



**ACTION PLAN FOR RESTORATION OF POLLUTED  
STRETCH OF  
RIVER MANGALA ALONG PURI  
UNDER PRIORITY CATEGORY V**

	effluent		
	d. Existing HW Treatment and Disposal Facilities and total capacity with life span	:	Nil

## **C O N T E N T S**

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## **1.0 Background**

Water quality assessment of river Mangala has been carried out by the State Pollution Control Board, Odisha under the project “National Water Quality Monitoring Programme” on regular basis at two locations, such as Malatipatpur (Mangala upstream) and Golasahi (Mangala Downstream since April, 2017). The maximum Biochemical Oxygen Demand (BOD) range in this stretch of Mangala river during 2017 was observed to be in the range 3.4-5.7 mg/l. BOD has exceeded the tolerance limit of 3.0 mg/l at Golasahi four times during the total period of observation and therefore has been identified as polluted river stretch by the Central Pollution Control Board (CPCB). The polluted river stretches are categorized under five different priorities based on the BOD values as per Central Pollution Control Board (CPCB) classification. Monitoring locations with BOD concentration exceeding 30 mg/l has been categorized as Priority-I. Monitoring locations with BOD concentrations in the range 20-30 mg/l, 10-20 mg/l, 6-10 mg/l and 3-6 mg/l are categorized as Priority-II, Priority-III, Priority-IV and Priority-V respectively. Based on this classification, Mangala river stretch along Puri has been categorized under Priority-V.

## **2.0 Puri city**

Puri city is the only urban local body situated on the bank of Mangala river. It is district Head quarter of Puri district and is the coastal city on Bay of Bengal. The city is located at 85°49'53"E longitude and 19°48'38"N latitude at an elevation of only 1 m. The city is located at a distance of 64 km from the State Capital Bhubaneswar. As per 2011 census, Puri Municipality has a population of 2,01,026. The municipality covers an area of 16.5 sq. Km. As the city is famous for Lord Jagannath temple, floating population of the city is approximately 50,000 daily.

## **3.0 Water quality of Mangala River**

Mangala river, a small tributary of Bhargavi river, originates near the upstream of Puri town , flows along Puri city and ultimately culminates with Bay of Bengal at Puri. Water quality monitoring stations are shown in Fig.1. Since the monitoring location at Golasahi is very close to the sea, water quality of the river at Golasahi is greatly influenced by tidal effect of the sea.

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**Fig. 1 Monitoring stations on Mangala river**

Monthwise water quality data of river Mangala river with respect to Biochemical Oxygen Demand (BOD) during the year 2017 is given in Table-1.

The data show that BOD values have been exceeded the tolerance limit of 3.0 mg/l four times at Mangala downstream during period of monitoring.



**Table-1 Monthwise BOD (mg/l) in Mangala river during 2017 and 2018**

Month	BOD, mg/l			
	2017		2018	
	Mangala Upstream at Malatipatpur	Mangala Downstream at Golasahi	Mangala Upstream at Malatipatpur	Mangala Downstream at Golasahi
January			1.7	4.1
February			0.4	3.1
March			0.5	5.0
April	0.9	-	1.0	4.1
May	1.3	5.7	1.0	3.6
June	2.3	4.3	1.5	2.8
July	0.3	4.9	0.8	5.0
August	0.9	1.7	0.7	1.5
September	1.9	2.1	0.6	1.3
October	1.2	3.4	1.3	1.9
November	0.9	2.8	1.6	5.4
December	1.3	1.6	1.5	5.8
<b>Minimum BOD, mg/l</b>	<b>0.3</b>	<b>1.6</b>	<b>0.4</b>	<b>1.3</b>
<b>Maximum BOD, mg/l</b>	<b>2.3</b>	<b>5.7</b>	<b>1.7</b>	<b>5.8</b>

## **4.0 Sources of Pollution**

Deterioration of water quality in 3<sup>rd</sup> river may be attributed to the insignificant flow during lean period, riparian activities and tidal impact of the sea.

### **Industrial Wastewater**

There is no large scale water intensive industry located on the catchment area of Mangala river. Therefore there is no source of industrial wastewater and industrial waste to contribute to the pollution of Mangala river.

### **Municipal Wastewater**

Municipal wastewater of Puri city is channelized to a 15 MLD sewage treatment plant established at Mangalaghat to treat the domestic wastewater of Puri town prior to discharge into the Mangala river.

### **Biomedical waste**

Approximately 190 Kg of biomedical waste per day is generated from the health care units existing in Puri Municipality. The biomedical waste are being treated in the biomedical waste treatment facility installed at the District Head Quarter Hospital within Puri Municipality. A small fraction of the total amount of biomedical waste generated is also treated at the Common Biomedical Waste Treatment Facility situated at Tangiapada in Khurda district. Therefore, there is remote possibility of contamination of Mangala river along Puri stretch by biomedical waste generated in the city.

### **Municipal solid waste**

Approximately 71 tonne per day municipal solid waste is being generated in Puri Municipality. Solid waste is collected through both door to door collection and from community bins and then transported to earmarked landfill site at Baliapanda, . The dumping site has been chosen for its deep natural depression. A 100 TPD Municipal solid waste treatment plant has been established at Baliapanda to convert the biodegradable municipal solid waste to compost. here is remote chance of contamination of Mangala river by municipal solid waste disposal from Puri Municipality.

To summarize, there is remote possibility of contamination of Mangala river by industrial wastewater, biomedical waste or municipal solid waste generated from the city. However, the insignificant flow in the river is not capable of diluting the treated discharged effluent of the 15 MLD STP situated at Mangalaghat, to maintain the BOD level of the river at 3.0 mg/l most of the time. Therefore, during non-monsoon period, marginal water quality deterioration with respect to BOD in Mangala river has been observed.

## ***5.0 Action plan for restoration of Water quality of Mangala River***

Hon'ble National Green Tribunal (NGT) Principal Bench have mentioned the suggestions of the CPCB in Para 42 in the order of the Case No. 673/2018 for implementation of following a two-fold concept for restoration of polluted river stretches.

**1<sup>st</sup> concept :** To target enhancement of river flow through interventions on the water sheds/ catchment areas for conservation and recharge of rainwater for subsequent release during lean flow period in year. This concept will work on dilutions of pollutants in the rivers and streams to reduce concentration to meet the desired level of water quality.

**2<sup>nd</sup> concept :** Regulation and enforcement of standards in conjunction with the available flow in rivers/ streams and allocation of discharges with stipulated norms.

Since the BOD deviations are observed to be marginal as well as frequency of deviation is few, the water quality of the river can be improved by enhancement of river flow through interventions of the river catchment area for conservation and recharge of rainwater for subsequent release during lean flow period in the year. <sub>5</sub>

A Septage Treatment Plant of 50 KLD capacity at Puri with a total investment of Rs.1.38 crore has been commissioned in September, 2017. Actions to be taken to dispose the total fecal sludge of Puri in the Septage Treatment Plant.

**(Action : Odisha Water Supply and Sewerage Board)**

The As Puri city is a coastal area, massive plantation is being carried out by the Forest Department.

**(Action : Forest Department)**

The Water Resource Department is establishing the Rain water harvesting structures, and promoting the roof top rain water harvesting by giving incentives and creating public awareness.

**(Action : Water Resource Department)**

Further, stipulation of stringent discharge limit for the STP may improve the water quality of the river.

**(Action : State Pollution control Board, Odisha)**

Existing 5 MLD wastewater treatment plant at Bankimuhan is under renovation.

**(Action : Odisha Water Supply and Sewerage Board)**

**6.0 Conclusion**

This action plan has integrated and built on the on-going actions of the State Government in city level waste water treatment for control of water pollution that are already underway. The action plan has been developed keeping in view the needs of the protection of riparian rights of the people living downstream of Puri city.

This plan has identified the agencies responsible for implementation of each action point . This can be monitored for reporting and compliance.

The implementation of Action Plans will definitely improve the water quality of Mangala river.

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