ANNUAL REPORT
2020-21

ODISHA

STATE POLLUTION CONTROL BOARD, ODISHA

PARIBESH BHAWAN, A/118, NILAKANTHA NAGAR,
UNIT-VIII, BHUBANESWAR - 751012

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STATE POLLUTION CONTROL BOARD, ODISHA
A/118, NILAKANTHA NAGAR, UNIT-VIII
BHUBANESWAR-751012

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CONTENTS

HIGHLIGHTS OFACTIVITIES OF THESTATE POLLUTION CONTROLBOARD, ODISHA

The State Pollution Control Board (SPCB), Odisha was constituted on July, 1983 and was entrusted with the responsibility of implementing the Environmental Acts, particularly the Water (Prevention and Control of Pollution) Act, 1974, the Water (Prevention and Control of Pollution) Cess Act, 1977, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986. Several Rules addressing specific environmental problems like Hazardous Waste Management, Bio-Medical Waste Management, Solid Waste Management, E-Waste Management, Plastic Waste Management, Construction & Demolition Waste Management, Environmental Impact Assessment etc. have been brought out under the Environment (Protection) Act. The SPCB also executes and ensures proper implementation of the Environmental Policies of the Union and the State Government. The activities of the SPCB broadly cover the following:

- Planning comprehensive programs towards prevention, control or abatement of pollution and enforcing the environmental laws.
- Advising the State Government on any matter concerning prevention and control of water and air pollution.
- Environmental Monitoring and Research.
- Creating public awareness.

The achievements and activities of the Board during period of report are as follows.

1. Industrial Pollution Abatement and Control through Consent Administration

Improvement in compliance to pollution control norms, guidelines and regulations has been witnessed consistently through vigorous surveillance, regular inspections and monitoring, stipulation of a series of guidelines and directives. The Board has also taken the following measures/ activities:

(i) Implementation of the on-line consent management system (from receipt of application to grant of consent order) for all industries, mines, on-line authorization management for Hazardous Waste, Solid Waste, Bio-Medical Waste, E-waste and on-line registration for plastic products manufacturing units.

(ii) Implementation of GPRS based real time data transmission system with Y-Cable for online stack, ambient air quality and waste water monitoring network for highly polluting large scale industries and mines in order to keep the regulator and industries alert. So far online monitoring and data transmission system has been installed in 157 industries and 24 mines.

(iii) The Fly Ash Resource Centre (FARC) has been setup in the State Pollution Control Board for promoting safe management and utilization of fly ash in the State. This center has prepared guidelines on utilization of fly ash in various sectors and it also co-coordinates among the users and generators. In addition, FARC is also organizing Workshops and Interaction meet among the stakeholders for enhancing fly ash utilization. The utilization of fly ash was 90.58% during the reporting period.

(iv) The Board is monitoring bulk utilization of other industrial solid wastes like dolochar, phospho-gypsum, blast furnace slag, anode butt, ferro-manganese sludge in different sectors like brick making, road construction, cement manufacturing and power generation etc.

(v) The bedded health care establishments having 30 beds or more are covered under the Consent administration as per the provisions of Water (Prevention & Control of Pollution) Act, 1974 in order to dispose contaminated waste water in an environmentally sound manner.

(vi) **Activity of Integrated Coastal Zone Management (ICZM)**

- **Coastal Water (Paradeep to Dhamara) Monitoring and Analysis.**
  The assigned monitoring area is from Paradeep to Dhamara coast covering nearly 80km. along the sea. Total seventy three (73) sampling locations have been selected for the entire monitoring area, out of which 32 are along Mahanadi transect, 17 in Dhamara transect and 24 in Gahirmatha-Bhitarkanika transect. Sampling was made from on-shore and few off-shore sampling points with the help of monitoring vessel **MV Sagar Utkal**. 3100 water samples and 126 sediment samples have been collected and analyzed during the reporting period.

- **Blue Flag Beach Certification:**

  Out of twelve beaches in the country being developed by the Society for Integrated Coastal Management (SICOM), an Environment Ministry's body working for the management of coastal areas, the District Administration along the State Project Management Unit (SPMU), ICZM Cell, SPCB developed the designated stretch of 435 meters in Puri sea beach (from Raj Bhawan to hotel Mayfair) in line with recommendation of Blue Flag Beach Certification and it is certified as Pilot Blue Flag Beach.

- **Monitoring of Coastal water under National Water quality Monitoring Programme (NWMP)**
  The coastal water monitoring has been commenced by ICZM cell from January, 2021for 91 locations under NWMP covering 6 coastal districts viz., Ganjam, Puri, Jagatsinghpur, Kendrapara, Bhadrak and Balasore along 480 KM coastal stretch of Odisha. The assessment of the suitability of coastal water quality for different uses of the coastal segment has been proposed based on the "Water Quality Standards for Coastal Waters Marine Outfalls" (G.S.R. 7(E) dated 22.10.1998 and subsequent amendment vide G.S.R. No. 682 (E) dated 05.10.1999). In total 130 samples were collected and analysed during the month of January and March from coastal district Jagatsinghpur (100 no.) and Bhadrak (30 no.), respectively.

(vii) The Board has granted consent stipulating appropriate pollution control measures to 907 Industries, hotels, mineral stack yards, mineral processing units, railway sidings, stone crushers, brick kilns and DG Sets (as stand by) etc. for their establishment and refused / rejected consent of 62 units for establishment due to certain non compliances.

(viii) Consent to operate has been granted to 2845 industries, mines, hotels, hospitals, mineral stack yards, mineral processing units, country liquor manufacturing units, railway sidings, stone crushers, brick kilns, DG Sets (as stand by), housing projects, mineral based industries etc. during the reporting period. Board has issued show cause notices to 175 units and direction /closure direction to 93 units. Consent to operate of 13 units have been refused.

(ix) All the Urban Local Bodies have been directed to seek consent and submit time bound action plan for construction of sewage treatment plant.

(x) The Board has conducted 34 public hearings for major industrial / mining / development projects, requiring environmental clearance from MoEF and CC, Govt. ofIndia/ State Environment Impact Assessment Authority (SEIAA), Odisha.

2. Regulation under Hazardous Waste Management Rules

The Board has granted authorization to 159 hazardous waste generating units for collection, storage, treatment and disposal of hazardous wastes. 27 nos. of actual users inside Odisha and 15 nos. of actual users outside Odisha have been authorized by the Board during the reporting period for utilization of hazardous wastes.

3. Management of Lead Acid Batteries

The Board has received 221 half yearly returns for smooth management and handling of batteries (Lead-Acid) from battery units under the provisions of the said Rules.

4. Management of Bio-Medical Waste

The Board has granted authorization to 550 Health Care Facilities (HCF) under the provisions of the Bio-Medical Waste Management Rules, 2016 with conditions for proper management, segregation, handling, treatment and disposal of biomedical wastes. Show cause notice to 139 units and refusal of authorization to 04 units have been issued due to improper management of biomedical wastes.

5. Management of Plastic Waste

The Board is consistently vigilant on carry bag manufacturing units for their compliance with the statutory provisions of the Plastic Waste Management Rules. Eleven plastic product manufacturing units have been registered with the Board during the reporting period.

6. Management of Electronic Waste

The Board has issued authorization to 04 E-waste collection-cum-dismantling units during the reporting period.

7. Legal Matters

The Board has filed 131 cases in appropriate legal forum and 89 cases have been disposed during the reporting period.

8. Right to Information

Under the Right to Information Act, 2005, the Board has disposed 434 applications by providing information.

9. Disposal of Public Complaints

The Board has addressed 306 public complaints on various environmental issues during the reporting period.

10. Planning and Monitoring

For prevention and control of pollution, the Board has undertaken following activities..

- Board is regularly monitoring the river water quality at 129 stations on 11 major river systems of the State i.e., Mahanadi, Brahmani, Baitarani, Rushikulya, Subarnarekha, Nagavali, Budhabalanga, Kolab, Vansadhara, Indravati and Bahuda. Water quality is assessed in respect of

32 water quality parameters under National Water Quality Monitoring Programme (NWMP). Besides these, water quality of Taladanda Canal at six locations, Puri canal at three locations, religious ponds such as Bindusagar (Bhubaneswar) at its four bathing ghats and five ponds in Puri town such as Narendra, Markanda, Indradyumna, Swetaganga and Parbati Sagar, one pond in Jeypore town, one pond in Angul town, lakes such as Chilika (two locations) & Anshupa (four locations), Tampara (one location) and coastal water quality at Puri, Gopalpur and Paradeep on the Bay of Bengal and creek water at Atharbanki has also been monitored.

Monitoring of ground water quality at 48 stations of 11 towns i.e., Cuttack, Bhubaneswar, Puri, Berhampur, Sambalpur, Paradeep, Angul, Talcher, Ib valley-Jharsuguda area, Sukinda and Balasore has also been conducted in respect of 32 water quality parameters.

- Central Pollution Control Board, Delhi has sanctioned 43 no. of additional ground water monitoring stations during January-March, 2021.
- Bio-monitoring at 25 locations of 08 major rivers i.e. Mahanadi, Brahmani, Rushikulya, Subernarekha, Budhabalanga, Kolab, Vansadhara, Nagabali and one location in Jagannatha Sagar Pond, Jaypore has been monitored to assess the biological health.
- Surface water quality of 5 stations on Atharabanki creek and ground water quality at 3 stations in the peripherals of Phosphatic Fertiliser Units and water samples from 07 test wells as well as samples from 05 wastewater discharging points of the fertilizer manufacturing units at Paradeep have been monitored on quarterly basis to assess fluoride contamination in the area.
- Water quality of Ganda Nallah and Kharasrota river has also been monitored at seven stations on regular interval to assess the impacts of waste water discharge from the Industrial Units in Kalinganagar area to the Nallah.
- Water quality of Damasala river at nine stations in Sukinda Chromite Mines area has been monitored on regular interval to assess the hexavalent chromium content in river water.
- Surface water quality in and around M/s Vedanta Aluminium Limited, Jharsuguda has been monitored at fourteen stations to assess the fluoride contamination in the area.
- Impacts of idol immersion after Durga puja on water quality of Kuakhai and Daya river (in Bhubaneswar city), Kathajodi river (in Cuttack city) and Mangala river (in Puri town) have been investigated. No significant impact due to immersion activities on the water bodies was observed.
- 2266 industrial wastewater samples, 5567 water samples under NWMP, National River Conservation Programme (NRCP), SWMP & different projects have been analysed by the Board during this period.
- NABL Accreditation has been accorded to Central Laboratory of the Board for a period of two years from 01.02.2021 to 31.01.2023 under **Chemical and Biological** testing (25 Chemical parameters, 2 Biological parameters, 8 heavy metal parameters and 9 pesticide residue parameters) for Surface water / Ground water / Waste water and 7 parameters for Ambient air.
- Ambient air quality at 36 stations of 17 important towns and industrial areas of Angul, Balasore, Berhampur, Bhubaneswar, Bonaigarh, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rajgangpur, Rourkela, Sambalpur & Talcher have been monitored by the Board under National Ambient Air Quality Monitoring Programme (NAMP)/State Ambient Air Quality Monitoring Programme (SAMP) in respect of 08 parameters like PM_{10}, $PM_{2.5}$, SO_2,

NO_2, NH_3, O_3, Pb & Ni. In total, 1375 ambient air quality samples, 14,911 samples under NAMP/SAMP projects, 734 stack emission samples have been collected and analysed by the Board during the reporting period.

- Study on ambient noise levels in pre & during celebrations of Dusshera & Deepavali have been conducted in Industrial, Commercial, Residential and Silence Zones in 14 cities/towns such as Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rourkela and Sambalpur.
- To assess the impact of bursting of fire crackers during Deepavali, the ambient air quality with respect to parameters like SO_2, NO_2, PM_{10} & $PM_{2.5}$ have been monitored in pre- and on the day of Deepavali at 53 locations in 14 towns/ cities i.e., Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rourkela and Sambalpur.

11. Board's Publication

The Board has published two volumes of newsletters "Paribesh Samachar" during this period.

12 Awareness Programmes

- The Board observed the World Environment Day on 5th June' 2020 through its 12 Regional Offices. The theme of the World Environment Day for the year 2020 was **"Time for Nature"**. Due to the pandemic COVID-19 situation the regular celebration activities were not organized. However, awareness meetings involving different organizations through virtual mode and plantation programmes were done in different industries as well as inside office premises of Regional Offices maintaining Covid protocol. Other activities like **"International Coastal Clean-up Day"** and **"World Ozone Day"** were also not observed by the Board due to pandemic situation.
- Public awareness on **"Impact of bursting of fire crackers during Deepawali"** and **"Impact on immersion of idols on water quality of surface water bodies"** were created through public notices in local news papers.

13. Human Resource Development

- Due to the current pandemic COVID-19 situation the Board officials (68 nos.) were imparted training on various sectors on virtual mode.
- 2nd National E-Conference on **"Industrial Waste Management COVID-19 and Industrial Waste Management Ecosystem in India"** was organized by the Board through video conferencing.
- Students (3 nos.) from Siksha 'O' Anusandhan University, Bhubaneswar have done internship work under Legal Consultant of the Board during the reporting period.

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CHAPTER – I

INTRODUCTION

1.1 CONSTITUTION OF THE BOARD

The Odisha State Prevention and Control of Pollution Board was constituted in pursuance of sub-section (1) of section 4 of the Water (Prevention and Control of Pollution) Act, 1974, vide Notification No. 1481-VII-HI-11/83 (Vol. II)-S.T.E., dt. 15.7.1983 in the erstwhile Department of Science, Technology & Environment, Government of Odisha. The Board was re-designated as State Pollution Control Board, Odisha vide Govt. Notification No.Env.-E (F)/8/89/1882 F&E, dt.16.07.1999.

1.2 FUNCTIONS AND RESPONSIBILITIES OF THE BOARD

The constitution and functions of the Board are clearly spelt out in the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981. The Board is entrusted with the responsibility of implementation of Environmental Laws, particularly the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986 and a number of Rules and Notifications issued thereunder as amended from time to time.

Responsibilities of the Board, however, can broadly be classified into the following four main categories:

1. To plan a comprehensive programme for prevention, control or abatement of pollution and enforce the environmental laws
2. To advise the State Government on any matter concerning prevention and control of water and air pollution
3. To conduct Environmental Monitoring and Research
4. To create public awareness

In addition, the Board is also expected to execute and ensure proper implementation of the Environmental Policies of the Union and the State Government.

1.3 ENVIRONMENTAL LAWS

The major Acts and Rules / Notifications issued thereunder, with which the Board is entrusted for implementation and execution, are as follows:

1. The Water (Prevention and Control of Pollution) Act, 1974
2. The Air (Prevention and Control of Pollution) Act, 1981
3. The Environment (Protection) Act, 1986
4. The Public Liability Insurance Act, 1991
5. The Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 amended as the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
6. The Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Organisms or Cells Rules, 1989
7. The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
8. The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996

9. The Biomedical Waste (Management and Handling) Rules, 1998 amended as the Biomedical Waste Management Rules, 2016.
10. The Municipal Solid Waste (Management and Handling) Rules, 2000 amended as the Solid Waste Management Rules, 2016.
11. The Noise Pollution (Regulation and Control) Rules, 2000
12. The Ozone Depleting Substance (Regulation and Control) Rules, 2000
13. The Batteries (Management and Handling) Rules, 2001
14. The Environment Audit Notification, 1993
15. The Fly-ash Utilization Notification,1999 and amended thereof
16. The Environment Impact Assessment Notification, 2006
17. The Plastic Waste (Management and Handling) Rules, 2011 amended as the Plastic Waste Management Rules, 2016
18. The E-Waste (Management and Handling) Rules, 2011 amended as the E-Waste (Management) Rules, 2016.
19. The Construction & Demolition Waste Rules, 2016.

1.4 LOCATIONS AND MAILING ADDRESSES OF BOARD'S OFFICES

Headquarters of the State Pollution Control Board, Odisha is located at Paribesh Bhawan, A/118, Nilakantha Nagar, Bhubaneswar in Khordha District. The Board has established its state-of-art Central Laboratory at B-59/2 & 59/3, Chandaka Industrial Estate, Patia, Bhubaneswar.

The jurisdictions, various functions, role, responsibilities and powers of Regional Officers of all the 12 Regional Offices have been defined vide Board's Office Order No. 16908, dtd.19.09.2013. The mailing addresses, Telephone/Fax Nos., E-mail/website and jurisdiction of the Head Office, the Central Laboratory and Regional Offices are given in Table-1. The locations of twelve Regional Offices of State Pollution Control Board are illustrated in Odisha Map in Fig. 1.

Table – 1: Address, Telephone / Fax, e-mail / Website and Jurisdiction of State Pollution Control Board, Odisha

Sl. No.	Address	Telephone / FAX / e-Mail / Website	Jurisdiction (Districts)
	HEAD OFFICE		
1.	State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-8, Bhubaneswar-751 012	(0674) 2561909, 2562847 Fax- (0674) 2562827, 2560955 E- Mail:paribesh1@ospcboard.org Website : www.ospcboard.org	Whole of the Odisha State
2.	Central Laboratory, State Pollution Control Board, Odisha, B-59/2 & 59/3, Chandaka Industrial Estate, Patia, Bhubaneswar	E-Mail : centrallab@ospcboard.org Website : www.ospcboard.org	Whole of the Odisha State
	REGIONAL OFFICES		
1.	Regional Office, Angul S-3/3, Industrial Estate, Hakimpada, Angul - 759 143	Tel - (06764) 236389 Fax - (06764) 237189 E-mail:rospcb.angul@ospcboard.org	1) Angul 2) Dhenkanal

Sl. No.	Address	Telephone / FAX / e-Mail / Website	Jurisdiction (Districts)
2.	Regional Office, Balasore, Plot No – 1602, Ganeswarpur mouza, Januganj, Balasore – 756019	Tel/Fax-(06782) 265110 Email:rospcb.balasore@ospcboard.org	1) Balasore 2) Bhadrak 3) Mayurbhanj
3.	Regional Office, Berhampur, New Divisions Office, IDCO, Berhampur Division Industrial Estate – 760008, Ganjam	Tel- (0680) 2281075 Fax- (0680) 2280139 Email:rospcb.berhampur@ospcboard.org	1) Ganjam 2) Gajapati 3) Phulbani 4) Nayagarh
4.	Regional Office, Bhubaneswar, B-59/2 & 59/3, Chandaka Industrial Estate, Patia, Bhubaneswar	R.O Tel - (Mob) 9438883892 E-mail : rospcb.bhubaneswar@ospcboard.org Website: www.ospcboard.org	1) Puri 2) Khordha
5.	Regional Office, Cuttack, Plot No. 586, Surya Vihar, Link Road, Cuttack – 753 012	Tel/Fax-(0671) 2335478 E-Mail : rospcb.cuttack@ospcboard.org	1) Cuttack
6.	Regional Office, Keonjhar At - Baniapat, College Road, Keonjhar-758 001	Tel / Fax - (06766) 259077 E-Mail: rospcb.keonjhar@ospcboard.org	1) Keonjhar
7.	Regional Office, Rayagada 287/A, Kasturi Nagar, Rayagada – 765 001	Tel-(06856) 223073 Fax-(06856) 224281 E-Mail: rospcb.rayagada@ospcboard.org	1) Rayagada 2) Koraput 3) Nawarangpur 4) Malkangiri 5) Kalahandi
8.	Regional Office, Rourkela, Town Engineering Office Premises, Sector – 5, Rourkela – 769 002	Tel - (0661) 2646736 Fax – (0661) 2648999 E-Mail: rospcb.rourkela@ospcboard.org	1) Sundergarh except Himgiri block of Sundergarh district (Basundhara mining areas) 2) Deogarh
9.	Regional Office, Sambalpur, Plot No.1070 Hospital Road, Modipara, Sambalpur-768 002	Tel- (0663) 2541910 Fax – (0663) 2541978 E-Mail:rospcb.sambalpur@ospcboard.org	1) Sambalpur 2) Bargarh 3) Boudh 4) Bolangir 5) Nuapada 6) Sonepur
10.	Regional Office, Jharsuguda, Plot No. 370/5971, At – Babubagicha (Cox Colony) St. Marys Hospital Road, PO- Industrial Estate, Dist.-Jharsuguda- 768203	Tel- (06645) 273284 Fax – (06645) 2732294 E-Mail: rospcb.jharsuguda@ospcboard.org	1) Jharsuguda 2) Himgiri block of Sundergarh district
11.	Regional Office, Kalinga Nagar, At: Dhabalagiri, Near OMC Office, J.K. Road, PO: Ferro Crome Plant, , Dist – Jajpur – 755 019	Mob-9438883904 E-mail: rospcb.kalinganagar@ospcboard.org	1) Jajpur
12.	Regional Office, Paradeep, At- Centre for Management of Coastal Eco-system (CMCE), Plot No. 47, Nuasandhakuda, Near Panthaniwas, Marine Road, Paradeep-754142	Mob-9438883905 E-Mail: rospcb.paradeep@ospcboard.org	1) Jagatsinghpur 2) Kendrapara

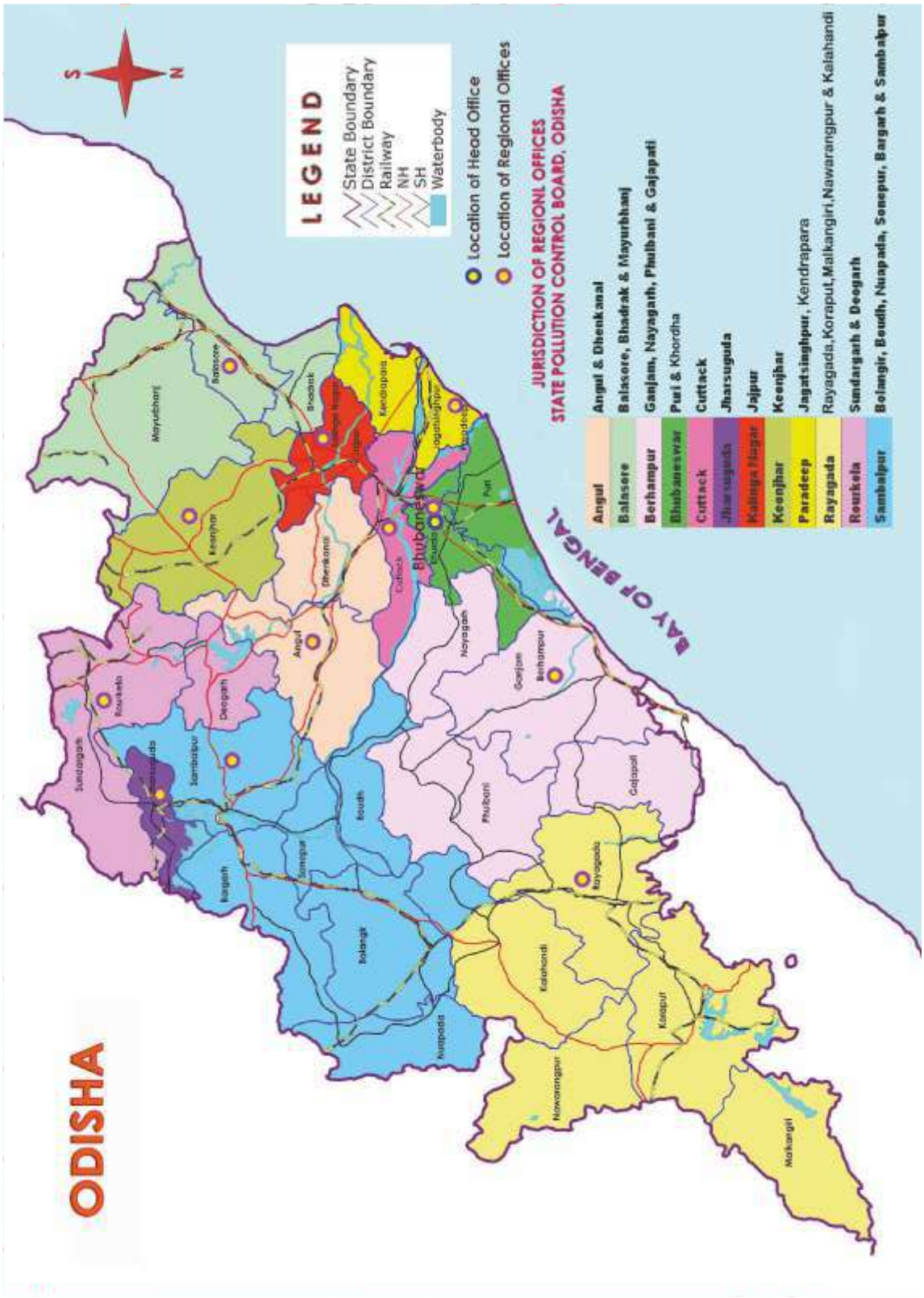

Fig. 1 Odisha Map Showing 12 Regional Offices of State Pollution Control Board

CHAPTER – II

CONSTITUTION OF THE STATE BOARD

2.1 As per the provisions of sub-section 2 of section 4 of the Water (Prevention and Control of Pollution) Act, 1974 and under sub-section 2 of section 5 of the Air (Prevention and Control of Pollution) Act, 1981, the State Board shall consist of the following members, namely:

i. A Chairman (either whole-time or part-time as the State Government may think fit), being a person having special knowledge or practical experience in respect of matters relating to environment protection or a person having knowledge and experience in administrating institutions dealing with the matters aforesaid, to be nominated by the State Government;

ii. Such number of officials, not exceeding five, to be nominated by the State Government to represent that Government;

iii. Such number of persons, not exceeding five, to be nominated by the State Government from amongst the members of the local authorities functioning within the State;

iv. Such number of officials, not exceeding three, to be nominated by the State Government to represent the interest of agriculture, fishery or industry or trade or any other interest which, in the opinion of the State Government, ought to be represented;

v. Two persons to represent the companies or corporations owned, controlled or managed by the State Government, to be nominated by that Government;

vi. A full time Member Secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, to be appointed by the State Government.

2.2 In exercise of the powers conferred under Sub-Section (1) of Section 4 of the Water (Prevention & Control of Pollution) Act, 1974 and Section 5 of the Air (Prevention & Control of Pollution) Act, 1981, Government in the Forest & Environment Department, Odisha constituted the present Board vide Notification No. 25653-Env-II-39/2018-F&E dated 29.11.2018 for a period of three years with the following members.

A. Chairman

Chairman, State Pollution Control Board, Odisha.

Sri Asit Tripathy, IAS, Chief Secretary, Odisha (From 19.08.2019 to 31.12.2020.)

Sri Suresh Chandra Mahapatra, IAS, Chief Secretary, Odisha (From 12.01.2021 and contd.)

B. Official Members

1. Secretary to Government, H & UD Department, Government of Odisha or his nominee, not below the rank of Joint Secretary
2. Secretary to Government, Industries Department, Government of Odisha or his nominee, not below the rank of Joint Secretary
3. Secretary to Government, Steel and Mines Department, Government of Odisha or his nominee, not below the rank of Joint Secretary
4. Director, Environment-cum-Special Secretary, Forest & Environment Department, Government of Odisha or his nominee
5. Director, Factories & Boilers, Government of Odisha or his nominee

C. Members Representing Local Authorities

1. Commissioner, Bhubaneswar Municipal Corporation, Bhubanewswar
2. Chairman / Executive Officer, Paradeep Municipality
3. Chairman / Executive Officer, Jharsuguda Municipality
4. Chairman / Executive Officer, Talcher Municipality
5. Chairman / Executive Officer, Barbil Municipality

D. Non-Official Members

1. Prof. Atanu Kumar Pati, Presently Vice Chancellor, G. M. University, Sambalpur
2. Dr. Ajit Kumar Patnaik, IFS (Retd), Former PCCF, Chief Executive, Chilika Development Authority
3. Dr. G.K. Roy, Retired Professor of Chemical Engineering & Former Director, NIT, Rourkela.

E. Members Representating Companies & Corporations

1. Managing Director, Odisha Mining Corporation Ltd., Bhubaneswar
2. Managing Director, Industrial Infrastructure Development Corporation (IDCO), Bhubaneswar

F. Member Secretary

Member Secretary, State Pollution Control Board, Odisha.

Dr.K. Murugesan, IFS (From 01.07.2020 and contd.)

CHAPTER – III

CONSTITUTION OF COMMITTEES

3.1 CONSENT COMMITTEE

3.1.1 Constitution of Consent Committees

The Board has re-constituted consent committee vide office order No. 355 dt. 08.01.2019 in pursuance to partial modification of order no.12547,dt.20.07.2015 with the members enlisted in Table-3.1 for establishment of various projects mentioned below:

17 categories of highly polluting industries having investment of ₹50 crores or more.

Coal, Bauxite, Iron Ore, Manganese, Limestone, Dolomite & Chromite Mines.

All Sponge Iron Plants.

Hazardous Waste recycling and re-processing unit including TSDF irrespective of any investment.

Reclamation of low lyling area / abandoned quarries with ash outside the plant premises for land measuring more than 10 Acres (Consent to Establish to be granted with the approval of Member Secretary and same to be taken to the Consent Committee for ratification on case to case basis as per Office Order no. 11047 / IND-IV-PCP-FARC-120, dated. 21.08.2017).

Members of the Committee are given in Table 3.1.

Table - 3.1 Members of the Consent Committee

1.	Member Secretary, SPC Board, Odisha, Bhubaneswar	Chairman
2.	One of the sectoral expert each of different Technical Committee constituted by the Board (such as Mining, Iron & Steel, Power, Chemical & Allied Industries, Petroleum refinery, Aluminium Smelter and Port Projects) in case of large industrial projects whose investment is ₹ 1000 crores or more or mining project with lease hold area 1000 ha. or more. (As per Table No.3.2)	Member
3.	External Expert Members to be nominated by the Chairman, SPC Board in specific cases, if required.	Member
4.	Secretary, Industries Department, Govt. of Odisha or his representative not below the rank of Deputy Secretary	Member
5.	Secretary, Steel & Mines Department, Govt. of Odisha or his representative not below the rank of Deputy Secretary	Member
6.	Secretary, Water Resources Department, Govt. of Odisha or his representative not below the rank of Deputy Secretary	Member
7.	Director -cum-Special Secretary to Govt. Forest & Env.Deptt. Govt. of Odisha or his representative	Member
8.	Director, Factories & Boilers, Odisha, Bhubaneswar or his representative not below the rank of Deputy Director	Member
9.	Chief Conservator of Forest (Nodal), Odisha or his nominee not below the rank of D.F.O. in the office of PCCF, Odisha, Bhubaneswar	Member
10.	Concerned District Collectors or their nominees	Member

11.	Branch Head de aling the subject of Hazardous Waste, SPC Board, Odisha, Bhubaneswar.	Member
12.	Branch Head dealing with Consent to Operate, Mines, SPC Board, Bhubaneswar.	Member
13.	Branch Head dealing the subject of environmental monitoring, SPC Board, Odisha, Bhubaneswar	Member
14.	Branch Head of Consnet to Establish Cell, SPC Board, Odisha, Bhubaneswar	Convener

The Technical Committee has been merged with Consent Committee vide Office Order No. 12547, dtd.20.07.2015.

Table – 3.2 Members of the Technical Committee

Sl. No.	Technical Committee constituted for	Sectoral Experts
1.	Mining Projects whose leasehold area is 1000 Ha or more. (vide Office Order No. 10729, dt. 03.05.07)	1) Prof. S. Jayantu, Dept. of. Mining Engineering, NIT Rourkela 2) Sri B. N. Mishra, Ex-Director (T) MCL, CMD, EDL, Bhubaneswar
2.	Iron and Steel Projects (vide Office Order No. 27958, dt. 16.11.06 & No. 10735 dt. 03.05.2007	1) Dr. Somanath Mishra, Ex- Principal, REC, Rourkela, 2) Dr. R. C. Gupta, Professor and Head, /Department of Metallurg ical Engineering , Institute of Technology, Banaras Hindu University
3.	Power Projects (vide Office Order No. 10761, dt. 03.05.07)	1) Sri B. C. Jena, Ex-CMD, Grid Corp. of Odisha Ltd, Bhubaneswar 2) Mr. G. S. Panda, Ex. Head TTPS, Sailashree Vihar, Bhubaneswar
4.	Chemical and Allied industries (vide Office Order No. 10850, dt. 05.05.07)	1) Prof. G. K. Roy, Dept. of Chemical Engineering, NIT, Rourkela 2) Sri R. K. Dash, Former Executive Director, PPL & OCFL,VIM 484 (near post office), Sailashree Vihar, Bhubaneswar
5.	Petroleum Refineries (vide Office Order No. 10761, dt. 03.05. 07)	1) Dr. M. O. Garg, Director, Institute of Petroleum, Dehradun 2) Prof. P. R ath, HOD, Department of Chemical Engineering, NIT, Rourkela
6.	Aluminium Smelter (vide Office Order No . 14791, dt. 22.06.07)	1) Dr. R. K. Paramguru, Scientist – G, Head, Hydro & Electrometallurgy Dept., Institute of Minerals & Materials Technology (formerly known as Regional Research Laboratory) Bhubaneswar, Odisha 2) Sri R. N. Jena, Ex-General Manager, NALCO Smelter Plant, Angul
7	Port Projects (vide office order No. 16387,dt. 05.07.2008)	1) Dr. R. Sundarvadivelu, Professor and Head, Department o f Ocean Engineering, Indian Institute of Technology, Chennai – 600 036 Or Dr. Sannasi Raj, Associate Professor, Department of Ocean Engineering, Indian Institute of Technology, Chennai – 600 036 2) Sri Dibakar Mohapatra, (Retd. Chief Engineer, Paradeep Port Trust), Plot No. 7A, Brahmeswar Bag,Tankapani Road, Bhubaneswar

3.1.2 Consent Committee Meetings

Ten Consent Committee meetings were held for consideration of 78 proposals for establishment during the financial year 2020-21. The details are given in Table - 3.3.

Table – 3.3 Details of Consent Committee Meeting

Sl. No.	Date of Consent Committee meeting	No. of cases disucssed
1.	24.06.2020	07
2.	22.07.2020	09
3.	27.08.2020	05
4.	24.09.2020	06
5.	03.11.2020	06
6.	27.11.2020	10
7.	08.01.2021	08
8.	02.02.2021	03
9.	25.02.2021	11
10.	25.03.2021	13
Total		**78**

Constitution of Internal Consent Committee

In pursuance of office order No.352, dt. 08.01.2019, an internal consent committee has been reconstituted with the members reflected in Table 3.4 to evaluate the applications for grant of consent to establish (NOC) for the following projects:

17 categories of highly polluting industries having investment of less than ₹50 crores.

Other than 17 categories of polluting industries (Red and Orange Category) having investment of ₹50 crores or more.

Table – 3.4 Members of the Internal Consent Committee

1.	Branch Head dealing with Consent to Establish, SPC Board, Odisha, Bhubaneswar	Chairman
2.	Senior Officer not below the rank of DEE & DES, SPC Board , Odisha, Bhubaneswar dealing with Consent to Establish.	Member
3.	Senior Officer not below the rank of DEE & DES, SPC Board , Odisha, Bhubaneswar dealing with Consent to Operate of Industry / Mines.	Member
4.	Senior Officer not below the rank of DEE & DES, SPC Board , Odisha, Bhubaneswar dealing with the subject of Hazardous Waste.	Member
5.	Senior Officer not below the rank of DEE & DES, SPC Board , Odisha, Bhubaneswar dealing with the subject of Environmental Monitoring.	Member
6.	Branch officer of Consnet to Establish Cell, SPC Board, Odisha, Bhubaneswar	Convenor

3.1.3 Internal Consent Committee Meetings

Five Internal Consent Committee meetings were held on following dates and twenty consent to establish cases were discussed. The details are given in Table - 3.5.

Table – 3.5 Details of Internal Consent Committee Meeting

Sl. So.	Date	No. of cases discussed
1.	27.05.2020	01
2.	19.10.2020	04
3.	15.12.2020	07
4.	13.01.2021	05
5.	09.03.2021	03
	Total	**20**

3.1.4 Constitution of Technical Committee for issue of "No Increase in Pollution Load" Certificate for Changes in Plant Configuration and Product Mix for the Project.

In pursuance to MoEF&CC, Govt.of India Notification vide So.3518(E) dtd.23.11.2016, State Pollution Control Board has constituted a Technical Committee with the following members to examine the application and to make recommendations for issue of **"No Increase in pollution load"** certificate for changes in plant configuration & product mix for the project.

Table - 3.6 Members of Technical Committee for issue of "No Increase in Pollution Load" Certificate

Sl. No.	Name	Designation
1.	Member Secretary, State Pollultion Control Baord, Odisha	Chairman
2.	Dr. Sanjat Ku. Sahu, Professor, Dept. of Env. Science, Sambalpur University, Sambalpur (Nominated by F&E Department).	Member
3.	Dr. Himanshu B. Sahu, Associate Professor, Dept. of Mining Engineering, NIT, Rourkela (Nominated by F&E Department).	Member
4.	Dr. Chitta Ranjan Mohanty, Associate Projessor, Dept. of Civil Engineering, SSUT, Burla (Nominated by F&E Department).	Member
5.	Dr. Abhaya Ku Dalai, Former Reader in Botany, Ravenshaw University, 6GH/1150, C-15, Sector-9, CDA, Cuttack-753014, (Nominated by F&E Department).	Member
6.	Sri R.C. Saxena, Regional Director, CPCB, Kolkata or his nominee not below the rank of Addl. Director,	Member
7.	Sr. Env. Scientist, L -I/Sr. Env.Engineer, L -I, SPC Board, dealing with Consent to Establish of Industries / Mines	Member
8.	Sr. Env. Scientist, L -I/Sr. Env. Enginer, L -I, SPC Board,dealing with Consent to Operate of Industries	Member
9.	Sr. Env. Scientist, L -I/Sr. Env.Engineer, L -I, SPC Board, dealing with Consent to Operate of Mines	Member
10.	Sr. Env. Engineer, L-II, SPC Board, dealing with Consent to Establish of Industries & Mines.	Member

3.2 PURCHASE COMMITTEE FOR SCIENTIFIC STORE

3.2.1 Constitution of the Purchase Committee

In pursuance of the provision Under Section 9 of the Water (Prevention & Control of Pollution) Act, 1974 and Under Section 11 of the Air (Prevention & Control of Pollution) Act, 1981, a purchase committees has been constituted for the financial year 2020-21 vide order No. 655, dt.07.05.2020 with the following members for the purchase and maintenance jobs of scientific items of the Central Laboratory as well as Regional Offices laboratories of the Board valuing ₹15,000.00 and above is given in Table 3.7

Table – 3.7 Members of the Purchase Committee for ₹15,000.00 and above.

1.	Member Secretary, State Pollution Control Board, Odisha	Chairman
2.	Incharge of Central Laboratory. State Pollution Control Board, Odisha	Member
3.	Dr. B.S.Jena, Sr. Principal Scientist, Institute of Materials and Minerals Technology (IMMT), Bhubaneswar.	Member
4.	Financial Adviser -cum-Addl.Secretary to Govt., Forest & Environment Dept., Govt. of Odisha, Bhubaneswar	Member
5.	Director or his representative, Directorate of Export Promotion & Marketing, Bhubaneswar	Member
6.	Addl. Administrative Officer, State Pollution Control Board, Odisha	Member
7.	Accounts Officer, State Pollution Control Board, Odis ha, Bhubaneswar	Member
8.	Incharge of Purchase, LEM Cell, State Pollution Control Board, Odisha, Bhubaneswar.	Member Convenor

Technical Committee has been constituted for the financial year 2020-21 vide order No. 650, dt.07.05.2020 for the specification of various equipments & instruments and to study the nature of requirement of different chemicals, glass wares, plastic wares, filtration products etc. required by the laboratory in Table - 3.8.

Table – 3.8- Members of the Technical Committee

1.	Incharge of Central Laboratory., State Pollution Control Board, Odisha	Chairman
2.	Dr. Giridhara Kumar Surabhi, Sr. Scientist, Regional Plant Resource Centre, Ekamrakanan, Bhubaneswar	Member
3.	Incharge of Biological Laboratory, State Pollution Control Board , Odisha,	Member
4.	Incharge of Chemical Laboratory., State Pollution Control Board, Odisha	Member
5.	Incharge of Soil Laboratory., State Pollution Control Board, Odisha	Member
6.	Incharge of Air Laboratory., State Pollution Control Board, Odisha	Member
7.	Addl. Administrative Officer, State Pollution Control Board, Odisha,	
8.	Accounts Officer, State Pollution Control Board, Odish a,.	Special Invitee
9.	Incharge of Purchase, LEM Cell State Pollution Control Board, Odisha,	Member Convenor

3.3 LIBRARY PURCHASE COMMITTEE

In pursuance of Section 9 of the Water (Prevention & Control of Pollution) Act, 1974 and Section 11 of the Air (Prevention & Control of Pollution) Act, 1981 an Internal Purchase Committee has been constituted vide office order No. 11994 dt. 23.07.2014 and amended vide office order No.2235/Estt.(Misc.) 60/2010 dt.28.02.2019 for examining and recommending purchase of Books, Journals, Reports, Non-book materials, furniture and other requisites for the Library. Members of the committee are given in Table - 3.9.

Table - 3.9 Members of the Library Purchase Committee

1.	Member Secretary, State Pollution Control Board, O disha	Chairman
2.	Senior Environmental Engineer- L-I (N), State Pollution Control Board, Odisha	Member
3.	Senior Environmental Engineer- L-I (C), State Pollution Control Board, Odisha	Member
4.	Senior Environmental Scientist – L-I (P), State Pollution Control Board, Odisha	Member
5.	Administrative Officer, State Pollution Control Board, Odisha	Member
6.	Sr. Law Off icer,State Pollution Control Board, Odisha	Member
7.	SES, In-Charge of Library upto 27.02.2019 (Order No.15332, dtd.23.11.2017) and SEE, In-Charge of Library (Order No. 2235/Estt. (Misc)60/2010 dtd. 28.02.2019)	Member Convener

CHAPTER – IV

BOARD MEETING

4.1 In the year 2020-21, three Board Meetings were held.
The 121st, 122nd & 123rd Board meetings of the State Pollution Control Board, Odisha were held on 15th October, 2020, 10th December,2020 & 22nd March, 2021 respectively.

4.2 IMPORTANT DECISIONS OF THE 121st BOARD MEETING ARE AS FOLLOWS:

- The Board approved the proposal towards establishment of 15 nos. of additional Continuous Ambient Air Quality Monitoring Stations (CAAQMS) in different air pollution prone cities in the districts of Cuttack, Balasore, Keonjhar, Sundargarh, Mayurbhanj, Angul and in the capital city of Bhubaneswar.
- The Board approved the proposal for the project work on "Development of Geo Data base for Environmental Mapping and Web Based GIS application in critically polluted areas in Odisha".
- The Board approved the re-constitution of Technical Committee for issue of "No increase in Pollution Load Certificate" for changes in plant configuration and product mix for the project.
- Revised Auto-renewal mechanism for Consent to Operate based on self-certification was approved by the Board.
- The Board approved the proposal of policy decision for applicability of consent of the Board for Extraction or Sourcing or Burrowing of ordinary earth for the linear projects such as roads, pipelines etc.
- The Board approved fund allocation for research project of State Pollution Control Board, Odisha.
- Activities of Coastal Management Cell, ICZMP working with proper staff structure was approved.
- Hiring charges for MV Sagar Utkal monitoring vessel for outside agency was taken into administrative approval of Chairman and accorded.

4.3 IMPORTANT DECISIONS OF THE 122nd BOARD MEETING ARE AS FOLLOWS:

- The Board approved the proposal to extend GIS based Geo Database to the whole State of Odisha.
- The Board approved the proposal for Development of Air Quality Data Management Centre in the Head Office in respect of different districts and cities of Odisha.
- The Board approved the proposal of restructuring of the cadre of Engineers, Scientists, Administrative staff, creation of promotional post and upgradation of posts in the cadre of Stenographer, Typist and Assistant Librarian.

4.4 IMPORTANT DECISIONS OF THE 123rd BOARD MEETING ARE AS FOLLOWS:

- The Board confirmed the proceedings of the 122nd special Board meeting held on 10.12.2020.
- The Board approved the draft Annual Repot for the Financial Year 2019-20.
- The Board approved revision of Budget for the financial year 2020-21 and Budget Estimate for the financial year 2021-22.
- The Board decided to carry out a study on Mercury Emission on Thermal Power Plants.

CHAPTER – V

ACTIVITIES

5.1 CONSENT TO ESTABLISH (CTE)

5.1.1 Projects related to Manufacturing and Service Sectors

Board received 1152 applications from different manufacturing and service sectors for consent to establish during 2020-21 and 346 pending proposals were carried forward from the year 2019-20.

Consent to establish was granted to 907 units. The detailed status of 1498 Consent to Establish applications processed during 2020-21 is given in Table-5.1 and 5.2.

Table - 5.1 Status of Consent to Establish (CTE)

Sl. No.	Status	Head office (H.O.)	Regional Offic es (R.O.)	Total
1.	No. of applications received during 2020-21	113	1039	**1152**
2.	No. of applications carried forward from 2019-20	94	252	**346**
	Total applications	**207**	**1291**	**1498**
	i) Consent to establish granted	75	832	**907**
	ii) Consent to establish refused/applications rejected.	01	61	**62**
	iii) No. of applications under evaluation	131*	398	**529**

N.B: *Incomplete applications and asked to comply-131 Nos.

Table - 5.2 Details of Consent to Establish Status by Regional Offices

Regional Office	No. of applications received during 2020-21	No. of applications carried forward from year 2019-20	Total no. of applications received	No. of units granted	No. of units refused/ rejected	No. of cases disposed off	Under evalua-tion
1	**2**	**3**	**4 (2+3)**	**5**	**6**	**7** (5+6)	**8** (4-7)
Angul	81	15	96	58	0	58	38
Balasore	70	0	70	68	0	68	02
Berhampur	141	08	149	95	45	140	09
Bhubaneswar	56	113	169	59	12	71	98
Cuttack	94	16	110	77	0	77	33
Jharsuguda	45	01	46	46	0	46	0
Kalinga Nagar	86	09	95	85	0	85	10
Keonjhar	23	16	39	32	0	32	07
Paradeep	13	04	17	07	0	07	10
Rayagada	126	48	174	101	04	105	69
Rourkela	141	14	155	72	0	72	83
Sambalpur	163	08	171	132	0	132	39
Total	1039	252	1291	832	61	893	398

5.1.2 Mines, Minor Minerals and Stone&Sand Quarry

The detailed status of 372 applications processed for consent to establish for mining, Minor Minerals and Stone & Sand Quarry operations during 2020-21 is given in Table-5.3.

Table - 5.3 Status of Consent to Establish for Mines, Minor Minerals and Stone & Sand Quarry of Regional Offices & H.O.

Sl. No.	Status	Mines, Minor Minerals, Stone & Sand Quarry
1.	Applications received during 2020-21	351
2.	Applications carried forward from 2019-20	21
3.	**Total number of applications**	**372**
	Consent to Establish granted	270
	Consent to Establish refused/ clarification raised	10
	No. of applications under evaluation	92

5.1.3 Status of Consent to Establish of Brick Manufacturing Units

Details of consent to establish of brick manufacturing units during 2020-21 are given in Table-5.4.

Table - 5.4 Status of Consent to Establish Brick Manufacturing Units

Sl. No.	Status	Number of Cases
1.	No. of applications received during 2020-21	10
2.	No. of applications carried forward from 2019-20	0
	Total number of complete applications	**10**
3.	Consent to Establish granted	06
4.	Consent to Establish refused /clacification raised	04
5.	No. of applications under evaluation	0

5.1.4 Status of Consent to Establish of Stone Crushers, Iron Ore Crushers, Mineral Beneficiation Units/Processing Units & Mineral Stack yards

Consent to establish status of Stone Crushers, Iron Ore Crushers, Mineral Beneficiation Units/Processing Units & Mineral Stack yards during 2020-21 is given in Table-5.5.

Table - 5.5 Status of Consent to Establish of Stone Crushers, Iron Ore Crushers, Mineral Beneficiation Units/Processing Units & Mineral Stack yards

Sl. No.	Status	Number of Cases
1.	No. of applications received during 2020-21	97
2.	No. of applications carried forward from 2019-20	35
	Total Number of complete applications	**132**
3.	Consent to Establish granted	87
4.	Consent to Establish refused /classification raised	05
5.	No. of applications under evaluation	40

5.2.1 CONSENT TO OPERATE (CTO)

5.2.1 Status of Consent to Operate

Board has received 3268 applications from industries, mines, stone crushers, iron ore crushers, brick kilns, hotels, hospitals, ceramic and refractories, telecom services, urban local bodies / townships and country liquor manufacturing units etc. and 528 pending cases were carried forward from 2019-20 and disposed 2938 applications for consent to operate during the year 2020-21. The details are given in Table-5.6.

Table - 5.6 Status of Consent to Operate

Name of the office	No. of complete Appli-cations received 2020-21	No. of cases carried forward from 2019-20	Total no. of complete appli-cations	No. of units granted CTO	No. of units refused/rej ected/clari fication raised	No. of cases disposed	No. cases under evalua-tion	No. of Show Cause Notices Issued
1	2	3	4 (2+3)	5	6	7 (5+6)	8 (4-7)	9
Angul R.O.	238	13	251	119	03	202	49	10
Balasore R.O.	289	51	340	284	0	284	56	28
Berhampur R.O.	358	45	403	316	60	376	27	87
BBSR, R.O	246	82	328	220	19	239	89*	0
Cuttack R.O.	152	35	187	130	0	130	57	0
Keonjhar R.O.	110	23	133	109	02	111	22	03
Rayagada R.O.	312	50	362	258	0	258	104	10
Rourkela R.O.	301	02	303	78	01	79	224	0
Sambalpur R.O.	547	154	701	546	03	549	152	19
Kalinga Nagar R.O.	274	24	298	263	0	263	35	01
Jharsuguda R.O.	98	18	116	115	0	115	01	0
Paradeep R.O.	32	*02	34	10	0	10	24	01
Head office	311	29	340	317	05	322	18	16
Total	**3268**	**528**	**3796**	**2845**	**93**	**2938**	**858**	**175**

N.B: * Incomplete applications 91(89+02)nos..

Category wise consent to operate status during 2020-21 is given in Table-5.7 (a),(b)&(c)

Table - 5.7 Categorywise Consent to Operate Status

(a) Mines, Minor Minerals,Stone quarry and Sand bed.

Name of the office	No. of complete appli-cations received	No. of cases carried forward from 2019-20	Total no. of complete appli-cations	No. of units granted CTO	No. of units refused/cl arificat-ion raised	No. of cases dispose d	Under evalua-tion	No. of Show Cause Notices Issued
1	2	3	4(2+3)	5	6	7(5+6)	8(4-7)	9
Angul R.O	77	01	78	68	03	71	07	01
Balasore R.O	140	0	140	131	0	131	09	0
Berhampur R.O	48	0	48	32	16	48	0	0
Bhubaneswar R.O	24	0	24	10	0	10	14*	0
Cuttack R.O	10	01	11	10	0	10	01	0
Jharsuguda R.O	08	07	15	15	0	15	0	0
Kalinga Nagar R.O	70	02	72	70	0	70	02	0
Keonjhar R.O	36	06	42	36	0	36	06	0
Paradeep R.O	0	0	0	0	0	0	0	0

Name of the office	No. of complete appli-cations received	No. of cases carried forward from 2019-20	Total no. of complete appli-cations	No. of units granted CTO	No. of units refused/cl arificat-ion raised	No. of cases dispose d	Under evalua-tion	No. of Show Cause Notices Issued
Rayagada R.O.	68	08	76	42	0	42	34	0
Rourkela R.O.	44	0	44	28	0	28	16	0
Sambalpur R.O.	74	0	74	49	0	49	25	0
Head office	97	03	100	97	02	99	01	03
Total	**696**	**28**	**724**	**588**	**21**	**609**	**115**	**04**

***Incomplete applications-14 nos.**

(a) Status of Consent to Operate (Stone Crusher, Iron ore Crusher & Mineral Beneficiation Unit)

Name of the office	No. Of complete Appli-cations received	No. Of cases carried forward from 2019-20	Total no. Of complete applicatio ns	No. Of units granted CTO	No. of units refused/ clarifica tion raised	No. of cases disposed	Under evalua-tion	No. Of Show Cause Notices Issued
1	**2**	**3**	**4** (2+3)	**5**	**6**	**7** (5+6)	**8** (4-7)	**9**
Angul R.O.	44	04	48	36	0	36	12	03
Balasore R.O.	38	13	51	48	0	48	03	0
Berhampur R.O.	52	06	58	31	16	47	11	22
Bhubaneswar R.O	32	27	59	38	01	39	20*	0
Cuttack R.O.	01	0	01	0	0	0	01	0
Jharsuguda R.O	01	02	03	03	0	03	0	0
Kalinga Nagar R.O	82	08	90	84	0	84	06	0
Keonjhar R.O.	22	08	30	24	0	24	06	01
Paradeep R.O	0	0	0	0	0	0	0	0
Rayagada R.O.	41	10	51	34	0	34	17	04
Rourkela R.O.	33	01	34	13	0	13	21	0
Sambalpur R.O.	66	06	72	46	0	46	26	0
Total	**412**	**85**	**497**	**357**	**17**	**374**	**123**	**30**

***Incomplete applications-20nos.**

(b) Brick Manufacturing Units

Name of the office	No. Of complete Appli-cations received	No. Of cases carried forward from 2019-20	Total no. Of complete appli-cations	No. Of units granted CTO	No. Of units refused/ Clarification raised	No. Of cases disposed	Under evalua-tion	No. of Show Cause Notices Issued
1	**2**	**3**	**4** (2+3)	**5**	**6**	**7** (5+6)	**8** (4-7)	**9**
Angul R.O.	01	03	04	04	0	04	0	0
Balasore R.O.	04	0	04	04	0	04	0	13
Berhampur R.O.	27	0	27	12	11	23	04	0
Bhubaneswar R.O	0	0	0	0	0	0	0	0

Name of the office	No. Of complete Appli-cations received	No. Of cases carried forward from 2019-20	Total no. Of complete appli-cations	No. Of units granted CTO	No. Of units refused/ Clarification raised	No. Of cases disposed	Under evalua-tion	No. of Show Cause Notices Issued
Cuttack R.O.	02	00	02	00	00	00	02	00
Jharsuguda R.O.	00	00	00	00	00	00	00	00
Kalinga Nagar R.O.	02	00	02	00	00	00	02	00
Keonjhar R.O.	00	00	00	00	00	00	00	00
Paradeep RO	01	00	01	00	00	00	01	00
Rayagada R.O.	00	00	00	00	00	00	00	00
Rourkela R.O.	03	00	03	00	00	00	03	00
Sambalpur R.O.	00	00	00	00	00	00	00	00
Total	**40**	**03**	**43**	**20**	**11**	**31**	**12**	**13**

5.2.2 Status of Consent to Operate for wastewater treatment facility by the Urban Local Bodies/ Townships under Water (Prevention & Control of Pollution) Act, 1974

The Urban Local Bodies (ULBs) and the industrial townships are required to be regulated under consent administration for disposal of sewage effluent as per provisions under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974.

The Board has issued directions to all Municipal authorities as per the CPCB direction dtd. 21.04.2015 to seek Consent under Water (PCP) Act, 1974 and submit the detail compliance with time bound action plan for setting up sewerage system/septage management covering proper collection, treatment & disposal of sewage generated in the local / urban area. The Board intimated all the ULBs to improve the sanitary conditions of open drains carrying sewage/sullage as per the CPCB guidelines. The new standards formulated by CPCB, Delhi for treated sewage effluent has been communicated to all the ULBs and concerned departments with instruction that the treated effluent shall meet the latest prescribed standard.

5.2.3 Status of Installation of GPRS based Real Time Data Acquisition System (RT-DAS) from the Online Monitoring Stations of the Industries in Odisha

The Board has implemented online monitoring system as a tool for self-regulation for the industries and at the same time, maintain transparency with the regulators i.e, SPCBs and CPCB. The CPCB advised all the SPCBs to install central server and software for acquisition of real time data. The system has been introduced with an objective to receive realtime data of online monitoring from all the States and to maintain a central data base at CPCB for the whole country.

The State Pollution Control Board, Odisha has developed a GPRS based Real Time Data Acquisition System (RT-DAS) using 'Y' cable to receive tamper proof data directly from online Stack, AAQ & Effluent monitoring systems installed by the industries. The central RT-DAS server has been installed in the Computer Cell of State Pollution Control Board, Odisha at its Head Office, Bhubaneswar. This RT-DAS server is receiving data from 157 industries and 24 mines operating in the State. The status of RT-DAS for the online is given in **Table -5.8.**

Table - 5.8 Status of Real Time Data Acquisition from the Online Continuous Monitoring Stations of Industries & Mines in Odisha

INDUSTRIES				
Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2021		
		AAQMS	CEMS	EQMS
1	ArcelorMIttal Nipon Steel Ltd. Formerly Essar Steel India Ltd	3	1	0
2	Penguin Trading & Agenci es Limited(Formerly Bhagawati Steels Pvt Ltd)	0	1	0
3	Bhushan Energy Limited	0	3	0
4	DALMIA DSP UNIT OCL India Ltd	1	3	0
5	Dhenkanal Steel Plant of M/s. Rungta Mines Ltd.	4	0	0
6	Nu Vista Limted Grinding Unit	0	2	0
7	Essar Power Orissa Ltd	2	1	1
8	Facor Power Limited	3	1	0
9	GM Iron & Steel Company Limited	0	2	0
10	GOA CARBON LIMITED	2	1	0
11	Grasim Industries Ltd (formerly known as Jayshree Chemicals Ltd)	0	5	1
12	Hindustan Coca-Cola Beverages Pvt Ltd	0	0	1
13	Indian Farmer Fertilizer Cooperatio n	3	8	1
14	Indian Metals & Ferro Alloys Ltd (120 MW PP)	4	2	0
15	Indian Metals & Ferro Alloys Ltd.	0	2	0
16	JK Lakshmi Cement Limited	1	1	0
17	JSW Cement LIMITED	1	2	0
18	Jai Hanuman Udyog Ltd	0	1	0
19	Jay Jagannath Steel & Power Ltd.	0	2	0
20	K.J.S. Ahluwalia Ltd. (Hima Ispat Pvt. Ltd)	0	3	0
21	KAMANDA STEEL PLANT	4	5	0
22	ACC Ltd	3	4	1
23	Grewal Associates (P) Ltd.	0	2	0
24	MAA MANASHA DEVI ALLOYS PVT LTD	0	1	0
25	Meta Sponge (P) Ltd	0	1	0
26	Neelachal Ispat Nigam Limited	3	4	2
27	Rourkela Steel Plant	4	21	8
28	Tata Steel Long Products Ltd. (Formerly known as Tata Sponge Iron Ltd)	3	3	0
29	Visa Steel Ltd	4	7	1
30	Emami Paper Mill Ltd.	3	3	1
31	Birla Tyres	1	3	0
32	Green Waves Pvt. Ltd.	0	0	1
33	Jalan Carbons and Chemicals Pvt. Ltd.	1	0	0
34	Jindal Steel & Power Limited	2	2	0
35	Kapilas Cement Manufacturing Works(A unit of OCL India Ltd)	3	1	0
36	MSP Sponge Iron Ltd	0	3	1
37	Talcher Thermal Power Stations	4	6	1
38	Tata Steel Limited	7	18	2
39	Utkal Metaliks Ltd	0	1	0
40	Vedanta Limited (2400 MW Thermal Power Plant)	4	4	1
41	Vedanta Limited (Smelter & CPP)	4	33	3
42	Virajaa Steel &Power Pvt. Lt d.	0	1	0
43	M/s Vishal Metallics Pvt. Ltd	0	1	0
44	KJ Ispat Ltd.	0	1	0
45	Bajrangbali Sponge and Power Limited (Formerly known as Kal inga Sponge Iron Limited) Kalinga Sponge Iron Limited	0	1	0

INDUSTRIES				
Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2021		
		AAQMS	CEMS	EQMS
46	Mahakali Ispat Pvt. Ltd.	0	1	0
47	Shree Ganesh Metaliks Limited	0	3	0
48	Aaditya Kraft and Papers Pvt. Ltd	0	1	1
49	Aarti Steels Ltd.	4	8	0
50	Adhunik Metaliks Limited	4	11	0
51	Aditya Aluminium(A unit of Hindalco Industries Ltd.)	4	14	1
52	Agarsen Sponge Private Limited	0	2	0
53	Aryan Ispat & Power Ltd.	3	2	0
54	B.R. Sponge & Power Limited	0	1	0
55	BRG Iron & Steel Co. Ltd.	0	2	0
56	Bhaskar Steel & Ferro Alloys Ltd.	0	1	0
57	Bhubaneshwar Power Pvt. Ltd.	4	2	1
58	Bhusan Power & Steel Ltd	2	35	4
59	Boudh Distillery Pvt Ltd	0	1	1
60	Brand Steel & Power Pvt. Ltd	0	1	0
61	Crackers India (Alloys) Ltd.	0	1	0
62	Ferro Alloys Plant Bamipal TATA STEEL LTD	0	1	0
63	GMR Kamalanga Energy Ltd.	4	3	1
64	Ganesh Sponge Pvt. Ltd	0	1	0
65	Green Waves Pvt. Ltd.	0	1	0
66	Govindam Projects (P) Ltd.	0	1	0
67	Hindalco Industries Ltd. (Smelter Plant)	2	7	5
68	Hindalco Industries Ltd.(CPP)	3	5	1
69	Hindalco Industries Ltd. (FRP)	0	3	2
70	IB Thermal Power Station (OPGC)	6	4	2
71	Indian Metals & Ferro Alloys Ltd.(138 MW)	0	6	0
72	J.K. Paper Ltd.	3	3	1
73	Jai Balaji Jyoti Steels Ltd	0	2	0
74	Jay Iron & Steels Limited	0	1	0
75	Jindal Coke Limited	0	1	1
76	Jindal India Thermal Power Ltd.	4	2	0
77	Jindal Stainless Steel Ltd.	4	6	1
78	Jindal Steel and Power Ltd.	4	37	3
79	Kashvi International Pvt Ltd.	0	2	0
80	Kaushal Ferro Metals (P) Ltd.	0	1	0
81	Khedaria Ispat Limited	0	1	0
82	L.N. Metallics Ltd.	0	1	0
83	Maa Samaleswari Industries Pvt. Ltd.	0	1	0
84	Maa Shakumbari Sponge Pvt. Ltd.	0	1	0
85	Mayur Electro Ceramics (P) Ltd.	0	2	0
86	N.K. Bhojani Pvt. Ltd.	0	1	0
87	Narbheram Power & Steel Ltd.	0	1	0
88	Nava Bharat Ventures Ltd. (CPP)	3	3	1
89	New Laxmi Steel and Power Pvt. Ltd. (Unit III) (Formerly known as Suryaa Sponge Iron Limited)	0	2	0
90	Dalmia Cement Bharat Limited (Formerly known as OCL INDIA Ltd.)	4	10	1
91	OCL Iron and Steel Ltd.	0	4	0
92	Ores Ispat Pvt. Ltd.	0	1	0
93	Paradeep Phosphate Limited	4	8	3

INDUSTRIES				
Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2021		
		AAQMS	CEMS	EQMS
94	Paradeep Refinery Project IOCL	7	21	1
95	Patnaik Steel & Alloys.	0	1	0
96	Pawanjay Sponge Iron Ltd.	0	1	0
97	Pooja Sponge (P) Ltd.	0	2	0
98	Prabhu Sponge Pvt. Ltd.	0	2	0
99	The Ramco Cements Limited	2	1	0
100	R.B. Sponge Iron Pvt. Ltd.	0	1	0
101	Rourkela Sponge LLP (Formerly known as Maa Tarini Industries Ltd)	0	2	0
102	Rathi Steel and Power Ltd	0	1	0
103	Reliable Sponge Pvt. Ltd.	0	1	0
104	Rexon Strips Ltd.	0	1	0
105	SMC Power Generation Ltd	4	2	0
106	Seeta Integrated Steel & Energy Ltd.	0	2	0
107	Shakti Sugar Ltd. (Distillery Unit)	0	1	2
108	Shiv Mettalicks (P) Ltd.	0	1	0
109	Shiva Cement Ltd.	0	4	0
110	Shree Hari Sponge Pvt. Ltd.	0	1	0
111	Shree Jagannath Steels & Power Ltd.	0	3	0
112	Shri Mahavir Ferro Alloys Private Limited.	0	4	0
113	Shyam Metaliks & Energy Ltd.	4	10	1
114	Sponge Udyog Pvt. Ltd.	0	1	0
115	Sree Metaliks Ltd.	0	9	0
116	Sri Balaji Metallics Pvt. Ltd.	0	1	0
117	Sri Hardev Steels Pvt. Ltd.	0	1	0
118	Suraj Products Ltd.	0	3	0
119	Surendra Mining Indsutries (P) Ltd	0	2	0
120	Swastik Ispat Pvt. Ltd.	0	2	0
121	T.R. Chemicals Pvt. Ltd.	0	1	0
122	Times Steel Power Pvt. Ltd.,	0	1	0
123	Toshali Cements Pvt. Ltd.	0	2	0
124	Vasundhara Metaliks Pvt. Ltd.	0	2	0
125	Vikram Pvt. Ltd.	0	1	0
126	Viraj Steel & Energy Pvt. Ltd	0	3	0
127	Yazdani Steel and Power Ltd	0	2	0
128	MGM Minerals Limited(Formerly MGM Steels Ltd.)	0	1	0
129	Maa Samaleswari Ferro Metals Pvt. Ltd	0	1	0
130	Mideast Integrated Steels Ltd	4	5	1
131	NALCO CPP	4	10	1
132	NALCO Ltd(Smelter Unit)	4	10	1
133	M/s.NALCO (Alumina Refinery)	4	9	0
134	NTPC Ltd Darlipali	4	1	1
135	NTPC-SAIL Power Company (P) Limited. (CPP-II)	3	2	1
136	Reliable Hi-Tech Infrastructure Pvt. Ltd	0	1	0
137	Reliable Sponge Pvt Ltd	0	1	0
138	Rungta Mines Ltd.(SID)	4	2	0
139	Sakthi Sugars Limited	0	1	1
140	Sani Clean Pvt Ltd.	0	1	0

INDUSTRIES				
Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2021		
		AAQMS	CEMS	EQMS
141	Mediaid Marketing Services	0	1	0
142	Scan Steels Ltd (Unit-2)	0	3	0
143	Scan Steels Ltd. (Unit-1)	0	1	0
144	Seven Star Steels Limited	0	2	0
145	Sumrit Metaliks Pvt Ltd	0	1	0
146	Talcher Super Ther mal Power Station NTPC	4	6	1
147	Tata Steel BSL	7	34	6
148	Tata Steel Ltd. Ferro Managnese Plant	0	4	0
149	Thakur Prasad Sao & Sons Pvt. Ltd (Unit-IV)	0	2	0
150	Thakur Prasad Sao & Sons Pvt.Ltd (Unit-1)	0	1	0
151	Thakur Prasad Sao & Sons Pvt.Ltd (Unit-3)	0	2	0
152	Toshali Cements Pvt Ltd	0	1	0
153	Ultratech Cement Limited	4	2	0
154	Utkal Alumina International Limite d	1	3	0
155	Vedanta Limited	6	3	0
156	Visa Sun Coke Limited	0	2	0
157	Odisha Cement Plant (A Unit of Shree Cement Ltd.)	4	CEMENT	0
	Total	**206**	**582**	**73**

MINES				
	Name of the Mine	CAAQMS	CEMS	EQMS
1	Barsuan-Taldih-Kalta Iron Ore Mines of SAIL, Sundargarh	3	0	0
2	Balda Block Iron Mines of Serajuddin & Co, Keonjhar	4	0	0
3	Bolani Iron Ore Mines of SAIL, Keonjhar	4	0	0
4	Jajang Iron and Manganese Mines of Rungta Mines Ltd., Keonjhar	4	0	0
5	Joda East Iron Mines of Tata Steel Ltd, Keonjhar	3	0	0
6	Kamarda Chromite Mines of B. C. Mohanty & Sons Pvt. Ltd., Jajpur	0	0	2
7	Kalarangiatta Chromite Mines of FACOR Ltd., Jajpur	0	0	2
8	Kaliapani Chromite Mines of Balasore Alloys Ltd., Jajpur	0	0	2
9	Katamati Iron Ore Mines of TATA Steel Ltd., Keonj har	3	0	0
10	Koira Iron Ore Mine of M/s. Essel Mining Industries Ltd, Sundargarh	3	0	0
11	Nadidih Iron and Manganese Ore Mines of Bona i Industrial Co. Ltd., Sundargarh	3	0	0
12	Nadidih Iron and Manganese Ore Mines of Feegrade & Co. Pvt. Ltd., Sundargarh	4	0	0
13	Nuagaon Iron Ore Mines of KJS Alhuwalia, Keonjhar	3	0	0
14	Oraghat Iron Ore Mines of Rungta Sons (P) Ltd., Sundargarh	3	0	0
15	Ostapal Chromite Mines of FACOR, Jajpur	0	0	2
16	Saruabil Chromite Mines of Mishrilal Mines (P) Ltd., Jajpur	0	0	2
17	Serenda Bhadrasahi Iron & Manganese Mine of M/s. OMC Ltd, , Keonjhar	1	0	0
18	South Kaliapani Chromite Mines of OMC Ltd., Jajpur	0	0	5
19	Sukinda Chromite Mines	0	0	2
20	Mahagiri Chromite Mines of M/s IMFA, Jajpur			
	Sukinda Chromite Mines of TATA Steel Ltd, Jajpur	0	0	3
21	Tailangi Chromite Mines of IDCOL, Jajpur	0	0	2
22	Thakurani Iron Ore Mines of Kaypee Enterprises , Keonjhar	4	0	0
23	Jillinga Mines of Essel Mining Corporation, Keonjhar	3	0	0
24	Kahandbondh Iron ore mines of Tata Steel , Keonjhar	3	0	0
	Total	**48**	**0**	**22**

5.3 CLOSURE DIRECTIONS

As a part of the Board's regulatory actions, units brought under consent administration, if found defaulting the prescribed standards or violating the directions of the Board, are allowed reasonable time to comply with the standards /directions. On persistent non-compliance, the defaulting units are served with Show Cause Notices (Table 5.6) followed by personal hearing to draw time bound action plan for compliance. Persistent non-compliances lead to issuance of closure directions. Table-5.9 shows the status of closure directions, issued by the Board.

Table - 5.9 Status of Closure Directions/Directions issued during 2020-21.

No. of directions issued	No of industries under closure	No. of revocations after due compliance
28 (18+10)	**08**	**37***

N.B: * Out of 37 applications, 27 are carried forward from previous year 2019-20.

5.4 PUBLIC HEARING

The State Pollution Control Board has been entrusted with the responsibility of conducting public hearing for the projects seeking environmental clearance from the Ministry of Environment and Forests and SEIAA in coordination with District Administration as per EIA Notification No. S.O.-1533 (E), dt. 14.09.2006.

Details of public hearings conducted during the period 2020-21 are given in Table-5.10 and 5.11.

Table - 5.10 Status of Public Hearings

1.	Number of projects received bythe Board for public hearing during the financial year 2020-21.	66
2.	Number of projects carried forward from previous financial year 2019-20	10
3	**Total Number of projects received for public hearing**	**76**
4	Number of projects for which public hearing have been conducted	34
5	Number of cases wherein Collectors were requested to fix up date	33
6	Number of cases for which public hearing date fixed	09

Table - 5.11 Details of Projects for which Public Hearings Conducted

Sl. No.	Name & Address of the project	Purpose	Date
1.	Anjira-Makundapur Hillocks (Cluster-1) at Anjira & Mukundapur village , tahsil –Dharmasala,Dist- Jajpur	Mining for production of building stone/ road metal over an area of 55.79 Ha. (15 nos of mining leases)	28.8.2020
2.	Aruha Hillocks (Cluster-2) mine at Aruha , tahsil –Dharmasala,Dist- Jajpur	Mining for production of building stone/road metal over an area of 59.89 Ha. (5nos of mining leases)	26.8.2020
3.	Bajabati Hillocks (Cluster-3) at Bajabati, tahsil –Dharmasala,Dist-Jajpur	Mining for production of building stone/ road metal over an area of 14.43 Ha. (6 nos of mining leases)	26.8.2020
4.	Bichhakhandi Hillocks (Cluster-4) at Bichhakhandi , tahsil – Dharmasala,Dist- Jajpur.	Mining for production of building stone over an area of 36.65 Ha. (16 nos of lease)	28.8.2020
5.	Dankari, Barada and Baraman Hillocks (Cluster-5) located in Dankari, Barada and baraman villages, tahsil – Dharmasala,Dist- Jajpur.	Mining over an area of 98.42 Ha.(24 nos of mining leases)	26.8.2020

Sl. No.	Name & Address of the project	Purpose	Date
6.	Lunibar Hillocks (Cluster-6) at Lunibar, tahsil –Dharmasala,Dist-Jajpur.	Mining for production of building stone over an area of 22.26 Ha. (5 nos of mining lease)	27.8.2020
7.	Rahadpur Hillocks (Cluster-7) at Rahadpur, tahsil –Dharmasala,Dist-Jajpur.	Mining for production of building stone/ road metal over an area of 42.40 Ha.(12 nos of mining leases)	25.08.2020
8.	Sahanidiha Hillocks (Cluster-8) at Sahanidiha, tahsil –Dharmasala,Dist-Jajpur.	Mining for production of building stone over an area of 20.08 Ha.(2 nos of mining lease)	27.8.2020
9.	M/s Vedanta Limited, at village Bhurkamunda, PO: Kalimandir ,district - Jharsuguda	Expansion of aluminium smelter from 16 LTPA to 18 LTPA,(CPP-1215MW),adding 2 smelter plant.	30.09.2020
10.	Dhania, Sankari and Tangeni Hillocks Stone Quarry (Cluster - I) over an area of 96.597 Ha. at village Kaipadar in the district of Khordha. Shree Jagannath Temple Administration	Dhania hillock(52.597ha), Sankhari hillock (33.428 ha) and Tangeni hillock (10.885 ha) Stone Quarry over an area of 96.597 Ha.	08.9.2020
11.	Golaputakhua hillocksDuburi hillocks Hatia hillocks) and Kalinga Hillocks) Stone Quarry (Cluster -II), Kiajhari, Nijagadatapanga, Chhatrama and Jhinkijhari,Khodha.	Golaputakhua hillocks(28.189ha), Duburi hillocks(2.72), Hatia hillocks(32.442ha) and Kalinga Hillocks(19.805ha	09.9.2020
12.	Cluster - 3 Kalachua Hillocks Stone Quarry,at- Dangarpada and Santarapur , Khordha	Cluster - 3 Kalachua Hillocks Stone Quarry, over an area of 49.84 Ha	10.9.2020
13.	M/s Shree Hari Sponge Pvt. Limited ,At- Kendrikela village, tehsil-Bonai ,Dist-Sundergarh.	Enhancement in production Sponge Iron from 60000 TPA to 2.7 LTPA, 1.35 LTPA Steel Billets, 1.20 LTPA TMT Bars, 26 MW Power through WHRB (16 MW) & AFBC (10 MW) and production of 30 million Fly Ash Bricks per annum	16.10.2020
14.	M/s Mohashakti Ferro Alloys Pvt. Ltd. at Bargada village, Bayree of Jajpur district	Expansion of 18,000 TPA capacity Low Carbon Ferro Alloys Plant	20.10.2020
15.	M/s Chariot Steel & Power Pvt. Ltd. at Kalunga Industrial Estate, Lathikata tahsil of Sundergarh district.	New Cement Grinding Unit of Chariote cement Company for production of 0.99 LTPA PSC/PPC/OPC Cement	04.12.2020
16	Baideswar Sand Ghat of M/s Minakshi Pradhan at Patugadadharpur village, Banki tahsil of Cuttack district	Sand ghat Capacity of 94120 Cum/Annum over ML area of 13.355 ha.	07.12.2020
17	M/s NHAI under Bharatmala Pariyojana Development of Economic Corridors, Inter-Corridors, feeder routes and Coastal Road),Nabarangpur.	Freight movement in India (Lot-3 Odisha & Jharkhand/Package-2) Raipur – Visakhapatnam(Ch.124.661 – Ch. 365.033 km) (Length 240 km)	07.12.2020
18	M/s NHAI under Bharatmala Pariyojana Development of Economic Corridors, Inter-Corridors, feeder routes and Coastal Road), Koraput.	Odisha & Jharkhand/Package-2) Raipur – Visakhapatnam(Ch.124.661 – Ch. 365.033 km) (Length 240 km)	08.12.2020
19	M/s Adish Minerals Pvt. Ltd. at Baunsamuli village, Badachana Thana , district – Jajpur.	Establishing Chrome Ore Beneficiation plant of 1,20,000 TPA throughput	15.12.2020
20	Sidhua River Jaripada Sand Quarry of Sri Pranakrushna at- village Sidhua, under Cuttak Sadar tahsil of Cuttack district	Jaripada Sand Quarry over an area of 10.11 ha.	22.12.2020
21	M/s Indian Oil Corporation Ltd at-, Pahimahura & Helpur villages, Bhandaripokhari tahsil of Bhadrak dist	Establishing a Greenfield Textile Project	30.12.2020

Sl. No.	Name & Address of the project	Purpose	Date
22	Katamati Iron Mine ,M/s Tata Steel Ltd. at Deojhar and Thakurani village, Dist - Keonjhar	Expansion Mine from 8 MTPA to 13.5 MTPA (ROM) with total excavation of 15 MTPA ,mineral beneficiation plant of 4 MTPA ,ML area -403.3238 ha.	30.12.2020
23	Aryan Ispat &Power (P)Ltd At-Bomaloi,rengali ,Sambalpur(coal washery)	Establishment of 5.0 MTPA capacity Coal Washery	12.1.2021
24	Aryan Ispat &Power (P)Ltd At-Bomaloi,rengali ,Sambalpur (Integrated steel plant)	Expansion of existing Steel Plant to Integrated Steel Plant	12.1.2021
25	M/s National Highway Authority of India under Bharatmala Pariyojana(Development of Economic Corridors, Inter-Corridors, feeder routes and Coastal Road) for Koraput district.	Development of Economic Corridors, Inter-Corridors, feeder routes and Coastal Road primarily to improve the efficiency of freight movement in India (Lot-3 Odisha & Jharkhand/Package-2) Raipur – Visakhapatnam(Ch.124.661 – Ch. 365.033 km) (Length 240 km	21.01.2021
26	Naini Coal Mine M/s Singareni Coal Co. Ltd Near Chhendipaada,Angul	Production of Coal upto 10 MTPA and coal washery capacity of 8 MTPA (Peak 9 MTPA) in mine lease area of 912.799 ha	20.01.2021
27	Rungta mines Ltd ,Korakolha sponge iron division At-Karakhendra ,Barbil,Keonjhar.	Expansion of Integrated steel plant(0.18MTPA DRI,22 MW CPP,0.554MTPA Steel,132 MW CPP)	11.02.2021
28	Rungta mines Ltd Karakhendra Steel Plant,Barbil, Keonjhar	Expansion of Steel Plant from 0.127 MTPA to 0.606 MTPA crude steel capacity with instillation of 121 MW CPP	11.02.2021
29	Shaheed Lakhan Nayak Small Hydroelectric Power Project M/s Meenakshi Odisha Power Pvt. Ltd. at Tentuligumma village in the district of Koraput	Small Hydroelectric Power Project capacity of 25 MW	17.2.2021
30	Kamanda Steel Plant ,M/s Rungta Mines Limited Kamanda Kamanda, Kula, Kusumdihi and Nuagaon PO: Koira ,dist- Sundargarh	Expansion capacity from (0.97 MTPA to 1.774 MTPA semi-finished Steel & from 0.912 to 2.022 MTPA finished steel)	09.03.2021
31	M/s Indian Oil Corporation Ltd. at IOCL Paradeep Refinery & Petrochemical Complex, Paradeep, Jagatsinghpur	Proposed Integrated Paraxylene & Purified Terephthalic Acid (PX-PTA) project at IOCL Paradeep Refinery & Petrochemical Complex,	02.03.2021
32	MGM Minerals Ltd, Nimidha,Dhenkanal.	Expansion of g Sponge Iron Plant from 1,05,000 TPA to 2,50,000 TPA and Power Generation through WHRB from 8 MW to 16 MW, installation of SMS with Induction Furnace, LRF & CCM toproduce M.S.Billets of 2,50,000 TPA, Rolling Mill to produce 2,50,000 TPA of Wire/TMT bars, Pellet Plant of 0.6 MTPA & CFBC Power Plant of 2x16 MW	16.03.2021
33	Anuary Sand Quarry of Sri. Patitapaban Swain for sand quarry mining on River Mahanadi over an area of 5.059Ha.in villagePatugadadharpur village, Banki-tahsil dist-Cuttack	Sand quarry mining on River Mahanadi over an area of 5.059Ha	17.03.2021
34	Manoharpur Coal Mine M/s Odisha Coal and Power Ltd. Manoharpur and at IB Valley Coalfield, tehsil,Himgir in the district of Sundargarh.	Expansion of Manoharpur Coal Mine production capacity from 8 MTPA to 16 MTPA over M.L area of 1848.379 Ha	23.03.2021

STATUS OF WATER CESS

The Water Cess Act, 1977 has been repealed with effect from 01.07.2017.

5.6 ENFORCEMENT UNDER THE ENVIRONMENT (P) ACT, 1986

5.6.1 Implementation of the Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016.

Ministry of Environment, Forest and Climate Change, Govt. of India in supersession of Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008 has notified the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 on 4th April, 2016. These rules apply to the management of hazardous and other waste as specified in the Schedules to these rules.

The Authorization status of hazardous waste generating industries during 2020-21 is given in Table 5.13.

Table 5.13 Authorization Status of Hazardous Waste

Sl. No.	Authorization status	Number
(i)	**Total no. of applications received**	211
(ii)	No. of units granted authorisation	159
(iii)	No. of units refused/rejected	07
(iv)	**Total No. of applications disposed**	166
(v)	**No. of applications under evaluation**	45
(vi)	**No of show cause notices issued**	26

(A) Authorisation Status of Actual Users of Hazardous Wastes :

During the period 2020-21, 27 Nos. of Actual Users (inside Odisha) and 15 Nos. of Actual Users (Outside Odisha) have been authorised by the Board for recycling / reprocessing of different hazardous wastes (Used Oil, Waste Oil, Used Anode Butt, Aluminium Dross,Used Lead Acid Battery, Zinc Skimming / Zinc Ash / Zinc Dross etc.) under Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.

List of Actual users (Processor / Recyclers) having valid authorization of SPCB (Inside Odisha)

Sl. No.	Name and address of the Actual Users	Hazardous & other Waste	Validity of Authorisation
1	A K Enterprises, Plot No. - 7, Khurda Industrial Estate, Dist - Khurda, Odisha	Aluminium Dross	31.03.2022
2	A K Enterprises, Plot No. - 7, Khurda Industrial Estate, Dist - Khurda, Odisha	Aluminium Dross Residue / Rejects	31.03.2023
3	A. K. Enterprises, Plot No. - A/29, Sarua Industrial Area, Khurda, Odisha – 752057	Aluminium Dross	31.03.2021
4	A. K. Enterprises, Plot No. - A/29, Sarua Industrial Area, Khurda, Odisha – 752057	Aluminium Dross	31.03.2023
5	Aditya Aluminium Limited, (A Unit of Hindalco Industries Limited), At/Po - Lapanga, Beside SH- 10, Dist – Sambalpur, Odisha – 768212	Aluminium Dross Used Anode Butt	31.03.2023
6	Hindalco Industries Ltd., Smelter Unit, (In-house Dross Recycling Plant), At/Po- Hirakud,Dist - Sambalpur, Odisha – 768016	Aluminium Dross	31.03.2023
7	Vedanta Limited, (Smelter and CPP) At - Bhurkamunda, PO - Siripura, Dist - Jharsuguda	Used Anode Butt	31.03.2022
8	BNDM Enterprises, At - Ladukhai, PO - Kalamati, PS - Burla, Dist - Sambalpur, Odisha – 768025	Aluminium Dross	04-11-2020

Sl. No.	Name and address of the Actual Users	Hazardous & other Waste	Validity of Authorisation
9	BNDM Enterprises, At - Ladukhai, PO - Kalamati, PS - Burla, Dist - Sambalpur, Odisha – 768025	Aluminium Dross	31-03-2022
10	East Coast Biotech Project, Dist - Khurda	Zinc Skimming / Zinc Ash / Zinc Dross	31-03-2022
11	Gajanan Petro Chemical Industry, Dist - Jajpur	Waste Oil	31-03-2025
12	Ideal Industries, Dist - Jharsuguda	Aluminium Dross Residue / Rejects	13-11-2020
13	Ideal Industries, Dist – Jharsuguda	Aluminium Dross Residue / Rejects	18-04-2021
14	Ideal Industries, Jharsuguda	Aluminium Dross Residue / Rejects	31-03-2024
15	Konark Steel Industries Pvt. Ltd., Sundargarh	Iron and Steel Scrap (M. S. Scrap /C. I. Scrap)	31-03-2021
16	MaaLaxmi Petrochemicals, Dist - Ganjam	Used Oil	31-03-2024
17	Metacast International, Dist – Sambalpur	Used / Spent Anode Butt	31.03.2023
18	Ratna Industries, Dist - Sundargarh	Used Oil	31.03.2022
19	Shree Shyam Minerals, Dist – Jharsuguda	Aluminium Dross	31-03-2023
20	ShriSaiMetallik, At – Jamunalia, PO – Badaposhi, VIA – Naranpur, Dist - Keonjhar, Odisha	Aluminium Dross	31-03-2020
21	ShriSaiMetallik, At – Jamunalia, PO – Badaposhi, VIA – Naranpur, Dist - Keonjhar, Odisha	Aluminium Dross	31-03-2024
22	ShyamJi Processors and Recyclers Pvt. Ltd., Sundargarh	Used / Spent Anode Butt	31.03.2022
23	ShyamJi Processors and Recyclers Pvt. Ltd., Sundargarh	Used / Spent Anode Butt	31.03.2022
24	Siddhi Industries, Dist - Sambalpur	Aluminium Dross	30-09-2020
25	Siddhi Industries, Dist – Sambalpur	Aluminium Dross	21-12-2020
26	Siddhi Industries, Dist – Sambalpur	Aluminium Dross	31-03-2021
27	Susim Enterprises, Dist - Cuttack	Used / Spent Oil	31-03-2022

List of Actual users (Processor / Recyclers) having valid authorization of SPCB (Outside Odisha)

Sl. No.	Name & Address of the actual Users Authorized by SPCB, Odisha	Hazardous and other Waste	Validity of Authorisation
1	Ashirwad Enterprise, Dist : Rajkot	Aluminium Dross	17-11-2024
2	Columbia Petrochemicals, Chhattisgarh	Used Oil	31-03-2023
3	Green Living, Andhra Pradesh	Used / Spent Anode Butt	02-09-2021
4	Mangalam Lubricants Pvt. Ltd., Jharkhand	Used / Spent Oil	30.06.2020
5	K M Oils Pvt. Ltd., Banagalore	Used Oil	30-06-2020
6	K M Oils Pvt. Ltd., Banagalore	Used Oil	31-03-2026
7	National Lubricants, Dist – Palghar, Maharashtra	Used Oil	31-03-2021
8	National Lubricants, Dist – Palghar, Maharashtra	Used Oil	31-03-2023
9	Neelam Metal Products, Rajasthan	Zinc Skimming / Zinc Ash / Zinc Dross	31-03-2024
10	Plus Lubricants, At - Gut No.- 228, Survey No.- 43, Satepada Road, City - Abitghar – 421303, Taluka – Wada, Dist - Thane, Maharashtra	Used Oil	31-03-2023
11	R. S. Oil industries, West Bengal	Used Oil	31-03-2021
12	Rolex Enterprises, Maharashtra	Used Lead Acid Battery / Plates / Ashes / Residue / Scraps	31-03-2021
13	Sankalp Enterprise, Gujarat	Zinc Skimming / Zinc Ash / Zinc Dross	31-12-2023
14	ShriShyam Ingot and Casting Pvt. Ltd., Chhattisgarh	Aluminium Dross	31-03-2021
15	ShivamMetallurgicalsPvt. Ltd., Chhattisgarh	Aluminium Dross	26-10-2021

B. Common Facility for Disposal of Hazardous Wastes

A Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF) has been established during 2010-11 at Kanchichuan, Jajpur, Odisha operated by M/s Ramky Enviro Engineers Ltd., Hyderabad with consented capacity of 75,000 T/A. During this period, 234 nos. of Industries / Mines have entered into membership agreement with Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF).

The status of disposal of hazardous waste at CHWTSDF is as follows:

Hazardous waste received from various Industries/Mines by CHWTSDF -54351.32T

i.	Landfill after treatment(LAT) Waste	-	38489.24T
ii.	Direct Land Fill(DLF) Waste	-	11230.22 T

5.6.2 Implementation of Manufacture, storage and Import of Hazardous Chemical Rules, 1989 and amendments thereof

The Board has not received any application for import of Hazardous Chemicals to the State during 2020-21.

5.6.3. Implementation of Public Liability Insurance Act, 1991

As per provisions of the Public Liability Insurance Act, 1991, the industries handling hazardous substances above the regulatory quantity are required to take insurance policy for providing immediate relief to the victims in case of chemical accidents. Efforts have been made to create awareness among the concerned industries to take such insurances. During this period 26 nos. of industries handling hazardous chemicals have renewed their insurance policies under the PLI Act, 1991.

5.6.4. Implementation of Batteries (M & H) Rule, 2001

The Board has received **82 nos.** of half yearly returns from **April' 2020 to Sep' 2020** and **139 nos.** of half yearly returns from **Oct' 2020 to March' 2021** from battery units. These returns have been received from Manufacture, Re-conditioner, Assembler, Dealer, Bulk Consumer, Auctioneer, Importer and Recycler.

5.6.5 Implementation of the Biomedical Waste Management Rules, 2016

It is the prime responsibility of every occupier of the **Health Care Establishments (**HCE) generating Biomedical Wastes (BMWs) to ensure requisite management and disposal of wastes as per the Biomedical Waste Management Rules, 2016. Biomedical wastes generated in different HCEs are required to be disposed off safely without causing any adverse impacts on the environment and human health.

5.6.5.1 Inventorisation of Health Care Establishments (HCE)

The Board has brought 3715 nos. of HCEs under the authorization administration under the Biomedical Waste Management Rules 2016 and the district wise distribution of such HCEs with respect to bed strength is given in Table- 5.14.

Table- 5.14 Districtwise Distribution of Health Care Establishments

SL. No.	District	< 50 beds	50 beds and < 200 beds	200 beds and <500 beds	500 beds and above	*Other Category	Total
1	**Angul**	48	9	0	0	77	134
2	**Balangir**	37	2	1	0	56	96
3	**Balasore**	48	4	1	0	110	163
4	**Bargarh**	42	2	0	0	72	116
5	**Bhadrak**	23	5	1	0	56	85
6	**Boudh**	5	1	0	0	12	18
7	**Cuttack**	245	23	2	1	267	538
8	**Deogarh**	6	1	0	0	9	16
9	**Dhenkanal**	41	4	0	0	38	83
10	**Gajapati**	15	2	0	0	21	38
11	**Ganjam**	111	9	0	1	144	265
12	**Jagatsinghpur**	24	3	0	0	44	71
13	**Jajpur**	43	0	1	0	77	121
14	**Jharsuguda**	29	3	0	0	32	64
15	**Kalahandi**	31	3	0	0	96	130
16	**Kandhamal**	17	2	0	0	49	68
17	**Kendrapara**	23	1	0	0	54	78
18	**Keonjhar**	50	4	0	0	111	165
19	**Khurda**	137	16	11	5	189	358
20	**Koraput**	23	3	1	0	79	106
21	**Malkangiri**	21	1	0	0	25	47
22	**Mayurbhanj**	43	4	1	0	80	128
23	**Nawarangpur**	12	2	0	0	49	63
24	**Nayagarh**	31	3	1	0	57	92
25	**Nuapada**	12	3	0	0	17	32
26	**Puri**	47	1	1	0	73	122
27	**Rayagada**	22	3	1	0	64	90
28	**Sambalpur**	55	2	1	1	67	126
29	**Subarnapur**	11	1	0	0	21	33
30	**Sundargarh**	55	10	5	1	198	269
	Total	**1307**	**127**	**28**	**9**	**2244**	**3715**

N.B: *Pathological Laboratories and Diagnostic Centers etc.

- As per the provisions of the Biomedical Waste Management Rules, 2016 all the HCEs are required to treat and dispose different types of biomedical waste properly. Most of the Health Care Units in Odisha have taken up biomedical waste segregation, treatment and captive disposal method as specified in the rule.
- Three major Govt. Medical Colleges and Hospitals namely, S.C.B Medical College and Hospital (SCB MCH), Cuttack, VIMSAR, Burla, Sambalpur and M.K.C.G Medical College and Hospital (MKCG MCH), Berhampur have developed their own infrastructures such as incinerator, shredder, microwave etc. which are operated by engaging private agencies namely M/s. Medi-Aid Marketing Services, M/s. Biotech Solution & M/s. Life Line Pharma respectively. In addition, M/s. Medi-Aid Marketing Services is operating common biomedical waste management facility at Amsarang, Sundargarh and at Seragada, Ganjam.
- Out of 3715 HCEs units 792 are utilizing the services of aforesaid common facilities.

5.6.5.3 Status of Authorisation Application of Health Care Establishments

The authorisation application status of the HCEs during 2020-21 is presented in Table-5.15

Table - 5.15 Authorisation Status of HCEs During 2020-21

Sl. No.	Status of HCEs	
1	No. of applications received during 2020-21	621
2	No. of cases carried over from year 2019-20	202
3	**Total no. of applications received**	**823**
4	No. of HCEs granted authorisation	561
5	No. of HCEs refused authorisation	01
6	Total No. of applications disposed	562
7	No. of HCEs issued show cause notices	14
8	No. of inspection conducted	482

5.6.6. Implementation of the Solid Waste Management Rules, 2016

As per the Solid Waste Management Rules, 2016 the Urban Local Bodies (ULBs) are required to take action for proper management of municipal solid wastes, seek authorization for setting up and operation of waste processing and disposal facilities from the Board and submit the annual report in Form-II every year to the State Pollution Control Board, Odisha. The Board has been pursuing this matter with all urban local bodies since the enactment of the Rules. All the ULBs have been asked to ensure compliance to the standards of the treatment and disposal of waste specified in schedule-II of the Rule. During this period one ULB has applied for authorization which is under scrutiny.

The Board has submitted the Annual Report on solid waste management for the period 2020-21 to CPCB, New Delhi.

5.6.7. Implementation of Plastic Waste Management Rules, 2016

As per the provision of Plastic Waste Management Rules, 2016, the Board has been declared as prescribed authority to issue or renew registration to manufacturers of plastic products, multilayered packaging and plastic waste recycling & processing units. Brand owners who sell their commodity/products using multilayered plastics for packaging need to obtain registration from the Board for managing the plastic waste. The Board is consistently vigilant on carry bag manufacturing units for their compliance to the statutory provisions of the Plastic Waste Management Rules. During the reporting period 08 plastic product manufacturing units (01 Importer, 01 Brand Owner, 03 Recycler & 03 producers) have been registered with the Board.

The State Pollution Control Board has instructed all Urban Local Bodies to implement the provision of Plastic Waste Management Rule, 2016. Major ULBs have also been instructed to send segregated plastic wastes to cement plants namely ACC Ltd., Bargarh, OCL Ltd. Rajgangpur, Shiva Cement, Sundergarh, Toshali Cement, Ampavali, Koraput for co-processing in cement kilns.

Cement Manufacturing units in the State (M/s ACC Cement, Bargarh, M/s OCL India Ltd., Rajgangpur, M/s Shiva Cement Ltd., Kutra, Sundergarh & M/s Toshali Cement Pvt. Ltd., Ampavally, Koraput) have been requested vide Board's letter No. 9398, dt.01.10.2020 to use segregated plastic waste from nearby ULBs in their kilns.

About 91 MT of plastic wastes have been used by M/s ACC Ltd., Bargarh for co-processing in its cement kilns during the calendar year 2020. M/s OCL India Ltd., Rajgangpur has used 11253 MT of segregated plastic waste collected from different ULBs for co-processing during January, 2020 to December, 2020.

Annual report on Plastic waste management for the period 2020-21 has been sent to CPCB, New Delhi.

Action is being taken for implementation of provisions of Plastic Waste Management Rules, 2016 by Gram Panchyats of the State.

SPCB has closed down following 8 nos. of different units in the State engaged in the manufacture/production of prohibited plastic items.

(Bhubaneswar-04, Cuttack-02, Berhampur-01, Rourkela-01)

State Govt. in Forest, Environment & Climate Change Department has issued ban order vide Order No.18441, dtd. 30.09.2019 there by prohibiting sell, trade, manufacture, import, store, carry, transport, use or distribute polythene carry bags of any shape, thickness and size, PET bottles of less than 200 ml capacity and single use disposable cutleries made up of thermocol (polystyrene), polyurethane in all urban areas of the State with effect from 2nd October,2019.

5.6.8 Implementation of the E-Waste Management Rules, 2016.

After enforcement of E-waste Management Rules, 2016 i.e. on 01.10.2016, no individual E-waste collection centre is allowed to collect E-waste. However, the captive collection centres of Producer / Dismantler/ Recycler/ Refurbishers are only allowed to collect E-waste. The Board has granted authorization to 04 E-waste Collection-cum-dismantling units during 2020-21.Annual report on E-Waste management for the period 2020-21 has been sent to CPCB,New Delhi.

5.6.9. Construction and Demolition Waste Management Rules, 2016

This Rule is applicable to every waste resulting from construction, re-modelling, repair and demolition of any civil structure of individual or organisation or authority who generates construction and demolition waste such as building materials, debris & rubble etc.

The authorities of Revenue Department, Housing & Urban Development Department, Works Department and Town Planning, Government of Odisha have been asked to take appropriate action for wide publicity of the Rules to create awareness amongst the local authorities and sensitize the general public about their responsibilities in handling such type of waste.

All the construction and demolition waste generators have been requested through public notice in Daily News Papers to go through the aforesaid Rules which is available at the SPC Board website www.ospcboard.org and Ministry website www.moef.nic.in. Furthermore, the operators of the waste processing facilities have been asked to apply for authorization from State Pollution Control Board.

Construction and Demolition Waste Processing facility is yet to be developed in Urban Local Bodies of the State. The waste collected is generally disposed at existing solid waste dump site or low lying areas.

Annual report on Construction & Demolition waste management has been sent to CPCB, New Delhi.

5.7 MONITORING NETWORK FOR WATER AND AIR QUALITY

5.7.1 National Water Quality Monitoring Programme (NWMP)

Inland Surface Water

The Board is monitoring the water quality of eleven river systems viz. Mahanadi, Brahmani, Baitarani, Rushikulya, Nagavali, Subarnarekha, Budhabalanga, Kolab, Vansadhara, Indravati and Bahuda at127 stations under the CPCB assisted National Water Quality Monitoring Programme (NWMP); one station on Brahmani river and one station on Baitarani river under National river Conservation Programme (NRCP).

Board is also monitoring the water quality of other surface water bodies such as canals (Taladanda and Puri canal), ponds in Puri, Bhubaneswar, Angul and Jeypore, Lakes (Chilka, Anshupa and Tampara), Atharabanki Creek and coastal water at Puri, Gopalpur and Paradeep under NWMP. Details of monitoring stations are given in Table-5.16.

The following water quality parameters are determined on monthly basis at all stations.

(a) *Physical parameters*: Temperature, pH, Alkalinity, Total suspended solids (TSS)

(b) *Indicators of Organic pollution*: Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Free ammonia – Nitrogen, Ammonical (Ammonium + ammonia) – Nitrogen, Total Kjeldahl Nitrogen (TKN)

(c) *Bacteriological parameters*: Total Coliform (TC) and Fecal Coliform (FC) at all stations and Fecal streptococci (FS) at selected stations

(d) *Mineral constituents*: Electrical Conductivity (EC), Total Dissolved Solids (TDS), Boron, Sodium Absorption Ratio (SAR), Percent Sodium, Total Hardness (TH) , Chloride, Sulphate, Fluoride.

(e) *Nutrients*: Nitrate (Nitrate + Nitrite) – Nitrogen, Phosphate – Phosphorous

(f) *Metals* : Chromium (Cr) hexavalent, Iron (Fe), Nickel (Ni), Copper (Cu), Zinc (Zn), Cadmium (Cd), Mercury (Hg), Lead (Pb) are determined only during lean period, that is, in the month of April or May

(g) *Biological Indices*: Saprobic Index (SI) and Diversity Index (DI) are monitored at selected stations and in the months of January, April and October.

Table-5.16 Surface Water Quality Monitoring Stations conducted by the Board under NWMP and NRCP

Sl. No.	Source of monitoring	Total No. of Stations		Sampling Station
		NWMP	NRCP	Monthly
(A)	**River system**			
1.	Mahanadi	55	-	**Ib :**(1) Sundargarh, (2) Jharsuguda, (3) Brajarajnagar U/s, (4) Brajarajnagar D/s; **Bheden :** (5) Jharsuguda; **Hirakud reservoir :** (6) Hirakud; **Power Channel**: (7) Power Channel U/s (8), Power Channel D/s; **Mahanadi :**(9) Sambalpur U/s, (10) Sambalpur D/s, (11) Sambalpur FD/s at Shankarmath, (12) Sambalpur FD/s at Huma, (13) Sonepur U/s, (14) Sonepur D/s, (15) Tikarpada, (16) Narasinghpur, (17) Mundali, (18) Cuttack U/s, (19) Cuttack D/s, (20) Cuttack FD/s, (21) Paradeep U/s,(22) Paradeep D/s; **Ong :**(23) Dharuakhaman ; **Tel :**(24) Monmunda; **Kathajodi:**(25) Cuttack U/s, (26) Cuttack D/s, (27) Cuttack FD/s at Mattagajpur, (28) Cuttack FFD/s at Kamasasan; **Serua :**(29) Cuttack FD/s at Sankhatrasa; **Kuakhai:** (30) Bhubaneswar FU/s, (31)Bhubaneswar U/s; **Daya :**(32) Gelapur, (33) Bhubaneswar D/s, (34) Bhubaneswar FD/s, (35) Kanas; **Gangua :**(36) Near Rajdhani Engg. College, (37) Hanspal, (38)

				Samantarpur, (39) Vadi mula; **Birupa:**(40) Choudwar D/s; **Kushabhadra :** (41) Bhingarpur, (42) Nimapara, (43) Gop; **Bhargavi :** (44) Chandanpur; **Mangala :** (45) Malatipatpur, (46) Golasahi; **Devi:** (47) Machhagaon; **Gobari :** (48) Kendrapada U/s, (49) Kendrapada D/s; **Nuna :** (50) Bijipur; **Kusumi:** (51) Tangi; **Kansari:** (52) Banapur ; **Badasankha:** (53) Langaleswar; **Sabulia :** (54) Rambha; and **Ratnachira :** (55) Kumardihi
2.	Brahmani	40	1	**Sankh** : (1) Sankh U/s; **Koel :**(2) Koel U/s; **Brahmani :**(3) Panposh U/s, (4) Panposh D/s, (5) Rourkela D/s, (6) Rourkela FD/s at Attaghat, (7) Rourkela FD/s at Biritola, (8) Bonaigarh, (9) Rengali, (10) Samal, (11) Talcher FU/s, (12) Talcher U/s, (13) Mandapal, (14) Talcher D/s, (15) Talcher FD/s,(16) Dhenkanal U/s, (17) Dhenkanal D/s, (18) Bhuban, (19) Kabatabandha, (20) Dharmasala U/s, (21) Dharmasala D/s *,(22) Pottamundai; **Nandira:** (23) Nandira U/s, (24) Nandira D/s ; **Kisindajhor :** (25) Kisindajhor; **Kharasrota :**(26) Khanditara, (27) Binjharpur, (28) Aul; **Guradih nallah:**(29) Guradih nallah; **Badajhor:** (30) Badajhor; **Damsala :** (31) Dayanabill; **Gonda nallah :** (32) Marthapur;
3.	Baitarani	13	1	**Kundra :** (1) Joda; **Kusei:**(2) Deogaon; **Baitarani :**(3) Naigarh, (4) Unchabali, (5) Champua, (6) Tribindha, (7) Joda, (8) Anandpur, (9) Jajpur, (10) Chandbali U/s and (11) Chandbali D/s*; **Salandi:** (12) Bhadrak U/s, (13) Bhadrak D/s; and **Dhamra :** (14) Dhamra
4.	Rushikulya	6	-	**Russelkunda reservoir :** (1) Russelkunda; **BadaNadi** : (2) Aska; **Rushikulya** : (3) Aska, (4) Nalabanta, (5) Madhopur ; and (6) Potagarh
5.	Nagavali	3	-	**Nagavali :** (1)Penta U/s, (2) Jaykaypur D/s, and (3) Rayagada D/s
6.	Subarnarekha	1	-	**Subarnarekha**: (1) Rajghat
7.	Budhabalanga	4	-	**Budhabalanga** : (1) Baripada D/s, (2) Balasore U/s, (3) Balasore D/s; and **Sone :** (4) Hatigond
8.	Kolab	1	-	**Kerandi :** (1) Sunabeda

9.	Vamsadhara	2	-	**Vansadhara :** (1) Muniguda, and (2) Gunupur
10.	Indravati	1	-	**Indravati :** (1) Nawarangpur
11.	Bahuda	1	-	**Bahuda :** (1) Damodarpally
	Sub Total	**127**	**2**	
(B)	**Canal**	**9**	**-**	**Taladanda canal :** (1) Jobra, (2) Ranihat, (3) Chatrabazar, (4) Nuabazar (5) Biribati, (6) Atharabanki; **Puri Canal :**(7) Hansapal, (8) Jagannathpur, and (9) Chandanpur
(C)	**Ponds**	**8**	**-**	**Bhubaneswar : (**1) Bindusagar ; (4 bathing ghats on each side of the pond) **Puri :**(2) Narendra pokhari, (3) Markanda Pokhari, (4) Indradyumna tank, (5) Swetaganga, (6) Parvati sagar; **Angul :** (7) Raniguda ; and **Jeypore :** (8) Jagannathsagar
(D)	**Lakes**	**7**	**-**	**Chilka lake :** (1) Rambha, (2) Satapada ; **Anshupa lake** : (3) Kadalibari, (4) Sarandagarh, (5) Subarnapur , (6) Bishnupur ; and **Tampara lake** : (7) Tampara lake
(E)	**Sea**	**3**	**-**	(1) Puri, (2) Gopalpur and (3) Paradeep
(F)	**Creek**	**1**	**-**	(1) Atharabanki creek
(G)	**STP**	**3**	**-**	(1) STP at CDA-Bidanasi, Cuttack, (2) STP at Mangalaghat, Puri and (3) STP at Mandapal, Talcher
	Total	**160**		

**** NRCP stations***

River Water Quality Monitoring

The annual average and range values of the criteria parameters such as pH, DO, BOD, TC, FC and FS obtained during the year 2020 for the river water quality monitoring stations listed under Table-5.16 are given in Table-5.18. Water quality in respect of other parameters is given in Table-4.19.

From the point of view of assessment of the river water quality on the basis of its use to which the river is put by the community, the water quality should conform to Class-C (drinking water source with conventional treatment followed by the disinfection). Comparison of the water quality has been made with respect to the tolerance limits stipulated for Class-C surface water bodies (IS: 2296-1982). Water quality data given in Table-5.18 indicate that out of the four critical parameters such as pH, DO, BOD and TC, parameters like pH and DO at most of the stations remained within the criteria limits, whereas BOD and/or TC have exceeded the criteria limits at several places. Non-compliance has been observed at 14 stations with respect to both BOD & TC, 1 station with respect to BOD alone and 4 stations with respect to TC alone(Table-5.17). The probable cause of downgrading the water quality from its desired use, are of organic origin. A major contribution towards this is from the discharge of untreated domestic water from the townships to the nearby water bodies.

Table-5.17 Water quality status of River monitoring stations during 2020

Sl. No.	River System	Total no. of Monitoring Stations	Conforming Stations	Non-conforming stations		
				Both BOD & TC	BOD alone	TC alone
1	Mahanadi	55	42	10	--	04
2	Brahmani	41	37	04	01	--
3	Baitarani	14	14	--	--	--
4.	Rushikulya	06	06	--	--	--
5.	Nagavali	03	03	--	--	
6.	Subarnarekha	01	01	--	--	--
7.	Budhabalanga	04	04	--	--	--
8	Kolab	01	01	--	--	--
9.	Vansadhara	02	02	--	--	--
10.	Indravati	01	01	--	--	--
11.	Bahuda	01	01	--	--	--
	Total	**129**	**110**	**14**	**01**	**04**

Water quality with respect to other parameters at all the monitoring stations except at Paradeep D/s, Devi at Macchagaon, Potagarh, Chandbali U/s, Chandbali D/s and Dhamra remain within the criteria limit for Class - C water quality laid down under IS : 2296-1982 (Tolerance limits for inland surface water bodies). Water quality at Paradeep D/s, Devi at Macchagaon, Potagarh, Chandbali U/s, Chandbali D/s and Dhamra are greatly influenced by the tidal effect as these stations are very close to the cstuary.

Table-5.18 Annual Average and Range values of Criteria Parameters (January-December, 2020)

(A) Mahanadi River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Ib river															
1.	Sundargarh	12	7.8 (6.8-8.3)	7.5 (6.4-8.2)	<1.0 (<1.0-1.6)	945 (330-1800)	240 (110-490)	NA	0	0	0	-	C		
2.	Jharsuguda	12	7.6 (6.8-8.3)	7.9 (7.4-8.6)	1.0 (<1.0-1.8)	912 (230-2200)	237 (45-790)	NA	0	0	0	-	C		
3.	Brajarajnagar U/s	12	7.6 (6.9-8.3)	8.2 (7.8-8.6)	1.1 (<1.0-1.8)	1242 (330-3500)	375 (78-790)	NA	0	0	0	-	C		
4.	Brajarajnagar D/s	12	7.6 (6.9-8.1)	8.0 (7.4-8.8)	1.2 (<1.0-1.8)	1932 (490-3500)	709 (130-2200)	NA	0	0	0	-	C		
Bheden river															
5.	Jharsuguda	12	7.6 (6.9-8.3)	7.9 (7.4-8.2)	1.1 (< 1.0-1.8)	839 (33-3500)	318 (7.8-1700)	NA	0	0	0	-	C		
Hirakud reservoir															
6.	Hirakud reservoir	12	7.7 (6.8-8.3)	8.2 (7.4-8.8)	1.0 (< 1.0-1.5)	808 (130-2400)	144 (20-230)	NA	0	0	0	-	C		
Power Channel															
7.	Power Channel U/s	12	7.6 (6.9-8.1)	7.5 (6.8-8.2)	<1.0 (<1.0-1.4)	324 (78-790)	92 (20-220)	NA	0	0	0	-	C		
8.	Power Channel D/s	12	7.5 (7.1-7.9)	7.5 (6.8-8.0)	1.1 (<1.0-1.7)	1003 (170-2400)	394 (20-1300)	NA	0	0	0	-	C		
Mahanadi river															
9	Sambalpur U/s	12	7.4 (6.6-8.2)	7.7 (6.6-8.6)	1.0 (< 1.0-1.4)	1025 (130-3500)	281 (45-1400)	NA	0	0	0	-	C		

NA : Not analysed

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
10	Sambalpur D/s	12	7.7 (6.9-8.5)	7.6 (7.0-8.4)	1.6 (1.0-2.7)	3087 (540-7000)	862 (130-2200)	17 (<1.8-79)	0	1 (8)	0	0	C		
11.	Sambalpur FD/s at Shankarmath	12	7.4 (6.6-8.0)	7.6 (6.4-8.2)	1.2 (< 1.0-1.8)	2841 (790-4900)	681 (170-1700)	5 (2-22)	0	0	0	0	C		
12.	Sambalpur FFD/s at Huma	12	7.7 (7.0-8.3)	7.8 (6.8-8.4)	1.0 (< 1.0-1.5)	2302 (330-3500)	518 (130-1700)	10 (<1.8-17)	0	0	0	0	C		
13.	Sonepur U/s	12	7.8 (7.1-8.3)	7.7 (6.8-8.8)	< 1.0 (< 1.0-1.5)	597 (20-3300)	245 (1.8-1300)	6 (2-17)	0	0	0	0	C		
14.	Sonepur D/s	12	7.8 (7.1-8.3)	7.5 (6.2-8.8)	1.0 (< 1.0-1.9)	961 (170-3400)	451 (20-1700)	13 (4-70)	0	0	0	0	C		
15.	Tikarapada	12	7.6 (6.8-8.3)	7.5 (5.8-10.4)	1.0 (< 1.0-1.6)	568 (78-1700)	221 (20-780)	17 (<1.8-49)	0	0	0	0	C		
16.	Narasinghpur	12	7.9 (7.2-8.4)	8.1 (7.2-9.2)	< 1.0 (< 1.0-1.7)	856 (170-2800)	189 (45-790)	17 (<1.8-22)	0	0	0	0	C		
17.	Mundali	12	7.9 (7.2-8.4)	7.9 (7.1-8.8)	< 1.0 (< 1.0-1.4)	943 (170-2400)	260 (20-790)	11 (<1.8-32)	0	0	0	0	C		
18.	Cuttack U/s	12	8.0 (7.3-8.5)	8.1 (6.8-9.4)	< 1.0 (< 1.0-1.5)	1150 (230-3500)	374 (78-1300)	24 (<1.8-49)	0	0	0	0	C		
19.	Cuttack D/s	12	7.7 (7.3-8.3)	7.9 (6.3-8.9)	1.3 (< 1.0-2.6)	2699 (790-4900)	1026 (220-2300)	21 (<1.8-70)	0	0	0	0	C		
20.	Cuttack FD/s	12	7.7 (7.1-8.4)	7.9 (6.2-8.6)	1.0 (< 1.0-1.7)	2138 (330-3500)	803 (130-1700)	19 (<1.8-79)	0	0	0	0	C		
21.	Paradeep U/s	12	7.8 (7.1-8.1)	7.5 (6.4-8.6)	< 1.0 (< 1.0-1.3)	6945 (45-1700)	182 (20-490)	7 (2-14)	0	0	0	0	C		
22	Paradeep D/s	12	7.7 (7.1-8.4)	7.3 (6.0-8.6)	1.3 (< 1.0-2.4)	665 (1.8-1700)	192 (1.8-490)	11 (<1.8-23)	0	0	0	0	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Ong River															
23.	Dharuakhaman	12	8.0 (7.2-8.5)	7.5 (6.4-8.6)	< 1.0 (< 1.0-1.3)	229 (20-490)	61 (1.8-130)	NA	0	0	0	-	C		
Tel River															
24.	Mommunda	12	7.9 (7.0-8.3)	7.5 (6.2-8.4)	1.0 (< 1.0-1.9)	246 (78-1100)	65 (20-230)	NA	0	0	0	-	C		
Kathajodi River															
25.	Cuttack U/s	12	8.0 (7.6-8.4)	8.0 (7.4-8.6)	< 1.0 (< 1.0-1.3)	1533 (170-3500)	735 (45-1700)	NA	0	0	0	0	C		
26.	Cuttack D/s	12	8.0 (7.5-8.5)	7.5 (6.1-8.4)	2.3 (< 1.0-3.6)	11108 (1700-54000)	5511 (1300-24000)	27 (5-140)	2 (18)	8 (67)	5 (42)	1 (8)	Doesn't conform to Class C	BOD, TC	Waste water of Cuttack city
27.	Mattagajpur (Cuttack FD/s)	12	7.8 (7.2-8.2)	7.1 (5.6-9.0)	2.5 (< 1.0-3.3)	7869 (330-17000)	2885 (68-7900)	35 (4-170)	3 (25)	7 (58)	3 (25)	1 (8)	Doesn't conform to Class C	BOD, TC	
28.	Kamasasan (Cuttack FFD/s)	12	7.9 (7.4-8.2)	7.6 (6.2-9.2)	< 1.0 (< 1.0-1.4)	1933 (230-4900)	554 (45-1700)	NA	0	0	0	0	C		
Serua River															
29.	Sankhatrasa (Cuttack FD/s)	12	7.8 (7.0-8.5)	7.7 (6.1-8.8)	2.2 (< 1.0-3.8)	10216 (490-54000)	3593 (130-22000)	17 (8-49)	1 (8)	8 (67)	3 (25)	0	Doesn't conform to Class C	BOD, TC	Waste water of Cuttack city

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Kuakhai River															
30	Bhubaneswar FU/s	12	7.7 (7.4-8.3)	7.5 (4.7-8.8)	1.0 (< L.0-1.7)	1991 (490-3500)	709 (130-1700)	14 (<1.8-46)	0	0	0	0	C		
31.	Bhubaneswar U/s	12	7.7 (7.3-8.3)	7.4 (5.4-9.7)	1.2 (< L.0-1.9)	3283 (1300-5400)	1257 (330-2200)	13 (2-27)	0	1 (8)	0	0	C		
Daya River															
32.	Gelapur	12	7.4 (7.0-8.3)	7.3 (4.7-9.5)	1.0 (< L.0-1.4)	3833 (1400-16000)	2542 (790-13000)	8 (4-17)	0	1 (8)	1 (8)	0	C		
33.	Bhubaneswar D/s	12	7.5 (7.0-8.4)	6.2 (4.3-8.8)	3.4 (1.1-4.7)	44033 (2400-160000)	28722 (1300-92000	51 (2-170)	9 (75)	8 (67)	10 (83)	2 (17)	Doesn't conform to Class C	BOD, TC	Waste water of Bhubaneswar city
34.	Bhubaneswar FD/s	12	7.4 (7.0-8.1)	6.1 (4.1-8.9)	2.9 (1.7-4.2)	29733 (2400-160000)	24288 (790-160000)	61 (2-220)	8 (67)	10 (83)	10 (83)	2 (17)	Doesn't conform to Class C	BOD, TC	
35.	Kanas	12	7.5 (7.0-7.9)	6.9 (5.5-8.5)	2.0 (< 1.0-2.9)	10158 (1400-35000)	3069 (450-17000)	27 (4-79)	0	8 (67)	5 (42)	0	Doesn't conform to Class C	TC	Human activities

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Gangua River															
36.	Near Rajdhani Engg. College	12	7.2 (6.9-7.9)	2.1 (0.6-3.4)	6.5 (3.3-13.3)	154333 (92000-160000)	91222 (14000-160000)	203 (110-280)	12 (100)	12 (100)	12 (100)	12 (100)	Doesn't conform to Class C	DO#, BOD, TC	Waste water of Bhubaneswar city
37.	Palasuni	12	7.0 (5.9-7.8)	1.6 (0.4-2.3)	7.8 (3.8-19.9)	151167 (54000-160000)	123889 (28000-160000)	265 (130-920)	12 (100)	12 (100)	12 (100)	12 (100)	Doesn't conform to Class C	DO#, BOD, TC	
38.	Samantraypur	12	7.0 (5.7-7.8)	1.5 (<0.3-3.2)	9.1 (5.1-13.8)	129417 (35000-160000)	114667 (13000-160000)	194 (79-350)	12 (100)	12 (100)	12 (100)	11 (92)	Doesn't conform to Class C	DO#, BOD, TC	
39.	Vadimula	12	7.2 (6.1-7.9)	3.6 (1.3-8.3)	4.8 (3.4-8.5)	33718 (7900-92000)	14763 (2100-54000	78 (23-170)	12 (100)	12 (100)	10 (83)	10 (83)	Doesn't conform to Class C	DO##, BOD, TC	
Birupa River															
40.	Choudwar D/s	12	7.7 (7.0-8.5)	7.4 (6.2-8.6)	1.0 (< 1.0-1.9)	3502 (230-17000)	1011 (45-4900)	NA	0	2 (17)	1 (8)	-	C		
Kushabhadra River															
41.	Bhingarpur	12	7.4 (6.6-8.2)	7.5 (5.5-11.3)	1.4 (< 1.0-2.2)	4724 (790-17000)	1666 (330-7900)	NA	0	2 (17)	2 (17)	-	C		
42.	Nimapara	12	7.5 (6.8-8.0)	7.4 (5.8-10.3)	1.3 (< 1.0-2.0)	5132 (780-13000)	1764 (110-4900)	NA	0	3 (25)	4 (33)	-	Doesn't conform to Class C	TC	Human activities

Frequency of violation for DO is 12 times (100% of total observation)
Frequency of violation for DO is 10 times (83% of total observation)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
43.	Gop	12	7.4 (6.7-8.0)	7.1 (5.3-8.6)	1.5 (< 1.0-2.1)	6458 (1300-22000)	2501 (700-13000)	NA	0	4 (33)	4 (33)	-	Doesn't conform to Class C	TC	Human activities
Bhargavi River															
44.	Chandanpur	12	7.6 (6.9-7.9)	7.2 (6.1-8.3)	1.1 (< 1.0-1.4)	1663 (230-4900)	693 (78-2300)	NA	0	0		-	C		
Mangala River															
45.	Malatipatpur	12	7.6 (6.7-8.3)	7.0 (6.1-7.8)	1.1 (< 1.0-1.7)	2603 (130-11000)	1301 (45-4900)	NA	0	1 (8)	1 (8)	-	C		
46.	Golasahi	12	7.6 (6.8-8.3)	7.4 (4.5-15.7)	2.6 (1.3-4.6)	16131 (490-160000)	3512 (130-22000)	20 (4-140)	3 (25)	2 (17)	2 (17)	1 (8)	Doesn't conform to Class C	BOD, TC	Human activities
Devi River															
47.	Machhagaon	12	7.7 (6.9-8.2)	7.1 (5.8-8.4)	1.1 (< 1.0-2.1)	632 (45-3300)	290 (20-1300)	NA	0	0	0	-	C		
Govari River															
48.	Kendrapara U/s	12	7.6 (7.0-8.2)	6.3 (5.2-8.2)	1.1 (< 1.0-1.6)	1467 (230-2800)	452 (20-790)	NA	0	0	0	-	C		
49.	Kendrapara D/s	12	7.4 (6.8-8.2)	6.2 (4.6-8.0)	1.5 (< 1.0-2.4)	2855 (470-4700)	695 (45-1700)	NA	0	0	0	-	C		
Nuna River															
50.	Bijipur	12	7.5 (7.0-8.1)	6.9 (5.3-8.8)	1.1 (< 1.0-1.8)	9075 (1700-54000)	3400 (110-22000)	NA	0	2 (17)	1 (8)	-	Doesn't conform to Class C	TC	Human activities

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Kusumi River															
51.	Tangi	12	7.5 (6.9-8.1)	7.2 (6.3-8.7)	1.1 (< 1.0-2.0)	3318 (2200-4900)	1248 (400-2200)	41 (13-70)	0	0	0	0	C		
Kansari River															
52.	Banapur	12	7.6 (7.2-8.3)	7.0 (5.9-8.3)	1.2 (< 1.0-1.9)	1654 (400-3500)	630 (230-1100)	NA	0	0	0	-	C		
Badasankha River															
53.	Langaleswar	12	7.5 (6.9-7.8)	6.7 (5.6-8.0)	1.2 (< 1.0-2.1)	2821 (330-4900)	1464 (130-2800)	NA	0	0	0	-	C		
Sabulia River															
54.	Rambha	12	7.8 (7.5-8.2)	7.4 (5.8-10.6)	1.3 (< 1.0-1.9)	3250 (2100-4900)	1180 (330-2300)	36 (<1.8-79)	0	0	0	0	C		
Ratnachira River															
55.	Kumardihi	12	7.4 (6.6-7.9)	6.9 (5.4-8.3)	1.2 (< 1.0-1.8)	1883 (220-4900)	764 (170-1700)	14 (2-49)	0	0	0	0	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**							**Drinking water source with conventional treatment followed by disinfection**		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			**6.5-8.5**	**5 and above**	**3 or less**	**-**	**2500 (Maximum Permissible)**	**100**					**Bathing Water**		

NB : The criteria of non-compliance with respect to TC for Class C rivers has been calculated on the following basis:
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.(Ref : IS 2296-1982 foot note)

(B) Brahmani River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Sankh River															
1.	Sankh U/s	12	7.6 (6.5-8.1)	7.4 (6.2-8.6)	<1.0 (< 1.0-1.3)	1951 (270-3500)	607 (110-1300)	NA	0	0	0	-	C		
Koel River															
2.	Koel U/s	12	7.5 (6.7-8.1)	7.8 (6.6-8.7)	1.0 (< 1.0-1.6)	2977 (230-4900)	734 (110-1400)	NA	0	0	0	-	C		
Brahmani River															
3.	Panposh U/s	12	7.5 (6.7-8.2)	7.4 (6.5-8.6)	1.1 (< 1.0-1.6)	2106 (170-3400)	526 (110-1300)	NA	0	0	0	-	C		
4.	Panposh D/s	12	7.3 (6.6-7.9)	4.8 (2.8-7.2)	4.6 (2.8-6.3)	12050 (4000-24000)	5256 (1100-13000)	19 (4-30)	10 (83)	10 (83)	8 (67)	0	Doesn't conform to Class C	DO#,BOD, TC	Waste water of Rourkela town and Steel Plant
5.	Rourkela D/s	12	7.2 (6.5-7.8)	5.8 (4.0-8.6)	3.8 (2.1-5.4)	8100 (1100-14000)	2492 (230-4900)	17 (8-49)	9 (75)	8 (67)	6 (50)	0	Doesn't conform to Class C	BOD, TC	-do-
6.	Rourkela FD/s (Attaghat)	12	7.4 (6.6-7.9)	7.1 (5.6-10.0)	2.9 (1.5-4.0)	2933 (130-11000)	1139 (78-3300)	11 (<1.8-22)	4 (33)	2 (17)	1 (8)	0	Doesn't conform to Class C	BOD, TC	-do-
7.	Rourkela FD/s (Biritola)	12	7.6 (6.8-8.4)	7.5 (6.7-8.4)	2.0 (< 1.0-3.2)	1653 (220-3500)	696 (78-1700)	13 (<1.8-17)	1 (8)	0	0	0	Doesn't conform to Class C	BOD	-do-
8.	Bonaigarh	12	7.6 (6.8-8.4)	7.2 (6.0-8.5)	1.0 (< 1.0-1.4)	845 (140-2300)	280 (45-1300)	NA	0	0	0	-	C		

Frequency of violation for DO is 5 times (42% of total observation)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
9.	Rengali	12	7.6 (7.0-8.3)	7.6 (5.8-9.4)	< 1.0 (< 1.0-1.2)	358 (20-1700)	223 (20-790)	NA	0	0	0	-	C		
10.	Samal	12	7.6 (6.9-8.2)	7.4 (5.0-8.6)	1.0 (< 1.0-1.3)	1457 (220-3500)	470 (110-790)	NA	0	0	0	-	C		
10.	Talcher FU/s	12	7.6 (7.0-8.2)	7.7 (6.8-9.6)	< 1.0 (< 1.0-1.1)	833 (46-2800)	263 (7.8-1100)	NA	0	0	0	-	C		
10.	Talcher U/s	12	7.5 (7.0-8.1)	7.8 (6.4-8.8)	< 1.0 (< 1.0-1.1)	1284 (140-3300)	460 (33-1300)	NA	0	0	0	-	C		
13.	Mandapal	12	7.6 (7.1-8.1)	7.8 (6.6-9.4)	< 1.0 (< 1.0-1.6)	2901 (490-4900)	988 (170-2300)	NA	0	0	0	-	C		
14.	Talcher D/s	12	7.5 (7.0-7.9)	7.4 (6.2-8.8)	1.7 (< 1.0-2.4)	2213 (170-7900)	914 (20-3300)	NA	0	1 (8)	1 (8)	-	C		
15.	Talcher FD/s	12	7.6 (7.0-8.0)	7.7 (6.8-8.8)	1.2 (< 1.0-1.9)	1364 (130-4900)	342 (23-1300)	NA	0	0	0	-	C		
16.	Dhenkanal U/s	12	7.8 (7.2-8.5)	7.4 (6.4-9.0)	< 1.0 (< 1.0-1.5)	687 (170-2300)	266 (45-1300)	NA	0	0	0	-	C		
17.	Dhenkanal D/s	12	7.8 (7.4-8.2)	7.7 (5.8-10.2)	1.2 (< 1.0-1.9)	1071 (78-2400)	496 (45-2200)	NA	0	0	0	-	C		
18.	Bhuban	12	7.8 (7.2-8.2)	7.5 (6.2-8.6)	1.3 (< 1.0-2.4)	1631 (490-3300)	543 (78-1700)	NA	0	0	0	-	C		
19.	Kabatabandha	12	7.6 (6.8-8.2)	7.5 (6.5-8.2)	< 1.0 (< 1.0-1.6)	1527 (330-3500)	632 (130-1300)	NA	0	0	0	-	C		
20.	Dharmasala U/s	12	7.7 (6.9-8.3)	7.6 (7.2-8.0)	1.1 (< 1.0-1.9)	2074 (790-3500)	636 (220-1300)	NA	0	0	0	-	C		
21.	DharmasalaD/s	12	7.6 (6.5-8.3)	7.5 (7.1-7.9)	1.2 (< 1.0-1.9)	2233 (1300-3500)	739 (270-1700)	NA	0	0	0	-	C		
22.	Pottamundai	12	7.9 (7.1-8.0)	7.3 (5.8-8.3)	1.0 (< 1.0-1.8)	1801 (220-3500)	562 (220-790)	NA	0	0	0	-	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Nandira River															
23.	Nandira U/s	12	7.9 (7.2-8.5)	7.9 (5.8-9.4)	1.1 (< 1.0-1.7)	1048 (20-2200)	435 (70-790)	NA	0	0	0	-	C		
24.	Nandira D/s	12	7.8 (7.2-8.3)	7.6 (5.4-10.8)	1.5 (<1.0 -1.9)	2465 (330-4900)	937 (45-2200)	34 (<1.8-79)	0	0	0	0	C		
Kisinda Jhor															
25.	Kisindajhor	12	7.8 (7.5-8.1)	7.5 (6.0-10.4)	1.3 (< 1.0-1.8)	1537 (79-3500)	348 (23-790)	NA	0	0	0	-	C		
Kharasrota River															
26.	Khanditara	12	7.5 (6.6-8.4)	7.7 (7.1-8.2)	1.0 (< 1.0-1.8)	658 (130-2100)	247 (17-790)	NA	0	0	0	-	C		
27.	Binjharpur	12	7.3 (6.7-7.9)	7.6 (7.0-8.6)	< 1.0 (< 1.0-1.1)	1017 (220-2800)	388 (110-1300)	NA	0	0	0	-	C		
28.	Anl	12	7.9 (6.9-8.2)	7.4 (5.2-9.0)	< 1.0 (< 1.0-1.6)	1973 (220-4300)	893 (78-1700)	NA	0	0	0	-	C		
Guradih nallah															
29.	Guradih nallah	12	7.5 (6.6-8.0)	3.6 (2.3-5.8)	6.4 (2.9-11.7)	39427 (220-92000)	14663 (170-35000)	150 (<1.8-350)	8 (67)	11 (92)	11 (92)	3 (75)	Doesn't conform to Class C	DO[#],BOD, TC	Waste water of Rourkela town and Steel Plant
Badajhor															
30.	Badajhor	12	7.8 (7.6-8.2)	7.8 (5.4-10.4)	1.0 (< 1.0-1.6)	3067 (1700-4900)	824 (270-1700)	NA	0	0	0	-	C		
Damsala River															
31.	Dayanabil	12	7.5 (6.8-7.9)	7.4 (6.7-8.2)	< 1.0 (< 1.0-1.4)	803 (140-2200)	198 (45-640)	NA	0	0	0	-	C		
Ganda Nallah															
32.	Marthapur	12	7.3 (6.7-7.9)	7.1 (6.4-7.6)	1.0 (< 1.0-1.6)	1087 (49-4900)	177 (20-450)	NA	0	0	0	-	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Lingira River															
33.	Angul U/s	12	8.2 (7.9-8.4)	7.5 (5.6-10)	1.1 (< 1.0-1.7)	1378 (220-2400)	473 (78-1300)	NA	0	0	0	-	C		
34.	Angul D/s	12	8.1 (7.8-8.5)	7.5 (5.4-9.8)	1.3 (< 1.0-1.9)	2616 (490-3500)	1031 (130-1700)	NA	0	0	0	-	C		
Ramiala River															
35.	Kamakhyanagar	12	7.5 (6.9-8.0)	7.4 (6.4-8.8)	1.2 (< 1.0-1.9)	2382 (780-4900)	839 (330-1700)	NA	0	0	0	-	C		
Banguru nallah															
36.	Banguru nallah	12	7.8 (7.0-8.2)	7.1 (6.0-8.8)	1.1 (< 1.0-1.6)	1584 (490-3500)	708 (170-1700)	14 (5-23)	0	0	0	0	C		
Singadajhor															
37.	Singadajhor	12	7.8 (7.3-8.2)	7.0 (4.6-9.6)	< 1.0 (< 1.0-1.3)	1659 (330-3500)	738 (130-1700)	NA	0	0	0	-	C		
Tikira River															
38.	Kaniha U/s	12	7.9 (7.2-8.2)	7.7 (6.0-9.6)	1.1 (< 1.0-1.4)	1450 (220-3300)	542 (110-1300)	NA	0	0	0	-	C		
39.	Kaniha D/s	12	7.7 (7.2-8.0)	7.0 (5.6-8.4)	1.3 (< 1.0-1.9)	2950 (1700-4900)	1037 (330-2200)	NA	0	0	0	-	C		
Bangurusingada jhor															
40.	Bangurusingada jhor	12	7.8 (7.4-8.2)	7.3 (5.8-8.4)	1.2 (< 1.0-2.3)	1903 (490-3500)	808 (220-1700)	NA	0	0	0	-	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Karo River															
41.	Barbil	12	7.6 (6.8-8.2)	7.2 (6.7-8.0)	1.0 (< 1.0-1.8)	1028 (210-2400)	513 (45-1300)	NA	0	0	0	-	C		
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less							Drinking water source with conventional treatment followed by disinfection		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			6.5-8.5	5 and above	3 or less	-	2500 (Maximum Permissible)	100					Bathing Water		

NB : The criteria of non-compliance with respect to TC for Class C rivers has been calculated on the following basis:
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.(Ref : IS 2296-1982 foot note)

(C) Baitarani River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Kundra nallah															
1.	Joda	12	7.2 (6.8-7.9)	6.7 (4.9-8.2)	<1.0 (<1.0-1.6)	2092 (490-4900)	1118 (110-3300)	NA	0	0	0	-	C		
Kusei River															
2.	Deogaon	12	7.7 (7.3-8.1)	7.3 (5.8-8.4)	1.1 (<1.0-1.6)	1980 (220-4900)	810 (130-1700)	NA	0	0	0	-	C		
Baitarani River															
3.	Naigarh	12	7.3 (6.9-7.5)	6.9 (5.9-7.9)	<1.0 (<1.0-1.5)	821 (140-2300)	340 (45-1300)	NA	0	0	0	-	C		
4.	Unchabali	12	7.2 (6.7-7.7)	6.7 (5.8-7.6)	<1.0 (<1.0-1.4)	1808 (220-4900)	745 (68-1700)	NA	0	0	0	-	C		
5.	Champua	12	7.3 (6.6-7.6)	7.0 (6.2-8.3)	<1.0 (<1.0-1.8)	1378 (140-3300)	369 (20-780)	NA	0	0	0	-	C		
6.	Tribindha	12	7.5 (6.8-7.8)	7.0 (5.8-7.7)	<1.0 (<1.0-1.6)	995 (78-3300)	342 (20-780)	NA	0	0	0	-	C		
7.	Joda	12	7.4 (6.9-8.0)	6.9 (6.0-7.9)	<1.0 (<1.0-1.6)	1315 (170-3500)	551 (78-1300)	NA	0	0	0	-	C		
8.	Anandpur	12	7.5 (6.9-8.0)	7.3 (5.6-8.4)	1.1 (<1.0-1.8)	2038 (270-3300)	1068 (170-2300)	NA	0	0	0	-	C		
9.	Jajpur		7.6 (6.9-8.3)	7.4 (6.9-7.9)	1.0 (<1.0-1.3)	1204 (130-3500)	314 (20-1100)	NA	0	0	0	-	C		
10.	Chandbali U/s	12	7.3 (6.8-8.0)	6.7 (5.6-8.4)	1.0 (<1.0-2.3)	1889 (220-3500)	924 (220-2200)	NA	0	0	0	-	C		
11.	Chandbali D/s	12	7.3 (6.7-7.9)	7.2 (6.0-8.8)	1.3 (<1.0-2.4)	2822 (270-4900)	1480 (230-2400)	NA	0	0	0	-	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Salandi River															
12.	Bhadrak U/s	12	7.4 (6.5-8.1)	7.5 (6.0-9.2)	<1.0 (<1.0-1.4)	1584 (230-2200)	518 (130-1100)	NA	0	0	0	-	C		
13.	Bhadrak D/s	12	7.3 (6.5-8.5)	7.6 (6.0-9.6)	1.4 (<1.0-2.0)	3067 (1300-4900)	1584 (780-2800)	NA	0	0	0	-	C		
Dhamra River															
14.	Dhamra	12	7.4 (6.7-8.0)	7.3 (6.0-8.8)	1.3 (<1.0-1.8)	1311 (220-2400)	351 (45-790)	NA	0	0	0	-	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**							**Drinking water source with conventional treatment followed by disinfection**		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			**6.5-8.5**	**5 and above**	**3 or less**	**-**	**2500 (Maximum Permissible)**	**100**					**Bathing Water**		

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

(D) Rushikulya River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Russelkunda Reservoir															
1.	Russelkunda	12	7.6 (7.2-8.3)	7.9 (6.0-10.0)	1.2 (<1.0-1.8)	3094 (330-9200)	1710 (230-5400)	NA	0	1 (8)	1 (8)	-	C		
Bada Nadi															
2	Aska	12	7.9 (7.3-8.3)	7.2 (6.2-8.8)	1.1 (<1.0-1.7)	3133 (270-5400)	2067 (130-3400)	NA	0	1 (8)	1 (8)	-	C		
Rushikula River															
3.	Aska	12	7.9 (7.4-8.4)	7.4 (5.5-9.5)	1.2 (<1.0-2.2)	2653 (330-4900)	982 (230-1700)	NA	0	0	0	-	C		
4.	Nalabanta	12	8.0 (6.8-8.5)	7.2 (5.2-8.6)	<1.0 (<1.0-1.5)	3544 (330-4900)	1626 (130-2500)	NA	0	0	0	-	C		
5.	Madhopur	12	7.9 (7.1-8.5)	7.9 (6.2-9.5)	1.1 (<1.0-1.6)	3417 (1100-17000)	1414 (130-4900)	14 (<1.8-47)	0	1 (8)	1 (8)	0	C		
6.	Potagarh	12	7.9 (7.3-8.4)	7.0 (6.0-9.0)	1.2 (<1.0-2.1)	1900 (230-4800)	933 (78-2100)	16 (<1.8-70)	0	0	0	0	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**							**Drinking water source with conventional treatment followed by disinfection**		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			**6.5-8.5**	**5 and above**	**3 or less**	**-**	**2500 (Maximum Permissible)**	**100**					**Bathing Water**		

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

(E) Nagavali River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
1.	Penta U/s	11	7.5 (6.9-8.2)	7.1 (6.2-8.4)	< 1.0 (< 1.0-1.2)	1808 (230-3500)	625 (330-1300)	NA	0	0	0	-	C		
2.	J.K. Pur D/S	11	7.6 (7.1-8.0)	6.5 (6.1-7.3)	1.5 (< 1.0-2.1)	1878 (130-4900)	685 (270-1700)	15 (<1.8-33)	0	0	0	0	C		
3.	Rayagada D/S	11	7.7 (6.8-8.5)	7.2 (6.6-7.8)	1.0 (< 1.0-1.4)	1422 (78-3500)	487 (130-1100)	20 (<1.8-79)	0	0	0	0	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**							**Drinking water source with conventional treatment followed by disinfection**		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			**6.5-8.5**	**5 and above**	**3 or less**	**-**	**2500 (Maximum Permissible)**	**100**					**Bathing Water**		

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref ; IS 2296-1982 foot note)

(F) Subarnarekha River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Subarnarekha River															
1.	Rajghat	12	7.9 (7.2-8.5)	7.6 (6.0-8.8)	1.3 (1.0-1.8)	1830 (170-3500)	823 (45-2400)	NA	0	0	0	-	C		
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less							Drinking water source with conventional treatment followed by disinfection		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			6.5-8.5	5 and above	3 or less	-	2500 (Maximum Permissible)	100					Bathing Water		

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref ; IS 2296-1982 foot note)

(G) Budhabalanga River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Budhabalanga River															
1.	Baripada D/s	12	7.7 (7.2-8.4)	7.5 (6.0-8.8)	1.4 (1.1-1.9)	3200 (1300-7900)	1310 (490-2200)	30 (8-79)	0	1 (8)	0	0	C		
2.	Balasore U/s	12	7.7 (7.1-8.3)	7.4 (6.0-8.8)	1.0 (<1.0-1.4)	1160 (450-2300)	480 (130-1300)	NA	0	0	0	-	C		
3.	Balasore D/s	12	7.5 (6.9-8.1)	6.9 (6.0-8.4)	1.5 (<1.0-2.8)	3017 (2200-4300)	1242 (220-3500)	NA	0	0	0	-	C		
Sone River															
4.	Hatigond	12	7.7 (7.3-8.1)	7.1 (6.4-8.4)	1.1 (<1.0-1.5)	2168 (330-3500)	1148 (78-3500)	NA	0	0	0	-	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**							**Drinking water source with conventional treatment followed by disinfection**		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			**6.5-8.5**	**5 and above**	**3 or less**	**-**	**2500 (Maximum Permissible)**	**100**					**Bathing Water**		

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

(H) Kolab River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Kerandi River															
1.	Sunabeda	11	7.4 (6.9-8.0)	7.1 (6.7-7.4)	<1.0 (<1.0-1.4)	1484 (110-3300)	418 (110-790)	NA	0	0	0	-	C		
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less							Drinking water source with conventional treatment followed by disinfection		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			6.5-8.5	5 and above	3 or less	-	2500 (Maximum Permissible)	100					Bathing Water		

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

(I) Vansadhara River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Vansadhara River															
1.	Munigoda	11	7.6 (6.9-8.2)	7.1 (6.7-7.8)	<1.0 (<1.0-1.2)	647 (130-1700)	139 (45-330)	NA	0	0	0	-	C		
2.	Gunupur	11	7.7 (6.7-8.2)	7.2 (6.5-7.7)	<1.0 (<1.0-1.4)	1954 (220-4900)	996 (130-1700)	NA	0	0	0	-	C		
Class 'C' water quality			6.5-8.5	4 and	3 or less	5000 or less							Drinking water source with conventional		

Criteria (IS-2296-1982)		above									treatment followed by disinfection
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000	6.5-8.5	5 and above	3 or less	-	2500 (Maximum Permissible)	100					Bathing Water

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

(J) Indravati River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Indravati River															
1.	Nawarangpur	11	7.4 (6.8-7.8)	7.1 (6.5-7.4)	1.2 (< 1.0-1.8)	1677 (340-3500)	369 (170-490)	NA	0	0	0	-	C		
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	4 and above	3 or less	5000 or less							Drinking water source with conventional treatment followed by disinfection		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			6.5-8.5	5 and above	3 or less	-	2500 (Maximum Permissible)	100					Bathing Water		

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

(K) Bahuda River System (2020)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters						Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	FS (MPN/ 100 ml)	BOD	TC	FC	FS			
Bahuda River															
1.	Damodarpally	12	8.0 (7.5-8.4)	7.2 (5.2-10.0)	1.2 (< 1.0-1.8)	2349 (450-3500)	631 (170-1400)	NA	0	0	0	-	C		
Class 'C' water quality Criteria (IS-2296-1982)			**6.5-8.5**	**4 and above**	**3 or less**	**5000 or less**							**Drinking water source with conventional treatment followed by disinfection**		
Water quality criteria MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000			**6.5-8.5**	**5 and above**	**3 or less**	**-**	**2500 (Maximum Permissible)**	**100**					**Bathing Water**		

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

Table-5.19: Water Quality With Respect to Other Parameters during 2020 (January-December)

(A) Mahanadi River System (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Ib River																
1.	Sundargarh	82 (<10-379)	57 (24-88)	8.5 (<5-14.4)	0.64 (<0.4-1.12)	0.014 (0-0.082)	5.38 (<1.5-14)	140 (66-183)	0.32 (0.11-0.55)	17.28 (6.23-29.12)	<0.5	96 (92-104)	54 (24-76)	9.2 (<5-30)	10.47 (5.5-19.64)	0.251 (<0.2-0.337)
2.	Jharsuguda	43 (<10-227)	60 (40-80)	9.6 (<5-22.2)	0.56 (0.6-0.56)	0.005 (0-0.028)	1.96 (<1.5-4.76)	154 (109-204)	0.43 (0.15-0.61)	21.03 (8.91-27.31)	<0.5	100 (92-112)	57 (40-80)	9.1 (6-12)	12.82 (<5-21.91)	0.234 (<0.2-0.313)
3.	Brajrajnagar U/s	68 (<10-315)	59 (32-88)	8.6 (<5-11.8)	0.8 (0.6-1.12)	0.014 (0-0.055)	2.94 (<1.5-5.6)	154 (97-242)	0.49 (0.18-1.04)	23.24 (11.64-35.84)	<0.5	112 (96-144)	52 (36-72)	9.3 (6-21.1)	13.4 (8.1-31.2)	0.251 (<0.2-0.316)
4.	Brajrajnagar D/s	56 (<10-298)	61 (32-84)	10.5 (6-14.8)	1.16 (0.6-2.8)	0.018 (0-0.084)	3.02 (<1.5-5.32)	172 (102-248)	0.54 (0.25-0.90)	24.11 (15.12-37.97)	<0.5	129 (112-152)	58 (36-84)	12.6 (6-23.1)	16.6 (10.4-27.1)	0.263 (<0.2-0.312)
Bheden River																
5.	Jharsuguda	25 (<10-87)	65 (40-108)	9.7 (6-14.5)	0.91 (<0.4-1.68)	0.022 (0-0.109)	2.46 (<1.5-5.04)	215 (121-342)	0.59 (0.16-1.24)	22.9 (8.93-39.96)	<0.5	170 (144-204)	72 (48-96)	15.5 (6-38.5)	23.42 (5.3-50.24)	0.344 (<0.2-0.533)
Hirakud Reservoir																
6.	Hirakud reservoir	21 (<10-86)	66 (40-108)	9.1 (6-12)	0.75 (0.6-1.12)	0.008 (0-0.036)	3.11 (<1.5-7.84)	169 (124-215)	0.34 (0.10-0.84)	15.6 (5.45-35.98)	<0.5	104 (92-120)	71 (52-88)	8.0 (<5-18)	13.31 (7.6-26.91)	0.286 (<0.2-0.344)
Power Channel																
7.	Power Channel U/s	21 (<10-64)	67 (52-96)	7.2 (<5-11.5)	0.96 (0.6-1.12)	0.012 (0-0.042)	3.11 (1.68-6.16)	172 (146-195)	0.32 (0.19-0.43)	15.57 (9.57-21.09)	<0.5	104 (96-112)	68 (56-84)	8.4 (5.8-12)	14.35 (7.1-23.93)	0.288 (<0.2-0.383)
8.	Power Channel D/s	17 (<10-72)	68 (36-92)	9.9 (6-13.7)	0.74 (0.6-1.12)	0.010 (0-0.025)	4.26 (<1.5-7.84)	178 (143-208)	0.31 (0.19-0.42)	14.9 (9.72-17.83)	<0.5	109 (104-112)	72 (54-88)	9.8 (7.7-14)	14.84 (9.4-23.33)	0.287 (<0.2-0.374)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Mahanadi River																
9.	Sambalpur U/s	19 (<10-61)	67 (40-92)	8.3 (6-14.8)	0.63 (0,6-1.12)	0.008 (0-0.039)	3.28 (<1.5-6.72)	181 (143-299)	0.52 (0,24-1.77)	20.88 (11,92-45.94)	<0.5	130 (92-196)	67 (50-84)	14.29 (8-45.2)	15.96 (7,3-23.21)	0.305 (<0,2-0.422)
10.	Sambalpur D/s	18 (<10-93)	69 (44-88)	14.1 (9-21.2)	0.87 (<0.4-2.24)	0.016 (0-0.067)	4.45 (<1.5-10.07)	207 (157-342)	0.61 (0.18-1.64)	22.62 (9.55-43.15)	<0.5	143 (112-204)	75 (48-96)	16.8 (6-51.9)	18.44 (11.2-32.35)	0.304 (<0.2-0.408)
11.	Sambalpur FD/s at Shankarmath	23 (<10-78)	76 (44-128)	12.6 (7,5-18.9)	0.65 (<0,4-1.12)	0.009 (0-0.034)	3.64 (<1,5-6.16)	209 (140-288)	0.47 (0,24-0.75)	20.25 (13,11-25.85)	<0.5	127 (112-140)	74 (60-108)	12.14 (6-20)	17.61 (7,6-25.98)	0.374 (0,206-0.538)
12.	Sundergarh	16 (<10-58)	69 (40-84)	9.2 (<5-17,7)	0.56 (<0.4-1,12)	0.011 (0-0,034)	3.61 (<1.5-5,88)	179 (140-206)	0.38 (0.21-0,60)	17.9 (10.96-25,06)	<0.5	110 (88-120)	70 (48-84)	10.79 (7.7-16)	15.24 (8.9-23,45)	0.329 (<0.2-0,51)
13.	Sonepur U/s	14 (<10-55)	70 (36-106)	7,2 (<5-11.1)	0,5 (<0.4-0.84)	0,013 (0-0.036)	2,46 (<1.5-3.92)	178 (128-255)	0,33 (0.19-0.48)	15,62 (10.21-21.59)	<0,5	125 (96-156)	70 (48-104)	8,55 (6-12.5)	15,05 (8.7-25.48)	0,319 (<0.2-0.412)
14.	Sonepur D/s	17 (<10-57)	81 (40-124)	9.9 (<5-19.2)	0.65 (<0,4-1.12)	0.025 (0-0.090)	2.6 (<1,5-5.6)	202 (147-287)	0.36 (0,18-0.56)	15.77 (8,19-20.77)	<0.5	139 (104-172)	82 (64-116)	9.63 (5,8-15.4)	15.5 (6,2-27.14)	0.342 (0,204-0.428)
15.	Tikarapada	34 (<10-130)	76 (48-120)	8.2 (<5-13,7)	0.62 (<0.4-1,12)	0.011 (0-0,067)	2.97 (<1.5-8,4)	191 (145-272)	0.49 (0.16-1,94)	19.18 (9.05-50,9)	<0.5	133 (104-180)	71 (56-96)	13.06 (6-57,7)	14.48 (6.6-30,48)	0.291 (<0.2-0,354)
16.	Narasinghpur	20 (<10-72)	72 (36-92)	8.1 (<5-11.6)	0.6 (<0,4-1.12)	0.027 (0-0.105)	4.17 (<1.5-16.8)	183 (146-225)	0.54 (0,21-1.41)	22.26 (10,8-49.56)	<0.5	115 (96-132)	67 (44-80)	13.66 (6-26)	10.66 (6,3-22.02)	0.315 (<0.2-0.393)
17.	Mundulí	44 (<10-173)	68 (34-84)	8.4 (<5-15,5)	0.62 (<0.4-1,68)	0.029 (0-0,109)	3.53 (<1.5-16,8)	179 (142-212)	0.35 (0.17-0,56)	16.37 (8.98-22,97)	<0.5	115 (104-120)	72 (64-80)	11.15 (8-14)	13.08 (5.9-29,7)	0.304 (0.2-0,399)
18.	Cuttack U/s	31 (<10-107)	59 (20-84)	8,2 (<5-14.7)	0.5 (<0.4-1.12)	0,026 (0-0.087)	2,69 (<1.5-6.16)	163 (82-209)	0,36 (0.15-0.48)	17.62 (8.16-29.09)	<0.5	106 (88-124)	65 (24-92)	10,69 (<5-18)	13,07 (6.2-22.14)	0,302 (<0.2-0.441)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
19.	Cuttack D/s	34 (<10-104)	67 (36-88)	11.6 (6-16)	0.65 (<0.4-1.4)	0.021 (0-0.056)	2.46 (<1.5-3.36)	190 (135-230)	0.44 (0.13-0.88)	18.86 (7.16-32.8)	<0.5	125 (116-132)	72 (54-88)	14.75 (6-19.2)	16.24 (8-41.43)	0.257 (<0.2-0.383)
20.	Cuttack FD/s	36 (<10-116)	67 (32-88)	7.7 (<5-12)	0.62 (<0.4-2.24)	0.024 (0-0.070)	2.63 (<1.5-4.48)	173 (124-212)	0.41 (0.16-0.72)	18.78 (8.81-31.73)	<0.5	111 (96-128)	65 (48-84)	9.7 (<5-15.4)	14.39 (7.1-26.55)	0.291 (<0.2-0.399)
21.	Paradeep U/s	37 (<10-127)	73 (36-96)	9.8 (<5-29.1)	0.74 (<0.4-1.12)	0.014 (0-0.045)	3.36 (1.68-9.52)	1630 (146-7746)	4.22 (0.21-22.28)	35.64 (12-82.28)	<0.5	1059 (116-2948)	56 (52-540)	303.43 (6-1534.5)	68.99 (6.8-223.81)	0.32 (<0.2-0.512)
22.	Paradeep D/s	92 (<10-237)	118 (64-192)	21.1 (<5-38.8)	0.84 (<0.4-2.24)	0.031 (0-0.280)	4.87 (2.24-10.64)	13368 (292-42560)	30.96 (1.67-116.62)	69.51 (46.1-91.68)	1.558 (0.819-2.036)	7509 (1960-18600)	1145 (60-2200)	680.07 (48-19986)	385.14 (15.6-1000)	0.541 (0.273-0.868)
Ong River																
23.	Dharuakhamma	18 (<10-91)	97 (48-148)	8 (<5-11.8)	0.61 (0.6-0.84)	0.017 (0-0.087)	2.88 (<1.5-4.48)	230 (127-318)	0.64 (0.19-2.22)	22.38 (8.46-53.43)	<0.5	146 (96-184)	81 (46-120)	12.59 (6-26)	11.73 (<5-22.02)	0.416 (0.216-0.625)
Tel River																
24.	Monmunda	37 (<10-133)	71 (40-116)	8.6 (<5-19.2)	0.47 (<0.4-0.56)	0.016 (0-0.055)	2.8 (<1.5-6.16)	167 (105-218)	0.43 (0.18-0.74)	20.43 (8.19-30.65)	<0.5	99 (68-120)	63 (40-96)	9.91 (5.8-16.3)	8.29 (<5-20.83)	0.268 (<0.2-0.373)
Kathajodi River																
25.	Cuttack U/s	36 (<10-112)	66 (40-88)	9.3 (<5-14)	0.64 (<0.4-1.12)	0.023 (0-0.070)	2.88 (<1.5-6.72)	173 (136-225)	0.37 (0.12-0.75)	16.95 (6.67-32.09)	<0.5	108 (92-136)	70 (56-92)	9.63 (6-14)	14.97 (6.1-29.12)	0.306 (<0.2-0.476)
26.	Cuttack D/s	48 (<10-154)	72 (36-104)	15.4 (6-21.4)	1.06 (<0.4-1.68)	0.056 (0-0.174)	3.3 (<1.5-5.6)	205 (162-318)	0.45 (0.18-0.82)	19.79 (9.13-32.18)	<0.5	139 (100-184)	74 (44-108)	13.13 (6-25.9)	17.13 (9.2-34.41)	0.295 (0.215-0.393)
27.	Cuttack FD/s at Mattagajpur)	25 (<10-51)	83 (36-104)	17.5 (9-31.9)	1.24 (<0.4-2.8)	0.045 (0-0.182)	3.7 (1.68-5.04)	240 (147-334)	0.71 (0.33-1.79)	25.03 (15.35-46.07)	<0.5	131 (0-204)	81 (56-108)	21.35 (10-53.8)	14.63 (8.1-30.83)	0.238 (<0.2-0.31)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal-inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
28.	Cuttack FFD/s at Kamasasan	41 (<10-192)	74 (44-104)	8 (<5-14)	0.74 (<0.4-1.12)	0.024 (0-0.073)	2.77 (<1.5-5.04)	195 (130-287)	0.61 (0.15-2.11)	22.51 (8.44-53.52)	<0.5	130 (112-164)	68 (44-88)	13.95 (6-40.4)	13.35 (8.1-22.8)	0.286 (<0.2-0.409)
Serua River																
29.	Cuttack FFD/s at Sankhatarasa	50 (<10-238)	75 (52-100)	16.2 (7.7-23.3)	1.24 (<0.4-2.8)	0.044 (0-0.164)	3.61 (<1.5-5.6)	194 (128-301)	0.54 (0.16-1.62)	20.77 (8.5-43.49)	<0.5	135 (112-184)	73 (52-84)	13.72 (6-51.9)	14.82 (5.2-25.95)	0.329 (<0.2-0.714)
Kuakhai River																
30.	Bhubaneswar FU/s	65 (<10-200)	71 (28-116)	9 (<5-16.6)	0.74 (<0.4-1.12)	0.011 (0-0.045)	3.11 (<1.5-8.4)	183 (113-251)	0.51 (0.23-1.06)	21.96 (13.69-41.24)	<0.5	122 (96-160)	63 (36-84)	11.63 (<5-20.2)	13.16 (7.4-22.14)	0.254 (<0.2-0.341)
31.	Bhubaneswar U/s	51 (<10-180)	73 (36-120)	10.9 (<5-18.5)	0.98 (0.6-1.68)	0.022 (0-0.084)	2.86 (<1.5-6.16)	198 (141-258)	0.52 (0.29-0.85)	22.13 (15.19-29.8)	<0.5	126 (88-164)	69 (44-88)	13.54 (6-20.2)	14.22 (7.1-23.33)	0.231 (<0.2-0.328)
Daya River																
32.	Gelapur	63 (<10-361)	74 (48-110)	11.2 (6-19.1)	0.91 (0.6-1.68)	0.010 (0-0.038)	3.27 (<1.5-6.16)	208 (151-346)	0.55 (0.19-1.16)	22.37 (10.29-36.03)	<0.5	128 (92-164)	70 (52-80)	15.44 (<5-25.9)	14.38 (8.5-21.43)	0.29 (<0.2-0.41)
33.	Bhubaneswar D/s	53 (<10-132)	71 (36-116)	22.1 (11-35.5)	1.54 (0.6-2.8)	0.012 (0-0.035)	4.42 (<1.5-6.16)	266 (152-391)	1.08 (0.44-1.80)	34.24 (20.06-45.91)	<0.5	193 (104-232)	75 (44-100)	33.93 (10-66)	21.34 (5.8-50.24)	0.378 (<0.2-0.649)
34.	Bhubaneswar FD/s	53 (<10-198)	72 (36-124)	16.4 (7.3-23.3)	1.33 (0.6-2.24)	0.013 (0-0.067)	3.39 (<1.5-5.06)	274 (148-402)	1.04 (0.42-1.79)	32.06 (21.07-44.64)	<0.5	180 (84-236)	75 (52-92)	35.03 (10-66)	18.19 (<5-39.0484)	0.353 (<0.2-0.579)
35.	Kmas	27 (<10-74)	74 (52-108)	12.4 (<5-17.1)	0.68 (0.6-0.84)	0.008 (0-0.019)	3.15 (<1.5-5.04)	227 (162-430)	0.98 (0.34-2.70)	30.65 (16.23-56.71)	<0.5	175 (108-240)	70 (48-96)	23.68 (<5-55.8)	19.59 (7.1-38.33)	0.306 (<0.2-0.472)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(ug/L)					
Gangua River																
36.	Near Rajdhani Engg. College	37 (<10-73)	67 (34-104)	32.2 (14.9-49.5)	2.39 (0.6-5.32)	0.015 (0-0.129)	5.13 (2.24-7)	274 (186-391)	1.20 (0.61-1.87)	37.16 (24.69-51.39)	<0.5	185 (120-244)	77 (52-124)	34.87 (14-52)	19.95 (5.1-62.38)	0.238 (<0.2-0.497)
37.	Palasuni	99 (19-537)	67 (40-124)	38.7 (17.4-69.8)	3.36 (1.1-7.84)	0.021 (0-0.164)	6.5 (4.48-9.24)	366 (180-642)	1.76 (0.65-2.93)	42 (24.26-51.9)	<0.5	256 (208-316)	82 (64-152)	57.43 (6-175.9)	27.95 (11.3-67.62)	0.743 (0.26-1.45)
38.	Samantrapur	87 (<10-413)	77 (56-116)	45.2 (31.4-68.6)	3.08 (0.6-8.4)	0.010 (0-0.067)	7.75 (3.36-14.56)	357.6 (212-511)	1.56 (0.70-1.99)	39.54 (28.08-47.19)	<0.5	260 (204-296)	87 (68-120)	52.43 (20-106.2)	30.06 (10.7-73.09)	0.485 (<0.2-0.861)
39.	Vadimula	121 (<10-437)	68 (52-92)	27.6 (11.9-49.5)	1.4 (0.6-2.24)	0.009 (0-0.067)	4.2 (<1.5-10.08)	308 (175-401)	1.38 (0.44-2.27)	37.52 (19.97-54.02)	<0.5	218 (196-240)	74 (66-88)	42.93 (10-67.3)	23.65 (9.5-54.52)	0.386 (<0.2-0.941)
Birupa River																
40.	Choudwar D/s	59 (<10-209)	75 (54-96)	8.4 (<5-11.6)	0.98 (0.6-1.12)	0.031 (0-0.174)	3.75 (<1.5-7.28)	187 (121-226)	0.41 (0.16-0.99)	18.09 (8.82-39.23)	<0.5	120 (116-132)	71 (48-88)	10.01 (6-18)	15.32 (5.9-26.42)	0.299 (<0.2-0.412)
Kushabhadra River																
41.	Bhimgarpur	20 (<10-44)	82 (52-124)	10 (6-17.4)	0.92 (0.6-2.24)	0.007 (0-0.022)	2.8 (<1.5-5.04)	250 (172-359)	0.71 (0.30-1.77)	25.92 (13.35-46.88)	<0.5	164 (128-204)	79 (56-108)	18.34 (11.5-42.3)	17.35 (6.2-32.5)	0.22 (<0.2-0.314)
42.	Nimapara	24 (<10-67)	87 (60-184)	10.2 (<5-19.1)	0.64 (<0.4-1.12)	0.007 (0-0.025)	3.15 (<1.5-8.4)	245 (166-401)	0.76 (0.24-1.62)	26.61 (12.96-49.64)	<0.5	155 (120-172)	77 (36-144)	19.81 (6-37.5)	15.58 (7.8-22.14)	<0.2 (<0.2-0.247)
43.	Gop	30 (<10-140)	87 (64-124)	10.4 (<5-17.1)	1.04 (0.6-2.8)	0.010 (0-0.045)	3.92 (<1.5-12.32)	239 (148-318)	0.82 (0.31-1.41)	29.86 (15.44-46.08)	<0.5	156 (132-184)	73 (44-102)	20.21 (10-34)	16.39 (8.1-25.7)	0.228 (<0.2-0.377)
Bhargavi River																
44.	Chandanpur	47	87 (56-	10.5	0.56	0.010	2.52	340	1.63	33.21	<0.5	344	83	56.45	19.53	0.242

		(<10-178)	148)	(6-14.7)	(0.6-0.56)	(0-0.022)	(<1.5-4.48)	(148-1100)	(0.32-5.18)	(15.31-64.86)		(164-672)	(52-168)	(8-284.6)	(6.8-38.33)	(<0.2-0.416)
Sl. No.	**Sampling Location**	**Physical parameters**		**Organic pollution Indicators**				**Mineral constituents**								
		Annual average values (Range of values)														
		TSS	**Total alkal -inity**	**COD**	**NH_3-N**	**Free NH_3-N**	**TKN**	**EC**	**SAR**	**% Na**	**B**	**TDS**	**TH**	**Cl**	**SO_4**	**F**
		(mg/L)		**(mg/L)**				**(□S/cm)**			**(mg/L)**					
Mangala River																
45.	Malatipatapur	48 (<10-223)	82 (44-140)	9.3 (<5-19.1)	0.91 (0.6-1.12)	0.013 (0-0.039)	2.99 (<1.5-7.28)	480 (128-3286)	1.64 (0.22-10.96)	26.9 (12.07-65.05)	<0.5 (<0.5-1.165)	723 (132-2480)	116 (56-500)	105.37 (6-972)	39.03 (5.2-273.2)	0.227 (<0.2-0.395)
46.	Golasahi	61 (<10-126)	126 (64-192)	22.7 (11.9-42.9)	1.3 (0.6-1.68)	0.019 (0-0.090)	4.2 (1.96-7.28)	5487 (163-16140)	14.70 (0.23-46.01)	51.52 (8.18-84.18)	1.08 (<0.5-1.62)	5892 (3720-10348)	569 (56-1700)	1716.31 (10-5765.2)	207.27 (5.7-444.1)	0.286 (<0.2-0.528)
Devi River																
47.	Machhagaon	40 (15-104)	99 (48-196)	16.2 (7.4-37.4)	0.93 (0.6-1.68)	0.017 (0-0.134)	3.67 (1.68-9.52)	6154 (147-24960)	23.27 (0.3-83.71)	48.7 (13.59-93.03)	0.794 (<0.5-1.699)	10380 (5560-16460)	358 (54-1680)	2183.37 (9.6-9418.8)	106.93 (<5-291.67)	0.348 (<0.2-0.518)
Gobari River																
48.	Kendrapada U/s	31 (<10-84)	87 (44-128)	9.7 (6-15)	1.17 (0.6-2.24)	0.025 (0-0.179)	2.69 (<1.5-6.16)	411 (110-1644)	1.57 (0.23-6.60)	33.37 (12.75-60.67)	<0.5	418 (160-996)	97 (48-228)	83.01 (8-496.1)	28.72 (6.8-58.34)	0.225 (<0.2-0.271)
49.	Kendrapada D/s	38 (<10-109)	90 (44-160)	12.8 (7.6-22.2)	0.89 (0.6-1.68)	0.021 (0-0.134)	4.48 (<1.5-20.16)	556 (178-1645)	2.62 (0.54-10.23)	40.1 (23.7-74.09)	<0.5	620 (176-1116)	117 (64-272)	143.42 (14-534.6)	30.58 (9.2-60.72)	0.241 (<0.2-0.361)
Nuna River																
50.	Bijipur	22 (<10-51)	97 (68-144)	9.9 (6-15.5)	0.92 (0.6-1.12)	0.013 (0-0.073)	4.9 (<1.5-11.76)	266 (141-446)	0.77 (0.31-1.30)	27.67 (15.28-39.35)	<0.5	183 (104-260)	78 (64-116)	17.25 (8-38.5)	14.73 (<5-28.45)	0.269 (<0.2-0.429)
Kusumi River																
51.	Tangi	43 (<10-108)	65 (44-100)	10.6 (<5-19.3)	1.17 (0.6-1.68)	0.018 (0-0.109)	5.16 (<1.5-12.32)	195 (125-273)	0.75 (0.42-1.37)	29.7 (18.32-45.27)	<0.5	118 (88-140)	56 (44-80)	13.64 (6-19.2)	15.84 (<5-45.24)	0.202 (<0.2-0.322)
Kansari River																
52.	Banapur	50 (<10-156)	91 (52-120)	11.3 (7-15.4)	1.06 (0.6-1.68)	0.013 (0-0.055)	4.48 (1.68-14)	225 (166-290)	0.83 (0.37-1.82)	28.87 (14.3-53.43)	<0.5	162 (144-180)	77 (48-108)	17.72 (6-26.9)	14.62 (<5-41.19)	0.219 (<0.2-0.449)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Badasankha River																
53.	Langaleswar	18 (<10-48)	143 (96-196)	14.1 (6-46.6)	1.07 (0,8-1.12)	0.013 (0-0.039)	4.12 (<1,5-16.24)	483 (315-877)	2.11 (0,79-4.54)	42.44 (22,65-68.61)	<0.5	313 (288-348)	111 (56-164)	58.99 (20-101.9)	21.39 (9,7-47.86)	0.398 (0,324-0.504)
Sabulia River																
54.	Rambha	21 (<10-80)	129 (80-212)	14.5 (8.9-23.1)	0.93 (0.6-1.68)	0.019 (0-0.091)	6.72 (<1.5-18.48)	513 (298-818)	1.85 (0.47-5.29)	38.51 (16.72-63.81)	<0.5	262 (216-288)	128 (88-200)	84.03 (22-226.9)	23.24 (6.2-47.62)	0.503 (0.267-0.651)
Ratnachira River																
55.	Kumardihi	28 (<10-67)	93 (60-148)	12.3 (6-15.2)	1.47 (0,6-2.24)	0.013 (0-0.090)	4.26 (<1,5-7.28)	352 (173-627)	1.69 (0,53-3.98)	38.53 (21,77-60.95)	<0.5	214 (116-288)	82 (56-128)	55.86 (10-149.9)	12.58 (<5-27.50)	0.273 (<0,2-0.405)
❖ Class 'C'		-	-	-	-	-	-	-		-	-	1500	-	600	400	1.5
❖ Class 'E'		-	-	-	-	-	-	2250		26	2,0	2100	-	600	1000	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality

(A) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)[##]	Fe[##]	Ni[##]	Cu[##]	Zn[##]	Cd[##]	Hg[##]	Pb[##]
		(mg/L)			(mg/L)						
Ib River											
1.	Sundergarh	5.617 (0.767-32.922)	<0.05 (<0.05-0.061)	<0.002	0.247	0.005	0.005	0.012	0.0024	0.00032	0.004
2.	Jharsuguda	2.269 (0.93-4.653)	<0.05 (<0.05-0.096)	<0.002	0.289	0.007	0.003	0.013	0.0006	0.00038	0.007
3.	Brajarajnagar U/S	2.175 (0.778-3.516)	<0.05 (<0.05-0.112)	<0.002	0.513	0.007	0.005	0.003	0.0007	0.00032	0.005
4.	Brajarajnagar D/S	2.12 (0.824-4.171)	<0.05 (<0.05-0.106)	<0.002	0.293	0.020	0.004	0.009	0.0013	0.00032	0.006
Bheden River											
5.	Bheden	1.994 (0.824-4.39)	<0.05 (<0.05-0.111)	<0.002	0.069	0.018	0.004	0.127	0.0007	0.00057	0.005
Hirakud reservoir											
6.	Hirakud	2.594 (0.866-5.379)	0.05 (<0.05-0.234)	<0.002	0.452	0.008	0.009	0.006	0.0031	0.00038	0.010
Power Channel											
7.	Power Channel U/s	2.668 (1.015-5.211)	0.05 (<0.05-0.255)	<0.002	1.094	0.011	0.018	0.008	0.0036	0.00006	0.004
8.	Power Channel D/s	2.783 (0.91-5.436)	<0.05 (<0.05-0.106)	<0.002	0.083	0.009	0.008	0.004	0.0033	0.00044	0.004
Mahanadi River											
9.	Sambalpur U/s	2.112 (0.72-3.831)	<0.05 (<0.05-0.077)	<0.002	0.073	0.004	0.006	0.008	0.0026	0.00019	0.005
10.	Sambalpur D/s	2.678 (0.623-7.951)	<0.05 (<0.05-0.145)	<0.002	0.034	0.012	0.010	0.006	0.0046	0.00025	0.002
11.	Sambalpur FD/s at Shankarnath	2.482 (0.785-5.703)	<0.05 (<0.05-0.121)	<0.002	1.625	0.007	0.008	0.004	0.0031	0.00019	0.004
12.	Sambalpur FFD/s Huma	2.267 (0.784-4.481)	<0.05 (<0.05-0.082)	<0.002	0.348	0.010	0.010	0.009	0.0029	0.00025	0.002
13.	Sonepur U/s	2.733 (0.724-5.667)	<0.05 (<0.05-0.129)	<0.002	0.056	0.003	0.008	0.040	0.0026	0.00032	0.003

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
14.	Sonepur D/s	3.079 (0.971-9.862)	<0.05 (<0.05-0.083)	<0.002	0.184	0.003	0.006	0.002	0.0027	0.00013	0.006
15.	Tikarapada	2.861 (0.612-8.37)	<0.05 (<0.05-0.096)	<0.002	0.149	0.001	0.001	0.017	0.0006	0.00057	0.006
16.	Narasinghpur	1.969 (0.62-8.064)	<0.05 (<0.05-0.112)	<0.002	0.307	0.004	0.004	0.004	0.0012	0.00006	0.004
17.	Mundali	2.812 (0.724-10.688)	<0.05 (<0.05-0.085)	<0.002	0.958	0.009	0.006	0.003	0.0011	0.00057	0.005
18.	Cuttack U/S	2.233 (0.614-7.163)	0.07 (<0.05-0.195)	<0.002	0.064	0.003	0.004	0.012	0.0011	0.00019	0.003
19.	Cuttack D/S	2.982 (0.76-8.811)	0.08 (<0.05-0.208)	<0.002	0.035	0.004	0.002	0.003	0.0013	0.00032	0.002
20.	Cuttack FD/s	3.084 (0.473-7.058)	0.07 (<0.05-0.226)	<0.002	0.083	0.002	0.004	0.021	0.0014	0.00006	0.004
21.	Paradeep U/s	2.068 (0.569-4.653)	0.07 (<0.05-0.143)	<0.002	0.055	0.019	0.006	0.010	0.0026	0.00013	0.006
22.	Paradeep D/s	2.697 (0.784-9.437)	0.16 (<0.05-0.451)	<0.002	0.036	0.014	0.039	0.027	0.0023	0.00032	0.003
Ong river											
23.	Dharuakhamma	2.253 (0.666-5.703)	<0.05 (<0.05-0.09)	<0.002	0.026	0.005	0.008	0.003	0.0031	0.00038	0.007
Tel River											
24.	Momundal	2.033 (0.748-3.204)	<0.05 (<0.05-0.075)	<0.002	0.024	0.002	0.006	0.002	0.0033	0.00038	0.004
Kathajodi River											
25.	Cuttack U/s	2.626 (0.668-6.227)	0.07 (<0.05-0.350)	<0.002	0.035	0.005	0.003	0.004	0.0017	0.00006	0.004
26.	Cuttack D/s	3.115 (0.669-10.268)	0.07 (<0.05-0.208)	<0.002	0.304	0.001	0.005	0.005	0.0012	0.00057	0.003
27.	Cuttack FD/s Mattagajpur	4.085 (0.705-9.219)	0.07 (<0.05-0.182)	<0.002	0.149	0.002	0.004	0.010	0.0011	0.00019	0.003
28.	Kamasasan (Cuttack FFD/s)	2.749 (0.839-6.026)	0.05 (<0.05-0.098)	<0.002	0.534	0.002	0.004	0.052	0.0012	0.00038	0.005

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)[##]	Fe[##]	Ni[##]	Cu[##]	Zn[##]	Cd[##]	Hg[##]	Pb[##]
		(mg/L)			(mg/L)						
Serua River											
29.	Cuttack FD/s Sankhatrasa	3.546 (0.608-11.03)	0.05 (<0.05-0.131)	<0.002	0.081	0.003	0.007	0.005	0.0013	0.00006	0.006
Kuakhai River											
30.	Bhubaneswar FU/s	1.909 (0.824-3.061)	0.07 (<0.05-0.247)	<0.002	0.023	0.002	0.001	0.004	0.0012	0.00057	0.003
31.	Bhubaneswar U/s	1.907 (0,69-3,478)	0.09 (<0,05-0,227)	<0.002	0.064	0.002	0.004	0.007	0.0013	0.00095	0.003
Daya River											
32.	Gelapur	2,74 (1.382-5.739)	0,12 (<0.05-0.321)	<0,002	0,666	0,002	0,004	0,005	0,0014	0,00013	0,004
33.	Bhubaneswar D/s	10.913 (1.364-36.092)	0.17 (<0.05-0.478)	<0.002	0.564	0.005	0.011	0.016	0.0013	0.00064	0.005
34.	Bhubaneswar FD/s	11.157 (1,303-40,946)	0.17 (<0,05-0,536)	<0.002	0.140	0.005	0.001	0.003	0.0019	0.00070	0.004
35.	Kanas	3,831 (0.778-15.499)	0,07 (<0.05-0.224)	<0,002	0,445	0,015	0,006	0,145	0,0028	0,00070	0,004
Gangua River											
36.	Near Rajdhani Engg. College	10.998 (3.079-43.986)	0.28 (<0.05-0.893)	<0.002	0.058	0.002	0.003	0.006	0.0015	0.00025	0.005
37.	Palasuni	13.449 (1.539-40.094)	0.38 (0.1-0.794)	<0.002	0.154	0.007	0.005	0.003	0.0015	0.00006	0.004
38.	Samantrapur	14.417 (0,93-52,62)	0.52 (0,1-0,944)	<0.002	1.225	0.004	0.004	0.004	0.0011	0.00006	0.005
39.	Vadimula	13,347 (1.088-42.025)	0,32 (0.1-0.829)	<0,002	0,785	0,010	0,017	0,004	0,0012	0,00019	0,005
Birupa River											
40.	Choudwar D/s	2.247 (0.565-6.289)	<0.05 (<0.05-0.087)	<0.002	0.426	0.002	0.010	0.003	0.0014	0.00006	0.002
Kushabhadra River											
41.	Bhingarpur	4.431 (0.315-24.984)	0.08 (<0,05-0,212)	<0.002	0.403	0.014	0.007	0.068	0.0027	0.00051	0.004
42.	Nimapara	4.286 (1.385-16.137)	0.06 (<0.05-0.207)	<0.002	0.279	0.005	0.004	0.020	0.0022	0.00025	0.008

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)[##]	Fe[##]	Ni[##]	Cu[##]	Zn[##]	Cd[##]	Hg[##]	Pb[##]
		(mg/L)			(mg/L)						
43.	Gop	5.596 (1.38-27.417)	0.06 (<0.05-0.192)	<0.002	0.223	0.016	0.004	0.014	0.0021	0.00032	0.009
Bhargavi River											
44.	Bhargavi at Chandanpur	4.041 (1.003-9.935)	0.05 (<0.05-0.112)	<0.002	0.070	0.002	0.006	0.010	0.0026	0.00038	0.008
Mangala River											
45.	Malatipatpur	3.075 (1.21-6.192)	0.06 (<0.05-0.131)	<0.002	0.821	0.007	0.011	0.006	0.0033	0.00025	0.007
46.	Golasahi	9.442 (1.167-37.905)	0.17 (<0.05-0.612)	<0.002	0.109	0.016	0.027	0.114	0.0028	0.00032	0.009
Devi River											
47.	Devi at Machhagaon	2.152 (0.743-5.685)	0.09 (<0.05-0.218)	<0.002	1.250	0.008	0.022	0.023	0.0026	0.00025	0.004
Gobari River											
48.	Kendrapada U/s	2.386 (0.638-8.519)	<0.05 (<0.05-0.192)	<0.002	0.730	0.011	0.006	0.008	0.0024	0.00019	0.002
49.	Kendrapada D/s	3.179 (1.07-8.65)	0.07 (<0.05-0.296)	<0.002	0.793	0.010	0.006	0.068	0.0017	0.00025	0.005
Nuna River											
50.	Bijipur	2.424 (0.473-6.439)	0.07 (<0.05-0.204)	<0.002	0.207	0.006	0.009	0.018	0.0069	0.00038	0.004
Kusumi River											
51.	Tangi	2.013 (0.253-4.566)	<0.05 (<0.05-0.119)	<0.002	1.034	0.005	0.004	0.013	0.0013	0.00051	0.004
Kansari River											
52.	Banapur	1.914 (0.572-3.516)	0.12 (<0.05-0.315)	<0.002	0.485	0.006	0.006	0.006	0.001	0.00057	0.002
Badasankha River											
53.	Langaleswar	1.786 (0.572-2.913)	0.05 (<0.05-0.161)	<0.002	0.007	0.002	0.002	0.001	0.0010	0.00019	0.004
Sabulia River											
54.	Rambha	1.877 (0.572-3.114)	0.08 (<0.05-0.154)	<0.002	0.064	0.004	0.001	0.010	0.0008	0.00032	0.009

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Ratnachira River											
55.	Kumardihi	4.196 (0.93-15.945)	0.06 (<0.05-0.286)	<0.002	0.494	0.007	0.009	0.006	0.0024	0.00038	0.009
	❖ Class 'C'	50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
	❖ Class 'E'	-	-	-	-	-	-	-	-	-	-

Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality
* Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Data for the period April, 2020

(B) Brahmani River System (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Sankh river																
1.	Sankh U/s	84 (<5-408)	60 (24-92)	8.4 (<5-11.5)	0.68 (<0.4-0.84)	0.005 (0-0.017)	3.73 (<1.5-15.12)	155 (91-272)	0.35 (0.1-0.78)	17.09 (5.63-31)	<0.5	120 (92-164)	59 (34-96)	8.8 (<5-17.3)	9.999 (5.69-18.43)	0.224 (<0.2-0.326)
Koel River																
2.	Koel U/s	95 (<5-377)	69 (32-92)	9.8 (<5-14.4)	0.92 (<0.4-1.12)	0.007 (0-0.025)	2.96 (<1.5-7.84)	166 (103-257)	0.28 (0.09-0.37)	13.91 (5.87-19.03)	<0.5	125 (96-164)	65 (36-88)	7.1 (<5-12.0)	11.438 (6.08-20.12)	0.229 (<0.2-0.342)
Brahmani River																
3.	Panposh U/S	90 (<10-383)	63 (24-96)	9.3 (<5-18.5)	0.76 (<0.4-1.12)	0.005 (0-0.017)	2.68 (<1.5-8.4)	161 (95-213)	0.29 (0.12-0.5)	14.72 (7.21-22.87)	<0.5	107 (92-120)	63 (36-92)	7.9 (<5-12.5)	15.701 (<5-34.048)	0.254 (<0.2-0.364)
4.	Panposh D/S	76 (<10-280)	62 (12-116)	27.8 (11.9-38.1)	1.3 (0.56-2.24)	0.016 (0-0.090)	4.88 (1.68-8.4)	262 (168-379)	0.62 (0.2-1.25)	22.42 (9.23-35.41)	<0.5	177 (120-220)	84 (60-112)	18.1 (10-37.5)	34.831 (16.47-57.858)	0.525 (0.226-1.02)
5.	Rourkela D/S	78 (12-369)	57 (32-96)	21.5 (10.4-29.6)	1.08 (0.84-1.12)	0.005 (0-0.025)	3.98 (<1.5-8.96)	183 (120-249)	0.39 (0.14-0.69)	17.69 (8.38-28.2)	<0.5	121 (96-136)	66 (36-92)	10.9 (6-18)	20.838 (8.53-32.858)	0.317 (<0.2-0.669)
6.	Attaghat	58 (<10-333)	61 (28-140)	16 (9-23.2)	0.8 (<0.4-1.12)	0.005 (0-0.017)	2.8 (<1.5-8.96)	163 (101-240)	0.36 (0.13-0.66)	17.59 (8.54-30.03)	<0.5	107 (96-140)	62 (48-84)	9 (6-18.3)	17.87 (6.47-31.429)	0.362 (<0.2-0.604)
7.	Rourkela FD/s (Biritola)	86 (<10-343)	54 (24-88)	12.3 (<5-18.3)	1.07 (<0.4-2.8)	0.005 (0-0.035)	2.92 (<1.5-8.4)	161 (95-227)	0.37 (0.12-0.72)	17.96 (7.13-31.01)	<0.5	110 (88-128)	57 (36-88)	8.5 (<5-15.4)	17.723 (8.14-30.98)	0.273 (<0.2-0.502)
8.	Bonaigarh	82 (<10-388)	54 (28-76)	7.6 (<5-14.7)	0.68 (<0.4-1.12)	0.007 (0-0.034)	3.3 (<1.5-10.64)	150 (94-220)	0.29 (0.12-0.42)	17.1 (7.83-26.76)	<0.5	99 (92-112)	56 (40-80)	8.3 (6-12.5)	13.262 (7.619-22.262)	0.273 (<0.2-0.495)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
9.	Rengali	21 (<10-82)	46 (32-58)	8 (<5-11)	0.7 (<0.4-1.68)	0.010 (0-0.059)	2.27 (<1.5-3.36)	119 (93-169)	0.29 (0.09-0.45)	15.72 (6.44-22.9)	<0.5	74 (64-80)	48 (28-64)	7.2 (<5-12)	10.053 (<5-15.238)	0.228 (<0.2-0.288)
10.	Samal	28 (<10-83)	51 (36-72)	9.1 (<5-14.7)	0.88 (<0.4-1.68)	0.009 (0-0.034)	2.02 (<1.5-2.8)	129 (94-183)	0.26 (0.07-0.41)	14.4 (4.54-22.68)	<0.5	81 (72-92)	52 (40-68)	7.6 (6-11.5)	11.176 (5.62-18.4)	0.247 (<0.2-0.362)
11.	Talcher FU/s	23 (<10-84)	48 (36-64)	7.1 (<5-11)	1.05 (<0.4-2.24)	0.014 (0-0.078)	3.28 (<1.5-8.4)	135 (103-184)	0.32 (0.16-0.45)	17.4 (9.72-24.64)	<0.5	87 (80-96)	54 (44-64)	6.9 (<5-9.6)	13.689 (7.143-17.75)	0.248 (<0.2-0.356)
12.	Talcher U/s	24 (<10-69)	50 (40-64)	8.3 (<5-11.5)	1.12 (<0.4-2.52)	0.030 (0-0.164)	2.94 (<1.5-8.4)	139 (111-205)	0.41 (0.27-0.66)	19.77 (13.06-31.27)	<0.5	91 (84-100)	55 (40-76)	7 (5.8-9.6)	14.094 (7.024-18.33)	0.234 (<0.2-0.298)
13.	Mandapal	29 (<10-92)	49 (40-64)	9 (<5-15.4)	0.93 (<0.4-2.24)	0.016 (0-0.045)	1.9 (<1.5-4.76)	145 (113-199)	0.28 (0.12-0.41)	15.47 (7.62-21.54)	<0.5	94 (84-112)	54 (44-60)	6.8 (<5-9.6)	15.816 (6.786-31.905)	0.241 (<0.2-0.354)
14.	Talcher D/s	27 (<10-102)	54 (44-68)	13.8 (7.4-19.3)	1.15 (0.56-2.24)	0.018 (0-0.090)	3.28 (1.68-5.88)	164 (115-241)	0.41 (0.27-0.66)	19.77 (13.06-31.27)	<0.5	107 (88-120)	63 (40-88)	9.6 (6-13.5)	17.965 (9.91-30.83)	0.287 (<0.2-0.4)
15.	Talcher FD/s	34 (<10-98)	62 (44-128)	10.2 (<5-14.7)	0.72 (<0.4-1.12)	0.016 (0-0.045)	2.38 (<1.5-5.32)	165 (129-215)	0.31 (0.12-0.44)	15.44 (7.01-23.63)	<0.5	102 (84-120)	65 (44-96)	7.7 (5.8-10)	17.875 (11.19-27.738)	0.312 (<0.2-0.421)
16.	Dhenkanal U/s	26 (<10-64)	51 (32-60)	8.4 (<5-11.6)	0.7 (<0.4-1.12)	0.012 (0-0.036)	2.74 (<1.5-8.4)	143 (113-187)	0.37 (0.26-0.54)	19.34 (13.81-26.07)	<0.5	92 (76-104)	52 (36-60)	8.9 (5.8-13.5)	13.72 (8.57-20.715)	0.303 (<0.2-0.422)
17.	Dhenkanal D/s	39 (<10-180)	55 (36-80)	11.6 (<5-17.4)	0.81 (<0.4-1.68)	0.014 (0-0.045)	2.38 (<1.5-3.36)	151 (111-213)	0.36 (0.2-0.53)	18.18 (9.82-23.9)	<0.5	100 (88-112)	60 (40-76)	8.6 (5.8-12.5)	16.254 (8.69-28.05)	0.269 (<0.2-0.397)
18.	Bhuban	31 (<10-95)	54 (40-72)	10.1 (<5-15.4)	0.6 (<0.4-0.84)	0.009 (0-0.036)	1.99 (<1.5-5.04)	151 (112-191)	0.49 (0.11-1.33)	21.83 (6.68-48.6)	<0.5	99 (92-104)	57 (36-72)	10.7 (6-20)	13.349 (6.85-20)	0.282 (<0.2-0.378)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
19.	Kabatabandha	57 (<10-194)	51 (40-62)	7.3 (<5-11.3)	0.98 (<0.4-2.24)	0.011 (0-0.090)	3.24 (<1.5-5.6)	146 (114-181)	0.42 (0.16-0.64)	20.38 (8.38-28.62)	<0.5	98 (92-108)	55 (44-74)	10.2 (5.8-19.2)	15.709 (9.88-26.38)	0.245 (<0.2-0.347)
20.	Dharmasala U/s	42 (<10-118)	58 (40-88)	8.1 (5.7-11.5)	0.65 (<0.4-0.84)	0.009 (0-0.045)	2.89 (<1.5-5.6)	158 (119-246)	0.43 (0.1-0.87)	19.4 (5.91-32.35)	<0.5	119 (84-144)	62 (38-76)	11.5 (<5-23.1)	14.004 (8.09-22.619)	0.235 (<0.2-0.265)
21.	Dharmasala D/s	40 (<10-121)	60 (32-82)	9 (5.6-11.4)	0.84 (<0.4-1.12)	0.007 (0-0.025)	1.71 (<1.5-2.52)	155 (116-216)	0.33 (0.18-0.49)	16.7 (10.07-24.4)	<0.5	117 (112-124)	63 (48-88)	8.1 (6-11.5)	15.388 (8.43-23.69)	0.26 (0.215-0.298)
22.	Pottamundai	46 (<10-218)	66 (32-88)	7.7 (<5-11.6)	0.93 (<0.4-1.68)	0.015 (0-0.067)	4.14 (<1.5-12.6)	210 (123-477)	0.85 (0.24-3.07)	26.15 (10.92-56.16)	<0.5	143 (88-208)	71 (48-88)	30.9 (6-130.8)	13.514 (5-21.43)	0.271 (<0.2-0.373)
Nandira River																
23.	Nandira U/s	24 (<10-82)	127 (48-192)	9.9 (5.9-15.4)	0.92 (<0.4-1.12)	0.027 (0-0.109)	2.71 (<1.5-5.04)	463 (244-623)	1.06 (0.47-1.72)	28.85 (14.45-40.17)	<0.5	267 (176-344)	136 (88-200)	41.6 (18-63.5)	47.462 (26.96-73.692)	1.421 (0.251-2.58)
24.	Nandira D/s	25 (<10-72)	130 (64-192)	13.6 (7.8-19.3)	1.12 (0.56-2.24)	0.034 (0-0.109)	4.11 (2.24-6.72)	483 (348-585)	1.03 (0.57-1.53)	27.18 (16.84-38)	<0.5	301 (240-372)	154 (112-204)	39 (20-54)	58.491 (29.61-86.668)	1.641 (0.207-2.84)
Kisindajhor																
25.	Kisindhajhor	17 (<10-55)	128 (44-188)	11.7 (7.6-15.4)	0.88 (<0.4-1.68)	0.020 (0-0.056)	3.73 (<1.5-5.32)	421 (246-597)	0.86 (0.39-1.32)	24.87 (14.54-33.38)	<0.5	264 (204-308)	142 (88-220)	30.6 (12-56)	44.709 (19.43-73.692)	2.24 (<0.2-4.85)
Kharasrota River																
26.	Khanditara	49 (<10-210)	55 (36-76)	8.6 (5.8-11.8)	0.93 (<0.4-1.68)	0.007 (0-0.038)	3.86 (<1.5-8.96)	144 (113-203)	0.31 (0.15-0.57)	15.93 (9.88-24.2)	<0.5	98 (84-124)	58 (44-72)	7.7 (5.8-15.4)	13.43 (7.26-19.52)	0.238 (<0.2-0.294)
27.	Binjharpur	40 (<10-111)	57 (36-88)	7.8 (6.0-11.3)	0.75 (<0.4-1.12)	0.007 (0-0.039)	4.24 (<1.5-9.52)	150 (102-209)	0.33 (0.17-0.88)	16.67 (9.23-35.06)	<0.5	104 (84-120)	58 (40-76)	8.3 (6-21.1)	12.7 (6.76-16.548)	0.203 (<0.2-0.252)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
28.	Aul	46 (<10-145)	56 (44-76)	9.1 (<5-19.4)	0.84 (<0.4-1.12)	0.014 (0-0.045)	2.49 (<1.5-5.04)	198 (115-506)	0.9 (0.23-4.03)	25.83 (13.56-63.99)	<0.5	186 (92-296)	59 (48-72)	24.9 (6-103.8)	15.238 (7.97-38.1)	0.264 (<0.2-0.367)
Guradih nallah																
29.	Guradih Nallah	50 (11-141)	78 (28-132)	40.7 (14.9-65.6)	5.64 (1.68-22.4)	0.082 (0-0.336)	12.48 (2.8-29.4)	426 (222-698)	0.83 (0.54-1.33)	25.57 (16-36.64)	<0.5	249 (168-312)	125 (72-180)	27.3 (12-37.5)	76.834 (27.35-160.8)	1.107 (<0.2-1.62)
Badajhor																
30.	Badhajhor	21 (<10-65)	86 (28-124)	9.5 (5.7-19.3)	0.64 (<0.4-1.12)	0.013 (0-0.036)	2.8 (<1.5-5.6)	263 (167-410)	0.77 (0.36-1.55)	26.45 (14.4-45.6)	<0.5	149 (100-180)	85 (56-116)	24.3 (16-36)	15.088 (7.52-24.762)	0.267 (<0.2-0.351)
Damsala River																
31.	Dayanabil	38 (<10-157)	62 (32-86)	7.4 (<5-11.3)	0.7 (<0.4-1.12)	0.005 (0-0.045)	2.24 (<1.5-6.72)	163 (91-346)	0.25 (0.11-0.45)	13.05 (6.91-21.08)	<0.5	110 (92-124)	62 (40-84)	7.5 (6-9.6)	12.54 (3.14-26.786)	<0.2 (<0.2-0.312)
Gonda nallah																
32.	Marthapur	78 (<10-274)	72 (20-104)	10.2 (6-15.4)	0.98 (<0.4-1.68)	0.009 (0-0.034)	4.42 (<1.5-8.12)	300 (77-586)	0.89 (0.14-1.89)	26.09 (9.27-45.42)	<0.5	253 (120-336)	94 (40-188)	25.3 (6-53.8)	41.033 (8.09-116.193)	0.834 (<0.2-1.83)
Lingira River																
33.	Lingira U/s	12 (<10-68)	123 (52-196)	10.2 (5.9-15.4)	0.6 (<0.4-0.84)	0.023 (0-0.070)	2.86 (<1.5-5.6)	335 (222-453)	0.82 (0.42-1.57)	25.1 (13.93-39.41)	<0.5	186 (128-256)	118 (76-160)	26.3 (12-66)	17.816 (6.072-34.52)	0.516 (<0.2-0.884)
34.	Lingira D/s	14 (<10-62)	125 (56-216)	13 (5.9-19.3)	0.96 (<0.4-1.68)	0.048 (0-0.140)	2.89 (1.68-5.04)	355 (228-437)	0.8 (0.45-1.46)	24.18 (13.83-36.27)	<0.5	194 (132-268)	129 (76-176)	26.1 (10-68)	21.875 (11.17-37.62)	0.494 (<0.2-0.871)
Ramiala River																
35.	Kamakhyanagar	38 (<10-161)	60 (40-80)	9.2 (<5-15.9)	0.56 (<0.4-0.56)	0.010 (0-0.022)	3.08 (<1.5-8.96)	149 (107-183)	0.38 (0.11-0.72)	18.29 (6.45-32.13)	<0.5	102 (84-116)	62 (44-84)	10.5 (6-20)	10.865 (<5-20.953)	0.208 (<0.2-0.376)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Banguru nallah																
36.	Banguru nallah	40 (<10-123)	89 (28-184)	12.7 (<5-27,8)	0.56 (<0,4-0,56)	0.007 (0-0,028)	2.89 (<1,5-4,72)	592 (319-980)	0.73 (0,22-1,72)	19.31 (7,56-35,92)	<0.5	329 (224-512)	208 (96-380)	24.5 (8-40,4)	132.505 (54,41-238,1)	0.473 (0,211-0,784)
Singada jhor																
37.	Singada jhor	34 (<10-105)	104 (44-156)	10.7 (6.8-15,4)	0.76 (<0.4-1,12)	0.012 (0-0,045)	3.11 (<1.5-6,72)	307 (173-485)	0.51 (0.22-0,94)	18.73 (7.54-36,12)	<0.5	153 (104-208)	120 (48-200)	19.2 (10-40,4)	32.411 (14.51-72,09)	0.366 (0.239-0,547)
Tikira River																
38.	Kaniha U/s	72 (<10-339)	69 (40-88)	8.7 (5,9-11,6)	0.88 (<0,4-1,4)	0.026 (0-0,112)	2.43 (<1,5-4,48)	188 (149-250)	0.4 (0,19-0,66)	17.85 (10,15-26,85)	<0.5	122 (112-140)	72 (64-86)	11.1 (6-16)	17.419 (<5-29,76)	0.283 (<0,2-0,376)
39.	Kaniha D/s	67 (<10-320)	83 (32-108)	12,2 (<5-19.3)	1,0 (<0.4-1.68)	0,017 (0-0.067)	2,58 (<1.5-4.48)	253 (186-464)	0,43 (0.24-0.68)	17,82 (11.13-26.57)	<0,5	132 (112-152)	90 (64-124)	18,1 (9.6-52)	27,699 (7.024-47.14)	0,603 (<0.2-1.31)
Bangurusingada jhor																
40.	Bangurusingada jhor	20 (<10-78)	121 (48-172)	10.1 (5,7-19.2)	0.72 (<0,4-1.68)	0.011 (0-0.059)	3.17 (<1,5-8.4)	291 (185-409)	0.44 (0,14-0.82)	16.21 (5,91-29.46)	<0.5	157 (112-220)	119 (68-160)	16.2 (6-28)	22.301 (5,83-68.22)	0.492 (<0,2-0.864)
Karo River																
41.	Barbil	25 (<10-99)	63 (40-88)	7.8 (<5-18,5)	0.96 (<0.4-1,68)	0.013 (0-0,055)	3.22 (<1.5-6,72)	170 (109-282)	0.59 (0.14-3,08)	20.09 (8.39-63,38)	<0.5	111 (72-188)	61 (40-116)	17.8 (<5-59,6)	8.627 (<5-25,36)	<0.2 (<0.2-0,222)
❖ Class 'C'		-	-	-	-	-	-	-		-	-	1500	-	600	400	1,5
❖ Class 'E'		-	-	-	-	-	-	2250		26	2,0	2100	-	600	1000	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Class 'C' : Drinking water source with conventional treatment followed by disinfection

Class 'E' : Irrigation water quality

(B) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Sankh River											
1.	Sankh U/s	2.796 (0.68-9.306)	<0.05 (<0.05-0.052)	<0.002	0.252	0.002	0.001	0.003	0.0020	0.00044	0.005
Koel River											
2.	Koel U/s	2.606 (0,643-4,95)	<0.05 (<0,05-0,097)	<0.002	1.511	0.007	0.007	0.018	0.0021	0.00013	0.007
Brahmani River											
3.	Panposh U/S	2,256 (0.428-5.37)	<0,05 (<0.05-0.055)	<0,002	0,671	0,005	0,004	0,034	0,0023	0,00025	0,007
4.	Panposh D/S	16.054 (3.187-54.887)	0.062 (<0.05-0.166)	<0.002	0.586	0.013	0.004	0.177	0.0016	0.00044	0.006
5.	Rourkella D/S	9.066 (1,155-22,753)	0.065 (<0,05-0,29)	<0.002	0.747	0.008	0.001	0.008	0.0015	0.00019	0.004
6.	Attaghat	5,035 (1.326-9.68)	0,06 (<0.05-0.309)	<0,002	0,324	0,003	0,003	0,005	0,0011	0,00038	0,005
7.	Rourkela FD/s (Biritola)	4.525 (1.198-8.172)	0.05 (<0.05-0.23)	<0.002	0.570	0.003	0.004	0.011	0.0018	0.00013	0.005
8.	Bonaigarh	6.595 (1,544-30,457)	<0.05 (<0,05-0,237)	<0.002	0.139	0.005	0.003	0.005	0.0011	0.00025	0.004
9.	Rengali	1,962 (0.955-3.376)	<0,05 (<0.05-0.078)	<0,002	0,223	0,002	0,001	0,011	0,0015	0,00064	0,007
10.	Samal	1.792 (0.549-3.236)	<0.05 (<0.05-0.091)	<0.002	0.007	0.004	0.001	0.001	0.0004	0.00083	0.005
11.	Talcher FU/s	1.654 (0,55-3,324)	<0.05 (<0,05-0,126)	<0.002	0.155	0.005	0.001	0.046	0.0009	0.00064	0.010
12.	Talcher U/S	1,814 (0,534-3,394)	0,05 (<0,05-0,174)	<0,002	0,056	0,003	0,002	0,064	0,0011	0,00006	0,008
13.	Mandapal	1,646 (0.824-2.956)	0,051 (<0.05-0.138)	<0,002	0,454	0,005	0,002	0,002	0,0009	0,00064	0,005
14.	Talcher D/S	2.438 (0,399-8,432)	0.058 (<0,05-0,208)	<0.002	0.033	0.003	0.002	0.005	0.0004	0.00083	0.007

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
15.	Talcher FD/s	2.266 (0.979-4.143)	0.072 (<0.05-0.239)	<0.002	0.035	0.005	0.005	0.008	0.0008	0.00076	0.007
16.	Dhenkanal U/s	2.159 (0.888-4.828)	<0.05 (<0.05-0.154)	<0.002	0.028	0.009	0.005	0.023	0.0023	0.00038	0.007
17.	Dhenkanal D/s	2.069 (0.334-5.558)	0.05 (<0.05-0.169)	<0.002	0.281	0.005	0.002	0.008	0.0008	0.00032	0.010
18.	Bimban	1.712 (0.912-3.219)	0.076 (<0.05-0.316)	<0.002	0.304	0.007	0.004	0.016	0.0019	0.00025	0.011
19.	Kabatabandha	3.187 (0.728-6.236)	0.082 (<0.05-0.469)	<0.002	0.254	0.005	0.002	0.002	0.0008	0.00051	0.006
20.	Dharmasala U/s	3.164 (0.664-5.143)	<0.05 (<0.05-0.068)	<0.002	0.418	0.010	0.005	0.006	0.0019	0.00013	0.007
21.	Dharmasala D/s	2.592 (0.562-4.741)	<0.05 (<0.05-0.073)	<0.002	0.368	0.010	0.004	0.009	0.0010	0.00019	0.004
22.	Pottamundai	1.885 (1.076-4.408)	<0.05 (<0.05-0.135)	<0.002	1.317	0.009	0.030	0.151	0.0016	0.00025	0.005
Nandira jhor											
23.	Nandira U/s	3.197 (0.824-9.026)	0.06 (<0.05-0.237)	<0.002	0.111	0.002	0.003	0.019	0.0017	0.00019	0.010
24.	Nandira D/s	3.953 (0.779-11.405)	0.0770 (<0.05-0.247)	<0.002	0.174	0.009	0.008	0.005	0.0017	0.00064	0.007
Kisindajhor											
25.	Kisindhajhor	9.252 (0.824-37.073)	0.058 (<0.05-0.276)	<0.002	0.108	0.009	0.005	0.024	0.0051	0.00006	0.007
Kharasrota River											
26.	Khanditara	3.807 (1.38-10.251)	<0.05 (<0.05-0.078)	<0.002	0.664	0.018	0.009	0.007	0.0010	0.00013	0.004
27.	Binjharpur	2.897 (1.052-4.776)	<0.05 (<0.05-0.128)	<0.002	0.291	0.010	0.003	<0.001	0.0011	0.00013	0.007
28.	Aul	1.871 (0.302-4.758)	<0.05 (<0.05-0.204)	<0.002	0.767	0.003	0.005	0.032	0.0007	0.00057	0.004
Guradih nallah											
29.	Guradhi Nallah	21.296 (2.146-44.898)	0.11 (0.054-0.177)	<0.002	0.577	0.015	0.007	0.031	0.0017	0.00006	0.004

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Badajhor											
30.	Badhajhor	2.57 (0.824-5.484)	<0.05 (<0.05-0.197)	<0.002	0.296	0.011	0.003	0.005	0.0015	0.00013	0.011
Damsala River											
31.	Dayanabil	3.862 (0.93-8.202)	<0.05 (<0.05-0.188)	0.016	0.498	0.011	0.004	0.011	0.0011	0.00019	0.008
Gonda nallah											
32.	Marthapur	15.232 (1,003-60,661)	<0.05 (<0,05-0,051)	<0.002	0.162	0.015	0.005	0.007	0.0010	0.00025	0.007
Lingira River											
33.	Lingira U/s	1,626 (0.824-2.764)	0,052 (<0.05-0.184)	<0,002	0,171	0,007	0,002	0,004	0,0013	0,00019	0,009
34.	Lingira D/s	1.6 (0.71-2.974)	0.061 (<0.05-0.167)	<0.002	0.132	0.011	0.003	0.030	0.0019	0.00057	0.017
Ramiala River											
35.	Ramiala near Kamakhyanagar	1.59 (0,46-2,748)	<0.05 (<0,05-0,08)	<0.002	0.617	0.016	0.003	0.014	0.0009	0.00006	0.012
Bangurunallah											
36.	Bangurunallah	4,007 (0.824-8.764)	<0,05 (<0.05-0.09)	<0,002	0,742	0,718	0,010	0,020	0,0092	0,00013	0,011
Singadajhor											
37.	Singadajhor	1.675 (0.657-4.481)	<0.05 (<0.05-0.091)	<0.002	0.324	0.016	0.004	0.020	0.0031	0.00019	0.009
Tikira River											
38.	Kaniha U/s	1.811 (0.477-5.956)	<0.05 (<0.05-0.104)	<0.002	0.211	0.024	0.004	0.028	0.0009	0.00032	0.009
39.	Kaniha D/s	1.536 (0,824-2,785)	0.065 (<0,05-0,164)	<0.002	0.344	0.017	0.003	0.024	0.0026	0.00044	0.011
Bangurusingada jhor											
40.	Bangurusingada jhor	1.668 (0.824-3.058)	<0.05 (<0.05-0.096)	<0.002	0.140	0.013	0.002	0.015	0.0013	0.00064	0.010

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Karo River											
41.	Karo river at Barbil	2.282 (0.564-7.417)	0.053 (<0.05-0.166)	<0.002	0.182	0.004	0.002	0.007	0.0008	0.00013	0.004
❖ Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' : Drinking water source with conventional treatment followed by disinfection
Class 'E' : Irrigation water quality

Data for the period April, 2020

(C) Baitarani river system (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Kundra Nallah																
1.	Joda	46 (<10-210)	50 (28-96)	7.6 (<5-11.6)	0.89 (0.56-1.68)	0.006 (0-0.022)	3.44 (<1.5-12.88)	125 (88-221)	0.34 (0.08-0.59)	18.6 (5.67-28.34)	<0.5	90 (64-132)	49 (32-84)	9.6 (4.8-12.5)	6.2 (<5-15.83)	0.117 (0.087-0.168)
Kusei River																
2.	Deogaon	42 (<10-134)	78 (48-136)	7.7 (<5-11,2)	0.72 (0.56-1,12)	0.016 (0-0,073)	3.72 (<1.5-15,68)	180 (108-280)	0.41 (0.2-0,74)	18.48 (8.15-27,95)	<0.5	126 (76-160)	71 (48-120)	12.3 (6.0-28,0)	11.52 (<5-23,14)	0.18 (0.099-0,254)
Baitarani River																
3.	Naigarh	132 (<10-621)	34 (20-84)	7.2 (<5-11.2)	0.72 (0.56-1.12)	0.006 (0-0.022)	2.66 (<1.5-6.72)	106 (68-159)	0.34 (0.09-1.1)	19 (6.83-51.05)	<0.5	72 (48-104)	40 (20-76)	5.9 (3.8-8.0)	15.54 (<5-46.00)	0.097 (0.075-0.126)
4.	Unchabali	121 (<10-515)	33 (20-64)	6.4 (<5-11.2)	0.8 (0,56-1.12)	0.007 (0-0.017)	3.84 (<1,5-7.28)	108 (64-171)	0.28 (0,08-0.86)	16.13 (5,91-39.15)	<0.5	68 (48-92)	43 (24-72)	8.5 (3,8-24.0)	15.29 (<5-48.5)	0.181 (0,089-0.71)
5.	Champua	49 (<10-285)	49 (32-84)	7.1 (<5-14,8)	0.64 (0.56-1,12)	0.005 (0-0,025)	2.6 (<1.5-6,72)	132 (105-196)	0.4 (0.17-1,49)	19.17 (8.44-48,34)	<0.5	95 (72-128)	49 (36-80)	7.6 (4.8-12,0)	13.33 (<5-24,64)	0.156 (0.109-0,184)
6.	Tribindha	61 (<10-236)	60 (36-108)	8,1 (<5-18.5)	0,98 (0.56-1.68)	0,009 (0-0.039)	3,42 (<1.5-7.28)	142 (107-212)	0,31 (0.16-0.49)	16,63 (7.53-24.48)	<0,5	99 (88-128)	56 (36-98)	7,6 (4.0-14.0)	11,23 (<5-19.41)	0,142 (0.103-0.211)
7.	Joda	89 (<10-505)	47 (28-68)	8 (<5-11.9)	0.8 (0,56-1.12)	0.009 (0-0.034)	3.64 (<1.5-14.56)	127 (90-153)	0.4 (0,17-0.95)	20.42 (9,3-38.86)	<0.5	87 (80-96)	46 (36-66)	9.6 (5,8-26.0)	11.36 (<5-24.51)	0.116 (0,078-0.155)
8.	Anandpur	44 (<10-186)	54 (44-68)	9.4 (5,8-14.8)	0.7 (0,56-1.12)	0.008 (0-0.029)	3.92 (<1.5-10.64)	139 (117-166)	0.34 (0,16-0.52)	18.2 (9,25-26.17)	<0.5	84 (76-92)	53 (42-60)	8.8 (6,0-16.0)	11.06 (<5-20.6)	0.164 (0,103-0.217)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
9.	Jajpur	57 (<10-150)	73 (36-124)	9 (6.0-11.6)	0.8 (0.56-1.68)	0.009 (0-0.039)	4.66 (<1.5-13.44)	178 (111-269)	0.34 (0.17-0.53)	16.83 (9.55-27.13)	<0.5	109 (104-116)	71 (44-144)	8.5 (6.0-12)	17.11 (8.57-45.36)	0.235 (0.134-0.467)
10.	Chandbali U/s	148 (12-483)	80 (40-136)	11.8 (6.0-19.1)	0.73 (0.56-0.84)	0.002 (0-0.013)	2.1 (<1.5-3.92)	1226 (139-6210)	4.05 (0.43-17.4)	45.83 (18.18-71.62)	<0.5	1541 (276-4260)	161 (44-860)	286.5 (12.0-2111.4)	76.08 (9.2-473.8)	0.213 (0.114-0.403)
11.	Chandbali D/s	163 (30-461)	80 (8-156)	15.6 (9.0-32.1)	0.89 (0.56-1.12)	0.005 (0-0.034)	2.99 (1.68-5.6)	1449 (142-7980)	4.63 (0.47-22.18)	45.24 (19.94-73.02)	<0.5	2045 (496-5912)	198 (44-1080)	396.4 (16.0-3072.9)	83.51 (7.84-502.4)	0.208 (0.12-0.341)
Salandi River																
12.	Bhadrak U/s	24 (<10-81)	54 (28-96)	9.4 (7.2-17.9)	0.76 (0.56-1.68)	0.006 (0-0.028)	2.83 (<1.5-8.96)	150 (85-224)	0.46 (0.22-1.04)	22.25 (14.23-36.52)	<0.5	113 (72-140)	54 (32-84)	10.4 (6.0-18.0)	11.05 (<5-19.52)	0.238 (0.123-0.67)
13.	Bhadrak D/s	25 (<10-96)	54 (16-108)	12.1 (7.7-17.9)	1.08 (0.56-1.68)	0.019 (0-0.174)	3.73 (<1.5-7.84)	1160 (81-12100)	0.51 (0.24-0.77)	23.46 (15.93-29.44)	<0.5	135 (76-168)	59 (36-100)	14.8 (6.0-36.5)	33.45 (<5-210.59)	0.232 (0.116-0.423)
Dhamra River																
14.	Dhamra	171 (<10-379)	128 (52-280)	18.8 (<5-39.3)	0.93 (0.56-1.12)	0.006(0-0.039)	3.67 (1.68-9.52)	13323 (115-34510)	42.77 (2.08-117.69)	71.01 (43.76-91.98)	2.328 (2.237-2.462)	17766 (13292-26860)	1092 (56-3400)	5631.6 (62.0-15564.6)	414.37 (5.95-1204.78)	0.38 (0.118-0.596)
	❖ Class 'C'	-	-	-	-	-	-	-		-	-	1500	-	600	400	1.5
	❖ Class 'E'	-	-	-	-	-	-	2250		26	2.0	2100	-	600	1000	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Class 'C' :Drinking water source with conventional treatment followed by disinfection

Class 'E' :Irrigation water quality

(C) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Kundra Nallah											
1.	Joda	2.300 (0.778-5.484)	<0.05 (<0.05 -0.09)	<0.002	0.154	0.004	0.002	0.012	0.0010	0.00006	0.004
Kusei River											
2.	Deogaon	1.756 (0.763-3.778)	<0.05 (<0.05 -0.212)	<0.002	0.389	0.005	0.002	0.002	0.0008	0.00019	0.004
Baitarani River											
3.	Naigarh	2.372 (0.633-5.895)	0.06 (<0.05 -0.274)	<0.002	0.256	0.005	0.002	<0.001	0.0009	0.00006	0.005
4.	Unchabali	2.319 (0.743-4.933)	<0.05 (<0.05 -0.085)	<0.002	0.845	0.005	0.003	<0.001	0.0018	0.00000	0.002
5.	Champua	2.855 (1.102-6.192)	<0.05 (<0.05 -0.114)	<0.002	0.535	0.005	0.002	0.002	0.0012	0.00006	0.006
6.	Tribindha	2.654 (0.366-8.204)	<0.05 (<0.05 -0.072)	<0.002	0.128	0.004	0.002	0.001	0.0006	0.00025	0.005
7.	Joda	2.647 (0.831-6.956)	<0.05 (<0.05 -0.132)	<0.002	0.195	0.004	0.003	0.002	0.0008	0.00013	0.003
8.	Anandpur	2.289 (0.27-7.017)	0.069 (<0.05 -0.272)	<0.002	0.138	0.006	0.003	0.005	0.0006	0.00019	0.006
9.	Jajpur	2.965 (0.833-8.271	<0.05 (<0.05 -0.093)	<0.002	0.265	0.010	0.003	0.001	0.0014	0.00013	0.008

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
10.	Chandbali U/s	2.200 (1.003-4.015)	<0.05 (<0.05 -0.155)	<0.002	0.094	0.014	0.019	0.027	0.0015	0.00038	0.003
11.	Chandbali D/s	2.262 (1.07-4.39)	0.05 (<0.05 -0.115)	<0.002	1.165	0.022	0.015	0.048	0.0018	0.00057	0.002
Salandi River											
12.	Bhadrak U/s	2.198 (0.612-6.348)	0.06 (<0.05 -0.195)	<0.002	0.427	0.021	0.020	0.069	0.0016	0.00019	0.004
13.	Bhadrak D/s	2.058 (0.687-4.214)	<0.05 (<0.05 -0.104)	<0.002	0.791	0.015	0.015	0.037	0.0017	0.00006	0.004
Dhamra River											
14.	Dhamra	2.727 (0.961-8.125)	0.054 (<0.05 -0.225)	<0.002	1.065	0.019	0.013	0.038	0.0015	0.00019	0.004
❖ Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality
Data for the period April, 2020

(D) Rushikulya River System (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Russelkunda Reservoir																
1.	Russelkunda	50 (<10-256)	70 (44-96)	10.4 (5.9-14.8)	0.56 (0.56-0.56)	0.004 (0-0.017)	1.62 (<1.5-3.64)	225 (148-328)	0.88 (0.45-2.68)	29.8 (18.41-62.02)	<0.5	151 (112-196)	73 (48-96)	27.2 (6.0-69.2)	15.4 (5.6-48.3)	0.233 (<0.2-0.353)
Bada Nadi																
2	Aska	102 (<10-233)	83 (48-132)	9.4 (5.9-15.2)	0.7 (0.56-1.12)	0.014 (0-0.045)	2.18 (<1.5-3.92)	219 (133-298)	0.67 (0.32-0.96)	26.22 (16.67-35.81)	<0.5	120 (80-168)	73 (46-108)	18.8 (9.6-33.1)	11.9 (2.7-21.9)	0.236 (<0.2-0.309)
Rushikulya River																
3.	Aska	91 (<10-245)	98 (52-148)	10.3 (5.6-15.1)	0.61 (0.56-0.84)	0.012 (0-0.070)	1.34 (<1.5-1.96)	235 (144-309)	0.67 (0.44-0.87)	25.24 (19.37-32.22)	<0.5	142 (120-172)	81 (56-112)	17.2 (8.0-28.8)	10.4 (1.4-16.9)	0.249 (0.204-0.296)
4.	Nalabanta	90 (<10-222)	103 (56-148)	9.5 (3.8-14.8)	0.7 (<0.4-1.12)	0.030 (0-0.130)	2.52 (<1.5-3.92)	286 (194-576)	0.66 (0.5-0.83)	23.53 (19.15-29.88)	<0.5	197 (136-320)	96 (56-208)	21.1 (14.0-42.3)	17.7 (1.3-88.1)	0.245 (<0.2-0.279)
5.	Madhopur	80 (<10-266)	104 (64-152)	9.3 (3.8-15.1)	1.03 (0.56-3.36)	0.017 (0-0.087)	2.08 (<1.5-3.92)	404 (173-2050)	1.44 (0.56-8.21)	29.43 (20.23-66.57)	<0.5	468 (132-1412)	113 (56-376)	86.3 (8.0-765.3)	13.9 (4.9-56.8)	0.259 (<0.2 - 0.368)
6.	Potagarh	117 (<10-348)	130 (92-230)	14.4 (5.9-28.1)	0.84 (0.56-1.68)	0.016 (0-0.070)	1.74 (<1.5-3.08)	6989 (255-35300)	21.16 (0.62-86.03)	53.54 (21.92-88.95)	0.917 (<0.5-2.262)	12755 (600-27120)	495 (84-2200)	2818 (16.0-16149.3)	110.3 (4.4-297.6)	0.334 (0.235-0.512)
	❖ Class 'C'	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
	❖ Class 'E'	-	-	-	-	-	-	2250	26	-	2.0	2100	-	600	1000	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality

(D) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Russelkunda Reservoir											
1.	Russelkunda	1.740 (0.888-3.481)	0.091 (<0.05-0.49)	<0.002	0.268	0.002	0.002	0.003	0.0011	0.00006	0.003
Bada Nadi											
2	Aska	1.883 (0.663-5.720)	0.079 (<0.05-0.469)	<0.002	0.327	0.002	0.003	0.002	0.0012	0.00051	0.005
Rushikulya River											
3.	Aska	2.005 (0,691-5,615)	0.063 (<0,05-0,227)	<0.002	0.079	0.002	0.001	0.001	0.0013	0.00038	0.005
4.	Nalabanta	2,184 (0.499-6.245)	0,042 (<0.05-0.084)	<0,002	0,089	0,002	0,001	0,002	0,0010	0,00019	0,005
5.	Madhopur	1.653 (0.569-3.953)	0.042 (<0.05-0.115)	<0.002	0.145	0.003	0.002	0.002	0.0018	0.0006	0.006
6.	Potagarh	1.778 (0,772-4,741)	<0.05 (<0,05--0,071)	<0.002	0.214	0.002	0.001	0.004	0.0023	0.00038	0.003
❖ Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality

Data for the period April, 2020

(E) Nagavali river System (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Nagavali river																
1.	Penta	100 (<10-498)	72 (46-100)	7.6 (4.5-10.0)	1.04 (0.56-1.68)	0.012 (0-0.067)	2.17 (<1.5-2.80)	189 (136-279)	0.51 (0.17-1.24)	21.7 (8.3-47.1)	<0.5	126 (112-168)	67 (40-88)	12.2 (4.0-39.9)	14.4 (7.4-27.9)	0.214 (<0.2-0.324)
2.	Jaykaypur D/s	126 (<10-894)	83 (52-108)	14.2 (9.0-20.6)	1.03 (0.56-1.12)	0.011 (0-0.039)	4.52 (<1.5-6.72)	227 (166-393)	0.59 (0.19-1.51)	22.7 (9.1-41.7	<0.5	157 (128-224)	76 (48-100)	15.0 (6.0-48.1)	16.4 (6.3-40.2)	<0.2 (<0.2-0.281
3.	Rayagada D/s	113 (<10-713)	82 (56-104)	10.2 (6.0-12.3)	0.580 (0.56-1.68)	0.014 (0-0.056)	3.22 (<1.5-5.04)	212 (160-319)	0.46 (0.22-0.88)	18.6 (10.3-29.6)	<0.5	148 (112-188)	82 (54-100)	12.5 (5.8-28.8)	16.9 (<5-34.2)	<0.2 (<0.2-0.256)
	❖ Class 'C'	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
	❖ Class 'E'	-	-	-	-	-	-	2250	26	-	2.0	2100	-	600	1000	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Class 'C' :Drinking water source with conventional treatment followed by disinfection

Class 'E' :Irrigation water quality

(E) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Nagavali river											
1.	Penta	4.408 (0.824-18.656)	0.099 (<0.05-0.445)	<0.002	0.304	0.004	0.002	0.004	0.0013	0.00025	0.005
2.	Jaykaypur D/s	2.721 (0.824-8.160)	0.146 (<0.05-0.728)	<0.002	0.352	0.005	0.004	0.005	0.0014	0.00013	0.006
3.	Rayagada D/s	2.777 (0.824-7.811)	0.127 (<0.05-0.378)	<0.002	0.185	0.001	0.005	0.005	0.0017	0.00025	0.004
❖ Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ **Tolerance limit for Inland Surface water bodies (IS-2296-1982)**
Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality

Data for the period April, 2020

(F) Subarnarekha river system (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Subarnarekha river																
1.	Rajghat	30 (<10-70)	75 (52-108)	9.7 (7.2-14.6)	0.78 (0.56-1.12)	0.014 (0-0.073)	3.02 (<1.5-7.28)	239 (134-391)	0.9 (0.2-3.8)	27.0 (10.6-66.0)	<0.5 (<0.5-0.70)	162 (120-232)	72 (28-100)	21.2 (8.0-35.36)	16.7 (<5-40.5)	0.362 (<0.2-0.644)
❖ Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ Class 'E'		-	-	-	-	-	-	2250	26	-	2.0	2100	-	600	1000	-

(F) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Subarnarekha river											
1.	Rajghat	4.752 (0.623-20.929)	0.11 (<0.05-0.73)	<0.002	0.432	0.017	0.002	0.018	0.002	0.00025	0.004
❖ Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality

Data for the period April, 2020

(G) Budhabalanga River System (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Budhabalanga river																
1.	Baripada D/s	27 (<10-76)	94 (48-136)	11.2 (7.1-18.5)	1.01 (<0.4-2.24)	0.010 (0-0.034)	2.52 (<1.5-6.16)	259 (131-403)	0.66 (0.20-1.14)	24.27 (9.95-42.55)	<0.5	146 (104-220)	86 (44-120)	20.5 (8.0-38.0)	14.97 (6.76-27.62)	0.245 (<0.2-0.324)
2.	Balasore U/s	34 (<10-96)	67 (40-88)	8.3 (5.97-11.7)	8.29 (<0.4-14.72)	0.017 (0-0.118)	1.7 (<1.5-3.92)	167 (110-252)	0.41 (0.20-0.68)	19.37 (12.30-34.50)	<0.5	106 (76-128)	63 (36-80)	9.95 (6.0-14.4)	10.02 (6.27-14.52)	<0.2 (<0.2-0.271)
3.	Balasore D/s	29 (<10-62)	77 (42-104)	11.2 (7.2-14.8)	1.12 (<0.4-2.24)	0.014 (0-0.055)	2.2 (<1.5-4.48)	220 (149-313)	0.64 (0.23-1.01)	24.55 (11.47-34.48)	0.516 (<0.5-1.891)	130 (104-156)	75 (48-100)	20.9 (10.0-38.0)	14.07 (6.76-22.85)	0.222 (<0.2-0.322)
Sone River																
4.	Hatigond	74 (<10-340)	68 (44-100)	8.8 (5.7-11.7)	1.2 (<0.4-2.24)	0.019 (0-0.050)	1.6 (<1.5-3.92)	185 (118-255)	0.49 (0.16-0.90)	20.79 (9.36-36.96)	<0.5 (<0.5-1.741)	129 (116-136)	66 (44-104)	14.8 (6.0-24.9)	11.75 (5.2-18.21)	0.233 (<0.2-0.378)
	❖ Class 'C'	-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
	❖ Class 'E'	-	-	-	-	-	-	2250	26	-	2.0	2100	-	600	1000	-

(G) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Budhabalanga river											
1.	Baripada D/s	2.738 (1.058-6.913)	0.086 (<0.05-0.490)	<0.002	0.882	0.004	0.006	0.106	0.0012	0.00006	0.006
2.	Balasore U/s	1.873 (1.064-3.324)	0.054 (<0.05-0.201)	<0.002	0.069	0.006	0.007	0.014	0.0011	0.00057	0.005
3.	Balasore D/s	3.555 (1.070-11.443)	0.097 (<0.05-0.314)	<0.002	0.203	0.011	0.009	0.019	0.0017	0.00025	0.004
Sone River											
4.	Hatigond	1.512 (0.522-2.590)	0.069 (<0.05-0.329)	<0.002	0.229	0.002	0.003	0.001	0.0015	0.00013	0.006
❖	Class 'C'	50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖	Class 'E'	-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Class 'C' :Drinking water source with conventional treatment followed by disinfection

Class 'E' :Irrigation water quality

Data for the period April, 2020

(H) Kolab river system (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Kerandi river																
1.	Sunabeda	31 (<10-94)	28 (<20-48)	8,3 (3.0-15.4)	0,84 (<0.4-1.68)	0,016 (0-0.028)	3,15 (<1.5-5.04)	144 (70-278)	0,82 (0.09-2.05)	34,9 (6.9-62.8)	<0,5	113 (92-160)	33 (20-50)	15,6 (<5.0-61.5)	15,6 (6.1-31.3)	<0,2
❖ Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ Class 'E'		-	-	-	-	-	-	2250	26	-	2.0	2100	-	600	1000	-

(H) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Kerandi river											
1.	Sunabeda	2.279 (0,824-5,120)	0.134 (<0,05-0,490)	<0.002	0.617	0.006	0.006	0.006	0.0017	0.00025	0.004
❖ Class 'C'		50	-	0.05	50	-	1,5	15,0	0,01	-	0,10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality

Data for the period April, 2020

(I) Vansadhara river system (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Vansadhara river																
1.	Muniguda	54 (<10-244)	72 (60-92)	7.0 (<5.0-13.3)	0.76 (<0.4-1.12)	0.008 (0-0.036)	3.47 (<1.5-5.04)	186 (151-279)	0.4 (0.2-1.0)	19.4 (8.0-42.1)	<0.5	116 (92-156)	66 (36-84)	11.2 (6.0-24.9)	12.2 (3.9-28.8)	<0.2 (<0.2-0.286)
2.	Gumpur	108 (<10-684)	70 (46-92)	9.0 (5.6-17.7)	0.76 (0.56-1.12)	0.010 (0-0.034)	3.19 (<1.5-5.6)	184 (109-270)	0.4 (0.1-0.9)	17.9 (7.3-31.2)	<0.5	127 (104-160)	65 (40-88)	9.5 (<5-19.2)	13.2 (<5-33.1)	<0.2 (<0.2-0.259)
❖ Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ Class 'E'		-	-	-	-	-	-	2250	26	-	2.0	2100	-	600	1000	-

(I) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Vansadhara river											
1.	Muniguda	2.846 (0.824-9.254)	0.086 (<0.05-0.381)	<0.002	0.025	0.001	0.004	0.005	0.0014	0.00032	0.004
2.	Gumpur	2.639 (0.824-4.128)	0.079 (<0.05-0.209)	<0.002	0.052	0.015	0.006	0.007	0.0014	0.00038	0.004
❖ Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection
Class 'E' :Irrigation water quality ## Data for the period April, 2020

(J) Indravati river system (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Indravati river																
1.	Nawarangpur	87 (<10-420)	46 (20-84)	8.6 (<5-11.8)	0.76 (0.56-1.12)	0.008 (0-0.022)	3.26 (1.12-5.04)	168 (85-258)	0.8 (0.2-1.9)	30.4 (9.7-52.8)	<0.5	98 (48-144)	46 (20-80)	17.2 (5.8-38.0)	14.0 (5.2-28.1)	<0.2
❖ Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ Class 'E'		-	-	-	-	-	-	2250	26	-	2.0	2100	-	600	1000	-

(J) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
Indravati river											
1.	Nawarangpur	2.022 (0.824-3.988)	0.109 (<0.05-0.490)	<0.002	0.617	0.006	0.006	0.006	0.0017	0.00025	0.004
❖ Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Class 'C' :Drinking water source with conventional treatment followed by disinfection

Class 'E' :Irrigation water quality

Data for the period April, 2020

(K) Bahuda river system (2020)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
Bahuda river																
1.	Damodarpally	54 (<10-157)	139 (56-212)	9.0 (7.4-12.0)	0.595 (<0.4-1.120)	0.032 (0-0.090)	2.427 (<1.5-4.20)	356 (175-859)	0.77 (0.31-2.59)	22.1 (13.7-43.7)	<0.5	307 (220-520)	128 (64-240)	32 (10-169)	16.8 (6.8-43.2)	0.323 (<0.2-0.436)
❖ Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
❖ Class 'E'		-	-	-	-	-	-	2250	26	-	2.0	2100	-	600	1000	-

(K) Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual Average values (Range of values)						
		Nitrate as NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)			(mg/L)						
1.	Damodarpally	1.670 (0.621-4.478)	<0.05 (<0.05-0.062)	<0.002	0.098	0.003	0.001	0.001	0.0007	0.00032	0.007
❖ Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
❖ Class 'E'		-	-	-	-	-	-	-	-	-	-

❖ Tolerance limit for Inland Surface water bodies (IS-2296-1982)

Class 'C' :Drinking water source with conventional treatment followed by disinfection

Class 'E' :Irrigation water quality

Data for the period April, 2020

(A) Canal Water Quality Monitoring

Board regularly monitors the water quality of Taladanda canal at six stations and of Puri canal at three stations.

Taladanda canal originates from Mahanadi river at Jobra of Cuttack, passes through the city and finally culminates at Paradeep after covering a distance of 82 Km. The canal was constructed for the purpose of navigation and/ or irrigation of a part of Mahanadi delta of Cuttack and Jagatsinghpur districts. Besides this, the canal is also a source of fresh water for industries and the port at Paradeep. The canal water is also used for bathing and other domestic activities all along its stretch.

Board monitors the water quality of Taldanda canal within Cuttack city at five locations viz. Jobra, Ranihat, Chhatrabazar, Nuabazar, Biribati and one station at Atharabanki of Paradeep. The water quality data at these five stations with respect to critical parameters such as pH, DO, BOD, TC, FC, EC, SAR and B during 2020 are given in Table-5.20 and compared with the tolerance limits for Bathing water quality prescribed under E (P) Rule, 1986 and Class B (Outdoor bathing) and Class E (Irrigation) Inland surface water quality prescribed by Bureau of Indian Standards (IS: 2296-1982). The water quality of Taladanda canal at these locations remained well within the tolerance limit prescribed for Class-E inland surface water bodies. However, frequent deviations in the TC and FC values at Jobra, Ranihat, Chhatrabazar, Nuabazar, Biribati in Cuttack and DO, BOD, TC and FC values at Atharabanki in Paradeep, from the tolerance limits stipulated for other beneficial uses such as Class-B and Class-C surface water bodies have been observed.

Puri canal originates from Mahanadi river near Munduli barrage of Cuttack. The 42 Km long canal was constructed for the purpose of irrigation of Puri district and a part of Khordha district. The canal water is also used for bathing and other domestic activities all along its stretch. Board monitors the water quality of Puri canal at three locations viz. Hansapal, Jagannathpur and Chandanpur. The water quality of Puri canal at these locations remained well within the tolerance limit prescribed for Class-E inland surface water bodies. However, so far the bathing water quality is concerned, total coliform organisms remain above the prescribed limit for Class- B at all the monitoring stations most of the time during the period of study in 2020.

Water quality for other parameters in Taladanda canal and Puri canal, given in Table-5.21 (a) and (b), remain well within the tolerance limit for Class - C water quality.

Table-5.20 Water Quality of Canals with respect to Criteria parameters during 2020 (January-December)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/100 ml)	FC (MPN/100 ml)	DO	BOD	TC	FC			
Taladanda canal														
1.	Jobra*	8	8.0 (7.6-8.4)	8.2 (7.5-9.2)	<1.0 (<1.0-1.3)	4313 (2200-7900)	1648 (490-3300)	0	0	2$ (50) 8$$ (100)	1 (13)	Does not conform to Class B,C	TC,FC	Human activities
2.	Ranihat*	8	7.7 (7.2-8.4)	7.2 (6.3-8.6)	1.8 (1.2-2.6)	71988 (1400-160000)	66525 (700-160000)	0	0	2$ (25) 8$$ (100)	6 (75)	Does not conform to Class B & C	TC,FC	Human activities and waste water of Cuttack town
3.	Chatmbazar*	8	7.9 (7.3-8.5)	7.3 (6.1-8.4)	1.4 (<1.0-2.7)	66463 (2700-160000)	54373 (780-160000)	0	0	3$ (38) 8$$ (100)	4 (50)		TC,FC	
4.	Nuabazar*	8	7.7 (7.2-8.2)	7.2 (5.4-8.6)	1.5 (1.0-2.8)	39860 (3500-160000)	15475 (1700-54000)	0	0	2$ (50) 8$$ (100)	6 (75)	Does not conform to Class B & C	TC,FC	
5.	Biribati*	8	7.6 (7.2-8.0)	7.6 (7.0-9.0)	1.3 (<1.0-2.4)	7224 (490-28000)	2633 (130-11000)	0	0	5$ (63) 7$$ (88)	2 (25)		TC,FC	
6.	Atharabanki	12	7.3 (6.8-7.8)	5.6 (3.0-7.9)	1.7 (<1.0-3.7)	15950 (1100-160000)	14213 (220-160000)	2$ (17) 5$$ (42)	1 (8)	11$ (92) 12$$ (100)	1 (8)	Does not conform to Class B & C	DO, 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 excluding January, February, July and December, 2020

** Tolerance limits for Inland Surface water bodies (IS-2296-1982)$ for Class C and $$ for Class B

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Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	DO	BOD	TC	FC			
(b) Puri canal														
1.	Hansapal	12	7.6 (7.2-8.1)	7.6 (6.4-8.9)	1.1 (0.2-1.7)	5367 (1700-17000)	2348 (490-11000)	0	0	$2^{\$}$ (17) $12^{\$\$}$ (100)	2 (17)	Does not conform to Class B	TC	Human activities
2.	Jagannathpur	12	7.5 (7.1-8.2)	7.3 (5.9-8.9)	1.5 (0.6-2.5)	4217 (2200-11000)	1174 (330-2300)	0	0	$2^{\$}$ (17) $12^{\$\$}$ (100)	0	Does not conform to Class B	TC	Human activities
3.	Chandanpur	12	7.5 (6.5-8.0)	7.4 (5.7-9.6)	1.4 (0.9-2.5)	2310 (140-4600)	1056 (78-2200)	0	0	$0^{\$}$ $11^{\$\$}$ (92)	0	Does not conform to Class B, C	DO, TC	
**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)						

$ 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) Parameters				Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	EC (microSiemens /cm)	SAR	B (mg/L)	EC	SAR	B			
(a) Taladanda canal												
1.	Jobru*	8	8.0 (7.6-8.4)	172 (128-216)	0.42 (0.16-0.64)	<0.5	0	0	0	Conform to Class E		
2.	Ranihat*	8	7.7 (7.2-8.4)	171 (146-212)	0.46 (0.2-1.22)	<0.5	0	0	0			
3.	Chatrabazar*	8	7.9 (7.3-8.5)	180 (148-226)	0.5 (0.2-1.37)	<0.5	0	0	0			
4.	Nuabazar*	8	7.7 (7.2-8.2)	184 (145-211)	0.48 (0.16-1.16)	<0.5	0	0	0			
5.	Biribati*	8	7.6 (7.2-8.0)	178 (140-215)	0.41 (0.16-1.01)	<0.5	0	0	0			
6.	Atharabanki	12	7.3 (6.8-7.8)	226 (143-546)	0.57 (0.26-0.95)	<0.5	0	0	0			
Puri Canal												
1.	Hansapal	12	7.6 (7.2-8.1)	209 (146-285)	0.48 (0.26-0.79)	<0.5	0	0	0	Conform to Class E		
2.	Jagannathpur	12	7.5 (7.1-8.2)	229 (142-487)	0.61 (0.27-1.36)	<0.5	0	0	0			
3.	Chandanpur	12	7.5 (6.5-8.0)	188 (126-298)	0.6 (0.22-1.79)	<0.5	0	0	0			
****Class 'E'**			**6.0-8.5**	**2250 or less**	**26 or less**	**2.0 or less**	**Irrigation, industrial cooling, controlled waste disposal**					

* Data for the period excluding January, February, July and December, 2020
** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

Table- 5.21(a) Water Quality of Taladanda Canal with respect to other parameters during 2020 (January-December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents					
		Annual average values (Range of values)											
		TSS	Total alkalinity	COD	NH_3-N	Free NH_3-N	TKN	% Na	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)					(mg/L)				
1.	Jobra*	34 (<10-53)	63 (46-84)	7.0 (<5-11)	0.89 (0.56-1.12)	0.045 (0-0.140)	3.08 (1.96-5.6)	19.11 (8.97-26.03)	108 (104-112)	65 (46-80)	12.4 (8-22)	12.9 (7-22.86)	0.289 (<0.2-0.339)
2.	Ranihat*	38 (<10-97)	66 (56-76)	12.5 (7.1-18.4)	1.07 (0.56-1.68)	0.048 (0-0.210)	4.08 (<1.5-5.6)	20.32 (10.21-45.77)	124 (116-132)	62 (44-72)	10.21 (6-13.5)	13.41 (6.2-22.5)	0.294 (<0.2-0.379)
3.	Chhatrabazar*	29 (<10-59)	69 (48-92)	9.9 (7.3-12.0)	1.03 (0.56-1.12)	0.052 (0-0.174)	5.48 (1.96-7.28)	21.58 (10-52.32)	124 (112-136)	67 (32-84)	8.54 (6-10.6)	14.05 (5.6-25.24)	0.297 (<0.2-0.353)
4.	Nuabazar*	25 (<10-41)	73 (60-84)	12.6 (8.0-19.3)	1.26 (0.56-1.68)	0.042 (0-0.134)	5.24 (1.68-7.84)	20.62 (8.49-44.1)	128 (128-128)	68 (48-80)	11.81 (6-28)	13.52 (6.3-23.45)	0.285 (<0.2-0.41)
5.	Biribati*	22 (<10-56)	74 (60-84)	10.7 (7.3-14.7)	1.63 (0.84-2.24)	0.044 (0-0.112)	4.2 1.96-7.28)	18.78 (8.66-40.96)	114 (112-116)	65 (44-84)	9.23 (6-13.5)	11.41 (5.7-19.29)	0.299 (<0.2-0.402)
6.	Atharabanki	16 (<10-76)	86 (44-224)	13.9 (7.4-24)	0.89 (0.56-1.12)	0.008 (0-0.034)	3.98 (<1.5-12.04)	22.51 (13.27-30.45)	175 (80-340)	83 (48-214)	19.05 (6-59.6)	14.86 (6.4-29.29)	0.34 (0.202-0.556)
	**Class 'C'	-	-	-	-	-	-			1500	600	400	1.5
	**Class 'E'	-	-	-	-	-	-			2100	600	1000	-

* Data for the period excluding January, February, July and December, 2020

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

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Sl. No.	Sampling Location	Nutrients		Heavy metals							
		Annual average values (Range of values)									
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
1.	Jobra*	1.463 (0.523-2.846)	<0.05 (<0.05-0.087)	<0.002	0.112	0.010	0.010	0.006	0.0013	0.00019	0.005
2.	Ranihat*	2.026 (0.499-5.253)	<0.05 (<0.05-0.065)	<0.002	0.121	0.006	0.012	0.060	0.0011	0.00025	0.004
3.	Chhatrabazar*	2.513 (0.474-4.391)	<0.05 (<0.05-0.054)	<0.002	0.114	0.003	0.010	0.006	0.0011	0.00089	0.005
4.	Nuabazar*	2.26 (1.022-4.98)	0.09 (<0.05-0.314)	<0.002	0.098	0.011	0.008	0.006	0.0013	0.00019	0.004
5.	Biribati*	2.35 (1.277-3.359)	0.05 (<0.05-0.091)	<0.002	0.215	0.004	0.012	0.001	0.0017	0.00038	0.004
6.	Atharabanki	3.465 (0.388-19.452)	<0.05 (<0.05-0.076)	<0.002	0.698	0.004	0.003	0.006	0.0008	0.00019	0.004
**Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
**Class 'E'		-	-	-	-	-	-	-	-	-	-

* Data for the period excluding January, February, July and December, 2020

Data for the period April, 2020 ** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

Table-5.21(b) Water Quality of Puri Canal with respect to other parameters during 2020 (January-December)

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	% Na	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)					(mg/L)				
1.	Hansapol	26 (<10-70)	81 (44-112)	8.7 (<5-11.7)	0.76 (0.56-1.12)	0.013 (0-0.056)	3.19 (<1.5-5.6)	20.05 (12.86-29.28)	130 (112-156)	78 (60-108)	13.33 (6-28)	14.79 (7.7-25.6)	0.276 (<0.2-0.415)
2.	Jagannathpur	33 (<10-95)	77 (52-128)	9.3 (<5-15.4)	1.04 (0.56-2.24)	0.016 (0-0.045)	4.1 (2.24-6.16)	22.51 (12.09-36.85)	153 (116-264)	84 (48-144)	25.19 (6-86)	16.25 (5.8-30)	0.282 (<0.2-0.462)
3.	Chandanpur	32 (<10-73)	75 (40-104)	11.7 (7.0-15.6)	0.77 (0.56-1.12)	0.010 (0-0.056)	2.71 (<1.5-3.92)	23.15 (10.26-48.78)	137 (96-176)	65 (36-92)	13.35 (6-36.5)	10.95 (<5-24.52)	0.274 (<0.2-0.493)
**Class 'C'		-	-	-	-	-	-			-	600	400	1.5
**Class 'E'		-	-	-	-	-	-			-	600	1000	-

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Sl. No.	Sampling Location	Nutrients		Heavy metals							
		Annual average values (Range of values)									
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
1.	Hansapol	3.977 (0.834-18.6)	0.07 (<0.05-0.21)	<0.002	0.355	0.003	0.005	0.012	0.0021	0.00070	0.004
2.	Jagannathpur	2.578 (1.064-4.268)	0.08 (<0.05-0.262)	<0.002	0.154	0.013	0.019	0.012	0.0023	0.00025	0.005
3.	Chandanpur	4.406 (0.997-16.429)	0.06 (<0.05-0.118)	<0.002	0.020	0.000	0.007	0.002	0.0023	0.00013	0.008
**Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10
**Class 'E'		-	-	-	-	-	-	-	-	-	-

*Data for the period April, 2020 ** Tolerance limits for Inland Surface water bodies (IS-2296-1982)*

(B) Ponds Water Quality Monitoring

Board is regularly monitoring the water quality of eight ponds such as Bindusagar pond in Bhubaneswar, five religious ponds (Narendra, Markanda, Indradyumna, Swetaganga and Parvati Sagar) in Puri town, Jagannathsagar pond in Jeypore town and Raniguda pond in Angul town.

The annual average and range values of the criteria parameters such as pH, DO, BOD, TC and FC during 2020 in these eight ponds are given in Table-5.22. As these ponds are mostly used for bathing purposes, water quality data are compared with the bathing water quality. Comparison of the data with the tolerance limits for Class-B (Bathing water quality), specified by CPCB and water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000) reveals non-compliance at these monitoring stations with respect to DO, BOD, TC and FC for most time of the observation period during 2020. Frequent deviations in pH values in the ponds of Puri town from the tolerance limit of 6.5-8.5 have been observed. Water quality with respect to other parameters are given in Table-5.23 which remained within the tolerance limits for Class 'C'.

(C) Lake Water Quality Monitoring

The Board is regularly monitoring the water quality of Chilika lake at two stations (Rambha and Satpada), four stations on Anshupa lake (Kadalibari, Bishnupur Subarnapur and Sarandagarh) and one station on Tampara lake (Tampara). Annual average and range values of the water quality parameters of these lakes during the year 2020 are given in Table-5.24 and 5.25. Assessment of the water quality status of the lakes have been done based on the best use of water body made by the society as well as the type of water body.

As Chilika is a brackish water lake and the predominant activities at the monitoring stations such as Rambha and Satapada are contact water sports and commercial fishing, the water quality criteria parameters are compared with Class SW-II. Comparison of the water quality data of Chilika lake with the water quality criteria for SW-II waters (for bathing, contact water sports and commercial fishing) (Table-5.24(a)) reveals non-compliance with respect to fecal coliform values at both Rambha and Satapada. The probable cause of downgrading the water quality of lake may be due to human activities in the lake.

Anshupa and Tamprara lakes are sweet water lakes and the predominant activity in these lake are fish propagation. Comparison of the water quality data of Anshupa lake and Tampara lake (Table 5.24(b)) with the water quality criteria for Class-D surface water bodies (Fish culture and wild life propagation) reveals compliance with respect to all the criteria parameters. However, frequent deviation in Biochemical Oxygen Demand (BOD) and Total coliform (TC) values (Table 5.25 (b)) from the tolerance limits (3.0 mg/L and 5000 MPN/100 ml respectively) laid down for Class-C (drinking water source with conventional treatment followed by disinfection) are observed at Tampara lake. The

probable cause of downgrading the water quality of lake may be due to eutrophic condition of the lakes, human activities etc in the lake.

(D) Coastal Water Quality Monitoring

Coastal water quality near Puri town at three locations (Swargadwara, Baliapanda and Bankimuhan), Gopalpur at one location and Paradeep at one location are being regularly monitored by the Board. Annual average and range values of the water quality parameters of the sea at these five locations during the year 2020 are given in Tables -5.26 and 5.27. Assessment of the coastal water quality status have been done based on the best use and type of activities in the coastal segment.

Comparison of the coastal water quality data with the water quality criteria for SW-II waters (for bathing, contact water sports and commercial fishing) reveals frequent non-compliance with respect to fecal coliform values at all monitored locations in Puri and Paradeep. This may be attributed to the human activities and discharge of domestic wastewater into the sea.

Comparison of the coastal water quality at Gopalpur and Paradeep with the water quality criteria for SW-II waters (for bathing, contact water sports and commercial fishing) and SW-IV (for Harbour water) reveals compliance with the desired class.

Table -5.22 (a) Water Quality of Ponds with respect to Criteria parameters during 2020 (January- December)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value					Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	pH	DO	BOD	TC	FC			
(a) Bindusagar Pond in Bhubaneswar City															
1.	Lingaraj Temple side	12	7.7 (6.8-8.4)	7.9 (6.4-9.6)	2.0 (1.3-2.9)	23174 (490-160000)	3522 (20-22000)	0	0	0	11 (92)	2 (17)	Does not conform to Class B	TC,FC	Human activities
2.	Ananta Vasudev	12	7.6 (6.7-8.3)	7.5 (5.0-10.6)	2.2 (1.5-3.8)	12047 (170-92000)	2945 (20-22000)	0	0	1 (8)	10 (83)	2 (17)		BOD, TC,FC	
3.	Gyananagar	12	7.6 (6.8-8.4)	7.6 (6.3-9.3)	2.0 (1.3-2.5)	7225 (1600-16000)	2227 (240-7000)	0	0	0	12 (100)	4 (33)		TC,FC	
4.	Near Kedarnath Research Centre	12	7.6 (7-8.3)	7.1 (4.1-10.6)	2.1 (1.3-2.8)	7316 (790-28000)	2744 (130-13000)	0	1	0	12 (100)	3 (25)		DO, TC,FC	
*Class 'B'			6.5-8.5	5 and above	3 or less	500 or less		Outdoor bathing							
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	5 and above	3 or less		2500 (Maximum Permissible)	Water use for organised outdoor bathing							

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

Note : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

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												
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	pH	DO	BOD	TC	FC			
(b) Ponds (Puri)															
1.	Narendra	12	8.3 (7.9-8.7)	7.9 (4.5-12.4)	4.9 (2.3-6.3)	3213 (20-22000)	1869 (20-14000)	1 (8)	4 (33)	10 (83)	6 (50)	1 (8)	Does not conform to Class B	pH, DO, BOD, TC,FC	Human activities
2.	Markanda	12	8.2 (7.7-8.8)	8.7 (2.8-17)	5.6 (3.7-8.8)	1680 (36-4900)	607 (18-1700)	1 (8)	4 (33)	11 (92)	6 (50)	0		pH, DO, BOD, TC,FC	
3.	Indradyumna	12	8.0 (7.4-8.5)	7.1 (3.1-10.9)	4.2 (3.5-6.7)	4636 (78-24000)	1638 (20-7900)	0	1 (8)	11 (92)	9 (75)	0		DO, BOD, TC,FC	
4.	Swetaganga	12	8.2 (7.9-8.9)	9.5 (2.9-18.1)	5.4 (3.6-8.7)	4144 (230-22000)	1681 (20-11000)	1 (8)	5 (42)	11 (92)	8 (67)	1 (8)		pH, DO, BOD, TC	
5.	Parvati sagar	12	7.8 (7.2-8.5)	7.5 (3.5-12.3)	4.9 (3.3-8.4)	3891 (45-24000)	1525 (2-7900)	0	2 (17)	11 (92)	6 (50)	2 (17)		DO, BOD, TC,FC	
*Class 'B'			6.5-8.5	5 and above	3 or less	500 or less	-	Outdoor bathing							
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	5 and above	3 or less		2500 (Maximum Permissible)	Water use for organised outdoor bathing							

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

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value					Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	pH	DO	BOD	TC	FC			
(c) Pond in Jeypore town															
1.	Jagannathsagar	11	7.6 (7.1-8.2)	6.3 (5.4-8.4)	1.9 (<1.0-2.7)	4363 (790-7900)	1545 (220-3300)	0	0	0	11 (100)	1 (9)	Does not conform to Class B	TC, FC	Human activities
(d) Pond in Angul Town															
1.	Raniguda Pond	12	7.5 (7.3-7.8)	5.7 (2.8-9.4)	4.9 (2.0-8.4)	3283 (790-13000)	1760 (220-7900)	0	5 (42)	10 (83)	12 (100)	2 (17)	Does not conform to Class B	DO, BOD, TC, FC	Human activities
*Class 'B'			6.5-8.5	5 and above	3 or less	500 or less	-	Outdoor bathing							
Water quality criteria for bathing water (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	5 and above	3 or less		2500 (Maximum Permissible)	Water use for organised outdoor bathing							

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

NB : The criteria of non-compliance with respect to TC has been calculated on the following basis:
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.
(Ref : IS 2296-1982 foot note)

Table- 5.23 Water quality of Ponds with respect to other parameters during 2020 (January- December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
(a)	Bindusagar Pond in Bhubaneswar City															
1.	Lingaraj Temple side	38 (<10-283)	100 (32-126)	15.3 (9-19.6)	1.19 (0.56-2.8)	0.023 (0-0.112)	3.58 (<1.5-5.6)	360 (208-498)	1.53 (0.45-2.1)	39.53 (16.54-50.13)	<0.5	217 (188-256)	82 (40-108)	48.22 (28-62)	17.53 (9.7-29.61)	0.341 (0.218-0.517)
2.	Ananta Vasudev	21 (<10-55)	105 (80-124)	16.5 (11.5-26.5)	1.12 (0.84-1.68)	0.018 (0-0.059)	3.48 (2.24-5.6)	375 (280-468)	1.64 (1.31-2.16)	41.52 (37.96-46.97)	<0.5	228 (204-252)	87 (64-104)	51.75 (40-80)	16.6 (9.3-28.45)	0.302 (<0.2-0.43)
3.	Gyananagar	16 (<10-31)	104 (48-140)	16.1 (9-23.2)	0.88 (0.56-1.68)	0.012 (0-0.067)	3.05 (1.68-5.32)	363 (222-479)	1.62 (0.71-2.38)	41.16 (25.18-51.9)	<0.5	215 (136-268)	84 (52-108)	47.75 (22-86)	18.3 (9.4-30.48)	0.284 (<0.2-0.463)
4.	Near Kedarnath research Centre	24 (<10-69)	100 (56-124)	15.7 (9-24.3)	0.95 (0.56-1.68)	0.018 (0-0.084)	3.27 (1.96-4.48)	372 (294-486)	1.66 (1.25-2.08)	42.04 (34.63-50.38)	<0.5	221 (208-240)	86 (56-108)	51.99 (44-76)	18.42 (9.8-29.64)	0.301 (<0.2-0.435)
	*Class 'C'	-	-	-	-	-	-	-	-		-	1500	-	600	400	1.5

* Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection

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Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual average values (Range of values)						
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
(a)	Bindusagar Pond in Bhubaneswar City										
1.	Lingaraj Temple side	3.303 (0.754-7.33)	0.1 (<0.05-0.226)	<0.002	0.224	0.008	0.004	0.080	0.0016	0.00095	0.002
2.	Ananta Vasudev	3.818 (0.906-6.986)	0.091 (<0.05-0.213)	<0.002	0.284	0.005	0.007	0.030	0.0011	0.00013	0.004
3.	Gyananagar	3.175 (0.942-5.861)	0.095 (<0.05-0.208)	<0.002	0.222	0.013	0.008	0.019	0.0011	0.00013	0.004
4.	Near Kedarnath Research Centre	2.158 (0.572-4.889)	0.092 (<0.05-0.371)	<0.002	1.231	0.009	0.006	0.006	0.0010	0.00057	0.003
	*Class 'C'	50	-	0.05	50	-	1.5	15.0	0.01	-	0.10

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

Data for the period April, 2020

Class 'C' :Drinking water source with conventional treatment followed by disinfection

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	EC	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(□S/cm)			(mg/L)					
(b) Ponds in Puri town																
1.	Narendra	40 (15-125)	176 (96-220)	28.1 (13.4-49.5)	0.77 (0.56-1.12)	0.045 (0-0.109)	2.68 (1.68-5.04)	787 (461-1381)	3.19 (1.64-7.38)	46.38 (33.43-68.22)	<0.5	597 (292-860)	159 (112-208)	151.74 (66-356.7)	35.86 (19-68.93)	<0.2 (<0.2-0.361)
2.	Markanda	29 (14-49)	158 (100-196)	33.2 (17.4-61)	1.19 (0.56-1.68)	0.069 (0-0.260)	4.39 (2.24-6.72)	615 (513-735)	2.05 (1.1-3.66)	39.52 (28.4-54.4)	<0.5	377 (296-460)	150 (104-200)	82.76 (40-142.2)	39.08 (21.7-69.6)	<0.2 (<0.2-0.322)
3.	Indradyumna	20 (<10-61)	104 (72-172)	25.4 (10.4-45.7)	0.88 (0.56-1.12)	0.041 (0-0.174)	3.89 (<1.5-7.28)	537 (267-1279)	2.77 (1.03-6.99)	49.89 (32.14-69.99)	<0.5	377 (180-820)	97 (56-180)	108.59 (54-390.4)	23.28 (11.6-52.22)	0.235 (<0.2-0.482)
4.	Swetaganga	23 (<10-52)	151 (80-246)	32.9 (13.9-51.7)	0.95 (0.56-2.24)	0.056 (0-0.179)	3.64 (<1.5-5.04)	731 (424-1155)	2.97 (1.36-6.24)	47.38 (34.23-69.07)	<0.5	489 (260-692)	144 (76-300)	151.61 (66-246.8)	28.36 (20.2-58.09)	0.236 (<0.2-0.417)
5.	Parvati sagar	27 (11-67)	103 (68-184)	28.1 (10.4-53.3)	1.26 (0.56-2.24)	0.040 (0-0.174)	4.48 (<1.5-8.96)	384 (288-519)	1.71 (0.92-3.1)	41.29 (26.1-57.32)	<0.5	244 (196-316)	100 (64-160)	65.38 (36-112.8)	17.13 (8.2-28)	<0.2 (<0.2-0.321)
*Class 'C'		-	-	-	-	-	-	-	-		-	1500	-	600	400	1.5

* Tolerance limit for Inland Surface water bodies (IS-2296-1982)
Class 'C' :Drinking water source with conventional treatment followed by disinfection

Contd..

Sl. No.	Sampling Location	Nutrients			Heavy metals						
					Annual average values (Range of values)						
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
(b) Ponds in Puri town											
1.	Narendra	4.931 (2.019-8.65)	0.723 (0.139-2.586)	<0.002	0.409	0.010	0.008	0.016	0.0020	0.00025	0.009
2.	Markanda	14.402 (4.294-39.425)	0.939 (0.145-3.352)	<0.002	0.667	0.009	0.013	0.037	0.0027	0.00025	0.010
3.	Indradyumna	12.76 (1.198-61.068)	0.351 (<0.05-1.347)	<0.002	0.174	0.009	0.009	0.022	0.0034	0.00025	0.007
4.	Swetaganga	9.299 (1.302-30.464)	0.657 (0.097-4.093)	<0.002	0.284	0.012	0.009	0.028	0.0036	0.00006	0.007
5.	Parvati sagar	6.054 (0.833-17.965)	0.196 (<0.05-0.681)	<0.002	0.449	0.011	0.008	0.018	0.0039	0.00013	0.009
*Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10

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

Data for the period April, 2020

Class 'C' :Drinking water source with conventional treatment followed by disinfection

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Mineral constituents								
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_3-N	Free NH_3-N	TKN	EC (µS/cm)	SAR	% Na	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)							(mg/L)					
Pond in Jeypore town																
1.	Jagannathsagar	35 (<10-144)	99 (56-124)	17.3 (10-38.8)	0.72 (0.56-1.12)	0.007 (0-0.022)	2.1 (<1.5-2.8)	281 (176-369)	0.78 (0.23-1.91)	25.38 (9.85-48.62)	<0.5 (<0.5-<0.5)	145 (112-204)	90 (72-108)	26.09 (7.7-48.07)	13.23 (<5-37.14)	<0.2 (<0.2-0.247)
Pond in Angul town																
1.	Raniguda	41 (<10-88)	157 (64-264)	30.6 (11.8-54.9)	1 (0.56-1.68)	0.010 (0-0.025)	4.57 (2.24-11.2)	624 (246-1080)	2.13 (0.07-6.49)	34.47 (2.81-66.63)	<0.5 (<0.5-<0.5)	472 (176-692)	157 (84-240)	93.06 (7.7-274.9)	39.92 (25.1-58.2)	0.525 (0.246-0.843)
*Class 'C'		-	-	-	-	-	-	-	-		-	1500	-	600	400	1.5

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Sl. No.	Sampling Location	Nutrients		Heavy metals							
		Annual average values (Range of values)									
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
Pond in Jeypore town											
1.	Jagannathsagar	4.167 (0.824-7.994)	0.108 (<0.05-0.257)	<0.002	1.237	0.006	0.010	0.007	0.0016	0.00013	0.006
Pond in Angul town											
1.	Raniguda	6.359 (0.748-12.332)	0.225 (0.051-0.782)	<0.002	0.410	0.018	0.003	0.003	0.0018	0.00019	0.022
*Class 'C'		50	-	0.05 -	50	-	1.5	15.0	0.01	-	0.10

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

Data for the period April, 2020

Class 'C' :Drinking water source with conventional treatment followed by disinfection

Table-5.24 Water Quality of Lakes with respect to Criteria parameters during 2020 (January-December)

(a) Brackish Water Lake

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	Turbidity, NTU	FC (MPN/100 ml)	pH	DO	BOD	FC			
Chilka lake														
1.	Rambha	12	8.2 (7.4-8.6)	6.8 (5.8-8.5)	1.4 (<1.0-2.6)	9 (<1.0-34)	120 (1.8-220)	0	0	0	5 (42)	Does not conform to Class-SW-II	FC	Human activities
2.	Satpada	12	7.8 (7.0-8.4)	7.2 (6.1-8.2)	1.4 (<1.0-1.8)	31 (5-80)	439 (1.8-1300)	0	0	0	10 (83)		FC	
Water quality criteria for Class SW-II Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	4.0 or more	3.0 or less	30 or less	100 or less	For Bathing, Contact Water Sports and Commercial Fishing						

(b) Fresh Water Lake

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values) Parameters				Frequency of violation from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	Free ammonia (mg/L)	EC (micro Siemens /cm)	pH	DO	Free ammonia	EC			
(a) Anshupa Lake													
1.	Kadalibari	12	7.7 (6.9-8.4)	7.1 (5.1-7.8)	0.019 (0-0.090)	151 (92-196)	0	0	0	0	D	-	-
2.	Bishnupur	12	7.4 (6.9-7.9)	6.6 (4.6-7.8)	0.013 (0-0.059)	144 (112-209)	0	0	0	0	D	-	-
3.	Subarnapur	12	7.5 (6.6-8.4)	6.7 (4-8.4)	0.017 (0-0.082)	151 (108-239)	0	0	0	0	D	-	-
4.	Sarandagarh	12	7.3 (6.6-8.3)	7.1 (4.8-9.2)	0.006 (0-0.025)	155 (90-219)	0	0	0	0	D	-	-
(b) Tampara Lake													
5.	Tampara	12	8.1 (7.8-8.7)	5.2 (3.0-9.7)	0.026 (0-0.134)	598 (305-1614)	0	2 (17)	0	0	D	-	-
*Class 'D'			6.5-8.5	4 and above	1.2 or less	1000 or less	Fish Culture and Wild life propagation						

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

Table-10 Water Quality of Lakes with respect to other parameters during 2020 (January-December)

(a) Brackish Water Lake

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological Parameter	Mineral constituents								
		Annual average values (Range of values)															
		TSS	Total alkal-inity	COD	NH_3-N	Free NH_3-N	TK N	TC	EC	SAR	% Na	TDS	B	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(MPN/ 100 ml)	(□S/cm)			(mg/L)					
Chilka lake																	
1.	Rambha	49 (<10-102)	162 (88-272)	26.8 (19.1-37)	0.89 (0.56-1.12)	0.032 (0-0.140)	3.61 (1.68-4.48)	399 (20-1100)	13768 (6898-21180)	26.86 (2.03-44.64)	71.97 (42.82-83.5)	8083 (4912-10520)	0.777 (<0.5-1.117)	1991 (800-3600)	5135.25 (2598.8-7492.2)	447.04 (130.7-1656.9)	0.385 (<0.2-0.5)
2.	Satapada	147 (18-433)	136 (76-280)	39.2 (15.1-208.7)	2.03 (0.56-3.92)	0.036 (0-0.140)	4.2 (<1.5-12.32)	1333 (45-4900)	21144 (1830-47720)	41.42 (5.87-81.45)	77.65 (55.58-90.36)	21440 (15460-33800)	2.014 (1.169-2.845)	1444 (184-4000)	6999.52 (575.7-16991.5)	1036.05 (100.5-3357.2)	0.44 (<0.2-0.868)

Sl. No.	Sampling Location	Nutrients		Heavy metals							
		Annual average values (Range of values)									
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
Chilka lake											
1.	Rambha	1.845 (0.955-4.24)	0.051 (<0.05-0.128)	<0.002	0.177	0.012	0.019	0.032	0.0035	0.00076	0.127
2.	Satapada	4.592 (1.064-14.24)	0.064 (<0.05-0.236)	<0.002	0.701	0.002	0.002	0.009	0.0011	0.00051	0.004

Data for the period April, 2020

(b) Fresh Water Lake

Sl. No.	Sampling Locati	Physical parameters		Organic pollution Indicators				Bacteriological parameters		Mineral constituents							
		Annual average values (Range of values)															
		TSS	Total alkal -inity	BOD	COD	NH_4-N	TKN	TC	FC	TDS	B	SAR	% Na	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(MPN/ 100 ml)		(mg/L)				(mg/L)			
(a) Anshupa Lake																	
1.	Kadlibari	26 (<10-64)	56 (32-84)	1.4 (<1.0-2.5)	12.7 (7.1-19.4)	0.91 (0.56-2.24)	4.14 (<1.5-7.28)	2348 (490-5400)	817 (170-2200)	100 (88-112)	<0.5 (<0.5-<0.5)	0.45 (0.23-1.15)	21.29 (11.41-49.33)	56 (28-88)	9.7 (6-16)	11.89 (<5-23.6)	0.253 (<0.2-0.374)
2.	Bishnupur	19 (<10-75)	58 (40-96)	1.5 <1.0-2.4)	12.4 (6-18.4)	1.47 (0.56-2.24)	3.44 (<1.5-6.72)	1681 (110-3500)	612 20-2200)	101 (76-120)	<0.5 (<0.5-<0.5)	0.42 (0.19-1.06)	20.91 (8.73-44.17)	54 (34-92)	10.55 (6.7-14)	10.16 (<5-24.05)	0.252 (<0.2-0.336)
3.	Subarnapur	36 (<10-182)	55 (34-72)	1.3 (<1.0-2.1)	11.7 (7.3-21.4)	1.16 (0.56-2.8)	3.08 (1.68-5.04)	1430 (220-3500)	534 (110-1100)	93 (80-104)	<0.5 (<0.5-<0.5)	0.41 (0.23-0.75)	21.06 (10.82-36.73)	57 (34-88)	9.67 (5.8-16)	10.68 (<5-24.31)	).23 (<0.2-0.347)
4.	Sarandagarh	21 (<10-73)	51 (32-84)	1.5 (<1.0-2.4)	12.9 (7.5-19.3)	1.09 (0.84-1.68)	2.94 (1.68-4.48)	1898 (170-3500)	625 45-1300)	95 (72-124)	<0.5 (<0.5-<0.5)	0.44 (0.18-1.14)	21.88 (10.02-46.96)	53 (36-92)	20.15 (6-64)	10.94 (<5-21.19)	0.226 (<0.2-0.338)
(b) Tampara Lake																	
5.	Tampara	21 (<10-44)	125 (68-196)	4.3 (2.1-8.3)	35.1 (14.8-58.6)	1.35 (0.56-2.24)	6.19 (<1.5-8.96)	4360 (230-17000)	1405 (130-3300)	552 (196-1180)	<0.5 (<0.5-<0.5)	4.1 (1.36-13.43)	50.7 (38.58-68.89)	119 (56-220)	133.06 (34.6-573.05)	24.61 (9.9-52.38)	0.402 (0.284-0.865)
* Class 'C'		-	-	3.0	-	-	-	5000		1500	-	-		-	600	400	1.5

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

Class 'C' :Drinking water source with conventional treatment followed by disinfection

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Sl. No.	Sampling Location	Nutrients		Heavy metals							
		Annual average values (Range of values)									
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
(a) Anshupa Lake											
1.	Kadlibari	2.922 (0.841-7.138)	0.062 (<0.05-0.133)	<0.002	0.090	0.003	0.008	0.005	0.0011	0.00032	0.003
2.	Bishnupur	2.819 (0.444-7.19)	0.087 (<0.05-0.223)	<0.002	0.028	0.002	0.010	0.001	0.0011	0.00019	0.004
3.	Subarnapur	4.818 (0.705-20.397)	0.11 (<0.05-0.255)	<0.002	0.779	0.002	0.009	0.024	0.0012	0.00019	0.005
4.	Sarandagarh	2.617 (0.581-4.741)	0.098 (<0.05-0.251)	<0.002	0.055	0.003	0.007	0.005	0.0016	0.00032	0.004
(b) Tampara Lake											
5.	Tampada	3.413 (1.228-8.342)	<0.05 (<0.05-0.065	<0.002	0.028	0.005	0.002	0.004	0.0015	0.00044	0.007
* Class 'C'		50	-	0.05	50	-	1.5	15.0	0.01	-	0.10

* Class 'C' : Drinking water source with conventional treatment followed by disinfection

Data for the period April, 2020

Table-5.26 Coastal Water Quality with respect to Criteria parameters during 2020 (January-December)

Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value		Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	Turbidity, NTU	FC (MPN/100 ml)	BOD	FC			
1.	Puri											
(a)	Swargadwara	12	7.8 (6.8-8.5)	7.0 (5.9-8.3)	1.4 (<1.0-2.6)	14.7 (1.7-60.0)	68 (<1.8-170)	0	2 (17)	Does not confirm to Class-SW-II	FC	Human activities
(b)	Bankimuhan	12	7.8 (6.6-8.4)	6.8 (5.6-8.1)	1.4 (<1.0-1.9)	14.7 (3.1-40.0)	299 (<1.8-790)	0	4 (33)	Does not confirm to Class-SW-II	FC	Human activities
(c)	Baliapanda	12	7.9 (6.8-8.4)	6.8 (5.6-7.8)	1.4 (<1.0-1.9)	16.4 (1.9-45.0)	77 (<1.8-170)	0	2 (17)	Does not confirm to Class-SW-II	FC	Human activities
2.	Gopalpur	12	8.1 (7.8-8.3)	7.2 (6.3-8.5)	1.3 (<1.0-1.9)	23 (1.4-120)	31 (<1.8-78)	0	0	SW-II		
3.	Paradeep	12	7.9 (6.8-8.2)	6.6 (4.2-7.8)	1.4 (<1.0-2.2)	14.3 (1.5-37.)	122 (<1.8-490)	0	2 (17)	Does not confirm to Class-SW-II	FC	Human activities
Water quality criteria for Class SW-II Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	4.0 or more	3.0 or less	30 or less	100 or less*			For Bathing, Contact Water Sports and Commercial Fishing		

* The average value not exceeding 200/100 ml in 20 percent of samples in the year and in 3 consecutive samples in monsoon months.

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Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values) Parameters					Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			pH	DO (mg/L)	BOD (mg/L)	O&G, mg/L	FC (MPN/100 ml)	BOD	O&G	FC			
1.	Gopalpur	12	8.1 (7.8-8.3)	7.2 (6.3-8.5)	1.3 (<1.0-1.9)	1.4 (1.1-2.4)	31 (<1.8-78)	0	0	0	SW-IV		
2.	Paradeep	12	7.9 (6.8-8.2)	6.6 (4.2-7.8)	1.4 (<1.0-2.2)	1.2 (0.7-1.8)	122 (<1.8-490)	0	0	0	SW-IV		
Water quality criteria for Class SW-IV Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-9.0	3.0 or more	5.0 mg/L or less	10 or less	500 or less				For Harbour Waters		

Table-5.27 Coastal Water Quality with respect to other parameters during 2020 (January- December)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriolo-gical parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal-inity	COD	NH_4-N	Free NH_3-N	TKN	TC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(MPN/ 100 ml)	(□S/cm)		(mg/L)					
1.	Puri															
(a)	Swargadwara	261 (52-1087)	148 (96-332)	31.9 (20.7-55.05)	0.6 (0.56-0.84)	0.018 (0-0.087)	3.27 (<1.5-8.96)	149 (<1.8-270)	44472 (32970-66620)	118.27 (82.09-199.37)	3.673 (3.535-3.798)	36085 (26780-53340)	2467 (1320-4000)	19442 (14419-31726)	1743 (304-2607)	0.609 (0.377-0.885)
(b)	Bankimuhan	261 (76-1202)	127 (84-180)	32.6 (22.6-45.9)	0.74 (0.56-1.12)	0.026 (0-0.090)	2.77 (<1.5-4.76)	753 (<1.8-1700)	42593 (32550-48180)	106.27 (79.72-163.73)	3.479 (3.357-3.666)	33463 (26692-42680)	2678 (1320-4400)	18860 (14419-21841)	2105 (1095-4583)	0.627 (0.327-0.902)
(c)	Baliapanda	251 (46-968)	132 (92-188)	33.1 (22.6-55.05)	0.77 (0.56-1.68)	0.023 (0-0.070)	2.77 (<1.5-5.04)	137 (<1.8-270)	42640 (31520-48900)	105.08 (83.74-156.14)	3.545 (3.24-3.812)	32794 (26284-41480)	2651 (1400-4000)	18907 (14419-21841)	2008 (1095-3512)	0.622 (0.322-0.916)
2.	Gopalpur	166 (78-238)	156 (88-340)	33.7 (14.8-46.7)	1.07 (0.56-2.24)	0.043 (0-0.218)	3.48 (1.68-8.96)	62 (<1.8-130)	42967 (30250-59050)	105.61 (53.06-167.67)	3.564 (3.014-3.781)	33788 (23380-49820)	2573 (1400-5200)	18553 (11990-29803)	1825 (310-2917)	0.611 (0.311-0.865)
3.	Paradeep	180 (44-418)	135 (88-220)	34.6 (19.4-56.1)	0.72 (0.56-1.12)	0.018 (0-0.090)	3.11 (<1.5-7.84)	225 (<1.8-790)	41696 (31550-51920)	108.7 (49.81-180.12)	3.66 (3.413-3.941)	31358 (24892-42260)	2358 (1200-3600)	17783 (11990-21841)	1842 (245-4357)	0.731 (0.42-0.898)

Contd..

Sl. No.	Sampling Location	Nutrients		Heavy metals							
		Annual average values (Range of values)									
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
1.	Puri										
(a)	Swargadwara	3.845 (1.24-8.768)	<0.05 (<0.05-0.1)	<0.002	1.096	0.011	0.025	0.040	0.0030	0.00019	0.008
(b)	Bankimuhan	3.723 (1.811-6.433)	0.06 (<0.05-0.229)	<0.002	0.433	0.009	0.028	0.031	0.0026	0.00006	0.006
(c)	Baliapanda	2.789 (0.961-8.099)	<0.05 (<0.05-0.073)	<0.002	0.709	0.012	0.020	0.024	0.0023	0.00006	0.004
2.	Gopalpur	2.403 (1.268-6.149)	<0.05 (<0.05-0.056)	<0.002	0.198	0.003	0.002	0.003	0.0011	0.00006	0.007
3.	Paradeep	2.137 (0.572-4.741)	0.135 (<0.05-0.976)	<0.002	0.545	0.009	0.030	0.038	0.0028	0.00013	0.004

Data for the period April, 2020

(E) Creek Water Quality Monitoring

Board monitors the water quality of Atharabanki creek in Paradeep on regular basis. The creek flows along the boundary wall of M/s Paradeep Phosphate Ltd (PPL) and joins river Mahanadi near its confluence with Bay of Bengal. Atharabanki creek also acts as a receiving water body for treated effluent from M/s Paradeep Phosphates Limited and M/s Indian Farmers Fertilizer Cooperative operating at Paradeep.

Annual average and range values of the water quality parameters of the creek during the year 2020 is given in Table-5.28. Assessment of the creek water quality status have been done based on the best use and type of activities in the water segment.

Comparison of the Atharabanki creek water quality data with the water quality criteria for SW-II waters (for bathing, contact water sports and commercial fishing) reveals non-compliance with respect to DO, BOD and FC. This may be attributed to the discharge of domestic wastewater into the creek and other human activities. Fluoride concentration in the creek water varied within the range 3.85-8.26 mg/L with an annual average value of 2.26 mg/L.

Table-5.28 Water Quality of Atharabanki Creek during 2020 (January-December)

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											
			pH	DO (mg/L)	BOD (mg/L)	Turbidity, NTU	FC (MPN/100 ml)	pH	DO	BOD	FC			
1.	Atharabanki Creek	12	7.2 (6.6-8.2)	4.4 (2.2-6.4)	3.1 (<1.0-6.2)	23 (3-90)	1964 (170-7900)	0	6 (50)	5 (42)	12 (100)	Does not confirm to Class-SW-II	DO, BOD, FC	Human activities
Water quality criteria for Class SW-II Waters (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)			6.5-8.5	4.0 or more	3.0 or less	30 or less	100 or less					For Bathing, Contact Water Sports and Commercial Fishing		

Sl. No.	Sampling Locati	Physical parameters		Organic pollution Indicators				Bacteriolo -gica parameter	Mineral constituents							
		Annual average values (Range of values)														
		TSS	Total alkal -inity	COD	NH_4-N	Free NH_3-N	TKN	TC	EC	SAR	B	TDS	TH	Cl	SO_4	F
		(mg/L)		(mg/L)				(MPN/ 100 ml)	(□S/cm)		(mg/L)					
1.	Atharabanki Creek	92 (19-274)	115 (56-176)	29 (15-58)	1.54 (0.56-4.48)	0.032 (0-0.358)	4.42 (1.68-9.52)	6106 (220-24000)	5739 (2156-12710)	18.3 (7.6-43.0)	0.61 (<0.5-0.91)	5356 (2660-8980)	768 (152-1800)	1838 (700-5092)	212 (42-474)	5.15 (3.85-8.21)

Sl. No.	Sampling Location	Nutrients		Heavy metals							
		Annual average values (Range of values)									
		NO_3^-	PO_4^{3-}-P	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##
		(mg/L)		(mg/L)							
1.	Atharabanki Creek	6.989 (0.572-18.822)	1.29 (<0.05-3.64)	<0.002	0.231	0.011	0.017	0.072	0.0023	0.00025	0.004

Data for the period April, 2020

(F) Biomonitoring of Water Bodies

Biomonitoring of water quality is useful for assessing the over-all biological health of the water bodies. This indicates any disruption in ecological balance of the water bodies caused by the changes in its physical and chemical environment. Thus, measurement of the level of the ecological degradation would indicate the extent of pollution. Benthos are regarded as the best indicator of pollution as they are sedentary, sessile, long-lived and easily collectable.

To assess the actual health of water bodies, Central Pollution Control Board (CPCB) has derived a Biological Water Quality Criteria (BWQC) for water quality evaluation. This system is based on the range of saprobic values and diversity of the benthic macroinvertebrate families with respect to water quality. The entire taxonomic groups, with their range of saprobic score from 1 to 10, in combination with the range of diversity score from 0 to 1 has been classified into five groups as stated in Table 5.29

Table- 5.29 Biological Water Quality Class

Sl. No.	Taxonomic Group	Range of Saprobic score	Range of Diversity score	Water Quality Characteristic	Water Quality Class
1	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Diptera	7 and more	0.2-1.0	Clean	A
2	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Odonata, Diptera	6-7	0.5-1.0	Slight Pollution	B
3	Ephemeroptera, Plecoptera, Trichoptera, Hemiptera, Odonata, Diptera, Crustacea, Mollusca, Polychaeta, Coleoptera, Hirudinea, Oligochaeta	3-6	0.3-0.9	Moderate Pollution	C
4	Mollusca, Hemiptera, Coleoptera, Diptera, Oligochaeta	2-5	0.4 & less	Heavy Pollution	D
5	Diptera, Oligochaeta, No animals	0-2	0-0.2	Severe Pollution	E

Biomonitoring studies were carried out at 26 selected stations during 2020. Biological data generated from these stations were analysed for computing the saprobity indices (SI) and diversity indices (DI), which are presented in Table-5.30. From the Table, it is evident that the biological water quality class at seven stations conform to the Class 'B-C' (slight to moderate pollution),at four stations conform to Class B (slight pollution) and at fifteen stations conform to Class C (moderate pollution) water quality.

Table-5.30 - Biomonitoring of River Bodies (2020)

Station		Annual Average value (Range of values)		Existing Biological Water Quality Class
		Saprobity Index	Diversity Index	
(A) Mahanadi				
1.	Brajarajnagar U/s	5.3 (5.3-5.3)	0.66 (0.66-0.66)	C
2.	Brajarajnagar D/s	6.2 (5.6-6.8)	0.64 (0.64-0.64)	B-C
3.	Sambalpur U/s	6.3	0.56	B
4.	Sambalpur D/s	6.7	0.51	B
5.	Cuttack U/s	5.4 (5.0-5.7)	0.62 (0.60-0.64)	C
6.	Cuttack D/s	5.5 (5.2-5.8)	0.63 (0.61-0.64)	C
7.	Kathajodi U/s	5.7 (4.9-6.5)	0.52 (0.51-5.3)	B-C
8.	Kathojodi D/s	5.7 (5.5-5.8)	0.7 (0.61-0.78)	C
9.	Kuakhai U/s	5.4 (5.1-5.7)	0.62 (0.57-0.66)	C
10.	Kuakhai D/s	5.2 (5.2-5.2)	0.71 (0.7-0.71)	C
11.	Birupa D/s	6.4 (6.4-6.4)	0.58 (0.58-0.58)	B
(B) Brahmani (2020)				
12.	Pamposh D/s	5.4 (5.2-5.6)	0.64 (0.62-0.66)	C
13.	Rourkela D/s	5.8 (5.7-5.8)	0.54 (0.42-0.66)	C
14.	Talcher U/s	4.7 (4.2-5.3)	0.57 (0.51-0.62)	C
15.	Talcher D/s	5.17 (5.14-5.20)	0.58 (0.54-0.62)	C
(C) Rushikulya (2020)				
16.	Potagarh	5.5 (4.8-6.2)	0.55 (0.48-0.54)	B-C

Station		Annual Average value (Range of values)		Existing Biological Water Quality Class
		Saprobity Index	Diversity Index	
(D) Nagavali (2020)				
17.	Penta U/s	6.3 (5.69-6.6)	0.64 (0.62-0.66)	B-C
18.	J. K. Pur D/s	5.8 (5.6-6.0)	0.60 (0.58-0.61)	C
19.	Rayagada D/s	6.0 (5.6-6.4)	0.59 (0.53-0.65)	B-C
(E) Subarnarekha				
20.	Rajghat	6.15 (5.80-6.50)	0.74 (0.65-0.82)	B-C
(F) Budhabalnga (2020)				
21.	Baripada D/s	5.6 (5.4-5.8)	0.6 (0.58-0.62)	C
22.	Balasore U/s	5.4 (4.6-6)	0.58 (0.52-0.62)	C
23.	Balasore D/s	5.5 (5.4-5.7)	0.66 (0.6-0.75)	C
(G) Kerandi (2020)				
24.	Sunabeda	6.2 (6.0-6.4)	0.6 (0.4-0.7)	B-C
(H) Vansadhara (2020)				
25.	Muniguda	5.5 (5.3-5.6)	0.6 (0.6-0.61)	C
26.	Gunupur	6.4 (6.3-6.4)	0.6 (0.5-0.7)	B

G) Ground water quality status

The Board monitors ground water quality at 48 locations in eleven major towns of the state, such as, Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Paradeep, Jajpur (Sukinda), Jhasruguda, Puri, Sambalpur and Talcher. Ground water quality status during the year 2020 at 46 locations alongwith the acceptable and Permissible limit for drinking water under IS : 10500-2012 are given in Table-5.31.

pH of ground water in Khandagiri area (April), Kalpana-Laxmisagar area (April, Oct), Chandrasekharpur (Oct) and Capital Hospital Area (April) in Bhubaneswar was found to be beyond the permissible range of 6.5-8.5. pH at all other places remained well within the permissible range.

Fluoride in Kuanrpur (April) of Balasore exceeds the Permissible limit for drinking water i.e. 1.5 mg/L.

Frequent occurrence of total coliform and fecal coliform bacteria above the permissible limit (should be absent in 100 ml sample) are observed in the ground water of some of the monitored locations such as, Naigopalpur (April, Oct), Chakulia (April, Oct) in Balasore; Railway Station (Oct), MKCG Medical College (Oct), Bus stand area (April, Oct); Badabazar (Oct) in Berhampur; Khandagiri (Oct), Old Town- Samantarapur area (April, Oct), Kalpana- Laxmisagar area (April, Oct) in Bhubaneswar; Musadiha (April, Oct), Badapadia (Oct) in Paradeep; Saruabil (April, Oct), Kaliapani (April, Oct), Kamarda (April, Oct) in Sukinda; Near Sea beach (April), Baliapanda (April) in Puri, Near Railway Station (April) in Sambalpur; in Kaniha (April), Talcher Town (Oct), Talcher Thermal area (Oct), Banarpal (Oct) and Kulad (Oct) in Talcher.

Metal contents like iron, cadmium, lead and nickel are observed exceeding the prescribed limit in some of the tube wells in Angul, Berhampur, Bhubaneswar, Sambalpur, Talcher, Puri.

Table-5.31 Ground water Quality Status (Tube well) (2020)

Monitoring Station	Month of Monitoring	pH	Cond., µS/cm	BOD, mg/L	COD, mg/L	Turbidity, NTU	TDS, mg/L	TFS	Total Alkalinity, mg/L	Total Hardness CaCO3 mg/L	Calcium as Ca, mg/L	Magnesium as Mg, mg/L	Chloride, mg/L	Sulphate, mg/L	Nitrate, mg/L	NH3-N, mg/L
1. ANGUL (2 stations)																
1. Angul Township	April	7.4	830	< 1.0	5.9	6.7	NA	NA	316	NA	NA	NA	NA	145.84	NA	NA
	Oct	7.0	866	< 1.0	7.9	3.9	NA	NA	176	260	88.18	9.75	116	145.1	14.028	0.56
2. NALCO township	April	7.6	612	< 1.0	8.9	65	NA	NA	312	NA	NA	NA	NA	23.69	NA	NA
	Oct	7.5	366	< 1.0	19.9	2.5	NA	NA	160	152	52.91	4.87	16	24.02	1.329	0.56
2. BALASORE (3 stations)																
3. Naigopalpur	April	6.5	184	< 1.0	6.0	4.3	NA	NA	32	NA	NA	NA	NA	9.64	NA	NA
	Oct	6.8	392	< 1.0	8.0	12	NA	NA	64	144	25.65	19.50	64	47.55	22.802	1.12
4. Kuanrpur	April	7.6	548	< 1.0	< 5.0	6.1	NA	NA	180	NA	NA	NA	NA	16.07	NA	NA
	Oct	7.3	278	< 1.0	8.0	7	NA	NA	68	28	6.41	2.92	44	17.16	1.329	1.12
5. Chakulia	April	6.8	405	< 1.0	< 5.0	4.5	NA	NA	60	NA	NA	NA	NA	34.76	NA	NA
	Oct	7.5	132	< 1.0	8.0	11	NA	NA	56	36	8.02	3.90	10	8.73	1.583	1.12
3. BERHAMPUR(4 stations)																
6. Near Railway station	Apr	7.33	1139	< 1.0	5.9	8.2	NA	NA	260	NA	NA	NA	NA	48.45	NA	NA
	Oct	7.2	551	< 1.0	16.0	5.8	NA	NA	104	160	57.72	3.90	96	44.1	8.841	0.56
7. MKCG Medical College	Apr	7.24	1078	< 1.0	5.9	45	NA	NA	396	NA	NA	NA	NA	39.167	NA	NA
	Oct	7.8	707	< 1.0	8.0	5.8	NA	NA	144	172	54.51	8.77	115.9	85.3	1.329	0.56
8. Bus stand	Apr	7.86	951	< 1.0	5.9	85	NA	NA	312	NA	NA	NA	NA	40.119	NA	NA
	Oct	7.3	695	< 1.0	8.0	6.8	NA	NA	176	172	60.92	4.87	115.9	34.8	1.329	1.12
9. Badabazar	Apr	7.07	1204	< 1.0	5.9	12	NA	NA	248	NA	NA	NA	NA	68.81	NA	NA
	Oct	7.1	838	< 1.0	8.0	4.8	NA	NA	136	236	80.16	8.77	165.9	61.76	6.336	0.56
Drinking water specification (IS : 10500 (2012)																
Acceptable Limit		6.5-8.5	-	-	-	1	500	-	200	200	75	30	250	200	45	0.5
Permissible limit		No relax	-	-	-	5	2000	-	600	600	200	100	1000	400	No relax	No relax

Stn Name	Month of Monitoring	pH	Cond., µS/cm	BOD, mg/L	COD, mg/L	Turbidity, NTU	TDS, mg/L	TFS	Total Alkalinity, mg/L	Total Hardness $CaCO_3$ mg/L	Calcium as Ca, mg/L	Magnesium as Mg, mg/L	Chloride, mg/L	Sulphate, mg/L	Nitrate, mg/L	NH_4-N, mg/L
4. BHUBANESWAR (6 stations)																
10. Khandagiri Area	April	6.1	809	< 1.0	< 5.0	6.2	NA	NA	24	NA	NA	NA	NA	8.809	NA	NA
	Oct	7.8	169	< 1.0	7.8	5.6	NA	NA	60	56	17.64	2.92	18	16.96	3.557	0.56
11. Old town-Samantarapur Area	April	7.1	530	< 1.0	6.0	7.6	NA	NA	132	NA	NA	NA	NA	22.85	NA	NA
	Oct	6.8	365	< 1.0	7.8	5.3	NA	NA	188	144	44.89	7.80	14	16.96	6.579	1.12
12. Kalpana-Laxmisagar Area,	April	6.1	407	< 1.0	< 5.0	3.6	NA	NA	82	NA	NA	NA	NA	13.69	NA	NA
	Oct	6.1	337	< 1.0	7.8	4.9	NA	NA	60	68	19.24	4.87	50	33.82	31.813	1.12
13. Chandrasekharpur	April	6.5	169	< 1.0	< 5.0	4.8	NA	NA	38	NA	NA	NA	NA	6.31	NA	NA
	Oct	6.4	183	< 1.0	7.8	6.1	NA	NA	56	60	16.03	4.87	26	10.59	1.441	0.56
14. Capital Hospital Area	April	5.1	481	< 1.0	< 5.0	4.6	NA	NA	12	NA	NA	NA	NA	10.71	NA	NA
	Oct	6.1	162	< 1.0	7.8	8.7	NA	NA	48	32	9.62	1.95	20	10.88	1.824	0.56
15. Secretariate-Governor House-Old bus stand Area	April	Not Monitored														
	Oct	Not Monitored														
5. CUTTACK (5 stations)																
16. Jagatpur	April	6.9	651	< 1.0	3.0	18	NA	NA	172	NA	NA	NA	NA	16.66	NA	NA
	Oct	6.6	429	< 1.0	8.0	5.4	NA	NA	148	144	49.70	4.87	46	31.87	1.329	0.56
17. Mangalabag	April	7.3	198	< 1.0	9.0	7.7	NA	NA	68	NA	NA	NA	NA	15.12	NA	NA
	Oct	7.2	152	< 1.0	8.0	16	NA	NA	76	68	22.44	2.92	8	7.35	1.408	1.12
18. Madhupatna-Kalyan Nagar Area	April	6.9	503	< 1.0	< 5.0	23	NA	NA	112	NA	NA	NA	NA	14.52	NA	NA
	Oct	6.5	351	< 1.0	8.0	8.7	NA	NA	120	108	38.48	2.92	46	11.47	1.452	1.12

Stn Name	Month of Monitoring	pH	Cond., µS/cm	BOD, mg/L	COD, mg/L	Turbidity, NTU	TDS, mg/L	TFS	Total Alkalinity, mg/L	Total Hardness $CaCO_3$ mg/L	Calcium as Ca, mg/L	Magnesium as Mg, mg/L	Chloride, mg/L	Sulphate, mg/L	Nitrate, mg/L	NH_3-N, mg/L
19. Badambadi Area	April	7.3	320	< 1.0	< 5.0	9.7	NA	NA	134	NA	NA	NA	NA	15.59	NA	NA
	Oct	6.9	382	< 1.0	8.0	9.1	NA	NA	132	104	35.27	3.90	52	6.47	1.373	0.56
20. Bidanasi-Tulsipur Area	April	7.6	250	< 1.0	< 5.0	8.9	NA	NA	112	NA	NA	NA	NA	14.17	NA	NA
	Oct	6.9	135	< 1.0	8.0	3.5	NA	NA	64	52	12.83	4.87	10	5.69	1.329	0.56
6. PARADEEP (JAGATSINGHPUR) (2 stations)																
21. Musadiha	Apr	8.06	2598	< 1.0	3	1.0	NA	NA	252	NA	NA	NA	NA	13.93	NA	NA
	Oct	8.3	1364	1.7	12.0	1.2	NA	NA	80	68	19.24	4.87	435.8	87.3	6.910	1.12
22. Badapadia	Apr	8.34	1920	< 1.0	6	<1.0	NA	NA	204	NA	NA	NA	NA	8.33	NA	NA
	Oct	8.0	1818	1.1	8.0	3.4	NA	NA	124	168	49.70	10.72	595.7	80.3	7.015	1.12
7. SUKINDA (JAJPUR) (4 stations)																
23. TISCO	April	6.7	325	< 1.0	20.9	5.1	NA	NA	128	NA	NA	NA	NA	7.97	NA	NA
	Oct	7.1	349	< 1.0	8.0	14	NA	NA	96	132	38.48	8.77	38	34.31	7.771	1.12
24. Saruabil	April	6.5	251	< 1.0	6.0	42	NA	NA	72	NA	NA	NA	NA	5.35	NA	NA
	Oct	6.9	183	< 1.0	8.0	9.7	NA	NA	88	88	32.06	1.95	8	8.9	1.329	0.56
25. Kaliapani	April	7.5	181	< 1.0	< 5.0	26	NA	NA	80	NA	NA	NA	NA	6.31	NA	NA
	Oct	7.1	363	< 1.0	8.0	2.4	NA	NA	116	136	38.48	9.75	36	33.3	9.668	1.12
26. Kamarda	April	7.4	302	< 1.0	< 5.0	85	NA	NA	112	NA	NA	NA	NA	8.93	NA	NA
	Oct	6.8	264	< 1.0	8.0	80	NA	NA	68	76	25.65	2.92	28.2	30.88	2.080	1.12
8. JHARSUGUDA (8 stations)																
27. Thelkoi	April	Not Monitored														
	Oct	Not Monitored														
28. Bhurkhamunda	April	6.87	557	< 1.0	< 5.0	<1.0	NA	NA	36	NA	NA	NA	NA	12.26	NA	NA
	Oct	8.1	119	< 1.0	8.0	4.2	NA	NA	40	32	8.02	2.92	16	< 5	3.866	1.68
29. Badamal Industrial Estate	April	6.45	165	< 1.0	6	3	NA	NA	32	NA	NA	NA	NA	7.62	NA	NA
	Oct	7.3	75	< 1.0	8.0	13	NA	NA	32	24	6.41	1.95	8	< 5	1.417	0.56
30. Budhipadar	April	6.44	148	< 1.0	< 5.0	6	NA	NA	36	NA	NA	NA	NA	6.9	NA	NA
	Oct	6.8	128	< 1.0	8.0	5.8	NA	NA	36	24	6.41	1.95	22	5.69	3.359	0.56

Stn Name	Month of Monitoring	pH	Coud., µS/cm	BOD, mg/L	COD, mg/L	Turbidity, NTU	TDS, mg/L	TFS	Total Alkalinity, mg/L	Total Hardness CaCO3 mg/L	Calcium as Ca, mg/L	Magnesium as Mg, mg/L	Chloride, mg/L	Sulphate, mg/L	Nitrate, mg/L	NH_4-N, mg/L
31. Brajarajnagar Mining Belt	April	7.05	170	< 1.0	< 5.0	65	NA	NA	132	NA	NA	NA	NA	9.76	NA	NA
	Oct	6.5	123	< 1.0	8.0	11	NA	NA	28	32	6.41	3.90	20	11.96	5.302	1.12
32. Rampur (water tank)	April	7.11	438	< 1.0	6	65	NA	NA	160	NA	NA	NA	NA	20,71	NA	NA
	Oct	7.1	275	< 1.0	8.0	4.2	NA	NA	108	88	32,06	1,95	28	14,31	1,329	1,12
33. Ib thermal power station	April	7.15	432	< 1.0	< 5.0	65	NA	NA	164	NA	NA	NA	NA	27,85	NA	NA
	Oct	7.2	95	< 1.0	8.0	5.2	NA	NA	40	32	8,02	2,92	6	8,14	1,329	1,12
34. Belpahar Area	April	7.05	440	< 1.0	< 5.0	10	NA	NA	116	NA	NA	NA	NA	19.1	NA	NA
	Oct	6.9	198	< 1.0	8.0	2.7	NA	NA	52	76	17,64	7,80	16	32,35	2,080	1,12
9. PURI (4 stations)																
35. Hospital-Busstand-Mausima temple area	April	7.9	1128	< 1.0	< 5.0	6.9	NA	NA	60	NA	NA	NA	NA	18.69	NA	NA
	Oct	7.5	1048	< 1.0	7.9	3.7	NA	NA	184	300	73.75	28.27	215.9	90.7	28.706	0.56
36. Near Jagannath Temple	April	7.9	1044	< 1.0	< 5.0	16	NA	NA	198	NA	NA	NA	NA	168.34	NA	NA
	Oct	7.6	748	< 1.0	7.9	6.8	NA	NA	156	100	24.05	9.75	146	19.9	10.863	1.12
37. Near Sea Beach,	April	8.2	1091	< 1.0	< 5.0	8	NA	NA	212	NA	NA	NA	NA	24.88	NA	NA
	Oct	7.9	1487	< 1.0	7.9	4.4	NA	NA	160	360	48.10	58.49	255.9	210.8	1.854	1.12
38. Baliapanda	April	7.8	1116	< 1.0	< 5.0	60	NA	NA	46	NA	NA	NA	NA	23.33	NA	NA
	Oct	7.3	256	< 1.0	7.9	4.3	NA	NA	80	68	16,03	6,82	30	17	1,776	0,56
10. SAMBALPUR (3 stations)																
39. Near Panthanivas	April	7.89	324	< 1.0	< 5.0	5.8	NA	NA	56	NA	NA	NA	NA	30,71	NA	NA
	Oct	6.6	262	< 1.0	8.0	9.3	NA	NA	52	92	24,05	7,80	42	25,98	22,146	1,12
40. Near Railway station	April	7.4	344	< 1.0	< 5.0	2.2	NA	NA	276	NA	NA	NA	NA	27.85	NA	NA
	Oct	7.3	480	< 1.0	8.0	3.2	NA	NA	144	140	40,08	9,75	66	29,3	22,146	1,12
41. Near VSS Medical College, Burla	April	7.93	597	< 1.0	< 5.0	4.7	NA	NA	236	NA	NA	NA	NA	51.79	NA	NA
	Oct	7.4	324	< 1.0	8.0	2.9	NA	NA	116	136	36,87	10,72	20	32,35	29,580	0,56

Stn Name	Moath of Monitoring	pH	Cond., µS/cm	BOD, mg/L	COD, mg/L	Turbidity, NTU	TDS, mg/L	TFS	Total Alkalinity, mg/L	Total Hardness $CaCO_3$, mg/L	Calcium as Ca, mg/L	Magnesium as Mg, mg/L	Chloride, mg/L	Sulphate, mg/L	Nitrate, mg/L	NH_3-N, mg/L
11. TALCHER (7 stations)																
42. Mahanadi Coal Field Area	April	7.05	414	< 1.0	8.9	16	NA	NA	104	NA	NA	NA	NA	49.05	NA	NA
	Oct	7.0	263	< 1.0	19.9	6.7	NA	NA	96	88	25.65	5.85	24	16.57	1.329	0.56
43. Kaniha	April	7.85	387	< 1.0	< 5.0	70	NA	NA	220	NA	NA	NA	NA	14.17	NA	NA
	Oct	7.5	245	< 1.0	7.9	11	NA	NA	112	104	36.87	2.92	12	9.61	1.329	1.68
44. Talcher town	April	7.62	325	< 1.0	5.9	11	NA	NA	200	NA	NA	NA	NA	40.12	NA	NA
	Oct	7.0	235	< 1.0	11.9	28	NA	NA	116	80	25.65	3.90	18	6.67	1.329	1.68
45. Meramundali Area	April	7.91	1008	< 1.0	8.9	12	NA	NA	428	NA	NA	NA	NA	92.62	NA	NA
	Oct	7.4	470	< 1.0	7.9	14	NA	NA	108	128	41.68	5.85	96	16.57	1.329	1.68
46. Talcher Thermal Area	April	7.62	1178	< 1.0	5.9	17	NA	NA	248	NA	NA	NA	NA	98.22	NA	NA
	Oct	7.4	559	< 1.0	11.9	17	NA	NA	112	148	44.89	8.77	116	24.31	1.329	1.68
47. Banarpal	April	7.24	1023	< 1.0	8.9	8.6	NA	NA	300	NA	NA	NA	NA	73.45	NA	NA
	Oct	7.1	678	< 1.0	7.9	9	NA	NA	176	184	51.30	13.65	116	29.61	1.329	0.56
48. Kulad	April	7.54	557	< 1.0	11.8	65	NA	NA	320	NA	NA	NA	NA	18.57	NA	NA
	Oct	8.0	387	< 1.0	11.9	8	NA	NA	120	104	36.87	2.92	52	15.7	1.347	0.56
Drinking water specification (IS : 10500 (2012))																
Acceptable Limit		6.5-8.5	-	-	-	1	500	-	200	200	75	30	250	200	45	0.5
Permissible limit		No relax	-	-	-	5	2000	-	600	600	200	100	1000	400	No relax	No relax

NA : Not analysed

Contd..

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/L	Fluoride, mg/L	PO_4^{3-}-P, mg/L	Sodium, mg/L	Potassium, mg/L	Boron, mg/L	Cr (VI), mg/L	Mercury, mg/L	Cadmium, mg/L	Copper, mg/L	Lead, mg/L	Nickel, mg/L	Zinc, mg/L	Iron Total, mg/L	TC, MPN/ 100 ml	FC, MPN/ 100 ml
1. ANGUL (2 stations)																	
1. Angul Township	April	NA	0.467	0.094	NA	NA	NA	<0.002	0.00013	0.0039	0.008	0.019	0.091	0.012	0.943	<1.8	<1.8
	Oct	3.92	NA	< 0.05	87.4	3.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
2. NALCO township	April	NA	0.909	0.051	NA	NA	NA	<0.002	0.00025	0.0016	0.008	0.018	0.014	0.145	0.310	<1.8	<1.8
	Oct	2.24	NA	< 0.05	10.53	4.33	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
2. BALASORE (3 stations)																	
3. Nalgopalpur	April	NA	0.292	0.155	NA	NA	NA	<0.002	0.00013	0.0011	0.002	0.005	<0.001	0.006	0.585	33	4.5
	Oct	2.24	NA	< 0.05	22.93	1.86	NA	NA	NA	NA	NA	NA	NA	NA	NA	130	23
4. Kuanrpur	April	NA	5.94	0.288	NA	NA	NA	<0.002	0.00051	0.0014	0.002	0.004	0.010	0.005	0.166	1.8	1.8
	Oct	1.68	NA	< 0.05	41.32	8.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
5. Chakulia	April	NA	0.734	0.573	NA	NA	NA	<0.002	0.00032	0.0013	0.003	0.002	0.010	0.005	0.340	49	4.5
	Oct	2.24	NA	< 0.05	11.75	2.48	NA	NA	NA	NA	NA	NA	NA	NA	NA	240	23
3. BERHAMPUR (4 stations)																	
6. Berhampur near	Apr	NA	0.257	0.093	NA	NA	NA	<0.002	0.00006	0.0021	0.004	0.013	0.009	0.064	0.069	<1.8	<1.8
Railway station	Oct	1.68	NA	< 0.05	47	2.24	NA	NA	NA	NA	NA	NA	NA	NA	NA	49	13
7. MKCG medical College	Apr	NA	0.234	0.061	NA	NA	NA	<0.002	0.00006	0.0016	0.002	0.009	0.006	0.030	0.538	<1.8	<1.8
	Oct	3.92	NA	< 0.05	85.65	2.56	NA	NA	NA	NA	NA	NA	NA	NA	NA	49	13
8. Bus stand	Apr	NA	0.465	0.068	NA	NA	NA	<0.002	0.00044	0.0020	0.003	0.007	0.005	0.015	0.333	17	4.5
	Oct	3.36	NA	< 0.05	76.7	6.86	NA	NA	NA	NA	NA	NA	NA	NA	NA	79	23
9. Badabazar	Apr	NA	0.156	0.065	NA	NA	NA	<0.002	0.00006	0.0033	0.003	0.017	0.004	0.047	0.036	<1.8	<1.8
	Oct	1.68	NA	< 0.05	75.6	3.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	22	<1.8
Drinking water specification (IS : 10500 (2012)																	
Acceptable Limit		-	1.0	-	-	-	0.5	-	0.001	0.003	0.05	0.01	0.02	5.0	1.0	Absent	
Permissible limit		-	1.5	-	-	-	1.0	-	No relax	No relax	1.5	No relax	No relax	15.0	No relax	No relax	

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/L	Fluoride, mg/L	PO_4^{3-}-P, mg/L	Sodium, mg/L	Potassium, mg/L	Boron, mg/L	Cr (VI), mg/L	Mercury, mg/L	Cadmium, mg/L	Copper, mg/L	Lead, mg/L	Nickel, mg/L	Zinc, mg/L	Iron Total, mg/L	TC, MPN/ 100 ml	FC, MPN/ 100 ml
4. BHUBANESWAR (6 stations)																	
10. Khandagiri Area	April	NA	0.175	0.037	NA	NA	NA	<0.002	0.00006	0.0013	0.004	0.004	0.023	0.026	1.133	<1.8	<1.8
	Oct	1.68	NA	0.211	14	2.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	79	13
11. Old town-Samantarapur Area	April	NA	0.197	0.215	NA	NA	NA	<0.002	0.00019	0.0011	0.005	0.003	0.007	0.006	0.302	33	4.5
	Oct	2.24	NA	< 0.05	18	7.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	11	<1.8
12. Kalpana-Laxmisagar Area	April	NA	0.176	0.113	NA	NA	NA	<0.002	0.00025	0.0011	0.004	0.004	0.018	0.018	1.138	79	4.5
	Oct	2.8	NA	< 0.05	35	12.52	NA	NA	NA	NA	NA	NA	NA	NA	NA	23	<1.8
13. Chandrasekharpur	April	NA	0.17	0.391	NA	NA	NA	<0.002	0.00057	0.0012	0.003	0.004	0.008	0.145	1.558	<1.8	<1.8
	Oct	2.24	NA	0.104	15	6.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
14. Capital Hospital Area	April	NA	0.233	0.201	NA	NA	NA	<0.002	0.00006	0.0011	0.004	0.005	0.004	0.029	0.281	<1.8	<1.8
	Oct	<1.5	NA	< 0.05	16	9.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
15. Secretariate Governor House-Old bus stand Area	April	Not Monitored															
	Oct	Not Monitored															
5. CUTTACK (5 stations)																	
16. Jagatpur	April	NA	0.22	0.469	NA	NA	NA	<0.002	0.00006	0.0012	0.008	0.003	0.007	0.006	0.289	2	<1.8
	Oct	1.68	NA	<	29.35	2.85	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
17. Mangalabag	April	NA	0.286	0.023	NA	NA	NA	<0.002	0.00006	0.0017	0.007	0.003	0.006	0.005	0.160	2	<1.8
	Oct	5.04	NA	< 0.05	3.99	3.24	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
18. Madhupatna-Kalyan Nagar Area	April	NA	0.168	0.429	NA	NA	NA	<0.002	0.00044	0.0023	0.006	0.004	0.005	0.004	0.330	1.8	1.8
	Oct	2.24	NA	< 0.05	26.77	4.79	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/L	Fluoride, mg/L	PO_4^{3-}-P, mg/L	Sodium, mg/L	Potassium, mg/L	Boron, mg/L	Cr (VI), mg/L	Mercury,mg/L	Cadmium, mg/L	Copper, mg/L	Lead, mg/L	Nickel, mg/L	Zinc, mg/L	Iron Total, mg/L	TC, MPN/ 100 ml	FC, MPN/ 100 ml
19. Badambadi Area	April	NA	0.433	0.024	NA	NA	NA	<0.002	0.00076	0.0016	0.008	0.002	0.008	0.014	0.340	<1.8	<1.8
	Oct	< 1.5	NA	< 0.05	37.95	7.36	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
20. Bidanasi-Tulsipur Area	April	NA	0.16	0.049	NA	NA	NA	<0.002	0.00044	0.0015	0.006	0.004	0.005	0.003	0.420	<1.8	<1.8
	Oct	< 1.5	NA	< 0.05	5.12	2.78	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
6. PARADEEP (JAGATSINGHPUR) (2 stations)																	
21. Musadiha	Apr	NA	0.748	0.059	NA	NA	NA	<0.002	0.00057	0.0032	0.001	0.005	0.009	0.018	0.508	7.8	2
	Oct	2.24	NA	< 0.05	328.2	6.94	NA	NA	NA	NA	NA	NA	NA	NA	NA	1700	790
22. Badapadia	Apr	NA	1.17	0.059	NA	NA	NA	<0.002	0.00019	0.0028	0.002	0.004	0.003	0.041	1.016	<1.8	<1.8
	Oct	3.92	NA	< 0.05	386.5	12.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	1300	490
7. SUKINDA (JAJPUR) (4 stations)																	
23. TISCO	April	NA	0.168	0.037	NA	NA	NA	<0.002	0.00019	0.0010	0.004	0.005	0.005	0.029	0.113	<1.8	<1.8
	Oct	3.36	NA	< 0.05	14.23	6.85	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
24. Saruabil	April	NA	0.176	0.027	NA	NA	NA	<0.002	0.00006	0.0011	0.005	0.004	0.006	0.004	0.209	33	11
	Oct	1.68	NA	0.352	3.59	1.72	NA	NA	NA	NA	NA	NA	NA	NA	NA	79	22
25. Kalkapani	April	NA	0.123	0.013	NA	NA	NA	<0.002	0.00006	0.0011	0.004	0.003	0.007	0.003	0.454	79	13
	Oct	< 1.5	NA	< 0.05	18.32	4.69	NA	NA	NA	NA	NA	NA	NA	NA	NA	79	13
26. Kamarda	April	NA	0.185	0.022	NA	NA	NA	<0.002	0.00057	0.0015	0.008	0.008	0.016	0.053	1.391	17	4.5
	Oct	1.68	NA	< 0.05	21.78	9.72	NA	NA	NA	NA	NA	NA	NA	NA	NA	13	<1.8
8. JHARSUGUDA (8 stations)																	
27. Theikol	April	Not Monitored															
	Oct	Not Monitored															
28. Bhurkhamunda	April	NA	0.287	0.049	NA	NA	NA	<0.002	0.00013	0.0016	0.003	0.004	0.021	0.007	0.103	<1.8	<1.8
	Oct	3.36	NA	< 0.05	11.21	2.66	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
29. Badamal Industrial Estate	April	NA	0.164	0.044	NA	NA	NA	<0.002	0.00013	0.0029	0.009	0.007	0.006	0.104	0.578	<1.8	<1.8
	Oct	2.8	NA	< 0.05	5.2	3.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
30. Budhipadar	April	NA	0.169	0.056	NA	NA	NA	<0.002	0.00044	0.0026	0.011	0.008	0.011	0.083	1.123	<1.8	<1.8
	Oct	3.92	NA	< 0.05	13.49	4.76	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/L	Fluoride, mg/L	PO_4^{3-}-P, mg/L	Sodium, mg/L	Potassium, mg/L	Boron, mg/L	Cr (VI), mg/L	Mercury, mg/L	Cadmium, mg/L	Copper, mg/L	Lead, mg/L	Nickel, mg/L	Zinc, mg/L	Iron Total, mg/L	TC, MPN/ 100 ml	FC, MPN/ 100 ml
31. Brajarajnagar Mining Belt	April	NA	0.164	0.065	NA	NA	NA	<0.002	0.00006	0.0021	0.007	0.007	0.008	0.045	0.349	<1.8	<1.8
	Oct	2.8	NA	< 0.05	12.36	6.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
32. Rampur (water tank)	April	NA	0.162	0.056	NA	NA	NA	<0.002	0.00025	0.0021	0.014	0.007	0.012	0.061	1.322	<1.8	<1.8
	Oct	4.48	NA	< 0.05	19.22	8.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
33. Ib thermal power station	April	NA	0.177	0.051	NA	NA	NA	<0.002	0.00013	0.0015	0.018	0.008	0.013	0.120	1.333	<1.8	<1.8
	Oct	3.92	NA	< 0.05	4.53	5.21	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
34. Belpahar Area	April	NA	0.171	0.047	NA	NA	NA	<0.002	0.00057	0.0020	0.011	0.009	0.009	0.110	0.971	<1.8	<1.8
	Oct	3.36	NA	< 0.05	10.29	4.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
9. PURI(4 stations)																	
35. Hospital-Busstand-Mausima temple area	April	NA	0.153	<0.01	NA	NA	NA	<0.002	0.00038	0.0021	0.007	0.005	0.009	0.184	1.656	<1.8	<1.8
	Oct	3.92	NA	< 0.05	87	45.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
36. Near Jagannath Temple	April	NA	0.208	<0.01	NA	NA	NA	<0.002	0.00019	0.0041	0.014	0.008	0.017	0.074	1.465	<1.8	<1.8
	Oct	5.04	NA	< 0.05	88	46.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
37. Near Sea Beach	April	NA	0.412	<0.01	NA	NA	NA	<0.002	0.00025	0.0023	0.012	0.007	0.019	0.192	1.198	13	<1.8
	Oct	5.04	NA	0.101	129	51.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
38. Ballapanda	April	NA	0.175	<0.01	NA	NA	NA	<0.002	0.00013	0.0028	0.008	0.010	0.018	0.109	0.472	4.5	<1.8
	Oct	3.36	NA	< 0.05	28	4.59	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
10. SAMBALPUR(3 stations)																	
39. Near Panthanivas	April	NA	0.139	0.104	NA	NA	NA	<0.002	0.00038	0.0018	0.010	0.007	0.007	0.016	0.135	<1.8	<1.8
	Oct	5.6	NA	< 0.05	13.42	4.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
40. Near Railway station	April	NA	0.273	0.085	NA	NA	NA	<0.002	0.00038	0.0020	0.009	0.005	0.018	0.003	0.020	23	2
	Oct	2.24	NA	< 0.05	42.3	4.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8

Stn Name	Month of Monitoring	Total Kjeldahl N, mg/L	Fluoride, mg/L	PO_4^{3-}-P, mg/L	Sodium, mg/L	Potassium, mg/L	Boron, mg/L	Cr (VI), mg/L	Mercury, mg/L	Cadmium, mg/L	Copper, mg/L	Lead, mg/L	Nickel, mg/L	Zinc, mg/L	Iron Total, mg/L	TC, MPN/ 100 ml	FC, MPN/ 100 ml
41. Near VSS Medical College	April	NA	0.82	0.122	NA	NA	NA	<0.002	0.00051	0.0036	0.009	0.004	0.010	0.009	0.033	<1.8	<1.8
	Oct	1.68	NA	< 0.05	11.31	3.03	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
11. TALCHER (7 stations)																	
42. Mahanadi Coal Field Area	April	NA	0.919	0.150	NA	NA	NA	<0.002	0.00025	0.0016	0.032	0.008	0.029	0.104	0.458	<1.8	<1.8
	Oct	< 1.5	NA	< 0.05	17.22	8.57	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
43. Kaniha	April		0.229	0.044	NA	NA	NA	<0.002	0.00006	0.0018	0.008	0.005	0.014	0.134	1.028	13	4.5
	Oct	3.92	NA	< 0.05	9.25	2.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
44. Talcher town	April		0.432	0.046	NA	NA	NA	<0.002	0.00006	0.0014	0.003	0.006	0.022	0.116	1.132	<1.8	<1.8
	Oct	2.24	NA	< 0.05	11.26	10.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	79	22
45. Meramundali Area	April		0.82	0.082	NA	NA	NA	<0.002	0.00006	0.0023	0.004	0.004	0.011	0.073	0.321	<1.8	<1.8
	Oct	2.24	NA	< 0.05	49.76	2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.8	<1.8
46. Talcher Thermal Area	April	NA	0.726	0.062	NA	NA	NA	<0.002	0.00013	0.0026	0.011	0.005	0.025	0.162	0.888	<1.8	<1.8
	Oct	2.24	NA	< 0.05	60.3	2.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	23	<1.8
47. Banarpal	April	NA	0.351	0.056	NA	NA	NA	<0.002	0.00013	0.0074	0.007	0.051	0.032	0.148	0.582	<1.8	<1.8
	Oct	< 1.5	NA	< 0.05	69.9	4.74	NA	NA	NA	NA	NA	NA	NA	NA	NA	13	<1.8
48. Kulad	April	NA	0.889	0.040	NA	NA	NA	<0.002	0.00013	0.0015	0.015	0.026	0.016	0.156	0.677	<1.8	<1.8
	Oct	2.24	NA	< 0.05	40.15	2.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	13	<1.8
Drinking water specification (IS : 10500 (2012)																	
Acceptable Limit		-	1.0	-	-	-	0.5	-	0.001	0.003	0.05	0.01	0.02	5.0	1.0	Absent	
Permissible limit		-	1.5	-	-	-	1.0	-	No relax	No relax	1.5	No relax	No relax	15.0	No relax	No relax	

5.7.2 Air Quality Status

5.7.2.1 National Ambient Air Quality Monitoring Programme (NAMP) & State Air Quality Monitoring Programme (SAMP)

The Board monitors ambient air quality at 38 stations in seventeen areas of the State, under the CPCB assisted National Ambient Air Quality Monitoring programme (NAMP) and State Ambient Air Quality Monitoring programme (SAMP) of the Board. Details of air quality monitoring stations, station type and parameters monitored are listed in Table-5.32. Parameters like Respirable suspended particulate matter (RSPM or $PM_{10,}$ particulate matter having an aerodynamic diameter less than or equal to 10 µm), $PM_{2.5}$ (particulate matter having an aerodynamic diameter less than or equal to 2.5 µm), SO_2, NO_2, NH_3, O_3, CO, Pb & Ni are being regularly monitored at all monitoring stations. The monitoring is carried out for 24 hours (24-hourly sampling for $PM_{2.5,}$ 8-hourly sampling for PM_{10}, Pb & Ni and 4-hourly sampling for gaseous pollutants like SO_2 & NO_2 and 1hourly monitoring for NH_3 & O_3 with a frequency of twice in a week not in consecutive days, to have a minimum of 104 observations in a year as per CPCB Guideline.

Table-5.32 Ambient Air Quality Monitoring Stations

Sl. No	Name of the areas	Monitoring stations	Parameters monitored
1.	**Angul**	(i) RO, SPCB office building, Angul	**PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3, O_3, Pb & Ni**
		(ii) NALCO Nagar, Angul	
2.	**Balasore**	(iii) R.O, SPCB, Ganeswarpur	
		(iv) DIC office, Angaragadia	
		(v) Rasalpur Industrial Estate	
3.	**Berhampur**	(vi) RO, SPCB office building, Brahmanagar	
4.	**Bhubaneswar**	(vii) SPCB office Building, Unit-VIII	**PM_{10},,$PM_{2.5}$, SO_2, NO_2, NH_3, O_3, Pb, Ni & CO**
		(viii) I.R.C. Village, Nayapalli	
		(ix) Capital Police Station, Unit-I	
		(x) Chandrasekharpur	
		(xi) Patrapada	
		(xii) Palasuni water works	
5	**Bonaigarh**	(xiii) Bonai Govt. Hospital	**PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3,O_3, Pb & Ni**
6.	**Cuttack**	(xiv) Hotel Bishal Inn, Near Badambadi	
		(xv) RO, SPCB office building, Surya Vihar	
		(xvi) PHED Office, Barabati	
7.	**Jharsuguda**	(xvii)RO, SPCB office building, Babubagicha,	
		(xviii) Inside TRL Colony Premises	
8	**Kalinga Nagar**	(xix) BRPL Guest House(Near TATA Guest House)	**PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3 ,O_3, Pb & Ni**
		(xx) RO, SPCB Office building, Kalinganagar	
		(xxi) DET Hostel Tata Steel(Previous at NINL)	
9	**Keonjhar**	(xxii) RO, SPCB Office building, Baniapat	
10	**Konark**	(xxiii) Konark Police Station	

11	**Paradeep**	(xxiv) PPL Guest House	
		(xxv) IFFCO STP	
		(xxvi) PPT Colony	
12	**Puri**	(xxvii)Sadar Police Station	
		(xxviii) Town Police Station	
13	**Rayagada**	(xxix) RO, SPCB Office building, Indiranagar	
		(xxx) L.P.S high school Jakaypur	
14	**Rajgangpur**	(xxxi) DISR, Rajgangpur	
15	**Rourkela**	(xxxii) RO, SPCB Office building, Sector-5	
		(xxxiii)IDL Outpost, Sonaparbat	
		(xxxiv)IDCO Water Tank, IDC Kalunga	
		(xxxv)Kuarmunda Out Post, Kuarmunda	
16	**Sambalpur**	(xxxvi) PHED Office, Modipara	
17	**Talcher**	(xxxvii) TTPS, Talcher	
		(xxxviii) M.C.L., Talcher	

Ambient air quality status with respect to PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3, O_3, CO, Pb & Ni at 37 monitoring stations during the year 2020 are reflected in Table-5.33. The air quality of different cities/ towns have been compared with the national ambient air quality standards to assess the existing air quality status.

The Annual average concentration of Respirable Suspended Particulate Matter(RSPM or PM_{10}) at all monitoring locations are remained above the prescribed limit i.e. 60 ($\mu g/m^3$) except at Brahamanagar, Berhampur and at konark police station, Konark, where as the Annual average value of $PM_{2.5}$ remained below the limit i.e. 40 $\mu g/m^3$ at 21 locations (out of 30 locations monitored).

Comparing the 24-hrly average data with the prescribed standard, the % of data violated were calculated. It was observed that no violation was observed for gaseous pollutants.

The range of PM_{10} violation varied from 2.9 % to 100%.Similarly for $PM_{2.5}$ no violation observed at 09 places i.e.,DIC office, Angaragadia, (Balasore), R.O, SPCB, (Brahamanagar),I.R.C. Village, Nayapalli ,Capital Police station,Unit-1, Chandrasekharpur,(Bhubaneswar), Bonai Govt. Hospital(Bonaigarh), LPS High School, Jaykaypur(Rayagada), DISIR, Rajgangpur and R.O. SPCB building, Sector-5 (Rourkela). The range of violation varied from 0.9% to 25.3%

Air Quality Index (AQI)

AQI value of 17 areas during the year 2020 with prominent pollutant and category of different areas are shown in Table-5.34. The range of AQI value, categorization and health impact are presented in Table-5.35. From the Table-5.34, it was observed that out of 17 areas, 14 areas are falling under Satisfactory category & 03 areas like Cuttack, Kalinganagar & Paradeep are falling under Moderate category. The prominent pollutant was PM_{10} in all 15 areas. The highest AQI value i.e., 160 w.r.t $PM_{2.5}$ has been observed at Paradeep area and lowest in Berhampur i.e., 52

Table-5.33 Ambient Air Quality Status of different cities & towns of Odisha during -2020

Sl. No.	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O_3 8-hourly range)							% of violation of data from 24 hourly standard		Yearly AQI of the monitoring	Overall AQI of the City	Category
			PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb	PM_{10}	$PM_{2.5}$			
			(values expressed in Microgram per cubic meter)											
1	**Angul**													
	1. RO SPCB, Angul	106	85 (44-132)	39 (20-75)	9.7 (4.8-16.9)	24.1 (14.0-31.6)	25.5 (BDL-36.0)	20.2 (BDL-31.2)	0.012 (BDL-0.046)	26.4%	4.7%	85 (PM_{10})	86 (PM_{10})	Satisfactory
	2. NALCO Nagar, Angul	106	88 (46-134)	32 (17-62)	8.9 (5.6-12.9)	24.3 (16.1-28.4)	21.1 (BDL-34.5)	BDL (BDL-25.8)	0.016 (BDL-0.061)	28.3%	1.8%	88 (PM_{10})		
2	**Talcher**												92 (PM_{10})	Satisfactory
	3. TTPS , Talcher	105	88 (48-197)	38 (18-81)	10.0 (6.9-13.1)	27.1 (17.4-31.1)	32.8 (20.4-40.2)	BDL (BDL-20.6)	0.013 (BDL-0.044)	29.5%	7.6%	88 (PM_{10})		
	4.MCL, Talcher	105	97 (44-171)	33 (15-79)	9.1 (7.0-12.4)	26.7 (18.3-30.6)	21.1 (BDL-38.4)	BDL (BDL-25.6)	0.015 (BDL-0.063)	37.1%	9.5%	97 (PM_{10})		
3	**Balasore**												78 (PM_{10})	Satisfactory
	5. R.O, SPCB, Ganeswarpur	105	77 (46-96)	39 (29-62)	BDL (BDL-BDL)	10.1 (BDL-11.9))	23.3 (BDL-31.0)	23.8 (BDL-28.0)	Not Monitored	Nil	0.9%	77 (PM_{10})		
	6. DIC office, Anguragadia	105	74 (42-96)	37 (27-58)	BDL (BDL-BDL)	9.6 (BDL-12.2)	23.7 (BDL-31.0)	22.7 (BDL-28.0)		Nil	Nil	74 (PM_{10})		
	7.Rasalpur,Industrial Estate	83	84 (68-100)	43 (30-63)	7.3 (5.8-8.7)	11.1 (10.2-12.4)	28.1 (23.0-32.0)	24.4 (21.0-26.0)		Nil	3.6%	84 (PM_{10})		
4	**Berhampur**												52 (PM_{10})	Satisfactory
	8. R.O, SPCB, Brahamnagar	107	52 (15-79)	23 (10-35)	BDL (BDL- 6.9)	16.5 (BDL-30.3)	35.2 (27.3-46.3)	36.0 (25.9-47.9)	-	Nil	Nil	52 (PM_{10})		
5	**Bhubaneswar**												82 (PM_{10})	Satisfactory
	9. SPCB Office Building, Unit-VIII	93	92 (43-198)	31 (16-66)	BDL (BDL- 4.2)	14.3 (9.1-37.1)	34.8 (23.0-45.2)	23.4 (BDL-25.4)	0.015 (BDL-0.070)	33.3%	3.2%	92 (PM_{10})		
	10. I.R.C. Village, Nayapalli	87	73 (26-157)	19 (15-22)	BDL (BDL- BDL)	14.0 (BDL-24.6)	31.9 (BDL-86.7)	23.3 (BDL-30.2)	0.012 (BDL-0.075)	21.3%	Nil	73 (PM_{10})		
	11. Capital Police Station, Unit-I	59	94 (35-139)	33 (13-48)	BDL (BDL- BDL)	18.8 (9.4-25.6)	34.0 (23.4-42.5)	23.8 (20.8-25.8)	0.010 (BDL-0.060)	37.2%	Nil	94 (PM_{10})		
	12.Chandrasekharpur	93	76 (37-144)	22 (13-58)	BDL (BDL- BDL)	14.0 (BDL-22.3)	30.2 (22.2-48.0)	23.2 (20.6-28.9)	0.021 (BDL-0.241)	27.1%	Nil	76 (PM_{10})		
	13. Patrapada	80	70 (35-160)	32 (19-64)	BDL (BDL- BDL)	12.7 (BDL-18.7)	35.7 (22.0-54.0)	22.2 (20.3-28.1)	0.016 (BDL-0.075)	22.5%	2.5%	70 (PM_{10})		
	14.Paikasnai water works	82	84 (33-157)	37 (10-99)	BDL (BDL- BDL)	14.2 (BDL-26.1)	43.4 (30.9-65.9)	22.4 (BDL-31.9)	0.015 (BDL-0.070)	23.1%	8.5%	84 (PM_{10})		

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Sl. No	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O_3 8-hourly range)							% of violation of data from 24 hourly standard		Yearly AQI of the monitoring Stations	Overall AQI of the City	Category
			PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb	PM_{10}	$PM_{2.5}$			
			(values expressed in microgram per cubic meter)											
6	**Bonaigarh**													
	15.Bonai Govt. Hospital	79	87 (49-160)	36 (13-54)	6.7 (4.2-18.7)	13.1 (9.3-62.1)	27.1 (22.0-36.1)	23.5 (21.8-26.4)	0.022 (0.015-0.028)	27.8%	Nil	87 (PM_{10})	87 (PM_{10})	Satisfactory
7	**Cuttack**													
	16. Hotel Bishal Inn, Near Badambadi	67	133 (81-202)	42 (18-100)	5.3 (BDL-7.3)	18.8 (16.3-21.3)	29.9 (23.4-39.0)	27.0 (24.1-29.0	0.014 (BDL-0.025)	29.8%	25.3%	122 (PM_{10})	101 (PM_{10})	Moderate
	17. R.O.SPCB Building, Surya Vihar	103	85 (43-159)	41 (21-95)	BDL (BDL-6.1)	17.9 (12.0-26.3)	40.6 (20.6-96.5)	BDL (BDL-29.0)	0.014 (BDL-0.036)	34.9%	20.3%	85 (PM_{10})		
	18.PHD office ,Barabati	92	89 (40-183)	41 (20-112)	BDL (BDL- 5.3)	18.2 (12.9-22.8)	27.7 (20.4-35.9)	BDL (BDL-26.6)	0.012 (0.005-0.024)	41.3%	14.1%	89 (PM_{10})		
8	**Jharsuguda**													
	19. RO Building,Cox Colony, Babubagicha,	106	79 (40-125)	45 (18-72)	7.1 (4.4-21.2)	11.7 (8.9-24.1)	BDL (BDL-31.0)	BDL (BDL-30.0)	0.022 (BDL-0.227)	23.5%	6.6%	79 (PM_{10})	84 (PM_{10})	Satisfactory
	20.Inside TRL Colony Premises	106	89 (58-120)	46 (30-68)	7.4 (4.6-21.4)	13.9 (10.0-21.8)	21.4 (BDL-30.0)	22.8 (BDL-30.2)	0.023 (BDL-0.139)	30.1%	10.3%	89 (PM_{10})		
9	**Kalinga Nagar**													
	21. BRPL Guest House(Near TATA Guest House)	19	112 (55-171)	Not Monitored	BDL (BDL-BDL)	17.7 (13.0-20.0)	49.8 (42.6-53.9)	Not Monitored	-	52.6%	-	108 (PM_{10})	117 ($PM_{2.5}$)	Moderate
	22. RO SPCB, building	61	108 (45-194)	65 (52-84)	BDL (BDL-BDL)	14.9 (10.1-22.5)	45.7 (40.8-54.0)	BDL (BDL- 22.5)	0.018 (0.006-0.063)	47.5%	8.1%	117 ($PM_{2.5}$)		
	23.DET Hostel Tata Steel (Previous at NINL)	65	115 (65-192)	Not Monitored	BDL (BDL-BDL)	16.1 (11.5-20.3)	47.4 (42.1-53.3)	Not Monitored	0.017 (0.010-0.034)	75.3%	-	110 (PM_{10})		
10	**Keonjhar**													
	24. R.O.SPCB, Baniapat	92	74 (27-157)	Not Monitored	BDL (BDL-BDL)	12.0 (BDL-19.2)	51.2 (39.0-71.7)	Not Monitored	0.022 (BDL-0.090)	40.2%	-	74	74 (PM_{10})	Satisfactory
11	**Konark**													
	25. Konark Police station	101	60 (30-99)	Not Monitored	BDL (BDL-BDL)	10.7 (BDL - 14.3)	32.2 (BDL-45.6)	21.2 (BDL-27.2)	0.008 (BDL-0.092)	Nil	-	60 (PM_{10})	60 (PM_{10})	Satisfactory
12	**Paradeep**													
	26.PPL Guest House	101	126 (34-368)	78 (72-85)	16.8 (6.3-26.2)	11.5 (BDL-20.8)	185.2 (165.5-260.2)	76.9 (70.7-83.8)	0.026 (0.012-0.050)	71.2	2.9%	160 ($PM_{2.5}$)	160 ($PM_{2.5}$)	Moderate
	27. IFFCO STP	35	150 (108-219)	NM	20.2 (15.8-25.7)	12.7 (10.1-18.1)	181.9 (160.9-247.0)	74.4 (64.6-86.5)	0.032 (0.021-0.043)	100%	-	133 (PM_{10})		
	28. Paradeep port trust	104	122 (58-222)	NM	17.4 (9.1-25.1)	11.5 (BDL-16.4)	165.6 (147.4-262.8)	64.2 (52.3-74.2)	0.028 (0.012-0.074)	72.1%	-	115 (PM_{10})		

Sl. No.	Area / Stations	No. of Obs. (24 hrs)	Annual Average Value (24hourly range) except O_3 8-hourly range)							% of violation of data from 24 hourly standard		Yearly AQI of the monitoring Stations	Overall AQI of the City	Category
			PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb	PM_{10}	$PM_{2.5}$			
			(values expressed in microgram per cubic meter)											
13	**Puri**													
	29. Town police Station	90	70 (51-124)	NM	BDL (BDL- BDL)	13.1 (BDL-19.5)	44.4 (33.6-65.2)	BDL (BDL-23.7)	0.009 (BDL-0.027)	20%	NM	70 (PM_{10})	70 (PM_{10})	Satisfactory
14	**Rayagada**													
	30.R.O.SPCB Building, Indiranagar	103	62 (29-98)	30 (12-67)	BDL (BDL- 7.7)	15.1 (10.6-18.2)	29.0 (BDL-40.0)	24.6 (BDL-36.0)	0.016 (0.007-0.036)	Nil	0.9%	62 (PM_{10})	64 (PM_{10})	Satisfactory
	31. LPS High School, Jayraypur	101	66 (27-99)	34 (15-56)	BDL (BDL- 7.0)	15.5 (10.2-18.7)	29.6 (BDL-41.0)	22.8 (BDL-34.6)	0.021 (0.011-0.040)	Nil	Nil	66 (PM_{10})		
15	**Rajgangpur**													
	32. DSIR, Rajgangpur	104	91 (46-178)	36 (16-56)	6.5 (BDL-17.0)	11.2 (9.3-18.4)	25.4 (23.0-36.1)	22.9 (21.3-27.1)	0.040 (0.026-0.068)	36.5%	Nil	91 (PM_{10})	94 (PM_{10})	Satisfactory
16	**Rourkela**													
	33. R.O.SPCB building, Sector-5	104	75 (25-185)	31 (10-69)	6.0 (BDL-16.4)	11.0 (BDL-18.4)	25.3 (22.6-38.0)	23.0 (21.5-27.5)	0.033 (0.009-0.046)	17.3%	Nil	75 (PM_{10})	86 (PM_{10})	Satisfactory
	34. IDL Outpost	102	68 (40-108)	30 (10-68)	5.9 (BDL-16.2)	10.5 (BDL-18.1)	27.9 (23.5-56.7)	24.2 (21.0-27.0)	0.033 (0.018-0.042)	2.9%	0.9%	68 (PM_{10})		
	35. IDCO Water Tank, IDC Kalunga	104	107 (61-262)	33 (14-76)	6.7 (4.3-16.4)	10.5 (BDL-18.4))	25.9 (23.9-38.1)	24.3 (21.2-26.9)	0.039 (0.016-0.098)	50.6%	1.92%	105 (PM_{10})		
	36. Koelnanda Out Post, Koelnanda	102	94 (52-206)	30 (19-73)	6.5 (BDL-16.2)	10.9 (9.1-19.7)	24.8 (22.3-56.1)	23.5 (21.3-25.9)	0.042 (0.036-0.066)	37.2%	4.9%	94 (PM_{10})		
17	**Sambalpur**													
	37. PHD Office, Modipara	107	85 (27-176)	42 (16-89)	5.9 (4.3-9.8)	23.5 (18.3-33.8)	20.5 (BDL-29.4)	BDL (BDL-27.5)	0.039 (0.020-0.062)	40.1%	25.2%	85 (PM_{10})	85 (PM_{10})	Satisfactory
Prescribed Standard (24 hrly)			**100**	**60**	**80**	**80**	**400**	**180 (1Hourly)**	**1.0**					
Standard for Annual Avg. Value			**60**	**40**	**50**	**40**	**100**	**100 (8 Hourly)**	**0.5**					

N.B:BDL- Below Detectable Limit, PM_{10} – Particulate Matter ≤ 10 µ size , $PM_{2.5}$ – Particulate Matter ≤ 2.5 µ size SO_2 – Sulphur Dioxide, NO_2 – Oxides of Nitrogen, NH_3 – Ammonia, O_3 – Ozone &Pb-Lead, NM-Not Monitored

- BDL Value for SO_2 ≤4 µg/m³,NO_2 ≤ 9 µg/m³, NH_3 ≤10 µg/m³, O_3 ≤10 µg/m³, Pb ≤0.0022 µg/m³, PM_{10}≤ 5 µg/m³, $PM_{2.5}$ ≤ 2 µg/m³
- NO percentage of violation of data from 24 hourly average for all monitored gaseous like SO_2,NO_2,NH_3,O_3&Pb

Table-5.34 Annual Air Quality Index of Different monitored Stations in Odisha during the year 2020

.	Sub index value w.r.t parameter							Overall AQI With prominent parameter	Overall Categorisation
	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	Pb		
1.Angul									
1.Industrial Estate 2.NALCO Nagar	86	58	12	30	6	10.0	1.4	**86 (PM_{10})**	Satisfactory
2.Talcher									
3.TTPS , Talcher 4.MCL, Talcher	92	58	12	34	7	10.0	1.4	**92(PM_{10})**	Satisfactory
3.Baleswar									
5. R.O, SPCB, Ganeswarpur 6.DIC office, Angarangadia 7.Rasalpur,I.E	78	67	3	13	6	24	NM	**78(PM_{10})**	Satisfactory
4.Berhampur									
8.R.O, SPCB Brahamanagar	52	38	3	21	9	36.0	NM	**52 (PM_{10})**	Satisfactory
5.Bhubaneswar									
9.SPCB Office Building, Unit-VIII 10.I.R.C. Village, Nayapalli 11.Capital Police Station, Unit-I 12.Chandrasekharpur 13.Patrapada 14.Palasuni water works	82	48	3	18	9	23.0	1.5	**82 (PM_{10})**	Satisfactory
6.Bonaigarh 15.Bonai Govt. Hospital	87	36	8	16	7	24	2.2	**87(PM_{10})**	Satisfactory
7.Cuttack									
16.Traffic Tower Badambadi, 17.R.O.Building, Surya Vihar 18.PHD office ,Barabati	102	68	3	23	8	10.0	1.3	**102(PM_{10})**	Moderate
8.Jharsuguda									
19.RO Building,Cox Colony, Babubagicha, 20. Inside TRL Colony Premises	84	75	9	16	3	10.0	2.2	**84(PM_{10})**	Satisfactory
9.Kalinganagar									
21.Over the roof of BRPL Guest House(Near TATA Guest House) 22.Roof of Regional Office Building, 23.DET Hostel Tata Steel (Previous at NINL)	108	117	3	20	12	10.0	1.7	**117($PM_{2.5}$)**	Moderate

Table-5.35 AQI range with categorization and Health impact

AQI VALUE	CATAGORY	IMPACT ON HUMAN HEALTH
0-50	GOOD	Minimal Impact
51-100	SATISFACTORY	Minor breathing discomfort to sensitive people
101-200	MODERATE	Breathing discomfort to the people with lung, heart disease, children and adults
201-300	POOR	Breathing discomfort to people on prolonged exposure
301-400	VERY POOR	Respiratory illness to the people on prolonged exposure
>401	SEVERE	Respiratory effects even on healthy people

5.8 IMPACT OF LOCKDOWN TO CONTAIN COVID 19 ON WATER QUALITY AND AIR QUALITY OF THE STATE

State Government of Odisha had taken proactive measures to contain the COVID-19 pandemic and declared lockdown in the State from 22nd March to 29th March, 2020 in 40% of the State including the State Capital Bhubaneswar, Khurdha, Cuttack, Ganjam, Kendrapada and Angul districts and the towns of Puri, Rourkela Sambalpur, Jharsuguda, Balasore, Jajpur road and Jajpur town and Bhadrak. Subsequently, the Hon'ble Prime Minister of India declared the lockdown from 23rd March to 14thApril, 2020 in whole of the country which was subsequently extended upto 3rd May, 2020. During the lockdown period, activities of peoples including transportation of vehicles was highly restricted. Industries of essential services and manufacturing units which require continuous operation only were allowed after obtaining permission from the District administration.

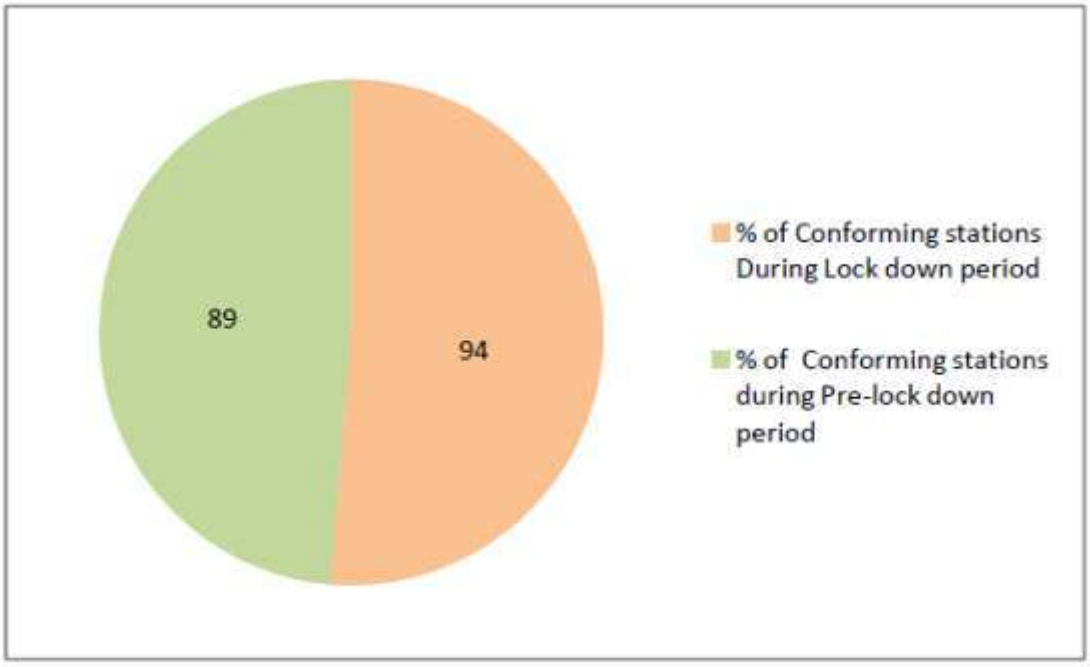
Discontinuance in the activities during lockdown period resulted in generation of less wastewater as well as decreased waste load in comparison to the normal period which were being discharged to the inland surface water bodies. Similarly, restriction on traffic movement, constructional activities, industrial activities has resulted in less emission into atmosphere. A study was undertaken to assess the impact of lockdown on the water quality and air quality of the State.

(a) Impact of lockdown on Water quality

To assess the impact of lockdown on the water quality, the critical parameter, BOD, has been chosen as the indicative parameter. Comparison of water quality monitoring data obtained during the lock down period with the results of pre-lockdown period revealed that, out of 129 river monitoring stations, the number of stations conforming to Class-C has been increased from 89% in "Pre-Lockdown" period to 94% in "During-lockdown" period. Discontinuance in the activities during lockdown period has generated less volume of wastewater in comparison to the normal period which were being discharged to the surface water bodies, less consumption of water by most of the water demanding sectors were the reasons attributed towards of significant reduction in BOD values and improvement on water quality. River-wise improvement in water quality monitoring stations is presented in Table-5.36.

Table-5.36 Impact of Lockdown on the river water quality status of the State

Sl. No.	Name of Water body	No. of Water quality monitoring stations	No. of monitoring stations conforming to Class C		Remarks
			Pre-lockdown period*	During - lockdown period**	Improved (I) Nos./ Deteriorated (D) Nos. (%)
Rivers					
1	Mahanadi River System	55	45	49	I (4) (+7%)
2	Brahmani River System	41	37	39	I (2) (+5%)
3	Baitarani River System	14	14	14	No Change
4	Rushikulya River System	6	6	6	No Change
5	Nagavali River System	3	3	3	No Change
6	Subarnarekha River System	1	1	1	No Change
7	Budhabalanga River System	4	4	4	No Change
8	Vansadhara River System	2	2	2	No Change
9	Kolab River System	1	1	1	No Change
10	Indravati River System	1	1	1	No Change
11	Bahuda River System	1	1	1	No Change
		129	115	121	



(b) Impact of lockdown on Air quality

Ambient air quality of 16 cities/ towns in Odisha in 'pre-lockdown' period (1st to 21st March, 2020 and 'During lock down' period in three time intervals such as 22nd to 31st March, 2020, 1st to 30th April, 2020 and 1st to 31st May, 2020 were compared to assess the impact of lockdown on the air quality status. Cities/ towns covered under this study were Angul, Talcher, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rajgangpur, Rourkela and Sambalpur. In Pre-lock down period, the Air Quality Index varied from 48 to 122 indicating Good to Moderate category with the prominent pollutant being respirable particulate matter (PM_{10}). The Air

Quality Index (AQI) was of good category at one station, satisfactory category at nine stations and moderate category at six stations.

During the Lockdown period (22nd to 31st March, 2020), out of 14 monitored stations, significant improvement in air quality has been observed with increased number of stations under good category to three and satisfactory category to eleven. During this period, the Air Quality Index varied from 22 to 80 with the prominent pollutant being respirable particulate matter (PM_{10}).

Similarly, in the lockdown period from 1st April to 30th April, 2020, out of 16 monitored stations the number of stations in good category was five and under satisfactory category was eleven. The Air Quality Index varied from 33 to 81 with the prominent pollutant being respirable particulate matter (PM_{10}) at twelve stations and fine particulate matter ($PM_{2.5}$) at four stations.

Improvement in air quality during lockdown period may be attributed to the minimal traffic movements, reduced construction and industrial activities. However, after 3nd May, 2020 on relaxation in traffic movements & construction activities was allowed by the State government, an increase in the Air Quality Index values of PM_{10} has been observed at some places compared to the previous month. The AQI value during the period 1st to 31st May, 2020, varied from 30 to 106 and the number of stations under good category was four, under satisfactory category was eleven and under Moderate Category was one. The prominent pollutant being respirable particulate matter (PM_{10}) at fourteen stations and fine particulate matter ($PM_{2.5}$) at two stations.

The Air Quality Index values with the prominent pollutant in different cities of Odisha in Pre-lockdown period and during lockdown periods with the category are given in Table-5.37. Comparison of air Quality Index (AQI) of different Cities/Towns of Odisha during the pre-lockdown period (March (1st to 21st) 2020 and during Lockdown Period of March (22nd to 31st), April (1st to 30th) and May (1st to 31st) 2020 are graphically presented in the following Figure.

Out of six Non-attainment cities of Odisha such as Angul, Talcher, Balasore, Bhubaneswar, Cuttack and Kalinganagar, AQI in pre-lockdown period was Satisfactory at four stations and Moderate at two stations whereas During-Lockdown period, AQI in all six cities was in Satisfactory category.

Air Quality Index (AQI) of different Cities/Towns of Odisha during the Normal Period of March (1st to 21st) 2020& Lockdown Period of March (22nd to 31st), April (1st to 30th) and May (1st to 31st) 2020

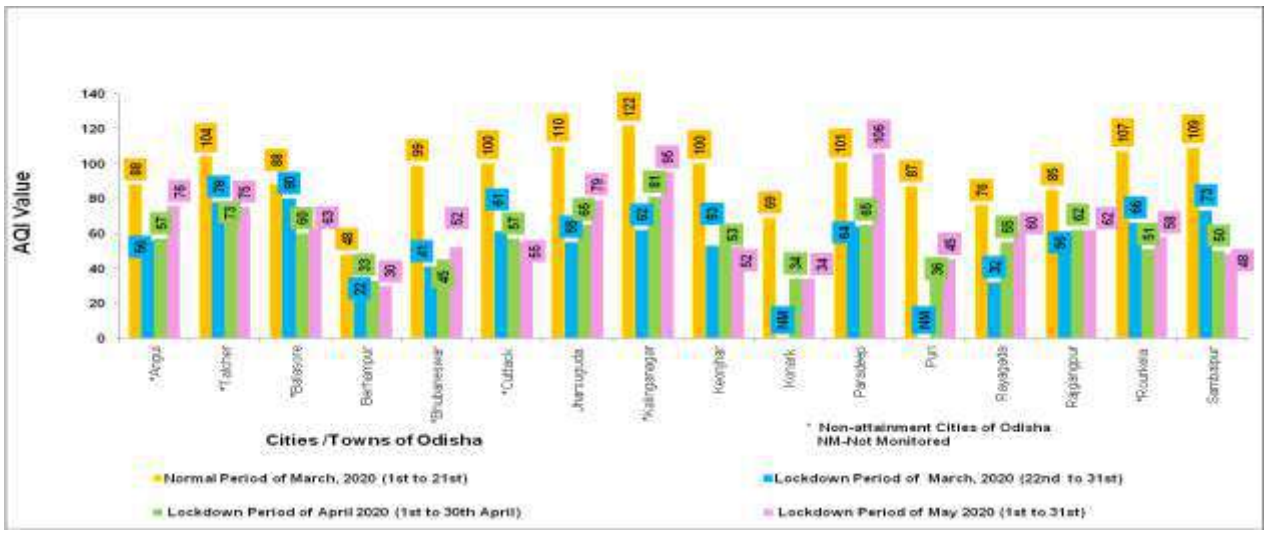


Table-5.37 Air Quality Index (AQI) of different Cities/Towns of Odisha during the Pre-Lockdown Period (March (1st to 21st) 2020), During Lockdown Periods (March (22nd to 31st) 2020, April (1st to 30th) 2020 and May (1st to 31st) 2020

Cities/Towns	Pre-Lockdown Period		During Lockdown Period					
	1st to 21st March, 2020		22nd to 31st March, 2020		1st to 30th April, 2020		1st to 31st May, 2020	
	AQI w.r.t Prominent Pollutant	Category	AQI w.r.t Prominent Pollutant	Category	AQI w.r.t Prominent Pollutant	Category	AQI w.r.t Prominent Pollutant	Category
*Angul	88(PM_{10})	Satisfactory	56(PM_{10})	Satisfactory	57(PM_{10})	Satisfactory	76(PM_{10})	Satisfactory
*Talcher	104(PM_{10})	Moderate	78(PM_{10})	Satisfactory	73(PM_{10})	Satisfactory	75(PM_{10})	Satisfactory
*Balasore	88(PM_{10})	Satisfactory	80(PM_{10})	Satisfactory	60($PM_{2.5}$)	Satisfactory	63($PM_{2.5}$)	Satisfactory
Berhampur	48(PM_{10})	Good	22(PM_{10})	Good	33($PM_{2.5}$)	Good	30(PM_{10})	Good
*Bhubaneswar	99(PM_{10})	Satisfactory	41(PM_{10})	Good	45(PM_{10})	Good	52(PM_{10})	Satisfactory
*Cuttack	100(PM_{10})	Satisfactory	61(PM_{10})	Satisfactory	57(PM_{10})	Satisfactory	55(PM_{10})	Satisfactory
Jharsuguda	110(PM_{10})	Moderate	55(PM_{10})	Satisfactory	65($PM_{2.5}$)	Satisfactory	79(PM_{10})	Satisfactory
*Kalinganagar	122(PM_{10})	Moderate	62(PM_{10})	Satisfactory	81(PM_{10})	Satisfactory	95(PM_{10})	Satisfactory
Keonjhar	100(PM_{10})	Satisfactory	53(PM_{10})	Satisfactory	53(PM_{10})	Satisfactory	52(PM_{10})	Satisfactory
Konark	69(PM_{10})	Satisfactory	NM	-	34(PM_{10})	Good	34(PM_{10})	Good
Paradeep	101(PM_{10})	Moderate	64(PM_{10})	Satisfactory	65(PM_{10})	Satisfactory	106(PM_{10})	Moderate
Puri	87(PM_{10})	Satisfactory	NM	-	36(PM_{10})	Good	45(PM_{10})	Good
Rayagada	76(PM_{10})	Satisfactory	32(PM_{10})	Good	55(PM_{10})	Satisfactory	60(PM_{10})	Satisfactory
Rajgangpur	85(PM_{10})	Satisfactory	56(PM_{10})	Satisfactory	62(PM_{10})	Satisfactory	62(PM_{10})	Satisfactory
*Rourkela	107(PM_{10})	Moderate	66(PM_{10})	Satisfactory	51(PM_{10})	Satisfactory	58(PM_{10})	Satisfactory
Sambalpur	109(PM_{10})	Moderate	73(PM_{10})	Satisfactory	50($PM_{2.5}$)	Good	48($PM_{2.5}$)	Good

* Non-attainment Cities of Odisha NM-Not Monitored

5.9 NABL ACCREDITATION OF CENTRAL LABORATORY OF THE BOARD

NABL Accreditation has been accorded to Central Laboratory, Patia, Bhubaneswar for a period of two years from 01.02.2021 to 31.01.2023 under Chemical and Biological Testing for following group of parameters.

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

CENTRAL LABORATORY, STATE POLLUTION CONTROL BOARD

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

PLOT NO. B-59/2 & 59/3, CHANDAKA INDUSTRIAL ESTATE, PATIA, BHUBANESWAR, KHORDHA, ODISHA, INDIA

in the field of

TESTING

Certificate Number: TC-9245

Issue Date: 01/02/2021 Valid Until: 31/01/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : State Pollution Control Board, Odisha

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

(A) Surface Water/ Ground Water/ Wastewater

25 chemical Parameters

(Temp, pH, EC, Turbidity, Total Suspended Solids, Total Dissolved Solids, Total Fixed Solids, Alkalinity, Dissolved Oxygen (DO) , Biochemical Oxygen Demand (BOD), Chemial Oxygen Demand (COD), Ammonical Nitrogen, Total Kjeldahl Nitrogen, Nitrate-N (NO_3^--N), Phosphate-P (PO_4^{3-} P) , Sodium, Potassium, Total Hardness, Calcium Hardness, Magnesium Hardness, Chloride, Sulphate, Fluoride, Boron)

2 Biological parameters (Total Coliform and Fecal Coliform)

8 Heavy metal parameters (Hexavalent Chromium, Iron, Nickel, Copper, Zinc, Cobalt, Cadmium and Lead)

9 Pesticide residue parameters (alpha-BHC, Lindane (gamma-BHC), o,p-DDT, p,p-DDT, Aldrin, Dieldrin, Alhpa- Endosulphan, Beta- Endosulphan, Chloropyriphos)

(B) Ambient Air : 7 parameters (Respirable Particulate Matter (PM_{10}), Fine Particulate matter ($PM_{2.5}$), Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Ammonia (NH_3), Ozone (O_3) and Lead) and Noise

5.10 INDUSTRIAL INSPECTIONS, MONITORING OF WATER, AIR AND SOLID WASTE SAMPLES

The status of inspection , monitoring and analysis conducted during the year 2020-21 is presented in Table-5.38.

Table - 5.38 Inspection and Monitoring of Water, Air and Solid Waste

Nos. of Inspec-tions	Samples under NWMP, SWMP & NRCP	No. of Bio-monitoring samples	Nos. of Industrial samples	Nos. of other water samples	Nos. of Soil/solid waste/ Plant samples	Nos. of Stack emission samples	Ambient Air Quality studies			Ambient Noise
							Industrial premises	SAMP / NAMP	Others	
5449	4489	60	2266	5567	88	734	1375	14,911	306	1376

5.11 PUBLIC GRIEVANCES

550 no. of public complaints were received during 2020-21 covering 17 caterories of highly polluting Industries, Hazardous waste, Chemicals, Stone Crushers, Brik Kilns, Mines, Iron Crushers, Public nuisance and Miscellaneous issues. Out of which, 306 cases were disposed and 244 cases are under investigation.

IMPLEMENTATION OF RIGHT TO INFORMATION ACT, 2005

The Right to Information Act, 2005 provides for setting out the practical regime of right to information for citizens to secure access to information under the control of Public Authorities (P.A), in order to promote transparency and accountability in the working of every public authority.

In accordance with Act, the State Pollution Control Board, Odisha is providing available information as and when sought through proper application. The status of applications received under RTI Act is presented at Table 5.40.

Table - 5.40 Status of Applications under RTI Act

SL. No.	Details of the Application	Nos.
01.	Total no. of applications received	490
02.	No. of applications on which Information provided	434
03	No. of applications on which request rejected	18
04.	No. of requests transferred to other public Authorities	18
05.	No. of applications under evaluation	20

The total amount collected for RTI requests during 2020-21 is ₹ 21,092/-.

CHAPTER - VI

LEGAL MATTERS

6.1 STATUS OF LEGAL CASES

The Board initiates legal action against those units which fail to adopt adequate pollution control measures or complying to norms / standards amount to violations Acts, Rules and statute. The Board initiates legal action when persistant non-compliance / violation of Acts, Rules or directions are observed. Persons aggrieved by the actives of the Board also take the shlter of legal course.

The Board has filed/counter filed 130 cases in various courts and 89 cases have been disposed off by the respective Courts during 2020-2021. The details of cases filed by the Board alongwith the status of public interest litigations and writ petitions filed in different Courts are presented in Table-6.1.

Table - 6.1 Details of Cases Filed by the Board

Sl. No	Name of the Court	No. of Cases	
		Filed/Counter filed	**Disposal***
A	**Lower Court (SDJM)**		
1.	The Water (PCP) Act	Nil	Nil
2.	The Air (PCP) Act	Nil	Nil
3.	The Environment (Protection) Act	Nil	Nil
B	**High Court**		
1.	PIL	29	22
2.	Writ	22	29
C	**Supreme Court**		
1.	PIL	Nil	Nil
2.	Writ	14	Nil
D	**Other Court**		
1.	Civil Suit	Nil	Nil
2.	Consumer Dispute Cases	Nil	Nil
3.	Lokpal Cases	Nil	Nil
4.	N.H.R.C. / O.H.R.C.	14 (NHRC-05+ OHRC-09)	Nil
5.	Cases U/S-133 of CrPC	Nil	Nil
6.	Cases before the State Appellate Authority	11	06
7.	Cases before the National Green Tribunal	40	32
8.	Misc. Cases	Nil	Nil
	Total	**130**	**89**

N.B: *Include cases carried over from the previous years :

CHAPTER - VII

FINANCE AND ACCOUNTS

The estimated and the actual receipts during 2020-21 are given in Table-7.1.
Table-7.2 reflects the details of budget provision and actual expenditure incurred during the year 2020-21.

Table - 7.1 **RECEIPTS OF THE BOARD FOR THE F.Y-2020-21**

(Rupees in Lakhs)

Sl No.	Head of Receipt	Budget for 2020-21	Amount
A.	**Board's Own Receipt**		
1	**Consent to Operate Fees.**	**3998.64**	**6167.17**
	a. Pre-paid Consent to Operate Fees	3298.64	3298.64
	b. Consent to Operate Fees	700.00	2868.53
2	**Consent to Establish Fees**	**1200.00**	**1358.02**
3	**Misc.Receipts** (Registration fees for PWM,Batteries, Empanelment of consultant fees, RTI,HRD(Board),auction sale etc.)	10.00	72.57
4	Analysis Charges	4.00	2.14
5	Recovery of Loans & Others	15.00	21.57
6	Public Hearing Fees	25.00	38.75
7	Hazardous Waste Auth. Fees	25.00	32.07
8	BMW Authorisation Fees.	15.00	21.08
9	Interest on Savings/Advances	2000.00	2273.49
	Sub-Total	**7292.64**	**9986.86**
B.	**Environmental Compensation Fund**		0.00
1	Pollution Charges	12.00	99.15
2	Forfeiture of Bank Guarentee	5.00	4.13
3	Environmental Penalties	410.00	486.13
	Sub-Total	**427.00**	**589.41**
C.	**Grants-in-Aid from MoEF & C.C/CPCB.**	**304.85**	**304.85**
1	For Scheme "Control Of Pollution"	304.85	304.85
D.	**Receipt of Projects/Schemes.**	**2705.76**	**1338.27**
	Grand Total	**10730.25**	**12219.39**

Table - 7.2 Expenditure during the Financial Year 2020-21 (Rupees in lakhs)

				(Rupees in lakhs)
Sl No.	**Source of Funding**	**Head of Account**	**Budget**	**Expenditure**
A	**Board's Own Receipt**	1. Salary	2001.00	1604.94
		2. Recurring Exp.	687.00	495.95
		3. Loans & advances	17.00	11.00
		4. Non Recurring	991.50	620.28
		5. Projects	786.50	175.10
		Sub Total	**4483.00**	**2907.27**
B	**Environmental Compensation Fund**	1. **Pollution Charges**	**0.00**	0.00
		2. Forfeiture of Bank Gaurantee	**0.00**	0.00
		3. Environmental Penalties:	**24.00**	22.46
		Sub Total	**24.00**	**22.46**
C	**GRANTs-IN-AID From MoEF & C.C/CPCB.**	1. Salary & Establishment Expenditure	150.00	150.00
		2. E-goverance & IT Operations	32.00	30.58
		3. Pollution Assessment and R& D Activities	90.00	80.69
		4. Laboratory Development	78.00	29.45
		5. Management of Polluting sources	4.20	4.15
		6. Training & Mass Awarness	9.00	8.71
		Sub Total	**363.20**	**303.58**
D	**Receipt of Sponsored Projects/Schemes.**		**2738.86**	**1008.11**
		Grand Total	**7609.06**	**4241.43**

CHAPTER - VIII

OTHER IMPORTANT ACTIVITIES

8.1 COASTAL WATER (PARADEEP TO DHAMARA) MONITORING AND ANALYSIS

Coastal Water Monitoring and Analysis are being made regularly since April 2014 on quarterly/seasonal basis by the Coastal Management Cell for the assigned monitoring area i.e. from Paradeep (20˚10'02.67˝N; 86˚31'22.63˝E) to Dhamara coast ($20^0$5'58.96N; $86^0$58'12.27E), covering nearly 80 KM in the sea. All samplings have been made from on-shore and off-shore sampling points with the help of trawler as well as monitoring vessel (MV Sagar Utkal. Seventy three (73) sampling locations have been selected for the entire monitoring area (Mahanadi transect-32 points, Dhamra transect-17 points and Gahirmatha-Bhitarkanika transect- 24 points).

The details of monitoring conducted during 2020-21 by the ICZM Cell are given in table below.

Table- 8.1

Year/ Monitoring Quarter	Period	Duration of sampling	Name of Stretch/Zone	No. of Water samples collected	No. of Sediment samples collected
2020/Q2	July-October	August-2020	Paradeep (Z-1)	96	Nil
2020/Q2	July-October	September-2020	Paradeep (Z-1)	454	12
2020/Q3	October - November	November-2020	Bhitarakanika-Gahirmatha (Z-2)	256	26
		November-2020	Dhamara (Z-3)	216	Nil
2020/Q4	December-February	December-2020	Dhamara (Z-3)	366	12
		December-2020	Bhitarakanika-Gahirmatha (Z-2)	428	6
		December-2020	Paradeep (Z-1)	132	6
2021/Q4	December-February	January-2021	Paradeep (Z-1)	944	50
2021/Q4	December-February	March-2021	Gahirmatha-Bhitarakanika (Z-2)	208	14
			Total no. of samples collected	**3100**	**126**

Parameters analysed for the water samples include pH, Conductivity, Total Suspended Solid, Total Dissolved solid, Turbidity, Fluoride, Dissolved Oxygen, Biochemical Oxygen Demand, Alkalinity, Salinity, Nitrite, Nitrate, Ammonia, Silicate, Ortho-phosphate, TOC, TIC , heavy metals(V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Mo, Pb, Cd, Hg), PAH, Pesticides, Total Coliform, Fecal Coliform, Chlorophyll-a, Chlorophyll-b, Chlorophyll-c, Total Chlorophyll, Phaeophytin pigment, Carotenoid, Phytoplankton and Zooplankton.

Parameters analysed for the sediment samples include pH, TOC, TIC, heavy metals, composition of sediment (sand, silt and clay), Macro Benthos and Meio Benthos.

Some photographs during sampling in vessel are given below:

Monitoring of Coastal water under National Water quality Monitoring Programme (NWMP)

The coastal water monitoring has been commenced by ICZM cell from January 2021 for 91 locations under NWMP covering 6 coastal districts viz., Ganjam, Puri, Jagatsinghpur, Kendrapara, Bhadrak and Balasore along 480 KM coast line of Odisha. The assessment of the suitability of coastal water quality for different

uses of the coastal segment has been proposed based on the "Water Quality Standards for Coastal Waters Marine Outfalls" (G.S.R. 7(E) dated 22.10.1998 and subsequent amendment vide G.S.R. No. 682 (E) dated 05.10.1999). In total, 130 samples were collected and analysed during the month of January and March 2021 in coastal district Jagatsinghpur (100 no.) and Bhadrak (30 no.), respectively.

8.2 FLY ASH RESOURCE CENTRE (FARC)

Fly Ash Resource Centre (FARC) is functioning in the Board since June'2013 as per the decision of High Level Committee, chaired by the Chief Secretary, Govt. of Odisha. During 2020-21, about 3,56,05,668 MT of fly ash has been generated, out of which about 90.58% has been utilised.

The mandate of the FARC is to enhance the utilisation of fly ash in the State by facilitating and exploring various options such as brick manufacturing, cement, asbestos manufacturing, quarry filling, coal mine void filling, dyke height raising, land development, road making etc. The Board has also taken up awareness programme from time to time among the stakeholders. FARC has prepared the following guidelines which are available in the Board's website.

a. Guidelines for Manufacturing of quality Fly Ash Bricks
b. Guidelines for Low lying area filling with fly ash
c. Guidelines for Use of Fly ash Tiles in canal lining
d. Best Practices in Fly ash utilization
e. Fly ash in Road construction

8.3 UNIDO-GEF-Funded MoEF Project on Biomedical Waste (BMW) Management

Odisha is one of the five States in the Country (Other States are Maharashtra, Gujarat, Punjab, Karnataka) implemented UNIDO-GEF-Funded MoEF Project on Biomedical Waste Management. SPC Board has been designated by the State Govt. as the Nodal Agency and the Board has signed the contract with UNIDO. The project is implemented in 28 Health Care Establishments (HCEs) including three Govt. Medical Colleges and Hospitals and 01 Common Bio-Medical Waste Treatment Facility (CBMWTF) Govt. of Odisha is co-financing the project.

The achievements of the project in implementing best BMW management in the State are as follows

14 qualified manpower have been provided to 03 large Medical College & Hospitals, State Bio-Medical Waste Cell in H & FW Dept., 06 District Head Quarters Hospitals and at SPCB, Bhubaneswar through outsourcing agency designated as Project Officers who exclusively deal with Bio-medical Waste Management

Regular training has been imparted to waste handlers and staff associated with Bio-medical waste handling.

Due to regular surveillance, the Bio-medical Waste Management practice in the aforesaid 9 Govt. HCEs has shown considerable improvement, particularly the practice of segregation of bio-medical wastes.

Colour-coded bins (3330 nos.) and waste collection trolleys (240 nos) have been provided to the identified 28 HCEs.

Capacity building of Medical Officers, Nurses, Paramedical Staff, Waste Handlers and related stockholders has been made.

Training has been imparted online to Health Care Personnel dealing with Bio-Medial Waste Management in the Hospital.

Training Guidelines / Manuals on environmetally sound management of Bio-Medical Waste for Doctors, Nurses, Nodal Officers and Waste Managers, Trainers Guide for training, Information Handbook on Bio-Medical Waste for Administrators, Training manual of Waste Handlers, SOPs and Posters have been prepared.

The training manuals have been translated into Odia language and circulated among all stakeholders.

Five microwaves and 05 shredders have been provided to 4 nos. of large medical college and hospitals namely SCB Medical College and Hospital, Cuttack; VIMSAR, Burla; MKCG Medical College and Hospital, Berhampur; and SUM Hospital, Bhubaneswar under the project.

Specification of PPE, Mercury Spill Kit, Biological Spill Kit and Needle Syringe Destroyer has been prepared and shared with all identified hospitals to procure it from their user fund.

The CBMWTF (M/s Sani Clean Pvt. Ltd., Tangiapada, Khordha) has upgraded its incinerator with residence time in the secondary chamber. Emision of dioxin and furans meet the prescribed standard.

8.4 OBSERVATIONS DURING DIFFERENT FESTIVALS

8.4.1. Impact of Festive Activities during Dussehra and Deepavali on Noise level and Ambient Air Quality (AAQ) of selected towns and cities of Odisha.

State Pollution Control Board, Odisha has taken pro-active measures to published public notices in two English and one Odia newspaper on dtd:-20.10.2020 to create public awareness on ill effects of noise and bursting of fire crackers.


STATE POLLUTION CONTROL BOARD, ODISHA

PUBLIC NOTICE

The times of India 21.10.20 P-9


ଓଡ଼ିଶା ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡ, କଟକ

ଜନସାଧାରଣଙ୍କ ନିକଟରେ

ସମ୍ବାଦପତ୍ର ୨୧.୧୦.୨୦୨୦ P-5


STATE POLLUTION CONTROL BOARD, ODISHA

PUBLIC NOTICE

The New Indian Express 21.10.20 P-5

Later Govt. of Odisha is the first state in India had prohibited the sale and use of fire crackers from 10th to 30th Nov-2020 in the public interest considering the potentially harmful consequences of burning of crackers amidst COVID-19 pandemic situation people usually burn fire crackers on the occasion of Deepawali & Kartika Purnima Festival. To assess the impact of Dussehra and Deepawali on ambient air quality, the Board has conducted monitoring of Noise Level on 'pre' and "on the day of Dussehra" and Deepawali at 14 towns/cities of the State as well as ambient air quality monitoring with respect to PM_{10}, $PM_{2.5}$, SO_2& NO_2 in 17 towns/cities on 'pre' and "on the day of Deepawali" along with continuous ambient air quality monitoring in two locations of the capital city Bhubaneswar with respect to parameters like PM_{10}, $PM_{2.5}$, SO_2& NO_2 and Heavy metals like, Pb, Ni & As in PM_{10}&, Al, Ba & Fe in $PM_{2.5}$as sought for by CPCB. The ambient air quality data of Deepawali has already been sent to CPCB in scheduled time for submission before Hon'ble Supreme court.

The findings of the monitoring results are summarized and presented in Tables 8.2 to 8.4. The ambient noise level as well as air monitoring results of 'pre' and 'during' and continuous air quality monitoring on eve of Deepawali for the year -2020 are compared with the data of -2019 and presented in Table 8.6.

IMPACT OF DUSSEHRA FESTIVAL CELEBRATION ON AMBIENT NOISE LEVEL

State Pollution Control Board, Odisha has conducted ambient noise monitoring at 53 locations in 14 towns/cities i.e., Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rourkela and Sambalpur covering Industrial, Commercial, Residential and Silence zone during day and night time in pre and during Dussehra to assess the impact of Dussehra festival on ambient noise level. Out of 53 locations, 11 were in Industrial, 14 each were in commercial, residential and silence zone respectively.

I. Industrial Zone

The noise level in day time at all locations in pre & on the day of Dussehra were below the prescribed limit i.e.,*75 dB (A)* Leq *except at RSP. Sail, Rourkela in pre Dussehra with noise level 75.4 dB(A) Leq.*

During night time, the noise level were below the prescribed limit i.e., 70 dB (A) Leq *at all locations except at Kalinganagar Industrial Estate in pre Dussehra with noise level 71.7 dB(A) Leq.*

II. Commercial Zone

The noise level in day time on pre & during Dussehra at all locations were above the limit i.e. 65dB(A) Leq except at two locations in pre Dussehra Sahidnagar, Bhubaneswar & Jhandachowk, Jharsuguda and at two locations i.e NAC market, Konark and Ambagaan ,Rourkela in both pre & during Dussehra were below the prescribed limit. The maximum noise was recorded at Gopabandhu chowk, Kalinganagar i.e., 79.5 dB (A) Leq on pre-Dussehra.

The noise level in night time exceeded the limit i.e.,55 dB (A) Leq at all locations in pre & on the day of Dussehra except at Sahidnagar, Bhubaneswar, Jhanda chowk, Jharsuguda & NAC Market, Konark, on pre Dussehra and Bazar chowk, Angul & Ambagaan, Rourkela in both pre & during Dussehra. The maximum noise level was recorded i.e., 75.9 dB (A) on pre-Dashera at Gopabandhu chowk, Kalinganagar.

III. Residential Zone

The noise level in the day time exceeded the limit i.e. 55 dB (A) Leq in both pre & during Dussehra at all locations except at Sahadevkhunta, Balasore and Madhipur, Konark on pre Dussehra. Madhipur Konark and Ainthapali, Sambalpur during Dussehra. The maximum noise level occurred at Kumutisahi, Old sadar lane, Puri i.e., 73.2 *dB (A) Leq in day time on the day of* Dussehra.

During night time, the noise level in pre & during Dussehra were more than the limit i.e.,45 dB (A) Leq at all locations except at Sahadevkhunta, Balasore, on pre Dussehra. Madhipur, Konark, Amalapada, Angul and Brahmanagar, Berhampur on the day of Dussehra.The maximum noise level occurred i.e., 69.3*dB (A) Leq*at Suryavihar, Cuttack during Dussehra.

IV. Silence Zone

The noise level in day time & night time at all locations were above their respective limit i.e., 50 dB (A) Leq & 40 dB (A) Leq respectively except at Public Health Centre, Konark & IGH steel Township, Rourkela in day time in pre Dussehra. Public Health Centre, Konark and District Head Quarter Hospital, Balasore on the day of Dussehra.The Maximum noise level i.e., 70.9 dB (A) Leq in day time on pre and 70.4 dB (A)Leq in night time were occurred at SCB Medical College & Hospital, Cuttack on the day of Dussehra.

Table-8.2 Noise level in dB(A) Leq at different locations on pre and on Dashera day during the year 2020

Sl. No	Towns/Cities	Monitoring Locations	Pre Dashera		On the day of Dashera	
			D	N	D	N
1.	Angul	1.Amalapada(R)	58.3	46.3	61.3	40.7
		2.Bazar chhak(C)	78.4	50.1	69.8	49.4
		3.District Head Quarter Hospital(S)	60.1	46.5	59.1	44.3
		4.Hakimpada(I)	63.7	54.7	60.7	52.4
2.	Balasore	5.Sahadevkhunta(R)	53.0	43.8	58.7	48.2
		6.Motiganj Bazar(C)	74.2	56.2	74.9	65.3
		7.District Head Quarter Hospital(S)	54.5	44.9	49.5	49.6
		8.Balasore Industrial Estate(I)	57.4	53.2	51.5	42.9
3.	Berhampur	9.Brahmanagar(R)	56.9	54.4	56.9	43.3
		10.Girija market square(C)	70.0	66.4	77.8	61.5
		11.MKCG Medical & Hospital(S)	62.6	58.4	70.0	49.0
		12.Ankuli(I)	66.1	56.2	66.6	58.8
4.	Bhubaneswar	13.Nayapalli(R)	59.7	49.0	68.3	58.1
		14.Sahidnagar(C)	64.4	49.1	72.4	64.6
		15.Capital Hospital(S)	51.3	41.1	56.5	46.4
		16.Rasulgarh(I)	66.4	52.1	69.0	62.3
5.	Cuttack	17.Suryavihar(R)	69.9	69.3	67.2	64.2
		18.Badambadi(C)	72.9	71.1	72.1	67.3
		19.SCB Medical College & Hospital(S)	70.9	70.4	63.3	65.2
		20.Khapuria(I)	73.0	69.4	63.8	63.2
6.	Jharsuguda	21.Cox Colony(R)	67.2	58.6	62.3	63.1
		22.Jhanda Chowk(C)	60.6	47.7	68.2	61.1
		23.District Head Quarter Hospital(S)	51.7	46.6	55.4	45.3
		24.Bombay Chowk(I)	62.4	58.2	65.6	64.8
7.	Kalinganagar	25.Sapagadia(R)	66.4	64.7	71.0	60.6
		26.Gopabandhu Chowk(C)	79.5	75.9	74.3	73.1
		27.CHC Hospital, Jajpur Road(S)	63.8	61.5	66.8	60.0
		28.Kalinganagar Industrial Estate(I)	72.2	71.7	74.6	66.0
8.	Keonjhar	29.Baniapat Chowk(R)	66.4	59.6	68.1	60.3
		30.Punjabi Chowk(C)	67.6	67.7	70.6	59.8
		31.Govt.Hospital(S)	63.8	43.3	60.2	48.0
		32.Drupada I/E(I)	73.5	69.8	68.7	62.5
9.	Konark	33.Madhipur(R)	46.5	45.8	46.0	44.0
		34.NAC Market(c)	58.8	54.2	64.4	57.0
		35.Public Health Centre(S)	47.8	46.9	50.0	49.9
10.	Paradeep	36.Near Police Colony(R)	66.4	62.1	68.9	63.8
		37.LIC Building Jagatsinghpur(C)	65.6	59.5	79.1	68.2
		38.District Head Quarter Hospital(S)	70.9	62.0	68.9	65.9
11.	Puri	39.Kumutisahi, Old Sadar lane(R)	66.0	60.5	73.2	62.5
		40.Sri Mandir(C)	75.2	65.0	78.5	66.0
		41.District Head Quarter Hospital(S)	64.5	60.0	67.5	58.5
12.	Rayagada	42.Indira Nagar(R)	69.8	64.2	64.1	57.3
		43.Near Main Market(C)	71.3	67.8	74.1	71.6
		44. District Head Quarter Hospital (S)	63.9	61.7	70.1	62.4
		45.Near Jesco(I)	70.6	66.1	71.9	59.6
13.	Rourkela	46.Sector-6(R)	66.4	62.1	57.5	47.0
		47.Amwargan(C)	62.9	52.5	62.9	53.6
		48.IGH steel Township(S)	45.1	41.9	52.1	44.3
		49.RSPL Sail(I)	75.4	59.1	68.9	68.5
14.	Sambalpur	50.Ainthapali(R)	57.9	51.4	53.3	51.9
		51.Golebazar(C)	72.8	62.9	74.9	68.2
		52.District Head Quarter Hospital(S)	56.9	49.8	58.5	58.4
		53.Bareipali(I)	59.6	52.7	57.3	55.3

N.B:-D-Day Time monitoring period (6PM to 10PM),N-Night Time monitoring period (10PM to 12.00 AM)

IMPACT OF DEEPAWALI CELEBRATION ON AMBIENT NOISE LEVEL

State Pollution Control Board, Odisha has conducted ambient noise level monitoring at 53 locations in 14 towns/cities i.e., Angul, Balasore, Berhampur, Bhubaneswar, Cuttack,Jharsuguda, Kalinganagar,Keonjhar, Konark, Paradeep,Puri, Rayagada, Rourkela and Sambalpur town/cities of Odisha covering Industrial, Commercial, Residential and Silence Zone in the day and night time in pre & on the day of Deepawali to assess the impact of noise on ambient air quality.Out of 53 locations, 11 locations were in Industrial zone,14 locations were in commercial, residential and silence zone respectively. The findings of the monitoring are summarized below and results are presented in Table-8.3.

I. Industrial Zone

The day time noise levels in the pre and during Deepawali were found below the prescribed standard of 75dB (A) Leq at all locations except one location at Kalinganagar Industrial Estate on pre Deepawali with noise level 77 dB (A).

In night time the noise level in pre and during Deepawali were within the prescribed standard of 70dB (A)Leq at all locations except at Kalinganagar Industrial Estate & RSP, Sail, Rourkela in pre-Depawali and Jesco, Rayagada on the day of Deepawali. The maximum noise level observed at Kalinganagar Industrial Estate i.e., 81.3 Leq dB(A).

II. Commercial Zone

The day time noise level in pre & on the day of Deepawali remained above the prescribed standard of 65 dB(A) Leq at all the locations except at Bazar chowk, Angul, NAC market, Konark and Ambagaan, Rourkela in pre & during Deepawali and Badapadia market, Paradeep on pre-Deepawali. The maximum noise level observed at Sri Mandir, Puri i.e 78.2 dB (A) Leq on pre-Deepawali.

In night time the noise level in pre and during Deepawali were above the prescribed standard of 55dB (A) Leq at all locations except at Bazar chowk, Angul both in pre & during Deepawali. At NAC Market, Konark and Panjabi Chock, Keonjhar in pre- Deepawali. The maximum noise level observed at Sahidnagar, Bhubaneswar on the day of Deepawali i.e., 74.8 dB(A) Leq.

III. Residential Zone

The day time noise level in residential zone exceeded the standard of 55 dB (A) Leq at all locations in pre &during Deepawali except at Brahmanagar, Berhampur, Cox colony, Jharsuguda, Sector-6, Rourkela and Madhipur, Konark in pre Deepawali and Madhuban, Paradeep in both Pre and on the day of Deepawali. The maximum noise level observed at Baniapat chowk, Keonjhar on the day of Deepawali i.e 73.1 dB(A)Leq.

The night time noise level in residential zone exceeded the standard of 45 dB (A) Leq at all locations except at Amalapada, Angul both in pre &during Deepawali Sector-6, Rourkela, Cox colony, Jharsuguda and Madhipur, Konark in pre Deepawali and Brahmanagar, Berhampur on the day of Deepawali. The maximum noise level observed at Baniapat, Keonjhar i.e., 74.2dB(A) Leq on the day of Deepawali.

IV. Silence Zone

The day time noise level were found to be exceeding the prescribed standard of 50 dB (A) Leq at all locations except at Capital Hospital, Bhubaneswar & IGH steel township, Rourkela in pre-Deepawali and Public

health centre, Konark in both pre & During Deepawali. The maximum noise level occurred at Govt. Hospital, Keonjhar on the day of Deepawali i.e., 73.4 dB(A) Leq.

In night time noise level in pre & during Deepawali were found to be exceeded the prescribed standardof 40 dB (A) Leq at all locations. The maximum noise level observed at CHC Hospital, Kalinganagar i.e., 67.7dB(A) Leq on pre Deepawali.

Table-8.3 Noise level in dB(A) Leq at different location in pre Deepavali & Deepavali day during the year 2020

Sl.No	Towns/ Cities	Monitoring Locations	Pre- Deepawali (09.11.2020)		On the day of Deepawali (14.11.2020)	
			D	N	D	N
1	Angul	1.Amalapada(R)	59.0	43.2	63.5	42.6
		2.Bazar chhak(C)	60.9	40.4	62.2	40.5
		3.District Head Quarter Hospital(S)	68.9	50.7	70.0	52.3
		4.Hakimpada(I)	63.4	55.1	64.8	54.7
2	Balasore	5.Sahadevkhunta(R)	56.2	46.4	64.2	49.2
		6.Motiganj Bazar(C)	72.7	65.8	76.1	67.2
		7.District Head Quarter Hospital(S)	55.5	46.1	57.8	50.0
		8.Balasore Industrial Estate(I)	59.9	47.7	63.8	54.8
3	Berhampur	9.Brahmanagar(R)	52.9	45.4	63.8	44.9
		10.Girija market square(C)	69.1	63.1	75.5	65.7
		11.MKCG Medical & Hospital(S)	60.4	53.2	55.9	53.2
		12.Ankuli(I)	64.7	54.0	60.5	52.7
4	Bhubaneswar	13.Nayapalli(R)	65.4	53.0	65.5	58.0
		14.Sahidnagar(C)	74.1	57.5	73.2	71.8
		15.Capital Hospital(S)	48.9	45.9	56.5	46.8
		16.Rasulgarh(I)	67.6	56.5	73.6	66.2
5	Cuttack	17.Suryavihar(R)	64.7	64.5	67.3	70.3
		18.Badambadi(C)	67.0	72.5	70.7	68.2
		19.SCB Medical College(S)	65.1	53.4	63.5	66.5
		20.Khapuria(I)	66.5	64.1	65.9	59.3
6	Jharsuguda	21.Cox colony(R)	53.0	39.5	67.2	57.4
		22.Jhanda Chowk(C)	65.3	63.4	71.1	71.8
		23.covid Hospital(S)	61.8	55.1	65.1	64.9
		24.Bombay Chowk(I)	68.4	48.0	64.3	64.7
7	Kalinganagar	25.Sapagadia(R)	65.1	72.5	63.4	58.7
		26.Gopabandhu Chowk(C)	77.4	72.9	75.3	60.9
		27.CHC Hospital(S)	66.9	67.7	66.5	63.5
		28.Kalinga nagar industrial estate (I)	77.0	81.3	70.4	60.1
8	Keonjhar	29.Baniapat Chowk(R)	60.6	52.0	73.1	74.2
		30.Punjabi Chowk(C)	68.0	54.6	71.5	60.4
		31.Govt.Hospital(S)	67.1	62.1	73.4	67.6
9	Konark	32.Madhipur(R)	47.1	44.2	56.1	46.1
		33.NAC Market(C)	57.7	53.3	60.6	56.4
		34.Public Health Centre(S)	48.4	46.6	45.5	42.9

10	Paradeep	35.Madhuban(R)	50.8	55.9	54.0	59.0
		36.Badapadia Market(C)	63.5	65.5	65.7	58.9
		37.Bijumemorial Hospital(S)	57.1	51.0	63.8	54.3
		38.IFFCO Ltd(I)	59.4	56.3	64.7	61.6
11	Puri	39.Kumutisahi, Old Sadar lane(R)	71.2	58.5	63.6	55.7
		40.Near Sri Mandir(C)	78.2	66.5	75.3	63.8
		41.District Head Quarter Hospital(S)	65.5	58.5	61.7	53.9
12	Rayagada	42.Indiranagar(R)	68.3	62.6	68.3	65.9
		43.Main market(C)	68.2	59.8	72.1	61.8
		44.District Head Quarter Hospital(S)	59.3	61.9	63.7	61.4
		45.Jesco(I)	70.7	62.6	70.2	71.4
13	Rourkela	46.Sector-6(R)	48.6	39.0	67.3	57.4
		47.Ambagaan(C)	60.5	60.1	61.9	66.7
		48.IGH steel Township(S)	48.6	47.8	55.9	52.4
		49.RSPL Sail(I)	71.1	72.0	60.7	59.8
14	Sambalpur	50.Ainthapali(R)	58.9	58.1	64.9	59.9
		51.Golebazar(C)	73.2	65.2	73.5	72.9
		52.District Head Quarter Hospital(S)	54.7	51.3	58.9	58.7
		53.Bareipali(I)	59.1	53.8	66.8	55.5

N.B:-D-Day Time monitoring period (6PM to 10PM), N-Night Time monitoring period (10PM to 12.00 AM)

IMPACT OF DEEPAWALI CELEBRATION ON AMBIENT AIR QUALITY

State Pollution Control Board, Odisha has monitored the Ambient Air Quality on pre & on the day of Deepawali at 37 locations in 17 town/cities of Odisha i.e., at Angul, Balasore, Berhampur, Bhubaneswar, Bonaigarh, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rajgangpur, Rourkela, Sambalpur & Talcher with respect to parameters like SO_2, NO_2 PM_{10}(at 35 locations)& $PM_{2.5}$ (at 29 locations)to assess the impact of brusting of fire crackers on the local ambient air quality.

The SO_2 & NO_2 values on pre & during Deepawali remained below the prescribed limit i.e 80µg/m^3(for both SO_2& NO_2 on 24 hourly average basis) at all 37 locations. The maximum SO_2 value i.e., 25.7 µg/m^3 observed at STP building, IFFCO and maximum NO_2 value i.e., 33.8 µg/m^3observed at Modipara, Sambalpur. The respirable dust particle matter (PM_{10}) values were below prescribed limit of 100µg/m^3on 24 hourly average basis at 11 locations on the day of Deepawali (out of 34 locations) and at 22 locations on pre Deepawali (out of 35 locations) whereas $PM_{2.5}$ values were remained below the prescribed limit i.e 60 µg/m3 24 hourly average basis at 23 locations on the day of Deepawali (out of 29 locations) and at 27 locations on pre Deepawali (out of 28 monitoring locations). However, 09 locations on pre and 08 locations during Deepawali were not monitored. On the day of Deepawali maximum PM_{10} value i.e., 171µg/m^3 observed at PPT, staff quarters Paradeep. The maximum $PM_{2.5}$ value i.e., 99 µg/m^3 observed at Palasuni water works, Bhubaneswar. The concentration of gaseous pollutants like SO_2, NO_2, PM_{10}& $PM_{2.5}$shows insignificant increase on the day of Deepawali compared to pre Deepawali concentration at all locations. This indicates minimal impact of bursting of fire crackers on the air quality due to prohibition on sale and use of fire crackers by Govt. of Odisha. The monitoring results are shown in Table no-8.4.

Table-8.4 Ambient Air Quality status of major cities/towns in the pre & during Deepavali-2020

Sl. No	Towns/cities	Monitoring Locations	Parameter Monitored							
			SO_2		NO_2		PM_{10}		$PM_{2.5}$	
			Values are expressed in microgram per cubic meter							
			Pre	During	Pre	During	Pre	During	Pre	During
1	Angul	1. RO, SPCBOffice Building	9.4	13.2	25.3	29.6	94	111	43	51
		2. Nalco Township	9.6	12.9	23.6	27.4	101	111	25	36
2	Balasore	3.Ganeswarpur	BDL	BDL	10.3	11.1	82	88	33	41
		4.Oriplast, OT Road	BDL	BDL	11.3	11.2	84	85	37	54
		5.Rasalpur Industrial Estate	7.7	7.8	11.3	11.7	89	92	41	46
3	Berhampur	6.Brahmanagar	5.5	6.4	18.6	20.2	42	48	23	24
		7.Girija market square	8.3	9.5	20.8	30.2	75	85	26	32
		8.MKCG Medical College& Hospital	7.1	9.3	17.9	22.5	68	79	16	22
		9.Industrial Estate, RO office	5.7	8.1	19.6	23.4	54	79	22	20
4	Bhubaneswar	10.RO,SPCB Office Building	BDL	4.2	17.0	19.0	80	136	46	56
		11.IRC Nayapalli	BDL	BDL	15.4	19.5	100	99	NM	NM
		12.Capital Police Station	Not Monitored							78
		13.Patrapada	BDL	BDL	15.3	18.7	90	160	31	64
		14.Chandrasekharpur	BDL	BDL	15.0	21.6	107	112	31	58
		15.Palasuni water works	BDL	NM	12.0	NM	97	NM	72	99
5	Bonaigarh	16.Govt. Hospital Bonai	8.7	15.4	12.4	17.6	68	117	28	46
6	Cuttack	17. PHD Office near Barabati Stadium	4.1	BDL	18.4	19.8	109	113	42	46
		18. RO, SPCBOffice Building Suryavihar	BDL	BDL	19.7	20.7	106	129	46	42
		19.Hotel Bishal Inn near Traffic Tower Badambadi	Not Monitored						36	34
7	Jharsuguda	20. RO, SPCB OfficeBuilding, Cox Colony, Babubagicha	7.7	16.3	12.3	18.2	89	116	51	72
8	Kalinganagar	21. DET Hostel,M/S Tata steel	BDL	BDL	18.0	19.2	114	124	NM	NM
9	Keonjhar	22 RO, SPCBOffice Building	BDL	BDL	16.2	19.2	99	105	NM	NM
10	Konark	23. Konark Police Station	BDL	BDL	13.6	13.8	82	82	NM	NM
11	Paradeep	24. STP Building, IFFCO,	19.4	25.7	12.7	18.1	153	164	NM	NM
		25. PPL Guest House,	20.9	25.2	11.7	18.2	161	168	NM	NM
		26. PPT Staff Quarters,	19.5	24.3	10.1	16.2	171	171	NM	NM
12	Puri	27.Town Police Station	BDL	BDL	14.9	19.3	82	105	NM	NM
13	Rayagada	28. RO, SPCB Office Building	4.7	7.7	16.6	17.8	69	93	39	67
		29.LPS High School	5.0	7.0	17.1	17.1	72	87	41	56
14	Rajgangpur	30.DISIR Rajgangpur	6.4	17.0	11.9	18.4	98	124	33	45
15	Rourkela	31. RO, SPCBOffice Building	7.8	16.4	12.4	18.4	136	107	60	47
		32.IDL Police Outpost	6.4	16.2	12.3	18.1	74	108	45	47
		33.IDC Kalunga	7.9	16.4	11.8	18.4	141	167	36	58
		34. Kuarmunda Hospital,	7.7	18.0	11.5	19.7	118	137	44	52
16	Sambalpur	35.Modipara	7.6	9.3	26.2	33.8	91	108	48	68
17	Talcher	36.Talcher Thermal	11.9	13.1	27.4	30.6	111	125	46	51
		37. MCL area, Talcher	8.5	12.4	25.1	29.2	115	120	37	48
Standard on 24hrly avg. Basis			**80**		**80**		**100**		**60**	

N.B-BDL-Below Detection Limit,BDL value for SO_2 =4 µg/m^3, NM-Not Monitored

Comparison of Ambient Air Quality and Ambient Noise Level during Deepawali for the year-2019 and 2020

Ambient Air and Ambient Noise monitoring results during Deepawali for the year 2020 has been compared with the year 2019 and the results are presented in Table-8.5 & 8.6.

Ambient Air Quality During Deepawali Festival

It was observed that the gaseous pollutants like SO_2 & NO_2 in both the years during Deepawali were below the prescribed limit i.e.,80µg/m^3.

Respirable Particulate Matter (PM_{10}) remained above the limit (i.e 100µg/m^3 on 24 hourly avg. standard) at all locations except at 04 locations in the year-2019 and 11 locations in the year 2020. PM_{10} values in the year 2020 were in increasing trend at 08 locations and decreasing trend at 26 monitoring locations in comparison to the year, 2019. The concentration of PM_{10} for the year 2019 was in the range of 77 to 266 µg/m^3 and for the year 2020 it was 48 to 171µg/m^3.

Fine Particulate Matter ($PM_{2.5}$) values remained above the limit i.e., 60µg/m^3 at 19 locations out of 29 locations in the year 2019 whereas in the year 2020, $PM_{2.5}$ values remained below the limit at 22 locations out of 28 locations. In the year 2020 $PM_{2.5}$ values were observed to be in increasing trend at 04 locations and decreasing trend at 25 monitoring locations during the year 2019. The range of $PM_{2.5}$ for the year 2019 was from 34 to 164 µg/m^3 whereas for the year 2020 it was from 22 to 99 µg/m^3. Comparative figures for the year 2019 & 2020 are shown in table no-8.5.

Ambient Noise level During Deepawali Festival

On comparison of ambient noise data for the year 2019 & 2020, it was observed that during Deepawali-2020, the noise level at 52 locations were in decreasing trend in day time and at 46 locations in night time compared to the result of Deepawali Day of year 2019. The range of Noise level in day time for the year 2019 was from 57.4 to 87.5 Leq dB(A) and for the year 2020, it was from 45.5 to 76.1. Similarly, in night time the noise level in the year 2019 varied from 51.8 to 84.1 and for 2020 it was in the range of 40.5 to 72.9 Leq dB(A). The results of noise level observed in 2019 & 2020 are presented in Table- 8.6.

Table-8.5 Ambient Air Quality of Deepawali festival during the year 2019 & 2020 in Odisha

Sl. No	Towns/ cities	Monitoring Locations	Parameter Monitored				Parameter Monitored			
			SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$
			Values are expressed in microgram per cubic meter							
			2019				2020			
1	Angul	1. RO, SPCB Office Building	19.1	31.2	189	84	13.2↓	29.6↓	111↓	51↓
		2. Nalco Township	15.4	34.1	222	60	12.9↓	27.4↓	111↓	36↓
2	Balasore	3.Ganeswarpur	BDL	12.0	103	62	BDL=	11.1↓	88↓	41↓
		4.Oriplast, OT Road	BDL	12.9	113	70	BDL=	11.2↓	85↓	54↓
		5.Rasalpur Industrial Estate	9.0	13.6	115	75	7.8↓	11.7↓	92↓	46↓
3	Berhampur	6.Brahmanagar	10.5	45.6	92	45	6.4↓	20.2↓	48↓	24↓
		7.Girija market square	14.2	48.5	110	55	9.5↓	30.2↓	85↓	32↓
		8.MKCG Medical College & Hospital	8.5	40.2	88	44	9.3↑	22.5↓	79↓	22↓
		9.Industrial Estate, RO office	10.2	50.2	104	65	8.1↓	23.4↓	79↓	20↓
4	Bhubaneswar	10.RO,SPCB Office Building	4.3	20.2	218	110	4.2↓	19.0↓	136↓	56↓

		11.IRC Nayapalli	4.9	22.1	234	129	BDL↓	19.5↓	99↓	NM
		12.Capital Police Station	7.1	25.0	206	37	Not Monitored			78↑
		13.Patrapada	4.3	26.0	164	34	BDL↓	18.7↓	160↓	64↑
		14.Chandrasekharpur	5.7	21.2	244	83	BDL↓	21.6↑	112↓	58↓
		15.Palasuni water works	6.9	21.2	110	40	NM	NM	NM	99↑
5	Bonaigarh	16.Govt. Hospital Bonai	12.1	19.6	177	83	15.4↑	17.6↓	117↓	46↓
6	Cuttack	17. PHD Office near Barabati Stadium	4.2	19.1	112	NM	BDL↓	19.8↑	113↑	46↓
		18. RO, SPCB Office Building Suryavihar	9.9	42.3	159	94	BDL↓	20.7↓	129↓	42↓
		19.Hotel Bishal Inn near Traffic Tower Badambadi	8.1	31.1	235	97	Not Monitored			34↓
7	Jharsuguda	20. RO, SPCB OfficeBuilding, Cox Colony, Babubagicha	30.6	44.8	167	97	16.3↓	18.2↓	116↓	72↓
8	Kalinganagar	21. DET Hostel, M/S Tata steel	4.9	25.9	179	NM	BDL↓	19.2↓	124↓	NM
9	Keonjhar	22 RO, SPCB Office Building	BDL	25.1	212	NM	BDL=	19.2↓	105↓	NM
10	Konark	23. Konark Police Station	BDL	13.8	77	NM	BDL=	13.8=	82↑	NM
11	Paradeep	24. STP Building, IFFCO,	26.2	18.1	139	NM	25.7↓	18.1=	164↑	NM
		25. PPL Guest House,	24.9	17.9	134	NM	25.2↑	18.2↑	168↑	NM
		26. PPT Staff Quarters,	26.6	19.2	139	NM	24.3↓	16.2↓	171↑	NM
12	Puri	27.Town Police Station	5.3	22.4	163	91	BDL↓	19.3↓	105↓	NM
13	Rayagada	28. RO, SPCB Office Building	11.6	21.6	112	91	7.7↓	17.8↓	93↓	67↓
		29.LPS High School	9.4	20.5	83	61	7.0↓	17.1↓	87↑	56↓
14	Rajgangpur	30.DISIR Rajgangpur	18.0	22.1	132	93	17.0↓	18.4↓	124↓	45↓
15	Rourkela	31. RO, SPCB Office Building	15.9	21.9	178	88	16.4↑	18.4↓	107↓	47↓
		32.IDL Police Outpost	10.3	16.3	160	93	16.2↑	18.1↑	108↓	47↓
		33.IDC Kalunga	15.4	24.8	124	45	16.4↑	18.4↓	167↑	58↑
		34. Kuarmunda Hospital,	13.6	21.9	199	93	18.0↑	19.7↓	137↓	52↓
16	Sambalpur	35.Modipara	35.6	46.2	266	164	9.3↓	33.8↓	108↓	68↓
17	Talcher	36.Talcher Thermal	13.9	31.9	116	53	13.1↓	30.6↓	125↑	51↓
		37. MCL area, Talcher	13.7	35.0	130	51	12.4↓	29.2↓	120↓	48↓
N.B-BDL-Below Detection Limit,BDL value for SO_2 ≤4 µg/m³, NM-Not Monitored										
↑: Indicates the value is higher.			↓: Indicates the value is lower.				(=):Dataremained same.			

Table-8.6

Noise level in dB(A) Leq at different location of OdishaOn the day of Deepawali during the year 2019 & 2020

Sl.No	Towns/Cities	Monitoring Locations	On the day of Deepawali, 2019		On the day of Deepawali,2020	
			D	N	D	N
1	Angul	1.Amalapada(R)	70.5	60.3	63.5↓	42.6↓
		2.Bazar chhak(C)	75.6	67.3	62.2↓	40.5↓
		3.District Head Quarter Hospital(S)	67.3	55.2	70.0↑	52.3↓
		4.Hakimpada(I)	67.4	59.3	64.8↓	54.7↓
2	Balasore	5.Sahadevikhunta(R)	77.0	58.5	64.2↓	49.2↓
		6.Motiganj Bazar(C)	87.5	75.6	76.1↓	67.2↓
		7.District Head Quarter Hospital(S)	66.9	61.0	57.8↓	50.0↓
		8.Balasore Industrial Estate(I)	73.3	66.4	63.8↓	54.8↓
3	Berhampur	9.Brahmanagar(R)	72.9	61.8	63.8↓	44.9↓
		10.Girija market square(C)	76.4	71.1	75.5↓	65.7↓
		11.MKCG Medical & Hospital(S)	67.7	59.1	55.9↓	53.2↓
		12.Ankuli(I)	67.7	60.6	60.5↓	52.7↓
4	Bhubaneswar	13.Nayapalli(R)	67.3	60.5	65.5↓	58.0↓
		14.Sahidnagar(C)	70.2	61.1	67.6↓	59.0↓
		15.Capital Hospital(S)	64.2	59.2	56.5↓	46.8↓
		16.Rasulgarh(I)	69.1	61.3	68.0↓	58.2↓

5	Cuttack	17.Suryavihar(R)	73.8	70.6	67.3↓	70.3↓
		18.Badambadi(C)	75.8	77.0	70.7↓	68.2↓
		19.SCB Medical College(S)	68.8	67.2	63.5↓	66.5↓
		20.Khapuria(I)	75.2	75.2	65.9↓	59.3↓
6	Jharsuguda	21.Cox colony(R)	77.6	83.2	67.2↓	57.4↓
		22.Jhanda Chowk(C)	73.1	84.1	71.1↓	71.8↓
		23.covid Hospital(S)	75.1	80.8	65.1↓	64.9↓
		24.Bombay Chowk(I)	74.5	80.0	64.3↓	64.7↓
7	Kalinganagar	25.Sapagadia(R)	83.3	83.1	63.4↓	58.7↓
		26.Gopabandhu Chowk(C)	83.9	76.7	75.3↓	60.9↓
		27.CHC Hospital(S)	73.8	79.4	66.5↓	63.5↓
		28.Kalinga nagar industrial estate (I)	76.9	74.9	70.4↓	60.1↓
8	Keonjhar	29.Baniapat Chowk(R)	76.0	69.8	73.1↓	74.2↑
		30.Punjabi Chowk(C)	79.8	76.0	71.5↓	60.4↓
		31.Govt.Hospital(S)	71.5	63.8	73.4↓	67.6↑
9	Konark	32.Madhipur(R)	60.0	56.6	56.1↓	46.1↓
		33.NAC Market(C)	68.8	56.7	60.6↓	56.4↓
		34.Public Health Centre(S)	57.4	51.8	45.5↓	42.9↓
10	Paradeep	35.Madhuban(R)	71.2	67.0	54.0↓	59.0↓
		36.Badapadia Market(C)	74.8	68.8	65.7↓	58.9↓
		37.Bijumemorial Hospital(S)	71.5	63.5	63.8↓	54.3↓
		38.IFFCO Ltd(I)	76.4	70.2	64.7↓	61.6↓
11	Puri	39.Kumartisahi, Old Sadar lane(R)	77.3	68.3	63.6↓	55.7↓
		40.Near Sri Mandir(C)	82.0	75.7	75.3↓	63.8↓
		41.District Head Quarter Hospital(S)	73.9	65.9	61.7↓	53.9↓
12	Rayagada	42.Indiranagar(R)	83.5	63.7	68.3↓	65.9↑
		43.Main market(C)	76.9	61.3	72.1↓	61.8↑
		44.District Head Quarter Hospital(S)	77.1	75.9	63.7↓	61.4↓
		45.Jesco(I)	79.5	66.8	70.2↓	71.4↑
13	Rourkela	46.Sector-6(R)	70.1	56.6	67.3↓	57.4↑
		47.Ambagaan(C)	73.3	60.5	61.9↓	66.7↑
		48.IGH steel Township(S)	60.7	63.7	55.9↓	52.4↓
		49.RSPL Sail(I)	67.3	69.3	60.7↓	59.8↓
14	Sambalpur	50.Ainthapali(R)	71.0	65.4	64.9↓	59.9↓
		51.Golebazar(C)	79.9	82.6	73.5↓	72.9↓
		52.District Head Quarter Hospital(S)	67.3	72.8	58.9↓	58.7↓
		53.Bareipali(I)	75.1	72.8	66.8↓	55.5↓

↑: Indicates the value is higher . ↓: Indicates the value is lower.

Comparison of Continuous Ambient Air Quality monitoring results on the eve of Deepawali for the year-2019 and 2020

Continuous ambient air quality monitoring has been carried out at two locations in Bhubaneswar i.e., at (i) SPCB Office building, Unit-8 & (ii) Central laboratory, Patia, Bhubaneswar to assess the impact of pre, during and 'post Deepawali' on ambient air quality with respect to parameters like PM_{10}, $PM_{2.5}$, SO_2 & NO_2 and Heavy metals like, Pb, Ni & As in PM_{10} &, Al, Ba & Fe. The monitoring results of the year 2020 are compared with the results of 2019 which are reflected in Table-8.7 to 8.12 & Graph-1, 2, 3 & 4.

From the Tables it was observed that the gaseous pollutants like SO_2 & NO_2 in both the years were for below the prescribed limit i.e.,80µg/m^3. The concentration of SO_2, NO_2, PM_{10}, $PM_{2.5}$ and heavy metals (Pb, Ni, As, Al, Ba & Fe) was less during 2020 as compared to the results of 2019.

SO_2:- The range of SO_2 varied from BDL to 4.3 µg/m^3 in the year 2019 whereas in 2020, it was from BDL to 4.2 µg/m^3 at SPCB Office Building, Unit-8. At Central Laboratory, Patia the range of SO_2 was from BDL to 5.7 µg/m^3 in 2019 and was BDL in 2020.

NO_2:- The range of NO_2 was 13.4 to 21.2 µg/m^3 for the year 2019 where as for the year 2020 it was from 14.3 to 19.0 µg/m^3 at SPCB Office Building, Unit-8. At Central Laboratory Patia the concentration range of NO_2 varied from 14.0 to 21.2 µg/m^3 for the year 2019 and from 13.9 to 21.6 µg/m^3 for the year 2020.

PM_{10} The range of PM_{10} was from 50 to 218µg/m^3 for the year 2019 where as for the year 2020, it was from 62 to 136 µg/m^3 at SPCB Office Building, Unit-8. At Central Laboratory, Patia the concentration was in the range of 46 to 244 µg/m^3 for the year 2019 and 78 to 112 µg/m^3 for the year 2020.

Pb:- The range of Pb in PM_{10} filter paper was BDL to 0.712 µg/m^3 at SPCB Office Building,Unit-8 for the year 2019 and for the year 2020 it was from BDL to 0.037 µg/m^3. At Central Laboratory, Patia Pb in PM_{10} was from BDL to 0.082 µg/m^3 for the year 2019 and BDL to 0.044 µg/m^3 for the year 2020.

Ni:- The range of Ni in PM_{10} filter paper was BDL to 21.6 ng/m^3 at SPCB Office Building, Unit-8 for the year 2019 and for the year 2020 it was from 0.5 to 8.4 ng/m^3. At Central Laboratory, Patia the concentration range was BDL to 18.5 ng/m^3 for the year 2019 and 6.7 to 11.8 ng/m^3 for the year, 2020.

As:- The range of As in PM_{10} filter paper was 4.0 to 5.8 ng/m^3 at SPCB Office Building, for the year 2020. At Central Laboratory, Patia the concentration range was from 3.2 to 5.1 ng/m^3 for the year, 2020.

$PM_{2.5}$:- The range of $PM_{2.5}$ was 16 to 110µg/m^3 for the year 2019 where as for the year 2020 it was 26 to 56 µg/m^3 at SPCB Office Building, Unit-8. At Central Laboratory, Patia the concentration range was from 13 to 83 µg/m^3 for the year 2019 and 29 to 58 µg/m^3 for the year, 2020.

Fe:- The range of Fe in $PM_{2.5}$ filter paper was 0.15 to 3.48 µg/m^3 at SPCB Office Building, Unit-8 for the year 2019 where as for the year 2020 it was from 0.136 to 1.065 µg/m^3.At Central Laboratory, Patia the concentration range was from 0.035 to 0.250 µg/m^3 for the year 2019 and 0.142 to 0.945 µg/m^3 for the year 2020.

Al:- The range of Al in $PM_{2.5}$ filter paper was 0.305 to 1.013 µg/m^3 at SPCB Office Building, Unit-8 for the year 2020. At Central Laboratory, Patia the concentration range was from 0.206 to 2.892 µg/m^3 for the year 2020.

Ba:- The range of Ba in $PM_{2.5}$ filter paper was 0.054 to 0.395 µg/m^3 at SPCB Office Building, Unit-8 for the year 2020. At Central Laboratory, Patia the concentration range was from 0.021 to 0.176 µg/m^3 for the year 2020.

Due to problem in ICP-MS (Inductive Couple Plasma Mass Spectroscope) the heavy metals like (As in PM_{10}) and (Al & Ba in $PM_{2.5}$) were not analysed in the year 2019. So the heavy metals (As, Al & Ba) data for the year 2020 could not be compared with the year 2019.

Conclusion- Ambient Noise level on the eve of Dussehra and Ambient Noise as well as ambient air quality results on the eve of Deepawali for the year 2020 have been compared with those of year 2019. From the results, it was observed that both noise and air quality for the year 2020 were low at most of the locations as compared to the year 2019 especially for the parameters like PM_{10} & $PM_{2.5}$. The reason for decrease in air pollution on the eve of Deepawali in 2020 is due to prohibition by Govt. of Odisha on sale and use of fire crackers on eve of Deepawali from 10th November to 30th November 2020 and due to restriction on COVID pandemic.

Comparison of Ambient Air Monitoring (Continuous monitoring) Data of Bhubaneswar city during Deepawali Festival 2020 and 2019

Table-8.7

1.Name of the Monitoring Station:-Office Building Unit-8, Bhubaneswar

Sl.No.	Date of Monitoring	2020				Date of Monitoring	2019			
		SO_2	NO_2	PM_{10}	$PM_{2.5}$		SO_2	NO_2	PM_{10}	$PM_{2.5}$
		(values expressed in Microgram per cubic meter)					(values expressed in Microgram per cubic meter)			
1.	07.11.2020	BDL	15.9	86	NM	20.10.2019	BDL	13.4	54	18
2.	08.11.2020	BDL	14.3	104	40	**21.10.2019**	BDL	18.5	86	29
3.	**09.11.2020**	BDL	17.0	80	46	22.10.2019	BDL	18.8	50	16
4.	10.11.2020	BDL	16.6	82	30	23.10.2019	BDL	16.2	63	19
5.	11.11.2020	BDL	16.1	79	26	24.10.2019	Not Monitored			
6.	12.11.2020	BDL	14.6	95	48	25.10.2019	BDL	18.5	89	26
7.	13.11.2020	BDL	16.9	129	38	26.10.2019	BDL	19.5	102	29
8.	**14.11.2020**	4.2	19.0	136	56	**27.10.2019**	4.3	20.2	218	110
9.	15.11.2020	BDL	15.9	93	40	28.10.2019	BDL	20.3	159	40
10.	16.11.2020	BDL	15.7	108	50	29.10.2019	BDL	21.2	104	31
11.	17.11.2020	BDL	15.1	80	35	30.10.2019	BDL	16.2	109	35
12.	18.11.2020	BDL	16.4	86	39	31.10.2019	BDL	15.6	134	39
13.	19.11.2020	BDL	15.2	62	41	01.11.2019	BDL	16.3	142	42
14.	20.11.2020	BDL	15.8	71	38	02.11.2019	BDL	16.3	108	34
15.	21.11.2020	BDL	16.4	81	40	03.11.2019	BDL	16.1	101	30

Table-8.8

1.Name of the Monitoring Station:-Office Building Unit-8, Bhubaneswar

Sl.No.	Date of Monitoring	2020			Date of Monitoring	2019		
		Metals in PM_{10}				Metals in PM_{10}		
		Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)		Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)
1.	07.11.2020	0.008	7.7	5.0	20.10.2019	BDL	BDL	NM
2.	08.11.2020	0.006	8.3	4.7	**21.10.2019**	BDL	BDL	NM
3.	**09.11.2020**	BDL	7.0	4.9	22.10.2019	BDL	9.5	NM
4.	10.11.2020	BDL	8.4	4.8	23.10.2019	BDL	4.1	NM
5.	11.11.2020	BDL	8.1	4.7	24.10.2019	Not Monitored		
6.	12.11.2020	0.024	7.2	5.2	25.10.2019	BDL	4.4	NM
7.	13.11.2020	0.022	7.5	4.3	26.10.2019	0.006	21.6	NM
8.	**14.11.2020**	0.025	7.4	5.4	**27.10.2019**	0.712	19.4	NM
9.	15.11.2020	0.022	6.0	4.0	28.10.2019	0.044	21.1	NM
10.	16.11.2020	0.025	6.4	5.5	29.10.2019	0.034	12.5	NM
11.	17.11.2020	0.032	4.1	4.2	30.10.2019	0.026	BDL	NM
12.	18.11.2020	0.021	0.5	4.0	31.10.2019	0.019	BDL	NM
13.	19.11.2020	0.037	6.4	5.8	01.11.2019	0.170	BDL	NM
14.	20.11.2020	0.026	6.4	5.4	02.11.2019	0.012	BDL	NM
15.	21.11.2020	0.033	6.6	4.9	03.11.2019	0.011	BDL	NM

Table-8.9

1.Name of the Monitoring Station:-Office Building Unit-8, Bhubaneswar

Sl.No.	Date of Monitoring	2020			Date of Monitoring	2019		
		Metals in $PM_{2.5}$				Metals in $PM_{2.5}$		
		Al ($\mu g/m^3$)	Fe ($\mu g/m^3$)	Ba ($\mu g/m^3$)		Al ($\mu g/m^3$)	Fe ($\mu g/m^3$)	Ba ($\mu g/m^3$)
1.	07.11.2020	Not Monitored			20.10.2019	NA	ND	NA
2.	08.11.2020	0.574	0.445	0.079	**21.10.2019**	NA	0.97	NA
3.	**09.11.2020**	0.326	0.685	0.072	22.10.2019	NA	2.00	NA

4.	10.11.2020	0.328	0.136	0.054	23.10.2019	NA	2.17	NA
5.	11.11.2020	0.552	0.197	0.092	24.10.2019	Not Monitored		
6.	12.11.2020	0.806	0.769	0.239	25.10.2019	NA	1.24	NA
7.	13.11.2020	0.305	0.249	0.395	26.10.2019	NA	1.63	NA
8.	**14.11.2020**	1.013	1.065	0.113	**27.10.2019**	NA	3.48	NA
9.	15.11.2020	0.607	0.419	0.089	28.10.2019	NA	1.26	NA
10.	16.11.2020	0.827	0.452	0.135	29.10.2019	NA	1.23	NA
11.	17.11.2020	0.630	0.297	0.099	30.10.2019	NA	1.89	NA
12.	18.11.2020	0.511	0.198	0.077	31.10.2019	NA	0.15	NA
13.	19.11.2020	0.557	0.872	0.352	01.11.2019	NA	ND	NA
14.	20.11.2020	0.567	0.260	0.206	02.11.2019	NA	0.53	NA
15.	21.11.2020	0.561	0.406	0.079	03.11.2019	NA	0.63	NA

Table-8.10

2,Name of the Monitoring Station:-Central Laboratory, Patia, Bhubaneswar

Sl.No.	Date of Monitoring	2020				Date of Monitoring	2019			
		SO_2	NO_2	PM_{10}	$PM_{2.5}$		SO_2	NO_2	PM_{10}	$PM_{2.5}$
		(values expressed in Microgram per cubic meter)					(values expressed in Microgram per cubic meter)			
1.	07.11.2020	BDL	17.7	106	33	20.10.2019	BDL	14.8	93	25
2.	08.11.2020	BDL	17.7	114	46	**21.10.2019**	BDL	14.0	97	29
3.	**09.11.2020**	BDL	15.0	107	31	22.10.2019	BDL	15.4	81	29
4.	10.11.2020	BDL	15.6	105	49	23.10.2019	BDL	15.7	46	13
5.	11.11.2020	BDL	16.4	98	29	24.10.2019				
6.	12.11.2020	BDL	15.8	107	48	25.10.2019	BDL	15.7	54	27
7.	13.11.2020	BDL	13.9	102	45	26.10.2019	BDL	14.9	73	24
8.	**14.11.2020**	BDL	21.6	112	58	**27.10.2019**	5.7	21.2	244	83
9.	15.11.2020	BDL	14.9	104	47	28.10.2019	BDL	19.6	87	22
10.	16.11.2020	BDL	14.9	91	41	29.10.2019	BDL	16.4	74	24
11.	17.11.2020	BDL	16.7	100	43	30.10.2019	BDL	17.0	87	29
12.	18.11.2020	BDL	17.6	93	41	31.10.2019	BDL	14.1	92	31
13.	19.11.2020	BDL	16.1	78	38	01.11.2019	BDL	14.7	88	27
14.	20.11.2020	BDL	17.0	98	42	02.11.2019	BDL	16.4	78	24
15.	21.11.2020	BDL	16.8	88	39	03.11.2019	BDL	15.2	87	27

Table-8.11

2,Name of the Monitoring Station:-Central Laboratory, Patia, Bhubaneswar

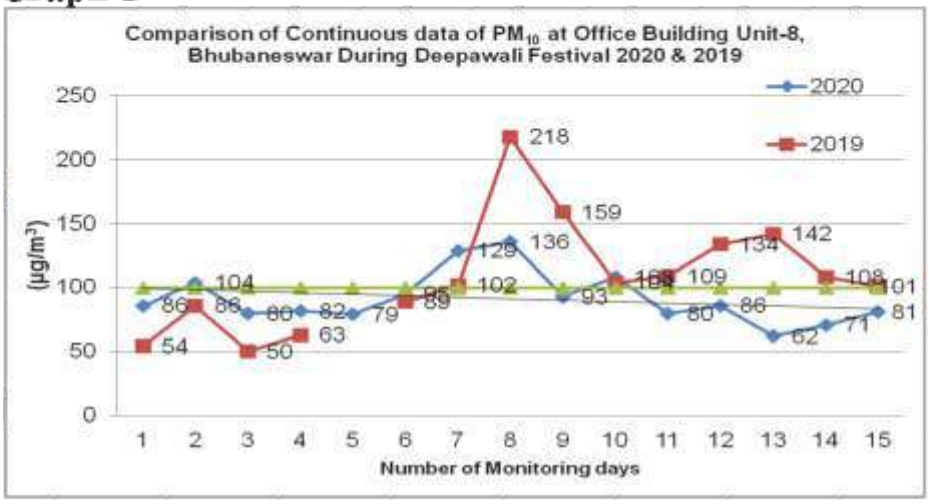
Sl.No.	Date of Monitoring	2020			Date of Monitoring	2019		
		Metals in PM_{10}				Metals in PM_{10}		
		Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)		Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)
1.	07.11.2020	BDL	9.6	4.7	20.10.2019	0.014	BDL	NA
2.	08.11.2020	0.032	9.5	4.9	**21.10.2019**	BDL	BDL	NA
3.	**09.11.2020**	0.003	11.0	4.9	22.10.2019	0.015	BDL	NA
4.	10.11.2020	BDL	9.6	4.2	23.10.2019	0.013	BDL	NA
5.	11.11.2020	BDL	8.5	4.5	24.10.2019	Not Monitored		
6.	12.11.2020	0.020	9.9	5.1	25.10.2019	BDL	BDL	NA
7.	13.11.2020	0.032	11.8	4.9	26.10.2019	0.022	5.2	NA
8.	**14.11.2020**	0.044	8.0	4.3	**27.10.2019**	0.082	18.5	NA
9.	15.11.2020	0.040	8.5	4.7	28.10.2019	0.013	12.3	NA
10.	16.11.2020	BDL	7.9	4.4	29.10.2019	0.021	4.2	NA
11.	17.11.2020	BDL	8.7	4.7	30.10.2019	0.070	7.4	NA
12.	18.11.2020	BDL	6.7	3.2	31.10.2019	0.033	3.6	NA
13.	19.11.2020	0.013	9.5	4.0	01.11.2019	0.025	BDL	NA
14.	20.11.2020	0.006	7.9	4.1	02.11.2019	0.026	BDL	NA
15.	21.11.2020	BDL	7.9	4.8	03.11.2019	0.022	BDL	NA

Table-8.12

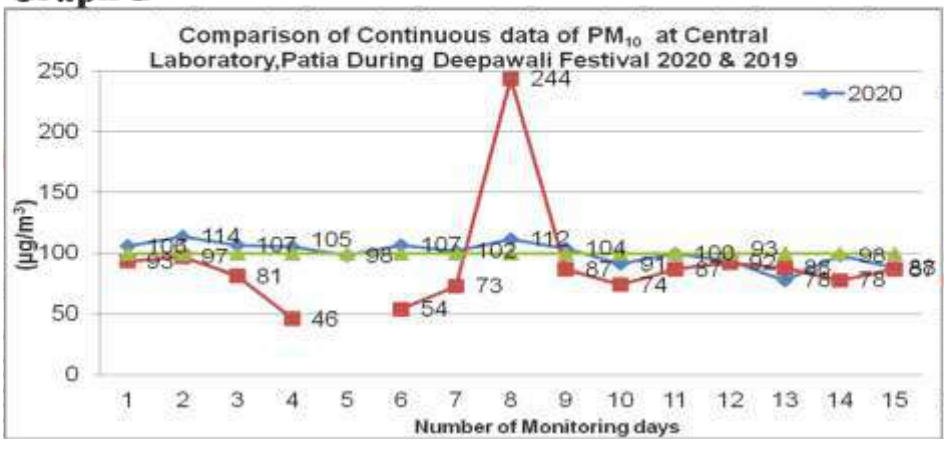
2.Name of the Monitoring Station:-Central Laboratory, Patia, Bhubaneswar								
Sl.No.	Date of Monitoring	2020 Metals in $PM_{2.5}$			Date of Monitoring	2019 Metals in $PM_{2.5}$		
		Al ($\mu g/m^3$)	Fe ($\mu g/m^3$)	Ba ($\mu g/m^3$)		Al ($\mu g/m^3$)	Fe ($\mu g/m^3$)	Ba ($\mu g/m^3$)
1.	07.11.2020	0.471	0.513	0.176	20.10.2019	NA	0.099	NA
2.	08.11.2020	0.933	0.461	0.119	**21.10.2019**	NA	0.066	NA
3.	**09.11.2020**	0.793	0.142	0.052	22.10.2019	NA	0.037	NA
4.	10.11.2020	0.471	0.149	0.122	23.10.2019	NA	0.116	NA
5.	11.11.2020	0.426	0.396	0.079	24.10.2019	Not Monitored		
6.	12.11.2020	0.662	0.181	0.089	25.10.2019	NA	0.065	NA
7.	13.11.2020	0.376	0.318	0.133	26.10.2019	NA	0.035	NA
8.	**14.11.2020**	2.892	0.330	0.157	**27.10.2019**	NA	0.250	NA
9.	15.11.2020	0.815	0.880	0.109	28.10.2019	NA	0.053	NA
10.	16.11.2020	0.788	0.201	0.077	29.10.2019	NA	0.068	NA
11.	17.11.2020	0.784	0.444	0.058	30.10.2019	NA	0.130	NA
12.	18.11.2020	0.352	0.945	0.121	31.10.2019	NA	ND	NA
13.	19.11.2020	0.206	0.733	0.021	01.11.2019	NA	ND	NA
14.	20.11.2020	0.786	0.205	0.087	02.11.2019	NA	ND	NA
15.	21.11.2020	1.233	0.342	0.160	03.11.2019	NA	0.097	NA

N.B:-BDL- Below Detectable Limit,BDL Value for $SO_2 \leq 4$ $\mu g/m^3$,Pb ≤ 0.0022 $\mu g/m^3$,
NA-Not Analysed

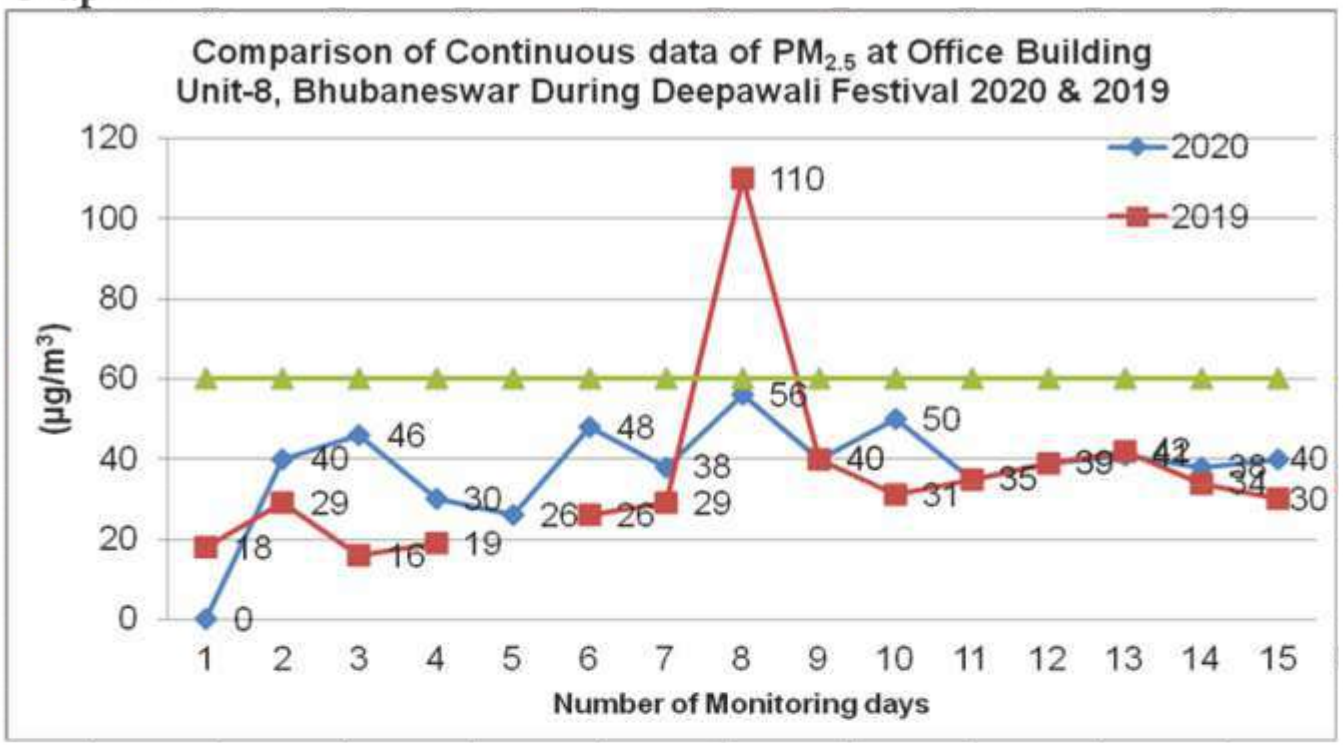
Graph-1



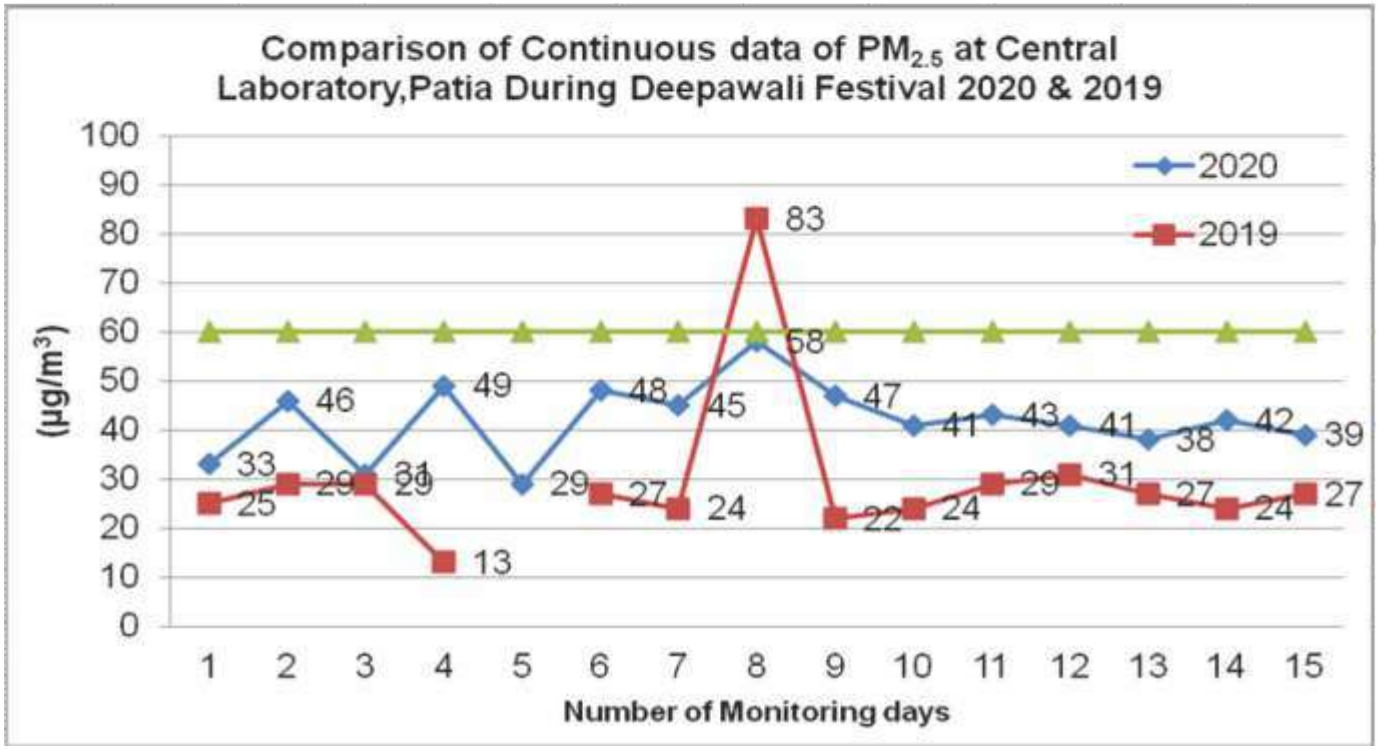
Graph-2



Graph-3



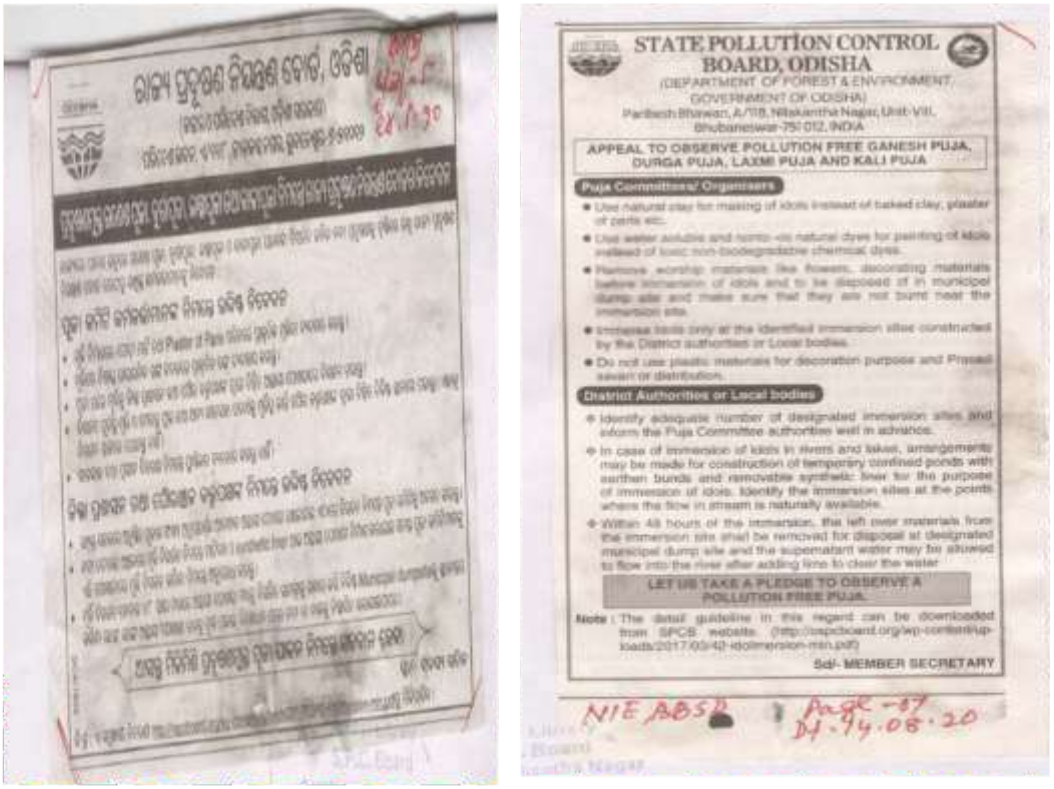
Graph-4



8.4.2 Impact of Immersion of Idols in Water Bodies

Durga Puja is celebrated in massive scale in most of the cities of the State of Odisha. Generally the idols are immersed on a single day at the designated sites of the rivers flowing along the cities in confirmty to the Guidelines of CPCB. To minimize the impact of idol immersion on the water quality, the State Pollution Control Board, Odisha has taken following steps as recommended in the Guideline for idol immersion.

- Asked all the District Collectors and authorities of urban local bodies of the State prior to Ganesh Puja and Durga Puja to implement the Guidelines of Immersion in their areas of jurisdiction.
- Created public awareness through Public Notices on safe Idol immersion practices in Local Newspapers, Board's website and through public address system.
- Conducted several meetings with the local bodies/ authorities, Puja Committee Organizers to create awareness on ill impacts of Idol immersion in water bodies and Guidelines.
- Coordinated with the local bodies/ authorities for construction of temporary immersion ponds near rivers as prescribed in the Guidelines.



STATE POLLUTION CONTROL BOARD, ODISHA
(DEPARTMENT OF FOREST & ENVIRONMENT, GOVERNMENT OF ODISHA)
Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751 012, INDIA

APPEAL TO OBSERVE POLLUTION FREE GANESH PUJA, DURGA PUJA, LAXMI PUJA AND KALI PUJA

Puja Committees/ Organizers

- Use natural clay for making of idols instead of baked clay, plaster of paris etc.
- Use water soluble and herbo-eco natural dyes for painting of idols instead of toxic non-biodegradable chemical dyes.
- Remove worship materials like flowers, decorating materials before immersion of idols and to be disposed of in municipal dump site and make sure that they are not burnt near the immersion site.
- Immerse idols only at the identified immersion sites constructed by the District authorities or Local bodies.
- Do not use plastic materials for decoration purpose and Prasad sawan or distribution.

District Authorities or Local bodies

- Identify adequate number of designated immersion sites and inform the Puja Committee authorities well in advance.
- In case of immersion of idols in rivers and lakes, arrangements may be made for construction of temporary confined ponds with earthen bunds and removable synthetic liner for the purpose of immersion of idols. Identify the immersion sites at the points where the flow in stream is naturally available.
- Within 48 hours of the immersion, the left over materials from the immersion site shall be removed for disposal at designated municipal dump site and the supernatant water may be allowed to flow into the river after adding lime to clear the water.

LET US TAKE A PLEDGE TO OBSERVE A POLLUTION FREE PUJA.

Note : The detail guideline in this regard can be downloaded from SPCB website. (http://ospcboard.org/wp-content/uploads/2017/03/42-idolimersion-min.pdf)

Sd/- MEMBER SECRETARY

NIE ABSP Page-87 04.14.08.20

Public awareness through print media to observe pollution free Ganesh puja, Durga Puja, Laxmi Puja and Kali Puja

- Generally idols are immersed in flowing waters for which rivers are ideal places. As per the Guideline, temporary ponds having earthen bunds along the river bank are constructed or a part of the river bed is cordoned to demarcate it as idol immersion site. The bottom of the pond in either cases are lined with removable synthetic liner well in advance of the idol immersion. The said liner and the remnants of the idols are removed within 48 hours of idol immersion by the local bodies and disposed in the municipal dumpsites. The water of the temporary ponds is then treated with lime and allowed to settle before the treated water is ultimately discharged into rivers.
- In some urban local bodies, though temporary immersion ponds were not constructed specifically for idol immersion purposes, the remnants of idol immersion were removed by the local people within 48 hours of idol immersion and disposed at the municipal dumpsites.
- Water quality assessment of Kuakhai River and Daya River along Bhubanewar city, Kathajodi river along Cuttack city and Mangala river along Puri city was conducted.
- Water quality status was assessed with respect to the physico-chemical parameters as recommended in the Guideline, such as, pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Conductivity (EC), Turbidity, Total Dissolved Solids (TDS), Total Solids (TS), and metals (cadmium, chromium, iron, lead, zinc and copper.
- Water quality status is evaluated by comparing with the tolerance limits for Class A (Drinking water source without conventional treatment but after disinfection) and Class C (Drinking water source with conventional treatment followed by disinfection) Inland surface water quality prescribed by CPCB. The variation in concentration of different parameters at the immersion sites were compared with the values at the upstream and downstream of immersion sites to assess the impact of idol immersion.

Observation from the water quality data

- pH of river water during the study period remained well within the tolerance limit of 6.5-8.5.
- Dissolved Oxygen content always remained above 4.0 mg/L which conformed Class C river quality.
- There was no significant change in total solid and total dissolved solid contents in river water quality in 'Pre' 'During' and 'Post-phases' of monitoring.
- BOD values also remained within the tolerance limit of 3.0 mg/L specified for Class C river. However, the BOD concentration in Kuakhai river at the downstream station of idol immersion pond during-immersion period exceeded the tolerance limit. But this was significantly reduced below the tolerance limit in Post-immersion monitoring.

- Dumping of puja materials and remnats into the rivers, disrupts the oxygen level of water body and therefore increase of BOD and COD values at the downstream of immersion site during - immersion monitoring were observed. By the time of post-immersion monitoring, the river water got rejuvenated itself due to continuous flow of water, which was indicated by decreased BOD values and other parameters in the rivers.
- Concentration of cadmium at all locations during the period of study remained below detection limit i.e. 0.02 mg/L. However, cadmium concentration in Kathajodi river at the downstream of idol immersion pond during-immersion period exceeded the tolerance limit. But this was reduced to below detection limit in post-immersion monitoring.
- Concentration of lead, copper and hexavalent chromium remained below the respective detection limits such as 0.1 mg/L, 0.03 mg/L and 0.05 mg/L.
- Because of the preventive measures taken by the district administration not to allow the water of idol immersion ponds to flow into the river, water quality of downstream stations during-immersion and Post-immersion periods mostly remained within the tolerance limits of the designated class use.
- From the study, it was be concluded that all the parameters specified for the study remained within the tolerance limit for designated class of the river i.e. Class-C (Drinking water source with conventional treatment followed by disinfection) even after immersion of idols except few cases. Concentration of heavy metals such as cadmium, chromium, lead, zinc and copper remained below the tolerance limits and there was no significant impact of heavy metal on water bodies due to immersion of idols. Further, immersion of idols in the temporary immersion ponds minimized the probability of contamination of the main course of river water.

Temporary arrangement for Idol immersion

Immersion of Idols in temporary Idol immersion ponds

Remnants of immersed materials in Idol immersion ponds

Transport of immersed materials to municipal solid waste disposal site

8.4.3 Impact of mass bathing during Kartika Purnima on Water quality of Mahanadi and Kathajodi river (Cuttack Stretch)

In view of prevailing COVID19 pandemic in 2020, Odisha Government had imposed restriction on mass gathering in public places and also banned congregation at river ghats and other water bodies for mass bathing and traditional celebration of Kartika Purnima i.e. on Dt. 30.11.2020. Therefore, Kartika Purnima 2020 was redused to a symbolic celebration. However, water quality of river Mahanadi and Kathajodi along the Cuttack city was monitored by the Board at the major bathing ghats on Pre- (27.11.2020), During- (30.11.2020) and Post-(10.12.2020) Kartika Purnima period. Water quality was assessed with respect to the physico-chemical parameters like pH, Dissolved oxygen (DO), Biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS) and bacteriological parameters e.g. total coliform (TC) and fecal coliform (FC).

Comparison of the water quality data with the bathing water quality standard prescribed under IS: 2296 (1982) and organized bathing water quality standard laid down by MOEF & CC (MoEF Notification G.S.R. No. 742(E) Dt. 25th September, 2000), it was revealed that, pH remained within the permissible range 6.5-8.5 at all the monitored locations. Dissolved oxygen remained well above the permissible limit of 5.0 mg/L on all occasions. BOD at all monitored places remained within the prescribed limit of 3.0 mg/L. There was no significant variation in the bacteriological quality with respect to total coliform and fecal coliform at the bathing ghats of Mahanadi river and Kathajodi rivers on the days of monitoring. Water quality data with respect to BOD, TC and FC in Pre-, During- and post-Kartika Purnima period is presented in Table-8.13.

Table-8.13 Water quality with respect to BOD, TC and FC at the bathing ghats of Mahanadi river and Kathajodi rivers on Pre-, During- and Post-Kartika Purnima -2020

Sl. No.	Location	BOD (mg/L)			TC (MPN/100ML)			FC (MPN/100ML)		
		Pre (27.11.2020)	During (30.11.2020)	Post (10.12.2020)	Pre (27.11.2020)	During (30.11.2020)	Post (10.12.2020)	Pre (27.11.2020)	During (30.11.2020)	Post (10.12.2020)
Mahanadi River										
1	Mundali	<1.0	<1.0	<1.0	1700	2400	4900	1300	790	2200
2.	Chahata Ghat	1.2	2.8	<1.0	160000	92000	22000	92000	4900	7900
3.	Gadagadia Ghat	<1.0	<1.0	<1.0	54000	22000	35000	7000	1300	7900
4.	Zobra	<1.0	<1.0	1.2	17000	22000	54000	7900	11000	13000
5.	Kanheipur	1.0	<1.0	<1.0	7900	4600	3300	4900	1700	450
Kathajodi River										
6.	Naraj	1.2	<1.0	<1.0	170	790	3300	130	170	400
7.	Puri Ghat	<1.0	<1.0	<1.0	4900	3300	7000	1700	1300	1700
8.	Khan Nagar	2.4	1.4	1.4	1300	7000	490	490	1700	170
9	Urali	1.4	1.4	1.4	17000	7000	7900	3300	2200	2200
Tolerance limit for Class B (IS-2296-1982) / E (P) Rule, 1986 *		**3.0**			**500**			**500 (Desirable)* 2500 (Permissible)***		

* MoEF Notification G.S.R. No. 742(E) Dt. 25th September, 2000

8.5 OTHER ONGOING PROJECT

Survey and Monitoring of Ground and Surface Water Quality with respect to Fluoride Content around Phosphatic Fertilizer Units, Paradeep

The Board conducted a survey on ground water and surface water quality in and around phosphatic fertilizer plants of Paradeep e.g. M/s Indian Farmers Fertiliser Corporation (IFFCO) and M/s Paradeep Phosphates Ltd. (PPL). During 2020, surface water sample were collected from Atharabanki creek at different locations adjoining to these two fertilizer plants. Ground water samples were collected from the test wells of both the plants and from three locations outside the plant. Water quality monitoring was done on quarterly basis during the months of February, May, August and November.

The fluoride concentration in Atharabanki creek at the upstream of the fertilizer plants varies 2.12- 3.40 mg/L. As the flow of Atharabanki creek is regulated by the tidal condition of the sea, it is not unidirectional, and therefore, wide fluctuation in fluoride content is observed in Atharabanki creek water. The fluoride concentration in Atharabanki creek varies within 0.832-13.8 mg/L. The fluoride concentration in creek water at Bhimbhoi colony varied within 3.07-6.80 mg/L, near entrance gate to Paradeep Port Township varied within 2.61 – 13.8 mg/L, near conveyor belt of IFFCO varied within 4.0 – 5.94 mg/L. The fluoride concentration in the creek water near fishing jetty showed a variations within 0.72-0.832 mg/L. However, the water quality near fishing Jetty was greatly influenced by sea water.

Fluoride concentration in the surface run-off drain near Gypsum pond of M/s PPL near Shyamakoti bridge varied within 2.13-4.4 mg/L, whereas, the same in the surface run-off drain near Loknath colony varied within 0.471-0.780 mg/L.

The test wells around M/s IFFCO exhibited fluoride concentration within 0.02-1.37 mg/L, whereas, those around M/s PPL, it was within 0.337-5.51 mg/L.

Fluoride content in ground water samples collected from outside of plant areas i.e. at Badapadia, varied within 1.21-1.57 mg/L, whereas in Musadiha, the fluoride concentration varied within 0.345 – 0.39 mg/L and inside the Shiv temple, it was in the range of 0.83 – 1.46 mg/L. Fluoride content in gruond water monitored at public locations remained mostly within the acceptable limit of 1.5 mg/L.

8.6 LIBRARY AND INFORMATION SERVICE

Board's Central Library at Bhubaneswar acts as a document repository and referral centre for dissemination of information in the field of environmental science, engineering, legal and allied subjects. Apart from Board employees, the Library is also used by research scholars, students of different Universities and technical institutions in Orissa. The Library has a collection of Books, Reports, Audio Visual materials, Maps, Photographs, Topo sheets, River Basin Atlas and soft copies of various subjects of environmental science and

engineering during 2020-21 the library has received 19 Books, 65 Reports, 18 Journals, 11 Newspapers and 02 Magazines on environmental issues from various sources of information for reference of the users. Few outside scholars have been enrolled as library members on payment during the period. As usual of Reprograpphic Service to outside members have been provided on payment basis.

8.7 TRAINING /WORKSHOP /SEMINAR ATTENDED BY BOARD OFFICIALS

The Board has deputed its officials on various training programmes, seminars and workshops for learning and up-gradation of their knowledge and exposure to recent technological advancements in the field of pollution control and environment protection. Due to current COVID-19 pandemic situation all the trainings attended in virtual mode.

The list of officials along with name of training programmes / workshops / seminars attended during 2020-21 is given in Table - 8.14.

Table - 8.14 Training Programme attended by officials and organized / sponsored by of the Board
A. Training / Workshop / Seminar attended by officials of the Board

Sl. No.	Name (Smt./Shri) & Designation	Date	Title of the Training/Workshop/ Seminar	Conducted by	Venue
1.	Er. Simanchal Dash, SEE(L-I) Head Office	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
2.	Er. Sitikantha Sahu, SEE(L-II) Head Office	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
3.	Er. Prasanti Swain, SEE(L-II) Head Office	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
4.	Er. Santosh Kumar Panda, EE Head Office	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
5.	Dr. (Mrs.) Usha Rani Pattnaik, ES Central Laboratory	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
6.	Dr. Anup Kumar Mallick, ES Regional Officer, Angul	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
7.	Er. Dillip Kumar Dash, EE Regional Officer, Paradeep	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
8.	Er. Babita Singh, EE, Regional Office, Rourkela	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
9.	Dr. Satya Narayan Nanda, AES Regional Office, Sambalpur	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)
10.	Dr. Sharada Srinivas Pati, AES Central Laboratory	2nd to 7th November, 2020	Training course on "Making Data Meaningful"	Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062	Online (Virtual Mode)

Sl. No.	Name (Smt./Shri) & Designation	Date	Title of the Training/Workshop/ Seminar	Conducted by	Venue
11.	Dr. B. B. Dash, Regional Officer, SPC Board, Bhubaneswar	29th December, 2020	Workshop / Webinar on Revised Guidelines for Idol Immersion	Central Pollution Control Board (CPCB), New Delhi	Online (Virtual Mode)
12.	Dr. Sohan Giri, Regional Officer, Cuttack	29th December, 2020	Workshop / Webinar on Revised Guidelines for Idol Immersion	Central Pollution Control Board (CPCB), New Delhi	Online (Virtual Mode)
13.	Er. Bibechita Sarangi, DEE	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
14.	Er. Dibyalochan Mohapatra, DEE	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
15.	Er. Deepesh Kumar Biswal, AEE	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
16.	Er. Debadutta Mohanty, AEE	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
17.	Er. Biswakanta Pradhan, AEE	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
18.	Er. Soumendra Nath Mohanty, AEE	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
19.	Er. Anil Kumar Barik, AEE	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
20.	Ashok Kumar Bhoi, DES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
21.	Anusha Ekka, DES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
22.	Kanchn Bala Bihari, DES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
23.	Leeta Soren, AES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)

Sl. No.	Name (Smt./Shri) & Designation	Date	Title of the Training/Workshop/ Seminar	Conducted by	Venue
24.	Anshumala Kusum Minj, AES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
25.	Bhima Charan Marandi, AES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
26.	Rashmi Rekha Pradhan, AES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
27.	Dr. Sangeeta Mishra, AES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
28.	Sumitra Nayak, AES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
29.	Dr. Sharada Shrinivas Pati, AES	4th to 17th January, 2021	Training programme on "CEMS and CEQMS – Technology Selection, its Installation, Data Handling and its Audit Methodology"	Centre for Science and Environment, New Delhi	Online (Virtual Mode)
30.	Hadibandhu Panigrahi, Env. Scientist	18th – 20th January, 2021	Training programme on "Epidemiological Study of Human Community towards Impact of Toxic Chemicals like Arsenic, Polycyclic Aromatic Hydrocarbon (PAH)"	TERI School of Advanced Studies, Plot No.10, Institutional Area, Vasant Kunj, New Delhi-110070 & sponsored by CPCB, Delhi	Online (Virtual Mode)
31.	Mitrasen Majhi, Env. Scientist, Regional Officer, Berhampur	18th – 20th January, 2021	Training programme on "Epidemiological Study of Human Community towards Impact of Toxic Chemicals like Arsenic, Polycyclic Aromatic Hydrocarbon (PAH)"	TERI School of Advanced Studies, Plot No.10, Institutional Area, Vasant Kunj, New Delhi-110070 & sponsored by CPCB, Delhi	Online (Virtual Mode)
32.	Er. Deepak Kumar Sahoo, Dy. Env. Engineer, Regional Office, Rourkela	19th – 21st January, 2021	Training programme on "Air Pollution Control Devices & OCEMS for Various Sectors"	Engineering Staff College of India, Gachi Bowli, Old Bombay Road, Hyderabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
33.	Er. Chandra Sekhar Chauhan, Asst. Env. Engineer, Regional Office, Angul	19th – 21st January, 2021	Training programme on "Air Pollution Control Devices & OCEMS for Various Sectors"	Engineering Staff College of India, Gachi Bowli, Old Bombay Road, Hyderabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
34.	Leeta Soren, Dy. Env. Scientist	27th – 29th January, 2021	Training programme on "Detailed Insight into Management of Various Wastes like Hazardous Waste, E-Waste, Construction and Demolition Waste, Municipal Solid Waste and Biomedical Waste"	Engineering Staff College of India, Gachi Bowli, Old Bombay Road, Hyderabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
35.	Er. Biswakanta Pradhan. Asst. Env. Engineer, Regional Office, Sambalpur	27th – 29th January, 2021	Training programme on "Detailed Insight into Management of Various Wastes like Hazardous Waste, E-Waste, Construction and Demolition Waste, Municipal Solid Waste and Biomedical	Engineering Staff College of India, Gachi Bowli, Old Bombay Road, Hyderabad & sponsored by CPCB, Delhi	Online (Virtual Mode)

Sl. No.	Name (Smt./Shri) & Designation	Date	Title of the Training/Workshop/ Seminar	Conducted by	Venue
			Waste"		
36.	Bishi Keshan Nayak, Sr. Env. Scientist	28th – 30th January, 2021	Training programme on "Hazardous and Plastic Waste Inventory"	UN Environmental Programme Country Office, India 55, Lodhi Estate, New Delhi-110 003 & sponsored by CPCB, Delhi	Online (Virtual Mode)
37.	Er. Prafulla Chandra Rauta, Sr. Env. Engineer	28th – 30th January, 2021	Training programme on "Hazardous and Plastic Waste Inventory"	UN Environmental Programme Country Office, India 55, Lodhi Estate, New Delhi & sponsored by CPCB, Delhi	Online (Virtual Mode)
38.	Dr. Saswat Kumar Mohanty, Dy. Env. Scientist	3rd – 4th February, 2021	Training programme on "Advance Instrumental Analytical Techniques and Preventive Maintenance"	National Institute of Occupational Health, Poojanahalli Road, Kannamangala Post, Devanahalli, Bangalore & sponsored by CPCB, Delhi	Online (Virtual Mode)
39.	Mamata Behera, ASO, Central Laboratory	3rd – 4th February, 2021	Training programme on "Advance Instrumental Analytical Techniques and Preventive Maintenance"	National Institute of Occupational Health, Poojanahalli Road, Kannamangala Post, Devanahalli, Bangalore & sponsored by CPCB, Delhi	Online (Virtual Mode)
40.	Er. Babita Singh, Env. Engineer, Regional Office, Rourkela	5th – 6th February, 2021	Training programme on "Operating Mechanism and Performance Evaluation of CBWTF"	Shri Guru Gobind Singhji Institute of Engineering & Technology, Vishnupuri, Nanded-431 606 (Maharashtra)	Online (Virtual Mode)
41.	Er. Debabrata Sethi, Env. Engineer, Regional Office, Berhampur	5th – 6th February, 2021	Training programme on "Operating Mechanism and Performance Evaluation of CBWTF"	Shri Guru Gobind Singhji Institute of Engineering & Technology, Vishnupuri, Nanded-431606,Maharashtra	Online (Virtual Mode)
42.	Er. Simanchal Dash, Sr. Env. Engineer	8th – 12th February, 2021	Training programme on "Environmental Data Interpretation, Compilation, Analysis, Presentation and Reporting – Hands-on Training and Case Study"	Indian Statistical Institute, 7, S.J.S. Sansanwal Marg, New Delhi & sponsored by CPCB, Delhi	Online (Virtual Mode)
43.	Er. Rabi Narayan Prusty, Sr. Env. Engineer	8th – 12th February, 2021	Training programme on "Environmental Data Interpretation, Compilation, Analysis, Presentation and Reporting – Hands-on Training and Case Study"	Indian Statistical Institute, 7, S.J.S. Sansanwal Marg, New Delhi & sponsored by CPCB, Delhi	Online (Virtual Mode)
44.	Dr. Sohan Giri, Env. Scientist, Regional Officer, Cuttack	8th – 12th February, 2021	Training programme on "Environmental Legislations, Interpretation, Enforcement, Legal and Statutory Requirements – Case Studies"	National Law School of India University, Nagarbhavi, Bangalore & sponsored by CPCB, Delhi	Online (Virtual Mode)
45.	Santosh Kumar Kuanr, Law Officer	8th – 12th February, 2021	Training programme on "Environmental Legislations, Interpretation, Enforcement, Legal and Statutory Requirements – Case Studies"	National Law School of India University, Nagarbhavi, Bangalore & sponsored by CPCB, Delhi	Online (Virtual Mode)
46.	Er. Prafulla Chandra Rauta, Sr. Env. Engineer	9th – 11th February, 2021	Training programme on "Aspects of Hazardous Waste TSDF from initiation till Commissioning and issues Pertaining to Compliance Monitoring"	International Institute of Waste Management, No.6, First Floor, Sankey Road, Lower Palace Orchards, Sadashivnagar, Bengaluru & sponsored by CPCB, Delhi	Online (Virtual Mode)
47.	Er. Pramod Kumar Behera, Env. Engineer, RO, Kalinganagar	9th – 11th February, 2021	Training programme on "Aspects of Hazardous Waste TSDF from initiation till Commissioning and issues Pertaining to Compliance Monitoring"	International Institute of Waste Management, No.6, First Floor, Sankey Road, Lower Palace Orchards, Sadashivnagar, Bengaluru & sponsored by CPCB, Delhi	Online (Virtual Mode)

Sl. No.	Name (Smt./Shri) & Designation	Date	Title of the Training/Workshop/ Seminar	Conducted by	Venue
48.	Er. Sitikantha Sahu, Sr. Env. Engineer	9th – 11th February, 2021	Training programme on "Performance Evaluation of ETP/STP/CETPS"	Engineering Staff College of India, Gachi Bowli, Hyderabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
49.	Er. Santosh Kumar Panda, Env. Engineer	9th – 11th February, 2021	Training programme on "Performance Evaluation of ETP/STP/CETPS"	Engineering Staff College of India, Gachi Bowli, Hyderabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
50.	Bishi Keshan Nayak, Sr. Env. Scientist	15th – 17th February, 2021	Training programme on "Monitoring of Implementation Status of Extended Producer Responsibility under the E-Waste & Plastic Waste Management Rules"	Centre for Environmental Studies, Anna University, Chennai & sponsored by CPCB, Delhi	Online (Virtual Mode)
51.	Er. Ramesh Kumar Ekka, Dy. Env. Engineer, Regional Office, Sambalpur	15th – 17th February, 2021	Training programme on "Monitoring of Implementation Status of Extended Producer Responsibility under the E-Waste & Plastic Waste Management Rules"	Centre for Environmental Studies, Anna University, Chennai & sponsored by CPCB, Delhi	Online (Virtual Mode)
52.	Puskar Chandra Behera, Dy. Env. Scientist, Regional Officer, Keonjhar	17th – 19th February, 2021	Training programme on "Environmental Sustainability of Sugarcane Ethanol Industries"	National Sugar Institute, Kalyanpur, Kanpur-208 017 (Uttar Pradesh) & sponsored by CPCB, Delhi	Online (Virtual Mode)
53.	Er. Rakesh Kumar Mohanty, Dy. Env. Engineer, RO, Angul	17th – 19th February, 2021	Training programme on "Environmental Sustainability of Sugarcane Ethanol Industries"	National Sugar Institute, Kalyanpur, Kanpur-208 017 (Uttar Pradesh) & sponsored by CPCB, Delhi	Online (Virtual Mode)
54.	Smita Nayak, ASO, Central Lab	17th – 19th February, 2021	Training programme on "Environmental Monitoring - Sample Collection of Effluent, AAQM, Stack and Testing of Various Environmental Parameters like Air, Water and Noise in the Laboratory"	National Productivity Council, Dr. Ambedkar Institute of Productivity, 6, Aavin Dairy Road, Ambattur Industrial Estate (North), Chennai & sponsored by CPCB, Delhi	Online (Virtual Mode)
55.	Soumya Ranjan Mallick, Sr. Scientific Asst., Central Lab, Bhubaneswar	17th – 19th February, 2021	Training programme on "Environmental Monitoring - Sample Collection of Effluent, AAQM, Stack and Testing of Various Environmental Parameters like Air, Water and Noise in the Laboratory"	National Productivity Council, Dr. Ambedkar Institute of Productivity, 6, Aavin Dairy Road, Ambattur Industrial Estate (North), Chennai & sponsored by CPCB, Delhi	Online (Virtual Mode)
56.	Hemendra Nath Nayak, Env. Scientist, Regional Officer, Rourkela	17th – 19th, February, 2021	Training programme on "Occupational Health & Safety Management System (OHSMS) 45001: 2018"	National Institute of Occupational Health, P.B. No. 2031, Meghani Nagar, Ahmedabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
57.	Er. Narottam Behera, Env. Engineer, Regional Officer, Bhubaneswar	17th – 19th, February, 2021	Training programme on "Occupational Health & Safety Management System (OHSMS) 45001: 2018"	National Institute of Occupational Health, P.B. No. 2031, Meghani Nagar, Ahmedabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
58.	Prasant Kumar Kar, Regional Officer, Rayagada	24th – 26th February, 2021	Training programme on "Advanced Oxidation Treatment Technology - A Futuristic Way forward for Treatment of Recalcitrant Pollutants"	Centre for Environmental Studies, Anna University, Chennai & sponsored by CPCB, Delhi	Online (Virtual Mode)
59.	Er. Bibechita Sarangi, Dy. Eenv. Engineer	24th – 26th February, 2021	Training programme on "Advanced Oxidation Treatment Technology - A Futuristic Way forward for Treatment of Recalcitrant Pollutants"	Centre for Environmental Studies, Anna University, Chennai & sponsored by CPCB, Delhi	Online (Virtual Mode)

Sl. No.	Name (Smt./Shri) & Designation	Date	Title of the Training/Workshop/ Seminar	Conducted by	Venue
60.	Dr. Prakash Kumar Mohapatra, Regional Officer, Rourkela	24th – 25th February, 2021	Training programme on "Urban Air Quality Management"	Centre for Env. Studies, The Energy and Resources Institute (TERI), India Habitat Centre, New Delhi & sponsored by CPCB, Delhi	Online (Virtual Mode)
61.	Er. Rashmita Priyadarshini, Env. Engineer, Regional office, SPC Board, Cuttack	24th – 25th February, 2021	Training programme on "Urban Air Quality Management"	Centre for Env. Studies, The Energy and Resources Institute (TERI), India Habitat Centre, New Delhi & sponsored by CPCB, Delhi	Online (Virtual Mode)
62.	Dr. Usha Rani Pattnaik, Env. Scientist, Central Laboratory	3rd – 5th March, 2021	Training programme on "Analysis of Pesticides & Other Organic Chemicals in Environmental Samples"	CSIR-Indian Institute of Toxicology Research, Vishvigyan Bhawan, 31, Mahatma Gandhi Marg, Lucknow & sponsored by CPCB, Delhi	Online (Virtual Mode)
63.	Dr. Sharada Srinivas Pati, Asst. Env. Scientist, Central Laboratory	3rd – 5th March, 2021	Training programme on "Analysis of Pesticides & Other Organic Chemicals in Environmental Samples"	CSIR-Indian Institute of Toxicology Research, Vishvigyan Bhawan, 31, Mahatma Gandhi Marg, Lucknow & sponsored by CPCB, Delhi	Online (Virtual Mode)
64.	Sumitra Nayak, Asst. Env. Scientist, ICZMP	15th – 17th March, 2021	Training programme on "Sophisticated Instruments for Analysis of Toxic Heavy Metals in Environmental Samples and GC / GC - Ms Operation"	National Geophysical Research Institute, Uppal Road, Hyderabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
65.	Sarat Kumar Mohanty, Sr. Scientific Asst., Central Laboratory	15th – 17th March, 2021	Training programme on "Sophisticated Instruments for Analysis of Toxic Heavy Metals in Environmental Samples and GC / GC - Ms Operation"	National Geophysical Research Institute, Uppal Road, Hyderabad & sponsored by CPCB, Delhi	Online (Virtual Mode)
66.	Dr. Pramode Kumar Prusty, Sr. Env. Scientist	16th March, 2021	Final Consultation Workshop	National Institute of Disaster Management, Ministry of Home Affairs, Govt. of India, New Delhi	Online (Virtual Mode)
67.	Dr. Anup Kumar Mallick, ES, Regional Officer, Angul	17th – 19th March, 2021	Training programme on "Control of Air Pollution, Source Apportionment Studies and Preparation of Emission Inventory"	Centre for Env. Studies, The Energy and Resources Institute (TERI), India Habitat Centre, New Delhi & sponsored by CPCB, Delhi	Online (Virtual Mode)
68.	Er. Subhadarshini Das, Env. Engineer	17th – 19th March, 2021	Training programme on "Control of Air Pollution, Source Apportionment Studies and Preparation of Emission Inventory"	Centre for Env. Studies, The Energy and Resources Institute (TERI), India Habitat Centre, New Delhi & sponsored by CPCB, Delhi	Online (Virtual Mode)

B. Training / Workshop / Seminar Organised / Sponsored by SPC Board

Sl. No.	Training Programme	Duration	Venue	Organised / Sponsored by
1.	2nd National E-Conference on "Industrial Waste Management in COVID-19 & Industrial Waste Management Ecosystem in India"	21st October, 2020	E-Conference (Virtual Mode)	Indian Chamber of Commerce (ICC)Odisha Regional Office, In Front of Pal Heights, Jayadev Vihar, Bhubaneswar & SPC Board, Odisha, Bhubaneswar

8.15 Internship taken by Students from different Educational Institutions

Sl. No.	Name of the Students	Name of the Educational Institutions	Duration of the Internship	Internship Taken Under
1.	Shri Sriram Ballav Bhola	Siksha 'O' Anusandhan University, Bhubaneswar	01.03.2021 to 21.03.2021	Shri B. P. Pattajoshi, Legal Consultant
2.	Shri Prajwol Kumar Parida	Siksha 'O' Anusandhan University, Bhubaneswar	01.03.2021 to 21.03.2021	Shri B. P. Pattajoshi, Legal Consultant
3.	Shri Swagat Mohapatra	Siksha 'O' Anusandhan University, Bhubaneswar	01.03.2021 to 21.03.2021	Shri B. P. Pattajoshi, Legal Consultant

8.9 OTHER ACTIVITIES

Observation of Important Days

➢ **Observation of World Environment Day**

The State Pollution Control Board, Odisha observed World Environment Day on 5th June, 2020 through its 12 Regional Offices. The global theme of the World Environment Day for the year 2020 was "Time for Nature". Due to the pandemic COVID-19 situation, the regular celebration activities like debate/quiz/rally/seminar/paining and essay competition etc. among schools and college students were not organized. However, awareness meetings involving different organizations through video conferencing and plantation programme were done in different industries as well as inside office premises of Regional Offices maintaining Covid protocol.

➢ **Celebrations**

The State Pollution Control Board, Odisha could not observe its **37th Foundation Day, International Coastal Clean-up Day and National Pollution Prevention Day** in 2020 due to the COVID-19 pandemic situation. The regular celebration / observation activities like debate / quiz / rally / seminar / painting and essay competition etc. among schools / college students were not organized. However, awareness meetings involving different organizations through video conferencing were organized.

8.10 AWARENESS ACTIVITES

- For creation of awareness amongst general public, the Board regularly publishes advertisements carrying messages on environmental issues in different periodicals / souvenirs / print media.
- The Board observed the World Environment Day on 5th June' 2020 through its 12 Regional Offices. The theme of the World Environment Day for the year 2020 was "Time for Nature". Due to the COVID-19 pandemic situation, the regular celebration activities were not organized. However, awareness meetings involving different organizations and industry houses through video conferencing and plantation programme were organised in different industrial premises as well as inside office premises of Regional Offices maintaining Covid protocol. Other activities like "International Coastal Clean-up Day" and "World Ozone Day" were also not observed by the Board due to pandemic situation.
- Public awareness on "Impact of bursting of fire crackers during Deepawali" and "Impact on immersion of idols on water quality of surface water bodies" were created through public notices in local news papers.

8.11 PUBLICATIONS

The Board has published two volumes of newsletters "Paribesh Samachar" during this period.

8.12 EMPANELLED ENVIRONMENTAL CONSULTANTS

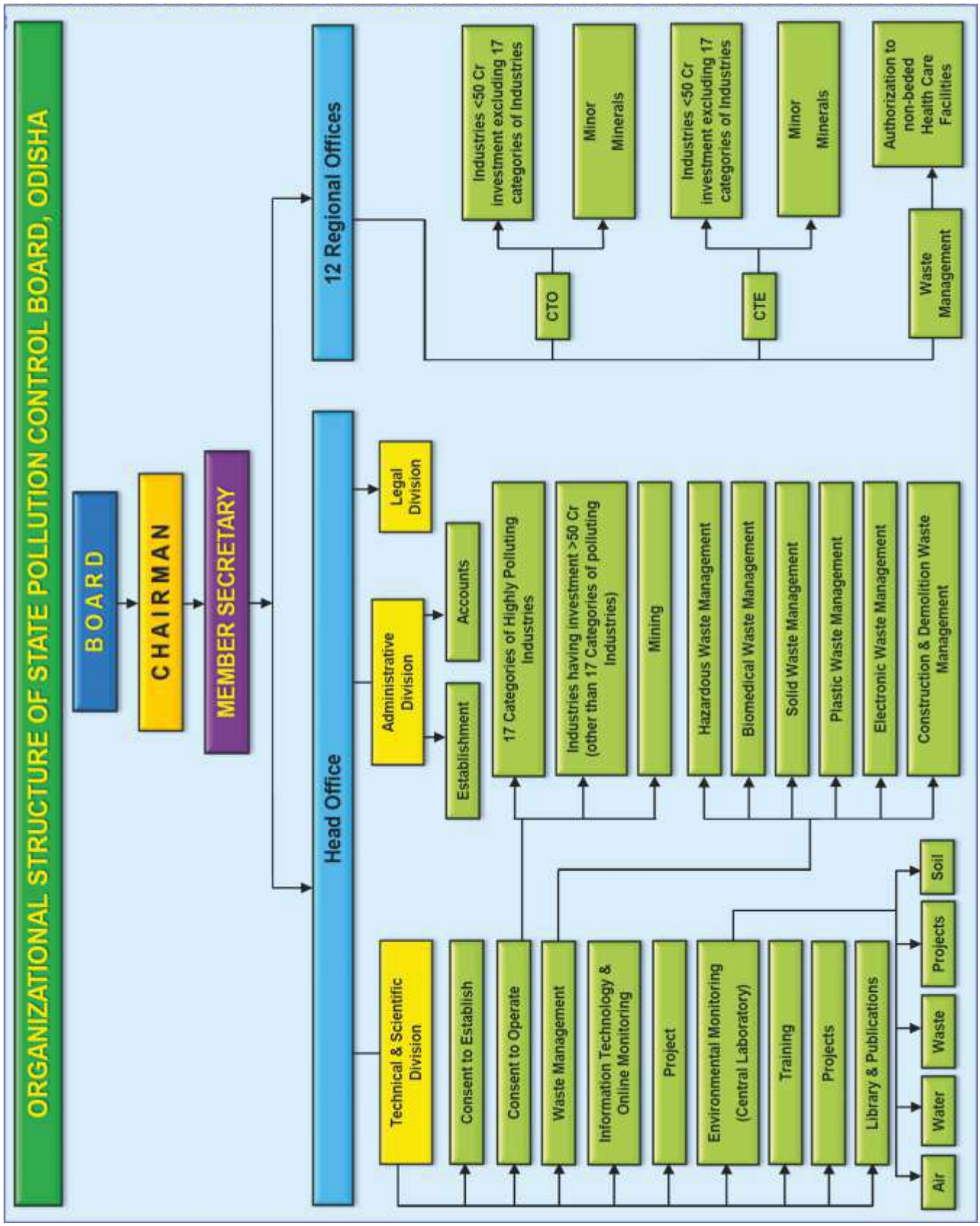
During the financial year 2020-21 following 02 Nos. of Consultants were Empanelled with the Board. The details are stated below.

Table-8.16 Status of Environmental Consultants for the Year 2020-21

Sl. no	Name of the Consultant	Category	Validity Period
1	M/s Sai Biocare Pvt. Ltd Plot No.- 819, Garage Square , Old Town, Adjacent to Kalika Temple, Bhubaneswar- 751002 Phone No. -977660148 Email Id – lab@saibiocare.com	*B*	*01.06.2020 - 31.05.2023*

2	M/s Vimta Labs Ltd. 142, IDA, Phase- II , Cherlapally, Hyderabad – 500051 Phone No. -040-27264141 Email Id – janardahan@vimta.in	*A*	*19.06.2020 to 18.06.2023*

However, the Board, in its 121st Board meeting held on 15.10.2020 decided to dispense with the process of empanelment of Environmental consultant and other institutes.


ORGANIZATIONAL STRUCTURE OF STATE POLLUTION CONTROL BOARD, ODISHA
BOARD
CHAIRMAN
MEMBER SECRETARY
Head Office
12 Regional Offices
Legal Division
Administrative Division
Accounts
Establishment
Technical & Scientific Division
Consent to Establish
Consent to Operate
Waste Management
Information Technology & Online Monitoring
Project
Environmental Monitoring (Central Laboratory)
Training
Projects
Library & Publications
Air
Water
Waste
Projects
Soil
17 Categories of Highly Polluting Industries
Industries having investment >50 Cr (other than 17 Categories of polluting Industries)
Mining
Hazardous Waste Management
Biomedical Waste Management
Solid Waste Management
Plastic Waste Management
Electronic Waste Management
Construction & Demolition Waste Management
CTO
CTE
Waste Management
Industries <50 Cr investment excluding 17 categories of Industries
Minor Minerals
Industries <50 Cr investment excluding 17 categories of Industries
Minor Minerals
Authorization to non-beded Health Care Facilities

ANNEXURE-II

RATE CHART FOR SAMPLING AND ANALYSIS OF ENVIRONMENTAL SAMPLES

(Office Order No. 7828, dated 01.08.2019)

A. SAMPLING CHARGES

(I) Sampling charges for Ambient Air/ Fugitive emission samples

Sl. No.	Type of sampling		Charges in Rs.
1.	**Air Monitoring**		
	(a)	Sampling (upto each 8 hrs) for suspended particulate matter and gaseous pollutants	3500.00
	(b)	Sampling (24 hrs) for suspended particulate matter and gaseous pollutants	10500.00
	(c)	Sampling of volatile organic compounds (VOCs) / Benzene Toluene Xylene (BTX)	3500.00
	(d)	Sampling of Poly Aromatic Hydrocarbons (PAHs)	4400.00
	(e)	Sampling (24 hrs using PUF HVS) of ambient air for Dioxin-Furan (PCDDs-PCDFs) congeners	15000.00

Note: (i) Transportation charges will be separate as per actual basis.

(ii) Sample analysis charges of respective parameters are separate as per list.

(II) Source Emission Monitoring / Sampling Charges

Sl. No.	Type of Sampling		Charges in Rs.
1.	**Source Emission Monitoring**		
	(a)	Sampling/ measurement of velocity, flow rate, temperature and molecular weight of Flue Gas (each specific location/ each sample in duplicate for the mentioned parameter)	9600.00
	(b)	Sampling of SO_2 / NO_2	3500.00
	(c)	Sampling of Volatile Organic Compounds (VOCs / Benzene Toluene Xylene (BTX)	5300.00
	(d)	Sampling of Poly Aromatic Hydrocarbons (PAHs)	6200.00
	(e)	Sampling of emission from stationery source for Dioxin-Furan (PCDDs-PCDFs) congeners using Manual sampling Kit	25000.00

Note: (i) Transportation charges will be separate as per actual basis.

(ii) Sample analysis charges of respective parameters are separate as per list.

(III) Noise Monitoring

Sl. No.	Type of Sampling	Charges in Rs.
1.	**Noise Monitoring**	
	(a) First Monitoring	7000.00
	(b) Each Subsequent Monitoring within same premises	3500.00
	(c) For 08 hours Continuous Monitoring or more	18,000.00

Note: (i) Transportation charges will be separate as per actual basis.

(ii) Sample analysis charges of respective parameters are separate as per list.

(IV) Sampling Charges for Water & Wastewater Samples

Sl. No.	Type of sampling	Charges in Rs.
1.	**GRAB SAMPLING:**	
	1) Grab sampling/ samples/ place	960.00
	2) For every additional Grab sampling / same place (at same point)	440.00
2.	**COMPOSITE SAMPLING:**	
	1) Composite sampling/source/place upto 8 hrs.	1800.00
	-do- upto16 hrs.	3500.00
	-do- upto 24 hrs.	5300.00
	2) For every additional composite sampling/same place but different source upto 8 hrs.	960.00
	-do- upto16 hrs.	2000.00
	-do- upto 24 hrs.	2900.00
3.	Flow rate measurement/ source -Once	700.00
	-do- - Every additional	270.00

Note: (i) Transportation charges will be separate as per actual basis.

(ii) Sample analysis charges of respective parameters are separate as per list.

(V) Sampling charges for Soil samples

Type of Sampling	Charges in Rs.
Grab sampling/ sample/ place	1050.00
For additional Grab sampling / same place	530.00

Note: (i) Transportation charges will be separate as per actual basis.

(ii) Sample analysis charges of respective parameters are separate as per list.

(VI) Hazardous Waste Sample collection charges at the premises of Industry/ Import site/ Disposal site

Type	Charges in Rs.
Integrated sample collection charges	1800.00

Note: (i) Transportation charges will be separate as per actual basis.

(ii) Sample analysis charges of respective parameters are separate as per list.

B. ANALYSIS CHARGES

I. Analysis charges of Ambient Air/ Fugitive Emission Samples

Sl. No	Parameters (Air)	Analysis charges per sample in Rs.
1.	Ammonia	1050.00
2.	Analysis using dragger (per tube)	700.00
3.	Benzene, Tohuene, Xylene (BTX)	1800.00
4.	Carbon Monoxide	1050.00
5.	Chlorine	1050.00

Sl. No	Parameters (Air)	Analysis charges per sample in Rs.
6.	Fluoride (gaseous)	1050.00
7.	Fluoride (particulate)	1050.00
8.	Hydrogen Chloride	1050.00
9.	Hydrogen Sulphide	1050.00
10.	Lead & Other Metals (per metal)	As mentioned in respective group at clause 5.0
11.	NO_2	1050.00
12.	Ozone	1800.00
13.	Poly Aromatic Hydrocarbons (PAHs)	As mentioned in respective group at clause 5.0
14.	Suspended Particulate Matter (SPM)	1050.00
15.	Particulate Matter ($PM_{2.5}$)	1800.00
16.	Respirable Suspended Particulate Matter (PM_{10})	1050.00
17.	Sulphur Dioxide	1050.00
18.	Volatile Organic Carbon	3500.00
19.	Trace metals on air, filter paper using ED-XRF Aluminium, Antimony, Arsenic, Barium, Bromine, Cadmium, Calcium, Cesium, Chlorine, Chromium, Cobalt, Copper, Gallium, Germanium, Gold, Iodine, Iron, Lanthanum, Lead, Magnesium, Manganese, Molybdenum, Nickel, Palladium, Phosphorous, Potassium, Rubidium, Rutherfordium, Selenium, Silicon, Silver, Sodium, Strontium, Sulphur, Telhurium, Tin, Titanium, Tungsten, Vanadium, Ytterbium and Zinc	5300.00 Per filter paper
20.	Water extractable ions in air particulate matter using Ion Chromatograph (IC) i) Processing / pretreatment charge per sample (filter paper) ii) Cations (Na^+, NH_4^+, K^+, Ca^{++}, & Mg^{++}) and Anions (F^-, Br^-, Cl^-, NO_3^-, NO_2^-, SO_4^{-2}& PO_4^{-3})	530.00 2100.00 (for 12 ions)
21.	Organic and Elemental Carbon (OC/EC) on quartz filter paper	3500.00
22	Sample processing and analysis for Dioxin-Furan (PCDDs-PCDFs) congeners (Isotope dilution method using GC-HRMS	75000.00

II. Analysis charges for Source Emission Parameters

Sl. No.	Parameters	Analysis charges per sample in Rs.
1	Acid mist	1050.00
2	Ammonia	1050.00
3	Carbon Monoxide	1050.00
4	Chlorine	1050.00
5	Fluoride (Gaseous)	1050.00
6	Fluorides (Particulate)	1050.00
7	Hydrogen Chloride	1050.00
8	Hydrogen Sulphide	1050.00
9	Oxides of Nitrogen	1050.00
10	Oxygen	880.00
11	Polycyclic Aromatic Hydrocarbons (Particulate)	As mentioned in respective group at clause 5.0
12	Suspended particulate matter	1050.00
13	Sulphur Dioxide	1050.00
14	Benzene Toluene Xylene (BTX)	2700.00
15	Volatile Organic Compounds (VOC)	5300.00
16	Sample processing and analysis for Dioxin-Furan (PCDDs-PCDFs) congeners (Isotope dilution method using GC-HRMS	75000.00

III. Ambient Air Quality Monitoring using on-line monitoring instruments by Mobile Van

Parameters	Charges in Rs.
PM_{10}, $PM_{2.5}$, SO_2, NO_x, SPM, CO along with Meteorological data viz. temperature, Humidity, wind speed, wind direction	Rs.6200.00 per hour (minimum charges Rs.15,000/-) + Rs.50.00/km run of the van for 24 hours monitoring.

IV. Auto Exhaust Monitoring – One time checking of Vehicular Exhaust

Sl. No.	Type of vehicles	Charges in Rs.
1	Carbon Monoxide %	As per rate notified by transport department
2	Hydrocarbon, PPM	
3	Smoke Density, HSU	

V. Analysis Charges of Water and Wastewater Samples

Sl. No	Parameters	Analysis charges per sample in Rs.
	PHYSICAL PARAMETERS	
1.	Conductivity	110.00
2.	Odour	110.00
3.	Sludge Volume index (S.V.I)	350.00
4.	Solids (dissolved)	180.00
5.	Solids (fixed)	270.00
6.	Solid (Volatile)	270.00
7.	Suspended Solids	180.00
8.	Temperature	110.00
9.	Total Solids	180.00
10.	Turbidity	110.00
11.	Velocity of Flow (Current Meter)	350.00
12.	Velocity of Flow (other)	960.00
	CHEMICAL PARAMETERS	
Inorganic		
1.	Acidity	180.00
2.	Alkalinity	180.00
3.	Ammonical Nitrogen	350.00
4.	Bicarbonate	180.00
5.	Biochemical Oxygen Demand (BOD)	1050.00
6.	Bromide	180.00
7.	Calcium (Titrimetric)	180.00
8.	Carbon dioxide	180.00
9.	Carbonate	180.00
10.	Chloride	180.00
11.	Chlorine Demand	350.00
12.	Chlorine Residual	180.00
13.	Chemical Oxygen Demand (COD)	620.00
14.	Cyanide	620.00
15.	Detergent	350.00
16.	Dissolved Oxygen (DO)	180.00
17.	Fluoride	350.00
18.	H. Acid	350.00
19.	Hardness (Calcium)	180.00
20.	Hardness (Total)	180.00
21.	Iodide	180.00
22.	Nitrate – Nitrogen	350.00
23.	Nitrite – Nitrogen	350.00
24.	Percent Sodium	1050.00
25.	Permanganate Value	350.00
26.	pH	110.00
27.	Phosphate (Ortho)	350.00
28.	Phosphate (Total)	620.00

Sl. No	Parameters	Analysis charges per sample in Rs.
29.	Salinity	180.00
30.	Sodium Absorption Ratio (SAR)	1050.00
31.	Settleable Solids	180.00
32.	Silica	350.00
33.	Sulphate	270.00
34.	Sulphide	350.00
35.	Total Kjeldahl Nitrogen (TKN)	620.00
36.	Urea Nitrogen	620.00
37.	Cations (Na^+, NH_4^+, K^+, Ca^{++}, & Mg^{++}) and Anions (F^-, Br^-, Cl^-, NO_3^-, NO_2^-, SO_4^{--}& PO_4^{---}) in surface and ground water samples using Ion Chromatograph	2100.00 (for 12 ions)
Metals		
	Processing / pre treatment charge per sample	880.00
1.	Aluminium	530.00
2.	Antimony	530.00
3.	Arsenic	530.00
4.	Barium	530.00
5.	Beryllium	530.00
6.	Boron	530.00
7.	Cadmium	530.00
8.	Chromium Hexavalent	350.00
9.	Chromium Total	530.00
10.	Cobalt	530.00
11.	Copper	530.00
12.	Iron	530.00
13.	Lead	530.00
14.	Magnesium	350.00
15.	Manganese	530.00
16.	Mercury (Processing and Analysis)	1400.00
17.	Molybdenum	530.00
18.	Nickel	530.00
19.	Potassium	350.00
20.	Tin	530.00
21.	Selenium	530.00
22.	Silver	530.00
23.	Sodium	350.00
24.	Strontium	530.00
25.	Vanadium	530.00
26.	Zinc	530.00
	Organics	
Organo Chlorine Pesticides (OCPs)		
	Processing / pretreatment charge per sample	1800.00
1.	Aldrine	700.00
2.	Dicofol	700.00

Sl. No	Parameters	Analysis charges per sample in Rs.
3	DIeldrin	700.00
4	Endosulfan-I	700.00
5	Endosulfan-II	700.00
6	Endosulfan-Sulfate	700.00
7	Heptachlor	700.00
8	Hexachlorobenzene (HCB)	700.00
9	Methoxychlor	700.00
10	o,p DDT	700.00
11	p,p'- DDD	700.00
12	p,p'- DDE	700.00
13	p'p DDT	700.00
14	α-HCH	700.00
15	β-HCH	700.00
16	γ-HCH	700.00
17	δ-HCH	700.00
Organo Phosphorous Pesticides (OPPs)		
	Processing / pre treatment charge per sample	1800.00
18	Chlorpyriphos	700.00
19	Dimethoate	700.00
20	Ethion	700.00
21	Malathion	700.00
22	Monocrotophos	700.00
23	Parathion-methyl	700.00
24	Phorate	700.00
25	Phosphamidon	700.00
26	Profenophos	700.00
27	Quinalphos	700.00
Synthetic Pyrethroids (SPs)		
	Processing / pre treatment charge per sample	1800.00
28	Deltamethrin	700.00
29	Fenpropethrin	700.00
30	Fenvalerate	700.00
31	α-Cypermethrin	700.00
32	β-Cyfluthrin	700.00
33	γ-Cyhalothrin	700.00
Herbicides		
	Processing / pre treatment charge per sample	1800.00
34	Alachlor	700.00
35	Butachlor	700.00
36	Fluchloralin	700.00
37	Pendimethalin	700.00
Polycyclic Aromatic Hydrocarbons (PAHs)		
	Processing / pre treatment charge per sample	1800.00
38	Acenaphthene	700.00
39	Acenaphthylene	700.00

Sl. No	Parameters	Analysis charges per sample in Rs.
40	Anthracene	700.00
41	Benzo(a)anthracene	700.00
42	Benzo(a)Pyrene	700.00
43	Benzo(b)fluoranthene	700.00
44	Benzo(e)Pyrene	700.00
45	Benzo(g,h,i) Perylene	700.00
46	Benzo(k)fluoranthene	700.00
47	Chrysene	700.00
48	Dibenzo(a,h)anthracene	700.00
49	Fluoranthene	700.00
50	Fluorene	700.00
51	Indeno (1,2,3-cd)pyrene	700.00
52	Naphthalene	700.00
53	Perylene	700.00
54	Phenanthrene	700.00
55	Pyrene	700.00
Polychlorinated Biphenyls (PCBs)		
	Processing / pre treatment charge per sample	1800.00
56	Aroclor 1221	700.00
57	Aroclor 1016	700.00
58	Aroclor 1232	700.00
59	Aroclor 1242	700.00
60	Aroclor 1248	700.00
61	Aroclor 1254	700.00
62	Aroclor 1260	700.00
.Trihalomethane (THM)		
	Processing / pre treatment charge per sample	1400.00
63	Bromodichloromethane	700.00
64	Bromoform	700.00
65	Chloroform	700.00
66	Dibromochloromethane	700.00
Other Organic Parameters		
67	Adsorbable Organic halogens (AOX)	3500.00
68	Tanin/ Lignin	620.00
69	Oil and Grease	350.00
70	Phenol	350.00
71	Total Organic carbon (TOC)	880.00
72	Volatile organic acids	620.00
BIOLOGICAL TEST		
1.	Bacteriological Sample Collection	350.00

Sl. No	Parameters	Analysis charges per sample in Rs.
2.	Benthic Organism Identification and Count (each sample)	1050.00
3.	Benthic Organism Sample collection	1800.00
4.	Chlorophyll Estimation	1050.00
5.	E. Coli (MFT technique)	700.00
6.	E. Coli (MPN technique)	620.00
7.	Fecal Coliform (MFT technique)	700.00
8.	Fecal Coliform (MPN technique)	620.00
9.	Fecal Streptococci (MFT technique)	790.00
10.	Fecal Streptococci (MPN technique)	700.00
11.	Plankton (sample collection)	440.00
12.	Plankton (Phytoplankton) count	1050.00
13.	Plankton (Zooplankton) count	1050.00
14.	Standard Plate Count	350.00
15.	Total Coliform (MFT technique)	700.00
16.	Total Coliform (MPN technique)	620.00
17.	Total Plate Count	620.00
18.	Toxicological Bio-assay (LC_{50})	4900.00
19.	Toxicological –Dimensionless toxicity test	2800.00

Note:

i. Sampling charges for water and waste water samples are separate as specified in Clause A(IV), but subject to minimum of Rs.700/- irrespective of number of samples.

ii. Transportation charges are separate on actual basis.

VI. Analysis charges of Soil/ Sludge/ Sediment/ Solid waste/ Solid samples

Sl. No.	Parameters	Analysis charges per test in Rs.
1	Ammonia	530.00
2	Bicarbonate	350.00
3	Boron	700.00
4	Calcium	270.00
5	Calcium Carbonate	620.00
6	Cation Exchange Capacity (CEC)	700.00
7	Chloride	270.00
8	Colour	175.00
9	Electrical Conductivity (EC)	175.00
10	Exchangeable Sodium Percentage (ESP)	960.00
11	Gypsum requirement	620.00
12	H. Acid	700.00
13	Heavy metal	As mention in respective group at clause 5.0
14	Trace metals using ED-XRF Aluminium, Antimony, Arsenic, Barium, Bromine, Cadmium,	7000.00

Sl. No.	Parameters	Analysis charges per test in Rs.
	Calcium, Cesium, Chlorine, Chromium, Cobalt, Copper, Gallium, Germanium, Gold, Iodine, Iron, Lanthanum, Lead, Magnesium, Manganese, Molybdenum, Nickel, Palladium, Phosphorous, Potassium, Rubidium, Rutherfordium, Selenium, Silicon, Silver, Sodium, Strontium, Sulphur, Tellurium, Tin, Titanium, Tungsten, Vanadium, Ytterbium and Zinc per sample	
15	Magnesium	530.00
16.	Mechanical Soil analysis(soil texture)	270.00
17	Nitrate	530.00
18	Nitrite	530.00
19	Nitrogen available	620.00
20	Organic Carbon/ Matter (chemical method)	620.00
21	Polycyclic Aromatic Hydrocarbons (PAHs)	As mention in respective group at clause 5.0
22	Polychlorinated Biphenyls (PCBs)	As mention in respective group at clause 5.0
23	Pesticides	As mention in respective group at clause 5.0
24	pH	175.00
25	Phosphorous (available)	700.00
26	Phosphate(ortho)	530.00
27	Phosphate(total)	700.00
28	Potash(Available)	350.00
29	Potassium	530.00
30	Sodium Absorption Ratio (SAR) in Soil extract	1140.00
31	Sodium	530.00
32	Soil Moisture	175.00
33	Sulphate	350.00
34	Sulphur	620.00
35	Total Kjehldhal Nitrogen (TKN)	700.00
36	TOC	960.00
37	Total Water Soluble Salts	350.00
38	Water Holding Capacity	175.00
39	Sample processing and analysis for Dioxin-Furan (PCDDs-PCDFs) congeners (Isotope dilution method using GC-HRMS)	75000.00

VIII. Analysis charges for Hazardous Waste samples

Sl. No.	Parameters	Analysis Charges per test in Rs.
1.	Preparation of Leachate (TCLP extract / Water Extract)	1750.00
2.	Determination of various parameters in Leachate	As mention in respective group at clause 5.0
3.	Flash point/ Ignitibility	960.00
4.	Reactivity	960.00
5.	Corrosivity	960.00
6.	Measurement of Toxicity	
	- LC_{50}	4900.00
	- Dimensionless Toxicity	2800.00
7.	Total Organic Carbon	880.00
8.	Adsorbable organic Halogen (AOx)	3500.00

VIII. AQC Participation Fees :

To be charged by the Board from respective recognized laboratories for Analytical Quality Control Exercise (AQC) samples.

1	Laboratories of Govt./Semi-Govt. / Public sector undertaken/Autonomous bodies	18000.00
2	Private Sector laboratories	27000.00

ANNEXURE-III

Staff Strength

Sl. No.	Name of the Post	No. of Post Sanctioned	No. of Post filled up	Post lying vacant
(A)	**Cadre of Scientist**			
1	Chief Environmental Scientist	2	0	2
2	Senior Enviornmental Scientist (L-I)	3	0	3
3	Senior Enviornmental Scientist (L-II)	3	2	1
4	Environmental Scientist	48	17	20
5	Deputy Environmental Scientist		4	
6	Assistant Environmental Scientist		7	
	Total	**56**	**30**	**26**
(B)	**Cadre of Engineer**			
7	Chief Environmental Engineer	2	2	0
8	Senior Environmental Engineer (L-I)	3	3	0
9	Senior Environmental Engineer (L-II)	3	3	0
10	Environmental Engineer	46	14	13
11	Deputy Environmental Engineer		5	
12	Assistant Environmental Engineer		14	
	Total	**54**	**41**	**13**
(C)	**Cadre of Laboratory Officials**			
13	Assistant Scientific Officer	7	5	2
14	Senior Scientific Assistant	15	7	8
	Total	**22**	**12**	**10**
(D)	**Administrative Cadre**			
15	Administrative Officer	1	0	1
16	Additional Administrative Officer	1	1	0
17	Accounts Officer	2	1	1
18	Section Officer	8	8	0
19	Accountant	5	0	5
20	Senior Assistant	13	10	3
21	Junior Assistant	18	7	11
	Total	**48**	**27**	**21**
(E)	**Legal Personnel Cadre**			
22	Senior Law Officer (L-I)	1	0	1
23	Senior Law Officer (L-II)	1	1	0
24	Law Officer	1	0	1
25	Assistant Law Officer	1	0	1
	Total	**4**	**1**	**3**
(F)	**Stenographer Cadres**			
26	Private Secretary (Gr. A)	1	1	0
27	Private Secretary (Gr. B)	2	2	0
28	Personal Assistant	8	7	1
29	Senior Stenographer	9	0	9
30	Junior Stenographer	7	1	6
	Total	**27**	**11**	**16**
(G)	**Others**			
31	Asst. Librarian	1	1	0
32	Sr. Typist	2	2	0
33	Jr. Typist	8	5	3
34	Store Keeper	1	0	1
35	Head Driver	0	0	0
36	Sr. Driver	3	3	0
37	Driver	9	5	4
38	Record Supplier	1	1	0
39	Diarist.	1	1	0
40	Xerox Asst	1	0	1
41	Daftary	1	1	0
42	Lift Operator	1	0	1
43	Laboratory Attendant	10	7	3
44	Library Attendant	1	1	0
45	TreasurySarkar	1	1	0
46	Zamadar	1	1	0
47	Peon	21	16	5
48	Watchman	2	1	1
49	Watchman-cum-Sweeper	5	3	2
	Sub-Total	**70**	**49**	**21**
	GRAND TOTAL (A+B+C+D+E+F+G)	**281**	**171**	**110**

STATE POLLUTION CONTROL BOARD, ODISHA

PARIBESH BHAWAN, A/118, NILAKANTHA NAGAR,
UNIT-VIII, BHUBANESWAR - 751012