

## MONITORING OF ENVIRONMENTAL PLAN FOR JN PORT

### ENVIRONMENTAL MONITORING REPORT- FEBRUARY 2021 EXECUTIVE SUMMARY

#### 1.0 Ambient Air Monitoring:

Monthly average values of Air Quality parameters at various stations in JNPT area during February, 2021

| Parameters                    |                    |       | Industrial (Port Operation) Area |              |              |              |              |              | Residential Area | Eco Sensitive area |
|-------------------------------|--------------------|-------|----------------------------------|--------------|--------------|--------------|--------------|--------------|------------------|--------------------|
|                               |                    |       | Station name                     |              |              |              |              |              |                  |                    |
|                               | Units              | NAAQS | POC                              | IMC          | NG           | SEZ          | APM          | BMCT         | RC               | EC                 |
| PM <sub>10</sub>              | µg/m <sup>3</sup>  | 100   | 177.9                            | 239.0        | 227.4        | 223.1        | 101.8        | 104.6        | 83.4             | 43.4               |
| PM <sub>2.5</sub>             | µg/ m <sup>3</sup> | 60    | 56.6                             | 66.6         | 60.9         | 66.6         | 57.7         | 54.7         | 46.4             | 36.6               |
| SO <sub>2</sub>               | µg/ m <sup>3</sup> | 80    | 5.3                              | 5.7          | 5.5          | 5.4          | 5.5          | 5.4          | 4.6              | 2.1                |
| NO <sub>2</sub>               | µg/ m <sup>3</sup> | 80    | 47.4                             | 55.1         | 52.9         | 53.3         | 53.5         | 53.4         | 36.6             | 11.5               |
| NH <sub>3</sub>               | µg/ m <sup>3</sup> | 400   | 35.5                             | 40.9         | 39.3         | 41.8         | 42.0         | 41.9         | 29.5             | 16.3               |
| O <sub>3</sub>                | µg/ m <sup>3</sup> | 100   | 16.0                             | 17.3         | 17.9         | 17.2         | 17.2         | 17.2         | 13.0             | 7.4                |
| Pb                            | µg/m <sup>3</sup>  | 0.5   | <0.05                            | <0.05        | <0.05        | <0.05        | <0.05        | <0.05        | <0.05            | <0.05              |
| As                            | ng/m <sup>3</sup>  | 6     | <0.5                             | <0.5         | <0.5         | <0.5         | <0.5         | <0.5         | <0.5             | <0.5               |
| Ni                            | ng/m <sup>3</sup>  | 20    | <1.0                             | <1.0         | <1.0         | <1.0         | <1.0         | <1.0         | <1.0             | <1.0               |
| C <sub>6</sub> H <sub>6</sub> | µg/ m <sup>3</sup> | 5     | 4.8                              | 5.7          | 5.4          | 3.1          | 3.1          | 3.1          | 2.0              | 0.3                |
| B(a)P                         | ng/ m <sup>3</sup> | 1     | <0.5                             | <0.5         | <0.5         | <0.5         | <0.5         | <0.5         | <0.5             | <0.5               |
| CO                            | mg/m <sup>3</sup>  | 2     | 0.75                             | 0.87         | 0.83         | 0.97         | 0.97         | 0.97         | 0.67             | 0.34               |
| CO <sub>2</sub>               | ppm                |       | 242.3                            | 258.9        | 254.5        | 250.6        | 233.0        | 231.9        | 211.9            | 165.0              |
| <b>AQI</b>                    |                    |       | <b>151.9</b>                     | <b>192.7</b> | <b>184.9</b> | <b>182.1</b> | <b>101.2</b> | <b>103.0</b> | <b>83.4</b>      | <b>61.0</b>        |

#### 1.1 Continuous Ambient Air Quality Monitoring:

Monthly average values of Air Quality parameters by Continuous Ambient Air Quality Monitoring Station at Port operation center - JNPT area during February, 2021

| Date           | PM <sub>10</sub>   | PM <sub>2.5</sub>  | SO <sub>2</sub>    | NO <sub>2</sub>    | NH <sub>3</sub>    | O <sub>3</sub>     | C <sub>6</sub> H <sub>6</sub> | CO                 | C <sub>7</sub> H <sub>8</sub> | NO                 | NO <sub>x</sub>    | AQI               |
|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------------------|--------------------|-------------------------------|--------------------|--------------------|-------------------|
|                | ug/ m <sup>3</sup> | ug/ m <sup>3</sup> | ug/ m <sup>3</sup> | ug/ m <sup>3</sup> | ug/ m <sup>3</sup> | ug/ m <sup>3</sup> | ug/ m <sup>3</sup>            | mg/ m <sup>3</sup> | mg/ m <sup>3</sup>            | ug/ m <sup>3</sup> | ug/ m <sup>3</sup> |                   |
| NAAQS          | 100                | 60                 | 80                 | 80                 | 400                | 100                | 5                             | 2                  | --                            | --                 | --                 | Remarks: Moderate |
| Average Feb-21 | 138.8              | 75.5               | 12.8               | 78.8               | 40.7               | 7.1                | 5.4                           | 0.9                | 4.6                           | 29.8               | 138.4              | <b>158.4</b>      |

### **Conclusion:**

- 24-hr average concentration of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, NH<sub>3</sub> other parameters were measured at eight locations viz. POC, IMC, NG, SEZ, APM, BMCT, JNP residential township and EC area using high volume samplers, respirable sampler (APM 460 NL and APM 550 MFC) and gaseous sampler.
- During February, 2021 overall ambient air quality of the JN Port area is within CPCB permissible limits. Except Particulate Matter anyway to overcome Particulate Matter problem, 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 which not just help saving cost but are friendly to environment, 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.. For cleaner and greener future.
- JNPT newly installed container scanner will improve turnaround by saving both cost and time for our stakeholders with less dwell time also induced Tug boat to speed up the operation timing.
- To minimize the impact of the port's operations on the environment, JNPT has set up comprehensive solid waste management plant at its township with a capacity of 10 metric tons per day solid waste, designed as per SWM Rules 2016 based on BARC technology. It is based on a Bio Gas plant for five MT/Day capacity with power generation from biogas and production of biogas and generation power setup for the future improvement.
- The prominent wind direction (blowing from) was North West (NW) in the port area, Average values of wind speed, temperature, relative humidity, solar radiation and total rainfall were 1.09 m/s, 28.39°C, 57.42% and 83.85 W/m<sup>2</sup> and 0.5mm respectively.

### **Corrective Action Suggested:**

- Water sprinklers should be used on heavy traffic road to settle the dust particle.
- Practice should be initiated for using mask as preventative measure, to avoid inhalation of dust particle.
- Avoid excessive idling of automobiles and ships.

- Proper disposal of solid waste in solid waste management plant to maintain clean environment.
- Use of renewable energy like solar energy should be optimal and ensure to work continuously.
- To avoid airborne disease Port workers must maintain a safe distance from anyone who is coughing or sneezing.
- New Services and technology like Electric cart, Inter-Terminal Transfer (ITT) are worthy selection to reduce Port operation efficiency and fuel cost.
- Conventional RTGCs should be altered as E-RTGCs counting inside the port completely.
- Stay sanitized of public transport and all basic items at public interaction places as much as possible.
- New scanning technology and New high power Tugs are reducing operation timing and CO<sub>2</sub> Emission are good creativity.
- Initiate Natural Gas (CNG) only as fuel by all buses and trucks.
- Dumper carrying construction material and earth filing material must be covered with tarpaulin sheet to reduce dispersal of dust in the air.
- Implementation of New technology RFID (Radio Frequency Identification) by incorporate PUC certificate status to minimize the vehicle emission are good initiative.

## 2.0 Marine Water Quality

Observed concentration ranges of Marine Water for various parameters for JNP area during tidal cycle (For February, 2021).

| Sr. | Parameter          | Observed | Unit            | Prescribed Limits            |
|-----|--------------------|----------|-----------------|------------------------------|
| 1   | Temperature        | °C       | 25.3-26.9       | -                            |
| 2   | pH                 | -        | 7.62-7.83       | <b>6.5 - 9.0</b>             |
| 3   | Salinity           | ppt      | 32.9-34.8       | -                            |
| 4   | Turbidity          | NTU      | 34.0-98.5       | -                            |
| 5   | TDS                | mg/L     | 36010-43539     | -                            |
| 6   | TSS                | mg/L     | 243--309        | -                            |
| 7   | TS                 | mg/L     | 36277-43796     | -                            |
| 8   | DO                 | mg/L     | 4.32-5.68       | <b>3.0 mg/L(min.) or 40%</b> |
| 9   | COD                | mg/L     | 60.8-113.6      | -                            |
| 10  | BOD                | mg/L     | 1.24-2.39       | <b>5 (max.)</b>              |
| 11  | NH <sub>3</sub> -N | mg/L     | 0.0069-0.0241   | -                            |
| 12  | Phenol             | mg/L     | 0.00036-0.00211 | -                            |
| 13  | Oil & Grease       | mg/L     | 0.109-0.665     | <b>10 (max.)</b>             |

|    |                   |           |        |            |
|----|-------------------|-----------|--------|------------|
| 14 | Total Plate Count | CFU/ml    | 62-101 | -          |
| 15 | Fecal Coliforms   | MPN/100ml | 51-96  | 500 (max.) |

### Conclusion:

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.

### 3.0 Marine Ecology (Flora and Fauna):

| Sr. No. | Parameter                  | Observed Range                     | Criteria   |
|---------|----------------------------|------------------------------------|--|
| 1       | Net Primary Productivity   | 1.47-4.54 mg C/m <sup>3</sup> /day | <1500 mg C/m <sup>3</sup> /day at surface  |
| 2       | Chlorophyll a              | 0.6487-0.8312mg/m <sup>3</sup>     | <4 mg/m <sup>3</sup> (Oligotrophic class),<br>4-10 mg/m <sup>3</sup> (Mesotrophic class),<br>>10 mg/m <sup>3</sup> (Eutrophic class) |
| 3       | Phosphate                  | 35.88-50.42 µg/L                   | 0.1-90 µg/L  |
| 4       | Nitrate                    | 125.6-168.4 µg/L                   | 1.0-500 µg/L   |
| 5       | Nitrite                    | 61.27-85.56 µg/L                   | <125 µg/L  |
| 6       | Particulate Organic Carbon | 4.87-24.39 mg/m <sup>3</sup>       | 10-100 mg/m <sup>3</sup>   |
| 7       | Silicate                   | 16.64-37.50 µg/L                   | 10-5000 µg/L   |

The results obtained from the study for the month of February, 2021. Phosphate, Nitrates, Nitrite and Silicate are also well within prescribing standards for ecological parameters for Arabian Sea. Net Primary Productivity and Chlorophyll-a were well within prescribe 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.

### Corrective Action Suggested:

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.