

Water Quality of Canals with respect to Criteria parameters during 2017

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					DO	BOD	TC	FC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)								
Taladanda canal															
1.	Jobra*	8	8.0 (7.5-8.4)	7.6 (6.6-9.0)	0.8 (0.3-1.6)	9388 (2400-16000)	6588 (1300-16000)	0	0	6 ^{\$} (75) 8 ^{\$\$} (100)	4 (50)	Does not conform to Class B,C	TC,FC	Human activities	
2.	Ranihat*	8	8.1 (7.5-8.4)	7.0 (6.1-8.1)	1.9 (1.0-3.9)	144375 (35000-160000)	142125 (17000-160000)		1 (13)	8 ^{\$} (100) 8 ^{\$\$} (100)	8 (100)	Does not conform to Class B & C	BOD, TC,FC	Human activities and waste water of Cuttack town	
3.	Chatrabazar*	8	8.0 (7.4-8.4)	6.7 (5.3-8.2)	2.2 (1.4-3.9)	119875 (13000-160000)	90363 (7900-160000)	0	1 (13)	8 ^{\$} (100) 8 ^{\$\$} (100)	8 (100)		BOD, TC,FC		
4.	Nuabazar*	8	8.0 (7.2-8.4)	6.3 (4.0-7.6)	1.9 (1.1-2.8)	73613 (4900-160000)	52025 (3300-160000)	1 ^{\$\$} (13)	0	7 ^{\$} (88) 8 ^{\$\$} (100)	8 (100)	Does not conform to Class B & C	DO, BOD, TC,FC		
5.	Birribati*	8	8.1 (7.4-8.5)	6.6 (4.9-8.4)	1.3 (0.9-1.7)	41013 (4900-160000)	28275 (4900-92000)	1 ^{\$\$} (13)	0	7 ^{\$} (88) 8 ^{\$\$} (100)	8 (100)		DO, TC,FC		
6.	Atharabanki**	12	7.9 (7.3-8.5)	5.7 (3.6-8.0)	2.7 (0.5-5.8)	65275 (2200-160000)	45683 (790-160000)	2 ^{\$} (17) 4 ^{\$\$} (33)	6 (50)	8 ^{\$} (67) 12 ^{\$\$} (100)	9 (75)	Does not conform to Class B & C	DO, BOD, TC,FC	Human activities	
***Class 'C'			6.5-8.5	4 and above	3 or less	5000 or less	Drinking water source with conventional treatment followed by disinfection								
***Class 'B'			6.5-8.5	5 and above	3 or less	500 or less	Outdoor bathing								
Water quality criteria for bathing water			6.5-8.5	5 and above	3 or less		2500 (Maximum Permissible)	Water use for organised outdoor bathing (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)							

* Data for the period February-May, July, Sep-Nov, 2017

** Data for the period January-December, 2017

*** Tolerance limits for Inland Surface water bodies (IS-2296-1982) \$ for Class C and \$\$ for Class B

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis: (Ref : IS 2296-1982 foot note)

For Class B : TC values with more than 5% of samples show more than 2000 MPN/100 ml and more than 20% of the samples show more than 500 MPN/ 100 ml.

For Class C : 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.

Contd..

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					DO	BOD	TC	FC			
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)							
(b) Puri canal														
1.	Hansapal*	9	8.1 (7.6-8.3)	8.0 (5.1-15.2)	1.2 (0.3-3.7)	28533 (1100- 160000)	22706 (45-160000)	0	1 (11)	7 ^{\$} (78) 9 ^{\$\$} (100)	5 (56)	Does not conform to Class B,C	BOD, TC,FC	Human activities
2.	Jagannathpur*	9	7.8 (7.3-8.3)	6.6 (4.4-7.6)	1.1 (0.5-2.0)	15007 (560-54000)	5212 (1.8-17000)	1 ^{\$\$} (11)	0	6 ^{\$} (75) 9 ^{\$\$} (100)	5 (56)	Does not conform to Class B & C	DO, TC,FC	Human activities and waste water of Cuttack town
3.	Chandanpur**	7	8.2 (8.0-8.4)	6.5 (4.8-8.6)	1.2 (0.9-1.5)	5453 (170-16000)	2478 (78-9200)	1 ^{\$\$} (17)	0	2 ^{\$} (29) 6 ^{\$\$} (86)	2 (29)		DO, TC,FC	
***Class 'C'			6.5-8.5	4 and above	3 or less	5000 or less		Drinking water source with conventional treatment followed by disinfection						
***Class 'B'			6.5-8.5	5 and above	3 or less	500 or less		Outdoor bathing						
Water quality criteria for bathing water			6.5-8.5	5 and above	3 or less		2500 (Maximum Permissible)	Water use for organised outdoor bathing (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)						

* Data for the period April-December, 2017

** Data for the period May, July-December, 2017

*** Tolerance limits 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: (Ref : IS 2296-1982 foot note)

For Class B : TC values with more than 5% of samples show more than 2000 MPN/100 ml and more than 20% of the samples show more than 500 MPN/ 100 ml.

For Class C : 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.

Sl. No	Sampling 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 (mg/l)						
(a) Taladanda canal												
1.	Jobra*	8	8.0 (7.5-8.4)	188 (117-220)	0.36 (0.17-0.46)	0.093 (0.004-0.249)	0	0	0	Conform to Class E		
2.	Ranihat*	8	8.1 (7.5-8.4)	201 (158-239)	0.36 (0.25-0.51)	0.104 (0.007-0.221)	0	0	0			
3.	Chatrabazar*	8	8.0 (7.4-8.4)	201 (165-239)	0.36 (0.21-0.58)	0.097 (0.004-0.189)	0	0	0			
4.	Nuabazar*	8	8.0 (7.2-8.4)	203 (161-253)	0.35 (0.28-0.52)	0.132 (0.004-0.316)	0	0	0			
5.	Birribati*	8	8.1 (7.4-8.5)	208 (163-239)	0.38 (0.22-0.65)	0.106 (0.007-0.256)	0	0	0			
6.	Atharabanki**	12	7.9 (7.3-8.5)	1836 (169-18370)	3.99 (0.25-33.11)	0.118 (0.004-0.864)	1 (8)	1 (8)	0			
(b) Puri canal												
1.	Hansapal#	9	8.1 (7.6-8.3)	184 (152-225)	0.37 (0.21-0.67)	0.022 (0.007-0.049)	0	0	0	Conform to Class E		
2.	Jagannathpur#	9	7.8 (7.3-8.3)	186 (124-246)	0.33 (0.29-0.46)	0.031 (0.004-0.067)	0	0	0			
3.	Chandanpur##	7	8.2 (8.0-8.4)	196 (161-235)	0.33 (0.22-0.47)	0.050 (0.014-0.112)	0	0	0			
*** Class 'E'			6.5-8.5	2250 or less	26 or less	2 or less				Irrigation, Industrial Cooling or controlled waste disposal		

* Data for the period February-May, July, Sep-Nov, 2017 ** Data for the period January-December, 2017

Data for the period April-December, 2017

Data for the period May, July-December, 2017

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

Water Quality of Taladanda Canal with respect to other parameters during 2017

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents				
		Annual average values (Range of values)										
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)				(mg/l)				
(a) Taladanda Canal												
1.	Jobra*	16 (2-54)	78 (46-96)	8.0 (5.43-11.0)	0.185 (0.056-0.460)	0.011 (0.002-0.035)	2.80 (0.56-10.36)	114 (78-138)	75 (44-90)	10.87 (5.99-15.99)	11.6 (7.0-20.4)	0.32 (0.23-0.43)
2.	Ranihat*	27 (7-62)	87 (70-92)	13.9 (7.3-22.2)	0.271 (0.056-0.770)	0.017 (0.003-0.050)	2.63 (1.12-6.16)	119 (99-137)	79 (66-88)	11.24 (6.99-16.99)	9.6 (6.8-13.3)	0.32 (0.21-0.42)
3.	Chhatrabazar*	22 (4-60)	82 (66-92)	15.7 (7.3-22.2)	0.322 (0.056-1.400)	0.019 (0.004-0.091)	3.40 (0.56-7.28)	117 (98-135)	77 (64-90)	10.62 (5.99-15.99)	10.7 (5.6-17.7)	0.32 (0.23-0.50)
4.	Nuabazar*	24 (2-70)	83 (64-96)	15.1 (7.3-27.8)	0.414 (0.056-1.400)	0.024 (0.002-0.091)	3.54 (0.56-7.84)	122 (104-146)	79 (66-96)	11.37 (6.99-17.99)	12.7 (7.2-20.8)	0.32 (0.22-0.47)
5.	Biribati*	29 (2-78)	86 (68-100)	9.8 (7.3-11.8)	0.280 (0.056-0.670)	0.024 (0.003-0.104)	2.59 (0.56-6.72)	123 (92-146)	80 (66-96)	12.36 (5.99-21.96)	11.3 (6.8-15.0)	0.32 (0.23-0.45)
6.	Atharabanki**	44 (10-206)	93 (56-128)	23.0 (5.0-60.2)	0.308 (0.055-1.456)	0.023 (0.001-0.182)	2.54 (0.56-8.96)	1275 (99-13100)	264 (56-2200)	568.3 (7.99-6262.4)	192.1 (2.54-2139.0)	0.54 (0.30-0.91)
	***Class 'C'	-	-	-	-	-	-	1500	-	600	400	1.5
	***Class 'E'	-	-	-	-	-	-	2100	-	600	1000	-

* Data for the period February-May, July, Sep-Nov, 2017

** Data for the period January-December, 2017

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

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents				
		Annual average values (Range of values)										
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)				(mg/l)				
(b) Puri Canal												
1.	Hansapal*	54 (8-144)	74 (48-100)	10.7 (6.7-17.5)	0.210 (0.056-0.450)	0.014 (0-0.044)	2.24 (0.28-6.16)	108 (88-132)	72 (54-88)	11.21 (5.99-17.99)	9.7 (5.5-13.6)	0.32 (0.22-0.58)
2.	Jagannathpur*	47 (6-114)	80 (48-114)	12.0 (5.5-19.3)	0.666 (0.056-3.360)	0.023 (0.001-0.134)	3.52 (0.56-10.08)	110 (72-146)	73 (52-94)	9.88 (7.99-14.99)	8.8 (4.4-13.9)	0.31 (0.21-0.46)
3.	Chandanpur**	50 (12-100)	75 (60-86)	10.2 (7.1-15.5)	0.271 (0.056-1.120)	0.019 (0.005-0.056)	2.28 (0.28-7.84)	114 (98-139)	77 (64-100)	10.99 (5.99-17.99)	11.5 (6.99-17.41)	0.27 (0.22-0.32)
***Class 'C'		-	-	-	-	-	-	1500	-	600	400	1.5
***Class 'E'		-	-	-	-	-	-	2100	-	600	1000	-

* Data for the period April-December, 2017

** Data for the period May, July-December, 2017

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

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)										
(a) Taladanda Canal												
1.	Jobra*	1.639 (0.551-4.352)	0.072 (0.002-0.380)	0.005	0.013	0.670	0.002	0.003	0.009	0.0011	<0.00006	0.005
2.	Ranihat*	2.670 (0.559-4.860)	0.230 (0.002-1.211)	0.005	0.015	0.810	0.009	0.007	0.018	0.0019	0.00019	0.008
3.	Chhatrabazar*	2.602 (0.645-4.539)	0.162 (0.002-0.575)	0.005	0.013	0.380	0.003	0.003	0.047	0.0016	0.00013	0.011
4.	Nuabazar*	3.582 (0.928-5.187)	0.185 (0.022-0.773)	0.007	0.018	0.170	0.003	0.004	0.019	0.0019	<0.00006	0.005
5.	Biribati*	3.404 (0.962-9.060)	0.204 (0.002-0.886)	0.005	0.02	1.230	0.003	0.006	0.004	0.0019	<0.00006	0.006
6.	Atharabanki**	4.846 (0.152-15.038)	0.296 (0.002-0.774)	0.005	0.024	0.950	0.005	0.009	0.011	0.0018	0.00013	0.019
***Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
***Class 'E'		-	-	-	-	-	-	-	-	-	-	-

* Data for the period February-May, July, Sep-Nov, 2017

** Data for the period January-December, 2017

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

Data for the period April, 2017

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)								
(b) Puri canal												
1.	Hansapal*	2.629 (0.413-10.499)	0.059 (0.002-0.137)	0.022	0.04	0.170	0.006	0.004	0.014	0.0016	0.00013	0.005
2.	Jagannathpur*	2.923 (0.517-8.584)	0.118 (0.002-0.477)	0.008	0.024	0.200	0.004	0.003	0.018	0.0019	0.00013	0.005
3.	Chandanpur**	3.931 (0.943-10.091)	0.229 (0.003-0.630)	0.005	0.019	0.140	0.008	0.005	0.038	0.0016	0.00032	0.009
***Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
***Class 'E'		-	-	-	-	-	-	-	-	-	-	-

* Data for the period April-December, 2017

** Data for the period May, July-December, 2017

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

Data for the period April, 2017