

# **IMPACT OF IDOL IMMERSION ON WATER QUALITY OF AQUATIC BODIES -2015**



**STATE POLLUTION CONTROL BOARD, ODISHA  
PARIVESH BHAWAN, A-118, NILAKANTHANAGAR  
UNIT-VIII, BHUBANESWAR-751012**

April, 2016



**CONTENTS**

<b>Sl. No.</b>	<b>Title</b>	<b>Page No.</b>
1.	Introduction	1
2.	Guideline for Idol Immersion	1
3.	Actions taken by the State Pollution Control Board, Odisha	3
4.	Water Quality Standard	11
5.	Water Quality Assessment	12
6.	Tables	16-54
7.	Recommendations	55
	Annexure Guidelines for Idol Immersion (PROBES/136/2010)	



**List of Tables**

Table-1	List of Urban local bodies where temporary immersion ponds were constructed near rivers for idol immersion purpose
Table-2	List of Urban local bodies where temporary immersion spots were created on a corner of the pond for idol immersion purpose
Table-3	Use Based Classification
Table-4	Primary Water Quality Criteria
Table-5	Tolerance limits for other parameters
Table-6	List of cities where water quality monitoring was carried out by the Board to assess the impact of idol immersion of various pujas
Table-7	Impact of idol immersion during Ganesh Puja on water quality of river Kathajodi at Cuttack
Table-8	Impact of idol immersion during Ganesh Puja on water quality of river Kuakhai at Bhubaneswar
Table-9	Impact of idol immersion during Ganesh Puja on water quality of river Mahanadi at Sambalpur
Table-10	Impact of idol immersion during Ganesh Puja on water quality of Atharabanki creek at Paradeep
Table-11	Impact of idol immersion during Ganesh Puja on water quality of Brahmani river at Rourkela
Table-12	Impact of idol immersion during Ganesh Puja on water quality of Brahmani river at Talcher
Table-13	Impact of idol immersion during Viswakarma Puja on water quality of Brahmani river at Talcher
Table-14	Impact of idol immersion during Durga Puja on water quality of Kathajodiriver at Cuttack
Table-15	Impact of idol immersion during Durga Puja on water quality of Kuakhai river at Bhubaneswar
Table-16	Impact of idol immersion during Durga Puja on water quality of Daya river at Bhubaneswar



Table- 17	Impact of idol immersion during Durga Puja on water quality of Musa river at Puri
Table- 18	Impact of idol immersion during Durga Puja on water quality of Mahanadi river at Sambalpur
Table-19	Impact of idol immersion during Durga Puja on water quality of river LingraJhor at Angul
Table-20	Impact of idol immersion during Durga Puja on water quality of river Brahmani at Talcher
Table- 21	Impact of idol immersion during Durga Puja on water quality of Ibriver at Jharsuguda
Table-22	Impact of idol immersion during Durga Puja on water quality of Jhanjabatiriver at Rayagada
Table-23	Impact of idol immersion during Durga Puja on water quality of river Baitarani at Anandpur Municipality
Table-24	Impact of idol immersion during Durga Puja on water quality of river Karo at Barbil Municipality
Table-25	Impact of idol immersion during Durga Puja on water quality of river Sona at Joda Municipality
Table- 26	Impact of idol immersion during Durga Puja on water quality of river Baitarani at Champua NAC
Table-27	Impact of idol immersion during Durga Puja on water quality of Ramialariver at Kamakhyanagar, Dhenkanal
Table-28	Impact of idol immersion during Durga Puja on water quality of Budhabalanga river at Balasore
Table-29	Impact of idol immersion during Durga Puja on water quality of Nuniajori at Balasore
Table-30	Impact of idol immersion during Durga Puja on water quality of Budhabalanaga River at Baripada
Table-31	Impact of idol immersion during Durga Puja on water quality of Alaka River at Kendrapada
Table-32	Impact of idol immersion during Durga Puja on water quality of canal at Purohitpur, Kendrapada



## Impact of Idol Immersion on Water Quality of Aquatic Bodies-2015

Table-33	Impact of idol immersion during Durga Puja on water quality of pond at Rourkela
Table-34	Impact of idol immersion during Durga Puja on water quality of Pond at Angul
Table-35	Impact of idol immersion during Durga Puja on water quality of Pond at Talcher
Table-36	Impact of idol immersion during Durga Puja on water quality of Pond (pond-1) at Dhenkanal
Table-37	Impact of idol immersion during Durga Puja on water quality of Pond (pond-2) at Dhenkanal
Table-38	Impact of idol immersion during Durga Puja on water quality of pond at Keonjhar Municipality
Table-39	Impact of idol immersion during Durga Puja on water quality of pond at Sundargarh
Table-40	Impact of idol immersion during Durga Puja on water quality of pond at Deogarh
Table-41	Impact of idol immersion during Durga Puja on water quality of sea at Gopalpur
Table-42	Impact of idol immersion during Gajalaxmi Puja on water quality of Pond at Angul
Table-43	Impact of idol immersion during Gajalaxmi Puja on water quality of Ponds at Dhenkanal
Table-44	Impact of idol immersion during Kali Puja on water quality of Kathajodi river at Cuttack
Table-45	Impact of idol immersion during Kali Puja on water quality of pond in Angul
Table-46	Impact of idol immersion during Kali Puja on water quality of pond in Dhenkanal



## 1. Introduction

Idol worship is being practiced in India since ancient times. Festivals like Ganesh Puja, Viswakarma Puja, Durga Puja, Kali Puja, Gaja laxmi Puja etc. are being celebrated in various parts of India with much pomp and galore. Large size idols are being worshiped by the peoples in such pujas which are ultimately immersed in water bodies like rivers, ponds etc. The puja left-overs are also being dumped in water bodies along with the idols. Since the pujas like Biswakarma Puja, Ganesh Puja and Durga Puja 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, 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 downstreams.

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

## 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 Janhit 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 and Durga Puja are celebrated in massive scale in most of the cities of the State of Odisha. However, celebrations of other Pujas like Gajalaxmi Puja and Kali pujas, are limited to certain cities of the State. Generally the idols are immersed on a single day at the designated sites of the rivers flowing along the cities. In recent past years, Board was informing all the District Collectors of the State to implement the Guidelines. Besides these, Board was also conducting the water quality monitoring of only two rivers i.e. Kathajodi river along Cuttack city and Kuakhai river along Bhubaneswar city to assess the impact of idol immersion.

However, 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 ensuing 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.

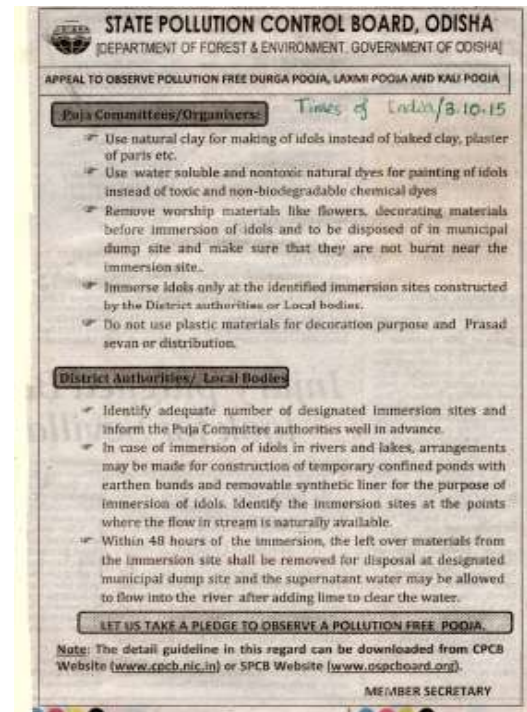




- Informed all the District Collectors and authorities of urban local bodies of the State prior to Ganesh Puja and Durga Puja to implement the Guidelines of Immersion in their areas of jurisdiction.
- Created public awareness through Public Notice on safe Idol immersion practices in Local Newspapers 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.



Public awareness through public address system



Appeal to Public to observe pollution free 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.

This year, in 32 urban local bodies (Table-1), temporary immersion ponds were constructed either on the bank of the rivers or by cordoning a portion of the river on its bank for idol immersion. 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.

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.

**Table-1 List of Urban local bodies where temporary immersion ponds were constructed near rivers for idol immersion purpose**

Name of the district	Sl. No.	Name of the ULB	Location of temporary idol immersion ponds on rivers
Balasore	1.	Balasore Municipality	<ul style="list-style-type: none"><li>Balighat of river Budhabalanga</li><li>At Nuniajori creek near river Budhabalanga</li></ul>
Bargarh	2.	Bargarh NAC	On the bank of river Jeera
Bhadrak	3.	Bhadrak Municipality	At Santhia ghat near Salandi river
Boudh	4.	Boudh	<ul style="list-style-type: none"><li>Near Podapoda ghat of Mahanadi river</li><li>Near Boudh bridge chhak on Mahanadi river</li></ul>
Cuttack	5.	Cuttack Municipal Corporation	At Devigada on the bank of river Kathajodi
	6.	Choudwar Municipality	Near Birupa Barrage on the bed of river Birupa



## Impact of Idol Immersion on Water Quality of Aquatic Bodies-2015

	7.	Athagarh NAC	At Nizigarh on the bed of river Sapua
Jajpur	8.	Jajpur Municipality	<ul style="list-style-type: none"><li>At Devigoda ghat on the bank of river Baitarani</li><li>At village Rudhia on the bank of river Budha</li></ul>
	9.	Vyasanagar Municipality	At Jokadia on the bank of river Kharasrota
Kandhamal	10.	Phulbani Municipality	At College square on the bank of Pila Salunki River
Koraput	11.	Koraput Municipality	Near Kolab Dam bridge of river Kolab
Khordha	12.	Bhubaneswar Municipal Corporation	<ul style="list-style-type: none"><li>At Tankapani on the bank of river Kuakhai</li><li>At Uttara on the bank of river Daya</li><li>At Hansapal on the bank of river Kuakhai</li></ul>
Keonjhar	13.	Anandpur Municipality	At Anandpur on river bed of Baitarani river
	14.	Joda Municipality	At Aam Bagan near Sona river
	15.	Barbil Municipality	At Chetai Hutting near river Karo
	16.	Champua NAC	At Hanuman Ghat on river bed of Baitarani river
Gajapati	17.	Parlakhemundi Municipality	On the bank of Mahendratanaya river
Jagatsinghpur	18.	Jagatsinghpur Municipality	<ul style="list-style-type: none"><li>At Galupada on the bank of Alaka river</li><li>Near College Chhak on the bank of Alaka river</li><li>Canal at Purohitpur</li></ul>
	19.	Paradeep Municipality	At Nuabazar near Atharabanki creek
Jharsuguda	20.	Brajarajnagar Municipality	Near Orient Paper Mill on the bank of Ib river
Kendrapada	21.	Pottamundai Municipality	Pond at Balipada Puja Padia on the bank of Brahmani river
Mayurbhanj	22.	Baripada Municipality	At Poda Astia on the bank of river Budhabalanga
	23.	Rairangpur Municipality	On the bank of Khadakhai river
	24.	Udala NAC	At Podagadi on the bank of Sono river
Nabarangpur	25.	Nabarangpur Municipality	Near Phuljodi nalla which is 200 m away from Indravarti river
	26.	Umerkote Municipality	<ul style="list-style-type: none"><li>Near Jhari Road on the bank of Bhaskel river</li></ul>



			<ul style="list-style-type: none"><li>• Dadiguda near Junapani nalla</li></ul>
Puri	27.	Puri Municipality	At Devighat on the Musa river
Rayagada	28.	Rayagada Municipality	At Kotlaguda on river Jhanjabati
Sambalpur	29.	Sambalpur Municipal Corporation	<ul style="list-style-type: none"><li>• At Marawaripada ghat of Mahanadi river</li><li>• At Balibandh ghat of river Mahanadi</li><li>• At Badabazar ghat of river Mahanadi</li><li>• At Maa Durga Ghat of river Mahanadi</li></ul>
Sundargarh	30.	Rourkela Municipal Corporation	At Pal Pal Basti near river Brahmani
	31.	Sundargarh Municipality	Near Mahadev Pada village on Ib river
Subarnapur	32.	Subarnapur NAC	At Subarnapur on the bank of Tel river

The following photographs depict the pre-, during- and post-activities in the temporary idol immersion sites on the rivers.

(1) On the main flow of the river as in Mahanadi at Sambalpur



Temporary Idol immersion pond created by barricading a portion of the Mahanadi river on its bank at Balibandha ghat , Sambalpur

(a) Pre-immersion view

(b) During-immersion view

(c) Post -immersion



(2) On the bank of the river as in Daya near Bhubaneswar.



Temporary Idol immersion pond created on the bank of Daya river, Bhubaneswar

- (a) Filling of temporary immersion pond by pumping Daya river water into the pond  
(b) Pre-immersion view      (c) During-immersion view      (d) Post -immersion

### **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 21 urban local bodies (Table-2) 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.

**Table-2 List of Urban local bodies where temporary immersion spots were created on a corner of the pond for idol immersion purpose**

Name of the district	Sl No.	Name of the ULB	Location of temporary idol immersion spots on Ponds
Angul	1.	Angul Municipality	Narayan Sagar pond
	2.	Talcher Municipality	Pond near Lingaraj OCP, Talcher
Balangir	3.	Balangir Municipality	Ranibandh Pond
	4.	Balangir Municipality	Maharani Sagar Pond
Balasore	5.	Soro NAC	Ponds
	6.	Nilagiri NAC	Ponds
	7.	Jaleswar NAC	Ponds
Bhadrak	8.	Basudevpur NAC	Ponds
Cuttack	9.	Banki NAC	Pathuritutha (Pond)
Dhenkanal	10.	Dhenkanal Municipality	Kathasankha Pond
Gajapati	11.	Parlakhemundi Municipality	Sadarabandha pond
Jharsuguda	12.	Jharsuguda Municipality	Kulakanta pond near Buxi Chowk, Jharsuguda
Kalahandi	13.	Bhawanipatna Municipality	Pond at Talibandha near Nuabandha
Khordha	14.	Khordha Municipality	Near TLC road in front of CESU Division Office
Khordha	15.	Jatani Municipality	Abandoned quarry at Kusumati
Keonjhar	16.	Keonjhar Municipality	Buapokhari at Janardan sasan inside Municipal area
Malkangiri	17.	Malkangiri Municipality	On Balisagar lake near the connecting road between Malkangiri and Balimela
	18.	Balimela NAC	NAC pond, Balimela
Mayurbhanj	19.	Karanjia NAC	Rajabandha Pond
Nayagarh	20.	Nayagarh NAC	Puruna Rajbati bandha pond in Ward No. 7
Nuapada	21.	Nuapada NAC	Gotma Pond

The following photographs depict the pre-, during and post-immersion views of the temporary idol immersion sites on the ponds.



Idol immersion Spot created by barricading a portion of the pond in in Janardan Sasan in Keonjhar Municipal area

(a) Pre-immersion view

(b) During-immersion view

(c) Post-immersion

### 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.

The following photographs depict the pre-, during and post-activities in sea.



Idol immersion activities in Sea at Gopalpur

(a) Temporary hording indicating way to the immersion site on sea (b) During-immersion view

(c) Post-immersion view



#### 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-3.

**Table-3 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-4.

**Table - 4 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
Sodim 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-5 for above mentioned designated uses of surface water bodies.

**Table-5 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 <sup>6+</sup> ), 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 cities preferably with population more than one lakhs and in the cities where pujas are celebrated in massive scale. A detail list of cities where water quality monitoring was conducted to assess the impact of idol immersion of various pujas is given in Table-6.

As per the Guidelines, water quality monitoring was conducted in three stages i.e. pre-immersion, during- immersion and post- immersion period. 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, nickel, 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.

**Table-6 : List of cities where water quality monitoring was carried out by the Board to assess the impact of idol immersion of various pujas**

<b>Ganesh Puja</b>	<b>Viswakarma Puja</b>	<b>Durga Puja</b>	<b>Gajalaxmi Puja</b>	<b>Kali Puja</b>
1. Cuttack 2. Bhubaneswar 3. Sambalpur 4. Paradeep 5. Rourkela 6. Talcher	1. Talcher	1. Cuttack 2. Bhubaneswar 3. Puri 4. Sambalpur 5. Rourkela 6. Angul 7. Talcher 8. Dhenkanal 9. Kamakhyanagar 10. Sundargarh 11. Jharsuguda 12. Deogarh 13. Rayagada 14. Berhampur 15. Keonjhar 16. Anandpur 17. Joda 18. Badbil 19. Champua 20. Balasore 21. Baripada 22. Kendrapada	1. Angul 2. Dhenkanal	1. Cuttack 2. Angul 3. Dhenkanal

The water quality data of samples collected to assess the impacts of idol immersion during Ganesh Puja are given in Tables 7 – 9. Impacts of idol immersion during Viswakarma Puja was assessed only in one city, i.e., Talcher and the water quality data is given in Table 10.



During Durga Puja, water quality assessment was conducted in rivers in 17 ULBs, of ponds in 4 ULBs and of sea in one ULB and water quality data are given in Tables 14 - 32, 33 -40 and 41 respectively.

Impacts of idol immersion during Gajalaxmi Puja was assessed in two cities, viz. Angul and Dhenkanal and the water quality data are given in Table 42 and 43. Whereas, water quality data of samples collected to assess the impacts of idol immersion during Kalipuja in Cuttack, Angul and Dhenkanal cities are given in Table 44, 45 and 46 respectively.

From the water quality data, it has been observed that

- During immersion period, parameters like turbidity and total solids increase at the immersion sites in comparison to the upstream and downstream stations which may be ascribed to the increase in suspended materials on the water body during immersion of idols.
- Dumping of puja materials and left-overs into the water body disrupts the oxygen level of water body and therefore lowering of dissolved oxygen (DO) at the immersion site was observed. Simultaneous 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.
- 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.
- However, significant increase in water quality parameters like DO, BOD, COD, EC, TDS and TS in the temporary idol immersion ponds were observed in comparison to its upstream station in during-immersion period. As the left-overs of the idol immersion were removed from the idol immersion ponds in subsequent days of idol immersion, the values of DO, BOD, COD, EC, TDS and TS parameters has been decreased in post-immersion monitoring period.



- In the temporary idol immersion ponds, the 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 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). 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. Such observation may be ascribed to the heavy flow in river during that period. 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- 7 Impact of idol immersion during Ganesh Puja on water quality of river Kathajodi at Cuttack**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Post-Immersion (22.09.2015)	Location-1	7.1	5.8	0.35	5.6	175	15.0	108	115	0.0026	0.002	0.072	0.218	0.008	0.015	0.002
	Location-2	7.2	5.6	0.95	7.05	193	60.0	129	281	0.0035	0.008	0.083	1.462	0.018	0.169	0.004
	Location-3	7.9	6.0	0.55	9.9	184	30.0	121	221	0.0033	0.007	0.078	0.922	0.012	0.020	0.004
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 near High Court
- \* Location-2 : Immersion site at Devi gada
- \* Location-3 : Downstream of Immersion site at Khannagar

**Table- 8 Impact of idol immersion during Ganesh Puja on water quality of river Kuakhai at Bhubaneswar**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Post-Immersion (22.09.2015)	Location-1	7.8	6.1	0.9	8.5	175	15.0	89	173	0.0026	0.002	0.072	0.212	0.008	0.015	0.002
	Location-2	7.6	5.0	2.05	14.1	193	60.0	118	275	0.0035	0.008	0.083	1.922	0.018	0.169	0.004
	Location-3	7.3	5.3	1.8	11.3	184	30.0	108	185	0.0033	0.007	0.078	1.456	0.012	0.020	0.004
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 near Mancheswar
- \* Location-2 : Immersion site
- \* Location-3 : Downstream of Immersion site at Balianta

**Table- 9 Impact of idol immersion during Ganesh Puja on water quality of river Mahanadi at Sambalpur**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (20.09.2015 at 12.00 Noon)	Location-1	7.9	4.0	8.0	38.0	298	7.8	168	212	0.0008	0.016	0.074	0.502	0.002	0.008	0.002
Post-Immersion (20.09.2015 at 8.00 PM)	Location-1	7.8	2.0	12.0	46.0	390	11.6	216	281	0.0011	0.018	0.056	0.614	0.004	0.085	0.003
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	1.5	15	0.1

\* Location-1 : River Mahanadi near Kachery ghat, Sambalpur

**Table- 10 Impact of idol immersion during Ganesh Puja on water quality of Atharabanki creek at Paradeep**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (23.09.2015)	Location-1	6.5	-	4	16	-	-	-	-	0.0029	0.008	0.040	1.47	0.028	0.011	0.008
	Location-2	7.0	-	1.9	12	-	-	-	-	0.0024	0.011	0.079	0.59	0.023	0.004	0.004
Post-Immersion (24.09.2015)	Location-1	7.5	-	5.4	32	-	-	-	-	0.0036	0.020	0.069	4.60	0.038	0.017	0.011
	Location-2	7.0	-	6	36	-	-	-	-	0.0031	0.015	0.090	1.23	0.026	0.009	0.008
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 : Near bridge on Atharabanki creek, Paradeep

\* Location-2 : Creek water at Bali plot adjacent to Dumpers Owner Association

**Table- 11 Impact of idol immersion during Ganesh Puja on water quality of Brahmani river at Rourkela**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (16.9.15)	Location-1	7.8	7.8	1.0	11.2	128	12.3	70	105	0.0015	0.008	0.044	0.738	0.004	0.007	0.001
	Location-2	8.1	5.6	1.5	16.0	275	21.8	157	305	0.0019	0.010	0.045	0.797	0.012	0.013	0.001
Post-Immersion (22.9.15)	Location-1	7.7	7.5	1.0	16.0	155	13.8	88	130	0.0018	0.010	0.047	0.749	0.004	0.007	0.003
	Location-2	8.4	5.0	3.0	18.2	318	32.3	170	338	0.0031	0.027	0.057	0.925	0.016	0.036	0.003
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 Panposh

\* Location-2 : Downstream of Immersion site at Deogaon





Table- 12 Impact of idol immersion during Ganesh Puja on water quality of Brahmani river at Talcher

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (26.09.2015)	Location-1	7.3	7.4	1.6	8	146	2	80	104	0.0011	0.013	0.061	0.43	0.005	0.003	0.001
	Location-2	7.2	7.2	1.6	8	160	2	92	120	0.0011	0.017	0.073	0.488	0.009	0.004	0.001
Post-Immersion (29.09.2015)	Location-1	7.4	7.4	1.6	8	154	2	84	106	0.0011	0.007	0.023	0.438	0.009	0.006	0.002
	Location-2	7.2	7.4	1.6	10	182	4	106	132	0.0013	0.010	0.036	0.864	0.016	0.039	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 site

\* Location-2 : Downstream of Immersion site



**Table- 13 Impact of idol immersion during Viswakarma Puja on water quality of Brahmani river at Talcher**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (23.09.2015)	Location-1	7.5	7.4	1.2	8	144	2	72	92	0.0006	0.005	0.035	0.407	0.003	0.002	0.001
	Location-2	7.4	7.4	1.2	8	148	2	74	96	0.0009	0.017	0.039	0.492	0.009	0.002	0.002
Post-Immersion (24.09.15)	Location-1	7.3	7.6	1.2	8	152	2	74	96	0.0010	0.005	0.069	0.421	0.005	0.004	0.001
	Location-2	7.3	7.4	1.2	8	148	2	76	100	0.0013	0.018	0.087	0.962	0.009	0.004	0.002
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

\* Location-2 : Downstream of Immersion site



**Table- 14 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, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	8.1	7.4	0.92	6	198	1.7	113	119	0.001	<0.002	0.013	0.205	0.010	0.015	0.008
	Location-2	8.1	7.4	1.7	6.9	248	3.3	144	156	0.001	<0.002	0.013	0.274	0.012	0.016	0.010
	Location-3	Sample not collected														
	Location-4	Sample not collected														
	Location-5	8.1	6.62	1.7	6.9	216	3.7	121	133	0.001	<0.002	0.016	0.229	0.013	0.019	0.015
During-Immersion (25.10.2015)	Location-1	7.7	8.7	0.74	5.9	179	1.6	100	106	0.001	<0.002	0.015	0.293	0.011	0.046	0.008
	Location-2	7.5	7.9	1.3	5.9	217	2.8	126	134	0.001	<0.002	0.040	0.696	0.012	0.055	0.008
	Location-3	7.3	Nil	18.4	39.7	634	125	393	483	0.001	<0.002	0.085	1.847	0.024	0.210	0.018
	Location-4	7.8	7.4	1.5	6.9	189	4.1	108	120	0.001	<0.002	0.062	1.136	0.011	0.048	0.009
	Location-5	8.18	7.73	1.5	6.9	209	14	123	149	0.001	<0.002	0.053	0.278	0.010	0.040	0.003
Post-Immersion (29.10.2015)	Location-1	8.02	7.7	.3	5.9	185	2.3	112	120	0.001	<0.002	0.020	0.206	0.009	0.039	0.007
	Location-2	7.9	7.4	1.5	7.9	189	5.4	112	118	0.001	<0.002	0.025	0.861	0.013	0.045	0.007
	Location-3	7.3	Nil	55.2	120	1180	20	710	748	0.001	0.013	0.077	1.418	0.027	0.100	0.012
	Location-4	7.9	7.5	1.7	6.9	227	1.3	144	158	0.001	<0.002	0.043	0.916	0.014	0.053	0.009
	Location-5	8.04	7.5	1.5	6.9	208	2.9	128	140	0.001	<0.002	0.045	0.826	0.007	0.013	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 site at Naraj Barrage
- \* Location-2 : At the Immersion site near Puri ghat (Devi gada)
- \* Location-3 : From temporary immersion pond
- \* Location-4 : Immediate downstream of Immersion site near Khan nagar
- \* Location-5 : Downstream of Immersion site near Khan nagar



**Table- 15 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, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.9	6.0	1.1	3.6	189	26.0	120	140	0.001	<0.002	0.013	0.237	0.007	0.008	0.008
	Location-2	Sample not collected														
	Location-3	8.2	8.1	0.8	3.2	174	22.0	92	108	0.002	<0.002	0.025	1.718	0.011	0.078	0.011
	Location-4	8.2	9.0	0.6	5.4	173	5.7	98	112	0.001	<0.002	0.011	0.640	0.009	0.015	0.008
	Location-5	8.2	8.8	1.2	12.6	189	36.0	116	136	0.002	<0.002	0.030	0.697	0.010	0.053	0.009
	Location-6	Sample not collected														
	Location-7	7.7	9.3	1.7	14.4	273	31.0	178	214	0.002	<0.002	0.005	0.781	0.018	0.056	0.011
During-Immersion (25.10.2015)	Location-1	7.7	7.1	0.45	3.5	184	6.0	102	114	0.002	<0.002	0.057	0.209	0.008	0.009	0.008
	Location-2	6.7	0.2	19.8	84.0	525	65.0	324	474	0.003	0.007	0.060	1.854	0.020	0.143	0.014
	Location-3	7.4	5.3	0.8	7.0	194	20.0	116	164	0.003	<0.002	0.035	1.754	0.012	0.125	0.009
	Location-4	8.4	8.7	0.4	3.5	176	11.0	108	220	0.001	<0.002	0.026	0.646	0.009	0.016	0.008
	Location-5	7.1	0.7	15.2	48.9	270	38.0	158	202	0.002	0.002	0.015	0.753	0.016	0.147	0.010
	Location-6	7.9	8.3	1.2	5.2	181	16.0	110	146	0.002	<0.002	0.028	0.675	0.014	0.133	0.009
	Location-7	8.0	8.4	1.1	7.0	197	12.0	124	138	0.001	<0.002	0.008	0.644	0.010	0.064	0.008
Post-Immersion (29.10.2015)	Location-1	7.7	7.9	0.3	5.4	195	7.0	123	138	0.001	<0.002	0.012	0.205	0.007	0.009	0.008
	Location-2	6.8	Nil	6.9	32.0	485	8.5	282	312	0.003	0.005	0.017	2.074	0.018	0.056	0.006
	Location-3	7.3	13.4	0.7	8.7	166	5.0	98	102	0.001	<0.002	0.01	0.306	0.008	0.011	0.006
	Location-4	Sample not collected														
	Location-5	Sample not collected														
	Location-6	7.9	8.1	1.4	10.5	183	4.4	116	132	0.001	<0.002	0.015	0.407	0.006	0.061	0.008
	Location-7	8.4	8.6	0.65	5.4	148	3.2	88	110	0.001	<0.002	0.006	0.153	0.006	0.057	0.008
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 Hansapal
- \* Location-2 : Temporary immersion pond-1 near Kuakhai river
- \* Location-3 : Downstream of Immersion pond-1 at Balianata
- \* Location-4 : Upstream of Immersion pond-2 near Tankapani bridge

- \* Location-5 : At the Immersion pond-2 near Tankapani bridge
- \* Location-6 : Immediate downstream of Immersion pond-2 near Tankapani bridge
- \* Location-7 : Downstream of Immersion pond-2 near Tankapani bridge



**Table- 16 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, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	8.4	8.8	0.6	3.6	180	17.0	106	124	0.002	<0.002	0.031	0.759	0.005	0.007	0.006
	Location-2	8.3	11.7	1.8	5.4	377	45.0	256	308	0.002	<0.002	0.021	0.758	0.012	0.019	0.007
	Location-3	8.2	7.7	0.6	9.0	199	17.0	112	134	0.002	<0.002	0.030	0.798	0.008	0.017	0.008
	Location-4	8.4	8.8	0.8	5.4	177	9.1	96	112	0.002	<0.002	0.042	0.835	0.010	0.019	0.007
During-Immersion (25.10.2015)	Location-1	8.2	8.3	1.4	3.5	189	10.0	110	126	0.001	0.002	0.025	0.786	0.003	0.008	0.001
	Location-2	6.4	Nil	64.0	384.0	670	400.0	390	472	0.003	0.007	0.045	2.316	0.018	0.292	0.026
	Location-3	8.3	8.3	1.1	7.0	187	11.0	118	168	0.001	0.002	0.015	0.704	0.009	0.023	0.008
	Location-4	7.9	8.4	2.0	8.7	204	20.0	122	142	0.001	0.002	0.013	0.628	0.009	0.023	0.008
Post-Immersion (29.10.2015)	Location-1	8.4	8.4	0.5	7.0	175	5.0	108	126	0.001	0.002	0.005	0.807	0.008	0.009	0.006
	Location-2	6.1	Nil	5.1	22.0	374	30.0	222	248	0.003	0.013	0.025	3.684	0.018	0.105	0.012
	Location-3	8.2	8.8	0.5	8.7	275	5.6	162	176	0.002	<0.002	0.003	1.058	0.013	0.018	0.009
	Location-4	7.8	7.0	0.9	10.5	208	5.7	108	126	0.001	0.007	0.010	1.005	0.012	0.015	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 near Daya bridge at Bhubaneswar

\* Location-2 : Temporary immersion pond near Daya River

\* Location-3 : Immediate Downstream of Immersion pond

\* Location-4 : Downstream of Immersion pond



**Table- 17 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, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.1	Nil	24.5	100.0	986	22.0	564	584	0.003	0.003	0.017	1.603	0.007	0.397	0.002
	Location-2	7.1	Nil	19.8	92.0	986	34.0	572	594	0.003	0.005	0.011	1.684	0.023	0.440	0.009
	Location-3	7.1	Nil	17.6	83.0	985	33.0	556	582	0.003	0.003	0.008	1.810	0.026	0.473	0.011
	Location-4	Sample not collected														
During-Immersion (25.10.2015)	Location-1	Sample not collected														
	Location-2	7.1	Nil	24.7	115.0	1034	37.0	592	602	0.003	0.033	0.042	2.988	0.034	0.465	0.012
	Location-3	7.1	Nil	31.7	144.6	1025	56.0	635	700	0.003	0.007	0.025	2.557	0.029	0.421	0.018
	Location-4	7.1	Nil	30.8	140.0	929	26.0	560	592	0.002	0.003	0.005	0.639	0.024	0.378	0.013
Post-Immersion (29.10.2015)	Location-1	7.0	Nil	24.6	92.0	1134	45.0	724	796	0.003	0.011	0.032	2.505	0.019	0.324	0.010
	Location-2	7.0	Nil	49.5	192.0	1137	55.0	673	698	0.003	<0.002	0.005	2.146	0.018	0.262	0.007
	Location-3	7.0	Nil	32.9	157.0	1313	56.0	822	876	0.003	0.005	0.010	1.890	0.012	0.355	0.003
	Location-4	Sample not collected														
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

\* Location-4 : Further downstream of Immersion point

**Table- 18 Impact of idol immersion during Durga Puja on water quality of Mahanadi river at Sambalpur**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
During-Immersion (26.10.2015)	Location-1	7.9	11.0	6.0	26.0	262	8.5	142	188	0.001	0.008	0.017	0.177	0.018	0.016	0.003
	Location-2	7.8	6.0	16.0	35.0	460	11.6	246	372	0.001	<0.002	0.012	0.961	0.025	0.039	0.007
	Location-3	7.8	7.6	22.5	64.0	490	12.2	267	406	0.001	0.007	0.015	3.148	0.016	0.030	0.011
	Location-4	7.8	4.4	24.4	68.0	520	11.3	274	416	0.001	<0.002	0.008	1.594	0.027	0.091	0.012
	Location-5	7.8	6.4	26.2	54.0	450	14.1	258	422	0.001	0.007	0.015	0.936	0.059	0.045	0.006
	Location-6	7.8	6.2	28.8	58.0	518	9.4	274	412	0.001	<0.002	0.017	2.776	0.024	0.002	0.009
Post-Immersion (28.10.2015)	Location-1	7.9	12.0	5.0	31.0	248	9.6	142	188	0.001	0.007	0.013	0.734	0.014	0.012	0.001
	Location-2	7.6	7.0	12.0	42.0	320	16.2	178	274	0.001	0.003	0.008	0.100	0.017	0.023	0.004
	Location-3	7.4	12.2	8.0	28.0	390	18.2	213	339	0.001	<0.002	0.010	1.859	0.023	0.119	0.003
	Location-4	7.2	14.2	12.4	44.0	330	17.2	189	313	0.001	0.002	0.015	0.585	0.018	0.097	0.008
	Location-5	7.6	18.6	14.2	38.0	350	22.0	194	312	0.001	0.002	0.012	0.680	0.014	0.071	0.006
	Location-6	8.2	14.4	12.6	32.0	385	16.0	212	336	0.002	<0.002	0.013	1.561	0.019	0.105	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 River Mahanadi near Durgapali
- \* Location-2 : Downstream of River Mahanadi near Bhatra
- \* Location-3 : Immersion site on Harad Jore, Govindtola Ghat
- \* Location-4 : Immersion site on River Mahanadi near Badbazar Ghat
- \* Location-5 : Immersion site on River Mahanadi near Balibandha Ghat
- \* Location-6 : Immersion site on River Mahanadi near Marwari Para Ghat



**Table-19 Impact of idol immersion during Durga Puja on water quality of river Lingra Jhor at Angul**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.8	6.4	1.2	8.0	110	2	72	92	0.002	0.003	0.013	0.311	0.008	0.003	0.002
	Location-2	7.9	6.4	1.2	8.0	118	2	76	98	0.003	0.003	0.031	0.337	0.011	0.008	0.002
	Location-3	7.8	6.4	1.2	8.0	124	2	76	98	0.003	<0.002	0.055	0.551	0.021	0.017	0.006
During-Immersion (23.10.2015)	Location-1	Sample not collected														
	Location-2	Sample not collected														
	Location-3	Sample not collected														
Post-Immersion (29.10.2015)	Location-1	7.2	6.4	1.4	8.0	120	2	74	98	0.002	0.008	0.015	0.356	0.036	0.011	0.002
	Location-2	Sample not collected														
	Location-3	7.7	6.4	1.4	8.0	124	2	74	102	0.002	0.002	0.03	0.401	0.044	0.014	0.002
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 idol immersion site of Lingara Jhor at Angul
- \* Location-2 : idol immersion site at Hularisingha bridge of Lingara Jhor at Angul
- \* Location-3 : Downstream of idol immersion site of Lingara Jhor at Angul



**Table-20 Impact of idol immersion during Durga Puja on water quality of river Brahmani at Talcher**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.2	7.0	1.2	8.0	142	2	76	96	0.002	0.008	0.06	0.059	0.005	0.144	0.001
	Location-2	8.0	6.8	1.2	8.0	138	2	78	98	0.002	0.003	0.035	0.060	0.005	0.185	0.003
	Location-3	7.9	6.8	1.2	8.0	138	2	78	100	0.003	0.002	0.033	0.067	0.011	0.192	0.003
During-Immersion (23.10.2015)	Location-1	7.2	7.0	1.4	8.0	148	2	80	102	0.002	0.005	0.028	0.062	0.009	0.147	0.001
	Location-2	6.9	6.8	1.4	8.0	148	2	80	106	0.002	0.011	0.035	0.085	0.040	0.251	0.003
	Location-3	6.9	6.8	1.4	8.0	156	2	82	108	0.002	0.003	0.011	0.082	0.034	0.221	0.005
Post-Immersion (29.10.2015)	Location-1	7.3	6.8	1.6	8.0	154	2	90	114	0.002	<0.002	0.023	0.078	0.004	0.134	0.003
	Location-2	7.6	6.8	1.6	8.0	162	2	94	118	0.002	0.003	0.048	0.084	0.032	0.194	0.003
	Location-3	7.7	6.6	1.6	8.0	190	2	106	132	0.002	0.002	0.033	0.074	0.027	0.207	0.003
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 idol immersion site of river Brahmani at Talcher

\* Location-2 Idol immersion site at Sarang Bridge of Brahmani at Talcher

\* Location-3 Downstream of idol immersion site of Brahmani at Talcher



**Table- 21 Impact of idol immersion during Durga Puja on water quality of Ib river at Jharsuguda**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	8.0	8.2	1.0	6.2	132	1.6	110	118	0.001	<0.002	0.013	0.105	0.008	0.002	0.002
	Location-2	Sample not collected														
	Location-3	Sample not collected														
	Location-4	8.2	9.4	1.2	6.4	146	2.4	124	134	0.003	<0.002	0.015	0.122	0.012	0.012	0.004
During-Immersion (25.10.2015)	Location-1	Sample not collected														
	Location-2	7.4	1.8	6.8	10.4	156	14.2	212	274	0.002	0.002	0.085	0.141	0.013	0.027	0.003
	Location-3	7.2	1.2	8.2	12.0	178	22.8	266	240	0.003	<0.002	0.023	0.238	0.026	0.022	0.003
	Location-4	Sample not collected														
Post-Immersion (29.10.2015)	Location-1	7.8	8.4	1.4	6.6	144	4.8	114	124	0.002	<0.002	0.082	0.104	0.013	0.003	0.002
	Location-2	Sample not collected														
	Location-3	Sample not collected														
	Location-4	7.6	8.6	1.6	7.2	152	6.6	128	140	0.002	<0.002	0.053	0.207	0.003	0.038	0.010
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 idol immersion location on Ib river near NH-200 bridge
- \* Location-2 : Temporary pond for Idol immersion located by Jharsuguda Municipality
- \* Location-3 : Temporary pond for Idol immersion located by Brajrajnagar Municipality
- \* Location-4 : Downstream of idol immersion location on Ib river near the Bhata village of Brajarajnagar



**Table-22 Impact of idol immersion during Durga Puja on water quality of Jhanjabati river at Rayagada**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.0	7.3	1.5	5.2	158	45.0	98	118	0.001	<0.002	0.013	0.736	0.018	0.142	0.004
	Location-2	8.2	7.0	2.5	6.24	164	33.0	101	144	0.001	<0.002	0.010	0.914	0.018	0.140	0.004
	Location-3	7.6	7.4	2.0	4.16	158	25.0	92	112	0.001	<0.002	0.006	0.981	0.018	0.135	0.004
	Location-4	7.7	7.1	2.2	7.28	154	22.0	89	124	0.001	0.008	0.017	1.327	0.019	0.164	0.006
During-Immersion (25.10.2015)	Location-1	7.5	6.9	3.5	6.27	169	3.1	106	108	0.001	<0.002	0.008	0.799	0.019	0.179	0.006
	Location-2	6.9	4.8	13.0	28.67	440	85.0	255	344	0.002	0.008	0.025	2.610	0.023	0.249	0.009
	Location-3	7.6	7.2	2.6	5.37	169	4.1	98	122	0.001	<0.002	0.015	2.356	0.021	0.249	0.008
	Location-4	6.9	7.1	2.7	7.16	173	5.0	100	120	0.001	<0.002	0.022	1.851	0.012	0.197	0.005
Post-Immersion (29.10.2015)	Location-1	7.9	7.2	1.7	4.8	165	4.8	96	112	0.001	<0.002	0.010	0.743	0.017	0.151	0.005
	Location-2	7.0	6.8	3.5	9.6	537	37.0	311	448	0.002	0.018	0.035	1.235	0.020	0.233	0.008
	Location-3	7.9	7.1	2.0	6.72	167	4.6	97	110	0.001	0.003	0.013	0.994	0.019	0.220	0.008
	Location-4	7.8	7.0	1.8	5.37	162	3.2	94	122	0.001	0.002	0.010	1.248	0.019	0.173	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 on River Jhanjabati
- \* Location-2 : Immersion pond near River Jhanjabati
- \* Location-3 : Adjacent to immersion pond on River Jhanjabati
- \* Location-4 : Downstream of immersion pond on River Jhanjabati



**Table-23 Impact of idol immersion during Durga Puja on water quality of river Baitarani at Anandpur Municipality**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (23.10.2015)	Location-1	7.2	9.0	1.2	4.6	159	5.2	83	128	0.001	0.011	0.053	0.081	0.009	0.008	0.001
	Location-2	7.4	5.1	1.7	4.6	279	4.1	141	196	0.001	<0.002	0.021	0.082	0.009	0.007	0.002
	Location-3	7.5	9.8	1.9	7.7	161	3.7	86	130	0.001	<0.002	0.008	0.089	0.011	0.011	0.001
During-Immersion (25.10.2015)	Location-1	7.4	8.6	1.8	7.7	173	10.9	86	146	0.001	<0.002	0.023	0.033	0.010	0.007	0.001
	Location-2	7.1	0.2	11.5	49.2	648	171	316	476	0.002	<0.002	0.025	0.201	0.023	0.062	0.011
	Location-3	7.5	8.5	1.8	7.7	164	10.2	82	152	0.001	<0.002	0.017	0.170	0.012	0.031	0.008
Post-Immersion (27.10.2015)	Location-1	7.2	8.8	1.3	6.15	168	8.3	83	133	0.001	<0.002	0.020	0.101	0.005	0.007	0.002
	Location-2	8.0	6.3	2.2	10.8	312	48.0	172	697	0.003	0.003	0.010	0.216	0.020	0.031	0.007
	Location-3	8.1	8.7	1.0	4.6	173	5.6	84	140	0.001	<0.002	0.030	0.119	0.003	0.020	0.008
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 on Baitarani River
- \* Location-2 : Temporary immersion pond
- \* Location-3 : Downstream of immersion site on Baitarani River



**Table-24 Impact of idol immersion during Durga Puja on water quality of river Karo at Barbil Municipality**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (22.10.2015)	Location-1	7.7	8.6	1.3	3.1	178	2.9	98	168	0.001	<0.002	0.012	0.105	0.003	0.005	0.001
	Location-2	7.3	5.9	1.9	6.15	210	17.5	112	183	0.002	<0.002	0.078	0.168	0.003	0.008	0.002
	Location-3	7.4	8.2	1.2	3.1	175	2.4	97	172	0.001	0.010	0.026	0.233	0.002	0.011	0.001
During-Immersion (26.10.2015)	Location-1	7.5	8.9	1.7	3.1	179	3.1	96	172	0.002	<0.002	0.008	0.128	0.003	0.005	0.002
	Location-2	6.1	0.2	3.5	18.5	418	230.0	220	655	0.002	0.025	0.290	0.646	0.003	0.011	0.002
	Location-3	7.3	9.1	1.2	3.1	180	2.8	101	176	0.002	0.007	0.008	0.372	0.006	0.014	0.002
Post-Immersion (28.10.2015)	Location-1	7.1	8.5	0.9	3.1	366	6.1	192	273	0.002	<0.002	0.008	0.143	0.006	0.003	0.003
	Location-2	6.2	1.2	3.5	18.5	546	77.0	286	431	0.003	0.017	0.112	0.467	0.017	0.017	0.011
	Location-3	6.4	8	2.9	7.7	358	5.9	196	281	0.002	<0.002	0.036	0.191	0.006	0.004	0.002
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 on Karo River
- \* Location-2 : Temporary immersion pond
- \* Location-3 : Downstream of immersion site on Karo River



**Table-25 Impact of idol immersion during Durga Puja on water quality of river Sona at Joda Municipality**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (22.10.2015)	Location-1	6.8	8.0	0.6	3.1	107	7.2	61	141	0.002	<0.002	0.013	0.185	0.001	0.003	0.002
	Location-2	6.9	6.7	2.1	16.9	148	8.5	86	177	0.002	0.003	0.031	0.171	0.001	0.003	0.002
	Location-3	6.2	8.2	1.4	6.15	159	7.6	90	194	0.002	<0.002	0.048	0.145	0.001	0.003	0.002
During-Immersion (26.10.2015)	Location-1	6.3	7.5	1.9	4.6	158	5.1	76	156	0.001	<0.002	0.003	0.156	0.001	0.004	0.002
	Location-2	6.9	5.4	2.5	12.3	171	46.0	84	279	0.002	0.002	0.018	0.809	0.011	0.049	0.012
	Location-3	6.9	8.5	1.8	4.6	165	5.1	80	190	0.002	0.020	0.028	0.320	0.006	0.014	0.002
Post-Immersion (28.10.2015)	Location-1	7.0	7.6	1.5	4.6	131	8.2	72	172	0.001	0.003	0.042	0.169	0.001	0.003	0.003
	Location-2	6.9	3.7	2.5	16.9	178	26.0	101	261	0.002	0.011	0.043	0.345	0.005	0.017	0.005
	Location-3	7.1	8.1	1.8	6.15	140	6.4	76	206	0.002	0.010	0.035	0.658	0.006	0.020	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 site on Sona River
- \* **Location-2** : Temporary immersion pond
- \* **Location-3** : Downstream of immersion site on Sona River

**Table- 26 Impact of idol immersion during Durga Puja on water quality of river Baitarani at Champua NAC**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (22.10.2015)	Location-1	7.84	8.4	0.9	6.15	103	6.2	55.63	106	0.002	0.003	0.042	0.155	0.005	0.004	0.003
	Location-2	7.27	9.5	1.4	4.5	105	17.6	56.03	111	0.002	0.003	0.023	0.178	0.006	0.008	0.004
	Location-3	7.29	8.5	1.4	6.15	108	6.4	57.41	117	0.002	0.003	0.026	0.202	0.008	0.008	0.004
During-Immersion (26.10.2015)	Location-1	7.31	9.9	1.8	6.15	105	3.4	56.22	116	0.002	0.008	0.031	0.169	0.006	0.004	0.004
	Location-2	6.64	5.2	3.5	15.4	538	97.3	281.3	551	0.002	0.021	0.047	2.179	0.018	0.069	0.011
	Location-3	7.2	9.9	1.7	7.7	101	5.2	53.89	114	0.002	0.007	0.048	0.532	0.012	0.029	0.006
Post-Immersion (28.10.2015)	Location-1	6.99	9	1.2	7.7	122	6.4	68.95	124	0.002	0.015	0.021	0.168	0.006	0.003	0.003
	Location-2	6.79	1.8	5.0	20.0	166	65.4	94.92	305	0.003	0.013	0.090	1.660	0.016	0.020	0.008
	Location-3	7.08	8.2	1.3	7.1	109	2.6	63.74	129	0.002	0.005	0.020	0.998	0.014	0.042	0.010
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 on Baitarani River
- \* Location-2 : Temporary immersion pond
- \* Location-3 : Downstream of immersion site on Baitarani River



**Table-27 Impact of idol immersion during Durga Puja on water quality of Ramiala river at Kamakhyanagar, Dhenkanal**

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 <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	6.7	7.4	1.2	8	144	11	80	116	0.002	0.005	0.023	0.601	0.024	0.018	0.002
	Location-2	6.6	7.2	1.2	8	152	69	86	246	0.002	0.005	0.015	0.937	0.024	0.026	0.002
	Location-3	6.7	7.4	1.2	8	120	14	78	118	0.002	0.002	0.048	0.911	0.029	0.023	0.003
During-Immersion (23.10.2015)	Location-1	7.1	6.8	1.6	8	130	12	84	118	0.002	0.005	0.033	0.937	0.034	0.025	0.003
	Location-2	6.4	11.0	1.4	8	126	70	90	200	0.002	0.018	0.144	2.456	0.049	0.061	0.002
	Location-3	6.6	7.0	1.4	8	148	18	110	148	0.002	0.003	0.05	2.093	0.044	0.048	0.002
Post-Immersion (29.10.2015)	Location-1	7.3	7.2	1.2	8	146	12	86	112	0.002	0.013	0.028	0.963	0.052	0.022	0.003
	Location-2	6.5	7.0	1.2	8	188	62	94	136	0.002	0.005	0.015	1.198	0.032	0.049	0.003
	Location-3	7.0	7.0	1.2	8	172	14	94	132	0.002	0.023	0.048	1.361	0.039	0.036	0.003
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 idol immersion pond on Ramiala river
- \* Location-2 Idol immersion pond near Ramiala river
- \* Location-3 Downstream of idol immersion pond on Ramiala river





**Table-28 Impact of idol immersion during Durga Puja on water quality of Budhabalanga river at Balasore**

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 <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (16.10.2015)	Location-1	7.2	6.6	0.6	12	274	-	158	218	0.001	0.003	0.031	0.227	0.029	0.003	0.003
	Location-2	7.3	6.8	1.2	15	326	-	176	252	0.001	0.003	0.047	0.339	0.027	0.003	0.003
	Location-3	7.1	7.2	1.6	30	406	-	212	290	0.001	0.002	0.035	0.407	0.038	0.006	0.003
	Location-4	7.4	6.8	1.4	15	318	-	168	238	0.001	0.002	0.035	0.383	0.035	0.004	0.003
	Location-5	7.3	7.4	1.4	15	254	-	136	202	0.001	0.002	0.02	0.325	0.034	0.004	0.003
During-Immersion (26.10.2015)	Location-1	7.3	7.2	0.8	15	289	-	164	232	0.001	0.007	0.02	0.398	0.030	0.004	0.008
	Location-2	7.2	6.0	1.2	30	334	-	184	260	0.003	0.007	0.04	0.537	0.048	0.017	0.007
	Location-3	7.1	5.2	4.6	45	384	-	206	330	0.002	0.008	0.033	1.444	0.046	0.030	0.008
	Location-4	7.3	6.4	2.8	30	288	-	154	224	0.001	0.007	0.033	1.423	0.046	0.018	0.009
	Location-5	7.2	6.8	1.4	15	256	-	142	210	0.001	0.008	0.02	1.039	0.044	0.015	0.008
Post-Immersion (29.10.2015)	Location-1	7.4	7.4	0.8	12	282	-	160	226	0.001	0.007	0.018	0.249	0.030	0.003	0.002
	Location-2	7.3	7.2	1.0	15	316	-	174	248	0.002	0.005	0.015	0.459	0.040	0.006	0.005
	Location-3	7.1	6.8	1.4	15	356	-	208	280	0.002	0.007	0.021	0.664	0.045	0.017	0.006
	Location-4	7.2	7.4	3.2	30	398	-	162	230	0.001	0.008	0.018	0.706	0.038	0.008	0.007
	Location-5	7.3	7.6	2.4	15	286	-	152	212	0.001	0.005	0.033	0.521	0.035	0.008	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 idol immersion site on river Budhabalanga at Balighat, Balasore
- \* Location-2 Near the Immersion site on river Budhabalanga
- \* Location-3 Temporary immersion site
- \* Location-4 Immediate downstream of temporary immersion site on river Budhabalanga
- \* Location-5 Downstream of temporary immersion site on river Budhabalanga



**Table-29 Impact of idol immersion during Durga Puja on water quality of Nuniajori at Balasore**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (16.10.2015)	Location-1	7.6	7.2	1.0	12	312	-	174	234	0.003	0.007	0.028	0.372	0.015	0.006	0.003
	Location-2	7.4	6.8	1.2	15	284	-	152	220	0.002	0.008	0.057	0.379	0.022	0.007	0.003
	Location-3	7.1	7.4	1.2	15	296	-	166	266	0.002	0.008	0.031	0.388	0.023	0.008	0.004
	Location-4	7.4	7.8	1.4	15	318	-	172	244	0.002	0.007	0.031	0.356	0.022	0.006	0.004
	Location-5	7.2	6.8	1.2	15	328	-	184	262	0.002	0.007	0.011	0.368	0.023	0.006	0.002
During-Immersion (26.10.2015)	Location-1	7.4	7.2	1.2	15	348	-	190	268	0.002	0.005	0.016	0.377	0.023	0.009	0.004
	Location-2	7.3	6.8	1.4	15	408	-	224	308	0.003	0.008	0.018	0.610	0.052	0.011	0.010
	Location-3	7.2	6.4	1.6	30	384	-	194	374	0.003	0.011	0.038	1.713	0.063	0.042	0.014
	Location-4	7.5	6.6	1.4	15	312	-	178	348	0.004	0.007	0.025	1.155	0.053	0.013	0.011
	Location-5	7.4	7.2	1.2	15	448	-	236	324	0.003	0.005	0.036	0.833	0.047	0.011	0.007
Post-Immersion (29.10.2015)	Location-1	7.6	7.2	1.0	12	312	-	174	234	0.003	0.008	0.028	0.380	0.018	0.007	0.004
	Location-2	7.4	6.8	1.2	15	284	-	152	220	0.002	0.007	0.036	0.446	0.036	0.011	0.007
	Location-3	7.1	7.4	1.2	15	326	-	186	268	0.003	0.005	0.045	0.884	0.038	0.021	0.007
	Location-4	7.4	7.8	1.4	15	318	-	172	244	0.003	0.011	0.058	0.654	0.034	0.008	0.007
	Location-5	7.2	6.8	1.2	15	326	-	184	262	0.002	0.007	0.04	0.431	0.031	0.007	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 idol immersion site on Nuniajori at Balasore
- \* Location-2 Near the Immersion site on Nuniajori
- \* Location-3 Temporary immersion site
- \* Location-4 Immediate downstream of temporary immersion site on Nuniajori
- \* Location-5 Downstream of temporary immersion site on Nuniajori



**Table-30 Impact of idol immersion during Durga Puja on water quality of Budhabalanaga River at Baripada**

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 <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (16.10.2015)	Location-1	7.3	6.8	1.0	12	294	-	164	236	0.001	0.003	0.04	0.347	0.003	0.003	0.007
	Location-2	7.1	7.2	1.2	12	328	-	176	244	0.003	0.003	0.031	0.357	0.006	0.004	0.007
	Location-3	6.9	7.4	1.6	15	336	-	188	262	0.001	0.003	0.048	0.389	0.010	0.002	0.006
	Location-4	7.2	7.6	1.4	15	384	-	216	296	0.003	0.007	0.053	0.344	0.008	0.002	0.007
	Location-5	7.3	7.8	1.6	15	234	-	182	254	0.003	0.003	0.04	0.340	0.007	0.006	0.005
During-Immersion (26.10.2015)	Location-1	7.2	7.6	1.2	15	482	-	256	358	0.003	0.008	0.062	0.428	0.003	0.004	0.008
	Location-2	7.3	7.2	1.2	15	284	-	194	276	0.003	0.002	0.048	0.540	0.013	0.010	0.008
	Location-3	7.1	6.8	1.6	30	392	-	212	294	0.003	0.010	0.042	0.726	0.028	0.024	0.011
	Location-4	7.3	7.2	1.4	15	414	-	224	310	0.003	0.008	0.057	0.649	0.018	0.014	0.008
	Location-5	7.4	7.8	1.4	15	334	-	188	266	0.003	0.005	0.062	0.427	0.012	0.008	0.009
Post-Immersion (29.10.2015)	Location-1	7.3	6.8	1.0	12	294	-	164	236	0.003	<0.002	0.042	0.406	0.004	0.003	0.007
	Location-2	7.1	7.2	1.2	12	328	-	176	244	0.003	0.005	0.023	0.512	0.007	0.008	0.009
	Location-3	6.9	7.4	1.6	15	286	-	188	262	0.003	0.003	0.078	0.619	0.026	0.010	0.007
	Location-4	7.2	7.6	1.4	15	384	-	216	296	0.003	0.003	0.035	0.538	0.011	0.006	0.008
	Location-5	7.3	7.8	1.6	15	284	-	182	254	0.003	0.003	0.045	0.356	0.010	0.005	0.008
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 idol immersion site on river Budhabalanga at Podastia bridge, Baripada
- \* Location-2 Near the Immersion site on river Budhabalanga
- \* Location-3 Temporary immersion site
- \* Location-4 Immediate downstream of temporary immersion site on river Budhabalanga
- \* Location-5 Downstream of temporary immersion site on river Budhabalanga



**Table-31 Impact of idol immersion during Durga Puja on water quality of Alaka River at Kendrapada**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (19.10.2015)	Location-1	7.0	6.4	2.8	28.1	219	-	142	154	0.002	0.002	0.011	1.174	0.019	0.006	0.003
	Location-2	7.0	1.0	3.2	24.6	220	-	124	135	0.002	0.003	0.023	1.428	0.022	0.006	0.003
	Location-3	7.5	1.4	5.2	56.3	203	-	132	149	0.002	0.002	0.011	1.276	0.021	0.006	0.003
	Location-4	7.5	5.6	2.2	10.5	148	-	96	107	0.001	<0.002	0.017	1.424	0.014	0.007	0.002
	Location-5	7.0	5.4	4.0	24.6	168	-	109	121	0.001	0.002	0.018	1.449	0.013	0.008	0.003
	Location-6	7.0	Nil	4.4	56.3	184	-	114	126	0.003	0.003	0.031	1.506	0.014	0.009	0.003
	Location-7	7.5	6.2	4.8	52.8	200	-	129	146	0.002	0.002	0.023	1.588	0.014	0.007	0.003
During-Immersion (26.10.2015)	Location-1	7.5	1.6	4.8	10.5	199	-	129	138	0.002	0.002	0.018	1.289	0.026	0.008	0.011
	Location-2	7.5	1.8	5.2	74.6	202	-	131	149	0.003	0.013	0.04	1.768	0.042	0.021	0.015
	Location-3	6.5	1.6	4.4	24.0	205	-	133	146	0.003	0.003	0.031	1.696	0.037	0.012	0.007
	Location-4	6.5	0.6	4.0	40.5	188	-	122	157	0.002	0.005	0.018	1.958	0.016	0.008	0.002
	Location-5	6.5	1.6	4.8	31.6	186	-	121	139	0.003	0.005	0.038	2.073	0.034	0.027	0.006
	Location-6	6.5	2.2	4.8	59.8	190	-	123	140	0.002	0.007	0.065	1.871	0.050	0.022	0.011
	Location-7	7.0	2.0	4.4	66.8	207	-	135	154	0.002	0.008	0.043	1.795	0.047	0.022	0.008
Post-Immersion (30.10.2015)	Location-1	6.5	2.2	2.6	15.6	194	-	125	138	0.003	0.002	0.018	1.190	0.022	0.006	0.007
	Location-2	7.0	1.8	2.4	35.6	199	-	129	155	0.002	0.007	0.026	1.729	0.025	0.010	0.009
	Location-3	6.5	1.6	2.6	17.8	201	-	130	144	0.002	0.002	0.028	1.471	0.027	0.009	0.005
	Location-4	6.5	1.0	2.2	11.7	185	-	120	141	0.002	<0.002	0.017	1.545	0.017	0.008	0.002
	Location-5	7.0	1.2	2.8	41.7	184	-	120	134	0.003	0.002	0.026	1.496	0.021	0.012	0.004
	Location-6	6.5	0.8	3.0	15.6	188	-	122	134	0.002	0.002	0.035	1.778	0.044	0.009	0.006
	Location-7	6.5	1.0	3.4	49.6	185	-	120	226	0.002	0.004	0.027	1.663	0.037	0.008	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 on Alaka river at Galupada
- \* Location-2 Near immersion pond at Galupada \*
- \* Location-3 Downstream of immersion pond on Alaka river at Galupada
- \* Location-4 Upstream of immersion pond -I on Alaka river at College chhak
- \* Location-5 Near immersion pond-I at College chhak
- \* Location-6 Near immersion pond -II at College chhak
- \* Location-7 Downstream of immersion pond -II on Alaka river at College chhak



**Table-32 Impact of idol immersion during Durga Puja on water quality of canal at Purohitpur, Kendrapada**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (19.10.2015)	Location-1	7.5	6.8	2.0	12.2	210	-	126	174	0.001	0.003	0.011	0.691	0.007	0.009	0.005
	Location-2	7.5	2.4	2.2	14.0	217	-	128	189	0.001	0.002	0.018	0.658	0.007	0.011	0.005
	Location-3	7.5	7.0	5.2	36.8	194	-	115	169	0.001	<0.002	0.035	0.678	0.008	0.008	0.005
During-Immersion (26.10.2015)	Location-1	7.5	6.6	4.8	24.0	196	-	127	163	0.002	0.005	0.017	0.702	0.008	0.016	0.007
	Location-2	7.0	7.0	3.2	28.7	201	-	131	161	0.003	0.005	0.176	1.119	0.032	0.092	0.021
	Location-3	7.5	7.4	3.2	28.1	197	-	128	161	0.001	<0.002	0.107	1.056	0.024	0.014	0.012
Post-Immersion (30.10.2015)	Location-1	7.5	6.6	2.6	37.8	198	-	128	325	0.001	0.003	0.02	0.740	0.008	0.014	0.007
	Location-2	7.5	7.0	2.7	27.4	190	-	123	335	0.001	0.003	0.076	1.013	0.012	0.019	0.011
	Location-3	7.0	6.6	2.4	27.8	185	-	121	291	0.001	<0.002	0.055	0.950	0.009	0.010	0.009
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 on canal at Purohitpur
- \* Location-2 Immersion site at Purohitpur
- \* Location-3 Downstream of immersion site on canal at Purohitpur



Table-33 Impact of idol immersion during Durga Puja on water quality of pond at Rourkela

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.5	7.8	10	60	292	22.3	164	180	0.001	<0.002	0.011	0.437	0.005	0.007	0.003
During-Immersion (25.10.2015)	Location-1	7.2	6.2	120	400	1797	47.3	911	1121	0.003	0.025	0.03	0.545	0.031	0.015	0.011
Post-Immersion (29.10.2015)	Location-1	7.2	6.4	13	80	249.5	16.1	189	219	0.001	0.005	0.031	0.239	0.029	0.005	0.008
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 : Idol immersion Pond at Balughat, Rourkela

**Table-34 Impact of idol immersion during Durga Puja on water quality of Pond at Angul**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.1	4.4	6.0	16	133	4	78	106	0.002	0.002	0.021	0.161	0.008	0.009	0.002
During-Immersion (23.10.2015)	Location-1	7.0	4.0	8.0	16	142	4	82	124	0.002	0.011	0.042	0.599	0.027	0.011	0.004
Post-Immersion (29.10.2015)	Location-1	7.8	4.6	8.0	32	146	6	80	106	0.002	0.002	0.026	0.605	0.038	0.019	0.002
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 Idol immersion site of the pond at Angul

**Table-35 Impact of idol immersion during Durga Puja on water quality of Pond at Talcher**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.7	4.8	4.0	18	170	12	94	150	0.003	0.063	0.082	0.164	0.011	0.009	0.007
During-Immersion (23.10.2015)	Location-1	7.0	3.6	6.0	32	132	18	85	145	0.004	0.663	0.882	2.137	0.062	0.044	0.010
Post-Immersion (29.10.2015)	Location-1	7.7	4.0	6.0	32	180	4	104	196	0.003	0.067	0.085	0.860	0.058	0.034	0.008
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 Idol immersion site of the pond at Lingaraj Time Office, Talcher



**Table-36 Impact of idol immersion during Durga Puja on water quality of Pond (pond-1) at Dhenkanal**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	5.8	1.8	26	48	218	180	120	180	0.003	0.01	0.06	0.882	0.023	0.010	0.007
During-Immersion (23.10.2015)	Location-1	5.8	2.4	36	64	240	200	134	220	0.003	0.04	0.057	2.663	0.047	0.026	0.005
Post-Immersion (29.10.2015)	Location-1	8.3	2.8	32	64	230	200	130	178	0.003	0.005	0.031	2.280	0.026	0.019	0.008
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 Idol immersion site of Katha Sankha Pokhari at Dhenkanal

**Table-37 Impact of idol immersion during Durga Puja on water quality of Pond (pond-2) at Dhenkanal**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.1	7.0	2.0	16	124	73	84	120	0.003	0.003	0.023	0.716	0.021	0.011	0.002
During-Immersion (23.10.2015)	Location-1	6.9	6.8	2.0	16	128	74	86	118	0.003	0.005	0.04	2.827	0.055	0.036	0.005
Post-Immersion (29.10.2015)	Location-1	7.3	6.8	2.0	8	130	62	82	120	0.003	0.007	0.023	1.381	0.047	0.013	0.004
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 Idol immersion site of Kunjakanta Pokhari at Dhenkanal

**Table-38 Impact of idol immersion during Durga Puja on water quality of pond at Keonjhararh Municipality**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (23.10.2015)	Location-1	7.5	0.7	8.0	38.5	1133	14.3	562	647	0.002	<0.002	0.015	0.804	0.017	0.009	0.003
During-Immersion (25.10.2015)	Location-1	8.5	0.7	16.5	76.9	1126	15.4	564	678	0.003	0.002	0.075	1.445	0.019	0.015	0.004
Post-Immersion (28.10.2015)	Location-1	7.2	0.2	10.0	40.0	1191	16.2	588	683	0.002	<0.002	0.053	0.731	0.015	0.010	0.002
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 Idol immersion site of the Pond at Kepojhargarh Municipality



**Table- 39 Impact of idol immersion during Durga Puja on water quality of pond at Sundargarh**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.1	5.8	3	18	84	17.5	54	95	0.001	0.003	0.011	0.443	0.005	0.008	0.003
During-Immersion (25.10.2015)	Location-1	7.4	6.9	30	200	810	55.2	449	599	0.002	0.02	0.026	0.568	0.024	0.010	0.026
Post-Immersion (29.10.2015)	Location-1	7.5	6.4	4	27	110	18.1	73	128	0.001	0.003	0.018	0.336	0.006	0.006	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 Idol immersion site of the pond at Sundargarh

**Table-40 Impact of idol immersion during Durga Puja on water quality of pond at Deogarh**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (15.10.2015)	Location-1	7.5	6.9	10	60	280	18.0	163	188	0.001	<0.002	0.011	0.481	0.006	0.007	0.003
During-Immersion (25.10.2015)	Location-1	7.4	6.0	50	200	1160	20.9	613	822	0.002	0.007	0.04	1.402	0.038	0.057	0.012
Post-Immersion (29.10.2015)	Location-1	7.4	6.8	11	62	326	13.0	184	89	0.002	0.003	0.043	1.049	0.023	0.047	0.008
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 Idol immersion site of the pond at Collectorate, Deogarh



**Table-41 Impact of idol immersion during Durga Puja on water quality of sea at Gopalpur**

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	Cr6+, mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (19.10.2015)	Location-1	7.0	-	1.0	25	36000	2.0	32000	10210	0.0024	<0.002	0.023	0.018	0.007	0.015	0.002
During-Immersion (26.10.2015)	Location-1	7.5	-	2.5	35	38000	3.0	33000	11310	0.0028	0.002	0.026	0.024	0.012	0.031	0.004
Post-Immersion (29.10.2015)	Location-1	6.8	-	1.0	26	33000	1.3	31000	10364	0.0026	<0.002	0.028	0.022	0.009	0.016	0.004

\* Location-1 Between high tide line and low tide line of Gopalpur Sea near idol immersion point

**Table-42 Impact of idol immersion during Gajalaxmi Puja on water quality of Pond at Angul**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (4.11.2015)	Location-1	7.0	5.8	6.0	16	140	2	80	112	0.003	0.003	0.022	0.285	0.005	0.006	0.007
During-Immersion (6.11.2015)	Location-1	6.5	5.6	6.0	16	146	3	82	120	0.003	0.003	0.025	1.653	0.035	0.095	0.032
Post-Immersion (30.10.2015)	Location-1	7.6	5.6	8.0	32	150	3	86	120	0.002	<0.002	0.022	0.593	0.034	0.008	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 Idol immersion site of the pond at Angul

**Table-43 Impact of idol immersion during Gajalaxmi Puja on water quality of Ponds at Dhenkanal**

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 <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (4.11.2015)	Location-1	5.8	2.8	32.0	64	240	19	136	176	0.003	0.015	0.035	1.432	0.007	0.097	0.009
	Location-2	6.7	6.8	2.0	8	128	68	82	116	0.003	<0.002	0.017	0.288	0.006	0.004	0.004
	Location-3	6.5	7.0	2.0	8	96	66	68	100	0.002	0.023	0.017	0.251	0.007	0.006	0.004
During-Immersion (6.11.2015)	Location-1	6.1	2.6	34.0	64	245	22	140	198	0.003	0.010	0.047	2.867	0.014	0.135	0.014
	Location-2	7.0	6.8	2.0	8	128	68	90	126	0.003	0.010	0.044	0.437	0.022	0.015	0.005
	Location-3	6.8	7.0	2.0	8	100	66	68	102	0.003	<0.002	0.049	0.251	0.012	0.006	0.005
Post-Immersion (30.10.2015)	Location-1	6.8	2.6	34.0	64	240	40	138	184	0.002	0.010	0.025	1.844	0.014	0.107	0.009
	Location-2	6.8	6.8	2.0	16	130	70	88	124	0.002	<0.002	0.027	0.232	0.011	0.004	0.004
	Location-3	7.0	7.0	2.0	8	100	68	70	104	0.002	<0.002	0.032	0.404	0.012	0.004	0.008
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 Idol immersion site of Katha Sankha Pokhari at Dhenkanal

\* Location 2 Idol immersion site of Kunjakanta Pokhari at Dhenkanal

\* Location 3 Idol immersion site of Nua Pokhari at Dhenkanal



**Table-44 Impact of idol immersion during Kali Puja on water quality of Kathajodi river at Cuttack**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu\text{S}/\text{cm}$	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Post-Immersion (15.11.2015)	Location-1	7.9	7.4	0.9	1.9	188	1.7	107	113	0.002	<0.002	0.024	0.584	0.015	0.016	0.009
	Location-2	8.1	7.4	0.9	1.9	211	3.6	127	141	0.002	<0.002	0.035	0.146	0.020	0.006	0.004
	Location-3	7.8	Nil	15.0	51.4	745	139	439	535	0.002	0.008	0.034	1.384	0.033	0.159	0.018
	Location-4	8.1	7.5	0.9	1.9	209	2.4	116	130	0.002	<0.002	0.024	0.082	0.016	0.030	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 idol immersion pond on river Kathajodi at Naraj
- \* Location-2 At the immersion site on river Kathajodi near Purighat
- \* Location-3 Temporary idol immersion pond at Purighat/ Devigada
- \* Location-4 Downstream of idol immersion pond on river Kathajodi at Khannagar

**Table-45 Impact of idol immersion during Kali Puja on water quality of pond in Angul**

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (13.11.2015)	Location-1	7.6	5.8	6	16	150	2	84	108	0.002	<0.002	0.012	0.395	0.013	0.006	0.003
During-Immersion (14.11.2015)	Location-1	8.1	5.8	6	16	148	2	86	118	0.002	0.006	0.11	2.979	0.020	0.148	0.005
Post-Immersion (15.11.2015)	Location-1	7.1	5.8	4	16	148	3	86	112	0.002	0.002	0.038	0.353	0.018	0.013	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- Idol immersion site of pond at Angul (Pond – 1)



**Table-46** Impact of idol immersion during Kali Puja on water quality of pond in Dhenkanal

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, $\mu$ S/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr <sup>6+</sup> , mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (13.11.2015)	Location-1	7.4	2.6	32	64	238	220	138	180	0.002	0.005	0.082	2.382	0.016	0.024	0.004
During-Immersion (14.11.2015)	Location-1	5.9	2.2	34	64	250	240	140	188	0.002	0.017	0.157	2.697	0.028	0.064	0.013
Post-Immersion (15.11.2015)	Location-1	7.3	2.4	34	64	248	220	140	190	0.002	0.011	0.155	2.904	0.022	0.017	0.008
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 Idol immersion site of Katha Sankha Pokhari at Dhenkanal



## 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.

----