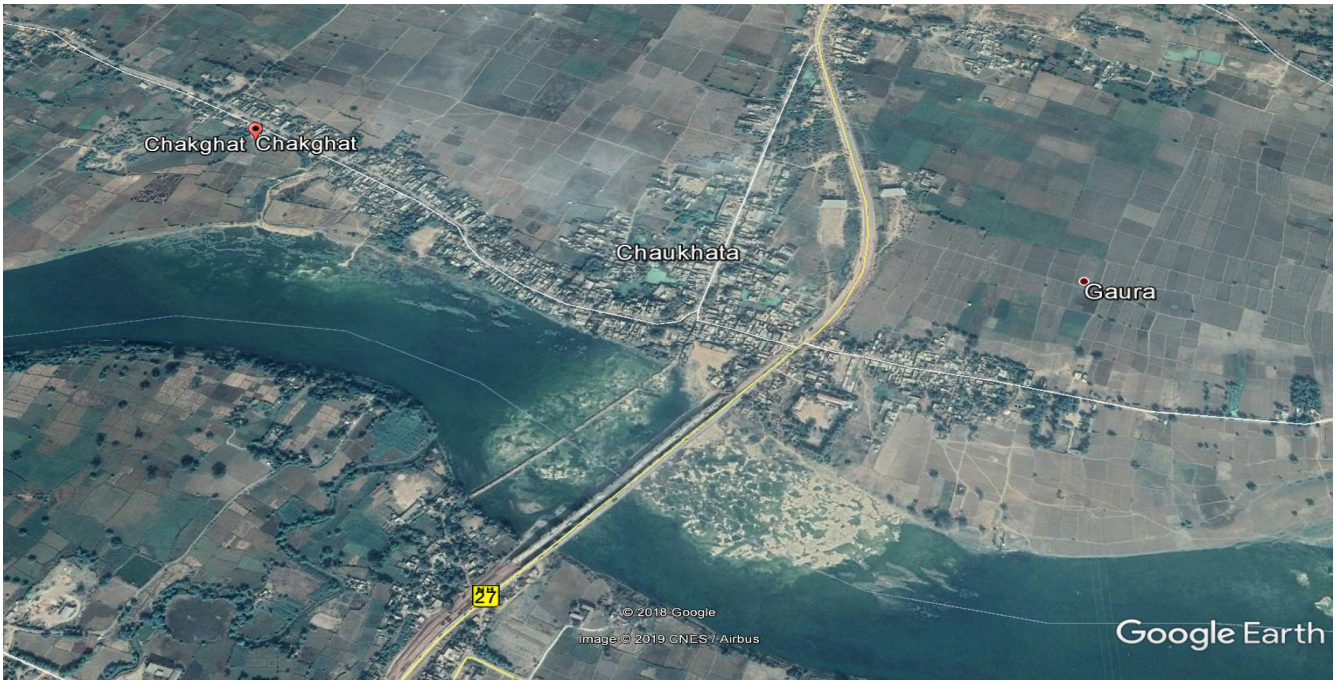
PROPOSED ACTION PLAN FOR CONTROL OF POLLUTION IN RIVER TONS AT CHAKGHAT, DISTT. REWA (M.P.)



Submit by

REGIONAL OFFICE
M.P. POLLUTION CONTROL BOARD
REWA (M.P.)

I N D E X

1.0 BACKGROUND

1.1 **NGT Case No. 673/2018** : Hon'ble National Green Tribunal Central Zonal Bench New Delhi, in the matter of original application no. 673/2018 *(News Item Published in the "Hindu" authored by Shri Jacob Koshy titled" More river stretches are now critically polluted: CPCB")* passed an order on 20/09/2018. The para 48, 49 and 50.3 of this order are relevant to comply. The para 48 states that *"it is absolutely necessary that Action Plans are prepared to restore the polluted river stretches to the prescribed standards"*. Para 49 states that *"Model Action Plan for Hindon River, already provided by CPCB, may also be taken into account"*

In para 50(i, ii, iii) Hon'ble National Green Tribunal has issued following directions:-

i. All States and Union Territories are directed to prepare action plans within two months for bringing all the polluted river stretches to be fit at least for bathing purposes (i,e BOD < 3 mg/L and FC < 500 MPN /100 ml) within six months from the date of finalization of the action plans.

ii. The action plans may be prepared by four-member Committee comprising, Director, and Environment. Director, Urban Development. Director, Industries. Member Secretary, State Pollution Control Board of concerned state. This Committee will also be the monitoring Committee for execution of the action plan. The Committee may be called "River Rejuvenation Committee" (RRC). The RRC will function under the overall supervision and coordination of Principal Secretary, Environment of the concerned State/Union Territory.

iii. The action plan will include components like identification of polluting sources including functioning/ status of STPs/ETPs/CETP and solid waste management and processing facilities, quantification and characterization of solid waste, trade and sewage generated in the catchment area of polluted river stretch. The action plan will address issues relating to; ground water extraction, adopting good irrigation practices, protection and management of Flood Plain Zones (FPZ), rain water harvesting, ground water charging maintaining minimum environmental flow of river and plantation on both sides of the river. Setting up of biodiversity parks on flood plains by removing encroachment shall also be considered as an important component for river rejuvenation. The action plan should focus on proper interception and diversion of sewage carrying drains to the Sewage Treatment Plant (STP) and emphasis should be on utilization of treated sewage so as to minimize extraction of ground or surface water. The action plan should have speedy, definite or specific timelines for execution of steps. Provision may be made to pool the resources,

utilizing funds from State budgets, local bodies, State Pollution Control Board/ Committee and out of Central Schemes.

EXECUTING SUMMARY

2. Basic Information About The Stretch :

Polluted River stretch/Length of River Tons at Chakhghat,Distt. Rewa:

(i) River Tons enters in Semariya Tehsil in Rewa district from Satna distt. The length of River Tons in Rewa district after entering from Satna Distt. is apprx.70-80 Kms. upto MP-UP border (Lat:25.0202N,Long: 81.4445E) near Chakghat.

(ii) During survey ,it was observed that in Tons rivers flow was apprx.1-2 Cusec in downstream due to Bakhiya Baraj dam .However in rainy season full flow remain in the river.

(iii) Beehar river meet Tons river at Chachai village in Sirmour Tahseel after making Chachai water fall, and these water diverted for used for Hydel Power generation .Hence rivers flow is completely nil except during rains.

ricity the Beehar water then mixes to River Tons in Downstream of Sirmour Hydel power project.

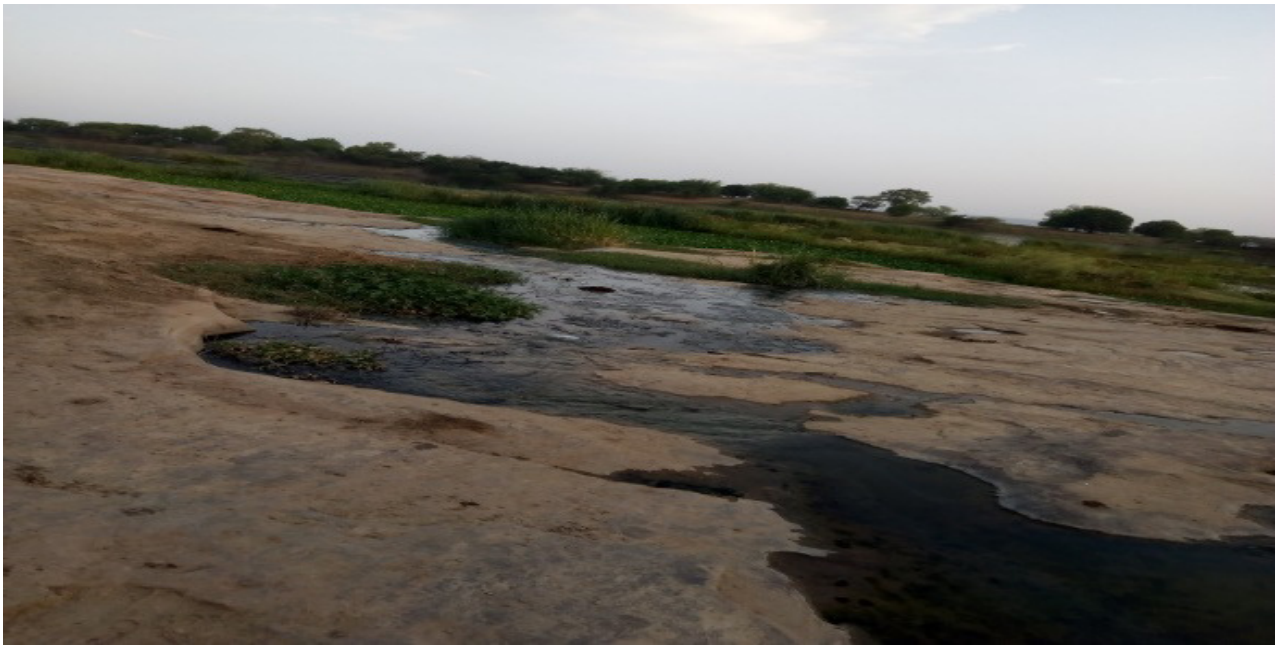
(iv) After Hydel Power generation water mixing in Tons river through Beehar canal , from this place the flow river is an average 102 Cusec during the whole year but in rainy season, it increases up to 325 Cusec .

(v) After the sangam of Beehar & Tons river in Sirmour Tahsel up to Chakghat area near M.P.-U.P. border, the length of Tamus River is apprx. 50Kms.

(vi) The various villages falling along the path of Tons river are mainly Patehra, Jawa, Chilla, Teonthar & Chakghat before entering into UP border. It is pertinent to mentioned that there is no villagese domestic waste water reaches in the River except in Chakghat.

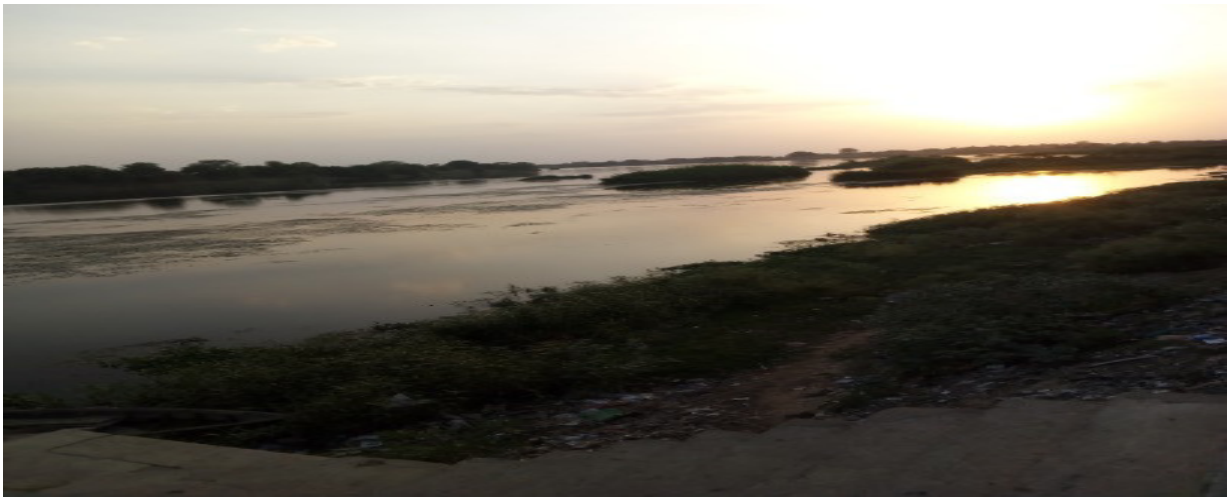
(Vii) In Chakghat before Allahabad-Rewa Rd. bridge, three nallahs were identified which enters into River Tons namely: (a) Khakkha nalla (wardNo.3) (latitude-25.0225N;

Longitude-81.4313) which is a natural nallah with less domestic waste water mixing into it .Flow is very nominal here.



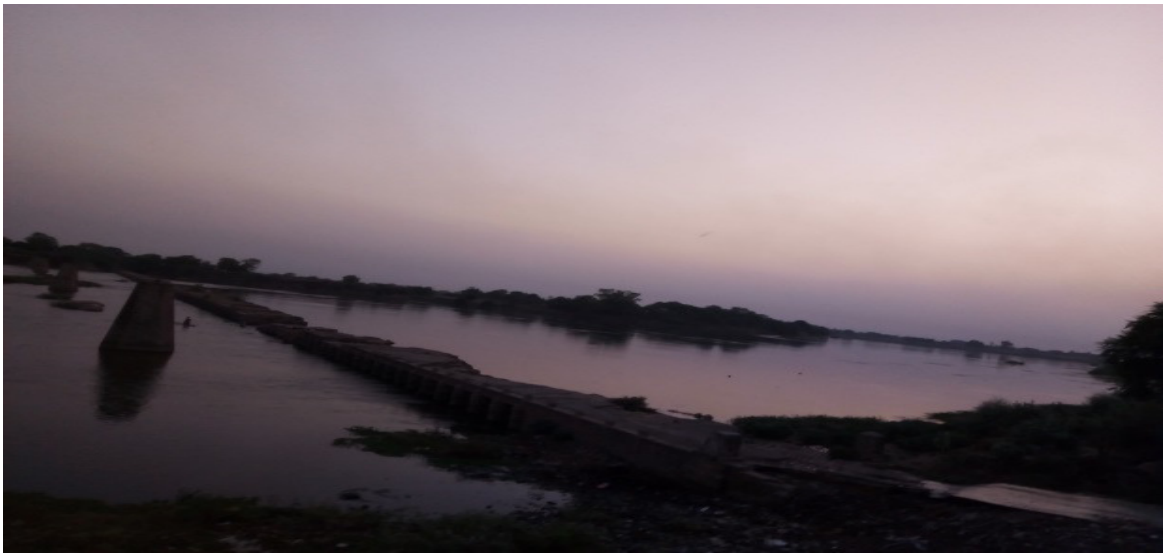
(Khakkha Nalla before mixing to River Tons at Chakghat(Ward No. 3)

(b) Nalla near purani galla mandi (ward No.4)(Latitude-25.0216N;Longitude-81.4340E).The flow of this nalla is also very less,however it carries mostly domestic waste water of nearby wards coming in left bank of river of Chakghat township .



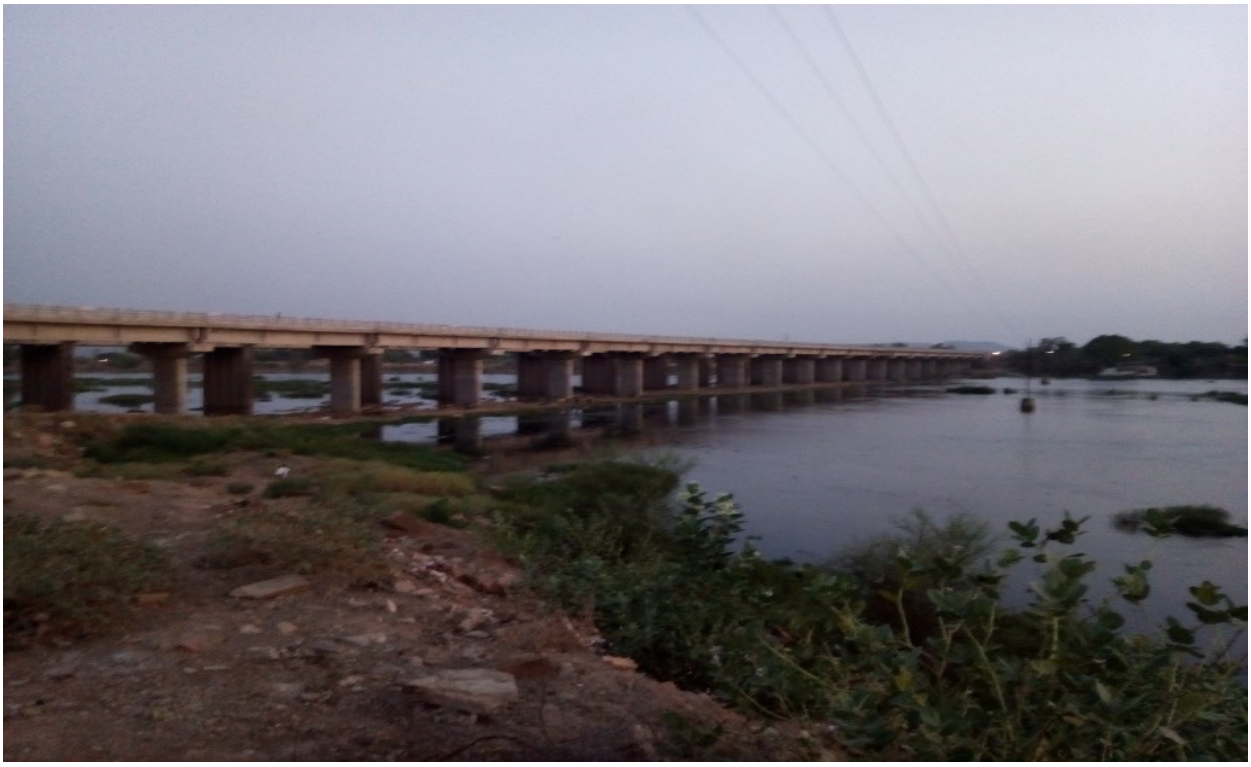
(River Tons at Chakghat near Purani GallaMandi nalla (ward No.4)

(c) The third nalla is located near Nehru Smarak degree College in ward No.11. (Latitude-25.0213 N & Longitude – 81.4348E) which cover nearby wards of Chakghat and its flow was seen in less amount .



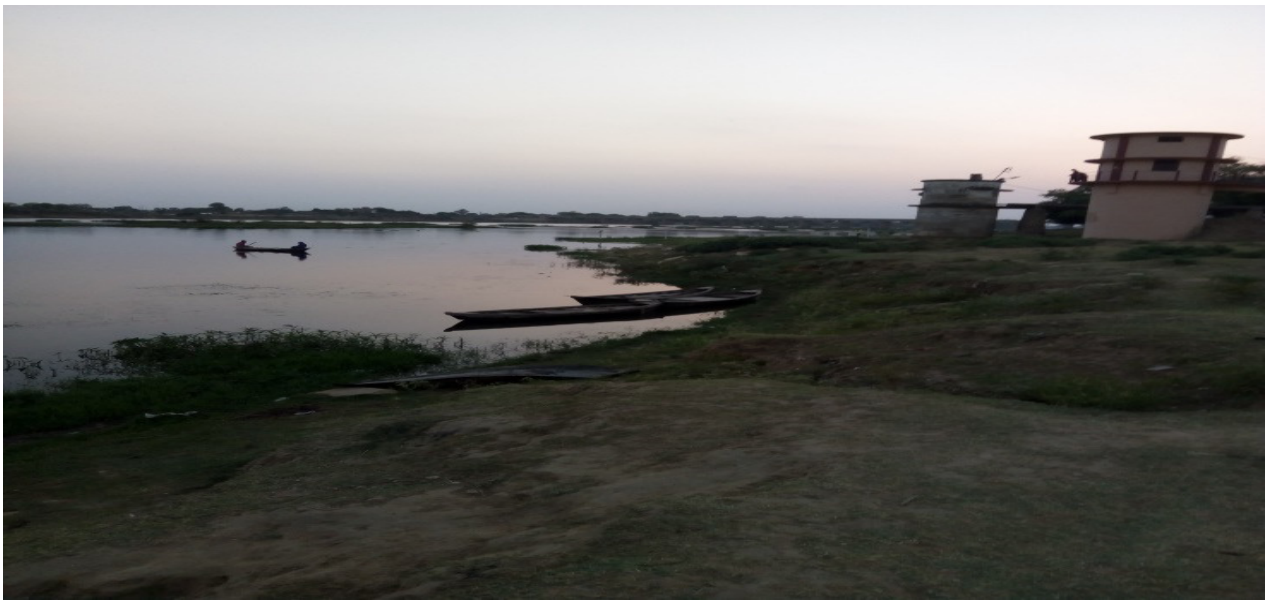
(River Tons at Chakghat ,near Nehru Smarak college nalla (ward No.9)

The flow in Tons river is sufficient to dilute the waste water discharging from these nallahs near Allahbad - Rewa Rd. bridge .The water quality near intake point ,which is approx. 1.5 Km. from the Nehru Smarak degree college, Chakghat, has been observed in A category as per IS-2296 throughout the year in 2018-19 (Report enclosed).



(River Tons at Chakghat ,nearRewa-Allahabad Rd. bridge)

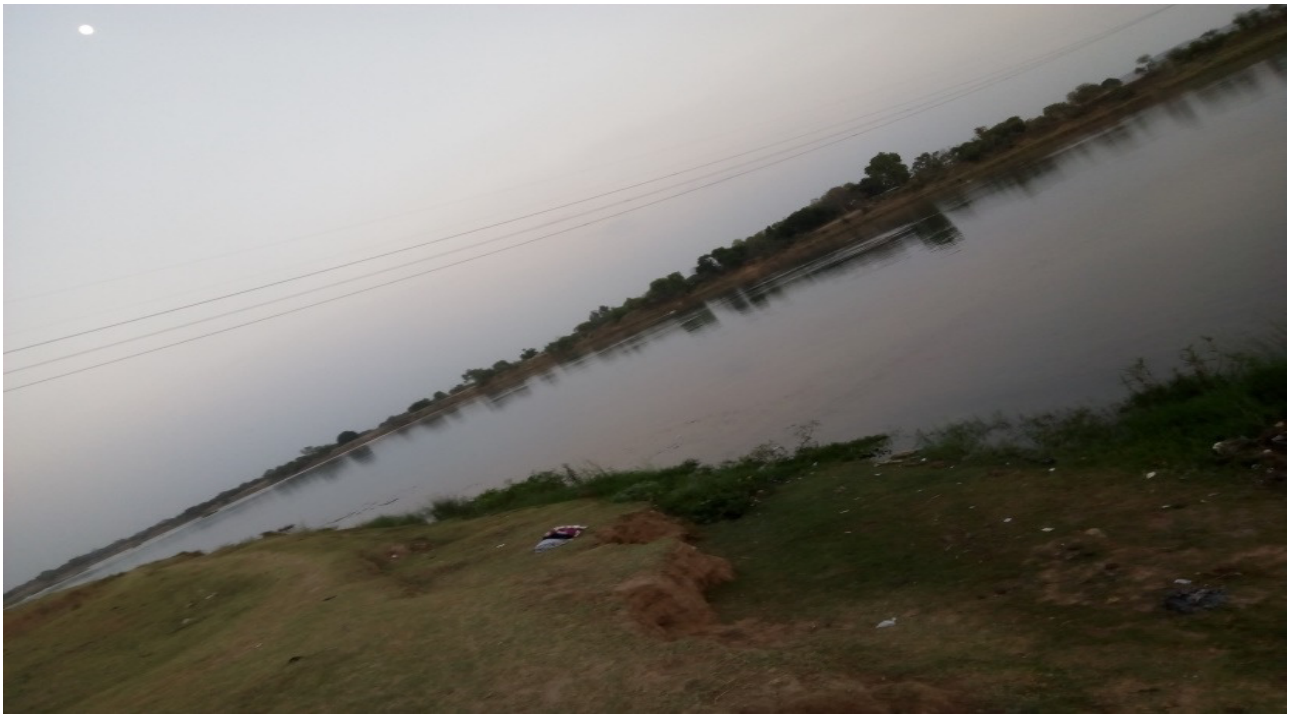
(viii) Pumping station near Allahabad-Rewa Rd .bridge treated water supplied to various area of Chakghat township.



(River Tons at Chakghat near Water Intake Point)

(ix)The stretch of River Tons in Chakghat area near Water intake point to near MP-UP boundary .At present the water quality of river is A category.

However, Nagar Parishad, Chakghat is taking steps to divert & channelized the municipal drains & construct STP to treat domestic sewage water, these activities will be completed within two year.



(River Tons at Chakghat near M.P.-U.P. boundary before mixing to River Belan in U.P)

(x) This is to maintained that the major quantity of water comes from River Beehar from Bansagar dam ,apprx.130 cubic meter (max.) into the Tons river hence the sufficient water flow in river.

4 . Inventory of sources of pollution:

a. Mainly the sewage of Chakghat area flows in the polluted river stretch.

b. Total Sewage generation of Chakghat =0.6 MLD.

c. No proposal for STP has been submitted by Nagar Parishad Chakghat.

5. **Action Plan For Rejuvenating River Tons:**

(a) Trapping the outfalls of domestic sewage from various nallas into the river through STP construction.

(b) No encroachment ware found on the bank of river Tons.

(c) Plantation has to be done with consultation of Forest department & Nagar Parishads with in two years.

(d) Regular monitoring is being carried out near Nagar Parishad pumping station ,at Chakghat near Rewa-Allahabad Rd. bridge, near M.P.-U.P. boundary as well as in U/s of river Tons at Chakghat, Jawa, Chilla & Patehara. The water quality has been observed in "A" category as per IS 2296 from 2016-17.(enclouser-1) .

(e) As per Hon'ble NGT's direction, an interdepartmental committee comprising of Collector, District Rewa, RO MPPCB, Rewa, Joint director Town & C P, Rewa & Executive Engineer, WRD, Rewa has to be set up so that action plan for rejuvenating river Tons in time bound manner.

Diversion Of Sewer outfalls & present proposed sewerage network :

S.No.	Action plan for rejuvenation of River Tons	Responsible agency	Time target for preparation of scheme	Present status
1.	Laying of sewerage network in various wards of Chakghat, Distt. Rewa	Nagar Parishad Chakghat	Apprx.2 years	-
2.	Plantation in the area	Forest department	Apprx.2 years.	-

Industrial effluent management:

In Chakghat no industry falls on the bank of Tons river. No CETP is either set up or under construction.In this region no Industry is discharging waste water effluent in water course .

6. Solid Waste management in Chakghat Nagar Parishad :

Type Of waste	Estimated Quantity	Detail of collection, Transportation, Treatment & Disposal	Detail of agency, capacity & Technology used	Status of compliance
Municipal Solid waste	2.4 TPD The area of Chakghat Nagar Parishad is 5.2 Sq.Km. & its population is 10,678 having 15 wards	1.100% door to door collection 2 .No.of green bins=10 No. of blue bins-10 Mode of transportation of waste to processing facility by vehicles.(01 Tractor, 15 containerized,02 Nos. ,tricycle, 12 Nos.-hand carts. Manual sweeping.	(a)Nagar parishad, Chakghat (b) Refuse Derived Fuel-2.4MT/D (d) Waste to Energy plant for processing ofapprx.340TPD waste is proposed in village Pahadiya, distt. Rewa (capacity of 6MW)	Common Solid Waste management facility for Rewa ,Satna & Sidhi districts for Waste to Energy plant of 6 MW is going to set up at Pahadiya village ,Distt. Rewa ,EC is awaited.

Bio Medical Waste :

S.No	Bio Medical Waste generated in Rewa city	Detail of CBWTF & disposal	Detail of agency, capacity & technology used	status of compliance
1.	Apprx. 5-10Kg/d from 05 HCFs of Chakghat	CBWTF at Satna **a**. All the 05 HCFs have taken membership of CBWTFin Rewa district **b**.100% collection in covered vehicles **c**.100% transportation to CBWTF at Satna.	M/s Indowater Waste Management & Pollution Control Corporation ,Satna Incinerator of 100Kg /hr. installed	Yes complying

7. Proposed action plan- Short term & Long term action and the identified authorities for initiating actions and the time limits for ensuring compliance.

The short term and long term action plans and the implementing agencies responsible for execution of the action plans and the time limits are given in table as below :-

Proposed Short Term and Long Term Action Plan for Rejuvenation of River Tons At Chakghat,Distt.Rewa

SI No.	Action plan for rejuvenation of river Tons	Organization/Agency Responsible for Execution of the Action Plan	Time Target (For Preparation of Scheme)	Present Status
I.	**Industrial Pollution Control**			
	(a) Construction of Effluent Conveyance System & CETP (Common Effluent Treatment Plant) for Chakghat	NA	NA	No CETP is set up in Chakghat as no major industry is set up along the bank of Tons River
	(b) Small scale/tiny and service providing units located in urban or semi-urban limits like Dairies. Auto Service Stations to have a minimum provision of O & G traps.	MPPCB	Within 06 month	Survey will be done by MPPCB along with Local administration.
	(c) Prohibition of Burning of any kind of waste including agro-residues	State Govt./District and Local authorities	Regularly	Govt. of M.P. has already issued prohibitory orders.
2	**Sewage Treatment & Disposal Plan**			
	No sewage Treatment Proposal submitted by Nagar Parishad ,Chakghat	Nagar Parishad Chakghat	proposal to be submitted within 01 year	-
				-
5.	**Implementation of Chakghat Sewerage project –Not applicable**			
5.1	**Interception & Diversion of Sewage with STP in river Tons**			
	(a) Laying of Sewer lines in the area	Nagar Palik Nigam,Rewa	proposal to be submitted within 01 year	
6.8	**Replacement of old Sewerage pipeline network. –No any old sewer pipeline in Chakghat**			
7.	**River front development of Tons river in Chakghat area-Not Applicable**			
III	**Ground water quality**			
	(a) To Conduct periodic	MPPCB and M.P.	Within 06	No major industries set

	surprise inspection of the industry to rule out any forceful injection of industrial effluents into groundwater resources	Ground Water Department	Months	up in this region.
IV	**Flood Plain Zone (FPZ)**			
	(a) Survey & Demarcation of FPZ of River Tons & Identification of encroachments.	District/Local administration	Within 06 Months	-
	(b) Checking encroachments in the FPZ of river Tons in Chakghat	District/Local administration	Within 06 Months	-
	(c) Notification of Flood plain Zone FPZ	State Government	Within 06 Months	-
	(d) Plantation in Flood plain Zone (FPZ)	M.P. State Forest Department	within one year	-
	(e) Prohibition of disposal of municipal plastic and biomedical waste particularly in drains	Local administration	Regularly	Disposal of Solid Waste in FPZ of rivers & Nallas already banned. The Nagar Palik Nigam is following practices in management of MSW
	E-Flow and Irrigation Practices			
	(a) Measurement of flow of Tons River and maintaining records	M.P. Irrigation Department /Nagar Nigam/ Local bodies	Regularly	-
	(b) To conserve water and good irrigation practices to be adopted by the farmers by organizing mass awareness programs and through media in vernacular language	M.P. State Irrigation and Agriculture Departments.& MPPCB	Regularly	General awareness programme will be conducted by MPPCB from time to time.

Action Plan for Ground water quality in catchment area of River Tons at Chakghat: No Under ground water pollution seen during survey.

Action Plan For Flood Plain Zone:

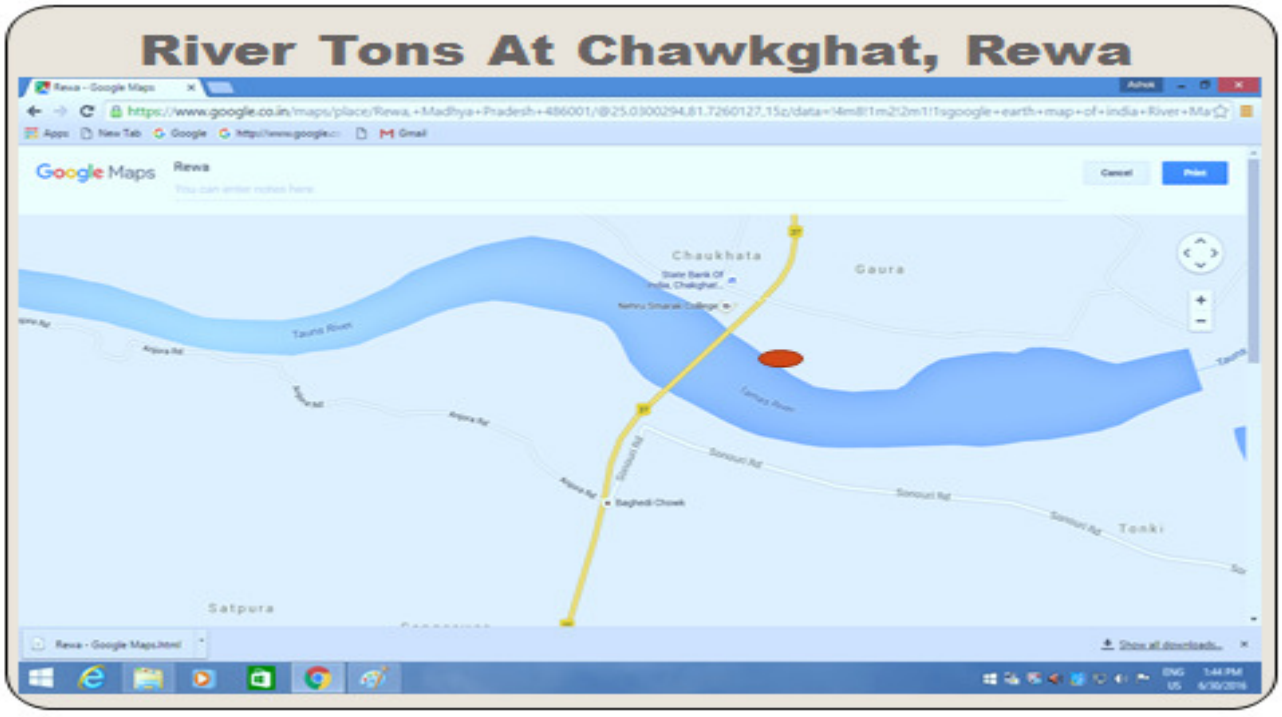
During rainy season, heavy rainfall as well as water discharge from Bakhiya Baraj in Tons river and heavy flow of Belan River from Uttar Pradesh causes back pressure in the area, thereby making it flood prone zone. Demarcation of Flood plain zone of River River Tons at Chakghat to be discussed with district/local administration for getting the area of Flood Plain zone notified.

Action Plan For Environmental Flow (E-Flow & Irrigation Practices) & Setting up of Biodiversity Park:

S.No.	Action plan for rejuvenation of River Tons at Chakghat	Responsible agency	Time target for preparation of scheme	Present status
1.	Removal of obstruction in upstream catchment of Tons river & cleaning of source channels	District Administration & ULB	- NA-	-
2.	Removal of encroachment if any	-do-	6 Month	As such there is no encroachment .how ever detail survey will be done and action taken accordingly
3.	Plantation in the area	Forest department	6 Month	-
4.	Repair of existing stop dams ,if any along the river Tons	-	-	No stop dam is in the river.
5.	To conserve water and good irrigation practices to be adopted by the farmers by organizing mass awareness programs and through media.	M.P. State Irrigation and Agriculture departments.	-	One year
6.	To set up Biodiversity park	-	-	-

Water Quality Of River Stretch / Main Drains Contributing Pollution (May 2019)

S.No.	River/Nallah	Flow	pH	BOD (Mg/L)	COD (mg/L)	TDS (Mg/L)
1.	River Tons near Intake point,Chakghat	Apprx.100 Cusic	7.58	1.3	6.49	282.0
2.	River Tons near MP-UP Boundary, Chakghat	-do-	7.48	1.1	4.64	275.0
3.	Nalla water sample near Nehru Smarak degree (ward No.11)college,	0.3 MLD	7.63	18.0	58.92	709.0
4.	Khakkanalla (ward No.3)	0.5	7.48	11.0	49.1	510.0
5.	Nalla near purani galla mandi(ward No.4)	0.1 MLD	7.56	13.0	68.74	619.0
6.	Underground water sample near Bus stand,Chakghat	-	7.10	0.9	4.91	688.0



क्षेत्रीय कार्यालय,
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क्रमांक/3388/क्षे.का/तक./प्रनिबो/2017 रीवा, दिनांक 06/12/17

प्रति,

मुख्य नगर पलिका अधिकारी
नगर पालिक परिषद चाकघाट रीवा
जिला–रीवा (म.प्र.)

विषय :– **नगर पलिक परिषद से विभिन्न वार्डों से उत्पन्न दूषित जल के लिए उपचार संयत्र बनाये जाने हेतु।**

सन्दर्भ :– (1) माननीय राष्ट्रीय हरित अधिकरण मे प्रचलित प्रकरण क्रमांक 200/2014, एम.सी. मेहता विरूद्ध भारत सरकार एवं अन्य।
(2) मुख्यालय का पत्र क्रमांक 365 दिनांक 27.11.2017।

उपरोक्त विषयान्तर्गत एवं संदर्भ मे आपको सूचित किया जाता है कि नगर परिषद चाकघाट के विभिन्न वार्डों से जनित घरेलू दूषित जल सीवेज के उपचार एवं प्रबंधन हेतु सीवेज ट्रीट प्लॉट का निर्माण कराया जाना अनिवार्य है। उल्लेखित है कि नगरीय निकाय को जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम 1974 की धारा 25/26 के तहत बोर्ड से सम्मति प्राप्त करना आवश्यक है एवं इसी कड़ी मे दूषित जल उपचार संयंत्र (एस टी पी) का निर्माण कराया जाना भी निहित है। विगत वर्षों मे निरीक्षण एवं मानीटरिंग के दौरान यह पाया गया है कि नगर के विभिन्न वार्डो से जनित दूषित जल सीवेज को सीधे टोन्स नदी में निस्सारित किया जा रहा है, जो कि जल अधिनियम 1974 के तहत वर्णित नियमों का उल्लंघन है। दूषित जल को बिना उपचार किये सीधे निस्सारण से नदी की जल गुणवत्ता प्रभावित होती है। टोन्स नदी गंगा बेसिन से लिंक अन्तर्राज्यीय नदी है जो कि अंतिम रूप से गंगा मे मिलती है। अतएव एन. जी.टी. के निर्देशों का पालन सुनिश्चित किया जाना अनिवार्य है। अतः आप 15 दिवस के अंदर दूषित जल उपचार संयंत्र (एस.टी.पी) के निर्माण हेतु प्रस्ताव अनुमोदित कराकर इस कार्यालय मे प्रस्तुत करें, तथा जल अधिनियम 1974 की धारा 25/26 के तहत सम्मति हेतु नियमानुसार आवेदन प्रस्तुत करें, अन्यथा जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम 1974 के प्रावधानों के तहत वैधानिक कार्यवाही की जावेगी, जिसकी समस्त जवाबदेही संबंधित नगरीय निकाय की होगी।

क्षेत्रीय अधिकारी
म.प्र.प्रदूषण नियंत्रण बोर्ड,
रीवा (म.प्र.)

पृ.क्रमांक/3389/क्षे.का/तक./प्रनिबो/2017 रीवा, दिनांक 06/12/17

प्रतिलिपि :–

1 – संयुक्त संचालक नगरीय प्रशासन रीवा संभाग रीवा की ओर कृपया सूचनार्थ एवं आवश्यक कार्यवाही हेतु सम्प्रेषित।
2 – मुख्य वैज्ञानिक अधिकारी, म.प्र.प्रदूषण नियंत्रण बोर्ड, भोपाल की ओर कृपया उपरोक्त संदर्भित पत्र के संबंध मे सूचनार्थ।

क्षेत्रीय अधिकारी
म.प्र.प्रदूषण नियंत्रण बोर्ड,
रीवा (म.प्र.)

manish Sharma

REGIONAL OFFICEM.P. POLLUTION CONTROL BOARD,REWA (M.P.)

River Tons At Chakghat ,near Pumping Station,Chakghat,Rewa(2017-18)

S.N		Unit															
			10.4.17	25.5.17	17.6.17	22.7.17	02.8.17	13.9.17	09.10.2017	14.11.17	05-12-17	03.01.18	03.02.18	01.03.18	Avg.	Max.	Min.
1	Appearence		Clear	Clear	Clear	Turbid	Turbid	Clear	clear	clear	clear	Clear	clear	clear			
2	Temperature	oC	31.5	32	28.5	26.7	32	32.5	29	29	24	20	22	23.5	27.558	32.5	20
3	Turbity	NTU	25	15	32	63	29	12	9	9	10	10	12	10	19.667	63	9
4	Colour	-	Colourless	CL	CL	Lmuddy	Lmuddy	CL	Colourless	Colourless	C.L.	CL	C.L.	C.L.			
5	Odour	-	Odourless	OL	OL	OL	OL	OL	Odourless	Odourless	O.L.	OL	O.L.	O.L.			
6	pH	-	7.6	7.61	7.69	7.71	7.5	7.44	7.59	7.59	7.65	7.4	7.42	7.6	7.5667	7.71	7.4
7	Specific Conductivity	ms/cm.	0.589	0.489	0.498	0.713	0.492	0.609	0.296	0.289	0.289	0.318	0.288	0.212	0.4235	0.713	0.212
8	Total Solids	mg/L	546	471	534	745	539	511	259	267	307	329	271	220	416.58	745	220
9	Dissolved Solids	mg/L	510	433	490	668	471	462	231	238	275	294	241	192	375.42	668	192
10	S.S	mg/L	36	38	44	77	68	49	28	29	32	35	30	28	41.167	77	28
11	Amm. N2	mg/L	0.03	0.03	0.21	0.03	0.02	0.05	0.02	0.03	0.06	0.08	0.08	0.02	0.055	0.21	0.02
12	Nitrite N2	mg/L	Traces	0.007	0.8	0.07	0.05	0.019	0.009	0.05	0.08	0.09	0.03	0.009	0.1104	0.8	0.007
13	Nitrate N2	mg/L	2.6	1.6	4.8	1.6	0.85	2	1.6	1.1	1.3	1.6	1.2	1.1	1.1	4.8	1.1
14	Phosphate	mg/L	0.82	0.73	0.97	0.77	0.79	0.03	0.69	0.72	0.79	0.83	0.95	0.87	0.7467	0.97	0.03
15	Chloride	mg/L	34.24	29.35	52.25	38	34.24	29.56	34.24	33.47	44.08	29.35	24.46	34.24	29.35	34.24	24.46
16	Sulphate	mg/L	10	11	10	15	7	11	9	11	12	11	13	10	10.833	15	7
17	Total Alkalinity	mg/L	64	68	60	88	72	92	84	80	80	88	96	84	79.667	96	60
18	Total Hardness	mg/L	148	148	172	284	188	192	172	148	172	180	188	112	175.33	284	112

19	Calcium Hardness	mg/L	80	76	100	148	100	108	92	100	108	104	104	84	100.33	148	76
20	Magnesium Hardness	mg/L	68	72	72	136	68	84	80	48	64	76	84	28	75	136	28
21	Dissolved Oxygen	mg/L	6	6	6.3	7.1	9	7.6	7.6	7.4	7.3	7.1	6.9	6.8	7.1083	9	6
22	BOD	mg/L	2	1.8	1.9	2.9	2.2	1.5	1.4	1.6	1.4	1.6	1.8	1.7	1.8167	2.9	1.4
23	COD	mg/L	19.2	9.82	19.2	19.2	19.76	20.4	9.82	9.6	19.2	38.4	43	19.2	20.567	43	9.6
24	Sodium	mg/L	6	6	6	6	4	7	9	7	22	10	11.8	12.5	8.9417	22	4
25	Potassium	mg/L	21	13	18	18	16	19	17	21	3	3	1.9	1.7	12.717	21	1.7
26	Total Coliform	MPN/100 ml.	40	44	110	240	40	40	37	40	37	40	60	50	64.833	240	37
27	Fecal Coliform	MPN/100 ml	6	14	33	50	21	4	2	2		4	4	6	13.273	50	2
28	Iron	mg/L	0.1	0.09	0.17	0.17	0.12	0.03	0.04	0.06		0.1	0.13	0.11	0.1018	0.17	0.03
29	Kjeldahl-N	mg/L		0.19				2.3		0.12		1.5	1.4	1.3	1.135	2.3	0.12
		Category:	A	A	A	B	A	A	A		A	A	A	A			

Jr. Scientist

Lab. Incharge
MPPCB Rewa

MADHYA PRADESH POLLUTION CONTROL BOARD REGIONAL LABORATORY REWA.

Water Quality during Year - 2017-2018

Natural Water Resource : River Tons at M.P.-U.P. boundary, before mixing of Bilan River

Description of Samp Near ... MP - UP boundary

S.No.	Characteristic	Unit	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb	March	Av.	Maxi.	Mini.
1	Date of Sampling		25.04.17	21.05.17	17.06.17	21.07.17	02.08.17	13.09.17	9.10.17	14.11.17	5.12.17	03.01.18	03.02.18	01.03.18			
2	Appearance		Clear	Clear	Clear	Turbid	Turbid	Sl.Turbid	Clear	Clear	Clear	Clear	Clear	Clear			
3	Temperature	oC	30.2	31	28.2	26..8	31.5	32	28.2	28.4	24	20	22	23.5	27.182	32	20
4	Turbidity	NTU	22	25	28	38	30	11	6	9	9	9	10	9	17.167	38	6
5	Colour	PCS	Cl	Cl	CL	Muddy	Muddy	CL	CL	CL	CL	CL	CL	CL			
6	Odour	T. No	OL	OL	Ol	OL	OL	OL	OL	Ol.	OL	OL	OL	Ol			
7	pH	pH Unit	7.43	7.39	7.66	7.89	7.6	7.63	7.25	7.1	7.28	7.2	7.3	7.5	7.44	7.89	7.1
8	Sp.	µMhos/c	0.439	0.475	0.487	0.723	0.473	0.521	0.267	0.272	0.278	0.308	0.258	0.213	0.3928	0.723	0.213
9	T. Solids	mg/l	486	469	512	698	524	508	258	265	268	321	260	216	398.75	698	216
10	D. Solids	mg/l	447	426	472	541	461	457	227	236	239	291	228	186	350.92	541	186
11	S. Solids	mg/l	39	43	40	157	63	51	31	29	29	30	32	30	47.833	157	29
12	Amm. Nitrogen	mg/l	0.04	0.05	0.12	0.04	0.03	0.06	0.02	0.01	0.04	0.03	0.04	0.02	0.0417	0.12	0.01
13	Nitrite N2	mg/l	0.009	0.01	0.008	0.02	0.01	0.01	0.009	trace	0.004	0.06	0.009	trace	0.0149	0.06	0.004
14	Nitrate N2	mg/l	2.7	3.3	4.5	4.8	3.3	1.6	0.98	0.72	1.4	1.1	1	0.95	2.20	4.80	0.72
15	Phosphate	mg/l	0.71	0.73	0.69	1.1	0.95	0.09	0.69	0.8	0.7	0.7	0.65	0.7	0.71	1.1	0.09
16	Chloride	mg/l	24.46	29.35	38	43.03	19.56	19.7	42.75	43.03	39.13	24.46	24.98	24.46	31.076	43.03	19.56
17	Sulphate	mg/l	12	13	9	14	11	7	6	8	10	8	12	8	9.8333	14.00	6
18	T. Alkalinity	mg/l	56	52	60	68	72	72	68	64	72	92	88	80	70.333	92	52
19	T. Hardness	mg/l	116	136	164	188	124	140	160	156	160	172	180	108	150.33	188	108
20	CalciumHardness	mg/l	76	80	96	100	80	88	92	84	108	104	118	68	91.167	118	68
21	Magnesium H.	mg/l	40	56	68	88	44	52	68	72	52	68	62	40	59.167	88	40
22	D. Oxygen	mg/l	6.6	6.5	6.4	7.2	9.2	7.9	7.7	7.1	7.4	7.3	7.1	6.9	7.275	9.2	6.4
23	B.O.D.	mg/l	1.6	1.9	1.7	2.3	2	1.3	1.2	1.4	1.2	1.3	1.2	1.5	1.55	2.3	1.2
24	C.O.D.	mg/l	9.82	9.6	19.2	9.6	9.88	10.2	9.56	9.82	9.6	9.6	9.6	9.6	10.507	19.2	9.56
25	Sodium	mg/l	13	16	15	19	21	23	17	21	26	11	13	11.8	17.233	26	11

26	Potassium	mg/l	4	7	3	6	7	9	8	12	3	2.8	3	1.8	5.55	12	1.8
27	T. Coliform	MPN/100 ml	40	33	21	70	33	30	27	30	21	33	26	33	33.083	70	21
28	F. Coliform	MPN/100 ml	7	11	6	21	17	4	<2	<2	2	2	<2	2	8	21	2
29	Iron	mg/l	0.09	0.11	0.19	0.2	0.1	0.21	0.19	0.07	0.01	1.2	0.75	0.09	0.2675	1.2	0.01

CATEGORY pH Unit=A,DO=A,BOD=A&T.C.=A except in July2017due to heavy rains

Classification of River water based on IS - 2296 - 1982

(Jr. Scientist)

Lab. Incharge
M.P.C.B. Reewa