



1. Introduction

Idol immersion of deities after culmination of puja is a religious practice of Hindu festivals in India. Large size idols are being worshiped by the peoples in Ganesh Puja, Durga Puja, Kali Puja, Biswakarma Puja, Gajalaxmi and are ultimately immersed alongwith all puja offerings in water bodies like rivers, ponds etc. Since these pujas are mostly celebrated in monsoon or post monsoon seasons, and the flow in rivers are high during this period, immersion of idols and puja offerings in the rivers usually have no significant impact on the water quality. However, with the increase in number and size of idols, use of alternate materials other than clay for making the idols, use of synthetic paints and varnishes rather than natural dyes to decorate the idols in present years and decreased flow in rivers, the probability of contamination of water after immersion of idols in water bodies, has been increased. Besides these, dumping of puja left overs such as vastras on idols, flowers, decorating materials (made of paper and plastic), etc. in water bodies during this immersion process has also increased the risk of contamination of water bodies. This, in turn, may affect the aquatic ecosystem at the immersion sites as well as its down-streams.

With this background, Central Pollution Control Board (CPCB) has prepared the "Guidelines for Idol Immersion" for implementation during immersion of idols in aquatic bodies to minimize the pollution load.

2. Guideline for Idol Immersion

In compliance of the directions of the Hon'ble High Court of Bombay in the matter of PIL W.P. No. 13251325/2003 Janahit Manch Vs the State of Maharashtra and others, the Competent Authority in CPCB has constituted a Committee, vide Order No. A-22011/1/90-Mon dated 10.02.2009, to formulate Guidelines for immersion of idols in natural stream. "Guidelines for Idol Immersion" (PROBES/136/2010) developed by the CPCB encompasses the roles of local bodies/ authorities, Puja Committee Organisers and State Pollution Control Board or Pollution Control committees for implementation of the Guideline to minimize the impact of idol immersion activities on the aquatic bodies.

(a) General Guidelines for idol immersion

- Use of traditional clay for making idols should be encouraged.
- Use of water soluble, non-toxic natural dyes should be encouraged to colour the idols rather than painting of idols.
- Worship materials like flowers, decorating materials, should be removed before immersion of idols. All biodegradable matters should be disposed separately for recycling or composting. All non-biodegradable matters should be collected separately for disposal in separate landfills.
- Mass awareness programmes should be conducted to aware the Public on ill effects of idol immersion.
- All idols should be immersed in an identified area on the surface water bodies which is cordoned, barricaded and preferably lined with synthetic liner. After immersion, the liner should be removed to collect the dumped materials for final disposal at appropriate places.

(b) General Guidelines for Local bodies/ Authorities

- Local bodies/ Authorities should identify adequate number of idol immersion spots to avoid overcrowding and to reduce pollution load on the water bodies. Such spots should be notified and informed to the Puja Committees through awareness programmes.
- At the immersion of sites, burning of solid wastes so generated during the immersion of idols, should be prohibited.
- Within 48 hours of idol immersion, the left over materials at the immersion sites should be collected by the local bodies for final disposal at appropriate places.
- In case of immersion of idols in rivers and lakes, arrangements may be made for construction of temporary confined ponds with earthen bunds for the purpose of immersion of idols. After the completion of immersion, supernatant water may be allowed to flow as usual after checking for colour and turbidity. Lime may be allowed to the temporary confined pond.
- Mass awareness programmes may be conducted to educate the people on ill effects of toxic idol immersion.



c) Role of State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs)

- Concerned SPCB/ PCC should conduct water quality monitoring of water bodies at the immersion sites preferably in Class-I cities (having population more than one lac), at three stages i.e. Pre-immersion, during immersion and post-immersion. For ascertaining water quality, 12 numbers of physico-chemical parameters such as pH, DO, BOD, COD, Conductivity, Turbidity, TDS, Total Solids, Chromium, lead, zinc and copper may be analysed and results posted on the SPCB's website.
- SPCB/ PCC shall help to local administration in preparing material for mass awareness for the purpose.

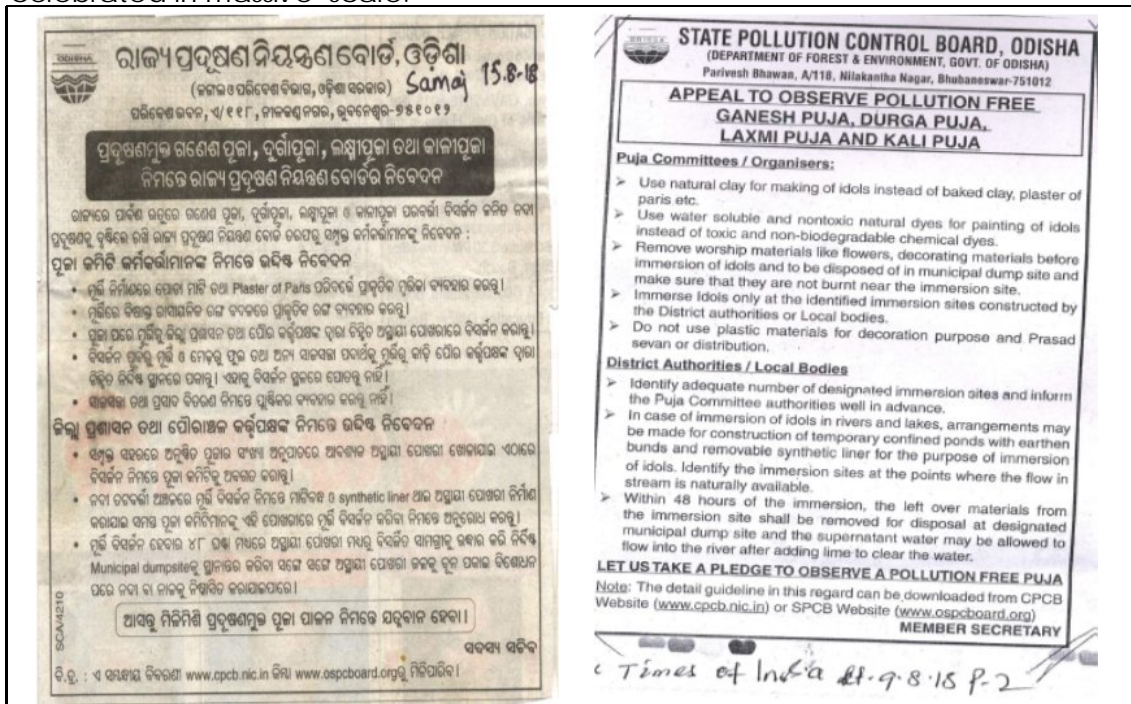
3. Actions taken by the State Pollution Control Board, Odisha

Ganesh Puja, Biswakarma Puja and Durga Puja, Lali Puja Gajalaxmi puja are celebrated in massive scale in most of the cities of the State of Odisha. After culmination of puja celebrations, the idols are generally immersed on a single day at the designated sites of the rivers flowing along the cities. In some places, idols are immersed in ponds, canals and sea in absence of any river nearby. Since last decade, Board has been informing all the District Collectors of the State to implement the Guidelines. Prior to onset of puja celebrations. Besides these, Board is also conducting the water quality monitoring of two major rivers i.e. Kathajodi river along Cuttack city and Kuakhai river along Bhubaneswar city to assess the impact of idol immersion.

In the year 2015, Hon'ble High Court of Orissa have intervened in this matter and vide their order dated 07.10.2015 directed the State Pollution Control Board, Odisha to render necessary assistance to the District Collectors and ensure strict compliances of the Guidelines for Idol Immersion during the Durga Puja and other pujas to follow thereof. In compliance to the order, the Board made an intensive approach to ensure the implementation of the Guidelines in all the urban local bodies of the State.

To minimize the impact of idol immersion on the water quality, the State Pollution Control Board, Odisha has taken following steps as recommended in the Guideline for idol immersion.

- Informed all the District Collectors and authorities of urban local bodies of the State prior to Ganesh Puja and Durga Puja to implement the Guidelines of Immersion in their areas of jurisdiction.
- Created public awareness through Public Notice on safe Idol immersion practices in Local Newspapers and in Board's website and through public address system.
- Made several meetings with the local bodies/ authorities, Puja Committee Organizers to create awareness on ill impacts of Idol immersion in water bodies.
- Coordinated with the local bodies/ authorities for construction of temporary immersion ponds near rivers as prescribed in the Guideline
- Conducted water quality assessment of the water body in three stages i.e. Pre-immersion. During immersion and post-immersion, preferably in Class-I cities (having population more than one lakh) and other cities where pujas are celebrated in massive scale.



Samaj Dt. 15.08.2018

Times India Dt. 09.08.2018

Appeal to Public to observe pollution free Ganesh puja, Durga Puja, Laxmi Puja and Kali Puja through Public Notice on Local Newspapers

(a) Actions taken for implementation of the Guideline during immersion of Idols in Rivers

Generally idols are immersed in flowing waters which makes the rivers as the ideal places for idol immersion. In such cases, the Guideline has prescribed to construct temporary ponds having earthen bunds along the river bank for use as idol immersion spots. The ponds are to be lined with removable synthetic liner at its bottom well in advance of the idol immersion. The said liner along with remains of the idols are to be removed within 48 hours of idol immersion. The left over-materials are to be collected by the local bodies for disposal in municipal dumpsites.

In Urban local bodies like Cuttack, Bhubaneswar, etc., temporary immersion ponds were constructed on the bank of the rivers by the district administration much before the day of idol immersion. Location of the idol immersion sites and route map were also informed to the Puja committee authorities. The temporary ponds were lined with removable synthetic liner. Within 48 hours of idol immersion, the left-overs were removed and transported to the designated municipal dumpsites of the respective areas for disposal. The pond water was then treated with lime and allowed to settle prior to ultimate discharge into rivers.

In Urban local bodies like Sambalpur, Puri etc. temporary immersion areas are made by cordoning a portion of the river on its bank for idol immersion. These temporary ponds were also lined with removable synthetic liner so as to facilitate the removal of dumped materials as per the Guideline.

However, in some urban local bodies, though temporary immersion ponds were not constructed specifically for idol immersion purposes, the left-overs of idol immersion were removed by the local peoples within 48 hours of idol immersion and disposed at the municipal dumpsites.

(b) Actions taken for implementation of the Guideline during immersion of Idols in Ponds

In absence of rivers in the cities, idols are immersed in the ponds. In such cases, the Guideline has prescribed to use a corner of the pond as idol immersion spot and is to be lined with removable synthetic liner at its bottom well in advance of the idol immersion. The said liner along with remains of the idols are to be removed within 48 hours of idol immersion. The left over-materials are to be collected by the local bodies for disposal in designated dumpsites.

Temporary immersion ponds were created in the urban local bodies like Keonjhar, Angul, Bhadrak, Balangir etc, by cordoning a corner of the pond or abandoned quarry. The temporary ponds were lined with removable synthetic liner. Within 48 hours of idol immersion, the left-overs were removed and transported to the designated dumpsites of the respective areas for disposal.

(c) Actions taken for implementation of the Guideline during immersion of Idols in Sea

In Berhampur, idols are immersed in the Sea near Gopalpur. In such cases, the Guideline prescribes to immerse the idols in between the low-tide line and high tide line (irrespective of its depth). The District Authority identified the low-tide line and high tide line well in advance of the idol immersion and notified for information of the Puja Committee authorities. Following photographs depict the idol immersion activities in Sea at Gopalpur.

4. Water Quality Standard

Evaluation of water quality status is carried out basing upon the use of a particular segment of water body, wherein each use has been assigned with tolerance limits for some defined criteria parameters. As per designated best use classification of surface water bodies by CPCB, water quality is usually assessed in respect of five broad categories as described in Table-1.



Table-1 Use Based Classification

Class	Use
A	Drinking water source without conventional treatment, but after disinfection.
B	Organised outdoor bathing
C	Drinking water source with conventional treatment followed by disinfection.
D	Fish culture and wild life propagation
E	Irrigation, Industrial cooling or controlled waste disposal

Water quality parameters relevant to the above uses are given in Table-2.

Table - 2 Primary Water Quality Criteria

Parameter	Quality Criteria				
	Class- A	Class - B	Class - C	Class - D	Class - E
pH	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	6.5 – 8.0
Dissolved Oxygen (DO) (mg/l) minimum	6.0	5.0	4.0	4.0	-
Biochemical oxygen Demand (BOD) (mg/l) Max	2.0	3.0	3.0	-	-
Total Coliform (TC) (MPN/100 ml) Max	50	500	5000	-	-
Free Ammonia-N (mg/l) Max	-	-	-	1.2	-
Electrical Conductivity (EC) (microSiemens/cm) Max	-	-	-	1000	2250
Sodium Absorption Ratio (SAR) Max	-	-	-	-	26
Boron (B) (mg/l) Max	-	-	-	-	2.0

Besides these, IS 2296-1982 prescribes tolerance limits for other parameters as listed in Table-3 for above mentioned designated uses of surface water bodies.

Table-3 Tolerance limits for other parameters

Parameter	Tolerance limits (mg/l)				
	Class-A	Class-B	Class-C	Class-D	Class-E
Total Dissolved Solids (TDS), max	500	--	1500	--	2100
Lead (Pb), max	0.10	--	0.10	--	--
Cadmium (Cd), max	0.01	--	0.01	--	--
Chromium (VI) (Cr ⁶⁺), max	0.05	0.05	0.05	--	--
Iron (Fe), max	0.3	--	50	--	--
Copper (Cu), max	1.5	--	1.5	--	--
Zinc (Zn), max	15	--	15	--	--

5. Water Quality Assessment

To assess the impact of idol immersion on water bodies, the Board had conducted water quality assessment studies in three Municipal areas like Cuttack, Bhubaneswar and Puri where pujas are celebrated in massive scale.

As per the Guidelines, water quality monitoring was conducted in three stages i.e. pre-immersion, during- immersion and post- immersion period of Durga Puja. The physico-chemical parameters as recommended by Central Pollution Control Board (CPCB) for such studies, such as pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Conductivity (EC), Turbidity, Total Dissolved Solids (TDS), Total Solids (TS), and metals (cadmium, chromium, iron, lead, zinc and copper) were analysed in the water samples and compared with the tolerance limits for Class A (Drinking water source without conventional treatment but after disinfection) and Class C (Drinking water source with conventional treatment followed by disinfection) Inland surface water quality. The variation in concentration of different parameters at the immersion sites are compared with the values at the upstream and downstream of immersion sites to assess the impact of idol immersion.

From the water quality data, it has been observed that

- Turbidity and Suspended solids in Kathajodi river along Cuttack city and in Daya river along Bhubaneswar in during-immersion period was observed to be higher in comparison to the pre- and post-immersion period. This may be attributed to the increase in suspended materials on the water body during immersion of idols. Whereas, no significant change was observed in case of turbidity and Suspended solid values in Kuakhai river along Bhubaneswar and Musa river along Puri city.
- Dumping of puja materials and left-overs into the water body disrupts the oxygen level of water body and therefore increase in BOD and COD values at the immersion site on the day of idol immersion were also observed. By the time of post-immersion monitoring, the river water rejuvenates itself due to continuous flow of water, which is indicated by lowering of BOD values and other parameters in Kuakhai and Daya rivers along Bhubaneswar city. However, BOD values of the river water at all these monitoring locations remained well within the tolerance limit of 3.0 mg/l during all the three phases of monitoring.
- BOD values in Musa river in Pre-immersion period was more than the tolerance limit of 3.0 mg/l. Immersion of idols in the Musa river has increased the BOD level significantly.
- During immersion period increase in the conductivity and total dissolved solid at the immersion site in comparison to the upstream and downstream stations may be ascribed to the leaching of dissolved materials from the puja materials and idols immersed in the water body.
- Variation in concentrations of heavy metals such as cadmium, lead, copper and hexavalent chromium during the period of study was not significant.
- Concentration of heavy metals such as cadmium, chromium, iron, lead, zinc and copper in both during-immersion and post-immersion period remain much below the tolerance limit for most beneficial uses of water. This may be correlated to the very slow leaching process of heavy metals from the synthetic paints and other materials used in the idols in natural conditions of water bodies.

- Further, because of the preventive measures taken by the district administration not to allow the water of idol immersion ponds to flow into the river, water quality of downstream stations in during-immersion and Post-immersion periods mostly remained well within the tolerance limits of the designated use.
- From the study, it may be concluded that all the parameters specified for the study remained within the tolerance limit for designated class of the river i.e. Class-C (Drinking water source with conventional treatment followed by disinfection) even after immersion of idols) excepting few cases. Concentration of heavy metals such as cadmium, chromium, iron, lead, zinc and copper remain much below the tolerance limits and no significant impact is exerted on the heavy metal concentration of the water bodies due to immersion of idols. Though some of the physical and chemical parameters like Turbidity, electrical conductivity, TDS and BOD shows higher values during-immersion period in comparison to the pre-and post-immersion period, but still remained much below the tolerance limit. Further, immersion of idols in the temporary immersion ponds has minimized the probability of contamination of the main course of river water.

Table- 4 Impact of idol immersion during Durga Puja on water quality of Kathajodi river at Cuttack

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, μ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr ⁶⁺ , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (10.10.2018)	Location-1	6.8	6.8	1.4	8.5	302	9.3	178	202	0.0024	<0.002	0.008	0.128	0.007	0.005	0.007
	Location-2	7.0	6.5	1.5	10.2	319	9.0	186	211	0.0020	<0.002	0.010	0.165	0.009	0.011	0.011
	Location-3	7.2	6.7	1.5	10.2	316	9.1	180	205	0.0020	<0.002	0.010	0.139	0.007	0.008	0.007
During-Immersion (21.10.2018)	Location-1	7.5	6.8	1.8	16.8	301	28.0	168	195	0.0020	<0.002	0.012	0.124	0.008	0.034	0.009
	Location-2	7.6	6.7	2.3	20.8	338	40.0	196	235	0.0030	0.003	0.018	0.577	0.013	0.115	0.017
	Location-3	7.5	6.7	2.2	18.5	332	21.0	188	217	0.0030	<0.002	0.013	0.438	0.010	0.112	0.011
Post-Immersion (29.10.2018)	Location-1	7.0	6.8	1.4	11.4	308	13.0	178	200	0.0009	<0.002	0.011	0.261	0.011	0.007	0.006
	Location-2	7.2	6.8	2.1	19.5	323	20.0	186	213	0.0008	<0.002	0.013	0.435	0.011	0.049	0.007
	Location-3	7.2	7.0	1.8	16.3	315	16.0	180	205	0.0006	<0.002	0.013	0.360	0.011	0.013	0.007
Tolerance limits for Class-C inland surface waters (IS : 2296-1982)		6.5-8.5	4 or more	3 or less	-	-	-	1500	-	0.01	0.05	-	50	0.1	15	1.5

- * Location-1 : Upstream of Immersion site at Naraj Barrage
- * Location-2 : Immediate downstream of Immersion site (Devi gada)
- * Location-3 : Downstream of Immersion site near Khan nagar

Table- 5 Impact of idol immersion during Durga Puja on water quality of Kuakhai river at Bhubaneswar

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu\text{S/cm}$	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr ⁶⁺ , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (10.10.2018)	Location-1	6.5	7.7	1.2	6.8	175	11.0	96	109	0.0008	<0.002	0.013	0.207	0.010	0.012	0.006
	Location-2	6.7	7.6	1.4	8.5	183	16.0	106	124	0.0012	<0.002	0.012	0.263	0.013	0.043	0.006
	Location-3	6.8	7.6	1.6	8.5	175	13.0	102	120	0.0007	<0.002	0.015	0.233	0.012	0.036	0.007
During-Immersion (21.10.2018)	Location-1	6.0	7.2	1.7	10.2	173	13.0	98	114	0.0013	<0.002	0.008	0.226	0.009	0.014	0.006
	Location-2	7.0	7.1	2.2	15.1	198	19.0	108	132	0.0008	<0.002	0.013	0.339	0.012	0.017	0.010
	Location-3	7.1	7.1	2.0	15.1	180	18.0	104	124	0.0010	<0.002	0.013	0.273	0.009	0.011	0.008
Post-Immersion (29.10.2018)	Location-1	7.2	7.5	1.6	9.8	172	11.0	92	104	0.0010	<0.002	0.013	0.242	0.001	0.012	0.001
	Location-2	7.5	7.2	1.8	13.0	188	16.0	116	136	0.0010	<0.002	0.015	0.277	0.009	0.016	0.009
	Location-3	7.5	7.3	1.4	8.1	178	11.0	102	115	0.0010	<0.002	0.015	0.256	0.007	0.013	0.007
Tolerance limits for Class-C inland surface waters (IS : 2296-1982)		6.5-8.5	4 or more	3 or less	-	-	-	1500	-	0.01	0.05	-	50	0.1	15	1.5

- * Location-1 : Upstream of Immersion pond-1 at Mancheswar
- * Location-2 : Immediate Downstream of Immersion pond
- * Location-3 : Downstream of Immersion pond-1 at Balianta

Table- 6 Impact of idol immersion during Durga Puja on water quality of Daya river at Bhubaneswar

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, μ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr ⁶⁺ , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (10.10.2018)	Location-1	6.8	6.7	1.1	8.5	168	14.0	106	122	0.0014	<0.002	0.020	0.185	0.008	0.012	0.006
	Location-2	6.8	6.7	1.2	8.5	160	14.0	102	118	0.0006	<0.002	0.010	0.315	0.011	0.015	0.006
	Location-3	7.3	6.2	1.9	8.5	162	14.0	98	114	0.0013	<0.002	0.024	0.297	0.011	0.014	0.007
During-Immersion (21.10.2018)	Location-1	7.3	6.7	1.2	8.5	155	25.0	86	109	0.0008	<0.002	0.015	0.192	0.008	0.014	0.008
	Location-2	7.4	6.5	1.7	10.2	195	30.0	122	157	0.0005	<0.002	0.018	0.432	0.011	0.018	0.011
	Location-3	7.4	6.2	1.6	10.2	163	28.0	96	127	0.0010	<0.002	0.018	0.236	0.015	0.016	0.010
Post-Immersion (29.10.2018)	Location-1	7.6	7.6	1.5	9.8	171	12.0	102	119	0.0014	<0.002	0.012	0.164	0.007	0.012	0.005
	Location-2	7.6	7.6	1.5	13.0	195	15.0	124	147	0.0023	<0.002	0.013	0.207	0.007	0.016	0.005
	Location-3	7.5	7.4	1.6	9.8	192	14.0	120	141	0.0021	<0.002	0.012	0.149	0.009	0.016	0.005
Tolerance limits for Class-C inland surface waters (IS : 2296-1982)		6.5-8.5	4 or more	3 or less	-	-	-	1500	-	0.01	0.05	-	50	0.1	15	1.5

* Location-1 : Upstream of Immersion pond near Daya bridge

* Location-2 : Immediate Downstream of Immersion pond

* Location-3 : Downstream of Immersion pond

Table- 7 Impact of idol immersion during Durga Puja on water quality of Musa river at Puri

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, μ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr ⁶⁺ , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (10.10.2018)	Location-1	7.0	2.3	7.2	56.2	584	29.0	312	357	0.0015	<0.002	0.018	0.123	0.012	0.018	0.007
	Location-2	8.1	2.5	7.1	51.1	582	30.0	318	367	0.0017	<0.002	0.013	0.584	0.015	0.020	0.008
	Location-3	7.2	2.3	7.4	54.5	587	28.0	328	372	0.0020	<0.002	0.018	0.277	0.012	0.022	0.007
During-Immersion (21.10.2018)	Location-1	6.9	1.9	8.3	68.9	651	32.0	383	438	0.0006	<0.002	0.030	0.233	0.009	0.018	0.007
	Location-2	7.4	1.0	8.9	72.2	693	33.0	422	482	0.0023	0.002	0.035	0.731	0.013	0.058	0.009
	Location-3	6.9	Nil	8.5	70.6	659	34.0	406	466	0.0011	<0.002	0.034	0.580	0.011	0.034	0.007
Post-Immersion (29.10.2018)	Location-1	7.6	1.7	6.1	48.8	549	31.0	334	46.0	0.0010	<0.002	0.024	0.180	0.009	0.011	0.005
	Location-2	7.1	Nil	9.9	89.4	550	34.0	346	49.0	0.0022	<0.002	0.027	0.426	0.009	0.013	0.006
	Location-3	7.2	Nil	8.8	73.2	542	33.0	324	46.0	0.0020	<0.002	0.025	0.384	0.009	0.013	0.006
Tolerance limits for Class-C inland surface waters (IS : 2296-1982)		6.5-8.5	4 or more	3 or less	-	-	-	1500	-	0.01	0.05	-	50	0.1	15	1.5

* Location-1 : Upstream of Immersion point near Devighat on Musa river

* Location-2 : At immersion point

* Location-3 : Downstream of Immersion point

6. Recommendations

- Guidelines of Idol Immersion should be strictly followed by the Puja Committee Organisers during the immersion of idols.
- Puja Committee Organisers should promote the construction of idols from clay only and colouring of the idols with natural colours.
- Adequate number and size of ponds shall be designated for idol immersion and shall be informed to the Puja Committee Organisers.
- Municipal authorities shall cooperate the Puja Committee Organisers for removal of the left-over materials of the idol immersions from the immersion sites within 48 hours of immersion and transportation of these debris to the dumpsites.
- Treatment of temporary immersion pond with lime and discharge of the settled water to main river channel within four days of idol immersion.
- Burning of left-over materials of idol immersion on the banks of river should be prohibited.
- Public awareness shall be given more thrust on the ill-impacts of idol immersion and implementation of the Guidelines.
- Public awareness should be created to limit the size of idols and number of idols in a locality in order to decrease the wasteload in the form of puja left-overs.
