



ENVIRONMENTAL MONITORING SUMMARY REPORT SEPTEMBER 2025

REPORT NO: AEC/JNPA/EMR-09/SEPTEMBER-25

MONTH & YEAR: SEPTEMBER 2025

PREPARED BY:



ASHWAMEDH ENGINEERS CONSULTANTS

**JNPA Environmental Monitoring Lab, New Business Facilitation Centre,
TAL- URAN, DIST: RAIGAD Nhava Sheva, Maharashtra 400707**

1.0 Ambient Air Monitoring:

Table 1. Monthly average values of Air Quality parameters at various stations in JNP Area during Sept., 2025.

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	95.60	86.10	80.05	82.53	78.71	88.91	76.48	91.44	71.08	46.19
PM _{2.5}	60	36.35	35.04	30.99	33.47	31.52	36.15	34.65	33.84	21.93	14.60
SO ₂	80	11.30	14.82	11.75	14.45	12.13	11.01	12.02	12.02	11.58	9.01
NO ₂	80	41.36	28.30	24.85	30.20	28.09	29.95	26.44	29.19	26.36	15.66
NH ₃	400	36.26	34.32	36.17	37.90	37.43	32.75	28.09	31.53	26.08	20.62
O ₃	100	35.56	35.36	29.54	28.74	29.08	28.64	26.07	28.76	16.70	11.22
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 ₆ H ₆	5	1.97	3.79	1.49	1.44	1.40	1.87	1.97	1.47	0.87	0.52
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	0.69	0.69	0.70	0.25	0.46	0.53	0.51	0.48	0.32	0.16
AQI		96.00	86.00	80.00	83.00	79.00	89.00	76.00	91.00	71.00	46.00

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 Sep 2025	54.78	22.68	0.88	20.59	3.35	5.15	0.77	0.27	0.87	17.31	37.90	55.00

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 air quality monitoring results indicate that the concentrations of major pollutants such as PM10, PM2.5, SO2, and NO2 at all monitoring locations are well within the National Ambient Air Quality Standards. This shows that the ambient air quality in the port and nearby regions remains satisfactory, reflecting effective environmental control and compliance with regulatory norms.
- Particulate matter levels are significantly below the permissible limits, confirming that dust suppression measures, proper road maintenance, and cargo handling controls are effectively implemented. These practices have helped minimize airborne dust emissions and maintain cleaner air across operational and residential zones.
- The concentrations of gaseous pollutants like SO2, NO2, and CO are found to be low, which can be attributed to the use of low-sulphur fuels, well-maintained machinery, and emission control systems in vehicles and equipment used in port activities. This demonstrates the success of ongoing efforts toward cleaner and more efficient operations.
- Residential and eco-sensitive areas show good air quality status with AQI values ranging from 46 to 71, indicating minimal impact from port operations. The low pollutant levels in these zones highlight the effectiveness of buffer zones and continuous environmental monitoring in protecting public health and nearby ecosystems.
- Overall, the AQI trend ranging between 76 and 96 in port operational areas and much lower values in residential and eco-sensitive areas indicates well-balanced and sustainable port operations. Consistent environmental surveillance and proactive management strategies are ensuring long-term air quality preservation and promoting a clean and healthy environment around the port region.

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 Sept., 2025.).

Sr. No.	Parameter	Unit	Observed Range	Prescribed Limits
1	Temperature	°C	28.4-28.8	
2	pH	-	7.11-7.96	6.5 - 9.0
3	Salinity	ppt	22.07-27.41	
4	Turbidity	NTU	12.4-152.6	
5	TDS	mg/L	12032-25895	-
6	TSS	mg/L	177-299	-
7	TS	mg/L	12320-26092	-
8	DO	mg/L	4.49-6.42	3.0 mg/L(min.) or 40% of saturation value
9	COD	mg/L	21.8-92.2	-
10	BOD	mg/L	0.64-3.21	5 (max.)
11	NH ₃ -N	mg/L	0.03-0.0920	-
12	Phenol	mg/L	0.011-0.034	-
13	Oil & Grease	mg/L	0.062-0.793	10 (max.)

14	Total Plate Count	CFU/ml	200-600	-
15	Fecal Coliforms	MPN/100ml	155.32-176.49	500 (max.)

The marine water quality analysis indicates that all observed parameters are within acceptable and desirable limits, reflecting a healthy and well-balanced aquatic environment. The pH values ranging from 7.11 to 7.96 fall within the prescribed range of 6.5 to 9.0, signifying stable and neutral conditions suitable for marine life. Dissolved Oxygen (DO) levels between 4.49 and 6.42 mg/L are well above the minimum requirement of 3.0 mg/L, ensuring adequate oxygen availability to support aquatic organisms. Biochemical Oxygen Demand (BOD) values remain low (0.64–3.21 mg/L), indicating minimal organic pollution and good self-purification capacity of the water body. Similarly, Oil & Grease and Fecal Coliform concentrations are significantly below permissible limits, suggesting limited anthropogenic contamination and effective management of port-related discharges. The moderate salinity and acceptable turbidity levels further confirm stable coastal water characteristics. Overall, the results demonstrate that the marine environment in the monitored region maintains good water quality and is conducive to sustaining healthy aquatic life and ecosystem balance.

3.0 Continuous Marine Water Quality Monitoring;

The marine water quality observed during September 2025 reflects a healthy, stable, and ecologically balanced environment with all key parameters within acceptable or natural limits. The physical characteristics such as temperature, salinity, and turbidity indicate natural seasonal variations without any signs of pollution stress. Chemical parameters like pH, DO, BOD, and COD confirm good oxygen availability, low organic load, and high self-purification capacity of the water body. Low levels of nutrients, phenols, oil & grease, and ammonia further demonstrate minimal anthropogenic influence. Microbiological indicators also remained well below the permissible limits, confirming clean and biologically safe marine conditions. Overall, the results signify that the marine ecosystem is healthy, well-aerated, and supportive of aquatic life, maintaining excellent environmental quality throughout the monitoring period.

3.0 Marine Ecology (Flora and Fauna):

Sr. No.	Parameter	Observed Range	Criteria
1	Net Primary Productivity	The observed values fall under 4.99 -27.37 mgC/m ³ /day	<1500 mg C/m ³ /day at surface

2	Chlorophyll A	0.9340 – 2.0550 mg/m ³	<4 mg/m ³ (Oligotrophic class),
		55.12 – 105.33 µg/L	4-10 mg/m ³ (Mesotrophic class),
			>10 mg/m ³ (Eutrophic class)
3	Phosphate	617.71 – 927.90µg/L	0.1-90 µg/L
4	Nitrate	25.94 – 62.10µg/L	1.0-500 µg/L
5	Nitrite	The observed values fall under 11.25- 28.66 mg/m ³	<125 µg/ L
6	Particulate Organic Carbon	The observed values falls under 32.12	10-100 mg/m ³
7	Silicate	– 72.74µg/L	10-5000 µg/L

The analysis of nutrients in both marine water and sediment from the JNP Harbor area indicates a healthy and balanced aquatic environment. Nutrient levels such as phosphate, nitrate, nitrite, silica, and sulphate are within acceptable ranges, supporting good productivity and ecological stability. The predominantly sandy sediment texture promotes aeration and nutrient recycling, benefiting benthic organisms and overall water quality. Together, these findings suggest that the JNP Harbor area maintains favorable environmental conditions with stable nutrient dynamics and a well-balanced marine ecosystem.

4.0 Drinking Water Quality:

The drinking water quality across all monitoring stations (DW1–DW22) complies fully with the IS 10500:2012 drinking water standards, indicating excellent potable water conditions. The physicochemical parameters such as pH, turbidity, TDS, hardness, and alkalinity are within desirable limits, reflecting well-maintained water treatment and distribution systems. Essential minerals like calcium and magnesium are present in balanced amounts, while heavy metals and toxic elements are well below permissible limits. The absence of coliform and E. coli confirms effective disinfection and hygienic conditions. Overall, the water quality across all locations is clear, safe, and suitable for drinking purposes, highlighting good environmental management and monitoring practices.

5.0 Monitoring Performance of Sewage Treatment Plant

The performance of both JNPA Township STP and JNPA POC STP during September 2025 demonstrates excellent operational efficiency and compliance with environmental discharge standards. The significant reduction in key parameters such

as TSS, BOD, COD, Oil & Grease, confirms that the treatment systems are effectively removing organic and inorganic impurities. The pH levels remained well-balanced, and all heavy metal s were observed within safe limits, ensuring the treated water is environmentally sound. The nutrient parameters showed efficient reduction, reflecting good biological activity within the treatment process. Furthermore, the bio-assay tests recorded 100% survival, indicating that the final effluent is non-toxic and eco-friendly. Overall, both STPs are functioning efficiently, producing clear, odorless, and high-quality effluent, demonstrating JNPA's strong commitment to sustainable wastewater management and environmental protection.