

Table-1 Annual Average and Range values of Four Criteria Parameters (January-December, 2012)

(A) Mahanadi river basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Ib river												
1.	Sundargarh	12	7.7 (7.2-8.2)	7.9 (7.1-9.0)	1.5 (1.0-2.2)	2241 (790-5400)	0	2 (17)	C	C		
2.	Jharsuguda	12	7.8 (6.9-8.4)	7.7 (6.7-8.8)	1.4 (0.5-2.2)	3609 (790-16000)	0	2 (17)	C	C		
3.	Brajarajnaragar U/s	12	7.6 (7.0-8.3)	7.8 (7.2-9.1)	1.3 (0.6-1.8)	1676 (330-2800)	0	0	C	C		
4.	Brajarajnaragar D/s	12	7.8 (6.9-8.4)	7.7 (6.8-8.9)	1.6 (0.8-2.3)	3191 (490-5400)	0	2 (17)	C	C		
Bheden river												
5.	Jharsuguda	12	7.8 (7.1-8.2)	7.9 (6.4-10.0)	1.7 (1.3-2.3)	1456 (490-3500)	0	0	C	C		
Hirakud reservoir												
6.	Hirakud reservoir	12	7.9 (7.4-8.3)	7.4 (6.2-9.3)	1.3 (1.0-1.8)	1376 (310-2800)	0	0	C	C		
Power Channel												
7.	Power Channel U/s	12	8.0 (7.3-8.4)	7.5 (6.0-8.8)	1.3 (1.0-1.6)	425 (110-1400)	0	0	C	C		
8.	Power Channel D/s	12	8.0 (7.5-8.4)	7.1 (5.6-8.5)	1.7 (1.2-2.0)	888 (170-2800)	0	0	C	C		
Mahanadi river												
9	Sambalpur U/s	12	8.0 (7.7-8.3)	7.8 (7.1-9.7)	1.6 (1.1-2.4)	3608 (700-16000)	0	2 (17)	C	C		

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
10	Sambalpur D/s	12	8.0 (7.4-8.4)	6.9 (4.0-8.9)	2.8 (1.7-4.9)	76042 (3500-160000)	3 (25)	11 (92)	C	Doesn't conform to Class C	BOD, TC	Waste water of Sambalpur town
11.	Sambalpur FD/s at Shankarmath	12	8.0 (7.3-8.4)	7.0 (5.5-8.2)	2.1 (1.0-3.7)	25575 (7900-54000)	3 (25)	12 (100)	C	Doesn't conform to Class C	BOD, TC	Waste water of Sambalpur town
12.	Sambalpur FFD/s at Huma	12	8.0 (6.9-8.4)	7.3 (6.1-8.9)	1.8 (1.3-3.0)	13662 (840-35000)	0	9 (75)	C	Doesn't conform to Class C	TC	Waste water of Sambalpur town
13.	Sonepur U/s	12	7.9 (7.0-8.3)	8.0 (7.1-9.6)	1.5 (0.9-2.3)	1749 (170-3500)	0	0	C	C		
14.	Sonepur D/s	12	8.1 (7.6-8.4)	7.7 (5.5-9.6)	2.0 (1.4-2.6)	2588 (270-5400)	0	1 (8)	C	C		
15.	Tikarapada	12	7.8 (6.9-8.4)	8.3 (7.3-9.6)	1.4 (1.0-1.8)	2393 (460-5400)	0	1 (8)	C	C		
16.	Narasinghpur	12	8.1 (7.6-8.4)	8.0 (6.3-9.4)	1.3 (0.5-1.9)	3567 (1100-9400)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
17.	Mundali	12	8.1 (7.4-8.4)	7.9 (6.6-8.9)	1.4 (0.4-2.4)	3629 (330-9200)	0	4 (33)	C	Doesn't conform to Class C	TC	Human activities
18.	Cuttack U/s	12	8.1 (7.4-8.3)	8.2 (7.0-10.3)	1.5 (1.0-2.0)	3256 (470-11000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
19.	Cuttack D/s	12	8.0 (6.8-8.4)	7.7 (6.8-9.1)	2.5 (1.6-3.9)	55417 (24000-160000)	3 (25)	12 (100)	C	Doesn't conform to Class C	BOD, TC	Waste water of Cuttack city
20.	Cuttack FD/s	12	8.1 (7.6-8.5)	7.7 (6.8-8.8)	2.0 (1.0-2.8)	24517 (9200-54000)	0	12 (100)	C	Doesn't conform to Class C	TC	Waste water of Cuttack city
21.	Paradeep U/s	12	7.9 (7.3-8.4)	7.6 (6.3-8.9)	1.5 (0.8-2.6)	5900 (2100-22000)	0	5 (42)	C	Doesn't conform to Class C	TC	Human activities
22.	Paradeep D/s	12	8.0 (7.6-8.4)	7.3 (5.7-8.5)	2.2 (0.7-3.7)	4875 (1700-11000)	1 (8)	3 (25)	C	Doesn't conform to Class C	BOD, TC	Human activities
Tel River												
23.	Monmunda	12	8.0 (7.2-8.4)	7.8 (6.1-9.1)	1.6 (0.9-2.3)	1858 (170-5400)	0	1 (8)	C	C		
Kathajodi river												
24.	Cuttack U/s	12	8.0 (7.4-8.4)	7.8 (6.5-8.6)	1.7 (1.2-3.6)	15889 (390-160000)	1 (8)	3 (25)	C	Doesn't conform to Class C	BOD, TC	Human activities
25.	Cuttack D/s	12	8.0 (6.9-8.4)	7.2 (6.1-8.3)	3.4 (1.5-4.4)	90333 (28000-160000)	7 (58)	12 (100)	C	Doesn't conform to Class C	BOD,TC	Waste water of Cuttack city

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
26.	Mattagajpur (Cuttack FD/s)	12	7.6 (7.1-8.2)	4.1 (0.8-7.8)	8.2 (4.5-14.0)	69333 (21000-160000)	12 (100)	12 (100)	C	Doesn't conform to Class C	BOD,TC	Waste water of Cuttack city
Serua River												
27.	Sankhatrasa (Cuttack FD/s)	12	8.0 (7.0-8.4)	7.9 (5.9-11.9)	2.5 (1.4-3.6)	41333 (11000-160000)	3 (25)	12 (100)	C	Doesn't conform to Class C	BOD, TC	Waste water of Cuttack city
Kuakhai river												
28	Bhubaneswar FU/s	12	7.9 (7.2-8.4)	7.9 (6.4-10.3)	1.6 (0.8-2.3)	1162 (400-2400)	0	0	C	C		
29.	Bhubaneswar U/s	12	7.9 (7.2-8.4)	6.8 (3.9-7.7)	2.4 (1.4-3.4)	7225 (1700-17000)	1 (8)	6 (50)	C	Doesn't conform to Class C	BOD, TC	Human activities
Daya river												
30.	Bhubaneswar D/s	12	7.8 (7.0-8.4)	6.5 (4.4-7.8)	4.3 (3.0-6.0)	40783 (7000-160000)	11 (92)	12 (100)	C	Doesn't conform to Class C	BOD,TC	Waste water of Bhubaneswar city
31.	Bhubaneswar FD/s	12	7.6 (7.0-8.3)	6.5 (3.9-7.8)	3.1 (1.4-4.1)	32458 (5800-160000)	6 (50)	12 (100)	C	Doesn't conform to Class C	BOD,TC	Waste water of Bhubaneswar city

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Birupa River												
32.	Choudwar D/s	12	8.0 (7.3-8.4)	8.7 (6.1-16.2)	1.6 (0.7-2.1)	4467 (1700-9200)	0	3 (25)	C	Doesn't conform to Class C	TC	Waste water of Choudwar town
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

(B) Brahmani river basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Sankh river												
1.	Sankh U/s	12	7.8 (6.9-8.1)	7.7 (6.5-9.2)	1.5 (0.9-2.1)	2235 (490-5400)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
Koel River												
2.	Koel U/s	12	7.9 (6.9-8.4)	7.4 (5.5-9.6)	1.6 (0.6-2.2)	3837 (700-9200)	0	5 (42)	C	Doesn't conform to Class C	TC	Human activities
Brahmani river												
3.	Panposh U/s	12	7.8 (7.0-8.3)	7.4 (5.0-8.7)	1.7 (1.0-2.2)	6075 (2100-16000)	0	6 (50)	C	Doesn't conform to Class C	TC	Human activities
4.	Panposh D/s	12	7.6 (6.8-8.3)	6.7 (5.2-9.2)	4.0 (2.4-5.6)	42333 (16000-92000)	11 (92)	12 (100)	C	Doesn't conform to Class C	BOD, TC	Waste water of Rourkela town and Steel Plant
5.	Rourkela D/s	12	7.7 (7.2-8.1)	7.1 (5.2-8.6)	3.2 (2.0-4.4)	33025 (3900-92000)	5 (42)	11 (92)	C	Doesn't conform to Class C	BOD, TC	-do-

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
6.	Rourkela FD/s (Attaghat)	12	7.8 (6.9-8.4)	7.6 (6.1-9.6)	2.1 (1.3-2.6)	8033 (2500-35000)	0	8 (67)	C	Doesn't conform to Class C	TC	Waste water of Rourkela town and Steel Plant
7.	Rourkela FD/s (Biritola)	12	7.9 (7.4-8.2)	8.1 (6.9-9.1)	2.3 (1.2-3.0)	7342 (2400-13000)	0	9 (75)	C	Doesn't conform to Class C	TC	-do-
8.	Bonaigarh	12	7.8 (7.0-8.4)	8.2 (7.1-11.5)	1.3 (0.8-2.0)	2841 (130-9200)	0	1 (8)	C	C		
9.	Rengali	12	7.7 (6.8-8.3)	8.1 (7.3-9.9)	1.3 (1.0-2.6)	2506 (78-9200)	0	2 (17)	C	C		
10.	Samal	12	7.8 (7.2-8.4)	7.7 (6.6-8.7)	1.5 (1.1-2.2)	2784 (170-9200)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
11.	Talcher FU/s	12	7.8 (6.8-8.4)	7.7 (6.9-8.6)	1.4 (0.9-2.0)	1240 (460-5400)	0	1 (8)	C	C		
12.	Talcher U/s	12	8.1 (7.2-8.5)	7.7 (7.0-8.7)	1.7 (0.9-2.8)	2924 (790-9200)	0	2 (17)	C	C		
13.	Talcher D/s	12	7.9 (7.3-8.3)	7.8 (6.0-10.0)	2.1 (1.3-2.6)	20183 (7000-54000)	0	12 (100)	C	Doesn't conform to Class C	TC	Waste water of Talcher township
14.	Talcher FDs	12	7.8 (6.4-8.4)	7.6 (6.7-8.8)	1.8 (1.2-2.3)	7700 (1700-22000)	0	5 (42)	C	Doesn't conform to Class C	TC	-do-

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
15.	Dhenkanal U/s	12	7.9 (7.3-8.3)	8.8 (6.7-16.1)	1.3 (0.8-2.0)	7183 (2200-22000)	0	6 (50)	C	Doesn't conform to Class C	TC	Human activities
16.	Dhenkanal D/s	12	7.9 (7.1-8.4)	7.9 (7.0-9.6)	1.6 (0.6-2.4)	26733 (3300-160000)	0	9 (75)	C	Doesn't conform to Class C	TC	Waste water of Dhenkanal township
17.	Bhuban	12	7.8 (7.2-8.2)	8.0 (6.3-10.2)	1.4 (1.0-2.0)	3398 (780-9400)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
18.	Kabatabandha	12	7.9 (7.4-8.4)	7.5 (6.1-9.1)	1.5 (0.8-2.4)	10574 (790-92000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
19.	Dharmasala	12	7.9 (7.1-8.3)	7.3 (2.1-9.8)	1.4 (0.6-2.0)	6033 (1100-28000)	0	12 (100)	B	Doesn't conform to Class B	TC	Human activities
20.	Pottamundai	12	7.8 (6.6-8.4)	8.0 (7.1-10.4)	1.7 (0.8-2.7)	4683 (790-9200)	0	12 (100)	B	Doesn't conform to Class B	TC	Human activities
Nandira river												
21.	Nandira river before confluence with river Brahmani	12	8.2 (7.5-8.4)	7.2 (5.6-9.2)	2.9 (1.6-4.1)	25408 (2200-54000)	5 (42)	8 (67)	C	Doesn't conform to Class C	BOD, TC	Human activities

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class*	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Kisindajhor												
22.	Kisindajhor	12	8.3 (7.7-8.6)	7.8 (6.1-10.5)	2.7 (1.1-6.8)	6608 (1100-24000)	2 (17)	5 (42)	C	Doesn't conform to Class C	BOD, TC	Human activities
Kharasuan River												
23.	Khanditara	12	7.8 (6.9-8.4)	8.0 (6.6-12.8)	1.7 (1.0-2.8)	3133 (1700-9200)	0	1 (8)	C	C		
24.	Binjharpur	12	7.8 (6.5-8.3)	7.8 (7.2-9.1)	1.7 (1.0-2.4)	4625 (1100-24000)	0	4 (33)	C	Doesn't conform to Class C	TC	Human activities
25.	Aul	12	8.0 (7.6-8.3)	7.5 (6.5-8.5)	1.7 (1.1-2.8)	3816 (790-11000)	0	3 (25)	C	Doesn't conform to Class C	TC	Human activities
Class 'B' water quality Criteria (IS-2296-1982)			6.5-8.5	5 and above	3 or less	500 or less			Outdoor bathing			
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

(C) Baitarani river basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Kusei River												
1.	Deogaon	11	8.1 (7.6-8.5)	8.1 (7.0-9.1)	1.4 (0.6-2.5)	3942 (630-9200)	0	4 (36)	C	Doesn't conform to Class C	TC	Human activities
Baitarani River												
2.	Joda	12	7.8 (7.2-8.3)	7.7 (6.5-8.8)	1.6 (0.9-2.2)	3428 (790-9200)	0	4 (33)	C	Doesn't conform to Class C	TC	Human activities
3.	Anandpur	12	7.8 (7.3-8.2)	7.7 (6.3-10.2)	1.4 (0.8-2.0)	5158 (1100-9200)	0	5 (41)	C	Doesn't conform to Class C	TC	Human activities
4.	Jajpur	12	7.7 (7.2-8.3)	7.3 (5.6-9.9)	2.0 (1.3-2.8)	8692 (1700-17000)	0	9 (75)	C	Doesn't conform to Class C	BOD,TC	Human activities
5.	Chandbali	12	7.8 (7.4-8.4)	7.3 (5.8-8.7)	1.4 (0.3-2.3)	7408 (2100-16000)	0	10 (82)	C	Doesn't conform to Class C	TC	Human activities
Dhamra River												
6.	Dhamra	12	7.7 (7.1-8.1)	7.1 (5.8-8.3)	1.5 (0.6-2.7)	2597 (230-9200)	0	2 (17)	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

(D) Rushikulya river Basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Rushikulya river												
1.	Madhopur	12	8.3 (7.9-8.7)	8.0 (5.1-10.6)	1.4 (0.8-2.2)	4319 (330-9200)	0	6 (50)	C	Doesn't conform to Class C	TC	Human activities
2.	Potagarh	12	8.0 (6.9-8.4)	8.2 (6.3-10.8)	2.0 (1.0-2.8)	1116 (68-3500)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

(E) Nagavali river basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Nagavali river												
1.	Penta U/s	12	8.0 (7.4-8.4)	7.3 (6.9-8.1)	1.6 (1.1-2.6)	4348 (790-11000)	0	3 (25)	C	C		
2.	J.K. Pur D/S	12	8.1 (7.5-8.4)	6.8 (6.0-7.3)	2.6 (1.6-3.9)	5142 (1300-11000)	4 (33)	5 (42)	C	Doesn't conform to Class C	BOD,TC	Human activities
3.	Rayagada D/S	12	8.1 (7.5-8.6)	7.2 (5.9-7.7)	1.9 (1.4-3.4)	4586 (230-13000)	1 (8)	4 (33)	C	Doesn't conform to Class C	BOD, TC	Human activities
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

(F) Subarnarekha river basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Subarnarekha river												
1.	Rajghat	12	8.0 (7.4-8.5)	7.7 (7.2 -8.2)	1.3 (0.4-2.1)	15758 (1700-92000)	0	6 (50)	C	Doesn't conform to Class C	TC	Human activities
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

(G) Budhabalanga river basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Budhabalanga river												
1.	Baripada D/s	12	7.9 (7.5-8.4)	7.8 (7.4-9.6)	1.5 (0.8-1.8)	15083 (5800-54000)	0	12 (100)	C	Doesn't conform to Class C	TC	Human activities
2.	Balasore U/s	12	8.0 (7.3-8.4)	7.8 (7.4-8.2)	1.6 (0.7-3.0)	3049 (790-9200)	0	2 (17)	C	C		
3.	Balasore D/s	12	8.1 (7.2-8.5)	7.7 (7.2-9.7)	2.0 (1.3-2.8)	32017 (8400-92000)	0	12 (100)	C	Doesn't conform to Class C	TC	Human activities
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

(H) Kolab river basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Kerandi River												
1.	Sunabeda	12	7.6 (6.7-8.2)	6.9 (6.4-7.2)	1.6 (1.0-2.4)	5395 (940-17000)	0	4 (33)	C	Doesn't conform to Class C	TC	Human activities
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

(I) Vansadhara river basin

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Vansadhara River												
1.	Muniguda	12	8.1 (6.9-8.4)	7.2 (6.8-7.5)	1.7 (1.2-2.1)	2249 (490-4700)	0	0	C	C		
2.	Gunupur	12	8.0 (6.7-8.4)	7.0 (6.4-7.3)	1.8 (0.9-2.9)	3648 (790-9200)	0	2 (17)	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:

TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml.

(Ref : IS 2296-1982 foot note)

Table-3 Water quality with respect to other parameters (2012)

(A) Mahanadi River Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		(mg/l)		(mg/l)				(MPN/100ml)	(μ S/cm)	(mg/l)						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
Ib River																
1.	Sundargarh	79 (12-284)	59 (32-76)	10.4 (6.1-16.1)	0.154 (0.112-0.448)	0.006 (0.001-0.029)	2.64 (1.12-7.84)	982 (330-2200)	144 (121-198)	0.43 (0.22-0.73)	0.035 (0.007-0.095)	91 (70-115)	55 (28-74)	11.9 (5.7-19.4)	6.15 (1.70-18.19)	0.377 (0.241-0.748)
2.	Jharsuguda	70 (9-222)	60 (36-76)	10.7 (5.8-20.1)	0.224 (0.112-0.672)	0.012 (BDL-0.042)	3.10 (0.84-8.40)	1970 (230-9200)	147 (118-196)	0.38 (0.20-0.59)	0.038 (0.011-0.095)	93 (70-115)	57 (36-72)	11.3 (6.6-18.6)	7.96 (2.23-18.32)	0.313 (0.248-0.422)
3.	Brajraj nagar U/s	53 (15-116)	64 (36-82)	9.0 (5.5-16.1)	0.294 (0.112-1.340)	0.013 (BDL-0.107)	3.22 (1.12-8.40)	1052 (230-1700)	154 (122-220)	0.40 (0.19-0.62)	0.032 (0.007-0.064)	97 (72-123)	59 (36-80)	11.8 (6.8-19.6)	6.66 (2.23-17.13)	0.304 (0.248-0.374)
4.	Brajraj nagar D/s	76 (17-276)	65 (32-86)	12.1 (7.8-16.1)	0.294 (0.112-0.896)	0.011 (BDL-0.028)	5.02 (1.68-14.28)	1673 (330-3500)	163 (122-225)	0.47 (0.29-0.80)	0.051 (0.011-0.136)	101 (73-128)	62 (36-82)	14.0 (7.6-23.1)	7.93 (2.26-20.69)	0.310 (0.221-0.383)
Bheden river																
5.	Jharsuguda	69 (6-180)	74 (28-120)	12.7 (5.7-19.6)	0.219 (0.112-0.728)	0.009 (0.001-0.025)	3.55 (1.12-11.76)	662 (220-1400)	252 (119-495)	0.77 (0.20-1.83)	0.033 (0.007-0.132)	147 (70-272)	77 (38-122)	21.8 (6.6-66.3)	15.97 (2.80-43.47)	1.154 (0.283-4.420)
Hirakud Reservoir																
6.	Hirakud reservoir	30 (5-84)	73 (52-88)	11.0 (5.7-17.3)	0.275 (0.112-0.896)	0.017 (0.002-0.058)	2.99 (1.12-6.72)	767 (130-1700)	179 (134-220)	0.33 (0.18-0.46)	0.048 (0.007-0.098)	111 (87-127)	75 (56-92)	11.2 (7.0-13.9)	6.93 (1.29-11.18)	0.358 (0.262-0.441)
Power Channel																
7.	Power Channel U/s	47 (7-170)	71 (52-84)	10.0 (5.8-14.1)	0.191 (0.112-0.616)	0.014 (0.001-0.049)	3.85 (0.56-15.12)	198 (45-790)	171 (136-198)	0.32 (0.20-0.62)	0.056 (0.015-0.148)	108 (87-129)	72 (64-84)	10.8 (97.0-18.9)	7.23 (1.29-11.78)	0.330 (0.210-0.432)

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
8.	Power Channel D/s	40 (2-156)	73 (44-88)	14.2 (8.8-18.9)	0.285 (0.112-0.952)	0.018 (0.002-0.063)	3.05 (0.56-9.52)	324 (80-1300)	174 (122-219)	0.31 (0.21-0.41)	0.052 (0.023-0.102)	106 (75-122)	70 (48-80)	10.4 (7.0-13.4)	8.02 (2.04-19.00)	0.326 (0.212-0.414)	
Mahanadi river																	
9.	Sambalpur U/s	47 (6-172)	72 (44-92)	13.1 (7.6-18.4)	0.200 (0.112-0.672)	0.009 (0.004-0.020)	2.78 (1.12-9.52)	2326 (330-16000)	180 (137-206)	0.36 (0.23-0.46)	0.052 (0.019-0.117)	109 (79-130)	72 (56-88)	12.0 (8.0-15.8)	8.36 (2.26-15.94)	0.390 (0.240-0.705)	
10.	Sambalpur D/s	55 (4-168)	76 (48-100)	22.9 (14.4-32.1)	0.331 (0.112-0.560)	0.019 (0.007-0.042)	4.20 (1.68-8.12)	45775 (1300-160000)	196 (151-250)	0.40 (0.23-0.71)	0.058 (0.026-0.098)	123 (93-149)	79 (60-92)	14.7 (10.6-22.2)	9.97 (3.66-23.06)	0.386 (0.250-0.673)	
11.	Sambalpur FD/s at Shankarmath	41 (10-80)	82 (48-1160)	16.5 (1.3-28.1)	0.196 (0.112-0.336)	0.011 (0.003-0.022)	3.34 (1.12-7.28)	14792 (3300-24000)	209 (261-280)	0.48 (0.24-0.82)	0.053 (0.025-0.079)	125 (90-161)	81 (60-108)	16.3 (10.0-26.6)	10.26 (2.80-28.61)	0.450 (0.235-0.723)	
12.	Sambalpur FFD/s at Huma	45 (8-126)	74 (48-98)	14.9 (9.8-26.1)	0.168 (0.112-0.280)	0.010 (BDL-0.022)	3.34 (1.12-7.28)	7493 (580-17000)	183 (144-208)	0.37 (0.25-0.47)	0.030 (0.011-0.064)	113 (81-132)	76 (62-90)	12.0 (8.0-15.4)	8.01 (1.29-19.70)	0.437 (0.245-0.790)	
13.	Sonepur U/s	48 (9-129)	74 (44-96)	10.7 (7.4-13.8)	0.257 (0.112-0.672)	0.012 (BDL-0.0044)	2.52 (0.56-3.92)	833 (130-2200)	186 (136-237)	0.39 (0.18-0.55)	0.053 (0.015-0.170)	112 (81-136)	74 (56-92)	13.7 (6.6-21.1)	6.86 (2.65-15.35)	0.375 (0.210-0.533)	
14.	Sonepur D/s	41 (8-82)	88 (64-116)	15.5 (8.8-19.7)	0.191 (0.112-0.336)	0.016 (0.003-0.042)	2.71 (0.56-6.44)	1158 (140-2400)	209 (187-252)	0.44 (0.23-0.68)	0.042 (0.004-0.096)	129 (103-160)	87 (78-100)	15.3 (8.7-26.9)	7.59 (2.67-17.52)	0.406 (0.272-0.572)	
15.	Tikarapada	58 (24-172)	75 (56-92)	11.8 (6.8-17.5)	0.172 (0.056-0.560)	0.008 (BDL-0.028)	3.14 (1.12-7.28)	1149 (170-2800)	181 (127-206)	0.36 (0.12-0.55)	0.066 (0.019-0.117)	110 (79-130)	69 (44-80)	11.1 (4.8-17.9)	7.53 (3.86-14.65)	0.350 (0.239-0.441)	
16.	Narasinghpur	50 (7-128)	79 (60-92)	10.2 (4.9-14.5)	0.168 (0.112-0.448)	0.015 (0.003-0.056)	3.36 (1.68-9.24)	1876 (490-4600)	199 (145-285)	0.40 (0.19-0.61)	0.056 (0.011-0.079)	118 (89-153)	78 (60-98)	13.4 (7.5-25.5)	6.56 (2.80-10.00)	0.377 (0.250-0.674)	
17.	Munduli	52 (18-192)	78 (56-94)	9.1 (4.9-16.2)	0.215 (0.112-0.728)	0.016 (0.002-0.071)	3.22 (1.12-7.28)	1965 (130-5400)	181 (153-221)	0.38 (0.28-0.57)	0.044 (0.019-0.083)	110 (90-135)	71 (44-92)	12.4 (8.1-20.5)	6.50 (1.38-10.69)	0.331 (0.109-0.468)	

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
18.	Cuttack U/s	46 (4-132)	78 (62-88)	11.6 (8.1-18.1)	0.191 (0.112-0.560)	0.011 (0.006-0.027)	2.66 (0.56-7.28)	2004 (140-9200)	189 (141-281)	0.42 (0.28-0.86)	0.038 (0.004-0.094)	114 (91-150)	74 (58-84)	13.4 (9.8-28.1)	6.00 (1.98-10.79)	0.505 (0.111-1.270)	
19.	Cuttack D/s	56 (12-158)	79 (54-96)	20.5 (12.1-28.6)	0.485 (0.224-1.300)	0.034 (BDL-0.112)	5.36 (1.12-12.32)	32583 (13000-92000)	188 (142-246)	0.38 (0.28-0.50)	0.052 (0.008-0.098)	116 (84-146)	75 (58-90)	12.9 (10.0-17.3)	7.39 (1.94-16.39)	0.353 (0.111-0.507)	
20.	Cuttack FD/s	49 (15-148)	80 (62-96)	15.7 (7.4-25.6)	0.266 (0.112-0.504)	0.022 (0.004-0.056)	3.71 (0.56-6.16)	14933 (5400-35000)	187 (140-222)	0.39 (0.32-0.48)	0.047 (0.004-0.113)	116 (80-135)	79 (64-92)	13.5 (10.0-16.9)	6.32 (2.18-13.76)	0.342 (0.114-0.465)	
21.	Paradeep U/s	89 (25-290)	82 (56-100)	13.5 (6.6-25.9)	0.297 (0.112-0.952)	0.017 (0.001-0.045)	2.67 (0.56-6.16)	3000 (330-13000)	6078 (155-18660)	13.77 (0.20-31.93)	0.401 (0.007-1.662)	4177 (96-13095)	1290 (60-7200)	2111.6 (6.6-6919.2)	267.3 (4.9-955.4)	0.484 (0.208-0.969)	
22.	Paradeep D/s	159 (28-386)	110 (88-172)	21.0 (12.3-31.1)	0.318 (0.112-0.616)	0.019 (0.005-0.042)	3.45 (1.40-7.28)	2408 (790-7000)	18179 (617-39030)	29.58 (1.63-54.99)	1.102 (0.011-1.934)	13760 (429-30174)	2798 (220-6400)	7245.2 (96.9-16817.5)	838.5 (85.8-2034.7)	0.710 (0.283-1.240)	
Tel river																	
23.	Monmunda	122 (9-376)	82 (64-100)	14.0 (6.9-29.5)	0.218 (0.112-0.392)	0.014 (0.001-0.033)	2.82 (1.12-6.16)	950 (78-2800)	195 (152-252)	0.47 (0.31-1.00)	0.062 (0.004-0.280)	119 (98-140)	77 (64-94)	15.0 (9.8-32.8)	5.87 (1.08-25.05)	0.368 (0.267-0.445)	
Kathajodi river																	
24.	Cuttack U/s	65 (10-274)	80 (60-102)	12.8 (9.8-28.5)	0.244 (0.112-1.018)	0.018 (0.002-0.099)	3.95 (1.12-8.40)	5450 (170-54000)	188 (137-220)	0.37 (0.22-0.47)	0.052 (0.015-0.136)	116 (84-132)	77 (64-92)	12.3 (8.8-14.9)	5.63 (1.51-13.06)	0.346 (0.110-0.490)	
25.	Cuttack D/s	56 (19-206)	81 (56-100)	26.0 (7.4-32.8)	0.626 (0.168-1.680)	0.049 (BDL-0.164)	6.09 (1.68-13.44)	51417 (14000-92000)	218 (140-400)	0.42 (0.23-0.59)	0.063 (0.019-0.106)	132 (85-229)	80 (60-96)	14.1 (9.8-21.8)	7.91 (2.67-18.31)	0.323 (0.109-0.441)	
26.	Mattagajpur (Cuttack FD/s)	58 (22-98)	130 (68-248)	49.4 (31.4-80.3)	1.001 (0.224-3.940)	0.027 (0.003-0.134)	9.35 (1.12-17.92)	51917 (11000-160000)	489 (196-649)	1.51 (0.43-2.19)	0.084 (0.019-0.225)	285 (126-374)	128 (76-172)	64.9 (20.5-90.1)	28.88 (6.53-60.10)	0.349 (0.080-0.550)	

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
Serua River																	
27.	Sankhatrasa (Cuttack FD/s)	49 (12-160)	77 (48-92)	20.3 (14.5-28.9)	0.589 (0.112-1.800)	0.041 (BDL-0.176)	5.51 (2.24-9.52)	21558 (7900-92000)	196 (148-243)	0.43 (0.27-0.70)	0.053 (0.011-0.106)	119 (90-141)	76 (56-96)	14.1 (8.6-22.6)	6.08 (2.04-12.17)	0.334 (0.090-0.507)	
Kuakhai River																	
28.	Bhubaneswar FU/s	83 (6-354)	76 (56-88)	11.4 (7.8-16.9)	0.406 (0.112-1.008)	0.019 (0.001-0.039)	3.03 (0.56-6.72)	578 (130-1300)	186 (157-211)	0.40 (0.24-0.66)	0.051 (0.007-0.106)	111 (92-126)	72 (60-88)	12.9 (9.8-19.3)	4.68 (0.59-11.88)	0.279 (0.105-0.428)	
29.	Bhubaneswar U/s	39 (16-138)	71 (48-92)	16.6 (7.4-29.0)	0.435 (0.112-1.300)	0.029 (0.011-0.042)	6.84 (2.57-13.96)	4073 (700-11000)	195 (179-217)	0.52 (0.25-0.86)	0.041 (0.007-0.091)	116 (100-135)	67 (44-84)	16.6 (9.8-24.2)	6.84 (2.57-13.96)	0.293 (0.108-0.486)	
Daya River																	
30.	Bhubaneswar D/s	77 (8-318)	77 (44-96)	33.2 (22.1-40.8)	0.641 (0.280-1.700)	0.040 (0.004-0.112)	10.75 (3.01-22.68)	20100 (4600-54000)	244 (176-379)	0.72 (0.28-1.37)	0.096 (0.018-0.412)	143 (107-222)	91 (48-264)	24.3 (12.5-46.3)	10.75 (3.01-22.68)	0.283 (0.177-0.441)	
31.	Bhubaneswar FD/s	71 (8-310)	73 (48-92)	26.1 (18.3-38.6)	0.322 (0.112-0.896)	0.012 (BDL-0.033)	9.05 (3.01-15.54)	15683 (4300-54000)	238 (180-373)	0.75 (0.29-1.45)	0.085 (0.022-0.242)	135 (101-212)	70 (48-88)	23.7 (11.5-46.2)	9.05 (3.01-15.54)	0.351 (0.180-0.990)	
Birupa river																	
32.	Choudwar D/s	58 (5-176)	79 (48-96)	11.6 (7.4-17.6)	0.234 (0.112-0.728)	0.015 (0.003-0.036)	6.53 (1.07-14.75)	2174 (700-5400)	195 (145-242)	0.41 (0.21-0.73)	0.076 (0.015-0.216)	113 (93-136)	76 (64-112)	12.4 (7.5-22.3)	6.53 (1.07-14.75)	0.372 (0.199-0.746)	
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5	
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-	

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

Table 3 Contd..

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Ib River												
1.	Sundargarh	1.60 (0.09-12.30)	0.033 (0.010-0.080)	BDL	0.020 (0.010-0.043)	6.044 (0.259-42.240)	0.006 (0.003-0.009)	0.005 (0.004-0.006)	0.007 (0.001-0.012)	0.002 (0.001-0.002)	BDL	0.006 (0.004-0.010)
2.	Jharsuguda	1.31 (0.05-7.59)	0.038 (0.010-0.141)	BDL	0.029 (0.018-0.055)	3.093 (0.182-12.360)	0.006 (0.004-0.009)	0.004 (0.002-0.005)	0.005 (0.001-0.010)	0.002 (0.001-0.002)	BDL	0.007 (0.003-0.010)
3.	Brajraj nagar U/s	12.64 (0.06-7.60)	0.035 (0.005-0.115)	BDL	0.027 (0.010-0.075)	2.809 (0.154-8.900)	0.008 (0.005-0.013)	0.004 (0.002-0.005)	0.005 (0.001-0.011)	0.001 (0.001-0.002)	BDL	0.006 (0.004-0.008)
4.	Brajraj nagar D/s	2.72 (0.17-11.72)	0.061 (0.006-0.375)	BDL	0.032 (0.007-0.080)	3.070 (0.413-12.920)	0.008 (0.004-0.014)	0.003 (0.002-0.005)	0.009 (0.001-0.015)	0.001 (0.001-0.002)	BDL	0.006 (0.004-0.009)
Bheden river												
5.	Jharsuguda	1.65 (0.14-5.13)	0.038 (0.002-0.092)	BDL	0.033 (0.005-0.050)	4.400 (0.340-11.650)	0.006 (0.002-0.009)	0.005 (0.004-0.006)	0.004 (0.002-0.0010)	0.002 (0.001-0.002)	BDL	0.005 (0.003-0.007)
Hirakud Reservoir												
6.	Hirakud reservoir	3.25 (0.17-8.78)	0.038 (0.006-0.124)	BDL	0.036 (0.024-0.060)	2.102 (0.139-8.390)	0.011 (0.007-0.013)	0.002 (0.001-0.004)	0.005 (0.002-0.008)	0.001 (0.001-0.002)	BDL	0.005 (0.003-0.007)
Power channel												
7.	Power channel U/s	3.82 (0.23-24.06)	0.048 (0.014-0.134)	BDL	0.025 (0.003-0.053)	1.620 (0.173-5.875)	0.007 (0.003-0.013)	0.003 (0.001-0.005)	0.005 (0.001-0.008)	0.001 (0.001-0.002)	BDL	0.005 (0.003-0.012)
8.	Power Channel D/s	1.95 (0.16-7.26)	0.052 (0.001-0.190)	BDL	0.030 (0.005-0.076)	1.575 (0.144-6.420)	0.006 (0.002-0.011)	0.003 (0.001-0.005)	0.004 (0.001-0.008)	0.001 (0.001-0.008)	BDL	0.005 (0.004-0.006)
Mahanadi river												
9.	Sambalpur U/s	2.34 (0.28-7.92)	0.032 (0.001-0.063)	BDL	0.028 (0.013-0.047)	1.981 (0.187-8.755)	0.008 (0.002-0.013)	0.004 (0.003-0.005)	0.003 (0.001-0.008)	0.001 (0.001-0.002)	BDL	0.005 (0.003-0.008)

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
10.	Sambalpur D/s	4.10 (0.33-17.15)	0.063 (0.007-0.166)	BDL	0.033 (0.008-0.069)	1.630 (0.139-7.600)	0.009 (0.005-0.014)	0.006 (0.003-0.011)	0.011 (0.002-0.032)	0.002 (0.001-0.003)	BDL	0.006 (0.005-0.010)
11.	Sambalpur FD/s at Shankarmath	3.65 (0.10-17.22)	0.054 (0.002-0.280)	BDL	0.028 (0.007-0.048)	1.655 (0.168-7.000)	0.008 (0.004-0.013)	0.005 (0.003-0.009)	0.005 (0.001-0.010)	0.001 (0.001-0.002)	BDL	0.004 (0.003-0.007)
12.	Sambalpur FD/s at Huma	2.97 (0.16-12.80)	0.042 (0.017-0.092)	BDL	0.028 (0.015-0.047)	1.630 (0.096-7.130)	0.005 (0.004-0.007)	0.005 (0.002-0.011)	0.005 (0.002-0.010)	0.002 (0.001-0.003)	BDL	0.005 (0.004-0.007)
13.	Sonepur U/s	2.46 (0.49-9.28)	0.024 (0.001-0.046)	BDL	0.031 (0.003-0.099)	1.578 (0.158-8.800)	0.006 (0.005-0.008)	0.005 (0.001-0.009)	0.005 (0.001-0.008)	0.002 (0.001-0.003)	BDL	0.006 (0.003-0.009)
14.	Sonepur D/s	1.95 (0.29-5.35)	0.041 (0.005-0.134)	BDL	0.037 (0.002-0.130)	1.340 (0.206-5.310)	0.007 (0.005-0.009)	0.004 (0.001-0.007)	0.005 (0.002-0.013)	0.002 (0.001-0.003)	BDL	0.005 (0.002-0.006)
15.	Tikarapada	1.80 (0.14-6.49)	0.029 (0.007-0.059)	BDL	0.028 (0.012-0.056)	3.058 (0.154-13.421)	0.006 (0.003-0.008)	0.003 (0.001-0.006)	0.003 (0.001-0.009)	0.002 (0.001-0.003)	BDL	0.004 (0.002-0.007)
16.	Narasinghpur	1.77 (0.42-6.58)	0.048 (0.007-0.110)	BDL	0.030 (0.007-0.087)	1.991 (0.197-11.880)	0.006 (0.003-0.009)	0.003 (BDL - 0.005)	0.005 (0.003-0.010)	0.001 (0.001-0.002)	BDL	0.004 (0.001-0.007)
17.	Munduli	1.49 (0.44-3.64)	0.064 (0.005-0.261)	BDL	0.022 (0.012-0.050)	2.720 (0.369-13.700)	0.004 (0.003-0.007)	0.004 (0.002-0.006)	0.005 (0.002-0.008)	0.001 (0.001-0.003)	BDL	0.004 (0.001-0.008)
18.	Cuttack U/s	1.37 (0.20-4.87)	0.146 (0.005-1.354)	BDL	0.029 (0.012-0.095)	2.853 (0.269-12.210)	0.005 (0.002-0.010)	0.004 (0.001-0.006)	0.008 (0.006-0.010)	0.001 (0.001-0.002)	BDL	0.006 (0.004-0.008)
19.	Cuttack D/s	1.67 (0.06-4.15)	0.226 (0.006-2.171)	BDL	0.040 (0.016-0.112)	2.575 (0.269-12.610)	0.003 (0.002-0.004)	0.004 (0.001-0.007)	0.009 (0.003-0.019)	0.001 (0.001-0.003)	BDL	0.008 (0.006-0.009)
20.	Cuttack FD/s	1.45 (0.25-4.49)	0.194 (0.006-1.818)	BDL	0.037 (0.015-0.135)	2.887 (0.154-12.090)	0.004 (0.002-0.006)	0.004 (0.002-0.006)	0.009 (0.004-0.013)	0.002 (0.001-0.003)	BDL	0.007 (0.006-0.008)

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
21.	Paradeep U/s	3.41 (1.30-7.61)	0.098 (0.021-0.479)	BDL	0.037 (0.007-0.085)	2.971 (0.142-16.400)	0.006 (0.005-0.007)	0.004 (0.002-0.008)	0.006 (0.001-0.009)	0.001 (0.001-0.002)	BDL	0.007 (0.006-0.010)
22.	Paradeep D/s	3.75 (0.23-9.15)	0.198 (0.080-0.445)	BDL	0.040 (0.017-0.060)	2.903 (0.130-18.500)	0.006 (0.005-0.007)	0.004 (0.003-0.008)	0.007 (0.002-0.012)	0.002 (0.001-0.003)	BDL	0.007 (0.004-0.012)
Tel River												
23.	Monmunda	2.17 (0.03-10.18)	0.071 (0.001-0.475)	BDL	0.025 (0.005-0.050)	4.063 (0.269-14.700)	0.006 (0.003-0.009)	0.003 (0.001-0.006)	0.005 (0.001-0.010)	0.001 (0.001-0.002)	BDL	0.005 (0.004-0.007)
Kathajodi River												
24.	Cuttack U/s	1.14 (0.01-4.79)	0.047 (0.004-0.146)	BDL	0.030 (0.015-0.085)	2.397 (0.129-8.700)	0.004 (0.002-0.007)	0.004 (0.001-0.006)	0.007 (0.003-0.013)	0.002 (0.001-0.003)	BDL	0.006 (0.003-0.009)
25.	Cuttack D/s	2.46 (0.19-11.12)	0.245 (0.009-2.378)	BDL	0.034 (0.010-0.075)	2.749 (0.475-11.770)	0.005 (BDL - 0.0112)	0.005 (0.002-0.008)	0.013 (0.004-0.020)	0.002 (0.001-0.003)	BDL	0.007 (0.004-0.011)
26.	Mattagajpur (Cuttack FD/s)	24.49 (3.89-54.74)	1.375 (0.102-2.846)	BDL	0.042 (0.010-0.061)	3.052 (0.298-12.770)	0.004 (0.002-0.006)	0.005 (0.001-0.008)	0.010 (0.003-0.022)	0.002 (0.001-0.003)	BDL	0.009 (0.007-0.012)
Serua River												
27.	Sankhatrasa (Cuttack FD/s)	1.84 (0.18-4.96)	0.257 (0.009-2.617)	BDL	0.030 (0.012-0.072)	2.454 (0.494-12.780)	0.003 (0.002-0.006)	0.005 (0.003-0.006)	0.007 (0.002-0.011)	0.002 (0.001-0.003)	BDL	0.006 (0.003-0.010)
Kuakhai River												
28.	Bhubaneswar FU/s	1.91 (0.04-8.52)	0.027 (0.005-0.076)	BDL	0.020 (0.004-0.048)	3.768 (0.149-21.980)	0.005 (0.002-0.009)	0.002 (0.001-0.003)	0.008 (0.004-0.012)	0.002 (0.001-0.003)	BDL	0.005 (0.005-0.006)
29.	Bhubaneswar U/s	3.82 (1.02-10.35)	0.082 (0.007-0.595)	BDL	0.023 (0.005-0.043)	2.231 (0.310-8.830)	0.004 (0.002-0.006)	0.005 (0.003-0.006)	0.011 (0.005-0.016)	0.002 (0.001-0.003)	BDL	0.007 (0.005-0.012)

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Daya River												
30.	Bhubaneswar D/s	9.47 (0.83-34.75)	0.231 (0.050-0.640)	BDL	0.035 (0.010-0.067)	6.044 (0.259-42.240)	0.005 (0.002-0.009)	0.005 (0.002-0.007)	0.011 (0.004-0.015)	0.002 (0.001-0.003)	BDL	0.007 (0.005-0.012)
31.	Bhubaneswar FD/s	9.49 (0.46-40.36)	0.199 (0.125-1.075)	BDL	0.024 (0.013-0.040)	4.177 (0.398-19.0)	0.005 (0.002-0.007)	0.005 (0.002-0.008)	0.013 (0.005-0.030)	0.001 (0.001-0.003)	BDL	0.005 (0.002-0.009)
Birupa River												
32.	Choudwar D/s	2.61 (0.30-10.50)	0.052 (0.016-0.116)	BDL	0.041 (0.012-0.110)	2.614 (0.302-10.500)	0.006 (0.004-0.008)	0.005 (0.001-0.009)	0.006 (0.003-0.009)	0.002 (0.001-0.003)	BDL	0.005 (0.002-0.008)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
Class 'E'		-	-	-	-	-	-	-	-	-	-	-

BDL = Below Detection Limit

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

* Data for the period Jan-May, 2012

(B) Brahmani River Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
Sankh river																	
1.	Sankha U/s	63 (6-286)	60 (32-80)	11.5 (7.8-22.2)	0.331 (0.112-1.008)	0.011 (BDL-0.045)	3.45 (1.12-13.44)	939 (210-3500)	147 (101-226)	0.34 (0.24-0.47)	0.026 (0.003-0.076)	91 (63-123)	55 (28-82)	10.2 (7.4-12.6)	5.81 (0.99-13.86)	0.294 (0.120-0.528)	
Koel river																	
2.	Koel U/s	73 (16-310)	79 (36-120)	13.6 (5.2-25.3)	0.243 (0.056-0.560)	0.011 (BDL-0.028)	3.81 (1.12-8.12)	1448 (230-3500)	182 (126-239)	0.39 (0.25-0.78)	0.038 (0.004-0.098)	111 (75-155)	71 (36-104)	11.8 (7.7-18.3)	7.17 (1.88-18.11)	0.313 (0.229-0.400)	
Brahmani river																	
3.	Panposh U/s	67 (15-174)	63 (32-80)	11.6 (6.1-19.7)	0.308 (0.112-0.840)	0.016 (BDL-0.055)	3.73 (0.56-10.64)	3192 (1300-9200)	149 (107-206)	0.35 (0.22-0.43)	0.040 (0.011-0.098)	93 (64-119)	56 (32-82)	10.8 (8.2-16.0)	6.51 (0.89-17.92)	0.293 (0.218-0.376)	
4.	Panposh D/s	101 (27-372)	71 (44-108)	33.0 (12.1-49.7)	0.500 (0.112-1.300)	0.016 (BDL-0.049)	3.90 (1.12-8.96)	23983 (7900-54000)	278 (170-363)	0.63 (0.24-1.48)	0.067 (0.030-0.180)	168 (111-222)	90 (72-120)	25.9 (13.5-60)	26.82 (4.85-37.52)	1.137 (0.305-1.970)	
5.	Rourkela D/s	92 (26-414)	71 (44-128)	27.0 (10.1-43.1)	0.631 (0.056-2.580)	0.016 (0.003-0.055)	4.81 (1.40-12.88)	16800 (2200-54000)	236 (171-338)	0.59 (0.21-1.31)	0.045 (0.011-0.085)	149 (110-213)	83 (66-118)	21.3 (10.6-55.0)	21.01 (3.27-37.62)	0.746 (0.310-1.690)	
6.	Biritola	89 (18-380)	69 (36-84)	19.7 (6.1-33.1)	0.397 (0.112-1.800)	0.014 (0.002-0.054)	3.73 (1.68-6.72)	3958 (790-7900)	192 (113-335)	0.45 (0.19-1.03)	0.041 (0.007-0.087)	120 (72-188)	71 (48-92)	15.6 (6.6-48.0)	12.22 (6.03-16.33)	0.515 (0.235-0.949)	
7.	Attaghat	84 (14-348)	80 (46-136)	18.2 (8.1-29.8)	0.261 (0.110-0.840)	0.008 (BDL-0.022)	4.34 (1.12-8.40)	3817 (1300-13000)	226 (144-368)	0.67 (0.25-1.48)	0.054 (0.032-0.091)	140 (94-237)	77 (44-112)	22.0 (7.4-58.2)	12.86 (6.00-25.54)	0.530 (0.230-1.000)	
8.	Bonaigarh	61 (8-144)	70 (44-84)	10.5 (5.2-17.7)	0.317 (0.112-0.840)	0.012 (BDL-0.031)	3.17 (0.56-6.72)	1399 (45-5400)	181 (131-226)	0.44 (0.20-0.62)	0.054 (0.011-0.113)	112 (80-147)	69 (50-92)	14.1 (6.6-21.1)	9.36 (2.57-17.11)	0.483 (0.236-0.911)	

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
9.	Rengali	43 (8-74)	56 (36-76)	9.0 (4.9-15.8)	0.383 (0.112-1.400)	0.013 (BDL-0.049)	2.85 (1.12-6.72)	963 (20-2400)	136 (99-180)	0.29 (0.16-0.44)	0.046 (0.003-0.068)	84 (56-102)	54 (28-72)	9.0 (5.2-12.4)	6.69 (1.00-19.80)	0.277 (0.196-0.373)	
10.	Samal	69 (6-278)	52 (38-72)	10.2 (6.1-15.8)	0.331 (0.112-1.120)	0.014 (0.002-0.045)	3.27 (1.12-6.72)	1310 (45-5400)	140 (112-196)	0.35 (0.21-0.67)	0.035 (0.004-0.087)	86 (70-113)	52 (44-62)	10.7 (5.9-17.4)	6.87 (2.00-19.50)	0.294 (0.212-0.386)	
11.	Talcher FU/s	72 (16-238)	54 (44-64)	10.5 (6.6-14.8)	0.348 (0.112-1.460)	0.021 (BDL-0.117)	4.67 (1.12-25.76)	588 (170-2400)	140 (112-198)	0.29 (0.20-0.37)	0.030 (0.003-0.068)	84 (70-110)	55 (46-72)	8.9 (5.6-10.6)	5.96 (0.99-15.54)	0.292 (0.177-0.421)	
12.	Talcher U/s	67 (10-182)	59 (44-78)	12.3 (6.9-16.4)	0.417 (0.112-1.300)	0.034 (0.002-0.126)	2.82 (1.12-5.32)	1342 (330-3500)	153 (123-204)	0.33 (0.21-0.45)	0.033 (0.004-0.072)	91 (78-117)	58 (48-70)	10.0 (7.0-12.6)	6.99 (0.79-23.56)	0.306 (0.205-0.450)	
13.	Talcher D/s	63 (12-136)	63 (52-88)	16.9 (5.9-22.4)	0.342 (0.112-1.300)	0.020 (0.003-0.104)	5.02 (1.40-22.96)	10575 (3300-24000)	169 (110-231)	0.38 (0.22-0.60)	0.042 (0.008-0.086)	104 (71-136)	66 (50-88)	12.3 (7.6-20.0)	9.79 (1.68-30.69)	0.378 (0.288-0.510)	
14.	Talcher FD/s	63 (12-150)	61 (50-72)	13.4 (6.6-18.9)	0.375 (0.112-1.200)	0.019 (BDL-0.07)	3.90 (1.40-8.96)	4250 (700-11000)	171 (116-208)	0.42 (0.20-0.57)	0.052 (0.008-0.174)	101 (79-131)	61 (48-70)	12.5 (6.6-16.7)	8.76 (4.00-20.42)	0.421 (0.220-0.862)	
15.	Dhenkanal U/s	63 (14-109)	56 (48-64)	9.1 (4.0-11.5)	0.266 (0.056-0.896)	0.010 (0.003-0.027)	6.93 (1.40-55.44)	3733 (700-14000)	149 (114-209)	0.33 (0.19-0.76)	0.029 (0.011-0.076)	90 (73-125)	56 (48-72)	9.7 (5.2-20.2)	6.75 (2.00-15.45)	0.282 (0.120-0.394)	
16.	Dhenkanal D/s	58 (9-130)	60 (50-70)	13.0 (4.0-20.6)	0.405 (0.056-0.672)	0.023 (BDL-0.084)	4.32 (1.20-8.96)	14517 (1700-92000)	156 (111-196)	0.35 (0.20-0.69)	0.034 (0.004-0.068)	94 (69-110)	58 (40-76)	11.2 (5.8-16.5)	7.77 (3.00-14.06)	0.311 (0.113-0.480)	
17.	Bhuban	120 (38-250)	55 (36-72)	11.0 (5.9-23.0)	0.229 (0.112-0.672)	0.009 (0.002-0.022)	2.54 (1.12-4.48)	1831 (330-7000)	147 (114-193)	0.33 (0.16-0.49)	0.050 (0.004-0.136)	90 (73-116)	54 (42-72)	10.1 (5.6-16.8)	9.51 (2.00-26.63)	0.261 (0.072-0.383)	
18.	Kabatabandha	108 (16-414)	53 (40-72)	10.7 (6.9-19.7)	0.365 (0.112-0.896)	0.025 (0.003-0.112)	2.83 (1.40-3.92)	6017 (230-54000)	152 (114-195)	0.36 (0.18-0.60)	0.042 (0.011-0.126)	92 (70-140)	53 (40-68)	10.3 (6.0-16.8)	10.01 (1.00-24.25)	0.290 (0.127-0.388)	

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
19.	Dharmasala	70 (13-234)	62 (44-84)	9.1 (4.9-15.2)	0.271 (0.112-0.620)	0.015 (0.001-0.050)	3.50 (1.40-8.40)	3271 (460-17000)	148 (115-194)	0.36 (0.21-0.50)	0.044 (0.004-0.095)	93 (76-113)	58 (40-78)	11.2 (6.7-16.9)	6.31 (1.88-14.95)	0.289 (0.121-0.414)	
20.	Pottamundai	78 (27-164)	77 (44-148)	12.3 (7.8-18.1)	0.0322 (0.112-1.008)	0.021 (BDL-0.098)	3.48 (1.40-7.84)	2233 (490-5400)	196 (132-292)	0.43 (0.22-0.59)	0.060 (0.006-0.106)	123 (88-183)	81 (52-130)	15.4 (7.6-22.2)	10.18 (1.88-18.81)	0.337 (0.131-0.543)	
Nandira River																	
21.	Nandira river before confluence with river Brahmani	58 (19-148)	124 (90-168)	26.3 (15.8-39.6)	0.587 (0.112-2.000)	0.039 (0.006-0.105)	4.63 (1.68-8.96)	15042 (1400-35000)	436 (354-558)	0.74 (0.36-1.28)	0.101 (0.019-0.291)	260 (195-324)	160 (100-196)	37.1 (18.3-69.8)	47.38 (21.00-70.50)	1.716 (0.663-3.500)	
Kisinda Jhor																	
22.	Kisindajhor	93 (18-210)	119 (70-168)	25.5 (13.8-55.8)	0.434 (0.112-1.120)	0.051 (0.007-0.174)	4.18 (0.84-8.96)	3064 (780-1300)	450 (216-672)	0.91 (0.37-1.48)	0.085 (0.004-0.443)	274 (129-426)	159 (80-236)	42.3 (16.3-80.9)	47.67 (8.34-84.55)	3.143 (0.720-8.810)	
Kharasrota River																	
23.	Khanditara	75 (13-200)	58 (36-88)	10.1 (4.9-16.1)	0.289 (0.112-1.008)	0.019 (BDL-0.126)	2.94 (1.12-5.32)	1668 (790-5400)	140 (110-203)	0.33 (0.22-0.43)	0.041 (0.004-0.136)	89 (75-122)	55 (36-76)	10.4 (6.6-14.8)	7.94 (2.27-17.52)	0.381 (0.189-0.872)	
24.	Binjharpur	63 (19-206)	61 (44-88)	10.4 (5.3-14.1)	0.163 (0.112-0.560)	0.008 (BDL-0.036)	2.64 (1.12-5.60)	2527 (490-11000)	147 (110-208)	0.34 (0.20-0.52)	0.042 (0.007-0.087)	92 (71-126)	60 (44-82)	11.3 (7.6-16.2)	6.29 (1.19-14.15)	0.269 (0.133-0.498)	
25.	Aul	87 (24-220)	60 (40-82)	13.2 (7.4-20.9)	0.281 (0.112-1.230)	0.016 (0.003-0.80)	3.36 (1.12-8.40)	2218 (220-7000)	157 (122-218)	0.38 (0.20-0.61)	0.045 (0.007-0.082)	97 (80-124)	62 (46-80)	12.4 (6.6-18.7)	8.96 (1.48-16.03)	0.296 (0.180-0.421)	
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5	
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-	

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

Table Contd..

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Sankha River												
1.	Sankha U/s	1.55 (0.15-7.65)	0.048 (0.002-0.153)	BDL	0.027 (0.010-0.057)	3.231 (0.220-15.860)	0.005 (0.003-0.009)	0.003 (0.002-0.004)	0.004 (0.003-0.005)	0.001 (BDL-0.002)	BDL	0.003 (0.001-0.008)
Koel River												
2.	Koel U/s	2.28 (0.19-9.39)	0.057 (0.009-0.168)	BDL	0.031 (0.012-0.095)	3.451 (0.206-13.920)	0.005 (0.004-0.008)	0.004 (0.002-0.006)	0.006 (0.005-0.007)	0.002 (BDL-0.003)	BDL	0.005 (0.003-0.007)
Brahmani river												
3.	Panposh U/s	1.97 (0.38-10.15)	0.032 (0.006-0.100)	BDL	0.038 (0.012-0.126)	2.997 (0.211-13.670)	0.004 (0.003-0.007)	0.004 (0.003-0.005)	0.006 (0.003-0.009)	0.002 (0.001-0.003)	BDL	0.005 (0.001-0.008)
4.	Panposh D/s	22.83 (0.79-41.62)	0.078 (0.019-0.260)	BDL	0.041 (0.017-0.078)	4.241 (0.562-14.240)	0.006 (0.003-0.011)	0.007 (0.005-0.013)	0.011 (0.005-0.019)	0.002 (0.001-0.002)	BDL	0.009 (0.008-0.010)
5.	Rourkela D/s	13.18 (1.95-28.06)	0.123 (0.016-0.720)	BDL	0.040 (0.013-0.113)	4.258 (0.341-13.670)	0.005 (0.003-0.007)	0.004 (0.003-0.007)	0.008 (0.002-0.013)	0.002 (0.001-0.003)	BDL	0.007 (0.006-0.009)
6.	Biritola	6.61 (1.64-13.58)	0.091 (0.005-0.413)	BDL	0.033 (0.005-0.089)	2.611 (0.240-13.050)	0.008 (0.003-0.028)	0.004 (0.002-0.007)	0.010 (0.006-0.013)	0.001 (0.001-0.002)	BDL	0.006 (0.005-0.007)
7.	Attaghat	4.83 (0.2-14.33)	0.084 (0.023-0.490)	BDL	0.034 (0.005-0.076)	3.062 (0.150-14.410)	0.005 (0.004-0.007)	0.004 (0.003-0.007)	0.004 (0.002-0.008)	0.002 (0.001-0.003)	BDL	0.005 (0.004-0.007)
8.	Bonaigarh	4.86 (0.89-9.18)	0.045 (0.003-0.237)	BDL	0.031 (0.013-0.070)	3.229 (0.197-13.900)	0.003 (0.001-0.007)	0.005 (0.003-0.007)	0.006 (0.004-0.008)	0.002 (0.001-0.002)	BDL	0.005 (0.004-0.006)
9.	Rengali	1.96 (0.25-8.49)	0.069 (0.002-0.447)	BDL	0.034 (0.013-0.070)	2.001 (0.120-7.800)	0.003 (0.002-0.004)	0.003 (0.001-0.006)	0.007 (0.005-0.008)	0.001 (0.001-0.002)	BDL	0.005 (0.004-0.005)
10.	Samal	2.02 (0.17-4.38)	0.037 (0.004-0.092)	BDL	0.028 (0.010-0.088)	2.515 (0.090-11.000)	0.002 (0.001-0.003)	0.003 (0.001-0.006)	0.005 (0.003-0.007)	0.001 (0.001-0.002)	BDL	0.004 (0.003-0.007)

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ^{3--P}	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
11.	Talcher FU/s	1.89 (0.46-7.13)	0.095 (0.008-0.774)	BDL	0.032 (0.012-0.076)	3.028 (0.182-10.906)	0.004 (0.002-0.006)	0.004 (0.002-0.006)	0.005 (0.002-0.009)	0.001 (0.001-0.002)	BDL	0.004 (0.001-0.008)
12.	Talcher U/s	1.39 (0.04-3.81)	0.044 (0.004-0.178)	BDL	0.031 (0.018-0.051)	2.953 (0.192-9.495)	0.003 (0.002-0.005)	0.004 (0.002-0.007)	0.006 (0.001-0.010)	0.001 (0.001-0.002)	BDL	0.004 (0.003-0.006)
13.	Talcher D/s	1.78 (0.06-5.09)	0.047 (0.011-0.126)	BDL	0.041 (0.023-0.065)	3.124 (0.422-9.040)	0.004 (0.002-0.007)	0.005 (0.002-0.008)	0.009 (0.002-0.012)	0.002 (0.001-0.003)	BDL	0.020 (0.006-0.048)
14.	Talcher FD/s	4.39 (0.03-42.77)	0.043 (0.005-0.163)	BDL	0.033 (0.018-0.056)	1.976 (0.187-7.104)	0.003 (0.001-0.005)	0.005 (0.003-0.007)	0.007 (0.002-0.011)	0.001 (0.001-0.002)	BDL	0.007 (0.004-0.015)
15.	Dhenkanal U/s	2.68 (0.01-10.17)	0.044 (0.011-0.176)	BDL	0.052 (0.010-0.077)	2.302 (0.230-6.900)	0.005 (0.002-0.008)	0.004 (0.002-0.005)	0.005 (0.001-0.008)	0.001 (0.001-0.002)	BDL	0.005 (0.003-0.009)
16.	Dhenkanal D/s	1.83 (0.27-6.46)	0.058 (0.017-0.116)	BDL	0.029 (0.008-0.052)	2.695 (0.494-7.600)	0.008 (0.003-0.016)	0.004 (0.003-0.006)	0.008 (0.003-0.012)	0.003 (0.001-0.008)	BDL	0.007 (0.004-0.009)
17.	Bhuban	3.60 (0.29-15.30)	0.066 (0.006-0.389)	BDL	0.036 (0.010-0.089)	4.540 (0.576-13.880)	0.004 (0.003-0.008)	0.004 (0.002-0.005)	0.005 (0.002-0.008)	0.001 (0.001-0.003)	BDL	0.004 (0.001-0.007)
18.	Kabatabandha	3.96 (0.05-18.55)	0.061 (0.005-0.285)	BDL	0.035 (0.015-0.070)	5.908 (0.274-27.700)	0.006 (0.003-0.007)	0.004 (0.003-0.005)	0.007 (0.002-0.011)	0.001 (0.001-0.002)	BDL	0.005 (0.002-0.009)
19.	Dharmasala	2.57 (0.26-10.37)	0.037 (0.006-0.074)	BDL	0.026 (0.007-0.044)	3.353 (0.254-16.000)	0.005 (0.004-0.006)	0.004 (0.003-0.004)	0.008 (0.003-0.013)	0.002 (0.001-0.002)	BDL	0.003 (0.002-0.004)
20.	Pottamundai	2.39 (0.15-10.08)	0.050 (0.007-0.298)	BDL	0.027 (0.005-0.073)	2.808 (0.640-7.500)	0.006 (0.003-0.010)	0.004 (0.003-0.006)	0.009 (0.005-0.012)	0.002 (0.001-0.003)	BDL	0.005 (0.003-0.007)
Nandira River												
21.	Nandira river before confluence with river Brahmani	2.85 (0.19-7.94)	0.078 (0.014-0.259)	BDL	0.041 (0.017-0.070)	1.944 (0.508-8.210)	0.007 (0.004-0.008)	0.006 (0.004-0.008)	0.013 (0.003-0.017)	0.002 (0.001-0.003)	BDL	0.021 (0.014-0.026)

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ^{3--P}	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Kisinda Jhor												
22.	Kisindajhor	4.80 (0.16-12.66)	0.111 (0.023-0.319)	BDL	0.037 (0.010-0.076)	2.829 (0.125-7.730)	0.004 (0.001-0.007)	0.005 (0.004-0.007)	0.012 (0.002-0.022)	0.002 (0.001-0.003)	BDL	0.013 (0.008-0.019)
Kharasrota River												
23.	Khanditara	1.84 (0.13-7.18)	0.038 (0.003-0.166)	BDL	0.025 (0.010-0.050)	4.641 (0.163-18.800)	0.004 (0.001-0.006)	0.004 (0.002-0.005)	0.006 (0.003-0.007)	0.001 (0.001-0.002)	BDL	0.004 (0.003-0.006)
24.	Binjharpur	4.11 (0.14-13.95)	0.056 (0.008-0.270)	BDL	0.022 (0.010-0.038)	3.465 (0.058-10.723)	0.005 (0.003-0.007)	0.004 (0.003-0.004)	0.007 (0.002-0.015)	0.001 (0.001-0.002)	BDL	0.007 (0.004-0.009)
25.	Aul	3.94 (0.22-12.88)	0.047 (0.003-0.154)	BDL	0.024 (0.010-0.038)	4.223 (0.466-12.580)	0.006 (0.003-0.009)	0.005 (0.002-0.007)	0.006 (0.004-0.008)	0.002 (0.001-0.003)	BDL	0.005 (0.003-0.008)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
Class 'E'		-	-	-	-	-	-	-	-	-	-	-

BDL = Below Detection Limit

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

* Data for the period Jan-May, 2012

(C) Baitarani river Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
Kusei river																
1.	Deogan	55 (11-144)	104 (80-130)	9.6 (5.9-13.6)	0.249 (0.112-0.896)	0.016 (BDL-0.056)	3.61 (1.12-5.88)	1695 (210-5400)	240 (180-291)	0.44 (0.24-0.65)	0.040 (0.004-0.076)	143 (114-174)	95 (80-120)	16.0 (11.5-24.4)	6.77 (2.17-14.85)	0.268 (0.187-0.373)
Baitaran river																
2.	Joda	182 (16-1020)	49 (28-68)	9.9 (6.9-16.4)	0.350 (0.112-1.064)	0.013 (0.002-0.043)	3.42 (1.68-7.00)	1570 (330-3500)	126 (93-182)	0.31 (0.15-0.64)	0.028 (0.007-0.053)	76 (61-101)	48 (28-64)	8.6 (4.6-16.0)	4.90 (0.99-9.0)	0.180 (0.111-0.244)
3.	Anandpur	106 (5-402)	64 (36-100)	9.5 (7.4-13.6)	0.415 (0.112-1.008)	0.016 (0.005-0.036)	6.96 (1.68-38.08)	2794 (490-5400)	155 (111-221)	0.36 (0.24-0.56)	0.022 (0.004-0.048)	94 (66-133)	59 (36-94)	10.1 (6.6-15.0)	6.62 (1.38-17.82)	0.201 (0.140-0.295)
4.	Jajpur	101 (23-298)	65 (40-102)	11.8 (7.1-20.8)	0.285 (0.112-1.120)	0.010 (0.001-0.026)	4.43 (1.40-9.52)	4625 (700-11000)	176 (119-381)	0.49 (0.21-1.69)	0.050 (0.004-0.121)	109 (74-248)	64 (44-84)	14.1 (7.1-49.0)	8.64 (0.79-21.88)	0.233 (0.126-0.414)
5.	Chandbali	239 (60-812)	85 (68-112)	16.5 (7.8-23.7)	0.476 (0.112-1.120)	0.021 (0.003-0.051)	6.43 (1.96-14.56)	3542 (1100-9200)	4390 (269-18460)	7.68 (0.33-29.88)	0.705 (0.053-2.350)	3297 (165-14087)	902 (60-3000)	1761.9 (15.4-7919.2)	151.8 (10.89-574.2)	0.319 (0.142-0.525)
Dhamra river																
6.	Dhamra	295 (114-842)	107 (60-148)	20.8 (7.8-45.0)	0.341 (0.112-0.840)	0.012 (0.001-0.029)	2.99 (1.68-7.84)	1088 (130-2800)	19614 (885-42560)	14120 (632-30238)	1.076 (0.083-3.320)	28.18 (0.70-56.26)	2863 (350-5800)	7824.1 (82.5-16650.0)	841.3 (210.7-2940.1)	0.555 (0.202-0.969)
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

Table Contd..

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Kusei River												
1.	Deogan	4.37 (0.14-33.82)	0.057 (0.007-0.158)	BDL	0.024 (0.012-0.052)	14.088 (0.180-102.220)	0.006 (0.002-0.013)	0.005 (0.001-0.007)	0.006 (0.002-0.010)	0.001 (0.001-0.002)	BDL	0.005 (0.003-0.008)
Baitarani River												
2.	Joda	4.66 (0.31-25.88)	0.125 (0.003-0.645)	BDL	0.043 (0.023-0.060)	12.752 (0.586-93.600)	0.006 (0.005-0.010)	0.004 (0.003-0.006)	0.003 (0.001-0.004)	0.001 (0.001-0.002)	BDL	0.005 (0.004-0.008)
3.	Anandpur	2.72 (0.22-10.75)	0.071 (0.012-0.201)	BDL	0.023 (0.015-0.028)	4.739 (0.570-15.700)	0.005 (0.003-0.008)	0.004 (0.003-0.004)	0.005 (0.001-0.006)	0.001 (0.001-0.002)	BDL	0.004 (0.003-0.006)
4.	Jajpur	4.50 (0.31-19.94)	0.042 (0.005-0.163)	BDL	0.032 (0.018-0.065)	4.759 (0.125-14.340)	0.004 (0.002-0.008)	0.004 (0.001-0.006)	0.007 (0.002-0.016)	0.001 (0.001-0.002)	BDL	0.004 (0.002-0.008)
5.	Chandbali	3.81 (0.55-9.50)	0.070 (0.003-0.214)	BDL	0.043 (0.018-0.085)	8.945 (0.394-19.910)	0.005 (0.004-0.009)	0.003 (0.001-0.006)	0.007 (0.005-0.009)	0.002 (0.001-0.003)	BDL	0.005 (0.004-0.008)
Dhamra River												
6.	Dhamra	3.54 (0.23-8.57)	0.049 (0.006-0.092)	BDL	0.041 (0.007-0.088)	7.442 (1.490-17.200)	0.006 (0.004-0.009)	0.006 (0.002-0.010)	0.007 (0.004-0.008)	0.002 (0.001-0.004)	BDL	0.007 (0.004-0.008)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
Class 'E'		-	-	-	-	-	-	-	-	-	-	-

BDL = Below Detection Limit

Class 'C' : Drinking water source with conventional treatment followed by disinfection**Class 'E' : Irrigation water quality**

* Data for the period Jan-May, 2012

(D) Rushikulya River Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
Rushikulya River																	
1.	Madhopur	114 (32-356)	108 (62-138)	13.2 (4.7-20.6)	0.274 (0.112-0.784)	0.029 (0.004-0.076)	3.78 (1.68-7.28)	1618 (230-2800)	112 (209-648)	0.74 (0.28-2.67)	0.116 (0.026-0.447)	186 (123-418)	103 (74-140)	30.2 (10.3-118.4)	13.9 (3.5-29.0)	0.370 (0.287-0.502)	
2.	Potagarh	194 (47-456)	112 (76-124)	20.1 (9.3-29.4)	0.378 (0.112-1.456)	0.021 (BDL-0.058)	3.87 (1.12-8.12)	624 (20-2400)	19595 (335-51840)	26.86 (0.35-66.79)	1.065 (0.125-2.831)	14380 (188-38831)	2928 (660-6600)	7211.7 (17.3-19887)	1235.0 (34.6-2435.6)	0.719 (0.302-0.988)	
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5	
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-	

Sl. No.	Sampling Location	Nutrients (mg/l)				Heavy metals (mg/l)							
		NO ₃ ⁻	PO ₄ ^{3--P}	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*	
Rushikulya River													
1.	Madhopur	3.16 (0.20-12.54)	0.051 (0.003-0.122)	BDL	0.031 (0.012-0.053)	3.01 (0.51-12.37)	0.006 (0.004-0.012)	0.002 (0.001-0.004)	0.012 (0.002-0.032)	0.002 (0.001-0.003)	BDL	0.006 (0.004-0.008)	
2.	Potagarh	4.03 (2.17-10.47)	0.081 (0.003-0.224)	BDL	0.038 (0.017-0.089)	2.85 (0.44-10.84)	0.007 (0.002-0.010)	0.005 (0.003-0.006)	0.008 (0.006-0.010)	0.001 (0.001-0.002)	BDL	0.006 (0.005-0.009)	
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10	
Class 'E'		-	-	-	-	-	-	-	-	-	-	-	

BDL = Below Detection Limit

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

* Data for the period Jan-May, 2012

(E) Nagavali River Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
Nagavali River																	
1.	Penta U/s	120 (37-330)	83 (28-112)	10.8 (7.4-19.2)	0.257 (0.112-0.900)	0.021 (0.004-0.113)	2.21 (1.12-3.36)	2346 (490-7000)	230 (115-318)	0.54 (0.18-1.39)	0.043 (0.015-0.083)	135 (98-112)	79 (26-112)	17.9 (6.1-26.7)	6.54 (1.08-16.73)	0.251 (0.198-0.343)	
2.	Jaykay Pur D/s	123 (29-382)	95 (64-132)	22.1 (13.8-30.9)	0.313 (0.112-0.730)	0.026 (0.006-0.071)	3.17 (0.84-7.84)	2428 (460-79.00)	263 (181-414)	0.57 (0.32-0.94)	0.040 (0.007-0.079)	156 (117-225)	98 (78-134)	21.5 (12.7-35.7)	10.60 (4.55-21.78)	0.210 (0.200-0.228)	
3.	Rayagada D/s	118 (42-354)	89 (64-108)	15.8 (10.3-29.0)	0.258 (0.056-0.560)	0.021 (0.004-0.064)	3.25 (1.40-6.72)	2196 (130-7900)	272 (160-659)	0.49 (0.33-0.65)	0.048 (0.004-0.091)	181 (100-616)	99 (54-168)	18.9 (12.5-25.9)	9.33 (1.28-18.91)	0.201 (0.176-0.224)	
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5	
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-	

Sl. No.	Sampling Location	Nutrients (mg/l)			Heavy metals (mg/l)							
		NO ₃ ⁻	PO ₄ ³⁻⁻ P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Nagavali River												
1.	Penta U/s	2.94 (0.26-6.53)	0.061 (0.007-0.240)	BDL	0.018 (0.005-0.034)	4.379 (0.782-10.157)	0.006 (0.004-0.007)	0.003 (0.001-0.004)	0.006 (0.004-0.008)	0.002 (0.001-0.003)	BDL	0.005 (0.004-0.008)
2.	Jaykay Pur D/s	4.90 (0.36-16.75)	0.056 (0.011-0.032)	BDL	0.024 (0.010-0.046)	4.424 (0.586-9.400)	0.006 (0.003-0.008)	0.005 (0.001-0.008)	0.010 (0.003-0.019)	0.002 (0.001-0.003)	BDL	0.009 (0.008-0.010)
3.	Rayagada D/s	6.34 (0.36-15.72)	0.100 (0.029-0.537)	BDL	0.020 (0.010-0.048)	8.424 (0.750-53.280)	0.004 (0.001-0.006)	0.004 (0.002-0.005)	0.009 (0.003-0.013)	0.002 (0.001-0.002)	BDL	0.009 (0.008-0.010)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
Class 'E'		-	-	-	-	-	-	-	-	-	-	-

BDL = Below Detection Limit

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

* Data for the period Jan-May, 2012

(F) Subarnarekha River Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		(mg/l)		(mg/l)				(MPN/100ml)	(μ S/cm)	(mg/l)						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
Subarnarekha River																
1.	Rajghat	74 (9-222)	76 (44-102)	12.3 (4.4-18.1)	0.156 (0.112-0.336)	0.013 (0.002-0.036)	3.08 (1.58-5.04)	8100 (1100-54000)	234 (151-290)	0.65 (0.35-0.95)	0.082 (0.030-0.148)	145 (98-184)	79 (60-96)	22.5 (10.5-31.1)	15.4 (5.1-20.8)	0.470 (0.239-0.860)
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

Sl. No.	Sampling Location	Nutrients (mg/l)			Heavy metals (mg/l)							
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Subarnarekha River												
1.	Rajghat	2.11 (0.18-6.36)	0.053 (0.004-0.158)	0.025 (0.013-0.048)	BDL	3.07 (0.21-12.72)	0.005 (0.002-0.009)	0.003 (0.002-0.005)	0.005 (0.002-0.008)	0.002 (0.001-0.003)	BDL	0.020 (0.004-0.074)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
Class 'E'		-	-	-	-	-	-	-	-	-	-	-

BDL = Below Detection Limit

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

* Data for the period Jan-May, 2012

(G) Budhabalanga River Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
Budhabalanga River																	
1.	Baripada D/s	57 (14-146)	98 (60-112)	9.7 (5.6-14.5)	0.280 (BDL-0.560)	0.016 (BDL-0.056)	3.41 (1.12-5.88)	7742 (2100-35000)	213 (129-287)	0.48 (0.30-0.69)	0.054 (0.015-0.087)	133 (83-185)	86 (52-104)	16.8 (9.6-24.2)	6.28 (2.11-11.88)	0.212 (0.135-0.310)	
2.	Balasore U/s	58 (12-116)	84 (48-108)	11.9 (7.1-19.9)	0.210 (0.112-0.448)	0.018 (0.001-0.085)	3.41 (1.68-8.40)	1142 (330-2400)	214 (113-307)	0.53 (0.23-0.99)	0.061 (0.013-0.113)	133 (70-199)	87 (52-114)	18.4 (6.8-34.3)	10.19 (1.34-23.47)	0.213 (0.154-0.303)	
3.	Balasore D/s	124 (21-560)	91 (72-112)	17.4 (6.9-24.4)	0.253 (0.112-1.176)	0.011 (BDL-0.028)	4.17 (1.12-9.52)	12675 (3100-35000)	312 (190-685)	1.05 (0.44-2.85)	0.171 (0.023-1.347)	193 (118-388)	103 (78-148)	42.5 (14.2-134.5)	17.31 (4.21-40.89)	0.241 (0.171-0.317)	
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5	
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-	

Sl. No.	Sampling Location	Nutrients (mg/l)			Heavy metals (mg/l)							
		NO ₃ ⁻	PO ₄ ³⁻⁻ P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Budhabalanga River												
1.	Baripada D/s	1.50 (0.04-6.48)	0.044 (0.001-0.149)	BDL	0.019 (0.010-0.038)	2.364 (0.264-6.400)	0.002 (0.001-0.004)	0.004 (0.002-0.005)	0.004 (0.001-0.005)	0.001 (0.001-0.002)	BDL	0.007 (0.003-0.010)
2.	Balasore U/s	1.74 (0.13-7.46)	0.033 (0.001-0.059)	BDL	0.026 (0.020-0.042)	2.475 (0.302-7.900)	0.003 (0.001-0.006)	0.004 (0.001-0.006)	0.004 (0.001-0.006)	0.001 (BDL-0.002)	BDL	0.007 (0.003-0.012)
3.	Balasore D/s	3.12 (0.10-8.86)	0.100 (0.030-0.187)	BDL	0.029 (0.012-0.060)	6.796 (0.720-45.120)	0.004 (0.002-0.006)	0.005 (0.004-0.006)	0.006 (0.002-0.008)	0.001 (0.001-0.003)	BDL	0.006 (0.001-0.009)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
Class 'E'		-	-	-	-	-	-	-	-	-	-	-

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

BDL = Below Detection Limit

* Data for the period Jan-May, 2012

(H) Kolab River Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		(mg/l)		(mg/l)				(MPN/100ml)	(µS/cm)	(mg/l)						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
Kerandi River																
1.	Sunabeda	121 (20-344)	38 (24-76)	11.9 (5.8-23.6)	0.234 (0.112-0.840)	0.005 (BDL-0.013)	2.0 (0.12-4.48)	3066 (460-11000)	108 (68-167)	0.37 (0.22-0.53)	0.040 (0.004-0.125)	67 (44-93)	43 (28-76)	9.1 (4.6-12.6)	6.7 (0.9-24.3)	0.149 (0.092-0.289)
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-

Sl. No.	Sampling Location	Nutrients (mg/l)			Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*	
Kerandi River													
1.	Sunabeda	6.08 (1.19-22.09)	0.088 (0.012-0.392)	BDL	0.020 (0.007-0.048)	6.88 (1.20-24.42)	0.005 (0.002-0.007)	0.004 (0.002-0.007)	0.004 (0.002-0.008)	0.002 (0.001-0.003)	BDL	0.006 (0.004-0.008)	
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10	
Class 'E'		-	-	-	-	-	-	-	-	-	-	-	

BDL = Below Detection Limit

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

* Data for the period Jan-May, 2012

(I) Vansadhara River Basin

Sl. No.	Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		(mg/l)		(mg/l)				(MPN/100ml)	(μ S/cm)	(mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
Kerandi River																	
1.	Muniguda	59 (24-152)	84 (60-124)	11.2 (6.0-26.9)	0.215 (0.112-0.730)	0.015 (BDL-0.058)	3.06 (1.12-8.96)	1151 (93-2700)	186 (145-218)	0.41 (0.22-1.19)	0.044 (0.011-0.128)	114 (94-137)	78 (66-110)	13.6 (7.8-35.4)	5.4 (0.9-14.4)	0.255 (0.142-0.313)	
2.	Gunupur	165 (28-592)	91 (54-156)	13.6 (6.0-24.1)	0.178 (0.112-0.336)	0.010 (BDL-0.033)	3.57 (1.12-14.0)	1592 (330-3300)	214 (144-346)	0.39 (0.20-0.67)	0.040 (0.004-0.098)	131 (88-230)	86 (48-156)	13.9 (8.6-32.3)	6.5 (0.9-17.9)	0.251 (0.154-0.363)	
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5	
Class 'E'		-	-	-	-	-	-	-	2250	26	2.0	2100	-	600	1000	-	

Sl. No.	Sampling Location	Nutrients (mg/l)			Heavy metals (mg/l)							
		NO ₃ ⁻	PO ₄ ^{3--P}	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Vansadhara River												
1.	Muniguda	1.56 (0.38-3.93)	0.045 (0.008-0.095)	BDL	0.023 (0.017-0.032)	1.82 (0.35-5.00)	0.010 (0.003-0.023)	0.004 (0.002-0.006)	0.004 (0.002-0.007)	0.002 (0.001-0.003)	BDL	0.007 (0.003-0.008)
2.	Gunupur	4.76 (0.18-18.57)	0.072 (BDL-0.319)	BDL	0.024 (0.012-0.034)	5.36 (0.50-32.0)	0.007 (0.002-0.010)	0.004 (0.001-0.006)	0.006 (0.002-0.011)	0.002 (BDL-0.003)	BDL	0.007 (0.002-0.010)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
Class 'E'		-	-	-	-	-	-	-	-	-	-	-

BDL = Below Detection Limit

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

* Data for the period Jan-May, 2012

Water Quality of Taladanda Canal with respect to Criteria parameters during 2012

Sl. No	Location	No. of Obs.	Annual average values (Range of values)					Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters					BOD	TC	FC			
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)						
1.	Jobra*	5	7.9 (7.1-8.2)	7.9 (5.5-10.2)	1.8 (1.0-2.7)	48200 (11000-160000)	40160 (4900-160000)	0	5 (100)	5 (100)	Does not conform to Class B,C	BOD, TC,FC	Human activities
2.	Ranihat*	5	8.0 (7.4-8.4)	8.0 (5.1-10.3)	1.9 (1.4-2.3)	109400 (43000-160000)	87400 (28000-160000)	0	5 (100)	5 (100)	Does not conform to Class B & C	BOD, TC,FC	Human activities and waste water of Cuttack town
3.	Chhatrabazar*	5	7.6 (6.9-8.4)	8.7 (5.8-11.8)	2.6 (1.8-3.3)	113800 (35000-160000)	83600 (22000-160000)	2 (40)	5 (100)	5 (100)			
4.	Nuabazar*	5	7.9 (7.4-8.5)	6.4 (5.2-7.9)	2.1 (1.6-2.6)	119200 (92000-160000)	71400 (35000-160000)	0	5 (100)	5 (100)			
5.	Biribati*	5	8.0 (7.7-8.3)	7.8 (6.1-9.2)	1.8 (1.0-2.3)	82800 (16000-160000)	85200 (17000-160000)	0	5 (100)	5 (100)			
6.	Atharabanki**	10	7.8 (6.5-8.4)	7.7 (6.2-16.3)	3.6 (1.1-4.7)	42700 (15000-92000)	19640 (9400-54000)	7 (70)	10 (100)	10 (100)			
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less					Drinking water source with conventional treatment followed by disinfection		
Class 'B' water quality Criteria (IS-2296-1982)			6.5-8.5	5 and above	3 or less	500 or less					Outdoor bathing		
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	5 and above	3 or less		500 (Desirable) 2500 (Permissible)				Water use for organised outdoor bathing		

* Data for the period June-November, 2012

** Data for the period March-December, 2012

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:
 TC values with more than 5% of samples show more than 20,000 MPN/100 ml and more than 20% of the samples show more than 5000 MPN/ 100 ml. (Ref : IS 2296-1982 foot note)

Contd..

Sl. No	Location	No. of Obs.	Annual average value (Range of values)				Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				EC	SAR	B			
			pH	EC (microSiemens /cm)	SAR	B						
1.	Jobra*	5	7.9 (7.1-8.2)	173 (148-205)	0.38 (0.22-0.51)	0.037 (0.007-0.072)	0	0	0	Conform to Class E		
2.	Ranihat*	5	8.0 (7.4-8.4)	186 (150-232)	0.41 (0.29-0.75)	0.052 (0.019-0.109)	0	0	0			
3.	Chhatrabazar*	5	7.6 (6.9-8.4)	(187) (160-206)	0.37 (0.28-0.42)	0.058 (0.019-0.140)	0	0	0			
4.	Nuabazar*	5	7.9 (7.4-8.5)	183 (148-219)	0.34 (0.23-0.50)	0.032 (0.015-0.052)	0	0	0			
5.	Biribati*	5	8.0 (7.7-8.3)	183 (149-215)	0.40 (0.34-0.54)	0.099 (0.023-0.174)	0	0	0			
6.	Atharabanki**	10	7.8 (6.5-8.4)	720 (147-2638)	2.74 (0.30-8.08)	0.217 (0.019-0.738)	1 (10)	0	0			
Class 'E water quality Criteria (IS-2296-1982)			6.5-8.5	2250 or less	26 or less	5				Irrigation, Industrial Cooling or controlled waste disposal		

* Data for the period June-November, 2012

** Data for the period March-December, 2012

Table-5 Water Quality of Taladanda Canal with respect to other parameters during 2012

Sl. No.	Sampling Location	Physical parameters (mg/l)		Organic pollution Indicators (mg/l)				Mineral constituents (mg/l)				
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TDS	TH	Cl	SO ₄	F
1.	Jobra*	168 (28-388)	70 (58-92)	11.4 (7.5-15.7)	0.252 (0.112-0.448)	0.013 (BDL-0.022)	3.36 (1.12-8.40)	106 (89-132)	68 (64-82)	13.1 (7.8-18.7)	7.22 (4.22-11.08)	0.327 (0.216-0.415)
2.	Ranihat*	99 (24-178)	75 (56-96)	16.2 (7.5-25.5)	0.294 (0.168-0.448)	0.016 (0.007-0.027)	4.37 (1.12-7.84)	115 (88-134)	74 (60-88)	15.3 (8.2-24.8)	8.41 (2.67-15.64)	0.341 (0.262-0.391)
3.	Chhatrabazar*	89 (52-140)	76 (64-92)	15.4 (7.5-27.6)	0.295 (0.112-0.392)	0.015 (BDL-0.042)	7.17 (4.48-12.32)	114 (91-131)	78 (66-90)	12.6 (8.4-15.9)	8.70 (4.46-17.32)	0.332 (0.2669-0.411)
4.	Nuabazar*	60 (40-114)	75 (56-94)	14.1 (6.1-23.5)	0.258 (0.112-0.392)	0.010 (BDL-0.035)	5.71 (1.68-15.12)	112 (88-127)	79 (60-92)	12.5 (7.8-16.0)	7.90 (4.26-10.91)	0.329 (0.261-0.399)
5.	Biribati*	96 (42-246)	70 (56-96)	12.2 (7.5-17.6)	0.157 (0.112-0.336)	0.005 (BDL-0.014)	4.14 (2.24-6.72)	110 (95-129)	75 (60-88)	13.1 (11.9-13.8)	9.91 (6.83-15.34)	0.330 (0.259-0.391)
6.	Atharabanki**	63 (23-140)	106 (52-192)	26.9 (5.8-40.7)	0.336 (0.112-0.952)	0.047 (BDL-0.179)	3.75 (1.40-6.16)	491 (95-1775)	167 (72-540)	188.6 (9.6-912.9)	54.10 (9.00-323.7)	0.465 (0.296-0.638)
Class 'C'		-	-	-	-	-	-	-	-	600	400	1.5
Class 'E'								2100	-	600	1000	-

* Data for the period June-November, 2012

** Data for the period March-December, 2012

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

Contd..

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni	Cu	Zn	Cd	Hg	Pb
1.	Jobra*	2.394 (0.745-5.166)	0.086 (0.011-0.252)	BDL	0.028 (0.010-0.052)	4.900 (0.820-12.420)	-	-	-	-	-	-
2.	Ranihat*	2.203 (0.429-5.350)	0.069 (0.009-0.192)	BDL	0.026 (0.012-0.040)	5.176 (0.620-13.090)	-	-	-	-	-	-
3.	Chhatrabazar*	2.018 (0.261-5.493)	0.121 (0.078-0.176)	BDL	0.031 (0.017-0.047)	5.730 (2.430-11.940)	-	-	-	-	-	-
4.	Nuabazar*	3.880 (0.948-12.115)	0.061 (0.015-0.141)	BDL	0.030 (0.020-0.043)	5.694 (1.470-12.370)	-	-	-	-	-	-
5.	Biribati*	2.062 (0.589-3.274)	0.041 (0.016-0.120)	BDL	0.028 (0.013-0.038)	4.880 (1.900-11.380)	-	-	-	-	-	-
6.	Atharabanki**	3.584 (0.325-11.577)	0.111 (0.023-0.315)	BDL	0.032 (0.013-0.050)	1.784 (0.040-6.800)	0.005 (BDL-0.008)	0.005 (0.002-0.008)	0.011 (0.006-0.016)-	0.001 (0.001-0.002)-	-	0.006 (0.005-0.009)-
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
Class 'E'		-	-	-	-	-	-	-	-	-	-	-

BDL = Below Detection Limit

* Data for the period June-November, 2012

** Data for the period March-December, 2012

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

Table-6 (a) Water Quality of Ponds with respect to Criteria parameters during 2012 (January-December)

Sl. No	Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)	BOD	TC	FC			
			Bindusagar Pond (Bhubaneswar)										
1.	Lingaraj Temple side	12	7.7 (6.7-9.2)	11.6 (5.9-15.4)	12.3 (4.3-35.0)	23208 (5800-92000)	12608 (2300-35000)	12 (100)	12 (100)	12 (100)	Does not conform to Class B	BOD, TC,FC	Human activities
2.	Ananta vasudev	12	7.8 (6.8-9.3)	10.8 (3.8-14.3)	8.8 (4.3-15.7)	22458 (4700-54000)	12808 (2700-35000)	12 (100)	12 (100)	12 (100)			
3.	Near Kedarnath research Centre	12	7.8 (7.0-9.1)	13.0 (6.4-17.5)	9.8 (4.5-16.0)	23425 (5800-92000)	11742 (2300-24000)	12 (100)	12 (100)	12 (100)			
4.	Gyananagar	12	7.9 (6.9-8.6)	12.8 (5.2-19.9)	8.6 (2.3-15.6)	25808 (7900-54000)	15875 (4900-35000)	11 (92)	12 (100)	12 (100)			
Class 'B' water quality Criteria (IS-2296-1982)			6.5-8.5	5 and above	3 or less	500 or less					Outdoor bathing		
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	5 and above	3 or less		500 (Desirable) 2500 (Permissible)				Water use for organised outdoor bathing		

Table 6(b) Water Quality of Ponds with respect to Criteria parameters during 2012 (January-December)

Sl. No	Location	No. of Obs.	Annual average values (Range of values)					Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters					BOD	TC	FC			
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)						
Ponds (Puri)													
1.	Narendra	12	8.5 (8.0-8.8)	11.4 (3.-9-16.1)	7.0 (4.1-12.0)	11344 (930-54000)	5021 (450-17000)	12 (100)	12 (100)	11 (92)	Does not conform to Class B	BOD, TC,FC	Human activities
2.	Markanda	12	8.2 (7.5-9.2)	12.6 (7.3-18.9)	6.3 (2.0-13.0)	24975 (2200-92000)	6780 (2200-9200)	11 (92)	12 (100)	12 (100)			
3.	Indradyumna	12	8.3 (7.4-8.7)	8.8 (4.3-16.3)	5.0 (2.2-8.0)	19550 (400-92000)	10417 (200-35000)	11 (92)	11 (92)	11 (92)			
4.	Swetaganga	12	8.7 (7.7-9.6)	14.4 (6.5-22.9)	11.5 (2.3-31.5)	16500 (1300-54000)	6754 (450-24000)	11 (92)	12 (100)	11 (92)			
5.	Parvati sagar	12	8.0 (7.5-8.5)	10.0 (1.5-18.4)	8.0 (1.9-18.0)	30146 (450-160000)	10641 (200-54000)	11 (92)	11 (92)	11 (92)			
Class 'B' water quality Criteria (IS-2296-1982)			6.5-8.5	5 and above	3 or less	500 or less					Outdoor bathing		
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	5 and above	3 or less		500 (Desirable) 2500 (Permissible)				Water use for organised outdoor bathing		

Table 7(a) Water quality of ponds with respect to other parameters during 2012 (January-December)

Sl. No.	Sampling Location	Physical parameters (mg/l)		Organic pollution Indicators (mg/l)				Mineral constituents (mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	EC (μS/cm)	SAR	B	TDS	TH	Cl	SO ₄	F
Bindusagar Pond (Bhubaneswar)															
1.	Lingaraj Temple side	84 (26-210)	101 (68-126)	92.1 (14.2-196.5)	0.564 (0.168-1.600)	0.034 (BDL-0.126)	6.77 (1.96-14.28)	459 (404-549)	2.15 (1.59-2.66)	0.075 (0.030-0.219)	277 (240-319)	83 (76-92)	78.9 (60.5-98.8)	10.05 (3.66-20.19)	0.384 (0.231-0.532)
2.	Ananta Vasudev	90 (22-252)	104 (78-124)	67.8 (20.6-132.7)	0.673 (0.112-2.100)	0.023 (BDL-0.057)	6.90 (0.56-15.12)	452 (349-542)	2.14 (1.49-2.78)	0.066 (0.030-0.132)	234 (317-277)	86 (72-118)	80.5 (60.5-97.8)	11.0- (3.56-23.66)	0.373 (0.228-0.502)
3.	Near Kedarnath Research Centre	81 (18-160)	104 (72-132)	78.5 (36.4-170.0)	0.570 (0.112-1.568)	0.032 (BDL-0.152)	7.00 (0.28-21.84)	446 (407-538)	2.10 (1.49-2.66)	0.063 (0.019-0.163)	273 (225-318)	80 (72-84)	79.7 (61.5-98.9)	8.59 (4.16-16.44)	0.381 (0.267-0.534)
4.	Gyananagar	68 (24-148)	100 (66-132)	70.3 (12.8-113.1)	1.039 (0.168-1.6720)	0.040 (BDL-0.196)	6.51 (1.12-20.16)	430 (191-532)	2.18 (1.81-2.65)	0.058 (0.023-0.096)	273 (219-311)	85 (76-102)	79.4 (60.5-97.8)	8.93 (3.86-19.59)	0.375 (0.235-0.541)
Class 'C'		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

Contd..

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr (VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Bindusagar Pond (Bhubaneswar)												
1.	Lingaraj Temple side	10.88 (2.19-26.95)	0.224 (0.056-0.792)	0.008 (0.003-0.012)	0.036 (0.008-0.060)	2.140 (0.250-5.000)	0.004 (0.002-0.010)	0.005 (0.001-0.008)	0.012 (0.004-0.017)	0.002 (0.001-0.003)	BDL	0.007 (0.004-0.015)
2.	Ananta vasudev	9.08 (1.10-15.08)	0.163 (0.031-0.647)	0.007 (0.002-0.010)	0.034 (0.014-0.056)	2.601 (1.100-8.184)	0.004 (0.001-0.008)	0.006 (0.002-0.008)	0.009 (0.004-0.016)	0.002 (0.001-0.003)	BDL	0.006 (0.003-0.012)
3.	Near Kedarnath Research Centre	8.77 (0.95-25.91)	0.248 (0.051-0.753)	0.008 (0.003-0.017)	0.044 (0.019-0.103)	1.370 (0.163-2.621)	0.004 (0.002-0.010)	0.005 (0.002-0.007)	0.010 (0.004-0.017)	0.002 (0.001-0.003)	BDL	0.004 (0.002-0.005)
4.	Gyananagar	10.74 (1.06-16.97)	0.221 (0.071-0.670)	0.008 (0.003-0.013)	0.036 (0.014-0.076)	1.612 (0.270-3.990)	0.003 (0.001-0.006)	0.005 (0.001-0.009)	0.010 (0.006-0.015)	0.002 (0.001-0.003)	BDL	0.005 (0.002-0.012)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10

BDL = Below Detection Limit

* Data for the period Jan-May, 2012

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Table 7(b) Water quality of ponds with respect to other parameters during 2012 (January-December)

Sl. No.	Sampling Location	Physical parameters (mg/l)		Organic pollution Indicators (mg/l)				Mineral constituents (mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	EC (μS/cm)	SAR	B	TDS	TH	Cl	SO ₄	F
Ponds (Puri)															
1.	Narendra	61 (33-92)	209 (136-268)	59.9 (43.8-86.9)	0.423 (0.168-1.008)	0.071 (0.022-0.218)	5.18 (2.24-10.08)	998 (872-1218)	3.19 (1.86-3.81)	0.164 (0.015-0.889)	595 (487-746)	207 (160-258)	184.7 (120.0-253.8)	30.32 (17.82-41.08)	0.223 (0.140-0.234)
2.	Markanda	44 (14-90)	178 (98-224)	40.7 (22.2-94.1)	0.331 (0.112-0.840)	0.038 (0.004-0.130)	5.76 (1.68-9.52)	750 (588-838)	2.05 (1.34-2.81)	0.264 (0.007-1.419)	454 (328-345)	179 (88-230)	113.1 (80.0-150.0)	33.62 (75.04-63.06)	0.145 (0.054-0.246)
3.	Indradyumna	50 (13-184)	131 (82-164)	40.4 (28.0-54.1)	0.308 (0.112-0.784)	0.052 (0.007-0.353)	5.02 (1.68-10.64)	706 (596-924)	3.54 (2.00-5.07)	0.335 (0.018-3.073)	423 (360-544)	115 (62-184)	142.2 (116.0-178.4)	13.96 (3.56-31.88)	0.231 (0.082-0.456)
4.	Swetaganga	66 (36-108)	153 (140-308)	64.5 (19.2-129.9)	0.275 (0.112-0.560)	0.073 (0.003-0.196)	5.95 (2.24-10.64)	1254 (1066-1879)	4.00 (2.74-6.14)	0.190 (0.022-0.624)	766 (588-1193)	219 (152-264)	254.4 (157.3-384.4)	47.71 (6.68-82.37)	0.217 (0.056-0.718)
5.	Parvati sagar	59 (15-132)	126 (80-198)	57.6 (7.4-126.7)	0.280 (0.112-0.504)	0.022 (0.003-0.063)	5.02 (0.56-8.96)	688 (548-1079)	2.91 (2.00-5.63)	0.187 (0.016-0.832)	413 (348-631)	128 (94-164)	134.3 (106.1-220.2)	25.29 (7.96-41.87)	0.192 (0.117-0.340)
Class 'C'		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

BDL = Below Detection Limit

* Data for the period Jan-May, 2012

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Table contd..

Sl. No.	Sampling Location	Nutrients (mg/l)		Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
Ponds (Puri)												
1.	Narendra	16.89 (0.41-43.51)	0.888 (0.110-2.356)	BDL	0.024 (0.017-0.032)	0.930 (0.154-3.274)	0.005 (0.002-0.008)	0.003 (0.001-0.005)	0.007 (0.005-0.009)	0.002 (0.001-0.002)	BDL	0.008 (0.003-0.014)
2.	Markanda	8.41 (1.19-29.96)	1.429 (0.104-3.168)	BDL	0.030 (0.020-0.042)	0.614 (0.068-3.400)	0.006 (0.002-0.008)	0.004 (0.003-0.008)	0.008 (0.003-0.012)	0.003 (0.001-0.004)	BDL	0.009 (0.008-0.011)
3.	Indradyumna	24.43 (1.33-45.38)	0.122 (0.010-0.422)	BDL	0.032 (0.020-0.050)	0.648 (0.139-4.276)	0.006 (0.002-0.010)	0.003 (0.002-0.005)	0.012 (0.008-0.019)	0.002 (0.001-0.003)	BDL	0.007 (0.003-0.008)
4.	Swetaganga	40.34 (6.52-69.33)	0.817 (0.040-1.715)	BDL	0.036 (0.022-0.053)	1.036 (0.211-3.476)	0.007 (0.003-0.010)	0.004 (0.002-0.006)	0.011 (0.003-0.021)	0.002 (0.001-0.004)	BDL	0.008 (0.005-0.012)
5.	Parvati sagar	7.57 (2.52-12.79)	0.249 (0.002-0.634)	BDL	0.031 (0.015-0.048)	0.953 (0.350-2.210)	0.004 (0.001-0.010)	0.005 (0.003-0.011)	0.009 (0.007-0.013)	0.002 (0.001-0.003)	BDL	0.007 (0.006-0.009)
Class 'C'				0.05	-	50	-	1.5	15.0	0.01	-	0.10

BDL = Below Detection Limit

* Data for the period March-May, 2012

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Table- 8 Water Quality of Lakes with respect to Criteria parameters during 2012 (January-December)

(a) Chilka Lake

Sl. No	Location	No. of Obs.	Annual average values (Range of values)					Frequency of violation (Percent of violation) from designated criteria value		Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters					BOD	FC			
			pH	DO (mg/l)	BOD (mg/l)	Turbidity, NTU	FC (MPN/100 ml)					
1.	Rambha	12	8.1 (7.9-8.9)	7.8 (5.4-10.1)	1.5 (0.7-2.2)	10 (0.3-28)	250 (45-1100)	0	4 (33)	Does not conform to Class-SW-II	FC	Human activities
2.	Satpada	12	8.0 (7.2-8.4)	7.6 (5.4-10.4)	1.6 (0.6-2.8)	54.3 (4.6-148)	842 (78-2400)	0	5 (41)			
Water quality criteria for Class SW-II Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	4.0 or more	3.0 mg/l or less	30 or less	100 or less			For Bathing, Contact Water Sports and Commercial Fishing		

(b) Anshupa Lake

Sl. No	Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation from designated criteria value		Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				Free ammonia	EC			
			pH	DO (mg/l)	Free ammonia (mg/l)	EC (microSiemens/cm)					
1.	Kadlibari	11	8.0 (7.3-8.4)	8.1 (6.4-11.2)	0.014 (0.001-0.066)	162 (107-223)	0	0			
2.	Bishnupur	12	7.9 (7.3-8.4)	8.2 (5.7-14.2)	0.019 (0.001-0.042)	146 (108-198)	0	0			
3.	Subarnapur	12	8.0 (7.4-8.5)	9.8 (7.9-12.8)	0.018 (0.002-0.035)	140 (106-190)	0	0			
4.	Sarandagarh	12	8.0 (7.5-8.5)	8.9 (6.0-13.0)	0.023 (0.002-0.104)	162 (110-246)	0	0			
Class 'D' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	1.2 or less	5000 or less			Fish Culture and Wild life propagation		

Table-9 Water Quality of Lakes with respect to other parameters during 2012 (January-December)

(a) Chilka Lake

Sl. No.	Sampling Location	Physical parameters (mg/l)		Organic pollution Indicators (mg/l)				Bacteriologic al Parameter (MPN/ 100 ml)	Mineral constituents (mg/l)							
		TSS	Total alkal-inity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TC	EC (µS/cm)	TDS	B	SAR	TH	Cl	SO ₄	F
1.	Rambha	126 (26-282)	118 (40-168)	25.2 (13.8-38.3)	0.355 (0.112-0.784)	0.041 (0.007-0.235)	3.85 (1.68-9.52)	633 (110-2400)	23083 (8080-34080)	16633 (5630-2367)	1.109 (0.072-1.890)	37.9 (10.7-55.6)	3032 (1800-6000)	8858 (2244-12345)	991 (180-2217)	0.684 (0.260-0.838)
2.	Satapada	172 (42-406)	105 (84-146)	27.8 (11.3-45.6)	0.261 (0.112-0.560)	0.016 (0.003-0.050)	4.34 (1.68-9.52)	1964 (230-9200)	28683 (3279-49470)	21444 (2344-35570)	1.201 (0.230-2.763)	42.5 (7.21-70.4)	4041 (1000-7000)	11689 (1078-20662)	1357 (314-2782)	0.804 (0.405-1.020)
Class 'C'		-	-	-	-	-	-	5000	-	1500	-	-	-	600	400	1.5

Sl. No.	Sampling Location	Nutrients (mg/l)			Heavy metals (mg/l)							
		NO ₃ ⁻	PO ₄ ^{3--P}	Cr(VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
1.	Rambha	5.80 (1.66-17.64)	0.038 (0.005-0.112)	BDL	0.043 (0.015-0.125)	0.922 (0.149-4.147)	0.006 (0.004-0.009)	0.006 (0.003-0.007)	0.008 (0.003-0.010)	0.002 (0.001-0.003)	BDL	0.008 (0.007-0.011)
2.	Satapada	5.34 (0.66-16.56)	0.056 (0.009-0.184)	BDL	0.038 (0.018-0.063)	5.426 (0.300-20.350)	0.005 (0.004-0.006)	0.005 (0.001-0.007)	0.008 (0.005-0.012)	0.003 (0.001-0.004)	BDL	0.007 (0.001-0.012)
Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10

Class 'C' : Drinking water source with conventional treatment followed by disinfection

BDL = Below Detection Limit

(b) Anshupa Lake

Sl. No.	Sampling Location	Physical parameters (mg/l)		Organic pollution Indicators (mg/l)				Bacteriological parameters (MPN/ 100 ml)		Mineral constituents (mg/l)						
		TSS	Total alkalinity	BOD	COD	NH ₄ -N	TKN	TC	FC	TDS	B	SAR*	TH	Cl	SO ₄	F
1.	Kadlibari	61 (21-134)	70 (48-92)	1.6 (1.0-2.8)	15.5 (4.9-23.6)	0.204 (0.112-0.672)	2.93 (1.40-6.72)	5433 (390-17000)	2452 (170-7900)	102 (69-139)	0.041 (0.011-0.079)	0.37 (0.16-0.73)	65 (44-92)	11.8 (6.7-19.2)	4.25 (1.26-14.26)	0.369 (0.216-0.580)
2.	Bishnupur	38 (16-108)	62 (50-84)	2.1 (1.2-4.1)	22.6 (8.4-47.3)	0.304 (0.112-0.784)	3.08 (0.40-9.24)	8289 (790-54000)	4334 (260-28000)	89 (70-123)	0.052 (0.019-0.117)	0.43 (0.22-0.75)	57 (40-76)	12.9 (7.5-22.1)	2.96 (0.45-16.62)	0.357 (0.234-0.514)
3.	Subarnapur	58 (32-106)	58 (32-80)	2.0 (1.0-2.8)	20.6 (11.5-36.2)	0.261 (0.056-0.560)	3.19 (1.12-8.96)	12511 (790-54000)	5684 (330-24000)	87 (70-112)	0.045 (0.015-0.076)	0.36 (0.19-0.47)	60 (48-74)	10.7 (6.7-14.4)	3.64 (1.08-18.12)	0.327 (0.205-0.491)
4.	Sarandagarh	53 (14-145)	60 (50-86)	2.0 (1.0-3.0)	23.4 (10.8-56.1)	0.257 (0.112-0.672)	3.72 (1.68-10.08)	8572 (330-35000)	4768 (230-24000)	101 (71-144)	0.036 (0.022-0.083)	0.50 (0.18-1.31)	59 (40-76)	15.7 (7.5-34.6)	3.80 (0.89-19.1)	0.357 (0.188-0.710)
Class 'C'		-	-	-	-	-	-	5000		1500	-	-	-	600	400	1.5

* No unit

Sl. No.	Sampling Location	Nutrients (mg/l)			Heavy metals (mg/l)								
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI)	T. Cr	Fe	Ni**	Cu**	Zn**	Cd**	Hg**	Pb**	
1.	Kadlibari	4.57 (0.79-16.27)	0.090 (0.015-0.220)	BDL	0.030 (0.017-0.072)	2.042 (0.365-7.100)	0.006 (0.005-0.007)	0.003 (0.002-0.004)	0.002 (0.001-0.005)	0.002 (0.001-0.003)	BDL	0.007 (0.005-0.010)	
2.	Bishnupur	3.86 (0.07-18.72)	0.062 (0.003-0.132)	BDL	0.034 (0.012-0.058)	1.517 (0.422-5.510)	0.006 (0.003-0.008)	0.004 (0.003-0.006)	0.005 (0.003-0.008)	0.002 (0.001-0.003)	BDL	0.006 (0.001-0.008)	
3.	Subarnapur	3.83 (0.36-17.19)	0.077 (0.010-0.214)	BDL	0.034 (0.015-0.084)	2.879 (0.552-7.738)	0.004 (0.002-0.005)	0.004 (0.002-0.006)	0.005 (0.002-0.008)	0.002 (0.001-0.003)	BDL	0.006 (0.003-0.008)	
4.	Sarandagarh	5.06 (0.50-15.30)	0.064 (0.001-0.185)	BDL	0.033 (0.015-0.067)	1.830 (0.350-3.060)	0.005 (0.003-0.007)	0.004 (0.004-0.005)	0.004 (0.002-0.008)	0.002 (0.001-0.003)	BDL	0.006 (0.004-0.009)	
Class 'C'				0.05	-	50	-	1.5	15.0	0.01	-	0.10	

Class 'C' : Drinking water source with conventional treatment followed by disinfection

BDL = Below Detection Limit

** Data for the period Jan-May, 2012

Table-10 Coastal Water Quality with respect to Criteria parameters during 2012 (January-December)

Sl. No	Location	No. of Obs.	Annual average value (Range of values)					Frequency of violation (Percent of violation) from designated criteria value		Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters					BOD	FC			
			pH	DO (mg/l)	BOD (mg/l)	Turbidity, NTU	FC (MPN/100 ml)					
1.	Puri	12	8.0 (7.8-8.3)	7.1 (5.8-11.4)	1.3 (0.2-3.0)	18.2 (5.8-53.3)	399 (20-2400)	0	8 (67)	Does not confirm to Class-SW-II	FC	Human activities
2.	Gopalpur	12	7.9 (7.5-8.3)	7.0 (5.4-8.8)	1.6 (0.7-3.8)	14.3 (1.1-28.0)	92 (20-490)	0	2 (17)	Does not confirm to Class-SW-II		
3.	Paradeep	12	7.9 (7.7-8.4)	7.1 (5.7-8.4)	1.2 (0.3-2.8)	20 (1.1-47.3)	115 (20-230)	0	7 (58)	Does not confirm to Class-SW-II		
Water quality criteria for Class SW-II Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	4.0 or more	3.0 mg/l or less	30 or less	100 or less			For Bathing, Contact Water Sports and Commercial Fishing		

Sl. No	Location	No. of Obs.	Annual average value (Range of values)					Frequency of violation (Percent of violation) from designated criteria value		Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters					BOD	O&G			
			pH	DO (mg/l)	BOD (mg/l)	O&G, mg/l	FC (MPN/100 ml)					
1.	Gopalpur	12	8.0 (7.8-8.3)	7.1 (5.8-11.4)	1.3 (0.2-3.0)	0.6 (0.2-0.9)	399 (20-2400)	0	0	SW-IV		
2.	Paradeep	12	7.9 (7.7-8.4)	7.1 (5.7-8.4)	1.2 (0.3-2.8)	0.8 (0.2-1.2)	115 (20-230)	0	0	SW-IV		
Water quality criteria for Class SW-IV Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-9.0	3.0 or more	5.0 mg/l or less	10 or less	500 or less			For Harbour Waters		

Table-11 Coastal Water Quality with respect to other parameters during 2012 (January-December)

Sl. No.	Sampling Location	Physical parameters (mg/l)		Organic pollution Indicators (mg/l)				Bacteriological parameter	Mineral constituents (mg/l)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TC (MPN/ 100 ml)	EC (µS/cm)	TDS	B	SAR	TH	Cl	SO ₄	F
1.	Puri	206 (13-338)	109 (92-148)	29.1 (18.8-36.9)	0.378 (0.112-1.176)	0.013 (0.004-0.029)	3.57 (1.12-7.84)	725 (20-3500)	40940 (28050-58400)	30927 (24811-37960)	1.147 (0.654-1.660)	50.0 (36.7-62.5)	6213 (4200-8400)	17128 (12537-20662)	2158 (1568-2972)	0.854 (0.470-1.080)
2.	Gopalpur	257 (36-456)	111 (60-134)	29.1 (18.7-43.4)	0.276 (0.112-0.448)	0.024 (0.004-0.076)	3.51 (1.40-10.10)	187 (45-790)	41660 (29980-57570)	31615 (23337-45506)	1.647 (0.782-2.990)	51.5 (40.8-65.8)	6392 (4400-8000)	18051 (12440-25968)	2083 (1422-2609)	0.844 (0.252-1.090)
3.	Paradeep	263 (18-642)	110 (96-124)	28.6 (8.1-41.4)	0.364 (0.112-0.120)	0.025 (0.004-0.073)	2.80 (1.12-7.28)	313 (45-490)	41072 (28110-57120)	31342 (22830-45628)	1.466 (0.108-2.736)	53.4 (40.1-69.0)	5954 (4600-7000)	17650 (11220-24968)	2126 (1322-2753)	0.837 (0.377-1.360)

Sl. No.	Sampling Location	Nutrients (mg/l)			Heavy metals (mg/l)							
		Nitrate NO ₃ ⁻	PO ₄ ³⁻ -P	Cr (VI)	T. Cr	Fe	Ni*	Cu*	Zn*	Cd*	Hg*	Pb*
1.	Puri	3.132 (2.077-4.655)	0.046 (0.006-0.093)	BDL	0.029 (0.015-0.044)	1.295 (0.270-2.808)	0.006 (0.001-0.010)	0.005 (0.003-0.007)	0.011 (0.003-0.019)	0.002 (0.001-0.003)	BDL	0.005 (0.001-0.009)
2.	Gopalpur	3.997 (0.648-8.309)	0.040 (0.001-0.089)	BDL	0.027 (0.007-0.047)	0.916 (0.18 0-2.150)	0.006 (0.001-0.010)	0.004 (0.002-0.006)	0.008 (0.003-0.015)	0.002 (0.001-0.002)	BDL	0.006 (0.005-0.007)
3.	Paradeep	4.550 (2.123-10.916)	0.065 (0.009-0.200)	BDL	0.038 (0.024-0.055)	1.338 (0.350-2.750)	0.007 (0.002-0.010)	0.004 (0.002-0.005)	0.010 (0.002-0.017)	0.001 (0.001-0.002)	BDL	0.007 (0.005-0.009)

BDL = Below Detection Limit

* Data for the period Jan-May, 2012

Table- 12 Biological Water Quality Class

Sl. No.	Taxonomic Group	Range of Saprobic score	Range of Diversity score	Water Quality Characteristic	Water Quality Class
1	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Diptera	7 and more	0.2-1.0	Clean	A
2	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Odonata, Diptera	6-7	0.5-1.0	Slight Pollution	B
3	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Odonata, Diptera, Crustacea, Mollusca, Polychaeta, Coleoptera, Hirudinea, Oligochaeta	3-6	0.3-0.9	Moderate Pollution	C
4	Mollusca, Hemiptera, Coleoptera, Diptera, Oligochaeta	2-5	0.4 & less	Heavy Pollution	D
5	Diptera, Oligochaeta No animals	0-2	0-0.2	Severe Pollution	E

Table-13 Biomonitoring of River Bodies (2012)

Station		Annual Average value (Range of values)		Existing Biological Water Quality Class
		Saprobity Index	Diversity Index	
(A) Mahanadi				
1.	Brajrajnagar D/s	5.5	0.75	C
2.	Sambalpur U/s	6.8	0.70	B
3.	Sambalpur D/s	5.4 (4.8-5.8)	0.55 (0.30-0.83)	C
4.	Cuttack U/s (Mahanadi)	6.2 (6.0-6.4)	0.52 (0.46-0.57)	B – C
5.	Cuttack D/s (Mahanadi)	5.6 (5.4-5.8)	0.43 (0.30-0.55)	C
6.	Cuttack U/s (Kathajodi)	6.1 (6.0 -6.3)	0.45 (0.35-0.60)	B – C
7.	Cuttack D/s (Kathajodi)	5.79 (5.75-5.83)	0.45 (0.35-0.60)	C
8.	Bhubaneswar U/s (Kuakhai)	5.4 (4.8-6.0)	0.64 (0.50-0.83)	C
9.	Bhubaneswar D/s (Daya)	5.3 (5.0-5.8)	0.55 (0.46-0.66)	C
10.	Choudwar D/s (Birupa)	5.7 (5.3-6.0)	0.49 (0.46-0.51)	C
11.	Paradeep D/s	5.0	0.50	C

(B) Brahmani				
12.	Panposh U/s	5.5 (4.8-6.0)	0.69 (0.60-0.83)	C
13.	Panposh D/s	5.5 (5.3-5.7)	0.49 (0.38-0.60)	C
14.	Talcher U/s	5.7 (4.8-6.4)	0.56 (0.45-0.72)	B-C
15.	Talcher D/s	5.5 (5.0-6.0)	0.62 (0.44-0.84)	C
16.	Nandira D/s	5.0	0.5	C
17.	Bhuban	4.8	0.45	C

(C) Rushikulya				
18.	Madhopur	5.0	0.52	C
19.	Potagarh	6.3 (6.0-6.5)	0.65 (0.44-0.85)	B

Station	Annual Average value (Range of values)		Existing Biological Water Quality Class*
	Saprobity Index	Diversity Index	

(D) Nagavali				
20.	Penta U/s	5.5 (4.5-6.3)	0.76 (0.74-0.78)	B – C
21.	J. K. Pur D/s	5.8 (5.5-6.4)	0.68 (0.56-0.83)	B – C
22.	Rayagada D/s	6.0 (5.3-6.8)	0.63 (0.58-0.72)	B – C

(E) Subarnarekha				
23.	Rajghat	6.12 (5.8-6.57)	0.66 (0.48-0.79)	B – C

(F) Budhabalnga				
24.	Baripada D/s	5.9 (5.7-6.0)	0.75 (0.67 -0.81)	B – C
25.	Balasore U/s	6.2 (6.0-6.50)	0.68 (0.44-0.95)	B – C
26.	Balasore D/s	5.7 (5.3-6.0)	0.57 (0.50-0.62)	B – C

(G) Kerandi				
27.	Sunabeda	5.7 (5.5-5.8)	0.58 (0.40-0.75)	C

(H) Vansadhara				
28.	Muniguda	6.2 (5.8-6.6)	0.75 (0.58-0.85)	B
29.	Gunupur	5.83 (5.8-6.0)	0.56 (0.41-0.63)	C

Ground water Quality Status (Tube well) of Cuttack, Bhubaneswar and Puri cities (2012)

Location → Parameter (Permissible limit,max.- IS :10500 :1991) ↓	Month	Cuttack					Bhubaneswar						Puri			
		Jagaipur Industrial area	Madhupatna- Kalyan nagar area	Bidanasi – Tulsipur area	Badambadi area	Ranihat – Mangalabag area	Khandagiri area	Capital Hospital	Samantaraypur	Jharpada	Chandrasekhar pur	Secretariat - Governor House- area	Badadanda	Mausima Mandir	Sea beach site	Baliapanda
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
pH (6.5 to 8.5)	A	7.3	6.8	7.2	7.3	7.3	5.2	6.2	6.2	6.0	6.4	5.2	7.1	7.2	7.5	8.1
	O	7.1	7.4	7.8	8.0	7.6	6.1	7.0	7.3	5.5	7.2	7.0	7.4	7.4	7.4	7.4
Conductivity, µS/cm	A	504	317	146	348	231	185	218	463	213	184	227	919	608	1532	307
	O	509	252	167	304	282	184	179	438	125	186	169	602	520	811	340
Biological Oxygen Demand, mg/l	A	0.8	1.0	0.3	1.0	0.6	1.4	1.9	1.6	1.6	1.4	2.1	0.7	0.6	0.6	0.5
	O	0.8	1.0	1.2	1.0	0.9	0.7	0.6	0.7	0.8	0.3	1.1	0.2	0.4	0.9	0.2
Chemical Oxygen Demand, mg/l	A	5.7	7.6	3.8	7.6	7.6	7.6	9.5	15.2	11.4	7.6	17.1	11.8	3.9	3.9	11.8
	O	10.1	8.1	4.0	6.1	6.1	8.0	12.0	4.0	6.0	12.0	2.0	3.6	5.4	3.6	5.4
Turbidity, NTU (10)	A	5	60	1	18	40	6	66	74	52	64	14	8	7	8	7
	O	3.8	3.2	4.1	4.8	2.1	2.2	4.8	4.2	3.8	4.2	3.6	3.2	4.1	3.9	3.4
Total Dissolved Solids, mg/l (2000)	A	275	177	95	221	150	181	124	286	118	117	135	542	389	1017	164
	O	323	163	108	184	179	119	113	259	76	117	104	395	363	561	179
Total Fixed Solids, mg/l	A	276	210	88	214	162	108	158	316	132	146	140	532	378	960	174
	O	317	158	102	178	170	101	128	267	77	126	98	362	342	520	178
Total Alkalinity, mg/l (600)	A	382	112	56	126	118	16	24	100	16	44	16	272	200	260	72
	O	76	98	68	96	124	46	68	110	24	76	88	164	134	148	98
T. Hardness (as CaCO ₃), mg/l (600)	A	72	112	50	112	100	46	24	98	34	38	44	260	184	460	74
	O	80	92	62	110	130	46	74	98	40	86	90	218	162	230	80

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Ca, mg/l (200)	A	15.2	27.2	15.2	22.4	24	9.6	4.8	24	8.8	10.4	8	48.8	35.2	80	12.8
	O	19.2	27.2	19.2	24.8	28.8	9.6	20.8	24	10.4	21.6	24.8	52	41.6	63.2	19.2
Mg, mg/l(100)	A	8.3	10.7	2.9	13.6	9.7	5.4	2.9	9.3	2.9	2.9	5.8	36.1	23.4	63.4	10.2
	O	7.8	5.8	3.4	11.7	14.1	5.4	5.4	9.3	3.4	7.8	6.8	21.4	14.1	17.5	7.8
Chloride, mg/l (1000)	A	110.5	28.8	14.4	46.9	13.4	32.8	53.8	94.2	44.2	14.4	44.8	129.7	81.7	264.3	40.4
	O	125	28	14	32	24	26	8	72	8	16	3	82	98	145	42.0
Sulphate, mg/l (400)	A	7.13	8.61	9.11	15.45	5.64	8.50	5.94	9.50	8.50	11.03	13.86	55.16	34.21	181.91	3.82
	O	5.2	7.7	10.7	16.1	5.7	9.5	12.7	11.1	12.3	7.5	6.2	66.6	32.3	110.6	4.5
Nitrate as NO ₃ , mg/l (45)	A	1.0	2.5	2.2	2.7	3.1	38.7	5.6	22.3	2.4	2.1	40.8	47.9	26.6	50.7	3.9
	O	46.0	1.2	3.2	21.8	3.3	44.5	19.8	41.0	30.9	10.7	1.2	59.0	54.7	51.4	6.3
Ammonium-N, mg/l	A	0.392	0.560	1.290	0.168	0.224	0.448	0.336	0.672	0.672	0.224	0.784	0.224	0.336	0.336	0.112
	O	0.112	0.224	0.112	0.112	0.112	0.224	0.392	0.224	0.112	0.448	0.112	0.336	0.336	0.336	0.336
Total Kjeldahl Nitrogen, mg/l	A	5.04	1.12	3.36	3.36	2.24	3.36	1.68	1.68	3.36	4.48	2.80	1.68	0.84	1.12	1.12
	O	2.2	2.8	2.2	2.8	1.7	1.7	2.2	3.9	2.8	2.8	1.7	2.2	1.7	1.7	1.7
Fluoride, mg/l (1.5)	A	0.302	0.209	0.129	0.644	0.225	0.166	0.103	0.145	0.133	0.112	0.161	0.102	0.191	0.164	0.161
	O	0.168	0.184	0.141	0.132	0.214	0.146	0.161	0.122	0.184	0.138	0.154	0.164	0.148	0.122	0.146
Phosphate-P, mg/l	A	0.031	0.025	0.011	0.062	0.019	0.015	0.043	0.013	0.037	0.025	0.035	ND	ND	ND	ND
	O	0.036	0.022	0.020	0.028	0.046	0.061	0.166	0.072	0.046	0.124	0.154	0.182	0.206	0.146	0.064
Sodium, mg/l	A	64.8	17.8	8.4	28.7	9.0	16.6	29.1	52.3	26.1	8.4	26.4	71.1	48.6	171.1	26.6
	O	76.8	15.4	7.6	18.9	11.2	14.2	4.6	45.8	4.9	8.4	1.3	46.8	56.2	86.4	25.2
Potassium, mg/l	A	3.1	3.1	1.9	2.2	2.6	5.2	4.3	15.3	4.1	0.9	5.2	23.6	16.0	33.6	8.7
	O	12.6	4.6	2.3	6.7	2.4	2.8	1.6	9.4	1.3	2.4	0.9	8.9	12.6	22.4	7.2
Boron, mg/l (5.0)	A	0.045	0.023	0.019	0.011	0.034	0.007	0.026	0.057	0.019	0.015	0.034	0.121	0.128	0.333	0.204
	O	0.048	0.036	0.026	0.016	0.032	0.042	0.026	0.008	0.016	0.024	0.083	0.084	0.068	0.098	0.096
Chromium (VI), mg/l (0.05)	A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	O	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium, Total, mg/l	A	0.012	0.02	0.025	0.038	0.046	0.036	0.056	0.028	0.026	0.02	0.01	0.02	0.01	0.017	0.015
	O	0.046	0.052	0.048	0.036	0.054	0.024	0.044	0.032	0.038	0.054	0.036	0.048	0.037	0.064	0.026
Iron, Total, mg/l (1.0)	A	1.267	11.27	0.648	2.035	2.554	2.635	19.565	8.736	10.963	45.984	2.294	0.552	0.43	0.931	0.451
	O	4.74	2.64	9.56	4.61	3.98	11.21	5.69	9.28	13.24	6.78	4.32	0.69	0.51	0.87	1.14

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Nickel , mg/l	A	0.005	0.003	0.005	0.005	0.007	0.005	0.003	0.008	0.003	0.001	0.002	0.009	0.008	0.008	0.005
	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper, mg/l(1.5)	A	0.002	0.001	0.002	0.002	0.002	0.002	0.007	0.003	0.009	0.002	0.003	0.002	0.000	0.001	0.001
	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc, mg/l (15)	A	0.008	0.003	0.005	0.006	0.008	0.002	0.003	0.008	0.016	0.018	0.004	0.010	0.004	0.014	0.002
	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, mg/l (0.01)	A	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.002	0.002
	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury, mg/l(0.001)	A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	O	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead, mg/l (0.05)	A	0.005	0.006	0.007	0.008	0.005	0.007	0.006	0.009	0.007	0.005	0.006	0.010	0.004	0.006	0.001
	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Coliform, MPN/100ml (10)	A	<2	4	<2	8	<2	<2	<2	240	<2	<2	<2	2	130	<2	<2
	O	<2	<2	<2	<2	<2	<2	<2	49	<2	<2	<2	<2	<2	<2	49
Fecal Coliform, MPN/100ml (Absent)	A	<2	2	<2	4	<2	<2	<2	79	<2	<2	<2	<2	49	<2	<2
	O	<2	<2	<2	<2	<2	<2	<2	23	<2	<2	<2	<2	<2	<2	17

BDL = Below Detection Limit

A : April

O : October

