Table – 1 (a) Water Quality of Bindusagar Pond with respect to Criteria parameters during 2014 (February- December)

Sl. No	Sampling 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)	pH	DO	BOD	TC	FC			
Bindusagar Pond (Bhubaneswar)															
1.	Lingaraj Temple side	11	7.9 (7.1 – 9.6)	6.6 (1.4 – 13.4)	2.6 (1.0 – 4.9)	65027 (3300 – 160000)	39246 (330 – 160000)	1 (9)	6 (54)	3 (27)	11 (100)	8 (73)	Does not conform to Class B	DO,BOD, TC,FC	Human activities
2.	Ananta Vasudev	11	7.9 (7.1 – 9.3)	6.6 (1.0– 14.9)	2.8 (1.0 – 4.1)	52709 (2800 – 160000)	27731 (940 – 160000)	1 (9)	4 (36)	5 (45)	11 (100)	10 (91)			
3.	Near Kedarnath Research Centre	11	7.8 (7.2 – 8.5)	6.6 (1.8 – 13.1)	3.1 (2.0 – 7.8)	39026 (490– 160000)	21473 (78– 92000)	0	4 (36)	3 (27)	10 (91)	8 (73)			
4.	Gyananagar	11	7.7 (7.2 – 8.2)	5.6 (1.6 – 9.3)	2.8 (1.2-4.4)	35000 (1300 – 160000)	25519 (230– 160000)	0	4 (36)	4 (36)	11 (100)	9 (82)			
***Class 'B'**			**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**		**2500 (Maximum Permissible)**	**Water use for organised outdoor bathing**							

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

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 - 1 (b) Water Quality of Religious Ponds in Puri with respect to Criteria parameters during 2014 (February- December)

Sl. No	Sampling 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												
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	pH	DO	BOD	TC	FC			
Ponds (Puri)															
1.	Narendra	11	8.7 (7.4 – 9.8)	11.2 (2.5 – 16.7)	11.2 (4.6 – 21.2)	6994 (230 – 35000)	3475 (78–24000)	7 (64)	1 (91)	11 (100)	10 (91)	3 (27)	Does not conform to Class B	pH, DO, BOD, TC,FC	Human activities
2.	Markanda	11	8.7 (7.6 – 10.4)	12.8 (3.9 – 19.2)	7.2 (3.2 – 13.8)	14485 (230 – 35000)	7950 (45–24000)	6 (55)	1 (91)	11 (100)	10 (91)	8 (73)			
3.	Indradyumna	11	8.3 (8.0-8.7)	7.1 (4.6 – 9.2)	5.0 (2.2 - 8.4)	10908 (490 – 24000)	4566 (230– 16000)	1 (91)	7 (64)	10 (91)	10 (91)	8 (73)			
4.	Swetaganga	11	8.3 (7.4 – 8.7)	8.5 (1.3 – 19.5)	9.4 (3.1 – 15.9)	8755 (210 – 35000)	3773 (130– 17000)	4 (36)	4 (36)	11 (100)	10 (91)	4 (36)			
5.	Parvati sagar	11	8.0 (7.0 – 8.6)	7.7 (2.9– 12.4)	13.1 (6.0 – 27.8)	26118 (3500– 92000)	10819 (310 –35000)	3 (27)	4 (36)	11 (100)	11 (100)	10 (91)			
***Class 'B'**			**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**		**2500 (Maximum Permissible)**	**Water use for organised outdoor bathing**							

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

NB : 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- 2 (a) Water quality of ponds with respect to other parameters during 2014 (February- December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents							
		Annual average values (Range of values)													
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)				(µS/cm)		(mg/l)					
Bindusagar Pond (Bhubaneswar)															
1.	Lingaraj Temple side	21 (9-43)	83 (54-120)	18.0 (5.5-34.3)	0.173 (0.056-0.336)	0.028 (0.001-0.222)	1.56 (0.056-3.08)	397 (318-521)	1.35 (0.96-1.85)	0.073 (0.003-0.189)	232 (172-296)	89 (60-122)	58.3 (31.4-97.9)	18.54 (9.57-28.97)	0.547 (0.384-0.718)
2.	Ananta Vasudev	19 (4-41)	88 (60-116)	16.5 (9.2-23.9)	0.173 (0.056-0.448)	0.019 (0.001-0.143)	1.48 (0.08-2.80)	408 (373-517)	2.06 (1.51-3.18)	0.060 (0.003-0.112)	238 (208-298)	91 (68-122)	58.1 (47.0-78.3)	17.55 (7.96-24.62)	0.567 (0.374-0.750)
3.	Near Kedarnath research Centre	28 (4-54)	86 (56-116)	17.5 (3.7-32.0)	0.183 (0.112-0.336)	0.008 (0.002-0.018)	1.63 (0.56-3.36)	395 (358-464)	1.97 (1.47-3.17)	0.060 (0.003-0.211)	231 (202-260)	89 (66-118)	55.7 (41.2-78.3)	17.83 (8.95-26.61)	0.542 (0.354-0.681)
4.	Gyananagar	22 (4-71)	96 (64-148)	18.8 (7.3-35.8)	0.275 (0.112-0.784)	0.009 (0.003-0.027)	1.88 (0.56-3.36)	423 (338-566)	2.13 (1.54-4.07)	0.055 (0.006-0.160)	244 (198-310)	94 (78-128)	60.1 (45.1-97.9)	17.91 (8.33-27.73)	0.551 (0.377-0.710)
***Class 'C'**		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

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

Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI)	T. Cr	Fe	Ni#	Cu#	Zn#	Cd#	Hg	Pb#
		(mg/l)		(mg/l)								
Bindusagar Pond (Bhubaneswar)												
1.	Lingaraj Temple side	7.037 (0.372-32.945)	0.130 (0.011-0.327)	0.010 (0.002-0.025)	0.037 (0.010-0.121)	0.603 (0.015-2.514)	0.010 (0.009-0.012)	0.011 (0.008-0.014)	0.015 (0.006-0.024)	0.0037 (0.0011-0.0064)	0.00020 (<0.00006-0.00076)	0.010 (0.010-0.011)
2.	Ananta Vasudev	8.098 (1.076-33.909)	0.105 (0.006-0.325)	0.010 (<0.002-0.025)	0.049 (0.003-0.220)	0.429 (0.082-1.410)	0.015 (0.009-0.021)	0.011 (0.009-0.012)	0.017 (0.006-0.028)	0.0032 (0.0019-0.0045)	0.00013 (<0.00006-0.00038)	0.014 (0.011-0.018)
3.	Near Kedarnath research Centre	8.755 (2.002-32.984)	0.190 (0.003-1.052)	0.012 (<0.002-0.033)	0.041 (0.015-0.080)	1.309 (0.036-8.339)	0.014 (0.013-0.014)	0.011 (0.009-0.014)	0.011 (0.004-0.018)	0.0035 (0.0013-0.0057)	0.00030 (<0.00006-0.00051)	0.011 (0.009-0.014)
4.	Gyananagar	8.787 (1.253-29.354)	0.238 (0.012-1.316)	0.011 (<0.002-0.025)	0.042 (0.013-0.091)	0.459 (0.071-0.938)	0.013 (0.011-0.015)	0.012 (0.010-0.015)	0.014 (0.006-0.022)	0.0040 (0.0012-0.0068)	0.00018 (<0.00006-0.00032)	0.010 (0.003-0.016)
***Class 'C'**		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

 # Data for the period February and March, 2014

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

Table- 2 (b) Water quality of ponds with respect to other parameters during 2014 (February- December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents							
		Annual average values (Range of values)													
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	EC (μS/cm)	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/l)		(mg/l)						(mg/l)					
Ponds (Puri)															
1.	Narendra	46 (16-190)	198 (80-244)	69.2 (26.9-127.6)	0.463 (0.112-1.176)	0.124 (0.011-0.588)	3.21 (1.40-6.44)	906 (583-1371)	2.90 (1.29-7.13)	0.097 (0.003-0.266)	539 (312-830)	180 (84-220)	169.1 (83.3-318.0)	27.18 (15.67-37.98)	0.204 (0.098-0.430)
2.	Markanda	21 (11-30)	182 (112-244)	43.4 (11.4-115.9)	0.361 (0.112-1.064)	0.123 (0.006-0.448)	2.44 (1.68-3.36)	755 (545-982)	1.63 (0.99-2.68)	0.088 (0.003-0.192)	446 (304-602)	182 (80-260)	117.5 (78.3-220.3)	30.39 (14.92-48.30)	0.285 (0.047-1.120)
3.	Indradyumna	18 (10-42)	119 (106-140)	33.0 (11.4-56.6)	0.316 (0.112-0.560)	0.036 (0.006-0.070)	2.37 (1.40-3.64)	669 (498-973)	1.64 (1.16-2.23)	0.073 (0.039-0.115)	400 (266-618)	92 (76-120)	141.0 (73.4-244.8)	13.03 (6.97-31.56)	0.192 (0.091-0.350)
4.	Swetaganga	22 (10-50)	227 (176-272)	42.2 (19.4-77.3)	0.789 (0.112-2.464)	0.114 (0.012-0.468)	3.46 (1.96-7.00)	1229 (972-1481)	1.66 (1.17-2.85)	0.126 (0.071-0.218)	714 (548-896)	217 (140-264)	239.5 (176.8-366.9)	45.69 (29.10-63.68)	0.126 (0.057-0.280)
5.	Parvati sagar	35 (15-118)	101 (84-122)	79.6 (22.8-164.2)	0.535 (0.168-1.344)	0.033 (0.003-0.128)	3.39 (1.12-5.88)	593 (371-989)	1.56 (1.19-2.38)	0.078 (0.032-0.105)	355 (210-610)	97 (84-110)	120.6 (48.9-269.0)	20.12 (11.69-29.40)	0.163 (0.085-0.300)
***Class 'C'**		-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

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

Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO_3^-	PO_4^{3-}-P	Cr(VI)	T. Cr	Fe	Ni#	Cu#	Zn#	Cd#	Hg	Pb#
		(mg/l)		(mg/l)								
Ponds (Puri)												
1.	Narendra	9.438 (1.718-20.957)	0.449 (0.020-1.210)	0.014 (<0.002-0.026)	0.033 (0.011-0.055)	0.548 (<0.005-2.310)	0.027 (0.025-0.028)	0.026 (0.024-0.027)	0.035 (0.025-0.045)	0.0030 (0.0024-0.0036)	0.00027 (<0.00006-0.00057)	0.009 (0.008-0.010)
2.	Markanda	17.097 (1.187-41.487)	0.736 (0.004-2.319)	0.011 (<0.002-0.035)	0.050 (0.003-0.273)	1.108 (0.071-9.445)	0.021 (0.015-0.027)	0.006 (0.004-0.008)	0.030 (0.028-0.032)	0.0020 (0.0016-0.0023)	0.00035 (<0.00006-0.00110)	0.009 (0.009-0.009)
3.	Indradyumna	5.584 (2.241-13.228)	0.112 (0.011-0.560)	0.010 (<0.002-0.036)	0.033 (0.003-0.070)	1.233 (<0.005-6.060)	0.020 (0.014-0.026)	0.004 (0.002-0.006)	0.062 (0.045-0.078)	0.0019 (0.0010-0.0028)	0.00023 (<0.00006-0.00064)	0.011 (0.010-0.012)
4.	Swetaganga	22.690 (1.457-35.699)	0.439 (0.004-1.040)	0.009 (<0.002-0.035)	0.042 (0.003-0.111)	0.619 (0.020-4.682)	0.021 (0.015-0.027)	0.005 (0.001-0.009)	0.014 (0.011-0.016)	0.0026 (0.0025-0.0027)	0.00026 (<0.00006-0.00093)	0.004 (0.002-0.007)
5.	Parvati sagar	8.145 (2.161-16.209)	0.112 (0.006-0.298)	0.009 (<0.002-0.020)	0.038 (0.003-0.070)	0.509 (<0.005-3.917)	0.017 (0.015-0.018)	0.008 (0.002-0.015)	0.029 (0.024-0.034)	0.0013 (0.0012-0.0013)	0.00038 (<0.00006-0.00076)	0.007 (0.005-0.009)
***Class 'C'**				0.05	-	50	-	1.5	15.0	0.01	-	0.10

*** Tolerance limit for Inland Surface water bodies (IS-2296-1982)**

 # Data for the period February and March, 2014

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