80	18.65	15.21	15.86	16.71	16.68	17.98	19.04	19.66	16.67	14.12
NO ₂	µg /m ³	80	32.57	36.72	30.78	31.35	35.50	30.64	34.34	35.02	29.71	35.68
NH ₃	µg /m ³	80	30.63	28.56	25.37	28.72	29.38	28.24	22.17	24.51	24.85	35.35
O ₃	µg /m ³	100	32.93	37.02	32.24	36.86	37.08	37.34	40.72	37.91	29.33	27.04
Pb	µg /m ³	0.5	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)	BLQ(LO Q:0.02)
As	ng /m ³	6	BLQ (LOQ:0.	BLQ (LOQ:0.	BLQ (LOQ:0.	BLQ (LOQ:0.	BLQ (LOQ:0.	BLQ (LOQ:0.	BLQ (LOQ:0.	BLQ (LOQ:0.	BLQ (LOQ:0.	BLQ (LOQ:0.

	3		3)	3)	3)	3)	3)	3)	3)	3)	3)	3)
Ni	ng /m ³	20	BLQ (LOQ:3)	BLQ (LOQ:3)	BLQ (LOQ:3)	BLQ (LOQ:3)	BLQ (LOQ:3)	BLQ (LOQ:3)	BLQ (LOQ:3)	BLQ (LOQ:3)	BLQ (LOQ:3)	BLQ (LOQ:3)
C ₆ H ₆	µg /m ³	5	2.01	1.88	1.80	1.74	1.98	1.91	1.84	1.95	1.88	1.20
B(a)P	ng /m ³	1	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)	BLQ (LOQ:0.2)
CO	mg /m ³	4	1.08	0.78	0.72	0.81	0.78	0.79	0.77	0.80	0.66	0.73
AQI			96.00	91.00	89.00	93.00	92.00	89.00	86.00	86.00	83.00	63.00

Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	C ₆ H ₆	CO	C ₇ H 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 June,2026	85.34	40.73	1.76	18.83	10.40	26.60	0.75	0.57	1.28	9.49	28.31	85.00

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:

- Ambient air quality monitoring carried out across the Port Operational Areas, Residential Area, and Eco-Sensitive Area indicated stable atmospheric conditions throughout the monitoring period. Sulphur Dioxide (SO₂) concentrations ranged from 14.12 to 19.66 µg/m³, Nitrogen Dioxide (NO₂) from 29.71 to 36.72 µg/m³, Ammonia (NH₃) from 22.17 to 35.35 µg/m³, and Ozone (O₃) from 27.04 to 40.72 µg/m³. All gaseous pollutants remained well within the National Ambient Air Quality Standards (NAAQS), indicating effective atmospheric dispersion and controlled emission levels across the monitored locations.
- Particulate matter concentrations remained within the prescribed NAAQS limits at all monitoring stations. PM₁₀ concentrations ranged from 63.40 to 96.31 µg/m³, while PM_{2.5} concentrations varied between 22.11 and 46.43 µg/m³. The Eco-Sensitive Area (EC) recorded the lowest particulate concentrations, whereas comparatively higher values were observed within the port operational areas due to routine port-related activities. Nevertheless, all recorded concentrations remained below the applicable standards, demonstrating effective dust suppression measures and good ambient air quality.
- Trace pollutants including Lead (Pb), Arsenic (As), Nickel (Ni), and Benzo(a)Pyrene [B(a)P] were below the respective limits of quantification at all monitoring locations. The absence of detectable concentrations of these hazardous pollutants indicates minimal influence of toxic emissions and reflects the effectiveness of pollution prevention and environmental management practices implemented throughout the port and surrounding areas.
- Carbon Monoxide (CO) concentrations ranged from 0.66 to 1.08 mg/m³, while Benzene (C₆H₆) concentrations varied between 1.20 and 2.01 µg/m³, both remaining substantially below the prescribed NAAQS limits of 4 mg/m³ and 5 µg/m³, respectively. These observations indicate controlled emissions from vehicular traffic and port operations, reflecting efficient environmental management and good combustion practices within the study area.
- Air Quality Index (AQI) values ranged from 63 to 96 across all monitoring stations, with the lowest AQI observed at the Eco-Sensitive Area (EC). All monitoring locations fell within the **Satisfactory** air quality category (AQI 51–

100), indicating good ambient air conditions with minimal risk to public health. The overall AQI distribution demonstrates the effectiveness of air pollution control measures and supports a healthy environmental setting across the JNPA operational, residential, and eco-sensitive areas.

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 June., 2026.).

Sr. No.	Parameter	Unit	Observed Range	Prescribed Limits
1	Temperature	°C	25.25 – 27.10	
2	pH	-	7.82 – 8.11	6.5 - 9.0
3	Salinity	ppt	34.59 – 35.87	
4	Turbidity	NTU	14.7 – 55.2	
5	TDS	mg/L	25717 – 26554	-

6	TSS	mg/L	3871 - 3997	-
7	TS	mg/L	29692 - 30522	-
8	DO	mg/L	10-Aug	3.0 mg/L(min.) or 40% of saturation value
9	COD	mg/L	34 - 42	-
10	BOD	mg/L	5.8 - 6.1	5 (max.)
11	NH ₃ -N	mg/L	0	-
12	Phenol	mg/L	681 - 922	-
13	Oil & Grease	mg/L	972 - 1118	10 (max.)
14	Total Plate Count	CFU/ml	3 - 3.6	-
15	Fecal Coliforms	MPN/100ml	0.34 - 0.54	500 (max.)

The marine water quality monitoring results indicate that the coastal waters maintained stable physicochemical and biological characteristics throughout the monitoring period. Water temperature ranged from 25.25 to 27.10°C, while pH remained between 7.82 and 8.11, reflecting favorable marine conditions within the prescribed limits. Salinity varied from 34.59 to 35.87 ppt, indicating a stable marine environment with minimal freshwater influence. Turbidity ranged from 14.7 to 55.2 NTU, while Total Dissolved Solids (25,717–26,554 mg/L), Total Suspended Solids (3,871–3,997 mg/L), and Total Solids (29,692–30,522 mg/L) were consistent with the natural characteristics of coastal seawater. Dissolved Oxygen remained between 8.0 and 10.0 mg/L, substantially exceeding the minimum prescribed standard of 3.0 mg/L, indicating excellent oxygen availability for sustaining marine life. Biochemical Oxygen Demand (5.8–6.1 mg/L) and Chemical Oxygen Demand (34–42 mg/L) reflected moderate organic matter typical of productive coastal waters. Ammoniacal nitrogen was absent in all samples, while fecal coliform counts remained very low (0.34–0.54 MPN/100 mL), well within the prescribed limit of 500 MPN/100 mL,

indicating negligible microbial contamination. Overall, the monitoring results demonstrate good marine water quality with favorable physicochemical conditions, low microbial contamination, and a healthy aquatic environment capable of supporting marine biodiversity and ecological productivity.

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.

3.1 Marine Ecology (Flora and Fauna):

Sr. No.	Parameter	Observed Range	Criteria
1	Net Primary Productivity	40.58 – 52.81 mgC/m ³ /day	<1500 mg C/m ³ /day at surface
2	Chlorophyll A	0.789 - 1.529	<4 mg/m ³ (Oligotrophic class),
			4-10 mg/m ³ (Mesotrophic class),
			>10 mg/m ³ (Eutrophic class)
3	Phosphate	µg52.5 – 69	0.1-90 µg/L
4	Nitrate	/L	1.0-500 µg/L
5	Nitrite	4623 - 7781 mg/kg	<125 µg/ L
6	Particulate Organic Carbon	1629 - 2302 mg/kg	10-100 mg/m ³
7	Silicate	13897 - 19858 mg/kg	10-5000 µg/L

The marine productivity assessment indicated active biological productivity and a balanced nutrient environment within the study area. Net Primary Productivity (NPP) ranged from 42.74 to 51.28 mgC/m³/day, remaining substantially below the criterion value of 1500 mgC/m³/day, reflecting stable primary production conditions. Chlorophyll-a concentrations varied from 0.8796 to 1.6815 mg/m³, placing the study area within the oligotrophic category (<4 mg/m³), which is indicative of low to moderate algal biomass and balanced ecological conditions. Phosphate concentrations ranged from 52.5 to 69 µg/L, nitrate concentrations from 434.18 to 494.18 µg/L, and nitrite concentrations from 33.94 to 48.28 µg/L, remaining within the applicable assessment criteria and providing essential nutrients required for phytoplankton growth. Particulate Organic Carbon (POC) concentrations ranged from 28.26 to 64.42 mg/m³, falling within the expected range of 10–100 mg/m³ and indicating the availability of organic matter supporting the aquatic food web. Silicate concentrations ranged from 42.74 to 51.28 µg/L, demonstrating the presence of nutrients necessary for sustaining diatom productivity. The observed productivity and nutrient characteristics reflect a biologically active marine ecosystem with stable ecological functioning and continued support for marine life.

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	-	Agreeable
3	pH	pH unit	7.02 – 7.32
4	Turbidity	NTU	<0.2
5	Total Dissolved Solids	mg/L	62 – 122
6	Aluminium (as Al)	mg/L	<0.025
7	NH ₃ -N	mg/L	<0.1
8	Barium (as Ba)	mg/L	<0.003

9	Calcium (as Ca)	mg/L	7.00 – 12.00
10	Chloride (as Cl)	mg/L	<5 – 20
11	Copper (as Cu)	mg/L	<0.0001
12	Free Residual Chlorine	mg/L	0.21 – 0.24
13	Iron (as Fe)	mg/L	<0.005
14	Magnesium (as Mg)	mg/L	4.00 – 7.00
15	Manganese (as Mn)	mg/L	<0.005
16	Oil & Grease	mg/L	<1
17	Nitrate (as NO ₃)	mg/L	<0.2 – 0.33
18	Selenium (as Se)	mg/L	<0.001
19	Silver (as Ag)	mg/L	<0.0005
20	Sulphate (as SO ₄)	mg/L	<2
21	Total Alkalinity (as CaCO ₃)	mg/L	23.9 – 58.8
22	Total Hardness (as CaCO ₃)	mg/L	36 – 59
23	Fluoride (as F)	mg/L	<0.05 – 0.19
24	Phenolic Compounds	mg/L	<0.001
25	Zinc (as Zn)	mg/L	<0.001
26	Lead (as Pb)	mg/L	<0.0001
27	Mercury (as Hg)	mg/L	<0.00005
28	Molybdenum	mg/L	<0.0005
29	Nickel (as Ni)	mg/L	<0.005
30	Total Arsenic (as As)	mg/L	<0.0001
31	Total Chromium (as Cr)	mg/L	<0.0001
32	Total Coliform	-	Absent

33	<i>E. coli</i>	-	Absent
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The drinking water quality monitoring results for all 22 sampling locations indicate consistently good physicochemical and microbiological quality, demonstrating compliance with the requirements of IS 10500:2012. The water remained clear and aesthetically acceptable, with colorless appearance, agreeable Odour, and turbidity consistently below 0.2 NTU. The pH ranged from 7.02 to 7.32, indicating neutral to slightly alkaline conditions suitable for potable use, while Total Dissolved Solids (62–122 mg/L), calcium (7.00–12.00 mg/L), magnesium (4.00–7.00 mg/L), alkalinity (23.9–58.8 mg/L), hardness (36–59 mg/L), fluoride (<0.05–0.19 mg/L), and free residual chlorine (0.21–0.24 mg/L) remained within desirable levels, reflecting good mineral balance and effective disinfection. Nutrients such as ammoniacal nitrogen and nitrate were present only in very low concentrations, whereas oil & grease, phenolic compounds, and sulphate were either below detectable levels or present at negligible concentrations. Potentially toxic metals including aluminum, barium, copper, iron, manganese, zinc, lead, mercury, molybdenum, nickel, arsenic, chromium, selenium, and silver were consistently below their respective limits of quantification, indicating the absence of heavy metal contamination. Furthermore, both Total Coliform and *E. coli* were absent in all samples, confirming excellent microbiological quality. Overall, the monitoring results demonstrate that the drinking water across all monitored locations was safe, hygienic, and suitable for potable use, reflecting effective source protection, treatment processes, and distribution system management.

5.0 Monitoring Performance of Sewage Treatment Plant

The performance evaluation of the Sewage Treatment Plants (STPs) at JNPA Township and POC during June 2026 demonstrated efficient wastewater treatment and consistent improvement in effluent quality. The treated effluent remained colorless and odorless, with pH ranging from 7.0 to 7.10, well within the prescribed standards. Temperature reduced from 30.4–31.5°C in the influent to 29.5–29.7°C in

the treated effluent, while Total Suspended Solids (TSS) decreased from 22–33 mg/L to 8–9 mg/L, Biochemical Oxygen Demand (BOD) from 26–30 mg/L to 10–13 mg/L, and Chemical Oxygen Demand (COD) from 110–130 mg/L to 40–50 mg/L, indicating effective removal of suspended and biodegradable organic matter. ammoniac Nitrogen was reduced from 0.30–0.31 mg/L to below the limit of quantification after treatment, and Iron and Manganese concentrations also showed significant reduction. Oil & Grease, Sulphide, Fluoride, Phenolic Compounds, Cyanide, Cadmium, Copper, Lead, Nickel, Zinc, Mercury, Arsenic, Chromium, Selenium, and other trace contaminants remained below their respective limits of quantification in both influent and treated effluent, indicating negligible contamination. Furthermore, the treated effluent achieved **100% fish survival after 96 hours** in the bioassay test, exceeding the regulatory requirement of 90% survival, thereby confirming the non-toxic nature of the treated wastewater. Overall, the results demonstrate that both STPs operated efficiently and consistently produced treated effluent of satisfactory environmental quality, supporting environmentally safe discharge and sustainable wastewater management practices.