MONITORING OF ENVIRONMENTAL PLAN FOR JN PORT

ENVIRONMENTAL MONITORING REPORT- APRIL 2023 EXECUTIVE SUMMARY

1.0 Ambient Air Monitoring:

Monthly average values of Air Quality parameters at various stations in JNP Area during April, 2023.

Parameters			Industrial (Port Operation) Area							Residential area	Eco Sensitive area
	Units	NAAQS	IMC	NG	SEZ	APM	BMCT	CB	DP World	RC	EC
PM_{10}	µg/m³	100	176.21	230.27	154.23	191.58	115.54	158.59	97.35	91.71	89.08
$PM_{2.5}$	µg/ m³	60	62.40	60.47	48.83	47.83	56.61	47.05	43.19	41.86	37.54
SO_2	µg/ m³	80	24.81	24.66	25.89	23.28	22.82	28.18	27.42	16.70	63.11
NO_2	µg/ m³	80	225.08	33.78	59.24	62.08	42.62	47.02	37.52	6.36	37.07
NH_3	µg/ m³	80	19.81	19.66	20.89	29.90	30.61	23.18	22.42	11.30	7.87
O^3	µg/ m³	100	45.53	30.07	25.54	38.50	21.80	38.29	48.85	8.88	13.71
Pb	µg/m³	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
As	ng/m³	6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ni	ng/m³	20	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
C_6H_6	µg/ m³	5	2.07	1.99	1.96	1.97	1.96	1.78	1.18	0.90	0.51
B(a)P	ng/ m³	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CO	mg/m³	4	0.75	0.71	0.69	0.70	0.70	0.61	0.39	0.34	0.23
AQI			245.08	186.85	136.15	161.05	110.36	139.06	97.35	91.71	89.08

1.1 Continuous Ambient Air Quality Monitoring:

Monthly average values of Air Quality parameters by Continuous Ambient Air QualityMonitoring Station at Port Operation Center (POC) - JNP area during April, 2023.

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
	ug/ m³	ug/ m³	ug/ m³	ug/ m³	ug/ m³	ug/ m³	ug/ m³	mg/ m³	ug/ m³	ug/ m³	ug/ m³	Remarks:
NAAQS	100	60	80	80	400	100	5	2	--	--	--	Satisfactory
Average April-2023	84.12	46.70	3.48	38.09	14.71	7.44	3.74	0.44	8.14	16.11	54.2	84.12

Conclusion:

- 24-hr average concentration of PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3 and other parameters were measured at 10 locations with one continuous at POC and 9 fixed Monitoring station viz. IMC, NG, SEZ, APM, BMCT, CB, DP World, JNP residential township and EC area using high volume air samplers, respirable dust sampler (APM 460 NL and APM 550 MFC) and gaseous sampler.

- During April, 2023 overall ambient air quality of the JNP was observed Poor at IMC, Moderate at NG, SEZ, APM, BMCT, CB and Satisfactory at DP-World, RC and EC locations as per CPCB standards. To improve air quality the port is using number of precautionary measures, such as maintained a wide expanse of Green zone, initiated Inter-Terminal Transfer (ITT) of tractor-trailers, switched from diesel to electrically powered e-RTGCs, installed solar panels on the roof tops of various building in the office premises which cumulatively reduces electricity consumption, the use of LED lights at JNP area helps in lower energy consumption and decreases the carbon foot prints in the environment, time to time cleaning of paved and unpaved roads, use of tarpaulin sheets to cover dumpers at project sites etc. are helping to achieve the cleaner and green future at port.

- JNPA goes green by deploys 13 E-vehicles including SEZ area and committed to sustainable growth to reduce the port's impact on the environment and neighboring communities. E-cars are zero-emission vehicles that enable the transition of JN Port to green and energy-efficient mobility solutions. The work of concretizing roads at JN Port will reduce fuel consumption, travelling time and maintenance smooth movement of traffic on the port road.

- JNPA received no rainfall during the month of April, 2023. The prominent wind direction (blowing from) was the West South West (WSW) in the port area. Average values of wind speed, temperature, relative humidity and solar radiation recorded were 5.55 Km/hr, 34.54°C, 72.10 % and 80.35 W/m^2 respectively. The maximum wind speed recorded was 6.84 Km/hr.

Solution towards the Green port:

- Alternative technology, clean energy and fuel will provide a solution for zero emissions.
- Shore power supply helps port to keep greener and clean.
- Avoid excessive idling of automobiles and ships.
- Perform periodic maintenance for electrical and water systems.
- Use the public transport at public interaction places as much as possible.

- Practice should be initiated for using mask as preventative measure, to avoid inhalation of dust particle- Mask advised in sensitive areas.
- Electric cart, Inter-Terminal Transfer (ITT) are worthy selection to reduce Port operation efficiency and fuel cost.
- Increase of green belt initiation like miyawaki tree plantation in JNPA will provide healthy eco system.
- Limit the Activity and time of Exposure in Sensitive Area Prior planning.
- Conventional RTGCs should be altered as E-RTGCs counting inside the port completely.
- New scanning technology and new high power Tugs are reducing operation timing and CO_2 Emission is good creativity.
- Green Port Initiative workshops will provide solutions to reduce carbon footprints.

2.0 Marine Water Quality

Observed concentration ranges of Marine Water for various parameters for JNP area during tidal cycle (For April, 2023*).*

Sr. No.	Parameter	Observed Range	Unit	Prescribed Limits
1	Temperature	˚C	28.20-29.63	**-**
2	pH	-	7.01-7.97	**6.5 - 9.0**
3	Salinity	ppt	34.1-35.65	**-**
4	Turbidity	NTU	20.6-128	**-**
5	TDS	mg/L	21961-43158	**-**
6	TSS	mg/L	263-344	**-**
7	TS	mg/L	22224-43460	**-**
8	DO	mg/L	3.85-7.06	**3.0 mg/L(min.) or 40% of saturation value**
9	COD	mg/L	27.2-90.0	**-**
10	BOD	mg/L	0.64-3.85	**5 (max.)**
11	Ammonia	mg/L	0.0108-0.0299	**-**
12	Phenol	mg/L	0.022-0.084	**-**
13	Oil & Grease	mg/L	0.056-0.874	**10 (max.)**
14	Total Plate Count	CFU/ml	166-478	**-**
15	Fecal Coliforms	MPN/100ml	178-696	**500 (max.)**

Conclusion:

The values of various parameters such as pH, Dissolved Oxygen, BOD and Oil & Grease are within the prescribed limits except Faecal coliforms observed slight slightly higher, From the above results it can be concluded that, the Port's working does not affect the Quality of the Marine water. The overall Marine Water Quality of the Harbour is in good category.

2.1. Continuous Marine Water Quality Monitoring:

A Continuous Marine Water Quality Monitoring system was installed at the JNPA berth bridge location to monitor parameters such as temperature, pH, dissolved oxygen, ammonia, conductivity, nitrate, salinity, turbidity, and total dissolved solids. These parameters are found satisfactory as per prescribed limits.

3.0 Marine Ecology (Flora and Fauna):

Sl. No.	Parameter	Observed Range	Criteria
1	Net Primary Productivity	41.23-65.45 mgC/m^3/day	**<1500 mg C/m^3/day at surface**
2	Chlorophyll a	0.2130-1.1748 mg/m^3	**<4 mg/m^3 (Oligotrophic class), 4-10 mg/m^3 (Mesotrophic class), >10 mg/m^3 (Eutrophic class)**
3	Phosphate	46.13-122.07 µg /L	**0.1-90 µg/L**
4	Nitrate	215.20-633.70µg/L	**1.0-500 µg/L**
5	Nitrite	19.32-56.85 µg/L	**<125 µg/ L**
6	Particulate Organic Carbon	19.91-35.25 mg/m^3	**10-100 mg/m^3**
7	Silicate	211.59-295.51 µg/L	**10-5000 µg/L**

The results obtained from the study for the month of April, 2023. Nitrates were observed higher than prescribed standards limits of ecological parameters for Arabian Sea disturbance in sediment leading to increase of these nutrients. Net Primary Productivity and Chlorophyll-a were well within prescribed standards for ecological parameters for Arabian Sea. However, considering the activities in JNP Harbour, it is seen that the marine ecosystem is not adversely affected by Port activities. Proper care should be taken for treatment of sewage and industrial waste before discharging into the open sea by nearby concerned cities, industrial estates and villages etc.

4.0 Drinking Water Quality

The drinking water being supplied to JN Port is safe for drinking purpose. At all drinking water monitoring stations around port area are found to be as per the drinking water specifications given in IS 10500:2012 and also on the basis of analysis parameter.

5.0 Monitoring Performance of Sewage Treatment Plant

It is seen that the performance of STP at JNP Township is satisfactory by overall. The treatment plant was well maintained during [April 2023] with considerable removal efficiency achieving the standards prescribed for final disposal.