

Water Quality of Canals with respect to Criteria parameters during 2018 (January-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					DO	BOD	TC	FC			
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)							
Taladanda canal														
1.	Jobra*	3	7.7 (7.3-8.1)	7.9 (6.6-8.8)	1.1 (0.7-1.6)	16133 (2400-35000)	13030 (790-35000)	0	0	2 ^s (67) 3 ^{ss} (100)	2 (67)	Does not conform to Class B,C	TC,FC	Human activities
2.	Ranihat*	3	7.7 (7.6-7.9)	7.2 (6.6-8.2)	1.7 (1.1-2.5)	160000 (160000-160000)	160000 (160000-160000)	0	0	3 ^s (100) 3 ^{ss} (100)	3 (100)	Does not conform to Class B & C	TC,FC	Human activities and waste water of Cuttack town
3.	Chatrabazar*	3	7.7 (7.7-7.8)	6.9 (6.2-8.1)	1.8 (1.1-3.2)	114667 (92000-160000)	92000 (92000-92000)	0	1 (33)	3 ^s (100) 3 ^{ss} (100)	3 (100)		BOD, TC,FC	
4.	Nuabazar*	3	7.5 (7.0-7.8)	7.2 (6.8-8.0)	1.6 (0.8-2.2)	95667 (35000-160000)	80667 (28000-160000)	0	0	3 ^s (100) 3 ^{ss} (100)	3 (100)	Does not conform to Class B & C	TC,FC	
5.	Birribati*	3	7.6 (7.3-7.7)	6.6 (5.9-7.8)	2.3 (1.5-3.3)	112000 (16000-160000)	76667 (16000-160000)	0	1 (33)	3 ^s (100) 3 ^{ss} (100)	3 (100)		BOD, TC,FC	
6.	Atharabanki	12	7.8 (7.2-8.2)	6.5 (1.4-8.2)	1.7 (0.8-5.7)	18843 (330-92000)	9502 (110-54000)	0	1 (8)	6 ^s (50) 9 ^{ss} (75)	6 (50)	Does not conform to Class B & C	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 January, August and October, 2018

*** 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.

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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*	11	7.7 (6.7-8.4)	7.8 (6.2-13.3)	1.5 (0.7-4.9)	4981 (790-16000)	2341 (330-9200)	0	1 (9)	3 [§] (27) 12 ^{§§} (100)	2 (18)	Does not conform to Class B,C	BOD, TC,FC	Human activities	
2.	Jagannathpur	12	7.8 (6.8-8.2)	7.0 (4.6-9.6)	1.7 (0.6-4.0)	5503 (330-16000)	2578 (130-9200)	0 [§] 1 ^{§§} (9)	1 (9)	3 [§] (25) 11 ^{§§} (92)	4 (33)	Does not conform to Class B & C	DO, BOD, TC,FC	Human activities	
3.	Chandanpur**	11	7.9 (7.4-8.6)	6.2 (2.9-8.9)	1.1 (0.4-2.0)	3434 (140-16000)	1678 (40-9200)	1 [§] (9) 3 ^{§§} (27)	0	2 [§] (18) 8 ^{§§} (73)	2 (18)		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 January-December, 2018 excluding March ** Data for the period January-December, 2018 excluding January

*** 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.

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*	3	7.7 (7.3-8.1)	190 (174-199)	0.44 (0.33-0.50)	0.0 (0.014-0.06)	0	0	0	Conform to Class E		
2.	Ranihat*	3	7.7 (7.6-7.9)	192 (184-198)	0.42 (0.35-0.49)	0.0 (0.01-0.46)	0	0	0			
3.	Chatrabazar*	3	7.7 (7.7-7.8)	199 (195-202)	0.51 (0.34-0.63)	0.1 (0.063-0.091)	0	0	0			
4.	Nuabazar*	3	7.5 (7.0-7.8)	195 (177-208)	0.38 (0.29-0.51)	0.1 (0.038-0.091)	0	0	0			
5.	Birribati*	3	7.6 (7.3-7.7)	220 (154-299)	0.78 (0.35-1.49)	0.1 (0.035-0.077)	0	0	0			
6.	Atharabanki**	12	7.8 (7.2-8.2)	343 (139-984)	1.59 (0.30-8.32)	0.0 (0.004-0.224)	0	0	0			
(b) Puri canal												
1.	Hansapal#	11	7.7 (6.7-8.4)	191 (134-248)	0.65 (0.22-3.60)	0.1 (0.01-0.256)	0	0	0	Conform to Class E		
2.	Jagannathpur	12	7.8 (6.7-8.4)	203 (161-284)	0.45 (0.28-0.82)	17.9 (0.003-143)	0	0	0			
3.	Chandanpur##	11	7.9 (7.4-8.6)	225 (153-326)	0.58 (0.23-1.88)	0.1 (0.03-0.126)	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 January, August, October, 2018 ** Data for the period January-December, 2018

Data for the period January-December, 2018 excluding March ## Data for the period January-December, 2018 excluding January

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

Water Quality of Taladanda Canal with respect to other parameters during 2018

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)				
1.	Jobra*	25 (4-50)	79 (68-94)	9.1 (7.5-11.2)	0.056 (0.056-0.056)	0.002 (0.001-0.004)	2.80 (1.12-5.60)	118 (106-127)	71 (66-76)	9.01 (7.40-9.99)	16.37 (8.58-24.87)	0.29 (0.25-0.33)
2.	Ranihat*	57 (7-146)	75 (68-82)	16.9 (8.5-27.3)	0.206 (0.056-0.450)	0.008 (0.001-0.018)	5.60 (3.36-8.96)	119 (112-126)	71 (66-74)	11.60 (9.30-13.50)	17.07 (13.30-22.38)	0.29 (0.26-0.33)
3.	Chhatrabazar*	39 (3-86)	79 (68-96)	15.4 (13.1-18.7)	0.246 (0.056-0.570)	0.008 (0.002-0.020)	5.79 (1.68-7.84)	124 (122-125)	74 (72-78)	11.71 (7.40-17.75)	17.78 (12.18-23.01)	0.29 (0.26-0.32)
4.	Nuabazar*	52 (5-96)	77 (64-84)	17.0 (13.1-19.3)	0.541 (0.168-1.230)	0.016 (0-0.043)	8.77 (3.92-15.12)	116 (106-122)	70 (64-74)	8.98 (8.30-9.64)	16.62 (11.69-21.51)	0.30 (0.26-0.33)
5.	Biribati*	41 (8-98)	72 (36-96)	19.6 (16.1-22.4)	0.559 (0.112-1.340)	0.016 (0.007-0.040)	5.71 (1.68-12.32)	134 (86-187)	68 (52-76)	20.97 (8.30-44.97)	17.16 (11.32-21.51)	0.29 (0.25-0.33)
6.	Atharabanki**	55 (7-120)	97 (48-176)	16.4 (7.6-57.8)	0.214 (0.056-0.900)	0.027 (0.001-0.224)	4.36 (0.56-12.88)	190 (76-655)	94 (52-188)	40.24 (7.71-299.85)	18.07 (4.10-66.90)	0.40 (0.19-0.60)
***Class 'C'		-	-	-	-	-	-	1500	-	600	400	1.5
***Class 'E'		-	-	-	-	-	-	2100	-	600	1000	-

* Data for the period January, August, October, 2018 ** Data for the period January-December, 2018

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

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)								
1.	Jobra*	1.385 (0.174-2.248)	0.048 (0.015-0.095)	Not analysed								
2.	Ranihat*	3.334 (2.781-4.116)	0.104 (0.019-0.186)	Not analysed								
3.	Chhatrabazar*	1.864 (1.015-3.105)	0.065 (0.019-0.150)	Not analysed								
4.	Nuabazar*	2.514 (2.117-3.262)	0.065 (0.022-0.150)	Not analysed								
5.	Biribati*	2.289 (2.003-2.598)	0.082 (0.014-0.141)	Not analysed								
6.	Atharabanki**	3.283 (0.833-12.595)	0.157 (0.002-1.199)	0.015	0.032	2.157	0.004	0.013	0.026	0.0008	<0.00006	0.009
***Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
***Class 'E'		-	-	-	-	-	-	-	-	-	-	-

* Data for the period January, August and October, 2018 ** Data for the period January-December, 2018

Data for the April, 2018 *** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

DO : Dissolved Oxygen, BOD : Biochemical Oxygen Demand, TC : Total Coliform, TSS : Total Suspended Solids; COD : Chemical Oxygen Demand, NH₄-N : Ammonical nitrogen, TKN : Total Kjeldahl Nitrogen; FC : Fecal Coliform, EC : Electrical Conductivity, TDS : Total Dissolved Solids, B : Boron ; SAR : Sodium Absorption Ratio, TH : Total hardness; Cl : chloride, SO₄ : sulphate; F : Fluoride; PO₄³⁻ : phosphate, : Cr(VI) : Hexavalent Chromium; T.Cr : total Chromium, Fe : Iron, Ni : Nickel, Cu : Copper, Zn : Zinc; Cd : cadmium; Hg : Mercury; Pb : Lead

Water Quality of Puri Canal with respect to other parameters during 2018

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)				
1.	Hansapal*	44 (11-120)	79 (60-100)	13.9 (5.7-41.2)	0.097 (0.056-0.220)	0.008 (0-0.036)	2.11 (0.28-5.04)	111 (68-145)	72 (52-88)	11.98 (7.40-20.20)	11.86 (4.85-19.65)	0.35 (0.22-0.64)
2.	Jagannathpur ^{\$}	45 (6-96)	77 (60-96)	16.4 (8.5-48.9)	0.149 (0.056-0.330)	0.014 (0-0.090)	2.36 (0.28-5.60)	119 (94-154)	72 (60-88)	14.58 (9.99-25.98)	12.91 (5.84-20.89)	0.33 (0.20-0.57)
3.	Chandanpur**	41 (14-80)	82 (60-98)	11.7 (7.8-17.8)	0.132 (0.056-0.224)	0.011 (0.001-0.055)	2.55 (0.56-11.20)	132 (92-184)	79 (60-94)	14.75 (7.71-41.97)	16.54 (6.22-26.86)	0.40 (0.21-0.61)
***Class 'C'		-	-	-	-	-	-	1500	-	600	400	1.5
***Class 'E'		-	-	-	-	-	-	2100	-	600	1000	-

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)								
1.	Hansapal*	2.411 (0.426-5.834)	0.117 (0.004-0.750)	0.015	0.032	2.157	0.004	0.013	0.026	0.0008	<0.00006	0.009
2.	Jagannathpur	2.183 (0.446-6.780)	0.095 (0.001-0.280)	<0.002	0.013	2.540	0.011	0.004	0.030	0.0007	0.00013	0.004
3.	Chandanpur**	2.269 (0.087-4.415)	0.333 (0.001-2.177)	<0.002	0.018	0.678	0.011	0.012	0.008	0.0006	0.00013	0.005
***Class 'C'		50	-	0.05	<0.002	50	-	1.5	15.0	0.01	-	0.10
***Class 'E'		-	-	-	-	-	-	-	-	-	-	-

* Data for the period January-December, 2018 excluding March

** Data for the period January-December, 2018 excluding January

\$ Data for the period January-December, 2018 ## Data for the April, 2018

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

