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# Pollution Status of Mithi River

Avdhi Shah[A], Prashant Bhave[B]

[A] (M-tech student, Environment Engineering Department, VJTI, Mumbai)
[B] (Associate professor, Civil & Environment Engineering Department, VJTI, Mumbai)

***Abstract -- The present investigation along the Mithi River of Mumbai deals with the study of physico-chemical parameters like pH, Dissolved Oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand content in water samples. The study was performed over a period of 8 months from October 2013 to May 2014. Sampling was carried out at five different locations along the stretch of the Mithi River in Mumbai. The study points towards Pollution Status of the Mithi River.***

***Keywords: River Water, pH, Dissolved Oxygen, Biochemical Oxygen demand Chemical Oxygen demand***

## 1. INTRODUCTION

Mithi has become synonymous with all the ills which a River is experiencing such as encroachment of flood plains, storm water drainage and disposal of untreated sewage and liquid waste [1]. According to recent report of Central Pollution Control Board the water from major Rivers of the country has been found to be polluted. One of such severely polluted River is Mithi River in Mumbai city.

Mithi River in Mumbai city is a confluence of tail water discharges of Powai and Vihar lakes. Mithi River originates at Powai and meets Arabian Sea at Mahim Creek flowing through residential and industrial complexes of Powai, Saki Naka, Kurla and Mahim over a distance of about 15 km. This river is treated like an open drain by the citizens who discharge raw sewage, industrial waste and garbage unchecked. [2] Mahim bay area, where Mithi River meets Arabian Sea, is a nominated bird sanctuary called "Salim Ali Bird Sanctuary" where migratory birds come for nesting. This part is full of mangroves and this fragile eco system requires considerations from pollution point of view, so that it is not destroyed. [3]

Illegal activities of washing of oil/chemical drums, discharge of unauthorized hazardous waste are also carried out along the course of this river. Cattle sheds in some areas contribute animal waste. Barrel cleaners, scrap dealers and others dump sludge oil, effluent and garbage in the river. The organic waste, sludge and garbage dumping has reduced the carrying capacity of the river. The water with mixture of sewage and industrial waste is a threat to marine life and the river is showing sign of total loss of aquatic biodiversity. [1]

Various studies have been conducted so far to determine the pollution levels of Mithi River. According to the MPCB Report on Mithi River Water Pollution and Recommendations for its Control (2004), Development of Action Plan for Environmental Improvement of Mithi River and along its banks (2006) by Indian Institute of Technology (IIT), Bombay, NEERI report of 2011 on Current status of Mithi River and possible Solutions, report on Development and Protection Plan of Mithi River and its Surroundings (2006) by MRDPA, it is well understood that the Mithi River water quality has reached an alarming stage and requires much attention to be given. Preliminary survey indicates that the pollution levels have reached an alarming stage[1-2].

## II.MATERIALS AND METHODS

Samples were collected along the stretch of Mithi River. All the samples were collected, preserved and analysed in the laboratory. The samples were analysed for various physicochemical characteristics as below.

1. Dissolved Oxygen: DO was fixed at site using $MnSO_4$ and alkali iodide azide.
2. BOD and COD : Preservation was done in ice

COD was measured by "Reflux Method".
BOD was measured using Bottle Incubation for 5 days at 20°C.

pH was measured using (a) using universal indicator
(b) Using pH papers

DO was measured by Wrinkler Azide Modification Titrimetric.

## III. RESULTS AND DISCUSSION

The results are presented in below table.

 

### 3.1 COD of Mithi River

Table 1. COD results of Mithi River

| Sampling Locations | Sampling Period | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Oct.'13 | Nov.'13 | Dec.'13 | Jan.'14 | Jan.'14 | Feb.'14 | March'14 | April'14 | May'14 |
| Santacruz(S1) | 211 | 257 | 197 | 91 | 112 | 166 | 193 | 140 | 188 |
| BKC(S2) | 185 | 217 | 143 | 82 | 158 | 124 | 246 | 127 | 146 |
| Dharavi(S3) | 150 | 306 | 116 | 91 | 312 | 129 | 184 | 89 | 146 |
| Bandra E (S4) | 123 | 247 | 134 | 109 | 145 | 104 | 167 | 76 | 125 |
| Kurla(S5) | 176 | 217 | 125 | 73 | 92 | 85 | 189 | 102 | 135 |

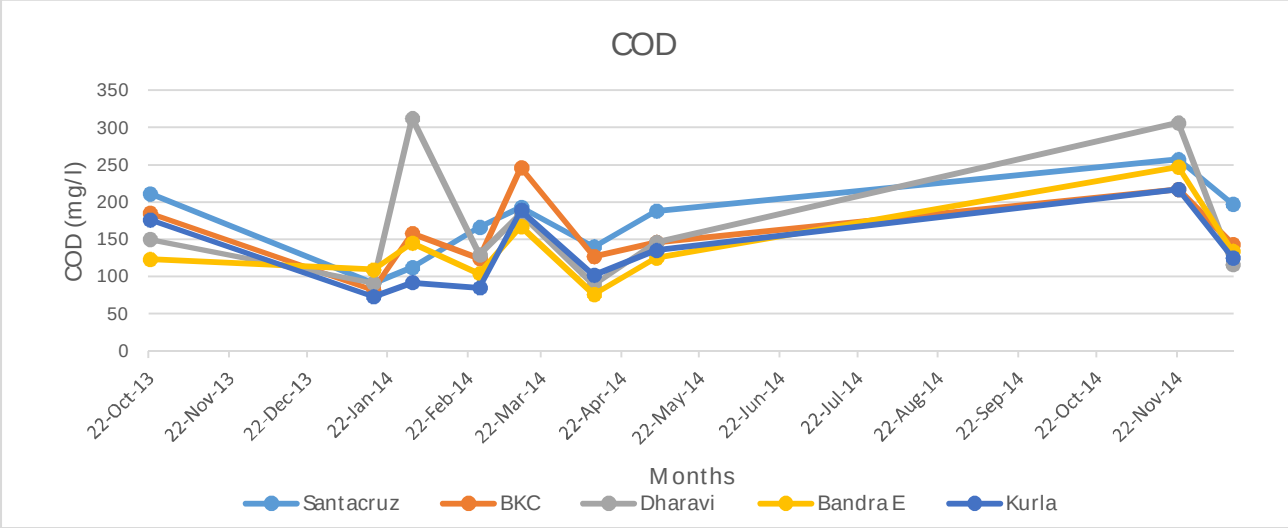


Fig.1 COD variation for sampling locations

COD variation was observed to vary between 100 to 350 mg/L. the highest COD was observed at sampling point 312 mg/l at Dharavi. The COD levels are higher than the prescribed effluent discharge standards. The reason for the higher COD levels are untreated sewage from the adjoining slums and unauthorized small scale industrial/ cottage units and small ware houses.

### 3.2 BOD of Mithi River

Table 2. BOD results of Mithi River

| Sampling Locations | Sampling Period | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Oct.'13 | Nov.'13 | Dec.'13 | Jan. '14 | Jan. '14 | Feb.'14 | March'14 | April'14 | May'14 |
| Santacruz(S1) | 26 | 40 | 17 | 23 | 20 | 54 | 23 | 26 | 27 |
| BKC(S2) | 30 | 32 | 15 | 24 | 25 | 37 | 25 | 28 | 22 |
| Dharavi(S3) | 31 | 25 | 12 | 22 | 48 | 33 | 28 | 22 | 21 |
| Bandra E (S4) | 16 | 30 | 13 | 27 | 21 | 42 | 29 | 18 | 18 |
| Kurla(S5) | 19 | 31 | 20 | 20 | 19 | 36 | 24 | 25 | 20 |

 

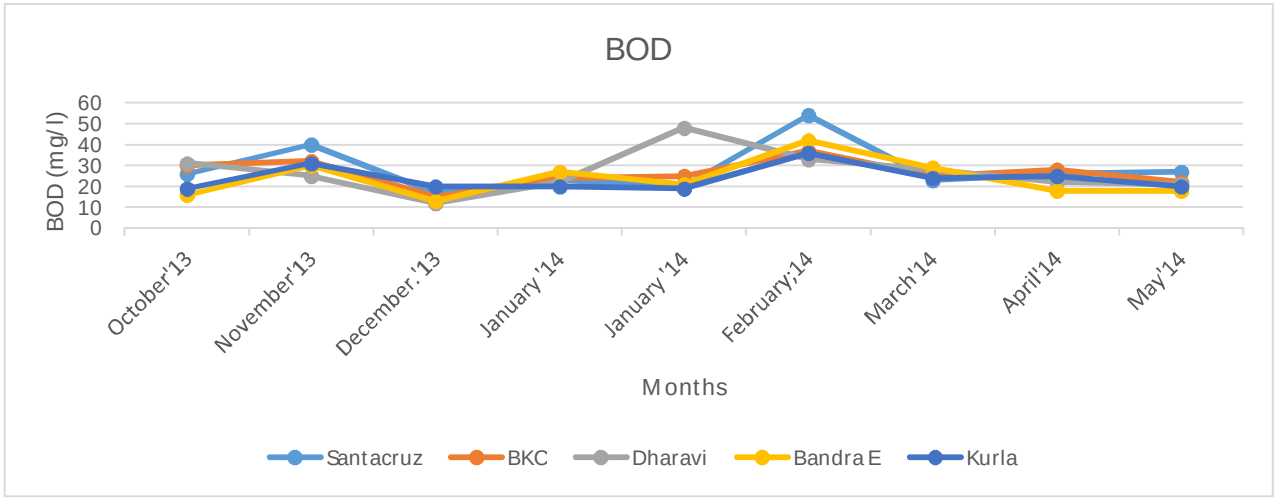


Fig.2 BOD results

The BOD of most of the samples at all the five different locations were in the range of 13 to 57 mg/lit which is exceptionally high. The highest BOD was recorded at Santacruz in the month of February 2014. The increase BOD at all the five locations indicated large amount of biodegradable organic matter. Animal waste due to cow sheds in various areas, garbage dump by citizens all along its course may have contributed to increase in BOD. Also the part of the river from Bandra Kurla road to Vakola is used as a dumping ground for garbage which might have resulted in increased BOD along that stretch.

The pH of all the river water sample was in the range of 7.2 to 8.3. This indicates the Mithi river water is slightly alkaline. The Dissolved oxygen for all the sample was Zero. This indicates the water is polluted.

## 4 CONCLUSION

On study of pollution parameters indicates pollution of the Mithi River. The stretch of Mithi River passes through the where the slums and unauthorized small and cottage industrial units exist. The waste water is directly discharged in the the Mithi river. The discharge of Mithi River ultimately reaches to the Arabian Sea via the Mahim creek. The resultant of polluted water of Mithi River (an open drain) is responsible for the nearby marine water heavily.

## REFERENCES

[1] NEERI, (2011) Report on Current Status of Mithi River and Possible Solutions

[2] MPCB, (2004) Report on Mithi River Pollution and Recommendations for its Control

[3] Ministry of Urban Development, New Delhi. Manual on Water Supply and Treatment, (CPHEEO) (1999) 3rd Edition

[4] APHA (2003) Standard Methods for Examination of Water and Waste Water, WASHINGTON D.C.

 