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## **Chapter III**

## **Water Pollution**

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### Water Pollution

The Water (Prevention and Control of Pollution) Act, 1974 defines pollution to mean such contamination of water or such physical, chemical or biological alteration of water by discharge of various kinds of wastes into water (whether directly or indirectly) which is harmful for the health of public, animals, plants and aquatic organism. Pollution in lakes leads to eutrophication<sup>5</sup> and ground water contamination causing loss of habitat and healthy environment. Domestic sewage, poor sanitation, industrial effluents, surface run off, etc. are the primary source of water pollution.

#### **3.1 Use based classification of surface water not made**

The term ‘Water Quality’ includes ‘those physical, chemical or biological characteristics of water by which the user evaluates the acceptability of water’. In this regard the Central Pollution Control Board (CPCB) has developed a concept of ‘designated best use’. According to this concept, out of several uses a particular water body is put to, the use which demands highest quality of water is called its “designated best use” and accordingly the water body is designated. The levels of quality of water along with ‘designated best uses’ are given in the following table:

**Table No. : 3.1**  
**Use Based Classification of Surface Water**

<b>Sl. No</b>	<b>Designated Best Use</b>	<b>Class of water</b>
1.	Drinking water source without conventional treatment but after disinfection	<b>A</b>
2.	Outdoor Bathing	<b>B</b>
3.	Drinking water source after conventional treatment and disinfection	<b>C</b>
4.	Propagation of Wildlife & Fisheries	<b>D</b>
5.	Irrigation, Industrial Cooling, Controlled Waste disposal	<b>E</b>

*Source: Central Pollution Control Board (CPCB)*

It was observed in Audit that the PCBA had not classified the water bodies according to their ‘designated best use’, thereby inviting the risk of harmful effects of indiscriminate use of unsuitable water bodies for purposes of sourcing drinking water with adverse impact on health and human habitation, and on flora and fauna.

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<sup>5</sup> A process where water bodies receive excess nutrients that stimulate excessive plant growth.

### 3.2 Inadequate analysis of water

Under the National Water Quality Monitoring Programme (NWQMP) the water samples were to be analysed at fixed regular frequencies on nine core parameters and 19 general parameters identified by the CPCB (List of parameters detailed in *Appendix II*) as indicated in the Table below:

**Table: 3.2**  
**Water Quality Parameters monitored by PCBA**

Sl No	Categories of Parameters	Total number identified	Being monitored by PCBA
1.	Core parameters, e.g., pH, temperature, dissolved oxygen etc.	9	8
2.	General parameters e.g., turbidity, alkalinity etc.	19	16
3.	Bio-monitoring i.e., saprobitry index, diversity index and P/R ratio	3	Nil
4.	Trace metals e.g., arsenic, cadmium, copper, lead, mercury, etc.	9	Nil
5.	Pesticides e.g., Alpha, Beta, Gamma, etc.	15	Nil

It was observed in Audit that out of five categories of parameters, the water samples were being analysed for only two categories by the PCBA *i.e.* eight core parameters (excluding nitrite) and 16 general parameters (excluding phenolphthalein alkalinity, total kjeldahl nitrogen<sup>6</sup> and ammonia). It was further observed that no facilities were available in the PCBA's laboratory for bio-monitoring. Due to not-analysing of some parameters, the quality of water in respect of those parameters could not be ascertained.

On being pointed out, the PCBA stated (August 2015) that all parameters were analysed as per the protocol issued by the CPCB but due to breakdown of some instruments, sometimes certain parameters were not completed. But the fact remained that PCBA were only analysing two categories out of five categories of parameters identified by CPCB.

### 3.3 Water Quality Monitoring Stations not classified

Under National Water Monitoring Programme (NWMP), the PCBA had established 101 Water Quality monitoring stations<sup>7</sup> across the State of which ten were in Guwahati (details of locations mentioned in Table 3.3 below) for monitoring both surface and ground water quality. As per the Water Quality Monitoring Protocol

<sup>6</sup> Total kjeldahl nitrogen is the sum of organic nitrogen, ammonia and ammonium in the chemical analysis of soil, water or waste water.

<sup>7</sup> Rivers : 42, Ponds : 27 and Well : 32

issued by the CPCB in 2008, initially all the monitoring stations in respect of ground water should be classified as *baseline*<sup>8</sup> stations and 20 to 25 per cent of the *baseline* stations should be classified as *trend*<sup>9</sup> or *trend-cum-surveillance* stations. For surface water, all stations should be a combination of *baseline* and *trend* stations. After sample data were collected for three years, the stations would be classified as *baseline*, *trend* or *flux*<sup>10</sup> station. The objectives of this monitoring protocol, inter-alia, included establishing base line water quality to observe the trend of water quality, surveillance for irrigation use and control/management of water pollution.

**Table: 3.3**  
**List of Monitoring Stations in Guwahati under NWMP Programme**

Sl. No.	Name of Water Bodies	Station Code	Type	Req. of Monitoring	Location of Monitoring Points
1.	Brahmaputra	1030	River	Monthly	Pandu, Guwahati
2.	Brahmaputra	2064	River	Quarterly	Chandrapur, Guwahati
3.	Brahmaputra	2069	River	Quarterly	Guwahati near Water Intake Point at Kacharighat
4.	Bharalu	1528	River	Quarterly	Near Pragjyotish College before confluence with Brahmaputra at Guwahati.
5.	Deepor beel	1529	Pond	Quarterly	Dharapur, Guwahati.
6.	Well	1541	Ground water	Half Yearly	Guwahati
7.	Well	1542	Ground water	Half Yearly	Guwahati
8.	SoubhagyaKunda	2217	Pond	Quarterly	Kamakhya
9.	Deepor Beel	2218	Pond	Quarterly	Boragaon near IASST, Guwahati
10.	Well	2252	Ground water	Half Yearly	Near MSW dumping site at Garchuk, Guwahati

It was noticed in Audit that the PCBA failed to classify the monitoring stations even after a lapse of more than seven years and all the stations were functioning as baseline monitoring stations. Hence, the Water Quality Monitoring Protocol was not being followed which deprived the PCBA the scope of observing the trend of water quality and, where necessary, making arrangements for taking corrective action in this regard.

<sup>8</sup> Monitored every two months for three years

<sup>9</sup> Monitored with an increased frequency of once every month

<sup>10</sup> Where it is considered necessary to measure the mass of any substance carried by the flow the frequency of sampling may be increased to 12-24 times per year

### 3.4 High pollution in major rivers/ponds in Guwahati

Audit obtained and analysed the test reports (2010-14) of the water samples of major rivers/ponds taken from different locations (Brahmaputra, Deepor Beel, Bharalu, Bor Sola, Saru Sola and Silsako Beel, Dighali Pukhuri and Soubhagya Kunda Pukhuri at Kamakhya Temple) by the PCBA. Analysis of the test reports of the three major water bodies of Guwahati - the Brahmaputra, Bharalu and the Deepor Beel. are shown in the following table:

Criteria for pollutants: Dissolved Oxygen - > 4 mg/ltr, Bio Chemical Oxygen Demand - < 3 mg/ltr and Total Coliform - < 5000 MPN/100 ml.

**Table: 3.4**  
**Pollutants of the three major water bodies in Guwahati**

Year	Dissolved Oxygen (DO) (mg/ltr) Criteria - > 4 mg/ltr			Bio Chemical Oxygen Demand (BOD) (mg/ltr) Criteria - <3 mg/ltr			Total Coliform (TC) (MPN/100ml) Criteria- < 5000 MPN/100ml		
	Brahmaputra Kachari ghat	Bharalu	Deepor Beel Boragaon	Brahmaputra Kachari Ghat	Bharalu	Deepor Beel Boragaon	Brahmaputra Kachari ghat	Bharalu	Deepor Beel Boragaon
2010	7.7	0.5	4.6	0.7	45	12.8	360	1583	648
2011	7	0	7.2	1.7	41.5	5.5	740	8467	878
2012	7.5	0.1	5.4	2	37.3	5	980	4875	1440
2013	7.2	0.2	5.3	1.9	47.5	11.4	7083	64875	1013
2014	8.1	0	10.3	0.9	38.5	8.35	123400	181100	16800

Source: Monitoring Reports submitted by PCBA

- Brahmaputra River**

The water of the river Brahmaputra was not fit for drinking even after traditional treatment as Total Coliform (TC) level was far above the standard norm. Incidentally, the samples for analysis were taken from Kacharighat



*Bharalu outlet into the Brahmaputra*

which is the intake point for the city's water supply.

In reply, the PCBA stated (April 2016) that the water quality in Brahmaputra has not shown any deteriorating trend and mere 1 or 2 higher values on 1-2 occasions cannot be regarded as deteriorating instead such isolated cases may be regarded as incidental. The reply is not tenable as the water quality is being monitored on a quarterly basis and TC level was

found to be 2 to 48 times above the permissible limit in four occasions (one occasion in 2013 and three occasions in 2014). Besides, as far as TC is concerned, there is a very major jump over the permissible limit during 2013 and 2014 which needs analysis and rectification.

- **Bharalu River** - The Dissolved Oxygen (DO), Bio-chemical Oxygen Demand (BOD) and TC levels were far beyond the stipulated criteria indicating severe organic pollution and the river water had reached a stage where no aquatic organism can survive. This river had been categorised by the CPCB among the 35 most polluted river stretches in the country in terms of water quality criteria. Accordingly, the CPCB had directed (May 2005) the PCBA to prepare an inventory of polluting sources, extent of pollution control requirements and an action plan to control water pollution. However, despite a lapse of ten years the PCBA had not come up with a detailed project report.
- **Deepor Beel<sup>11</sup>** - The mean value of BOD was well above the criteria during 2010-2014. High BOD values indicate severe organic pollution in the Deepor Beel. In spite of such severe organic pollution, PCBA had not formulated any Plan for addressing it. This assumes significance considering the lake is a designated Ramsar<sup>12</sup> site for which contracting Parties i.e. the various State Government Agencies had agreed to formulate and implement their planning so as to promote the conservation of the wetlands.

In reply, the PCBA stated (April 2016) that the BOD values remain near the criteria value. It does not establish pollution but occasional degradation. Reply also pointed out that audit team raised doubts over the water quality monitoring function of PCBA based on one monitoring report. Reply is not tenable as the PCBA's quarterly Monitoring Reports itself showed that the BOD level was well above the criteria during 2010-14 (20 numbers of monitoring reports during the period) which was also substantiated by collection of samples by Audit along with officials from the PCBA and analysed in the PCBA laboratory. Besides, PCBA did not prepare any plan for addressing the problem as advised by CPCB.



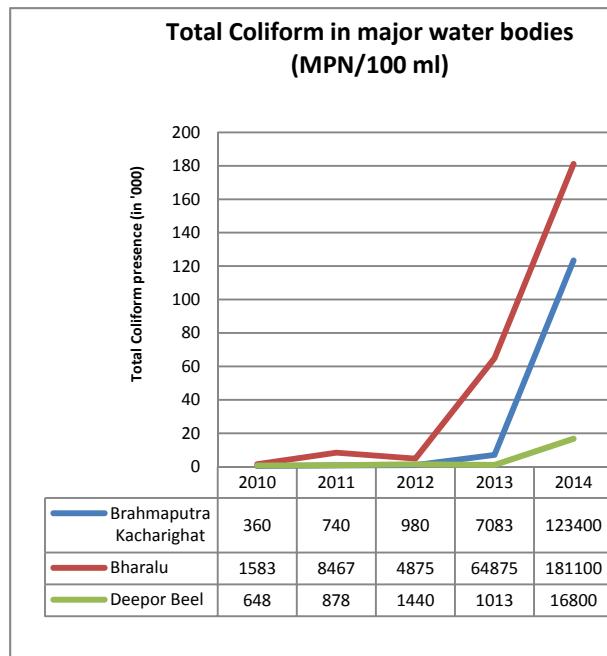
*Joint Team visiting city's garbage dumping ground  
abutting margin of Deepor Beel*

<sup>11</sup> Designated as a 'Ramsar Site' in November 2002.

<sup>12</sup> The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Besides the above three, reports of other water bodies which were analysed revealed the following:

- **Bor Sola, Saru Sola and Silsako Beel<sup>13</sup>** - Reports revealed that DO level was much lower than the prescribed standard which means that no organism can survive in these water bodies. BOD levels were also much higher than the prescribed criteria which indicated high presence of organic pollutants while TC level was around 48 times higher than the prescribed limit.
- **Dighali Pukhuri** - Mean value of DO and TC were well within the criteria. However, mean value of BOD was well above the criteria during 2010-2014 which indicated severe organic pollution.
- **Soubhagya Kunda Pukhuri at Kamakhya Temple** - Mean value of DO and TC (except in the year 2014) were well within the criteria and mean value of BOD was well above the criteria during 2010-2014. High BOD values indicate severe organic pollution in the Soubhagya Kunda Pukhuri, an important pilgrimage centre with heavy footfalls throughout the year.



In reply, the PCBA stated (April 2016) that water quality of Saubhagaya Kunda generally deteriorated after Ambubachi Mela held each year. Reply is not tenable as the readings were of the mean value of BOD (measured quarterly), which was well above the criteria during 2010-14 for all the quarters whereas the Ambubachi Mela was celebrated only in one month of the year.

It was observed in Audit that despite the alarming levels of water pollution in the rivers/water bodies in the State, the PCBA had not prepared any action plan for improving the water quality of these rivers/water bodies. It was also observed that the Government of Assam notified<sup>14</sup> Deepor Beel, Sarusala Beel, Borsola Beel, Silsako Beel and Bondajan water bodies located in Guwahati for preservation, protection, conservation, regulation and maintenance and to develop the water bodies into natural water reservoirs and convert them into eco-tourism recreation

<sup>13</sup> A joint team (consisting of officers from office of the PCBA and Audit Office) visited the site of these water bodies (as the PCBA did not have any testing stations) and collected water samples for testing at PCBA laboratory.

<sup>14</sup> Under the Guwahati Water Bodies (Preservation and Conservation) Act, 2008 and its Amendment Act 2010.

centres to suit the ecological balance and to protect the water bodies from the encroachers and further damage. However, it was observed in Audit that out of the five water bodies, the PCBA was carrying out water quality monitoring only in respect of Deepor Beel.

In July 2015 Audit officials and officers from office of the PCBA visited the city's garbage dumping ground abutting the margin of Deepor Beel for collecting water samples. Samples were tested at the PCBA laboratory and the analysis reports indicated TC level of 24,000 MPN/100 ml as against the expected level of 5,000 MPN/100 ml. The reports generated by the PCBA during the period 2010 to 2013 indicated a range of 648 MPN/100 ml to 1440 MPN/100 ml. In 2014, however, a mean of 16,800 MPN/100 ml was recorded. Incidentally, all the PCBA readings for TC during 2014 indicated astronomical levels of pollution (16,800 MPN/100 ml, 123,400 MPN/100 ml and 181,100 MPN/100 ml for Deepor Beel, Brahmaputra at Kacharighat and Bharalu respectively).

- As regards the high levels of pollution, PCBA stated (August 2015) that GMDA was the authorised agency for development of Deepor Beel. The reply was not acceptable because, as per the Water Act, PCBA was the regulatory body for abatement of water pollution and restoration of the wholesomeness of the water quality. It was observed that though PCBA had been monitoring the water quality of Deepor Beel, it failed to initiate steps for abatement of pollution levels. PCBA should have prepared action plan for abatement of pollution along with remedial measures which they had not done. Besides, they should carry out regular monitoring and also prepare action plan for preservation, protection and conservation with the co-ordination from other Govt. agencies such as GMDA, GMC, Forest Department etc. which had not been done. Further, as regards not-monitoring of other smaller water bodies, the PCBA stated (August 2015) that there was no need for regular monitoring of the ponds as they did not have water throughout the year. However, this action is also unacceptable as, besides Deepor Beel, GOA itself had in 2008 notified Sarusala Beel, Borsola Beel, Silsako Beel and Bondajan water bodies located in Guwahati for preservation, protection and conservation and as detailed above, the PCBA had the responsibility of regular monitoring to reduce pollution levels.

### 3.5 Ground Water quality

The occurrence of ground water and its availability is largely governed by the state of cementation and compaction of the geological formations, which control the pore volume and porosity, permeability, and the state of aquifer. A sizeable proportion of population (around 70 *per cent* in Guwahati) is dependent on ground water for drinking and other household uses. Over exploitation of ground water reserve leads to scarcity of ground water and associated deterioration of water quality.

To assess the problem of ground water deterioration in and around the Guwahati area, the PCBA carries out ground water quality monitoring under NWMP through

three monitoring stations. These stations collect the samples for testing either from open wells or tube wells. Ground water quality monitoring for the core parameters<sup>15</sup> was being carried out on half yearly basis (in April and October each year) and for the other general parameters<sup>16</sup> it was being done on yearly basis (in April).

The data (monitored by PCBA) was analysed in respect of 28 ground water samples<sup>17</sup> of the three stations based in Guwahati, for selected parameters for the period from 2010 to 2014 and observed that:

- TC count varied from 0 to 2400 MPN/100 ml which met the desired criteria except in one instance in the year 2014 at one station.
- pH<sup>18</sup> of ground water was in the range of 6.0 to 8.3 against the criteria of 6.5 to 8.5 prescribed by the CPCB. Further, pH was observed below the desired range in three instances at one station.
- BOD ranged from 0.4 to 5.0 mg/l whereas as per the criteria prescribed by the CPCB, value of BOD should be less than 3 mg/l. Incidentally, BOD was beyond the desired criteria in five instances at 3 stations.

The analysis shows that excessive extraction of ground water, if continued, would lead to scarcity as well as deterioration in the quality of ground water over a period of time and therefore, effective steps needed to be taken in this regard.

### 3.5.1 Contamination of ground water with Fluoride & Arsenic

Assam suffers from severe water shortage during the dry months of January to March leading to dependence on ground water in many areas of the State and particularly, in the areas where the public supply system is absent. This has created a new dimension<sup>19</sup> to the water problem as lowering of water level bears the risk of water coming into contact with rocks containing arsenic and fluoride which get introduced into water when the water flows through them.

- The permissible limits for human consumption of Fluoride and Arsenic in water are 1.0 mg/l and 10 µg/l respectively. Excessive fluoride content in water causes a multiplicity of ill effects for human beings such as fluorosis, osteoporosis, arthritis,

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<sup>15</sup> Core parameters denotes - pH, temperature, conductivity ( $\mu\text{mhos}/\text{cm}$ ), dissolved oxygen, biochemical oxygen demand, nitrate-N (mg/l), nitrite-N (mg/l), fecal coliform (MPN/100 ml), total coliform (MPN/100 ml) - these are used to prima facie ascertain the water quality.

<sup>16</sup> General parameters denotes - turbidity (NTU), phenolphthalein alkalinity as  $\text{CaCO}_3$ , total alkalinity as  $\text{CaCO}_3$ , chlorides (mg/l), chemical oxygen demand, (mg/l), total kjeldahl-N as N (mg/l), ammonia-N as N (mg/l), hardness as  $\text{CaCO}_3$ , calcium as  $\text{CaCO}_3$ , sulphate (mg/l), sodium (mg/l), total dissolved solids (mg/l), total fixed dissolved solids (mg/l), total suspended solid (mg/l), phosphate (mg/l), boron (mg/l), magnesium as  $\text{CaCO}_3$ , potassium (mg/l) fluoride (mg/l) - these are used to ascertain the quality of water in details.

<sup>17</sup> Data for the year 2014 in respect of two water samples of one station (station no.2252) not made available to audit.

<sup>18</sup> pH (Potential of Hydrogen) is a logarithmic scale (from 1 to 14) which measure the acidity alkalinity of water soluble substance. Values below 7 indicate acidity and above 7 indicate alkalinity.

<sup>19</sup> Study Report of PCBA.

hip fractures, cancer, infertility, thyroid disorder, brain damage, Alzheimer's disease and polydypsia as evident from the Project Report on Arsenic & Fluoride in ground water carried out by the PCBA themselves. Similarly, arsenic has been recognised as a human toxin and carcinogen and is of potential public concern. Long-term overexposure to arsenic causes chronic arsenic poisoning, which can cause skin disorders (pigmentation disorders, kurtosis, skin cancer. The PCBA carried out the study of estimation of fluoride and arsenic content in ground water of 11 Districts of Assam and the results reported are given in *Appendix III*. It was observed in Audit that in Greater Guwahati area, fluoride content was more than permissible limit (1.0 mg/l) in 17 out of 122 water samples, while arsenic content was more than permissible limit (10 µg/l) in 2 out of 122 water samples. However, despite the adverse analysis report, the PCBA had not prepared any action plan for remedial measures to be taken.

In reply, the PCBA stated (April 2016) that presence of both arsenic and fluoride in ground water observed may be generated due to mineral content in underground rock/soil. It is not under the scope of the Board to improve the water quality of ground water, unless there is some visible cause of deterioration from the surface. The reply of the PCBA is not tenable as it does not indicate if any action had been taken on its own findings, since under the Water Act, the PCBA was the regulatory body responsible for abatement of water pollution and restoration of the wholesomeness of the water quality and was therefore required to prepare scientific action plan for preservation, protection and conservation.

### 3.6 Inferior quality of piped drinking water

The water supply facilities in Guwahati Metropolitan Area (GMA) are provided by three departments, viz. Guwahati Municipal Corporation (GMC), Public Health Engineering Department (PHED) and Assam Urban Water Supply and Sewerage Board (AUWSSB) now Guwahati Jal Board (GJB). Treatment Plants are located at Panbazar, operated by both GMC and PHED, along with AUWSSB operated Zoo Road treatment plant and the GMC operated treatment plant at Satpukhuri and produce about 73.90 MLD<sup>20</sup> of potable water against the demand of 132 MLD. The public water supply within Guwahati covered only about 30 per cent and mostly South Central part of the city. Even within this area due to the old degraded water treatment plants and the high water leakage rate, the provision of water to individual households was limited to 2 to 3 hours a day and consequently supply of lesser quantity of water. Hence, a sizeable population of around 70 per cent was dependant on ground water for drinking and other household uses.

Audit collected two drinking water samples each (on 6.8.15 & 10.8.15) from the Jal Board water tank at Hengrabari, PHE water tank at Panbazar and GMC water tank at Panbazar and got them tested at the PCBA laboratory. Test reports revealed that Turbidity/Nephelometric Turbidity Units (NTU) level was above the permissible

<sup>20</sup> Million Litres per day.

limit in all samples. Iron, i.e. Fe level was higher than the criteria in two samples (Jal Board at Hengarabari on 6.8.15 and PHE Tank at Panbazar on date 10.8.15) whereas Total Coliform (TC) was found (4300 MPN/100) in one sample (GMC water tank at Panbazar on 10.08.15) against the nil criteria.

In reply, the PCBA stated (April 2016) that for drinking water, there is a separate department and the PCBA has no intention to intrude into their activities. The reply is not tenable because as per the uniform drinking water quality monitoring protocol issued (February 2013) by the Ministry of Drinking Water and Sanitation, GoI, the PCBA was required to take action for abatement of pollution in drinking water sources. However, no action was found to have been taken on the matter even though as per Uniform Drinking Water Quality Monitoring Protocol, PCBA should take action for abatement of pollution in drinking water sources.

### 3.7 Absence of Sewage units

The provision of Section 24 of Water (Prevention & Control of Pollution) Act 1974 imposed restriction on use of streams or water bodies for discharge of polluting matter which should be complied by every occupier, Municipal authority etc. The State Boards under section 33 of the Water Act may make an application to court for restraining the persons who are likely to cause such pollution.

It was observed in Audit that:

- The PCBA had no data regarding drainages.
- There was not a single Sewage Treatment Plant in the entire State of Assam. Hence, untreated sewage from various generating points got directly discharged to natural water bodies, rivers, etc.
- The results of water quality tests conducted by the PCBA between 2008 and 2013 indicated that the organic and bacterial contamination due to discharge of domestic waste water in untreated form continued to be on higher side as detailed in the chart in para 3.4.



*Drainage outlet at Bharalumukh*

A joint team (consisting of officers from office of the PCBA and Audit) visited the bank of the River Brahmaputra and collected water samples from nine drainages<sup>21</sup> directly linked to the River. Water samples were tested at the Laboratory of PCBA and analysis report revealed that DO, BOD and TC level were not in conformity

<sup>21</sup> (1) Bondajan (Bonda) (2) Pragjyotish College (Shantipur) (3) Gorchuk (4) Pandu (5) Chandrapur (6) Jaipur (7) Chatrakam Devalaya (8) Sukleswar Mandir (9) Fancy Bazar

with the prescribed criteria in any of the samples. In one water sample<sup>22</sup> Zinc (Zn) level was found 13 times more than the prescribed limit *i. e.* 5.0 mg/l.

The PCBA stated (August 2015) that it is very difficult to identify the causes for deterioration of the water quality and it is true that un-treated sewage get into the rivers. The PCBA further replied (April 2016) that directions under Water Act have been issued to all Municipal Authorities to set up sewerage system for sewage collection, conveyance, treatment and its disposal. Though the PCBA had accepted the observations of audit the fact remains that under the Water Act, the Pollution Control Board had the option to approach the Courts if it apprehended that water in any river is likely to be polluted, an option which the PCBA did not resort to.

### 3.8 Untreated industry effluent released

The PCBA had categorised various industries or projects in three broad categories viz. red, orange and green in decreasing order of severity of pollution<sup>23</sup>. As per this categorisation, there were 371 red category, 557 orange category and 217 green category industries during 2014-15 under the jurisdiction of Guwahati Regional Office. Of these, only 93 (70 red category and 23 orange category) industries had Effluent Treatment Plants (ETP).



*Drainage outlet at New Guwahati Diesel Locomotive Shed*

Joint inspection (consisting of officers from office of the PCBA and Audit) of nine randomly selected red category units out of the total 93 industries revealed the following.

- In four industries<sup>24</sup>, ETPs were either not installed or not functioning/working. Thus, waste water was being discharged to public drain, surface water, etc.
- Although ETP was installed at the New Guwahati Diesel Locomotive Shed, NF Railway, Bamunimaidam, Guwahati, the unit partially discharged waste water

<sup>22</sup> Water samples from Bharalu near Pragjyotish college

<sup>23</sup> Red category means highly polluting industries, Orange category means moderately polluting industries and Green Industries means least polluting or eco friendly industries.

<sup>24</sup> M/s Seven Sisters Trade and Distilleries, Amingaon, M/s Mangalam Distillery and Bottling Industries, Changsari, M/s North East Distilleries Pvt. Ltd, Khanapara and M/s Karnak Distillery Pvt. Ltd., Panikheti.

mixed with oil, grease, etc. directly into public drain outside the boundary wall bypassing ETP. Sample of this discharge analysed in the PCBA Laboratory revealed that the following parameters were much higher than the prescribed standards:

**Table No.: 3.5**

Parameters	Prescribed Standards	Analysis Report	Percentage
<b>BOD (3 days at 27°C) (mg/l)</b>	250 (max)	600.0	240 %
<b>COD (mg/l)</b>	250 (max)	1304.0	522%
<b>Oil &amp; Grease (mg/l)</b>	10 (max)	51900	519000%
<b>Total Suspended Solids (mg/l)</b>	100 (max)	350.0	350%

Interestingly, the test reports held by the PCBA and shared with Audit indicated that the parameters of the effluents of the Loco shed, NF Railways were within the prescribed standards. This shows that the samples for the purpose of tests collected by the PCBA were from the effluents passing through the ETP while the effluents directly released to the water bodies bypassing the ETP were not taken into consideration. This showed that the testing process of the PCBA was flawed.

In reply, the PCBA stated (April 2016) that ETP was not functioning since long and the authority was directed on numerous occasions to efficiently operate the ETP so that the released effluents meet the permissible standards all the time. The fact remained that the PCBA had not initiated legal proceedings against the offenders for the violations as envisaged in the Water Act.

### 3.9 Recommendations

- *The PCBA should prepare a time-bound action plan for use-based classification of surface water.*
- *Monitoring of water on all the parameters identified by the CPCB should be taken up on priority in order to have a proper assessment and reliable database of the quality of water.*
- *Action should be taken timely on defaulters.*