



# **Report on Water Quality across Tamil Nadu**

## **pre - & post - Idol immersion on**

### **Vinayagar Chaturthi**



**2022 - 2023**

## VINAYAGAR CHATHURTHI

In India, as a part of widely celebrated Vinayagar Chathurthi festival, it has been a tradition to immerse Vinayagar idols which are worshipped by devotees in water bodies like lakes, ponds, rivers, estuaries, open coastal beaches, wells etc. The immersion of idols concerns in terms of environmental impact of water pollution as the ingredients of the idols made of Plaster of Paris does not completely dissolve in water and leads to environmental pollution. Also, toxic paints used in decorating the idols containing mercury, lead, cadmium, Iron seeps into the water as the idol dissolves. It increases the acid content, Total Dissolved solids (TDS) and heavy metals in water thereby altering the water quality, damaging ecosystem under water and also leading to bio-accumulation. The idols can also block natural flowing water causing its stagnation and further, the decorative materials resurfaces and floats atop the water body resulting in eutrophication. It is therefore very important to celebrate the festival being mindful of the need for environment protection and also prevention and control of pollution.

In pursuance to the directions of Hon'ble High Court, Central Pollution Control Board (CPCB) evolved the Guidelines for immersion of idols and other puja materials reaching in the water bodies during festival. These guidelines have been prepared with a view to ensure environmental friendly idol immersion without affecting the quality of water bodies while ensuring religious observance. These guidelines emphasize the need for restriction on single use plastic materials for making idols, use of naturally occurring colors for coloring idols, imposing restrictions on size of the idol, construction of temporary synthetic lined ponds of adequate capacity, etc.

In this regard, it is directed to the State Pollution Control Boards having statutory powers under the Water (Prevention of Pollution) Control Act, 1974 and the Environment (Protection) Act, 1986 to give directions to implement the guidelines issued by the Central Pollution Control Board. And to conduct water quality assessment of the water bodies pre-immersion, during immersion and post-immersion on the basis of prescribed parameters.

Accordingly, in the State of Tamil Nadu, Tamil Nadu Pollution Control Board collected water samples from various water bodies across the State to oversee and monitor water quality and assess the impact of idol immersion activity during Vinayagar Chaturthi- 2022. Inorganic, metals and biological parameters were analyzed to evaluate the water quality. The reports received from Advanced Environmental Labs (AELs), Chennai, Cuddalore, Madurai, Salem and Tirunelveli, District Environmental Labs (DELs), Dindigul, Maraimalai Nagar and Tiruppur were compiled and the inferences and conclusion were drawn.

**Results of the Analysis (Physio-Chemical and Bacteriological Parameter) of the water bodies in **Chennai**, Tamil Nadu**  
monitored during pre- and post-idol immersion activity during

**Vinayagar Chaturthi (30.08.2022 & 10.09.2022)**

| S.No                                               | Sampling Location<br>in Chennai | Date of<br>sampling | Type of<br>water body | Pre/Post<br>immersion<br>sampling | pH Number | DO<br>(mg/L) | BOD<br>(mg/L) | Faecal<br>Coliform<br>(MPN/<br>100 ml) | Heavy metals in mg/L |                                                                                                       |          |         |       |           |         |         |         |
|----------------------------------------------------|---------------------------------|---------------------|-----------------------|-----------------------------------|-----------|--------------|---------------|----------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------|----------|---------|-------|-----------|---------|---------|---------|
|                                                    |                                 |                     |                       |                                   |           |              |               |                                        | Arsenic              | Cadmium                                                                                               | Chromium | Copper  | Iron  | Manganese | Nickel  | Lead    | Zinc    |
| 1                                                  | Kasimedu                        | 30.08.2022          | Harbour<br>near sea   | Pre-                              | 8.55      | 0.8          | 6             | <2                                     | <0.01                | 0.3845                                                                                                | <0.05    | <0.0015 | <0.05 | 0.0939    | <0.02   | <0.015  | <0.0015 |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 7.89 ↓    | 1.6 ↑        | 8 ↑           | <2                                     | <0.01                | 0.3934                                                                                                | <0.05    | <0.0015 | <0.05 | 0.1164 ↑  | <0.02   | <0.015  | <0.0015 |
| 2                                                  | Pattinapakkam                   | 30.08.2022          | Sea                   | Pre-                              | 8.39      | 1.5          | 5             | <2                                     | <0.01                | 0.376                                                                                                 | <0.05    | <0.0015 | <0.05 | <0.1      | <0.02   | <0.015  | <0.0015 |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 8.38      | 1.8 ↑        | 9 ↑           | <2                                     | <0.01                | 0.399 ↑                                                                                               | <0.05    | <0.0015 | <0.05 | <0.1      | <0.02   | <0.015  | <0.0015 |
| 3                                                  | Ennore                          | 30.08.2022          | Sea                   | Pre-                              | 8.52      | 1            | 7             | <2                                     | <0.01                | 0.491                                                                                                 | <0.05    | <0.0015 | <0.05 | 0.156     | <0.02   | <0.015  | <0.0015 |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 8.01 ↓    | 1.6 ↑        | 8 ↑           | <2                                     | <0.01                | 0.368                                                                                                 | <0.05    | <0.0015 | <0.05 | 0.084 ↓   | <0.02   | <0.015  | <0.0015 |
| 4                                                  | Kancheepuram                    | 30.08.2022          | Lake                  | Pre-                              | 6.76      | 3.03         | 5             | 110                                    | <0.01                | <0.0008                                                                                               | <0.05    | <0.0015 | 0.017 | 0.059     | <0.006  | <0.015  | 0.094   |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 6.52 ↓    | nil          | 11 ↑          | 140 ↑                                  | <0.01                | 0.088 ↑                                                                                               | <0.05    | 0.015   | 0.019 | 0.043 ↓   | 0.682 ↑ | <0.015  | 0.234 ↑ |
| 5                                                  | Sarva Theerthakulam             | 30.08.2022          | Lake                  | Pre-                              | 8.5       | 4.4          | 6             | 78                                     | <0.01                | <0.0008                                                                                               | <0.05    | <0.0015 | 0.017 | 0.059     | <0.006  | <0.015  | 0.089   |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 8.49      | nil          | 15 ↑          | 68 ↓                                   | <0.01                | 0.04 ↑                                                                                                | <0.05    | 0.025 ↑ | 0.015 | 0.151 ↓   | 0.751 ↑ | <0.015  | 0.246 ↑ |
| 6                                                  | Kusanthalair River              | 30.08.2022          | River                 | Pre-                              | 7.51      | 6.8          | 4             | 45                                     | <0.01                | <0.0008                                                                                               | <0.05    | 1.181   | <0.5  | <0.01     | <0.006  | 2.94    | 2.221   |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 7.58      | 6 ↓          | 5 ↑           | 93 ↑                                   | <0.01                | <0.0008                                                                                               | 0.452 ↑  | 1.461 ↑ | <0.5  | <0.01     | <0.006  | 3.694 ↑ | 2.321   |
| 7                                                  | Buckingham Canal                | 30.08.2022          | River                 | Pre-                              | 7.85      | 6.2          | 4             | 20                                     | <0.01                | <0.0008                                                                                               | <0.05    | 1.297   | <0.5  | <0.01     | <0.006  | 2.099   | 2.324   |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 7.92 ↑    | 5.8 ↓        | 4             | 45 ↑                                   | <0.01                | <0.0008                                                                                               | 0.1691 ↑ | 1.499 ↑ | <0.5  | <0.01     | <0.006  | 2.54 ↑  | 2.542 ↑ |
| 8                                                  | Pazhaverkadu                    | 30.08.2022          | Sea                   | Pre-                              | 8.27      | 6.2          | 5             | 91                                     | <0.01                | <0.0008                                                                                               | <0.05    | 6.496   | <0.5  | <0.01     | <0.006  | 3.224   | 5.766   |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 7.93 ↓    | 6.2          | 3             | 78 ↓                                   | <0.01                | <0.0008                                                                                               | 2.672 ↑  | 3.74 ↓  | <0.5  | <0.01     | <0.006  | 3.668 ↑ | 6.018 ↑ |
| 9                                                  | Ezhukan Palam                   | 30.08.2022          | River                 | Pre-                              | 7.56      | 6            | 5             | 61                                     | <0.01                | <0.0008                                                                                               | <0.05    | 0.293   | <0.5  | <0.01     | <0.006  | 2.224   | 0.426   |
|                                                    |                                 | 10.09.2022          |                       | Post-                             | 8.29 ↑    | 5.6 ↓        | 3 ↓           | 92 ↑                                   | <0.01                | <0.0008                                                                                               | 0.361 ↑  | 0.422 ↑ | <0.5  | <0.01     | <0.006  | 2.961 ↑ | 0.982 ↑ |
| Primary Water Quality Criteria for Outdoor Bathing |                                 |                     |                       |                                   |           |              |               |                                        |                      | Acceptable limit (mg/l): As-0.01, Cd-0.003, Cr-0.05, Cu-0.05, Fe-0.3, Mn-0.1, Ni-0.02, Pb-0.01 & Zn-5 |          |         |       |           |         |         |         |

| Parameters                                             | Primary Water Quality Criteria for Outdoor Bathing as per CPCB                                                            | Water Quality Standards for Coastal Waters Marine Outfalls as per CPCB |                                                       |                                                              |                  |                                           |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|------------------|-------------------------------------------|
|                                                        |                                                                                                                           | SW - I                                                                 | SW - II                                               | SW - III                                                     | SW - IV          | SW - V                                    |
| <b>pH</b>                                              | 6.5- 8.5                                                                                                                  | 6.5- 8.5                                                               | 6.5- 8.5                                              | 6.5- 8.5                                                     | 6.5- 9           | 6.0- 9                                    |
| <b>DO</b>                                              | >5 mg/L                                                                                                                   | min 5 mg/L                                                             | min 4 mg/L                                            | min 3 mg/L                                                   | min 3 mg/L       | min 3 mg/L                                |
| <b>BOD</b>                                             | <3 mg/L                                                                                                                   |                                                                        | 3 mg/L                                                | 3 mg/L                                                       | 5 mg/L           |                                           |
| <b>Faecal coliforms</b><br>Most Probable Number (MPN)  | <500 MPN/100 ml                                                                                                           |                                                                        | 100/100 ml (MPN)                                      | 500/100 ml (MPN)                                             | 500/100 ml (MPN) | 500/100 ml (MPN)                          |
| <b>Heavy metals (mg/L)</b><br>(acceptable limit)       | As-0.01 mg/L, Cd-0.003 mg/L, Cr-0.05 mg/L, Cu-0.05 mg/L, Fe-0.3 mg/L, Mn-0.1 mg/L, Ni-0.02 mg/L, Pb-0.01 mg/L & Zn-5 mg/L | Hg- 0.01 mg/L, Pb - 0.01 mg/L, Cd - 0.01 mg/L                          |                                                       | Fe -0.5 mg/L, Mn - 0.5 mg/L                                  |                  |                                           |
| <b>Oil &amp; grease</b>                                |                                                                                                                           | 0.1 mg/L                                                               |                                                       |                                                              |                  | None except for such small amount         |
| <b>Turbidity</b><br>Nephelometric Turbidity Unit (NTU) |                                                                                                                           |                                                                        | 30 NTU                                                | 30 NTU                                                       |                  |                                           |
| <b>Designated Best Use</b>                             |                                                                                                                           | Salt pans, Shell fishing, Mariculture and Ecologically Sensitive Zone. | Bathing, Contact Water Sports and Commercial fishing. | Industrial cooling, Recreation (non-contact) and Aesthetics. | Harbour.         | Navigation and Controlled Waste Disposal. |

## Chennai

- No exceedance observed in pH value at all monitored stations.
- Dissolved Oxygen (DO) does not meet the Primary Water Quality Criteria for Outdoor Bathing (>5 mg/L) at all monitored stations (pre- & post-idol immersion) except at Kusanthalair River, Buckingham Canal, Pazhaverkadu and Ezhukan Palam.
- Biochemical Oxygen Demand (BOD) does not meet the criteria (<3 mg/L) at any of the monitored locations (pre- & post-idol immersion). Further, surge in BOD value post-immersion was observed in Kancheepuram (increase by 9 mg/L), Ponneri (increase by 6 mg/L), Kasimedu (increase by 6 mg/L), Ennore (increase by 5 mg/L) and Pattinapakkam (increase by 2 mg/L).
- Faecal coliform met the criteria (<500 MPN/100 ml) at all the monitored locations.
- Arsenic (As) and Chromium (Cr), Lead (Pb) and Iron (Fe) are within the Acceptable Limit at all the monitored locations.
- Cadmium (Cd) level does not meet the standard limit (0.003 mg/l) at Kasimedu, Pattinapakkam and Ennore (pre- & post-). Also, a distinctive increase in concentration post-immersion was highly notable at Kancheepuram and Ponneri exceeding the standard limit.
- Copper (Cu) concentration was well within the standards prior to idol-immersion. However, post-idol immersion, concentration of the element had soared at Ennore, Kacheepuram, Ponneri Lake, Kusanthalair River, Buckingham Canal, Pazhaverkadu and Ezhukan Palam.
- Copper level at Kusanthalair River, Buckingham Canal, Pazhaverkadu and Ezhukan Palam exceed the standards (pre- & post-) with a post value of 1.461 mg/L, 1.499 mg/L, 3.74 mg/L and 0.498 mg/L respectively
- Likewise, Manganese concentration at Kasimedu exceeds the standard (post-) with a higher value of 0.1164 mg/L.
- At Kancheepuram and Ponneri Lake, Nickel concentrations detected prior to idol immersions were within acceptable limit (0.02 mg/l). But, Post-idol immersion values of Nickel at Kancheepuram - 0.662mg/L and Ponneri Lake - 0.751 mg/L exceed the limit significantly.

**Results of the Analysis (Physio-Chemical and Bacteriological Parameter) of the water bodies in Chengalpattu, Tamil Nadu**  
monitored during pre- and post-idol immersion activity during  
Vinayagar Chaturthi (30.08.2022 & 10.09.2022)

| S.No | Sampling Location<br>In Chengalpattu | Date of<br>sampling | Type of<br>water body | Pre/Post<br>immersion<br>sampling | pH Number | DO<br>(mg/L) | BOD<br>(mg/L) | Faecal<br>Coliform<br>(MPN/<br>100 ml) | Heavy metals in mg/L |         |          |         |      |           |        |        |        |
|------|--------------------------------------|---------------------|-----------------------|-----------------------------------|-----------|--------------|---------------|----------------------------------------|----------------------|---------|----------|---------|------|-----------|--------|--------|--------|
|      |                                      |                     |                       |                                   |           |              |               |                                        | Arsenic              | Cadmium | Chromium | Copper  | Iron | Manganese | Nickel | Lead   | Zinc   |
| 1    | Alamparaikuppam<br>village sea       | 30.08.2022          | Sea                   | Pre-                              | 8.2       | 6            | 5             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.2598 |
|      |                                      | 10.09.2022          |                       | Post-                             | 8.24      | 6.8          | 3             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.1    |
| 2    | Mamallapuram sea                     | 30.08.2022          | Sea                   | Pre-                              | 8.24      | 6.8          | 5             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.3107 |
|      |                                      | 10.09.2022          |                       | Post-                             | 8.32      | 6.3          | 2             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.01   |
| 3    | Maduranthagam Lake                   | 30.08.2022          | Lake                  | Pre-                              | 7.94      | 7.1          | 2             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.2471 |
|      |                                      | 10.09.2022          |                       | Post-                             | 7.92      | 7.1          | 2             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.12   |
| 4    | Sadurangapattinam<br>village sea     | 30.08.2022          | Sea                   | Pre-                              | 8.26      | 7.3          | 3             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.2042 |
|      |                                      | 10.09.2022          |                       | Post-                             | 8.34      | 6.6          | 3             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.38   |
| 5    | Vadapattinam village sea             | 30.08.2022          | Sea                   | Pre-                              | 8.23      | 7.3          | 2             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.2508 |
|      |                                      | 10.09.2022          |                       | Post-                             | 8.26      | 6.7          | 4             | <2                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | 0.38   |

| Parameters                                      | Primary Water Quality Criteria for Outdoor Bathing as per CPCB                                                            | Water Quality Standards for Coastal Waters Marine Outfalls as per CPCB |                                                       |                                                              |                  |                                           |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|------------------|-------------------------------------------|
|                                                 |                                                                                                                           | SW - I                                                                 | SW - II                                               | SW - III                                                     | SW - IV          | SW - V                                    |
| pH                                              | 6.5- 8.5                                                                                                                  | 6.5- 8.5                                                               | 6.5- 8.5                                              | 6.5- 8.5                                                     | 6.5- 9           | 6.0- 9                                    |
| DO                                              | >5 mg/L                                                                                                                   | min 5 mg/L                                                             | min 4 mg/L                                            | min 3 mg/L                                                   | min 3 mg/L       | min 3 mg/L                                |
| BOD                                             | <3 mg/L                                                                                                                   |                                                                        | 3 mg/L                                                | 3 mg/L                                                       | 5 mg/L           |                                           |
| Faecal coliforms<br>Most Probable Number (MPN)  | <500 MPN/100 ml                                                                                                           |                                                                        | 100/100 ml (MPN)                                      | 500/100 ml (MPN)                                             | 500/100 ml (MPN) | 500/100 ml (MPN)                          |
| Heavy metals (mg/L)<br>(acceptable limit)       | As-0.01 mg/L, Cd-0.003 mg/L, Cr-0.05 mg/L, Cu-0.05 mg/L, Fe-0.3 mg/L, Mn-0.1 mg/L, Ni-0.02 mg/L, Pb-0.01 mg/L & Zn-5 mg/L | Hg- 0.01 mg/L, Pb - 0.01 mg/L, Cd - 0.01 mg/L                          |                                                       | Fe -0.5 mg/L, Mn - 0.5 mg/L                                  |                  |                                           |
| Oil & grease                                    |                                                                                                                           | 0.1 mg/L                                                               |                                                       |                                                              |                  | None except for such small amount         |
| Turbidity<br>Nephelometric Turbidity Unit (NTU) |                                                                                                                           |                                                                        | 30 NTU                                                | 30 NTU                                                       |                  |                                           |
| Designated Best Use                             |                                                                                                                           | Salt pans, Shell fishing, Mariculture and Ecologically Sensitive Zone. | Bathing, Contact Water Sports and Commercial fishing. | Industrial cooling, Recreation (non-contact) and Aesthetics. | Harbour.         | Navigation and Controlled Waste Disposal. |

## Chengalpattu

- No exceedance of standard observed in pH value at all monitored stations.
- Dissolved Oxygen (DO) values are well within the acceptable range.
- Biochemical Oxygen Demand (BOD) met the criteria (<3 mg/L) at Maduranthagam Lake and Sadurangapattinam village sea (-pre & -post). At Alamparaikuppam Village Sea and Mamallapuram sea, exceeded BOD values (pre-) have declined.
- Faecal coliform was found well within the desirable level at all the monitored locations.
- Heavy metals Arsenic, Cadmium, Chromium, Copper, Iron, Manganese, Nickel, Lead and Zinc were all well within acceptable limit at all the locations.
- Change in post-idol immersion values were observed in all sampled locations.

**Results of the Analysis (Physio-Chemical and Bacteriological Parameter) of the water bodies in **Cuddalore**, Tamil Nadu**  
monitored during pre- and post-idol immersion activity during  
**Vinayagar Chaturthi (30.08.2022 & 10.09.2022)**

| S.No | Sampling Location<br>In Cuddalore | Date of<br>sampling | Type of<br>water body | Pre/Post<br>immersion<br>sampling | pH Number | DO<br>(mg/L) | BOD<br>(mg/L) | Faecal<br>Coliform<br>(MPN/<br>100 ml) | Heavy metals |         |          |         |       |           |  | Nickel | Lead   | Zinc    |
|------|-----------------------------------|---------------------|-----------------------|-----------------------------------|-----------|--------------|---------------|----------------------------------------|--------------|---------|----------|---------|-------|-----------|--|--------|--------|---------|
|      |                                   |                     |                       |                                   |           |              |               |                                        | Arsenic      | Cadmium | Chromium | Copper  | Iron  | Manganese |  |        |        |         |
| 1    | Ulundurpet Eri                    | 30.08.2022          | Lake                  | Pre-                              | 7.3       | 6            | 16            | <2                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.05 | <0.01     |  | <0.02  | <0.015 | 0.008   |
|      |                                   | 10.09.2022          |                       | Post-                             | 7.52 ↑    | 6            | 26 ↑          | <2                                     | <0.01        | <0.0008 | <0.05    | 0.019 ↑ | <0.05 | <0.01     |  | <0.02  | <0.015 | 0.009   |
| 2    | Bommalyar Palayam<br>Sea-shore    | 30.08.2022          | Sea                   | Pre-                              | 8.02      | 5.6          | 16            | <2                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.05 | <0.01     |  | <0.02  | <0.015 | 0.024   |
|      |                                   | 10.09.2022          |                       | Post-                             | 8.19 ↑    | 5.6          | 16            | <2                                     | <0.01        | <0.0008 | <0.05    | 0.021 ↑ | <0.05 | <0.01     |  | <0.02  | 0.001  | 0.028   |
| 3    | Ekkiyarkuppam<br>seashore         | 30.08.2022          | Sea                   | Pre-                              | 8.13      | 5.8          | 20            | <2                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.05 | <0.01     |  | <0.02  | <0.015 | 0.02    |
|      |                                   | 10.09.2022          |                       | Post-                             | 8.13      | 5.6          | 22 ↑          | <2                                     | <0.01        | <0.0008 | <0.05    | 0.009 ↑ | <0.05 | <0.01     |  | <0.02  | 0.002  | 0.022   |
| 4    | Kaipanikuppam<br>seashore         | 30.08.2022          | sea                   | Pre-                              | 8.14      | 5.4          | 18            | <2                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.05 | <0.01     |  | <0.02  | <0.015 | 0.031   |
|      |                                   | 10.09.2022          |                       | Post-                             | 8.12      | 5.2          | 18            | <2                                     | <0.01        | <0.0008 | <0.05    | 0.008 ↑ | <0.05 | <0.01     |  | <0.02  | 0.002  | 0.039   |
| 5    | Devanampattinam                   | 30.08.2022          | Sea                   | Pre-                              | 8.21      | 5.4          | 12            | <2                                     | <0.01        | <0.0008 | <0.05    | 0.002   | <0.05 | <0.01     |  | <0.02  | <0.015 | <0.0015 |
|      |                                   | 10.09.2022          |                       | Post-                             | 8.34 ↑    | 5.4          | 14 ↑          | <2                                     | <0.01        | <0.0008 | <0.05    | 0.002   | <0.05 | <0.01     |  | <0.02  | 0.002  | 0.019 ↑ |

| Parameters                                                | Primary Water Quality<br>Criteria for Outdoor Bathing<br>as per CPCB                                                                  | Water Quality Standards for<br>Coastal Waters Marine Outfalls as per CPCB          |                                                             |                                                                        |                  |                                                 |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------|------------------|-------------------------------------------------|
|                                                           |                                                                                                                                       | SW - I                                                                             | SW - II                                                     | SW - III                                                               | SW - IV          | SW - V                                          |
| <b>pH</b>                                                 | 6.5- 8.5                                                                                                                              | 6.5- 8.5                                                                           | 6.5- 8.5                                                    | 6.5- 8.5                                                               | 6.5- 9           | 6.0- 9                                          |
| <b>DO</b>                                                 | >5 mg/L                                                                                                                               | min 5 mg/L                                                                         | min 4 mg/L                                                  | min 3 mg/L                                                             | min 3 mg/L       | min 3 mg/L                                      |
| <b>BOD</b>                                                | <3 mg/L                                                                                                                               |                                                                                    | 3 mg/L                                                      | 3 mg/L                                                                 | 5 mg/L           |                                                 |
| <b>Faecal coliforms</b><br>Most Probable Number<br>(MPN)  | <500 MPN/100 ml                                                                                                                       |                                                                                    | 100/100 ml (MPN)                                            | 500/100 ml (MPN)                                                       | 500/100 ml (MPN) | 500/100 ml (MPN)                                |
| <b>Heavy metals (mg/L)</b><br>(acceptable limit)          | As-0.01 mg/L, Cd-0.003 mg/L,<br>Cr-0.05 mg/L, Cu-0.05 mg/L,<br>Fe-0.3 mg/L, Mn-0.1 mg/L,<br>Ni-0.02 mg/L, Pb-0.01 mg/L &<br>Zn-5 mg/L | Hg- 0.01 mg/L,<br>Pb - 0.01 mg/L,<br>Cd - 0.01 mg/L                                |                                                             | Fe -0.5 mg/L,<br>Mn - 0.5 mg/L                                         |                  |                                                 |
| <b>Oil &amp; grease</b>                                   |                                                                                                                                       | 0.1 mg/L                                                                           |                                                             |                                                                        |                  | None except for such<br>small amount            |
| <b>Turbidity</b><br>Nephelometric Turbidity<br>Unit (NTU) |                                                                                                                                       |                                                                                    | 30 NTU                                                      | 30 NTU                                                                 |                  |                                                 |
| <b>Designated Best Use</b>                                |                                                                                                                                       | Salt pans, Shell<br>fishing,<br>Mariculture and<br>Ecologically<br>Sensitive Zone. | Bathing, Contact Water<br>Sports and Commercial<br>fishing. | Industrial cooling,<br>Recreation (non-<br>contact) and<br>Aesthetics. | Harbour.         | Navigation and<br>Controlled Waste<br>Disposal. |

## Cuddalore

- No exceedance observed in pH value at all monitored locations.
- Dissolved Oxygen (DO) values fall well within the acceptable range.
- The Biochemical Oxygen Demand (BOD) values doesn't meet the standard at all sampled locations and further highlights the increase in number post-immersion at Ulundurpet Eri (increase by 10mg/L) , Ekkiyarkuppam seashore (increase by 2 mg/L) and Devanampattinam (increase by 2 mg/L).
- Faecal coliform met the criteria (<500 MPN/100 ml) at all the monitored locations.
- Heavy metals Arsenic, Cadmium, Chromium, Iron, Manganese, Nickel, Lead and Zinc were all well within acceptable limit at all the sampled locations.
- Post immersion, rise in Copper concentration is noted in all locations except Devanampattinam.

**Results of the Analysis (Physio-Chemical and Bacteriological Parameter) of the water bodies in *Dindigul*, Tamil Nadu**  
**monitored during pre- and post-idol immersion activity during**  
**Vinayagar Chaturthi (30.08.2022 & 10.09.2022)**

| S.No                                               | Sampling Location<br>in Dindigul       | Date of<br>sampling | Type of<br>water body | Pre/Post<br>immersion<br>sampling | pH Number | DO<br>(mg/L) | BOD<br>(mg/L) | Faecal<br>Coliform<br>(MPN/<br>100 ml) | Heavy metals in mg/L                                                                                  |         |          |         |       |           |        |        |       |
|----------------------------------------------------|----------------------------------------|---------------------|-----------------------|-----------------------------------|-----------|--------------|---------------|----------------------------------------|-------------------------------------------------------------------------------------------------------|---------|----------|---------|-------|-----------|--------|--------|-------|
|                                                    |                                        |                     |                       |                                   |           |              |               |                                        | Arsenic                                                                                               | Cadmium | Chromium | Copper  | Iron  | Manganese | Nickel | Lead   | Zinc  |
| 1                                                  | Anaipatti River<br>Nilakkottai         | 30.08.2022          | River                 | Pre-                              | 7.66      | 5.7          | 4             | <2                                     | <0.01                                                                                                 | <0.0008 | <0.05    | 0.036   | <0.5  | <0.01     | <0.006 | <0.015 | 0.023 |
|                                                    |                                        | 10.09.2022          | Post-                 | 8.07                              | 3.9       | 9            | <2            | <0.01                                  | <0.0008                                                                                               | <0.05   | 0.049    | <0.5    | <0.01 | <0.006    | <0.015 | 0.038  |       |
| 2                                                  | Kottakudi River<br>Bodinayakanur pudur | 30.08.2022          | River                 | Pre-                              | 7.99      | 5.7          | 4             | <2                                     | <0.01                                                                                                 | <0.0008 | <0.05    | 0.042   | <0.5  | <0.01     | <0.006 | <0.015 | 0.034 |
|                                                    |                                        | 10.09.2022          |                       | Post-                             | 7.65      | 5.5          | 7             | <2                                     | <0.01                                                                                                 | <0.0008 | <0.05    | 0.056   | <0.5  | <0.01     | <0.006 | <0.015 | 0.043 |
| 3                                                  | River cauvery at<br>Varangal           | 30.08.2022          | River                 | Pre-                              | 7.76      | 5.8          | 4             | <2                                     | <0.01                                                                                                 | <0.0008 | <0.05    | <0.0015 | <0.5  | 0.012     | <0.006 | <0.015 | 0.028 |
|                                                    |                                        | 10.09.2022          |                       | Post-                             | 8.16      | 4.2          | 12            | <2                                     | <0.01                                                                                                 | 0.019   | 0.023    | 0.048   | <0.5  | <0.01     | <0.006 | <0.015 | 0.051 |
| 4                                                  | River cauvery at<br>Kulithalai         | 30.08.2022          | River                 | Pre-                              | 7.98      | 5.6          | 5             | <2                                     | <0.01                                                                                                 | <0.0008 | <0.05    | 0.046   | <0.5  | <0.01     | <0.006 | <0.015 | 0.035 |
|                                                    |                                        | 10.09.2022          |                       | Post-                             | 8.02      | 4.6          | 11            | <2                                     | <0.01                                                                                                 | 0.021   | 0.019    | 0.054   | <0.5  | 0.011     | <0.006 | <0.015 | 0.047 |
| 5                                                  | Vaigai Dam DS                          | 30.08.2022          | Dam                   | Pre-                              | 7.96      | 5.4          | 4             | <2                                     | <0.01                                                                                                 | <0.0008 | <0.05    | 0.048   | <0.5  | <0.01     | <0.006 | <0.015 | 0.035 |
|                                                    |                                        | 10.09.2022          |                       | Post-                             | 7.99      | 5.2          | 7             | <2                                     | <0.01                                                                                                 | <0.0008 | <0.05    | 0.052   | <0.5  | <0.01     | <0.006 | <0.015 | 0.043 |
| Primary Water Quality Criteria for Outdoor Bathing |                                        |                     |                       |                                   |           |              |               |                                        | Acceptable limit (mg/l): As-0.01, Cd-0.003, Cr-0.05, Cu-0.05, Fe-0.3, Mn-0.1, Ni-0.02, Pb-0.01 & Zn-5 |         |          |         |       |           |        |        |       |

| Parameters                                      | Primary Water Quality Criteria for Outdoor Bathing as per CPCB                                                            | Water Quality Standards for Coastal Waters Marine Outfalls as per CPCB |                                                       |                                                              |                  |                                           |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|------------------|-------------------------------------------|
|                                                 |                                                                                                                           | SW - I                                                                 | SW - II                                               | SW - III                                                     | SW - IV          | SW - V                                    |
| pH                                              | 6.5- 8.5                                                                                                                  | 6.5- 8.5                                                               | 6.5- 8.5                                              | 6.5- 8.5                                                     | 6.5- 9           | 6.0- 9                                    |
| DO                                              | >5 mg/L                                                                                                                   | min 5 mg/L                                                             | min 4 mg/L                                            | min 3 mg/L                                                   | min 3 mg/L       | min 3 mg/L                                |
| BOD                                             | <3 mg/L                                                                                                                   |                                                                        | 3 mg/L                                                | 3 mg/L                                                       | 5 mg/L           |                                           |
| Faecal coliforms<br>Most Probable Number (MPN)  | <500 MPN/100 ml                                                                                                           |                                                                        | 100/100 ml (MPN)                                      | 500/100 ml (MPN)                                             | 500/100 ml (MPN) | 500/100 ml (MPN)                          |
| Heavy metals (mg/L)<br>(acceptable limit)       | As-0.01 mg/L, Cd-0.003 mg/L, Cr-0.05 mg/L, Cu-0.05 mg/L, Fe-0.3 mg/L, Mn-0.1 mg/L, Ni-0.02 mg/L, Pb-0.01 mg/L & Zn-5 mg/L | Hg- 0.01 mg/L, Pb - 0.01 mg/L, Cd - 0.01 mg/L                          |                                                       | Fe -0.5 mg/L, Mn - 0.5 mg/L                                  |                  |                                           |
| Oil & grease                                    |                                                                                                                           | 0.1 mg/L                                                               |                                                       |                                                              |                  | None except for such small amount         |
| Turbidity<br>Nephelometric Turbidity Unit (NTU) |                                                                                                                           |                                                                        | 30 NTU                                                | 30 NTU                                                       |                  |                                           |
| Designated Best Use                             |                                                                                                                           | Salt pans, Shell fishing, Mariculture and Ecologically Sensitive Zone. | Bathing, Contact Water Sports and Commercial fishing. | Industrial cooling, Recreation (non-contact) and Aesthetics. | Harbour.         | Navigation and Controlled Waste Disposal. |

## Dindigul

- No exceedance of pH value was observed at all monitored stations.
- Dissolved Oxygen (DO) at all the sampled locations have lowered values compared to pre-immersion values.
- Biochemical Oxygen Demand (BOD) does not meet the criteria (<3 mg/L) at any of the monitored locations (-pre & -post). Additionally, an increase in values of BOD was observed at all the locations.
- Faecal coliform was found well within the desirable level at all the monitored locations.
- Heavy metals Arsenic, Chromium, Iron, Manganese, Nickel, Lead and Zinc were all well within acceptable limit at all the locations.
- At Varangal and Kulithalai, exceedance of Cadmium values was noted (0.003 mg/l) post-idol immersion.
- Similarly, Copper too has shown an increase in values exceeding the standard (0.05 mg/l) post-idol immersion at Bodinayakanur pudur, Kulithalai and Vaigai Dam DS.

**Results of the Analysis (Physio-Chemical and Bacteriological Parameter) of the water bodies in **Madurai**, Tamil Nadu**  
monitored during pre- and post-idol immersion activity during  
**Vinayagar Chaturthi (30.08.2022 & 10.09.2022)**

| S.No | Sampling Location<br>in Madurai       | Date of<br>sampling | Type of<br>water body | Pre/Post<br>immersion<br>sampling | pH Number | DO<br>(mg/L) | BOD<br>(mg/L) | Faecal<br>Coliform<br>(MPN/<br>100 ml) | Heavy metals |         |          |         |        |           |        |        |         |
|------|---------------------------------------|---------------------|-----------------------|-----------------------------------|-----------|--------------|---------------|----------------------------------------|--------------|---------|----------|---------|--------|-----------|--------|--------|---------|
|      |                                       |                     |                       |                                   |           |              |               |                                        | Arsenic      | Cadmium | Chromium | Copper  | Iron   | Manganese | Nickel | Lead   | Zinc    |
| 1    | Agni Theertham<br>Seashore Rameswaram | 30.08.2022          | Sea                   | Pre-                              | 6.95      | 7.3          | <2            | <1.8                                   | <0.01        | <0.0008 | <0.05    | <0.0015 | 0.3012 | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                       | 10.09.2022          |                       | Post-                             | 7.35      | 5            | <2            | <2                                     | <0.01        | 0.005   | <0.05    | 0.02    | 0.682  | <0.01     | <0.006 | <0.015 | <0.0015 |
| 2    | Indra Nagar Seashore<br>Mandapam      | 30.08.2022          | Sea                   | Pre-                              | 7.65      | 7.8          | <2            | <1.8                                   | <0.01        | <0.0008 | <0.05    | <0.0015 | 0.24   | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                       | 10.09.2022          |                       | Post-                             | 7.83      | 3.2          | <2            | <2                                     | <0.01        | 0.006   | <0.05    | 0.019   | 0.712  | <0.01     | <0.006 | <0.015 | 0.002   |
| 3    | Navapasanam<br>Seashore Devipattinam  | 30.08.2022          | Sea                   | Pre-                              | 7.52      | 7.1          | <2            | <1.8                                   | <0.01        | <0.0008 | <0.05    | <0.0015 | 0.22   | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                       | 10.09.2022          |                       | Post-                             | 7.88      | 4.2          | <2            | <2                                     | <0.01        | 0.007   | <0.05    | 0.022   | 0.732  | <0.01     | <0.006 | <0.015 | 0.023   |
| 4    | Naripaliyur Seashore<br>Naripaliyur   | 30.08.2022          | Sea                   | Pre-                              | 7.9       | 7            | <2            | <1.8                                   | <0.01        | <0.0008 | <0.05    | <0.0015 | 0.256  | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                       | 10.09.2022          |                       | Post-                             | 7.84      | 4.7          | <2            | <1.8                                   | <0.01        | <0.0008 | <0.05    | 0.019   | 0.647  | <0.01     | <0.006 | <0.015 | 0.014   |
| 5    | Vaigai Thaikkal Palam                 | 30.08.2022          | River                 | Pre-                              | 7.46      | 6            | 3             | 63                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | 0.135  | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                       | 10.09.2022          |                       | Post-                             | 7.65      | 3.2          | 5             | 47                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | 0.647  | <0.01     | <0.006 | <0.015 | <0.0015 |

| Parameters                                   | Primary Water Quality Criteria for Outdoor Bathing as per CPCB                                                            | Water Quality Standards for Coastal Waters Marine Outfalls as per CPCB |                                                       |                                                              |                  |                                           |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|------------------|-------------------------------------------|
|                                              |                                                                                                                           | SW - I                                                                 | SW - II                                               | SW - III                                                     | SW - IV          | SW - V                                    |
| pH                                           | 6.5- 8.5                                                                                                                  | 6.5- 8.5                                                               | 6.5- 8.5                                              | 6.5- 8.5                                                     | 6.5- 9           | 6.0- 9                                    |
| DO                                           | >5 mg/L                                                                                                                   | min 5 mg/L                                                             | min 4 mg/L                                            | min 3 mg/L                                                   | min 3 mg/L       | min 3 mg/L                                |
| BOD                                          | <3 mg/L                                                                                                                   |                                                                        | 3 mg/L                                                | 3 mg/L                                                       | 5 mg/L           |                                           |
| Faecal coliforms Most Probable Number (MPN)  | <500 MPN/100 ml                                                                                                           |                                                                        | 100/100 ml (MPN)                                      | 500/100 ml (MPN)                                             | 500/100 ml (MPN) | 500/100 ml (MPN)                          |
| Heavy metals (mg/L) (acceptable limit)       | As-0.01 mg/L, Cd-0.003 mg/L, Cr-0.05 mg/L, Cu-0.05 mg/L, Fe-0.3 mg/L, Mn-0.1 mg/L, Ni-0.02 mg/L, Pb-0.01 mg/L & Zn-5 mg/L | Hg- 0.01 mg/L, Pb - 0.01 mg/L, Cd - 0.01 mg/L                          |                                                       | Fe -0.5 mg/L, Mn - 0.5 mg/L                                  |                  |                                           |
| Oil & grease                                 |                                                                                                                           | 0.1 mg/L                                                               |                                                       |                                                              |                  | None except for such small amount         |
| Turbidity Nephelometric Turbidity Unit (NTU) |                                                                                                                           |                                                                        | 30 NTU                                                | 30 NTU                                                       |                  |                                           |
| Designated Best Use                          |                                                                                                                           | Salt pans, Shell fishing, Mariculture and Ecologically Sensitive Zone. | Bathing, Contact Water Sports and Commercial fishing. | Industrial cooling, Recreation (non-contact) and Aesthetics. | Harbour.         | Navigation and Controlled Waste Disposal. |

## Madurai

- No exceedance of standard observed in pH value at all monitored stations.
- Post-idol immersion, a drastic decrease in Dissolved Oxygen (DO) level is observed at all monitored locations, affecting the values to exceed the bathing criteria (>5 mg/L).
- Biochemical Oxygen Demand (BOD) values except at Vaigai Thaikkal Palam (post-idol immersion) were detected within an acceptable limit.
- Faecal coliform was found well within the desirable level at all locations tested.
- Heavy metals Arsenic, Chromium, Copper, Manganese, Nickel, Lead and Zinc were all well within standard limit at all the locations.
- Cadmium values, post-idol immersion exceed the standard (0.003 mg/l) at Agni Theertham Seashore Rameswaram (0.005 mg/L) and Indra Nagar Seashore Mandapam (0.006 mg/L), Navapasanam Seashore Devipattinam (0.007 mg/L).
- Iron concentration observed pre-idol immersion are all well within the standards. However, post immersion data signifies its increase exceeding the standard at all the five monitored stations.

# Results of the Analysis (Physio-Chemical and Bacteriological Parameter) of the water bodies in Salem, Tamil Nadu

monitored during pre- and post-idol immersion activity during

Vinayagar Chaturthi (30.08.2022 & 10.09.2022)

| S.No. | Sampling Location<br>in Salem | Date of<br>sampling | Type of<br>water body | Pre/Post<br>immersion<br>sampling | pH Number | DO<br>(mg/L) | BOD<br>(mg/L) | Faecal<br>Coliform<br>(MPN/<br>100 ml) | Heavy metals |         |          |         |      |           |        |        |         |
|-------|-------------------------------|---------------------|-----------------------|-----------------------------------|-----------|--------------|---------------|----------------------------------------|--------------|---------|----------|---------|------|-----------|--------|--------|---------|
|       |                               |                     |                       |                                   |           |              |               |                                        | Arsenic      | Cadmium | Chromium | Copper  | Iron | Manganese | Nickel | Lead   | Zinc    |
| 1     | Cauvery (Hogenakkal)          | 30.08.2022          | Dam                   | Pre-                              | 7.51      | 6.9          | <2            | 7.8                                    | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.92      | 6.6          | <2            | 12                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 2     | Thenpennai                    | 30.08.2022          | River                 | Pre-                              | 7.65      | 5.8          | <2            | 12                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.25      | 5.4          | <2            | 17                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 3     | Mookaneri Lake                | 30.08.2022          | Lake                  | Pre-                              | 7.71      | 5.8          | <2            | 11                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.46      | 5.6          | <2            | 22                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 4     | Kumaragiri Lake               | 30.08.2022          | Lake                  | Pre-                              | 7.69      | 4.7          | <2            | 21                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.96      | 4.4          | <2            | 33                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 5     | Annaimaduvu Dam               | 30.08.2022          | Dam                   | Pre-                              | 7.77      | 6            | <2            | 12                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.8       | 4.6          | <2            | 25                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 6     | Maniakundam Lake              | 30.08.2022          | Lake                  | Pre-                              | 8.19      | 6.7          | <2            | 17                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.84      | 5.5          | <2            | 46                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 7     | Muttal Lake                   | 30.08.2022          | Lake                  | Pre-                              | 6.88      | 6.2          | <2            | 26                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.54      | 5.9          | <2            | 46                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 8     | Ottamparai Lake               | 30.08.2022          | Lake                  | Pre-                              | 7.02      | 5.6          | <2            | 31                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 6.98      | <0.5         | <2            | 58                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 9     | Sentharapatty Lake            | 30.08.2022          | Lake                  | Pre-                              | 7.93      | 5.7          | <2            | 17                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.75      | 5.2          | <2            | 31                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 10    | Jangamasamuthiram             | 30.08.2022          | Lake                  | Pre-                              | 8.34      | 5.2          | <2            | 17                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 8.42      | 5            | <2            | 25                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 11    | Seelanikkaenpatty             | 30.08.2022          | Lake                  | Pre-                              | 7.09      | 3.4          | <2            | 27                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.74      | 5.9          | <2            | 49                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 12    | Bhavani @ Nanjai Pullay       | 30.08.2022          | River                 | Pre-                              | 7.08      | 7            | <2            | 6.1                                    | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.81      | 6.8          | <2            | 11                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 13    | River Bhavani @ Athani        | 30.08.2022          | River                 | Pre-                              | 7.06      | 7.2          | <2            | 6.8                                    | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.61      | 6.9          | <2            | 17                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 14    | River Bhavani @ Padaguthurai  | 30.08.2022          | River                 | Pre-                              | 7.33      | 7.1          | <2            | 6.8                                    | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.35      | 7            | <2            | 12                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 15    | River Bhavani @ Perunthalayur | 30.08.2022          | River                 | Pre-                              | 7.35      | 7.2          | <2            | 6.8                                    | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|       |                               | 10.09.2022          |                       | Post-                             | 7.3       | 6.9          | <2            | 14                                     | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |

| Parameters                             | Primary Water Quality Criteria for Outdoor Bathing as per CPCB                                                            | Water Quality Standards for Coastal Waters Marine Outfalls as per CPCB |                                                       |                                                              |                  |                                           |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|------------------|-------------------------------------------|
|                                        |                                                                                                                           | SW - I                                                                 | SW - II                                               | SW - III                                                     | SW - IV          | SW - V                                    |
| pH                                     | 6.5- 8.5                                                                                                                  | 6.5- 8.5                                                               | 6.5- 8.5                                              | 6.5- 8.5                                                     | 6.5- 9           | 6.0- 9                                    |
| DO                                     | >5 mg/L                                                                                                                   | min 5 mg/L                                                             | min 4 mg/L                                            | min 3 mg/L                                                   | min 3 mg/L       | min 3 mg/L                                |
| BOD                                    | <3 mg/L                                                                                                                   |                                                                        | 3 mg/L                                                | 3 mg/L                                                       | 5 mg/L           |                                           |
| Faecal coliforms                       |                                                                                                                           |                                                                        |                                                       |                                                              |                  |                                           |
| Most Probable Number (MPN)             | <500 MPN/100 ml                                                                                                           |                                                                        | 100/100 ml (MPN)                                      | 500/100 ml (MPN)                                             | 500/100 ml (MPN) | 500/100 ml (MPN)                          |
| Heavy metals (mg/L) (acceptable limit) | As-0.01 mg/L, Cd-0.003 mg/L, Cr-0.05 mg/L, Cu-0.05 mg/L, Fe-0.3 mg/L, Mn-0.1 mg/L, Ni-0.02 mg/L, Pb-0.01 mg/L & Zn-5 mg/L | Hg- 0.01 mg/L, Pb - 0.01 mg/L, Cd - 0.01 mg/L                          |                                                       | Fe -0.5 mg/L, Mn - 0.5 mg/L                                  |                  |                                           |
| Oil & grease                           |                                                                                                                           | 0.1 mg/L                                                               |                                                       |                                                              |                  | None except for such small amount         |
| Turbidity                              |                                                                                                                           |                                                                        |                                                       |                                                              |                  |                                           |
| Nephelometric Turbidity Unit (NTU)     |                                                                                                                           |                                                                        | 30 NTU                                                | 30 NTU                                                       |                  |                                           |
| Designated Best Use                    |                                                                                                                           | Salt pans, Shell fishing, Mariculture and Ecologically Sensitive Zone. | Bathing, Contact Water Sports and Commercial fishing. | Industrial cooling, Recreation (non-contact) and Aesthetics. | Harbour.         | Navigation and Controlled Waste Disposal. |

## Salem

- No exceedance of pH value observed at all monitored stations.
- Drastic decrease in Dissolved Oxygen (DO) value post-idol immersion was observed at Ottamparai Lake (decrease by 5.1 mg/L), Seelanaickenpatti ( decrease by 2.5 mg/L), Annaimaduvu Dam (decrease by 1.4 mg/L), and Maniyarkundam Lake (decrease by 1.2 mg/L). Otherwise, a general decrease in DO values was detected in other stations.
- Biochemical Oxygen Demand (BOD) met the criteria (<3 mg/L) at all of the monitored locations (-pre & -post).
- A general increase in faecal coliform was noted in all the sampled locations post-idol immersion although, the values do not exceed the standard criteria(<500 MPN/100 ml).
- Heavy metals Arsenic, Cadmium, Chromium, Copper, Iron, Manganese, Nickel, Lead and Zinc were all well within acceptable limit at all the locations.

**Results of the Analysis (Physio-Chemical and Bacteriological Parameter) of the water bodies in **Tirunelveli**, Tamil Nadu**  
monitored during pre- and post-idol immersion activity during  
**Vinayagar Chaturthi (30.08.2022 & 10.09.2022)**

| S.No | Sampling Location<br>in Tirunelveli | Date of<br>sampling | Type of<br>water body | Pre/Post<br>immersion<br>sampling | pH Number | DO<br>(mg/L) | BOD<br>(mg/L) | Faecal<br>Coliform<br>(MPN/<br>100 ml) | Heavy metals in mg/L |         |          |         |      |           |        |        |         |
|------|-------------------------------------|---------------------|-----------------------|-----------------------------------|-----------|--------------|---------------|----------------------------------------|----------------------|---------|----------|---------|------|-----------|--------|--------|---------|
|      |                                     |                     |                       |                                   |           |              |               |                                        | Arsenic              | Cadmium | Chromium | Copper  | Iron | Manganese | Nickel | Lead   | Zinc    |
| 1    | Kadayam                             | 30.08.2022          | Dam                   | Pre-                              | 7.3       | 9            | <2            | 1.8                                    | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                     | 10.09.2022          |                       | Post-                             | 7.25      | 7.3          | <2            | 1.8                                    | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 2    | Alwarkurichi                        | 30.08.2022          | River                 | Pre-                              | 7.19      | 8.3          | <2            | 5.5                                    | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                     | 10.09.2022          |                       | Post-                             | 7.06      | 7.4          | <2            | 6.1                                    | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 3    | Gundaru                             | 30.08.2022          | Dam                   | Pre-                              | 7.2       | 7            | 2.8           | 6.1                                    | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                     | 10.09.2022          |                       | Post-                             | 6.96      | 7.2          | <2            | 10                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 4    | Karuppanathi                        | 30.08.2022          | Dam                   | Pre-                              | 7.2       | 8.1          | 4.1           | 15                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                     | 10.09.2022          |                       | Post-                             | 7.85      | 7.4          | <2            | 15                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 5    | Kudankulam                          | 30.08.2022          | Sea                   | Pre-                              | 6.88      | 5.7          | 4.5           | 8.2                                    | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                     | 10.09.2022          |                       | Post-                             | 7.3       | 6.5          | 4.4           | 5.5                                    | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
| 6    | Tirupudai Maruthur                  | 30.08.2022          | River                 | Pre-                              | 7.25      | 8.5          | <2            | 17                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |
|      |                                     | 10.09.2022          |                       | Post-                             | 7.12      | 7.2          | 2.5           | 14                                     | <0.01                | <0.0008 | <0.05    | <0.0015 | <0.5 | <0.01     | <0.006 | <0.015 | <0.0015 |

| Parameters                                      | Primary Water Quality Criteria for Outdoor Bathing as per CPCB                                                                        | Water Quality Standards for Coastal Waters Marine Outfalls as per CPCB    |                                                       |                                                              |                  |                                           |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|------------------|-------------------------------------------|
|                                                 |                                                                                                                                       | SW - I                                                                    | SW - II                                               | SW - III                                                     | SW - IV          | SW - V                                    |
| pH                                              | 6.5- 8.5                                                                                                                              | 6.5- 8.5                                                                  | 6.5- 8.5                                              | 6.5- 8.5                                                     | 6.5- 9           | 6.0- 9                                    |
| DO                                              | >5 mg/L                                                                                                                               | min 5 mg/L                                                                | min 4 mg/L                                            | min 3 mg/L                                                   | min 3 mg/L       | min 3 mg/L                                |
| BOD                                             | <3 mg/L                                                                                                                               |                                                                           | 3 mg/L                                                | 3 mg/L                                                       | 5 mg/L           |                                           |
| Faecal coliforms<br>Most Probable Number (MPN)  | <500 MPN/100 ml                                                                                                                       |                                                                           | 100/100 ml (MPN)                                      | 500/100 ml (MPN)                                             | 500/100 ml (MPN) | 500/100 ml (MPN)                          |
| Heavy metals (mg/L)<br>(acceptable limit)       | As-0.01 mg/L, Cd-0.003 mg/L,<br>Cr-0.05 mg/L, Cu-0.05 mg/L,<br>Fe-0.3 mg/L, Mn-0.1 mg/L,<br>Ni-0.02 mg/L, Pb-0.01 mg/L &<br>Zn-5 mg/L | Hg- 0.01 mg/L,<br>Pb - 0.01 mg/L,<br>Cd - 0.01 mg/L                       |                                                       | Fe -0.5 mg/L,<br>Mn - 0.5 mg/L                               |                  |                                           |
| Oil & grease                                    |                                                                                                                                       | 0.1 mg/L                                                                  |                                                       |                                                              |                  | None except for such small amount         |
| Turbidity<br>Nephelometric Turbidity Unit (NTU) |                                                                                                                                       |                                                                           | 30 NTU                                                | 30 NTU                                                       |                  |                                           |
| Designated Best Use                             |                                                                                                                                       | Salt pans, Shell fishing,<br>Mariculture and Ecologically Sensitive Zone. | Bathing, Contact Water Sports and Commercial fishing. | Industrial cooling, Recreation (non-contact) and Aesthetics. | Harbour.         | Navigation and Controlled Waste Disposal. |

## Tirunelveli

- No exceedance of standard observed in pH value at all monitored stations.
- Dissolved Oxygen (DO) values fall well within the acceptable range.
- Biochemical Oxygen Demand (BOD) values at all the stations monitored are recorded within the criteria except Karuppanathi (-pre) and Kudankulam (-pre & -post).
- Faecal coliform was found well within the desirable level at all the monitored locations.
- Heavy metals Arsenic, Chromium, Manganese and Zinc were all well within acceptable limit at all the locations.
- Post-idol immersion, increase in concentration of Cadmium, Copper, Nickel and Lead at Kudankulam was observed, thereby exceeding the standard.
- Also, increase in the iron value post immersion was noted exceeding the standard.

**Results of the Analysis (Physio-Chemical and Bacteriological Parameter) of the water bodies in **Tiruppur**, Tamil Nadu**  
monitored during pre- and post-idol immersion activity during  
**Vinayagar Chaturthi (30.08.2022 & 10.09.2022)**

| S.No | Sampling Location in Tiruppur | Date of sampling | Type of water body | Pre/Post immersion sampling | pH Number | DO (mg/L) | BOD (mg/L) | Faecal Coliform (MPN/ 100 ml) | Heavy metals |         |          |         |       |           |        |
|------|-------------------------------|------------------|--------------------|-----------------------------|-----------|-----------|------------|-------------------------------|--------------|---------|----------|---------|-------|-----------|--------|
|      |                               |                  |                    |                             |           |           |            |                               | Arsenic      | Cadmium | Chromium | Copper  | Iron  | Manganese | Nickel |
| 1    | Samalapuram Lake              | 30.08.2022       | Lake               | Pre-                        | 8.62      | 7.8       | 3          | <2                            | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.05 | <0.01     | 0.531  |
|      |                               | 10.09.2022       |                    | Post-                       | 8.44      | 6.9       | 12         | <2                            | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.05 | 0.019     | 0.804  |
| 2    | Amarawathy River at Kaniyur   | 30.08.2022       | Lake               | Pre-                        | 6.83      | 8         | <2         | <2                            | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.05 | <0.01     | <0.006 |
|      |                               | 10.09.2022       |                    | Post-                       | 7.53      | 8.1       | <2         | <2                            | <0.01        | <0.0008 | <0.05    | <0.0015 | <0.05 | <0.01     | 1.248  |
|      |                               |                  |                    |                             |           |           |            |                               |              |         |          |         |       |           | 0.106  |
|      |                               |                  |                    |                             |           |           |            |                               |              |         |          |         |       |           | 0.106  |

| Parameters                                      | Primary Water Quality Criteria for Outdoor Bathing as per CPCB                                                            | Water Quality Standards for Coastal Waters Marine Outfalls as per CPCB |                                                       |                                                              |                  |                                           |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|------------------|-------------------------------------------|
|                                                 |                                                                                                                           | SW - I                                                                 | SW - II                                               | SW - III                                                     | SW - IV          | SW - V                                    |
| pH                                              | 6.5- 8.5                                                                                                                  | 6.5- 8.5                                                               | 6.5- 8.5                                              | 6.5- 8.5                                                     | 6.5- 9           | 6.0- 9                                    |
| DO                                              | >5 mg/L                                                                                                                   | min 5 mg/L                                                             | min 4 mg/L                                            | min 3 mg/L                                                   | min 3 mg/L       | min 3 mg/L                                |
| BOD                                             | <3 mg/L                                                                                                                   |                                                                        | 3 mg/L                                                | 3 mg/L                                                       | 5 mg/L           |                                           |
| Faecal coliforms<br>Most Probable Number (MPN)  | <500 MPN/100 ml                                                                                                           |                                                                        | 100/100 ml (MPN)                                      | 500/100 ml (MPN)                                             | 500/100 ml (MPN) | 500/100 ml (MPN)                          |
| Heavy metals (mg/L)<br>(acceptable limit)       | As-0.01 mg/L, Cd-0.003 mg/L, Cr-0.05 mg/L, Cu-0.05 mg/L, Fe-0.3 mg/L, Mn-0.1 mg/L, Ni-0.02 mg/L, Pb-0.01 mg/L & Zn-5 mg/L | Hg- 0.01 mg/L, Pb - 0.01 mg/L, Cd - 0.01 mg/L                          |                                                       | Fe -0.5 mg/L, Mn - 0.5 mg/L                                  |                  |                                           |
| Oil & grease                                    |                                                                                                                           | 0.1 mg/L                                                               |                                                       |                                                              |                  | None except for such small amount         |
| Turbidity<br>Nephelometric Turbidity Unit (NTU) |                                                                                                                           |                                                                        | 30 NTU                                                | 30 NTU                                                       |                  |                                           |
| Designated Best Use                             |                                                                                                                           | Salt pans, Shell fishing, Mariculture and Ecologically Sensitive Zone. | Bathing, Contact Water Sports and Commercial fishing. | Industrial cooling, Recreation (non-contact) and Aesthetics. | Harbour.         | Navigation and Controlled Waste Disposal. |

## Tiruppur

- Exceedance in pH value prior to idol-immersion was observed at Samalapuram Lake. Otherwise, no exceedance of standard observed in pH value.
- Dissolved Oxygen (DO) values meet the Primary Water Quality Criteria for Outdoor Bathing (>5 mg/L) at both the monitored stations.
- Post idol-immersion, drastic increase in Biochemical Oxygen Demand (BOD) value (increase by 9 mg/L) exceeding the standard was observed at Samalapuram Lake.
- Faecal coliform was found well within the desirable level at all locations tested.
- Heavy metals Arsenic, Cadmium, Chromium, Copper, Iron and Manganese were all well within acceptable limit at all the locations.
- Nickel concentrations at Samalapuram Lake samples (-pre & -post) exceed the standards (0.02 mg/L). Further, a rise in Nickel level (0.804 mg/L) post-idol immersion was detected.
- Post idol-immersion, dramatic increase in concentration of Lead (1.248 mg/L) is noted causing to exceed the standard (0.01 mg/L).
- Increase in Zinc concentration was observed post-idol immersion at Samalapuram Lake.

## CONCLUSION

The following conclusions are drawn from the inferences:

- pH, quantitative measure of how acidic/basic water is, irrespective of Idol- immersion remained within the Water Quality Standards of Lakes, Rivers and Coastal Waters.
- Largely, a general decrease and at places depletion of Dissolved Oxygen (DO) is observed probably due to organic loading during the festivities leading to increase in Biochemical Oxygen Demand (BOD).
- Faecal coliform was found well within the desirable level at all the monitored locations probably due to lack of manmade discharge during the festivities.
- Conspicuous changes in metal concentration observed during post-immersion may be attributed to idol immersion activities.

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