

ANNUAL REPORT 2019-20



STATE POLLUTION CONTROL BOARD, ODISHA

A/118, NILAKANTHA NAGAR, UNIT - VIII

BHUBANESWAR

ANNUAL REPORT

2019-2020



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**A/118, NILAKANTHA NAGAR, UNIT-VIII
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Highlights of Activities of State Pollution Control Board

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 152 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 89.91%, during the reporting period, as against 82.71% in the preceding year.
- (iv) Initiatives have been made to facilitate 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 have been brought 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) In order to augment the capacity of the Board in the area of coastal environmental monitoring, the World Bank assisted Integrated Coastal Zone Management Project (ICZMP) has been implemented. Office of the Pilot Executing Agency (PEA) of the Board has been operating in Central Laboratory Building, Patia, Bhubaneswar. The coastal water over a stretch of about 80 km from Paradeep to Dhamra is being monitored with the help of the monitoring vessel MV Sagar Utkal. 73 sampling locations have been selected for the entire monitoring area, out of which 32 are along the Mahanadi transect, 17 in Dhamra transect and 24 in Gahiramatha- Bhitarkanika transect. In total 1733 water samples and 86 sediment samples have been collected and analyzed during the reporting period.
- **Blue Flag Beach Certification:**

Twelve beaches in the country are being developed by the Society for Integrated Coastal Management (SICOM), an Environment Ministry's body working for the management of coastal areas, in accordance with the Blue Flag standards. As per the Blue Flag standards, a beach needs to comply with at least 33 pre-requisites to achieve the Blue Flag tag. It must be plastic-free and equipped with a waste management system. Clean water should be available for tourists, apart from international amenities. SICOM has monitored five coastal stretches of Odisha i.e. one stretch at Chandrabhaga, two in Paradeep and two at Puri. Out of these stretches, a stretch of 435 meters in Puri beach (from Rajbhawan to Hotel Mayfair) has been certified as Pilot Blue Flag Beach.
 - **Monitoring, Sampling and Analysis of Sea water towards Blue Flag Beach:**

As per the proposal of Govt. of Odisha and MoEF & CC, GoI, the ICZMP Cell of the OSPCB has been involved to conduct monitoring since February, 2019 to assess the environmental qualities of the said stretches. A total of 334 water samples were collected in a regular basis from five different locations of Puri Beach and analyzed for 09 parameters under the guidelines of Foundation for Environmental Education (FEE), required for the Blue Flag Certification.
 - **Monitoring and sampling of sea water at Rajhansa, near Chilika in and around the grounded Malaysian TUG Boat**

Inspection has been conducted near the grounded Malaysian tug boat (JIN HWA 32) and towed barge (JINHA 42) landed off near Rajhansa Island close to Chilika lake and necessary sampling was made. Analysis result indicated no sign of pollution due to berthing of this tug boat and barge along the coast.
- (vii) The Board has granted consent stipulating appropriate pollution control measures to 874 Industries, hotels, mineral stack yards, mineral processing units, railway sidings, stone crushers, brick kilns and DG Sets (as stand by) etc. for their Establishment.
- (viii) Consent to operate has been granted to 2452 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 418 units and direction /closure direction to 127 units. Consent to operate of 27 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 22 public hearings for major industrial / mining / development projects, requiring environmental clearance from MoEF and CC, Govt. of India/ State Environment Impact Assessment Authority (SEIAA), Odisha.

2. Regulation of Hazardous Waste Management

The Board has granted authorization to 111 hazardous waste generating units for collection, storage, treatment and disposal of hazardous wastes. 26 nos. of actual users inside Odisha and 23 nos. of actual users outside Odisha have been authorized by the Board during the reporting period for utilization of hazardous wastes.

As per the provisions of Sec -23 of Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 and CPCB guidelines on “Implementing Liabilities for Environmental Damages due to Handling and disposal of Hazardous Wastes and Penalty”, the Board has recommended for levying of financial penalty against the industries for violation of different provisions of the Rule.

3. Management of Lead Acid Batteries

The Board has received 215 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 1735 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 30 units and refusal of authorization to 02 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. So far, 14 plastic product manufacturing units (06 producers, 05 brand owners and 03 re-processors) have been registered with the Board during the reporting period.

- Major ULBs have been instructed to send segregated plastic waste to cement plants namely M/s ACC Ltd., Bargarh, M/s OCL Ltd., Rajgangpur, M/s Shiva Cement, Sundargarh, M/s Toshali Cement, Ampavali, Koraput for co-processing in cement Kiln.
- 4.6 MT of plastic waste has been used for construction of 9.6 km road in Deogarh and Sambalpur Districts.
- Consent to Establish has been granted to M/s. Hindalco Industries to convert 0.5 MT/Day plastic waste to oil.

6. Management of Electronic Waste.

The Board has issued authorization to 04 E-waste dismantling units, 02 collection-cum-dismantling units and 01 captive collection centre during the reporting period.

7. Legal Activities

The Board has filed 152 cases in appropriate legal forum and 122 cases have been disposed during the reporting period.

8. Right to Information

Under the Right to Information Act, 2005, the Board has disposed 601 applications by providing information.

9. Disposal of Public Complaints

The Board has addressed 341 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.
- Bio-monitoring at 21 stations of 08 major rivers i.e. Mahanadi, Brahmani, Rushikulya, Subarnarekha, Budhabalanga, Kolab, Vansadhara and Nagabali has been monitored to assess the biological health of these river systems.
- To assess the impact of mass bathing during Kartika Purnima on the water quality of Mahanadi and Kathajodi rivers, water quality monitoring at eight major bathing ghats of these rivers along Cuttack city were conducted.
- 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 producing 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.
- 3001 nos. of industrial wastewater samples, 6567 water samples under NWMP, National River Conservation Programme (NRCP), SWMP & different projects have been analysed by the Board during this period.
- 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). Ambient air quality in 08 towns at 17 stations have been assessed in respect of 04 parameters namely PM_{10} , $PM_{2.5}$, Sulphur Dioxide (SO_2) and Nitrogen Oxides (NO_x). Additional parameters like NH_3 and O_3 were also monitored in 06 towns/cities i.e. Angul, Balasore, Berhampur, Cuttack, Keonjhar and Sambalpur. At 08 stations in Bhubaneswar, Puri and Konark, ambient air quality has been assessed in respect of 08 parameters like PM_{10} , $PM_{2.5}$,

SO₂, NO_x, NH₃, O₃, Pb & Ni. In total, 1832 ambient air quality samples, 11,715 samples under NAMP/SAMP projects, 873 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.
- Technical assistance to Commissionerate of Police has been provided for performance evaluation of 111 numbers of sound limiters of different band parties in respect of noise [limited to 65 dB(A)].
- To assess the impact of bursting of fire crackers during Deepavali, the ambient air quality with respect to parameters like SO₂, NO_x, PM₁₀ & PM_{2.5} have been monitored in pre- and on the day of Deepavali at 36 locations in 14 towns/ cities i.e., Angul, Balasore, Berhampur, Bhubaneswar, Cuttack, Jharsuguda, Kalinganagar, Keonjhar, Konark, Paradeep, Puri, Rayagada, Rourkela and Sambalpur. In addition to this, continuous ambient air quality monitoring was conducted in capital city, Bhubaneswar from 20th October to 3rd November, 2019 in compliance to the orders of Hon'ble Supreme Court.

11. Board's Publications

The Board has published the following Book & Reports during April, 2019 to Mar, 2020.

- » Three volumes of Newsletters "Paribesh Samachar" i.e. April-June, 2019, July-September, 2019 & October- December, 2019).
- » Book on "**Status and Trends of coastal parameters 2013-2018**" by ICZMP, SPCB, Odisha.

12. Awareness Programmes

- The Board observed the World Environment Day on 5th June' 2019 through 12 Regional Offices to create awareness on environmental protection. Messages on protection of environment were given to the public through meetings, mass campaign, paintings, debates & plantations etc.
- The 36th Foundation Day of the Board was observed on 18th Sept, 2019 at Jaydev Bhawan, Bhubaneswar followed by release of newsletters and books. Prof. Binay Kumar Dutta, Former Chairman of West Bengal Pollution Control Board and Visiting Professor, School of Environmental Science and Engineering, IIT Kharagpur delivered Prof. M.K. Rout Memorial Lecture on "**Remediation of Contaminated Soil**".
- The International Coastal Clean-up Day was observed by the Board on the Sea Beaches of Puri, Konark, Chandipur, Gopalpur & Paradeep on 21st Sept, 2019 for creation of mass awareness on protection and management of coastal environment involving District Administration, different NGOs & Volunteers.
- The World Ozone Day was observed by the Board through Regional Offices on 16th September, 2019 involving stake holders of different industries, NGOs and students from different Institutes to spread awareness on depletion of Ozone layer.
- During Deepavali festival, awareness campaign was organized in & around Bhubaneswar and Cuttack for creating awareness among the public on effect of crackers on air pollution & noise pollution.
- Out of 7 non-attainment cities (Angul, Balasore, Bhubaneswar, Cuttack, Kalinga Nagar, Rourkela and Talcher) in Odisha, State Pollution Control Board Odisha in association with Energy Policy Institute at the University of Chicago organized 4 citizen engagement workshops at 4 non-attainment cities such as Angul, Balasore, Kalinga Nagar and Rourkela under National Clean Air Program (NCAP).

13. Human Resource Development

- The Board has conducted various programmes through the Centre for Excellence for imparting training to various stakeholders on pollution control and environment protection and also deputed its officials on exposure training to acquire knowledge and exposure in the above field.
- Imparted training on “Ambient air quality monitoring” to 65 B.Sc Nursing (Hons) Students and 33 numbers of MBBS students of All India Institute of Medical Science, Bhubaneswar.
- Imparted training on “Prevention & control of Vehicular Pollution” to 309 numbers of Traffic personnel at Traffic Training Institute, Bhubaneswar.
- The Board in association with Centre for Science and Environment (CSE), Delhi and Forest and Environment Govt. of Odisha had organized a stake holder workshop in Air Quality Action Plan (AQAP) for 6 non attainment cities (Angul, Balasore, Bhubaneswar, Cuttack, Rourkela and Talcher) in Odisha on 4th June, 2019.
- Board officials were deputed as resource persons in three different training programmes such as “Environment Impact Assessment”, “ETP/STP operation and maintenance” and “Waste Management” under “Green Skill Development Programme (GSDP)” of MoEF & CC organized by Centre for Environmental Studies (CES). In each training programme 60 participants in three different batches were given demonstration and hands-on training for sampling and analysis of water, wastewater, ambient air monitoring & analysis, soil and hazardous waste sampling & analysis.
- One day workshop was organized on “**Pollution Control in Iron & Steel Industry – Digital Transformation with the power of IOT**” by Biju Pattnaik National Institute, Puri, in collaboration with SPCB, Odisha held on 8th January, 2020.

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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.

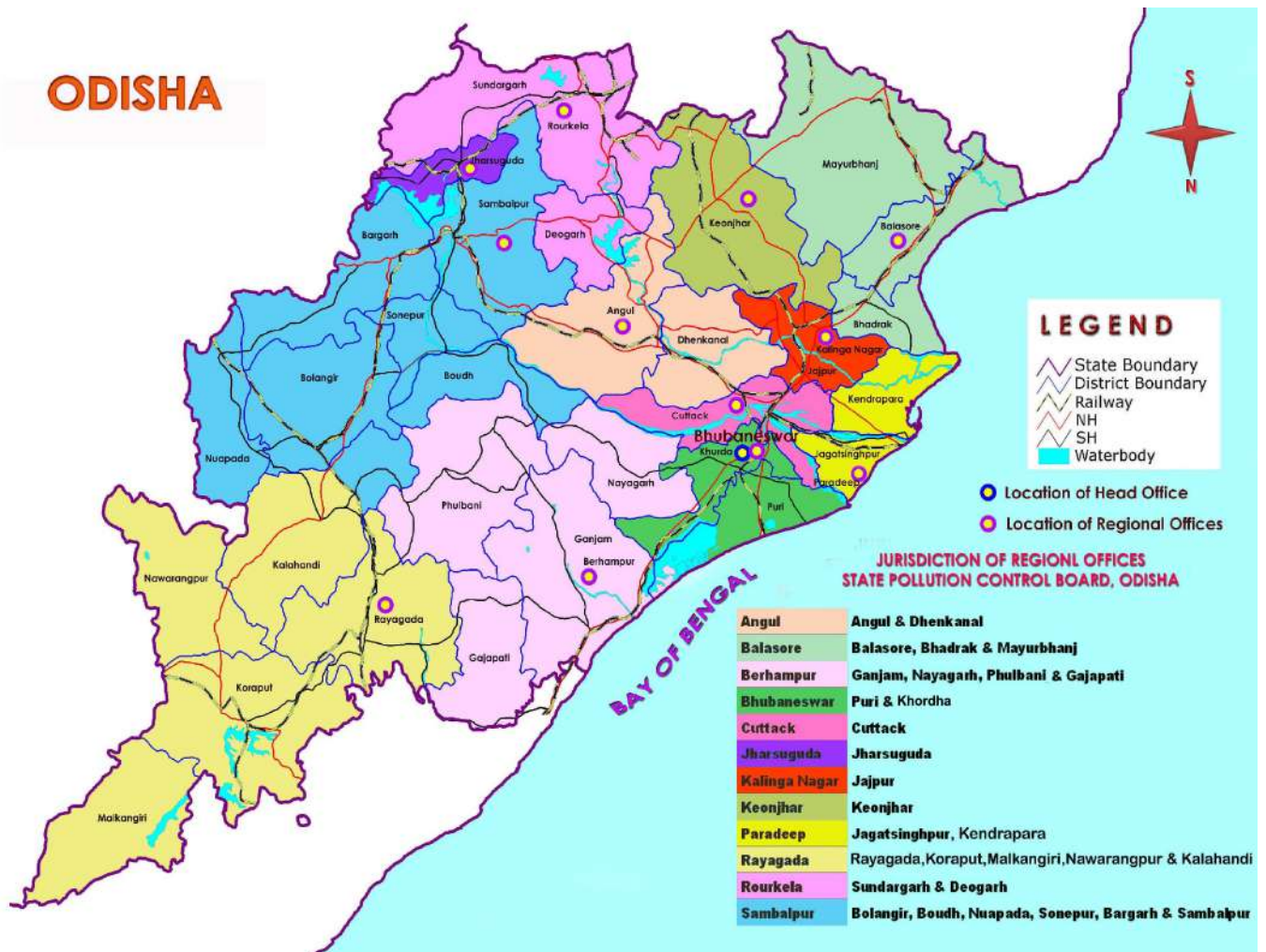
The jurisdictions, various functions, role, responsibilities and powers of Regional Officers of all the 12 Regional Offices have been defined vide Board's Office Order No. 16908, dtd.19.09.2013. The mailing addresses, Telephone/Fax Nos., E-mail/website and jurisdiction of the Head Office, the Central 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
2	Regional Office, Balasore, Plot No – 1602, Ganeswarpur mouza, Januganj, Balasore – 756019	Tel/Fax-(06782) 265110 Email:rospcb.balasore@ osp- cboard.org	Balasore Bhadrak 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	Ganjam Gajapati Phulbani Nayagarh

Sl. No.	Address	Telephone / FAX / e-Mail / Website	Jurisdiction (Districts)
4	Regional Office, Bhubaneswar, B-59/2 & 59/3, Chandaka Industrial Estate, Patia, Bhubaneswar	R.O Tel - (Mob) 9438883892 E-mail : rospcb.bhubaneswar @ospcb.org Website: www.ospcb.org	Puri Khordha
5	Regional Office, Cuttack, Plot No. 586, Surya Vihar, Link Road, Cuttack – 753 012	Tel/Fax-(0671) 2335478 E-Mail : rospcb.cuttack@ ospcb.org	Cuttack
6	Regional Office, Keonjhar At - Baniapat, College Road, Keonjhar- 758 001	Tel / Fax - (06766) 259077 E-Mail: rospcb.keonjhar@ ospcb.org	Keonjhar
7	Regional Office, Rayagada 287/A, Kasturi Nagar, Rayagada – 765 001	Tel-(06856) 223073 Fax-(06856) 224281 E-Mail: rospcb.rayagada@ ospcb.org	Rayagada Koraput Nawarangpur Malkangiri Kalahandi
8	Regional Office, Rourkela, Town Engineering Office Premises, Sector – 5, Rourkela – 769 002	Tel - (0661) 2646736 Fax – (0661) 2648999 E-Mail: rospcb.rourkela@ ospcb.org	Sundergarh except Himgiri block of Sundergarh district (Basundhara mining areas) Deogarh
9	Regional Office, Sambalpur, Plot No.1070 Hospital Road, Modipara, Sambalpur- 768 002	Tel- (0663) 2541910 Fax – (0663) 2541978 E-Mail:rospcb.sambalpur@ ospcb.org	Sambalpur Bargarh Boudh Bolangir Nuapada Sonepur
10	Regional Office, Jharsuguda, Plot No. 370/5971, At – Babubagicha (Cox Colony) St. Mary's Hospital Road, PO- Industrial Estate, Dist.-Jharsuguda- 768203	Tel- (06645) 273284 Fax – (06645) 2732294 E-Mail: rospcb.jharsuguda@ ospcb.org	Jharsuguda Himgiri block of Sunder- garh 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@ ospcb.org	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@ ospcb.org	Jagatsinghpur 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 administering 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 A. P.Padhi, IAS (From 01.12.2018 to 19.08.2019)

Sri Asit Tripathy, IAS, Chief Secretary, Odisha (From 19.08.2019 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, Bhubaneswar
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.

Sri Debidutta Biswal, IFS (From 29.07.2016 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 lying 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 dealing 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 Consent 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)	Prof. S. Jayantu, Dept. of Mining Engineering, NIT Rourkela 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)	Dr. Somanath Mishra, Ex- Principal, REC, Rourkela, Dr. R. C. Gupta, Professor and Head, /Department of Metallurgical Engineering , Institute of Technology, Banaras Hindu University
3.	Power Projects (vide Office Order No. 10761, dt. 03.05.07)	Sri B. C. Jena, Ex-CMD, Grid Corp. of Odisha Ltd, Bhubaneswar Mr. G. S. Panda, Ex. Head TTPS, Sailashree Vihar, Bhubaneswar
4.	Chemical and Allied industries (vide Office Order No. 10850, dt. 05.05.07)	Prof. G. K. Roy, Dept. of Chemical Engineering, NIT, Rourkela 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)	Dr. M. O. Garg, Director, Institute of Petroleum, Dehradun Prof. P. Rath, HOD, Department of Chemical Engineering, NIT, Rourkela
6.	Aluminium Smelter (vide Office Order No. 14791, dt. 22.06.07)	Dr. R. K. Paramguru, Scientist – G, Head, Hydro & Electrometallurgy Dept., Institute of Minerals & Materials Technology (formerly known as Regional Research Laboratory) Bhubaneswar, Odisha Sri R. N. Jena, Ex-General Manager, NALCO Smelter Plant, Angul
7.	Port Projects (vide office order No. 16387, dt. 05.07.2008)	Dr. R. Sundarvadivelu, Professor and Head, Department of 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 Sri Dibakar Mohapatra, (Retd. Chief Engineer, Paradeep Port Trust), Plot No. 7A, Brahmeswar Bag, Tankapani Road, Bhubaneswar

3.1.2 Consent Committee Meetings

Eleven Consent Committee meetings were held for consideration of 98 proposals for establishment during the financial year 2019-20. 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 discussed
1.	03.04.2019	14
2.	22.05.2019	15
3.	24.06.2019	07
4.	24.07.2019	09
5.	27.08.2019	11
6.	30.09.2019	11

Sl. No.	Date of Consent Committee meeting	No. of cases discussed
7.	28.10.2019	07
8.	29.11.2019	05
9.	06.01.2020	08
10.	28.01.2020	08
11.	28.02.2020	03
Total		98

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

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

Table – 3.5 Details of Internal Consent Committee Meeting

Sl. No.	Date	No. of cases discussed
1.	18.11.2019	03
2.	22.01.2020	04
3.	18.02.2020	03
4.	18.03.2020	02
Total		12

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 Pollution Control Board, 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 Professor, 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. Engineer, 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 2019-20 vide order No. 4871, dt.22.05.2019 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.	Chief Env. Scientist, Central Lab. 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, Odisha, Bhubaneswar	Member
8.	Env. Scientist, (Purchase), CLP Cell, State Pollution Control Board, Odisha, Bhubaneswar.	Member Convenor

Technical Committee has been constituted vide order No. 4866, dt.22.05.2019 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.	Chief Environmental Scientist, Central Lab., State Pollution Control Board, Odisha	Chairman
2.	Sr. Environmental Scientist, (L-I) Central Lab., State Pollution Control Board, Odisha	Member
3.	Dr. S.G. Kumar, Senior Scientist, Regional Plant Resource Centre, Bhubaneswar	Member
4.	Env. Scientist, (In charge of Chemical and Biological Laboratory), State Pollution Control Board, Odisha, Bhubaneswar	Member
5.	Env. Scientist, (In charge of (Air Lab.), State Pollution Control Board, Odisha, Bhubaneswar	Member
6.	Addl. Administrative Officer, State Pollution Control Board, Odisha, Bhubaneswar	Member
7.	Accounts Officer, State Pollution Control Board, Odisha, Bhubaneswar.	Special Invitee
8.	Env. Scientist, (Purchase), State Pollution Control Board, Odisha, Bhubaneswar	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, Odisha	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 Officer, 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 2019-20, two Board Meetings were held.

The 119th & 120th Board meetings of the State Pollution Control Board, Odisha were held on 29th June, 2019 & 2nd January, 2020 respectively.

4.2 IMPORTANT DECISIONS OF THE 119th BOARD MEETING ARE AS FOLLOWS:

- The Board confirmed the proceedings of 118th Board Meeting held on 29th January, 2019.
- The Board approved the proposal for delegation of financial power to the Addl. Administrative Officer for sanction to an extent of Rs. 75,000/- (Rupees Seventy Five Thousand) only in each case in order to meet day to day official expenses.
- The Board approved the proposal for revision of sampling and analysis charges at par with the rate fixed by the CPCB, New Delhi.
- The Board approved the proposal of extending the project work on “Development of Geo-Database for Environmental Mapping and Web Based GIS Application conducted in Critically Polluted Areas” to the whole state in Odisha.
- The Board approved the proposal to revise the categorization of HCEs in the State of Odisha as follows:
 - 1) HCEs having wastewater generation < 100 KLD and having ≥ 30 beds to be categorized as Orange category.
 - 2) HCEs having less than 30 beds to be categorized as “white category”. They will be regulated under authorization administration under Bio Medical Waste Management Rules. 2016.
- The Board approved the proposal for delegation of power for grant/refusal of Consent to Operate of Common Hazardous Waste Treatment, Storage & Disposal facility (CHWTSDF) to the Member Secretary.
- The Board ratified delegation of power, made to the officers of the Board under authorization of Biomedical Waste Management Rules, 2016.
- The Board ratified the constitution of “Technical Committee” & “Purchase Committee” for procurement of scientific items and their maintenance.
- The Board approved the proposal for adoption the policy for Regulating Consent to Establish and Authorisation of Hazardous Waste Recycling Industries /Actual users.

4.3 IMPORTANT DECISIONS OF THE 120th BOARD MEETING ARE AS FOLLOWS:

- The Board confirmed the proceedings of the 119th Board meeting held on 29.06.2019.
- The Board approved the draft Annual Report for the Financial Year 2018-19.
- The Board approved delegation of financial power to the Member Secretary to incur expenditure and sanction for a sum of Rs. 10.00 lakh (Rupees Ten Lakh) in each case.
- The Board approved the proposal for filling up of the existing base level vacant posts of Asst. Env. Engineers (13 posts), Asst. Env. Scientists (15 posts), in Group-B category.
- The Board approved the proposal of filling up of base level vacant posts of Sr. Scientific Assistant (07 posts) and Asst. Law Officer (01 post) following due procedure as contained in the “Recruitment and Conditions of Service of Employees of the SPC Board, Orissa Regulation -2011”.
- The Board ratified the action taken by the Chairman for realisation of EPF employer share withdrawn by the employees prior to Pension Regulation 2011 – Policy Thereon.
- The Board ratified the Pension / Family Pension of Pre-2016 and post-2016 Pensioners/Family Pensioners.

CHAPTER – V

ACTIVITIES

5.1 CONSENT TO ESTABLISH (CTE)

5.1.1 Projects related to Manufacturing and Service Sectors

Board received 992 applications from different manufacturing and service sectors for consent to establish during 2019-20 and 401 pending proposals were carried forward from the year 2018-19.

Consent to establish was granted to 874 units. The detailed status of 1393 Consent to Establish applications processed during 2019-20 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 Offices (R.O.)	Total
1.	No. of applications received during 2019-20	104	888	992
2.	No. of applications carried forward from 2018-19	90	311	401
	Total applications	194	1199	1393
	Consent to establish granted	100	774	874
	Consent to establish refused/applications rejected.	00	158	158
	No. of applications under evaluation	94*	267	361

N.B: *Incomplete applications and asked to comply-94 Nos.

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

Regional Office	No. of applications received during 2019-20	No. of applications carried forward from year 2018-19	Total no. of applications received	No. of units granted	No. of units refused/rejected	No. of cases disposed off	Under evaluation
1	2	3	4 (2+3)	5	6	7 (5+6)	8 (4-7)
Angul	30	28	58	42	00	42	16
Balasore	69	03	72	62	01	63	09
Berhampur	139	37	176	146	22	168	08
Bhubaneswar	150	126	276	61	102	163	113
Cuttack	33	11	44	44	00	44	00
Jharsuguda	71	02	73	72	00	72	01
Kalinga Nagar	52	11	63	54	00	54	-9
Keonjhar	40	08	48	30	02	32	16
Paradeep	22	06	28	24	00	24	04
Rayagada	83	43	126	50	28	78	48
Rourkela	96	15	111	74	02	76	35
Sambalpur	103	21	124	115	01	116	08
Total	888	311	1199	774	158	932	267

5.1.2 Mines, Minor Minerals and Stone&Sand Quarry

The detailed status of 99 applications processed for consent to establish for mining, Minor Minerals and Stone & Sand Quarry operations during 2019-20 is given in Table-5.3.

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

Sl. No.	Status	Mines, Minor Minerals & Stone, Sand Quarry
1.	Applications received during 2019-20	88
2.	Applications carried forward from 2018-19	11
3.	Total number of applications	99
	Consent to Establish granted	72
	Consent to Establish refused/ clarification raised	08
	No. of applications under evaluation	19

5.1.3 Status of Consent to Establish of Brick Manufacturing Units

Details of consent to establish of brick manufacturing units during 2019-20 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 2019-20	11
2.	No. of applications carried forward from 2018-19	11
	Total number of complete applications	22
3.	Consent to Establish granted	11
4.	Consent to Establish refused	11
5.	No. of applications under evaluation	00

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 2019-20 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 2019-20	108
2.	No. of applications carried forward from 2018-19	51
	Total Number of complete applications	159
3.	Consent to Establish granted	108
4.	Consent to Establish refused	15
5.	No. of applications under evaluation	36

5.2 CONSENT TO OPERATE (CTO)

5.2.1 Status of Consent to Operate

Board has received 2801 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 774 pending cases were carried forward from 2018-19 and disposed 2935 applications for consent to operate during the year 2019-20. The details are given in Table-5.6.

Table - 5.6 Status of Consent to Operate

Name of the office	No. of complete Applications received 2019-20	No. of cases carried forward from 2018-19	Total no. of complete applications	No. of units granted CTO	No. of units refused/ rejected/ clarification raised	No. of cases disposed	No. cases under evaluation	No. of Show Cause Notices Issued
1	2	3	4 (2+3)	5	6	7 (5+6)	8 (4-7)	9
Angul R.O.	187	144	331	264	00	264	67	17
Balasore R.O.	108	16	124	118	05	123	01	44
Berhampur R.O.	334	143	477	368	64	432	45	55
BBSR, R.O	546	188	734	158	383	541	193	86
Cuttack R.O.	80	08	88	87	00	87	01	00
Keonjhar R.O.	62	03	65	43	02	45	20	05
Rayagada R.O.	154	112	266	207	11	218	48*	23
Rourkela R.O.	111	48	159	121	06	127	32	32
Sambalpur R.O.	595	80	675	517	04	521	154	83
Kalinga Nagar R.O	141	10	151	127	00	127	24	20
Jharsuguda RO	174	01	175	156	00	156	19	13
Paradeep RO	36	05	41	34	05	39	02	00
Head office	273	16	289	252	03	255	34	40
Total	2801	774	3575	2452	483	2935	640	418

N.B: * Out of 48 applications, 38 are incomplete and 10 are under process.

Category wise consent to operate status during 2019-20 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 applications received 2019-20	No. of cases carried forward from 2018-19	Total no. of complete applications	No. of units granted CTO	No. of units refused/ clarification raised	No. of cases disposed	Under evaluation	No. of Show Cause Notices Issued
1	2	3	4(2+3)	5	6	7(5+6)	8(4-7)	9
Angul R.O.	13	06	19	19	00	19	00	00
Balasore R.O.	12	00	12	12	00	12	00	00
Berhampur R.O.	23	03	26	23	03	26	00	00

Name of the office	No. of complete applications received 2019-20	No. of cases carried forward from 2018-19	Total no. of complete applications	No. of units granted CTO	No. of units refused/clarification raised	No. of cases disposed	Under evaluation	No. of Show Cause Notices Issued
Bhubaneswar R.O	13	01	14	04	10	14	00	08
Cuttack R.O.	02	00	02	01	00	01	01	00
Jharsuguda R.O.	43	00	43	36	00	36	07	00
Kalinga Nagar R.O.	13	02	15	13	00	13	02	07
Keonjhar R.O.	09	00	09	06	00	06	03	00
Paradeep RO	00	00	00	00	00	00	00	00
Rayagada R.O.	17	00	17	09	00	09	08	00
Rourkela R.O.	10	09	19	14	00	14	05	00
Sambalpur R.O.	35	02	37	37	00	37	00	00
Head office	87	09	96	92	01	93	03	07
Total	277	32	309	266	14	280	29	22

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

Name of the office	No. of complete Applications received 2019-20	No. of cases carried forward from 2018-19	Total no. of complete applications	No. of units granted CTO	No. of units refused	No. of cases disposed	Under evaluation	No. of Show Cause Notices Issued
1	2	3	4 (2+3)	5	6	7 (5+6)	8 (4-7)	9
Angul R.O.	60	92	152	125	00	125	27	11
Balasore R.O.	45	00	45	45	00	45	00	05
Berhampur R.O.	36	19	55	43	06	49	06	00
Bhubaneswar R.O	210	30	240	29	184	213	27	14
Cuttack R.O.	01	03	04	04	00	04	00	00
Jharsuguda R.O.	16	00	16	14	00	14	02	00
Kalinga Nagar R.O.	53	05	58	50	00	50	08	03
Keonjhar R.O.	12	02	14	06	00	06	08	03
Paradeep R.O.	00	00	00	00	00	00	00	00
Rayagada R.O.	25	03	28	18	00	18	10	13
Rourkela R.O.	14	14	28	26	00	26	02	02
Sambalpur R.O.	28	14	42	36	00	36	06	05
Total	500	182	682	396	190	586	96	56

(c) Brick Manufacturing Units

Name of the office	No. of complete Applications received	No. of cases carried forward from 2018-19	Total no. of complete applications	No. of units granted CTO	No. of units refused	No. of cases disposed	Under evaluation	No. of Show Cause Notices Issued
1	2	3	4 (2+3)	5	6	7 (5+6)	8 (4-7)	9
Angul R.O.	00	10	10	00	00	00	10	00
Balasore R.O.	00	00	00	00	00	00	00	16
Berhampur R.O.	00	00	00	00	00	00	00	00
Bhubaneswar R.O.	04	00	04	00	04	04	00	00
Cuttack R.O.	00	00	00	00	00	00	00	00
Jharsuguda R.O.	00	00	00	00	00	00	00	00
Kalinga Nagar R.O.	00	00	00	00	00	00	00	00
Keonjhar R.O.	00	00	00	00	00	00	00	00
Paradeep RO	01	00	01	00	01	01	0	00
Rayagada R.O.	00	00	00	00	00	00	00	00
Rourkela R.O.	00	06	06	00	06	06	00	24
Sambalpur R.O.	00	01	01	00	01	01	00	00
Total	05	17	22	00	12	12	10	40

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 sanitary conditions of open drain carrying sewage/sullage as per the CPCB guidelines. The new standards formulated by CPCB, Delhi for treated sewage effluent has been intimated 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 through online monitoring from all the States and to maintain a central data base by 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 152 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 31.03.2020		
		AAQMS	CEMS	EQMS
1	Arcelor Mittal Nipon Steel Ltd. Formerly Essar Steel India Ltd	3	1	0
2	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	Emami Cement Ltd. Grinding Unit	0	2	0
6	Essar Power Orissa Ltd	2	1	1
7	Facor Power Limited	3	1	0
8	GM Iron & Steel Company Limited	0	2	0
9	GOA CARBON LIMITED	2	1	0
10	Grasim Industries Ltd (formerly known as Jayshree Chemicals Ltd)	0	5	1
11	Hindustan Coca-Cola Beverages Pvt Ltd	0	0	1
12	Indian Farmer Fertilizer Cooperation	3	8	1
13	Indian Metals & Ferro Alloys Ltd (120 MW PP)	4	2	0
14	Indian Metals & Ferro Alloys Ltd.	0	2	0
15	JK Lakshmi Cement Limited	1	1	0
16	JSW Cement LIMITED	1	2	0
17	Jai Hanuman Udyog Ltd	0	1	0
18	Jay Jagannath Steel & Power Ltd.	0	2	0
19	K.J.S. Ahluwalia Ltd. (Hima Ispat Pvt. Ltd)	0	3	0
20	KAMANDA STEEL PLANT	4	5	0
21	ACC Ltd	3	4	1
22	Grewal Associates (P) Ltd.	0	2	0
23	MAA MANASHA DEVI ALLOYS PVT LTD	0	1	0
24	Meta Sponge (P) Ltd	0	1	0
25	Neelachal Ispat Nigam Limited	3	4	2
26	Rourkela Steel Plant	4	21	8
27	Tata Sponge Iron Ltd	3	3	0
28	Visa Steel Ltd	4	7	1

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2020		
		AAQMS	CEMS	EQMS
29	Emami Paper Mill Ltd.	3	3	1
30	Birla Tyres	1	3	0
31	Green Waves Pvt. Ltd.	0	0	1
32	Jalan Carbons and Chemicals Pvt. Ltd.	1	0	0
33	Jindal Steel & Power Limited	2	2	0
34	Kapilas Cement Manufacturing Works(A unit of OCL India Ltd)	3	1	0
35	MSP Sponge Iron Ltd	0	3	1
36	Talcher Thermal Power Stations	4	6	1
37	Tata Steel Limited	7	18	2
38	Utkal Metaliks Ltd	0	1	0
39	Vedanta Limited (2400 MW Thermal Power Plant)	4	4	1
40	Vedanta Limited (Smelter & CPP)	4	33	3
41	Virajaa Steel &Power Pvt. Ltd.	0	1	0
42	Vishal Metaliks Pvt. Ltd	0	1	0
43	KJ Ispat Ltd.	0	1	0
44	Kalinga Sponge Iron Limited	0	1	0
45	Mahakali Ispat Pvt. Ltd.	0	1	0
46	Shree Ganesh Metaliks Limited	0	3	0
47	Aaditya Kraft and Papers Pvt. Ltd	0	1	1
48	Aarti Steels Ltd.	4	8	0
49	Aditya Aluminium(A unit of Hindalco Industries Ltd.)	4	14	1
50	Agarsen Sponge Private Limited	0	2	0
51	Aryan Ispat & Power Ltd.	3	2	0
52	B.R. Sponge & Power Limited	0	1	0
53	BRG Iron & Steel Co. Ltd.	0	2	0
54	Bhaskar Steel & Ferro Alloys Ltd.	0	1	0
55	Bhubaneshwar Power Pvt. Ltd.	4	2	1
56	Bhusan Power & Steel Ltd	2	35	4
57	Boudh Distillery Pvt Ltd	0	1	1
58	Brand Steel & Power Pvt. Ltd	0	1	0

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2020		
		AAQMS	CEMS	EQMS
59	Crackers India (Alloys) Ltd.	0	1	0
60	GMR Kamalanga Energy Ltd.	4	3	1
61	Ganesh Sponge Pvt. Ltd	0	1	0
62	Govindam Projects (P) Ltd.	0	1	0
63	Hindalco Industries Ltd. (Smelter Plant)	2	7	5
64	Hindalco Industries Ltd.(CPP)	3	5	1
65	Hindalco Industries Ltd. (FRP)	0	3	2
66	IB Thermal Power Station (OPGC)	6	4	2
67	Indian Metals & Ferro Alloys Ltd.(138 MW)	0	6	0
68	J.K. Paper Ltd.	3	3	1
69	Jai Balaji Jyoti Steels Ltd	0	2	0
70	Jay Iron & Steels Limited	0	1	0
71	Jindal Coke Limited	0	1	1
72	Jindal India Thermal Power Ltd.	4	2	0
73	Jindal Stainless Steel Ltd.	4	6	1
74	Jindal Steel and Power Ltd.	4	37	3
75	Kashvi International Pvt Ltd.	0	2	0
76	Kaushal Ferro Metals (P) Ltd.	0	1	0
77	Khedaria Ispat Limited	0	1	0
78	L.N. Metallics Ltd.	0	1	0
79	Maa Samaleswari Industries Pvt. Ltd.	0	1	0
80	Maa Shakumbari Sponge Pvt. Ltd.	0	1	0
81	Mayur Electro Ceramics (P) Ltd.	0	2	0
82	N.K. Bhojani Pvt. Ltd.	0	1	0
83	Narbheram Power & Steel Ltd.	0	1	0
84	Nava Bharat Ventures Ltd. (CPP)	3	3	1
85	New Laxmi Steel and Power Pvt. Ltd. (Unit III) (Formerly known as Suryaa Sponge Iron Limited)	0	2	0
86	OCL INDIA Ltd.	4	10	1
87	OCL Iron and Steel Ltd.	0	4	0
88	Ores Ispat Pvt. Ltd.	0	1	0

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2020		
		AAQMS	CEMS	EQMS
89	Paradeep Phosphate Limited	4	8	3
90	Paradeep Refinery Project IOCL	7	21	1
91	Patnaik Steel & Alloys.	0	1	0
92	Pawanjay Sponge Iron Ltd.	0	1	0
93	Pooja Sponge (P) Ltd.	0	2	0
94	Prabhu Sponge Pvt. Ltd.	0	2	0
95	R.B. Sponge Iron Pvt. Ltd.	0	1	0
96	Rourkela Sponge LLP (Formerly known as Maa Tarini Industries Ltd)	0	2	0
97	Rathi Steel and Power Ltd	0	1	0
98	Reliable Sponge Pvt. Ltd.	0	1	0
99	Rexon Strips Ltd.	0	1	0
100	SMC Power Generation Ltd	4	2	0
101	Seeta Integrated Steel & Energy Ltd.	0	2	0
102	Shakti Sugar Ltd. (Distillery Unit)	0	1	2
103	Shiv Metallicks (P) Ltd.	0	1	0
104	Shiva Cement Ltd.	0	4	0
105	Shree Hari Sponge Pvt. Ltd.	0	1	0
106	Shree Jagannath Steels & Power Ltd.	0	3	0
107	Shri Mahavir Ferro Alloys Private Limited.	0	4	0
108	Shyam Metaliks & Energy Ltd.	4	10	1
109	Sponge Udyog Pvt. Ltd.	0	1	0
110	Sree Metaliks Ltd.	0	9	0
111	Sri Balaji Metalics Pvt. Ltd.	0	1	0
112	Sri Hardev Steels Pvt. Ltd.	0	1	0
113	Suraj Products Ltd.	0	3	0
114	Surendra Mining Indsutries (P) Ltd	0	2	0
115	Swastik Ispat Pvt. Ltd.	0	2	0
116	T.R. Chemicals Pvt. Ltd.	0	1	0
117	TIMES STEEL POWER PVT LTD	0	1	0
118	Toshali Cements Pvt. Ltd.	0	2	0

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2020		
		AAQMS	CEMS	EQMS
119	Vasundhara Metaliks Pvt. Ltd.	0	2	0
120	Vikram Pvt. Ltd.	0	1	0
121	Viraj Steel & Energy Pvt. Ltd	0	3	0
122	Yazdani Steel and Power Ltd	0	2	0
123	MGM Minerals Limited (Formerly MGM Steels Ltd.)	0	1	0
124	Maa Samaleswari Ferro Metals Pvt. Ltd	0	1	0
125	Mideast Integrated Steels Ltd	4	5	1
126	NALCO CPP	4	10	1
127	NALCO Ltd (Smelter Unit)	4	10	1
128	NTPC Ltd Darlipali	4	1	1
129	NTPC-SAIL Power Company (P) Limited. (CPP-II)	3	2	1
130	Reliable Hi-Tech Infrastructure Pvt. Ltd	0	1	0
131	Reliable Hi-Tech Infrastructure Pvt. Ltd	0	0	0
132	Reliable Sponge Pvt Ltd	0	1	0
133	Rungta Mines Ltd. (SID)	4	2	0
134	Sakthi Sugars Limited	0	1	1
135	Sani Clean Pvt Ltd.	0	1	0
136	Scan Steels Ltd (Unit-2)	0	3	0
137	Scan Steels Ltd. (Unit-1)	0	1	0
138	Seven Star Steels Limited	0	2	0
139	Sumrit Metaliks Pvt Ltd	0	1	0
141	Talcher Super Thermal Power Station NTPC	4	6	1
142	Tata Steel BSL	7	34	6
143	Tata Steel Ltd. Ferro Managnese Plant	0	4	0
145	Thakur Prasad Sao & Sons Pvt. Ltd (Unit-IV)	0	2	0
146	Thakur Prasad Sao & Sons Pvt.Ltd (Unit-1)	0	1	0
147	Thakur Prasad Sao & Sons Pvt.Ltd (Unit-3)	0	2	0
148	Toshali Cements Pvt Ltd	0	1	0
149	Ultratech Cement Limited	4	2	0
150	Utkal Alumina International Limited	1	3	0

Sl. No.	Name & Address	No. of Online Monitoring Stations Connected to RT-DAS Server of the SPC Board, Odisha till 31.03.2020		
		AAQMS	CEMS	EQMS
151	Vedanta Limited	6	3	0
152	Visa Sun Coke Limited	0	2	0
	Total	188	558	73

MINES

Sl. No	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., Keonjhar	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 Bonai 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 role, all units brought under consent administration, if found defaulting the prescribed standards, are allowed reasonable time to comply with the standards. On persistent non-compliance, the defaulting units are served with Show Cause Notices (Table 5.6) followed by personal hearing and are generally prescribed time bound action plan for compliance. Consistent non-compliances lead to issue of closure directions. Table-5.9 shows the status of closure directions, issued by the Board.

Table - 5.9 Status of Closure Directions issued during 2019-20.

No. of directions issued	No of industries under closure	No. of revocations after due compliance
127	95	32

5.4 PUBLIC HEARING

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

Details of public hearings conducted during the period 2019-20 are given in Table-5.10 and 5.11.

Table - 5.10 Status of Public Hearings

1	Number of projects received by the Board for public hearing during the financial year 2019-20.	30
2	Number of projects carried forward from previous financial year 2018-19	07
3	Total Number of projects received for public hearing	37
4	Number of projects for which public hearing have been conducted	22
5	Number of cases wherein Collectors were requested to fix up date	10
6	Number of cases for which public hearing date fixed	05

Table - 5.11 Details of Projects for which Public Hearings Conducted

Sl. No.	Name & Address of the project	Purpose	Date
1	Bharat Petroleum Corporation Ltd., Baulsingha, Bhatli, Dist-Bargarh	LPG bottling plant of storage capacity of 3x300 MT.	17-07-2019
2	Bhagabanpur Decorative Stone Mine, Illiyas Granite, Dist-Ganjam	Production of decorative stone over an area of 24.225 Ha (Cluster area 28.333 Ha).	06-08-2019
3	M/s Orissa Mining Corporation Ltd., Mahaparbat (Unchabali) Iron Ore Mines, Unchabali and Balda villages, Joda Block, Dist-Keonjhar	Enhancement of Iron Ore production from 0.07 MTPA to 1.0 MTPA over an area of 68 Ha.	28-08-2019
4	Ghatapada Garnet Mines, At-Ghatapada village, Tehasil: Kesinga, Dist-Kalahandi	Production of Gemstone of 264 Kg/Annum quantity over an area of 25.127 ha	28-08-2019
5	Ghatapada Garnet Mines, At-Ghatapada village, Tehasil:Kesinga, Dist-Kalahandi	Production of Gemstone quantity of 41 Kg/Annum over an lease area of 40.946 Ha	28-08-2019
6	Dhunkapara Decorative Stone Mine, At-Dhunkapara, Tehasil:Polasara, Dist-Ganjam	Production of Decorative Stone Mine 13,272 TPA and processed stone of 2960 m ³ over an area of 23.337 ha (55.8 Ha cluster)	18-09-2019
7	M/s JSW Utkal Steel Ltd. Slurry Pipeline near Joda, Dist- Keonjhar	Iron ore grinding and de-sliming plant to produce 30 MTPA Iron Ore concentrate (Dry process)	19-09-2019

Sl. No.	Name & Address of the project	Purpose	Date
8	M/s ShriMahavir Ferro Alloys Pvt. Ltd. At - Jiabahal, Kalunga Industrial Estate, Kalunga, Dist-Sundergarh	Expansion of Pellet plant with beatification (1800 TPD to 4800 TPD), DRI Plant (300 TPD to 1000 TPD), SMS Plant (0.1 MTPA to 0.3 MTPA), Captive Power Plant (12 MW to 38 MW) and Rolling Mill capacity of 0.25 MTPA at Jiabahal, Kalunga Industrial Estate,	26-09-2019
9	Daitari Iron Ore Mines of M/s OMC Ltd., At- Talapada village, Keonjhar, Jajpur district (Keonjhar district)	Enhancement of Iron Ore production capacity from 3.0 MTPA to 6.0 MTPA over lease area of 1018.3085 ha in village Talapada, Rebana Reserve Forest in Harichandanpur tehsil in Keonjhar and Daitari Protected Forest in Jajpur (Keonjhar district)	01-10-2019
10	Daitari Iron Ore Mines of M/s OMC Ltd., At- Talapada, Keonjhar, Jajpur district (Keonjhar district)	Enhancement of Iron Ore production capacity from 3.0 MTPA to 6.0 MTPA over lease area of 1018.3085 ha in village Talapada, Rebana Reserve Forest in Harichandanpur tehsil in Keonjhar and Daitari Protected Forest in Jajpur (Jajpur district)	04-10-2019
11	Tata Steel Ltd, Kalinganagar, Duburi, Dist- Jajpur	Expansion of steel Plant capacity 6MTPA to 8MTPA	25.10.2019
12	M/s NLC India Ltd. 3x800 MW NLC Talabira Thermal Power Project, At- Khumbhari and Tareikela , Dist -Jharsuguda and Thelkoloji village in the district of Sambalpur (For Jharsuguda Dist)	3 x 800 MW Coal based super critical Thermal Power Plant	13.11.19
13	Paikadakulguda Semi Precious Stone (Cat's Eye) Mine of Sri Bijay Kumar Bansal, At- Paikadakulguda and Kandhadakulguda, Tehasil; BisamCuttack, Dist- Rayagada	Production of Gemstone quantity 41 Kg per annum ML area 40.946 Ha	15.11.19
14	Kurmitar Iron and Manganese Mines of M/s OMC Ltd, At-Tilkuda, Uskuda, Sareikala and Khandadhar Reserve forest, Bonai sub-division of Sundargarh Dist.	Enhancement of Iron ore Production from 2.4 MTPA to 6.0 MTPA, ML area 651 Ha	19.11.19
15	Pottangi Bauxite Mines M/s. NALCO Pottangi	Production of 3.5 MTPA Bauxite ML area 697.979Ha	17.12.19
16	M/s JSW Utkal Steel Ltd in JatadhariMuhan , Dist-Jagatsinghpur. (development of All Weather, Multi-cargo,)	Establishment of 52 MTPA Captive Jetty	20.12.19
17	M/s JSW Utkal Steel Ltd. for establishment of Integrated Steel Plant Paradeep , district - Jagatsinghpur.	Establishment of 13.2 MTPA Crude Steel Plant along with 900 MW CPP & 10 MTPA Cement Plant	20.12.19
18	M/s NLC India Ltd. , Talabira Thermal Power Project ,At- Khumbhari and Tareikela ,Dist-Jharsuguda and Thelkoloji village in the district of Sambalpur (For Sambalpur Dist.)	Establishment of 3x800 MW NLC Talabira Thermal Power Project	10.01.2020
19	Green Tech Environment Management (P) Ltd AT: Plot No. 473, Chaka khata Po- 536 and 207, Mouza: Parmanpur, Dist-Sambalpur	Proposed common Biomedical waste treatment facility	18.01.2020

Sl. No.	Name & Address of the project	Purpose	Date
20	M/s Kandheikela O.S. Shop of Sri LaxmandasRawalani, At- Kandheikela,Lakhanpur Tehasil Dist- Juarsuguda	Production of 1.350 KLD Mahua Flower based Country Sprit/ Liquor	20.01.2020
21	Rarbahal Graphite Mines of ShriAntaryami Mishra, At -Rarbahal,P.O:Belpara. Tehsil -Patnagarh ,Dist- - Bolangir.	Production of Graphite ore upto 0.0138 MTPA over lease area of 20.675 Ha	22.01.2020
22	Raikela Iron ore mines of M/s GeetaraniMohanty,At- Raikela, Tehasil-Koira , Dist- Sundargarh	Enhancement in iron ore production from 0.864 MTPA to 2.99 MTPA over an area of 67.586 ha.	26.02.2020

5.5 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.

5.6.1.1. Authorisation

The Authorization status of hazardous waste generating industries during 2019-20 is given in Table 5.13.

Table 5.13 Authorization Status of Hazardous Waste

Sl. No.	Authorization status	Number
1	Total no. of applications received	171
2	No. of units granted authorisation	111
3	No. of units refused	09
4	Total No. of applications disposed	120
5	No. of applications under evaluation	51
6	No of show cause notices issued	40

5.6.1.2 Utilization and Disposal of Hazardous Waste

Utilisation of Aluminium Dross Rejects / Residues:

Aluminium Dross is a Hazardous Waste generated from the Aluminium Smelters. Although, a good numbers of actual users have been established and operating for reprocessing of the Aluminium Dross, there is no reprocessing unit in Odisha for utilisation of dross rejects / residue generated from Aluminium Dross reprocessing activities. As such rejects / residues constitute about 80% of dross, its disposal in Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF) becomes very uneconomical. In the meantime, an entrepreneur, M/s A. K. Enterprises, Plot No. 45, Mouza - Brahmapur, Dist - Khurda has developed a technology in consultation with M/s Institute of Minerals and Materials Technology (IMMT), Bhubaneswar, a CSIR laboratory for production of non-ferric Alum by utilisation of Aluminium Dross rejects/residues. The unit has already been established with Consent Establish (CTE) of the Board. Trial permission has been accorded by CPCB and trial run has been witnessed by officials of Central Pollution

Control Board (CPCB) and State Pollution Control Board (SPCB), Odisha in the presence of the Scientist of the IMMT and the report has been sent to CPCB for consideration.

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

During the period 2019-20, 26 Nos. of Actual Users (inside Odisha) and 23 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, Spent Pot Lining, Used Lead Acid Battery, Zinc Skimming / Zinc Ash / Zinc Dross, Flue Gas Dust / Gas Cleaning Plant (GCP) Sludge, Vanadium Sludge, 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 & Address of the Actual Users Authorized by SPCB, Odisha	Quantity of Hazardous Waste	Validity
1	Hindalco Industries Ltd., Smelter Unit, (In-house Dross Recycling Plant) At/Po- Hirakud, Dist - Sambalpur, Odisha – 768016 E-mail : ak.agarwala@adityabirla.com hirakud.e@adityabirla.com jagannath.p.nayak@adityabirla.com Mobile : 9090060015	Aluminium Dross - 4,000 T/A	31.03.2023
2	Aditya Aluminium Limited, (A Unit of Hindalco Industries Limited), (In-house Dross Recycling Plant) At/Po - Lapanga, Beside SH - 10, Dist – Sambalpur, Odisha – 768212 E-mail : ranjan.j@adityabirla.com Mobile : 8018043156	Aluminium Dross – 3,060 T/A & Used Anode Butt	31.03.2023
3	National Aluminium Company Ltd., Smelter Plant, NALCO Nagar, Dist-Angul-759145 E-mail : abhijit.sinha@nalcoindia.co.in Mobile : 9437155606	Used Anode Butt	31.03.2021
4	Vedanta Limited, (Smelter and CPP) At - Bhurkamunda, PO - Siripura, Dist - Jharsuguda, Odisha – 768202 E-mail : ASP.Mishra@vedanta.co.in Mobile : 9937285045	Used Anode Butt	31.03.2021
5	A. K. Enterprises Plot No. - A/29, Sarua Industrial Area, Khurda, Odisha - 752057 E-mail : enterprisesake@yahoo.co.in Mobile : 9437199846 / 9238444846	Aluminium Dross – 1,125 T/M	31.03.2021
6	A. K. Enterprises, Plot No. 45, Mouza - Brahmapur, Dist - Khordha, Odisha E-mail : enterprisesake@yahoo.co.in Mobile : 9437199846 / 9238444846	Aluminium Dross Rejects to manufacture Alum- 100T/M	31.03.2023
7	A. K. Enterprises, Plot No. 07, Khordha Industrial Estate, Dist - Khordha, Odisha E-mail : enterprisesake@yahoo.co.in Mobile : 9437199846 / 9238444846	Aluminium Dross – 920 T/M	31.03.2021

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Quantity of Hazardous Waste	Validity
8	Murugappa Enterprises At - Beherapat, Po - H. Kantapali, Dist - Jharsuguda, Odisha E-mail : khanmoinuddin927@gmail.com Mobile : 9824711777	Aluminium Dross - 750 T/M	31-03-2021
9	Shri Sai Metallik At - Jamunalia, PO - Badaposhi VIA - Naranpur, Dist - Keonjhar, Odisha E-mail : shrisaimetalik@gmail.com Mobile : 977601244	Aluminium Dross - 640 T/M	30-09-2021
10	Shree Shyam Minerals, At/Po - Hirma, Dist - Jharsuguda, Odisha E-mail : lalitpoddar@gmail.com Mobile : 9437559511	Aluminium Dross - 1500 T/M	31-03-2021
11	BNDM Enterprises, At: Ladukhai, PO- Kalamati, PS-Burla, Dist: Sambalpur, Odisha- 768025 E-mail : bndmenterprises@gmail.com Mobile: 7377621835	Aluminium Dross - 375 T/M	04.10.2020
12	Metacast International, At/Po - Katapali, Dist - Sambalpur, Odisha E-mail : mci1990@hotmail.com Mobile : 9437052973	Used Anode Butt - 28 T/Day	31.03.2021
13	Green Energy Resources, At - Shanti Nagar Road, Near Furniture Point, Budharaja, Dist - Sambalpur, Odisha - 768004 E-mail : gerodisha@gmail.com Mobile : 9437045555	Spent Pot Lining (Carbon Portion) - 43,200 T/A	31-03-2023
14	ECO Resource Solutions At - Kuradhamalla, Dalaiput, Dist - Khurda, Odisha E-mail : swayamprakashj@gmail.com Mobile : 9178764604	Decontamination of Empty Barrels / Containers / Liners used for handling of hazardous wastes/chemicals as per SOPs of CPCB - 700Nos./Day	31.03.2022
15	Suraj Products Ltd., At - Barapali, Post - Kesharmal, Rajgangpur, Dist - Sundargarh, Odisha E-mail : suproduct@gmail.com Mobile : 9437049074	Flue Gas Dust / Gas Cleaning Plant (GCP) Sludge of LD Furnace / Electric Arc Furnace (EAF) / Blast Furnace of Steel Plant / Captive Blast Furnace - 68,500 T/A GCP Sludge of Ferro Alloy Plant - 2,400 T/A	31.03.2024
16	Asian Petro Chemicals, At- Asanabahali, Po.-Barada, Gundichapada, Dist-Dhenk Mobile : 9040181849	Used Oil - 960 KL/A	31.03.2021
17	Chemical & Metallurgical Co., Shed No. S/III-24, Industrial Estate, Kalunga, Rourkela E-mail : chemical_042@yahoo.com	Used Oil - 720 KL/A	31.03.2021

Sl. No.	Name & Address of the Actual Users Authorized by SPCB, Odisha	Quantity of Hazardous Waste	Validity
18	Jay Maa Durga Industries, Plot No.- A/6, Industrial Estate , Kalunga-770031, Dist- Sundargarh E-mail : felixkumar007@yahoo.com Mobile : 9439231461	Used Oil - 80 T/A	31.03.2023
19	N. S. Chemicals, Plot No.-E/72, Chhend Colony, Rourkela, Sundargarh E-mail : nschemical_2902@yahoo.in Mobile : 9437220798	Used Oil - 936 KL/A	31.03.2023
20	Shree Durga Petrochemicals, Plot No. 89A, New Industrial Estate, Phase-II, Jagatpur, Dist - Cuttack, Odisha - 754021 E-mail : sdpetrochem.103@gmail.com Mobile : 9437021103	Used oil - 2,160 KL/A	31.03.2022
21	M/s. Phoenix India, (Formerly M/s. Purbanchal Petroleum Private Limited), At: Kaligarh, PO: Jadupur, Marsaghai, Dist: Kendrapara, Odisha- 754 213 E-mail : phoenixindia.2015@rediffmail.com Mobile : 8596020218	Used Oil – 3,650KL/A & Waste Oil -12,045 KL/A	31.03.2021
22	Swaraj Lubricants, At - Gobinda, Po - Haldipada, Dist - Balasore, Odisha E-mail : swarajlubricants@gmail.com Mobile : 9777076006	Used Oil - 1,500 KL/A & Waste Oil - 6,000 KL/A	31.03.2023
23	N. C. Oil Refinery Pvt. Ltd., Vill- Sova, Po - Osakana, Balikuda, Dist - Jagatsinghpur, Odisha E-mail : ncoil2010@gmail.com Mobile : 7978386334	Waste Oil - 5,000 KL/A	31.03.2023
24	Omm Sai Refinery, 58/263, Kochilagadia, Po. - Darpanigarh, Dist - Jajpur, Odisha E-mail : prafulla_raj@yahoo.com Mobile : 9437108545	Waste Oil - 10,400 KL/A	31-03-2021
25	Shriya Metals & Chemicals, At - Khairbandh, PO - Ranto Birkeria, PS- Bramhanitarang, Dist - Sundargarh, Odisha – 770037 E-mail : shriya.engineersandchemicals001@gmail.com Mobile : 9438245981	Waste Oil - 7,350 KL/A	31.03.2023
26	Gajanan Petro-Chemical Industry, At-Batijanga, PO: Haridaspur, Dharmasala, Dist: Jajpur, Odisha E—mail : gajananpetrochemical@gmail.com Mobile : 9437090148	Waste Oil – 10,400/KL/A	31.03.2025

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	Capacity of Re-processing	Validity of Authorisation
1	Ashirwad Enterprise, Plot No. 17, Jalaram Industrial Estate, B/H RUDA Trans port, Sonkhada, NavagamTa & Di : Rajkot - 360003 E-mail : dmjethava@gmail.com Mobile : 9998953184	Aluminium Dross – 500 T/M	31-03-2021

Sl. No.	Name & Address of the actual Users Authorized by SPCB, Odisha	Capacity of Re-processing	Validity of Authorisation
2	Shivam Metallurgical Pvt. Ltd., At - 16/1, CSIDC Phase - 2, Siltara Raipur, Chhattisgarh E-mail : shivammetal123@gmail.com Mobile : 8435011000	Aluminium Dross 1,000 T/M	26.10.2021
3	Green Living, Sy. No. 24/3, D-2 of Chimalapalli (V), Porlupalem Gram Panchayat, Visakhapatnam, Dist. (Andhra Pradesh) E-mail : greenliving.vizag@gmail.com Mobile : 8142323683	Spent Anode Butt - 15 T/Day	31.03.2021
4	Alfa Pigment & Chemicals Pvt. Ltd., At/PO: Dankuni, PS: Dankuni, Dist: Hooghly, West Bengal E-mail : spca@gmail.com Mobile : 9674302401	Zinc Dross/Ash/ Skimming-200 T/Month	30.06.2021
5	Cosmo Agromet Industries, At - Plot No. - 409, Industrial Area, Phase - 1, Panchkula - 134113, Haryana E-mail : cosmoagromet@yahoo.com Mobile : 9814334856	Zinc Dross /Ash / Skimmings - 11,724 T/A Brass Dross - 5,400 T/A	06-02-2022
6	G M Admixtures, At-Plot No. 189, Industrial Area, Phase-I, Panchkula, Haryana-134109 E-mail : gmadmixtures@gmail.com Mobile : 9816631328	Zinc Dross / Ash / Skimming - 6,000 T/A	05-02-2022
7	Neelam Metal Products , At - F-40, RIICO Industrial Area, Odela Road, Dholpur, Rajasthan-21 E-mail : neelammetalproducts@gmail.com Mobile : 98370251	Zinc Dross /Ash / Skimmings / Scrap 900 T/A Copper Scrap / Copper wire - 39.96 T/A	31.03.2021
8	R K Products, Village -Mahishrekha, PS - Uluberia, Dangadi,Dist - Howrah, West Bengal E-mail : banerjee.shiv1@gmail.com Mobile : 8910302315	Zinc Dross / Ash / Skimming - 7,200 T/A	31-12-2020
9	Bachhelal Metal Industries, At/Po - 22G Shiv Krishna Daw Lane, Kolkata, West Bengal - 700054 E-mail : bachhelalmetalindustries2015@rediffmail.com Mobile : 9830836045	Lead acid battery plates / ashes / residue / scraps - 4,320 T/A	31-10-2020
10	OM Industries, 7 K. M. Stone, VPO- Titoli, Jind Road, Rohtak, Haryana-124001, India E-mail : happykumarkamra@ymail.com Mobile : 8076652698	Used Oil - 1,000 KL/A	31-03-2021
11	Bharat Petro Industries, At - Khasra No. 2, Plot No - 3A, Khodamatand Area, Udaipur, Madanganj, Dist - Ajmer, Rajasthan - 305801 E-mail : bharatpetroind@gmail.com Mobile : 9269166829	Used Oil - 2,000 KL/A Waste Oil - 800 KL/A	31.03.2023
12	Haryana Petro Oils, At - Plot No. 31, Phase - III rd , Industrial area, Sirsa, Haryana E-mail : sachin_love82@yahoo.com / haryanapetrooil@yahoo.com Mobile : 9215655572/76	Used Oil / Waste Oil - 500 KL/A	30.09.2021
13	JMR Petro Industries, At - Plot No. - EE - 24, AIE Pedagantyada, Gajuwaka, Visakhapatnam, A.P E-mail : jmrpetro@gmail.com Mobile : 9866678645 / 9963487854	Used Oil - 250 KL/A Waste Containing Oil - 2,000 KL/A	31.03.2023

Sl. No.	Name & Address of the actual Users Authorized by SPCB, Odisha	Capacity of Re-processing	Validity of Authorisation
14	K M Oils Pvt Ltd., Plot No-75, 76, 77(A-Part) 2 nd Phase, Kapnoor Industrial Area, Kalaburagi, Banagalore Mobile : 9886927866	Used Oil - 1,500 KL/A Waste Oil - 3,000 KL/A	31.03.2021
15	Lakhdata Petro Chemicals, At-Ramsara, Near GGS Refinery Main Gate, Bhatinda, Punjab E-mail : lakhdatachemical@gmail.com Mobile : 9810015932	Used Oil - 200 KL/A Waste Oil - 1,000 KL/A	30-09-2022
16	Lubrina Recycling Pvt. Ltd., Joy Chandipur, PO- Bakrahat, PS- Bishnupur, Dist - 24 Parganas (South), West Bengal – 743377 E-mail : aashish@lubrinare.com Mobile : 9874290909 / 9831151692	Used Oil - 4,800 KL Waste Oil - 1,800 KL	31.03.2024
17	National Lubricants, At - Gut No. - 495/498 (P), Plot No. - 29, Vill - Kondale, Tal. - Wada, Dist - Palghar, Maharashtra - 421312 E-mail : info@nationallubricants.in Mobile : 9820520853	Used Oil - 1,500 KL/A Waste Oil - 1,500 KL/A	31-03-2021
18	Plus Lubricants, Gvt No.-228, Survey No.-43, Satepada Road, City- Abhitghar-421303, Thane, Maharashtra E-mail : pluslubricants@pluslubricants.in Mobile : 9867421136 / Ph : 022-2666-5151	Used Oil -1000 KL/A Waste Oil - 3000 KL/A	31.03.2023
19	R. S. Oil Industries, Junglepur, Jalan Industrial Complex, Baniyara, Begri (G.P.), Domjur, Howrah - 711 411 E-mail : rsoilind90@gmail.com Phone : 033 - 24598574 / 8576	Used Oil - 100 KL Waste Oil - 1500 KL	31.03.2021
20	Sri Lakshmi Narayana Industries At - Pidimgoyyi (V), Rajahmundry, Dist - East Godavari, Andhra Pradesh E-mail : krishna.nsr111@gmail.com Mobile : 9396622208	Used Oil - 500 KL/A Waste Oil - 1,000 KL/A	31-03-2025
21	Tanu Petrochem Products Private Limited, Plot No - 238, Phase - II, I.D.A, Pashamylarm, Dist - Medak, Andhra Pradesh – 502307 E-mail : tanu_petrochem@yahoo.com Mobile : 9885082850	Used Oil - 1,000 KL/A Waste Oil - 3,000 KL/A	30-09-2022
22	Bristol Petroleum Pvt. Ltd., At: 26/5/D-E, A.M. Ghosh Road, Budge Budge, 24 parganas (S) West Bengal E-mail : bristolpetroleum74@gmail.com Mobile : 9007005515	Used Oil - 500 KL/A Waste Oil - 500 KL/A	31-05-2021
23	N.K. Company, At: 816, Jaigirghat Road, Panerara, Thakurpukur, Kolkata, West Bengal-700 063 E-mail : nkcompany99@gmail.com Mobile : 9230058555	Used Oil – 2,000 KL/A Waste Oil – 3,000 KL/A	30-06.2022

(B) Common Facility for Disposal of Hazardous Wastes

A Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF) has been established during financial year 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, 179 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 -46903.17T
 - i. Landfill after treatment(LAT) Waste - 34823.77 T
 - ii. Direct Land Fill(DLF) Waste - 12079.40 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 2019-20.

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 24 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 110 nos. of half yearly returns from April' 2019 to Sep' 2019 and 105 nos. of half yearly returns from Oct' 2019 to March' 2020 from battery units. These returns have been received from Manufacturer, Re-conditioner, Assembler, Dealer, Bulk Consumer, Auctioneer, Importer & 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 3619 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 Establishment under Authorization Administration.

Sl. No.	District	< 50 beds	50 beds and < 200 beds	200 beds and <500 Abeds	500 beds and above	Other Category*	Total
1	Angul	47	9	0	0	73	129
2	Balangir	36	2	01	0	62	101
3	Balasore	47	4	01	0	110	162
4	Bargarh	40	2	0	0	72	114
5	Bhadrak	19	5	01	0	55	80
6	Boudh	05	1	0	0	12	18
7	Cuttack	230	23	02	01	266	522
8	Deogarh	07	1	0	0	08	16
9	Dhenkanal	38	4	0	0	37	79
10	Gajapati	15	2	0	0	21	38
11	Ganjam	116	9	0	01	142	268
12	Jagatsinghpur	22	3	0	0	44	69

Sl. No.	District	< 50 beds	50 beds and < 200 beds	200 beds and <500 Abeds	500 beds and above	Other Category*	Total
13	Jajpur	38	0	02	0	75	115
14	Jharsuguda	27	3	0	0	32	62
15	Kalahandi	32	3	0	0	96	131
16	Kandhamal	18	2	0	0	49	69
17	Kendrapara	22	1	0	0	53	76
18	Keonjhar	49	4	0	0	100	153
19	Khurda	131	13	10	04	166	324
20	Koraput	24	3	01	0	79	107
21	Malkangiri	21	1	0	0	25	47
22	Mayurbhanj	42	4	01	0	81	128
23	Nawarangpur	12	2	0	0	49	63
24	Nayagarh	33	3	01	0	57	94
25	Nuapada	10	3	0	0	16	29
26	Puri	48	1	01	0	66	116
27	Rayagada	22	3	01	0	64	90
28	Sambalpur	54	2	01	01	65	123
29	Sonepur	11	1	0	0	20	32
30	Sundargarh	53	9	04	01	197	264
Total		1269	123	27	08	2192	3619

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

5.6.5.2 Management of Biomedical Waste

- » 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 important Govt. Medical Colleges and Hospitals namely, S.C.B Medical College and Hospital (SCB MCH), Cuttack, M.K.C.G Medical College and Hospital (MKCG MCH), Berhampur and VIMSAR, Burla, Sambalpur have developed their own infrastructures such as incinerator, shredder, microwave etc. which are being operated by engaging private agencies for the treatment of Biomedical Wastes. The agencies are: M/s. Medi-Aid Marketing Services - engaged by SCB MCH, M/s. Biotech Solution- engaged by VIMSAR & M/s. Life Line Pharma engaged by MKCG MCH. In addition, M/s. Medi-Aid Marketing Services is operating the biomedical waste management facility of Rourkela Govt. Hospital campus, Rourkela on Public Private Partnership mode. These facilities are also being shared by other nearby small Government HCEs.
- » The Common Biomedical Waste Treatment Disposal Facility (CBWTDF) namely M/s Saniclean Pvt. Ltd., at Tangiapada, Khordha is receiving segregated biomedical waste of hospitals in Cuttack city, Bhubaneswar city, Jagatpur, Choudwar, Duburi, Jatni, Paradeep & Khordha town.
- » Out of 3619 HCEs, 694 units 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 2019-20 is presented in Table-5.15

Table - 5.15 Authorisation Status of HCEs During 2019-20

Sl. No.	Status of HCEs	
1	No. of applications received during 2019-20	1362
2	No. of cases carried over from year 2018-19	596
3	Total no. of applications received	1958
4	No. of HCEs granted authorisation	1735
5	No. of HCEs refused authorisation	02
6	Total No. of applications disposed	1737
7	No. HCEs under evaluation / Incomplete application	221
8	No. of HCEs violating the Rules	62
9	No. of HCEs issued show cause notices	30
10	No. of inspection conducted	1578

The Board has submitted the Annual Report on Biomedical Waste Management for 2018 to CPCB.

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.

The Board has submitted the Annual Report on solid waste management for the period 2019-20 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 manufacturer 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. So far, 14 plastic product manufacturing units (06 producers, 05 brand owners and 03 re-processors) have been registered with the Board during the reporting period.

- Major ULBs have been instructed to send segregated plastic waste to cement plants namely M/s. ACC Ltd., Bargarh, M/s. OCL Ltd., Rajgangpur, M/s. Shiva Cement, Sundargrh, M/s. Toshali Cement, Ampavali, Koraput for co-processing in cement Kiln.
- About 28 MT of plastic waste has been sent to M/s. ACC Ltd., Bargarh for co-processing (upto November, 2019).
- 4.6 MT of plastic waste has been used for construction of 9.6 km road in Deogarh and Sambalpur Districts.
- Consent to Establish has been granted to M/s. Hindalco Industries to convert 0.5 MT/Day plastic waste to oil.
- Annual report on Plastic waste management for the period 2019-20 has been sent to CPCB, New Delhi.

State Govt. 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 dismantling units, 02 collection-cum-dismantling units and 01 captive collection centre during 2019-20. Annual report on E-Waste management for the period 2019-20 has been sent to CPCB, New Delhi.

5.6.9. Construction and Demolition Waste Management Rules, 2016

- Ministry of Environment, Forest and Climate Change, Govt. of India has notified Construction and Demolition Waste Management Rules, 2016 on 29th March, 2016. This Rule is applicable to every waste resulting from construction, re-modeling, 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 requested 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. 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 at 127 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)
- (d) *Mineral constituents*: Electrical Conductivity (EC), Total Dissolved Solids (TDS), Boron, Sodium Absorption Ratio (SAR), Total Hardness (TH), Chloride, Sulphate, Fluoride.
- (e) *Nutrients*: Nitrate (Nitrate + Nitrite) – Nitrogen, Phosphate – Phosphorous
- (f) *Metals* :Chromium (Cr) (total and 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) Vadimula; 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

Sl. No.	Source of monitoring	Total No. of Stations		Sampling Station
		NWMP	NRCP	Monthly
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) Binjharapur, (28) Aul; Guradih nallah : (29) Guradih nallah; Badajhor : (30) Badajhor; Damsala : (31) Dayanabill; Gonda nallah : (32) Marthapur; Lingira : (33) Angul U/s, (34) Angul D/s; Ramiala : (35) Kamakhyanagar; Banguru nallah : (36) Bangurunallah; Singada jhor : (37) Singadajhor; Tikira : (38) Kaniha U/s, (39) Kaniha D/s; Bangurusingada jhor : (40) Bangurusingada jhor ; and Karo : (41) Barbil
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

Sl. No.	Source of monitoring	Total No. of Stations		Sampling Station
		NWMP	NRCP	Monthly
(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 and TC, obtained during the year 2019 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-5.19.

From assessment 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 and 2 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. Out of 129 stations, one station is monitored on drain.

Table-5.17 Water quality status of river monitoring stations during 2019

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	11	-	2
2	Brahmani *	41	37	03	-	-
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	112	14	--	2
* 1 station is Drain						

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 sea confluence.

Table-5.18 Annual Average and Range values of Four Criteria Parameters (January-December, 2019)

(A) Mahanadi River System (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Ib river												
1.	Sundargarh	12	7.2 (6.7-8.0)	7.1 (5.8-8.1)	0.8 (0.2-1.7)	1012 (2-3500)	0	0	C	C		
2.	Jharsuguda	12	7.3 (6.5-8.2)	7.9 (7.4-8.8)	1.3 (0.3-2.0)	2103 (640-4900)	0	0	C	C		
3.	Brajarajnagar U/s	12	7.5 (6.7-8.2)	7.9 (7.6-8.6)	1.0 (0.4-1.6)	1759 (330-4700)	0	0	C	C		
4.	Brajarajnagar D/s	12	7.5 (6.9-8.2)	7.5 (7.2-8.0)	1.5 (0.5-2.6)	2341 (490-4900)	0	0	C	C		
Bheden river												
5.	Jharsuguda	12	7.6 (7.0-8.4)	7.8 (7.4-8.6)	1.1 (0.2-2.0)	1560 (20-4900)	0	0	C	C		
Hirakud reservoir												
6.	Hirakud reservoir	12	7.7 (7.3-8.4)	8.0 (7.0-8.6)	0.7 (0.2-1.3)	508 (2-220)	0	0	C	C		
Power Channel												
7.	Power Channel U/s	12	7.7 (7.2-8.2)	7.3 (6.2-8.2)	0.7 (0.4-1.2)	285 (2-1100)	0	0	C	C		
8.	Power Channel D/s	12	7.5 (6.6-7.9)	7.2 (6.0-8.2)	0.8 (0.4-1.3)	424 (2-1300)	0	0	C	C		
Mahanadi river												
9	Sambalpur U/s	12	7.4 (6.7-7.8)	7.3 (6.2-8.2)	0.8 (0.5-1.1)	1549 (45-4900)	0	0	C	C		
10	Sambalpur D/s	12	7.5 (6.7-8.3)	7.2 (6.6-7.8)	1.4 (0.7-1.9)	4716 (130-35000)	0	2 (17)	C	Doesn't conform to Class C	TC	Wastewater of Sambalpur city

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
11.	Sambalpur FD/s at Shankarmath	12	7.4 (7.0-7.7)	7.1 (6.4-7.8)	1.0 (0.3-1.6)	2452 (110-22000)	0	1 (8)	C	Doesn't conform to Class C	TC	Wastewater of Sambalpur city
12.	Sambalpur FFD/s at Huma	12	7.5 (7.0-8.2)	7.4 (6.8-8.2)	0.9 (0.3-1.9)	817 (20-3500)	0	0	C	C		
13.	Sonepur U/s	12	7.6 (7.0-8.3)	7.4 (6.6-8.2)	0.6 (0.3-1.0)	585 (2-3500)	0	0	C	C		
14.	Sonepur D/s	12	7.6 (7.0-8.2)	6.9 (6.2-7.8)	0.9 (0.4-2.3)	1082 (20-3500)	0	0	C	C		
15.	Tikarapada	12	7.4 (6.7-8.3)	7.5 (6.2-8.6)	0.6 (0.3-0.9)	403 (2-1300)	0	0	C	C		
16.	Narasinghpur	12	7.3 (6.6-8.3)	8.0 (6.2-9.2)	0.8 (0.3-1.7)	2139 (20-7900)	0	1 (8)	C	C		
17.	Mundali	12	7.3 (6.6-8.3)	7.7 (6.4-8.9)	0.7 (0.3-1.3)	1181 (120-3500)	0	0	C	C		
18.	Cuttack U/s	12	7.4 (6.7-8.3)	7.9 (6.4-9.1)	0.7 (0.4-1.0)	1292 (20-3300)	0	0	C	C		
19.	Cuttack D/s	12	7.4 (6.9-8.0)	7.4 (4.8-8.7)	1.2 (0.5-1.8)	4090 (78-17000)	0	2 (17)	C	C		
20.	Cuttack FD/s	12	7.4 (6.9-8.0)	8.0 (7.3-9.3)	0.9 (0.4-1.4)	3111 (45-13000)	0	1 (8)	C	C		
21.	Paradeep U/s	12	7.5 (6.8-8.2)	7.6 (6.0-9.0)	1.0 (0.2-1.9)	720 (78-2200)	0	0	C	C		
22.	Paradeep D/s	12	7.6 (7.1-8.2)	7.3 (5.8-9.0)	0.9 (0.5-1.5)	327 (2-1100)	0	0	C	C		
Ong River												
23.	Dharuakhaman	12	7.6 (7.1-8.2)	7.1 (6.2-7.8)	0.9 (0.2-1.2)	275 (2-2200)	0	0	C	C		
Tel River												
24.	Monmunda	12	7.6 (6.9-8.1)	7.21 (6.6-7.8)	0.7 (0.4-1.2)	379 (2-2200)	0	0	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Kathajodi river												
25.	Cuttack U/s	12	7.6 (7.0-8.4)	7.6 (6.0-8.8)	0.7 (0.4-1.1)	1256 (20-3500)	0	0	C	C		
26.	Cuttack D/s	12	7.5 (7.0-8.0)	7.0 (4.9-8.4)	2.1 (0.8-3.9)	35350 (2200-160000)	2 (17)	8 (67)	C	Doesn't conform to Class C	BOD, TC	Waste water of Cuttack city
27.	Matt-agajpur (Cuttack FD/s)	12	7.4 (6.6-8.4)	6.5 (5.0-8.6)	2.0 (0.5-3.5)	19229 (140-160000)	2 (17)	4 (33)	C	Doesn't conform to Class C	BOD, TC	
28.	Kamasasan (Cuttack FFD/s)	12	7.4 (6.6-8.1)	7.3 (5.7-8.8)	1.0 (0.5-1.6)	1641 (20-3500)	0	0	C	C		
Serua River												
29.	Sankhatrasa (Cuttack FD/s)	12	7.3 (6.8-7.9)	7.5 (6.4-8.6)	1.5 (0.7-3.1)	7925 (1300-54000)	1 (8)	3 (25)	C	Doesn't conform to Class C	BOD, TC	Waste water of Cuttackcity
Kuakhai river												
30	Bhubaneswar FU/s	12	7.4 (6.6-8.3)	7.4 (5.5-8.7)	1.1 (0.8-2.2)	1479 (330-3500)	0	0	C	C		
31.	Bhubaneswar U/s	12	7.4 (6.8-8.0)	7.4 (6.1-9.6)	1.5 (1.0-2.8)	2778 (330-4900)	0	0	C	C		
Daya river												
32.	Gelapur	12	7.4 (6.7-8.2)	7.9 (5.5-9.1)	0.9 (0.4-2.3)	1888 (260-3500)	0	0	C	C		
33.	Bhubaneswar D/s	12	7.3 (6.8-7.5)	6.1 (4.1-7.7)	3.8 (1.8-7.3)	38000 (3500-160000)	7 (58)	10 (83)	C	Doesn't conform to Class C	BOD, TC	Waste water of Bhubaneswar city
34.	Bhubaneswar FD/s	12	7.3 (6.7-7.9)	6.3 (4.9-7.5)	3.0 (1.3-7.1)	26500 (2400-160000)	5 (42)	9 (75)	C	Doesn't conform to Class C	BOD, TC	
35.	Kanas	12	7.4 (6.9-8.1)	6.5 (4.4-8.1)	2.0 (0.9-5.1)	7117 (1300-17000)	1 (8)	6 (50)	C	Doesn't conform to Class C	BOD, TC	Human activities

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Gangua River												
36.	Near Rajdhani Engg. College	12	7.0 (6.5-7.5)	2.2 (0.9-5.5)	9.7 (0.7-20.6)	138250 (24000-160000)	11 (92)	12 (100)	C	Doesn't conform to Class C	DO#, BOD, TC	Waste water of Bhubaneswar city
37.	Palasuni	12	7.0 (6.6-7.8)	2.4 (1.0-4.6)	11.7 (1.2-25.5)	148667 (24000-160000)	11 (92)	12 (100)	C	Doesn't conform to Class C	DO#, BOD, TC	
38.	Samantraypur	12	7.1 (6.5-8.0)	1.7 (0.6-4.3)	14.7 (1.7-39.2)	160000 (160000-160000)	11 (92)	12 (100)	C	Doesn't conform to Class C	DO#, BOD, TC	
39.	Vadimula	11	7.0 (6.7-7.4)	3.7 (0.9-5.6)	5.4 (2.0-12.6)	121455 (16000-160000)	9 (82)	12 (100)	C	Doesn't conform to Class C	DO###, BOD, TC	
Birupa River												
40.	Choudwar D/s	12	7.5 (6.8-8.5)	7.5 (6.0-8.7)	0.8 (0.2-2.4)	1629 (260-3500)	0	0	C	C		
Kushabhadra River												
41.	Bhingarpur	12	7.6 (6.7-8.4)	8.1 (6.5-10.6)	1.2 (0.2-2.3)	2203 (230-4300)	0	0	C	C		
42.	Nimapara	12	7.5 (6.8-8.2)	7.4 (5.8-9.3)	1.5 (0.6-2.6)	2740 (490-5400)	0	1 (8)	C	C		
43.	Gop	12	7.5 (6.9-8.3)	7.2 (5.9-9.1)	1.2 (0.3-2.5)	2349 (790-4000)	0	0	C	C		
# Frequency of violation for DO is 11 times (92% of total observation)												
## Frequency of violation for DO is 10 times (83% of total observation)												
### Frequency of violation for DO is 6 times (54% of total observation)												
Bhargavi River												
44.	Chandanpur	12	7.5 (6.5-8.4)	7.0 (5.5-8.2)	1.0 (0.3-1.6)	3391 (790-9200)	0	1 (8)	C	C		
Mangala River												
45.	Malatipatpur	12	7.4 (6.5-8.5)	6.4 (5.4-7.8)	1.0 (0.5-1.7)	2155 (170-3500)	0	0	C	C		
46.	Golasahi	12	7.5 (6.7-8.4)	6.9 (5.4-8.9)	2.9 (0.8-7.4)	4080 (20-11000)	3 (25)	3 (25)	C	Doesn't conform to Class C	BOD, TC	Human activities

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Devi River												
47.	Machhagaon	12	7.6 (6.7-8.2)	7.6 (5.8-9.8)	1.1 (0.4-1.8)	459 (2-3500)	0	0	C	C		
Gobari River												
48.	Kendrapara U/s	12	7.7 (7.0-8.3)	7.2 (6.0-8.8)	1.0 (0.5-1.8)	2189 (79-4300)	0	0	C	C		
49.	Kendrapara D/s	12	7.5 (6.7-8.1)	6.1 (4.2-8.4)	1.4 (0.7-2.3)	3690 (490-16000)	0	2 (17)	C	C		
Nuna River												
50.	Bijipur	12	7.5 (6.8-8.3)	6.3 (4.7-7.7)	1.6 (0.6-2.5)	2825 (1100-4700)	0	0	C	C		
Kusumi River												
51.	Tangi	12	7.4 (6.6-8.2)	7.3 (6.1-9.1)	1.4 (0.5-2.6)	3267 (1300-5400)	0	1 (8)	C	C		
Kansari River												
52.	Banapur	12	7.3 (6.6-8.2)	6.7 (5.8-7.9)	1.3 (0.5-2.5)	3326 (490-4900)	0	0	C	C		
Badasankha River												
53.	Lan-galeswar	12	7.2 (6.6-8.2)	6.5 (4.5-8.5)	1.4 (0.6-2.3)	2752 (330-4900)	0	0	C	C		
Sabulia River												
54.	Rambha	12	7.4 (6.8-8.4)	6.8 (5.8-7.8)	1.2 (0.4-2.2)	2801 (270-5400)	0	2 (17)	C	C		
Ratnachira River												
55.	Kumardihi	12	7.4 (6.6-8.1)	6.9 (5.5-7.8)	1.0 (0.4-2.7)	2463 (170-3500)	0	0	C	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			

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)

(B) Brahmani River System (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Sankhriver												
1.	Sankh U/s	12	7.2 (6.6-7.6)	7.3 (5.6-9.1)	0.8 (0.2-1.5)	1601 (45-4900)	0	0	C	C		
Koel River												
2.	Koel U/s	12	7.2 (6.8-7.5)	7.2 (5.8-9.0)	0.9 (0.2-2.0)	2059 (210-3500)	0	0	C	C		
Brahmani river												
3.	Panposh U/s	12	7.3 (6.8-7.9)	7.6 (6.2-8.9)	1.1 (0.4-2.3)	1800 (490-3500)	0	0	C	C		
4.	Panposh D/s	12	7.2 (6.4-7.7)	5.8 (4.2-7.6)	4.1 (2.2-5.3)	19642 (3500-54000)	10 (81)	11 (89)	C	Doesn't conform to Class C	BOD, TC	Waste water of Rourkela town and Steel Plant
5.	Rourkela D/s	12	7.1 (6.5-7.7)	5.9 (4.5-8.1)	3.1 (0.5-4.6)	10075 (2100-22000)	7 (57)	7 (57)	C	Doesn't conform to Class C	BOD, TC	-do-
6.	Rourkela FD/s (Attaghat)	12	7.2 (6.5-7.6)	6.9 (5.2-8.2)	2.0 (0.5-4.6)	2497 (340-11000)	1 (8)	1 (8)	C	Doesn't conform to Class C	BOD, TC	-do-
7.	Rourkela FD/s (Biritola)	12	7.3 (6.6-7.9)	7.1 (5.0-8.4)	1.0 (0.4-1.8)	1020 (1.8-3500)	0	0	C	C		
8.	Bonaigarh	12	7.4 (6.7-7.8)	7.4 (6.1-9.4)	0.8 (0.2-1.2)	1863 (20-11000)	0	1 (8)	C	C		
9.	Rengali	12	7.5 (6.9-8.4)	7.4 (6.0-9.6)	0.8 (0.4-1.3)	318 (130-1100)	0	0	C	C		
10.	Samal	12	7.5 (6.9-8.2)	7.6 (6.0-9.4)	0.9 (0.3-1.8)	851 (130-3500)	0	0	C	C		
11.	Talcher FU/s	12	7.5 (7.0-8.2)	7.6 (6.8-9.2)	0.8 (0.2-1.3)	499 (45-1400)	0	0	C	C		
12.	Talcher U/s	12	7.4 (6.6-8.2)	7.8 (7.0-8.8)	0.8 (0.2-1.9)	904 (45-2400)	0	0	C	C		
13.	Mandapal	12	7.5 (6.7-7.9)	7.2 (6.6-8.0)	1.0 (0.4-2.0)	2358 (230-4000)	0	0	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
14.	Talcher D/s	12	7.5 (6.8-8.1)	7.8 (7.0-9.0)	1.2 (0.4-2.1)	1363 (130-3500)	0	0	C	C		
15.	Talcher FD/s	12	7.6 (7.2-8.2)	8.1 (6.6-9.4)	0.8 (0.2-2.2)	508 (20-1300)	0	0	C	C		
16.	Dhenkanal U/s	12	7.5 (7.1-7.9)	8.0 (7.2-8.6)	0.7 (0.3-1.2)	488 (45-1100)	0	0	C	C		
17.	Dhenkanal D/s	12	7.7 (7.0-8.4)	8.1 (7.2-8.8)	1.0 (0.3-1.8)	1250 (130-4900)	0	0	C	C		
18.	Bhuban	12	7.5 (6.7-8.1)	7.9 (7.2-8.8)	0.9 (0.2-1.6)	1314 (20-3500)	0	0	C	C		
19.	Kabat-abandha	12	7.6 (6.9-8.4)	7.8 (7.2-9.2)	0.7 (0.1-1.2)	593 (78-1700)	0	0	C	C		
20.	Dharmasala U/s	12	7.6 (7.0-8.4)	7.6 (7.2-8.1)	0.9 (0.4-1.7)	1798 (330-5400)	0	1 (8)	C	C		
21.	Dharmasala D/s	12	7.6 (7.1-8.3)	7.5 (6.8-8.4)	1.1 (0.6-2.1)	2250 (330-5400)	0	1 (8)	C	C		
22.	Pottamundai	12	7.8 (7.0-8.4)	7.6 (5.8-9.6)	0.6 (0.3-1.1)	2420 (130-5400)	0	1 (8)	C	C		
Nandira river												
23.	Nandira U/s	12	7.6 (7.0-7.9)	7.8 (6.0-9.4)	0.8 (0.4-1.4)	1079 (45-2400)	0	0	C	C		
24.	Nandira D/s	12	7.8 (7.1-8.2)	7.4 (6.4-9.2)	1.3 (0.6-1.9)	1714 (170-3500)	0	0	C	C		
Kisindajhor												
25.	Kisindajhor	12	7.7 (7.2-7.9)	6.7 (5.0-8.7)	1.1 (0.2-1.9)	1569 (130-3500)	0	0	C	C		
KharasuanRiver												
26.	Khanditara	12	7.7 (7.1-8.3)	7.6 (6.8-8.2)	0.6 (0.2-1.1)	1175 (110-4300)	0	0	C	C		
27.	Binjharpur	12	7.5 (6.8-8.2)	7.6 (6.5-8.4)	0.8 (0.1-1.8)	2828 (330-4600)	0	0	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
28.	Aul	12	7.8 (7.0-8.4)	7.5 (6.4-9.2)	0.9 (0.4-1.8)	1821 (200-3500)	0	0	C	C		
Guradih nallah												
29.	Guradih nallah	12	7.3 (6.4-8.4)	4.7 (2.8-8.0)	5.4 (2.9-8.5)	64117 (3500-160000)			Drain			
Badjhor nallah												
30.	Badjhor nallah	12	7.8 (7.3-8.0)	7.5 (5.6-9.4)	1.2 (0.4-1.8)	1893 (230-3500)	0	0	C	C		
Damsala River												
31.	Dayanabil	12	7.5 (6.6-8.4)	7.1 (6.4-8.4)	0.7 (0.1-1.5)	1519 (78-3500)	0	0	C	C		
Gandanallah												
32.	Marthapur	12	7.5 (6.9-8.1)	7.0 (6.2-8.1)	1.2 (0.9-1.6)	1374 (92-4600)	0	0	C	C		
Lingira River												
33.	Angul U/s	12	8.1 (7.5-8.5)	7.5 (4.6-10.2)	0.8 (0.2-1.3)	1206 (170-3500)	0	0	C	C		
34.	Angul D/s	12	8.1 (7.7-8.4)	7.3 (4.0-9.8)	1.0 (0.2-1.6)	2158 (700-5400)	0	1 (8)	C	C		
Ramiala River												
35.	Kam-akhyana-gar	12	7.6 (7.0-8.1)	8.0 (6.6-9.4)	0.8 (0.2-1.7)	1369 (110-3500)	0	0	C	C		
Banguru nallah												
36.	Banguru nallah	12	7.4 (6.8-7.9)	7.6 (6.2-9.2)	0.9 (0.4-1.9)	779 (45-3500)	0	0	C	C		
Singadajhor												
37.	Singadajhor	12	7.8 (6.6-8.3)	7.4 (4.8-9.8)	1.0 (0.2-2.0)	1386 (230-3500)	0	0	C	C		
Tikira River												
38.	KanihaU/s	12	7.9 (7.1-8.3)	7.8 (5.2-9.2)	0.8 (0.2-1.7)	1140 (20-3500)	0	0	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
39.	KanihaD/s	12	7.8 (7.0-8.4)	7.5 (6.0-8.6)	1.0 (0.3-1.7)	1945 (40-4900)	0	0	C	C		
Bangurusingadajhor												
40.	Bangurusingadajhor	12	7.6 (6.8-8.1)	7.2 (5.4-9.6)	1.0 (0.2-2.2)	1614 (68-4900)	0	0	C	C		
Karo River												
41.	Barbil	12	7.5 (7.0-8.0)	6.9 (5.9-8.3)	0.6 (0.3-1.2)	480 (110-1700)	0	0	C	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			

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)

(C) Baitarani river System (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Kundra nallah												
1.	Joda	12	7.3 (6.5-7.7)	6.7 (5.8-8.6)	1.0 (0.5-1.8)	1754 (170-4900)	0	0	C	C		
Kusei River												
2.	Deogaon	12	7.5 (6.8-8.3)	7.5 (5.7-10.8)	1.1 (0.3-2.2)	3158 (1100-9400)	0	0	C	C		
Baitarani River												
3.	Naigarh	12	7.4 (6.5-8.0)	7.0 (5.8-8.2)	0.8 (0.3-1.7)	951 (170-4700)	0	0	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
4.	Unchabali	12	7.3 (6.5-7.8)	6.8 (6.0-7.9)	0.7 (0.3-1.4)	978 (68-3500)	0	0	C	C		
5.	Champua	12	7.4 (6.5-7.8)	6.9 (6.2-8.3)	0.9 (0.4-1.8)	794 (92-1700)	0	0	C	C		
6.	Tribindha	12	7.5 (6.6-8.0)	7.1 (6.3-9.1)	0.6 (0.3-1.3)	965 (130-2200)	0	0	C	C		
7.	Joda	12	7.4 (6.6-7.8)	6.6 (5.5-8.0)	0.9 (0.3-1.8)	1827 (260-4900)	0	0	C	C		
8.	Anandpur	12	7.5 (6.7-8.1)	7.4 (6.2-8.6)	0.9 (0.3-1.6)	2499 (490-4700)	0	0	C	C		
9.	Jajpur	12	7.6 (7.1-8.2)	7.3 (6.4-7.9)	1.1 (0.3-2.4)	2248 (490-4300)	0	0	C	C		
10.	Chandbali U/s	12	7.7 (7.0-8.5)	7.3 (6.0-8.4)	0.6 (0.2-1.6)	2481 (430-5400)	0	1 (8)	C	C		
11.	Chandbali D/s	12	7.6 (7.0-8.4)	7.4 (6.4-8.4)	1.0 (0.2-2.3)	3080 (920-5400)	0	1 (8)	C	C		
Salandi River												
12.	Bhadrak U/s	12	7.7 (6.8-8.2)	7.3 (6.0-8.8)	0.7 (0.2-1.2)	1463 (110-4300)	0	0	C	C		
13.	Bhadrak D/s	12	7.6 (6.9-8.1)	7.0 (5.8-8.8)	1.2 (0.4-2.3)	3058 (700-5400)	0	1 (8)	C	C		
Dhamra River												
14.	Dhamra	12	7.6 (7.0-8.0)	7.5 (6.4-8.4)	1.1 (0.4-1.8)	953 (1.8-3500)	0	0	C	C		
Class 'C' water quality Criteria (IS-2296-1982)			6.5-8.5	12	3 or less	5000 or less			Drinking water source with conventional treatment followed by disinfection			

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 (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Russelkunda Reservoir												
1.	Russelkunda	12	7.6 (6.9-8.4)	8.6 (6.8-11.0)	1.1 (0.2-1.9)	1868 (1.8-3500)	0	0	C	C		
BadaNadi												
2	Aska	12	7.8 (7.1-8.3)	7.4 (5.6-9.2)	1.4 (0.4-2.3)	3113 (460-9200)	0	1 (8)	C	C		
Rushikulya River												
3.	Aska	12	7.8 (7.0-8.3)	7.1 (5.3-8.2)	1.1 (0.6-2.3)	3517 (1100-5400)	0	2 (17)	C	C		
4.	Nalabanta	12	7.9 (7.2-8.4)	7.0 (4.5-9.3)	1.3 (0.2-2.4)	4143 (130-16000)	0	2 (17)	C	C		
5.	Madhopur	12	7.9 (7.1-8.4)	7.1 (5.0-8.5)	1.2 (0.5-2.0)	3263 (230-16000)	0	1 (8)	C	C		
6.	Potagarh	12	7.9 (7.4-8.4)	7.8 (4.7-10.0)	1.4 (0.2-2.6)	1188 (1.8-3500)	0	0	C	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			

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(2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Nagavali river												
1.	Penta U/s	12	7.5 (6.6-8.4)	7.5 (7.2-7.8)	0.8 (0.3-1.3)	1350 (170-3500)	0	0	C	C		

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
2.	J.K. Pur D/S	12	7.5 (6.7-8.4)	6.6 (6.2-7.1)	1.3 (0.4-2.2)	2528 (230-5400)	0	1 (8)	C	C		
3.	Rayagada D/S	12	7.5 (6.9-8.3)	7.1 (6.2-7.5)	1.0 (0.2-1.9)	1580 (110-3500)	0	0	C	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			

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 (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for down-grading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Subarnarekha river												
1.	Rajghat	12	7.8 (7.0-8.5)	7.5 (6.4-8.4)	1.2 (0.4-1.9)	1364 (260-3500)	0	0	C	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			

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 (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Budhabalanga river												
1.	Baripada D/s	12	7.6 (6.9-8.0)	7.4 (6.0-8.8)	1.1 (0.3-1.8)	3633 (2200-5400)	0	1 (8)	C	C		
2.	Balasure U/s	12	7.6 (7.1-7.9)	7.3 (6.4-8.4)	1.2 (0.4-1.9)	2950 (1700-4900)	0	0	C	C		
3.	Balasure D/s	12	7.5 (6.9-7.9)	6.9 (5.6-8.0)	1.7 (1.0-2.5)	6008 (2400-17000)	0	2 (17)	C	C		
Sone River												
4.	Hatigond	12	7.5 (7.0-7.9)	7.2 (5.6-8.8)	1.3 (0.2-2.7)	2052 (330-3500)	0	0	C	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			

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 (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
KerandiRiver												
1.	Sunabeda	12	7.5 (6.9-8.4)	7.2 (6.3-7.9)	0.8 (0.2-1.4)	657 (20-1700)	0	0	C	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			

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 (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Vansadhara River												
1.	Muniguda	12	7.6 (7.0-8.3)	7.4 (6.9-7.8)	0.9 (0.2-1.9)	1090 (78-4900)	0	0	C	C		
2.	Gunupur	12	7.6 (6.6-8.4)	7.8 (7.1-8.9)	0.9 (0.2-1.6)	1399 (78-4900)	0	0	C	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			

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 (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Indravati River												
1.	Nawarangpur	12	7.5 (6.6-8.2)	7.4 (6.4-8.2)	0.8 (0.2-2.0)	860 (170-3500)	0	0	C	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			

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 (2019)

Sl. No	Sampling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Designated Class	Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				BOD	TC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)						
Bahuda River												
1.	Damodar-pally	12	7.9 (6.9-8.4)	7.6 (5.8-9.0)	1.3 (0.2-2.4)	1459 (45-4300)	0	0	C	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			

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 2019 (January-December)

(A) Mahanadi River System (2019)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter		Mineral constituents						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)				(MP-N/100ml)		(mg/l)						
Ib river																
1.	Sundargarh	53 (2-368)	64 (32-98)	7.2 (3.8-9.7)	0.826 (0.056-2.240)	0.010 (0-0.070)	2.92 (0.56-6.16)	419 (2-1700)	154 (95-285)	0.41 (0.12-0.60)	0.010 (0.003-0.024)	95 (60-158)	60 (32-92)	9.7 (3.8-16.3)	10.13 (2.11-17.50)	0.293 (0.160-0.430)
2.	Jharsuguda	19 (3-88)	69 (48-102)	9.1 (4.0-15.6)	0.705 (0.056-1.960)	0.010 (0-0.045)	2.64 (0.56-5.60)	1038 (220-3300)	177 (134-263)	0.44 (0.17-0.80)	0.118 (0.010-0.560)	107 (84-152)	68 (44-108)	9.9 (3.8-16.3)	12.98 (6.55-17.78)	0.320 (0.227-0.478)
3.	Brajrajnagar U/s	20 (1-77)	67 (44-110)	8.0 (5.2-9.5)	0.616 (0.056-1.400)	0.012 (0-0.045)	2.68 (0.56-5.88)	628 (45-2200)	160 (110-210)	0.46 (0.27-0.70)	0.047 (0.003-0.140)	96 (72-132)	58 (40-102)	9.8 (4.8-14.4)	10.01 (6.55-17.28)	0.362 (0.233-0.495)
4.	Brajrajnagar D/s	19 (3-122)	66 (44-118)	10.9 (5.2-17.2)	0.943 (0.112-2.800)	0.023 (0-0.084)	2.66 (0.84-5.32)	998 (78-2700)	167 (136-264)	0.45 (0.21-0.66)	0.046 (0.007-0.099)	101 (84-148)	62 (44-108)	10.2 (5.8-13.5)	12.85 (7.02-18.40)	0.334 (0.234-0.493)
Bheden river																
5.	Jharsuguda	21 (1-89)	72 (48-116)	9.0 (5.5-15.3)	0.635 (0.056-1.400)	0.025 (0-0.175)	2.38 (0.56-5.32)	686 (1.8-2400)	255 (141-486)	0.84 (0.22-2.99)	0.035 (0.003-0.069)	152 (92-296)	77 (52-140)	23.0 (5.8-76.9)	27.49 (7.71-74.87)	0.863 (0.224-1.410)
Hirakud Reservoir																
6.	Hirakud reservoir	20 (6-97)	69 (56-88)	7.5 (4.0-11.6)	0.779 (0.112-1.680)	0.032 (0.002-0.105)	2.18 (0.84-3.80)	206 (1.8-940)	175 (152-213)	0.36 (0.28-0.51)	0.046 (0.003-0.204)	105 (88-120)	71 (60-88)	9.7 (7.6-12.4)	12.88 (7.46-20.15)	0.357 (0.183-0.596)
Power Channel																
7.	Power Channel U/s	15 (1-61)	71 (56-88)	7.2 (3.6-11.6)	0.770 (0.280-1.680)	0.025 (0.003-0.090)	2.57 (1.12-4.76)	137 (1.8-700)	178 (141-224)	0.36 (0.19-0.68)	0.014 (0.003-0.031)	109 (88-124)	72 (60-84)	9.9 (3.8-14.4)	13.78 (11.19-19.77)	0.317 (0.180-0.443)
8.	Power Channel D/s	20 (1-90)	74 (52-98)	8.1 (3.6-11.6)	1.148 (0.056-3.920)	0.026 (0-0.078)	2.57 (1.12-4.76)	185 (1.8-700)	177 (139-215)	0.34 (0.19-0.57)	0.024 (0.010-0.035)	108 (84-128)	75 (60-92)	9.8 (3.8-16.3)	14.28 (11.19-21.52)	0.300 (0.168-0.393)

Sl. No.	Sam-pling Location	Physical pa-rameters		Organic pollution Indicators				Bacteri-ological parameter	Mineral constituents							
		TSS	Total alkali-ity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)				(MP-N/100ml)	(μS/cm)	(mg/l)						
Mahanadi river																
9.	Sambalpur U/s	19 (1-62)	80 (56-104)	9.4 (7.0-13.9)	1.120 (0.280-3.640)	0.018 (0-0.063)	2.80 (0.84-6.72)	399 (1.8-1100)	201 (145-246)	0.47 (0.19-0.92)	0.017 (0.005-0.045)	121 (92-148)	75 (60-92)	12.1 (4.8-19.2)	15.09 (10.32-19.40)	0.356 (0.187-0.459)
10.	Sambalpur D/s	17 (2-52)	76 (48-96)	11.5 (6.9-16.2)	1.311 (0.056-3.360)	0.031 (0-0.070)	3.87 (0.28-8.68)	1022 (1.8-4900)	206 (150-264)	0.45 (0.24-0.64)	0.019 (0.003-0.066)	124 (88-152)	80 (64-98)	12.8 (5.7-19.2)	17.88 (10.24-32.58)	0.378 (0.172-0.573)
11.	Sambalpur FD/s at Shankar-math	24 (1-121)	81 (56-100)	10.8 (5.7-14.8)	1.055 (0.056-3.360)	0.018 (0-0.050)	3.92 (1.12-12.32)	542 (1.8-4900)	211 (153-269)	0.49 (0.35-0.68)	0.014 (0.003-0.031)	129 (96-156)	80 (64-100)	13.1 (7.7-21.2)	18.01 (7.14-31.22)	0.432 (0.188-0.558)
12.	Sambalpur FFD/s at Huma	17 (1-63)	76 (58-88)	8.8 (4.0-15.6)	1.031 (0.056-3.360)	0.019 (0-0.042)	3.64 (0.84-14.56)	216 (1.8-1700)	194 (152-249)	0.43 (0.29-0.74)	0.012 (0.005-0.035)	118 (96-148)	76 (60-94)	11.2 (7.7-19.2)	16.77 (10.59-28.48)	0.358 (0.209-0.452)
13.	Sonepur U/s	28 (1-201)	78 (62-92)	6.8 (3.5-11.6)	1.023 (0.056-2.520)	0.028 (0-0.109)	2.73 (0.28-5.32)	68 (1.8-460)	196 (156-285)	0.45 (0.33-0.64)	0.043 (0.003-0.353)	119 (92-168)	76 (64-96)	11.1 (5.8-21.1)	16.52 (11.90-29.85)	0.339 (0.180-0.487)
14.	Sonepur D/s	23 (2-127)	84 (64-108)	8.5 (4.0-17.1)	1.517 (0.280-5.040)	0.035 (0-0.113)	3.50 (1.40-6.44)	282 (1.8-1700)	209 (159-271)	0.50 (0.15-0.70)	0.023 (0.003-0.131)	129 (88-184)	81 (64-108)	12.8 (3.8-19.2)	15.35 (5.22-35.57)	0.326 (0.183-0.467)
15.	Tikarapa-da	25 (1-78)	80 (62-96)	7.5 (3.1-9.7)	0.630 (0.280-2.240)	0.018 (0-0.112)	3.57 (0.84-19.60)	126 (1.8-490)	190 (157-233)	0.45 (0.33-0.57)	0.059 (0.003-0.239)	118 (96-144)	77 (64-110)	11.8 (7.7-18.3)	12.62 (7.59-24.17)	0.304 (0.207-0.672)
16.	Narasing-hpur	64 (1-435)	82 (66-88)	9.0 (5.6-17.1)	0.985 (0.056-2.520)	0.029 (0-0.137)	2.71 (0.28-6.16)	901 (1.8-3300)	189 (155-241)	0.42 (0.17-0.78)	0.075 (0.003-0.367)	119 (104-146)	80 (64-108)	12.7 (4.8-19.2)	10.08 (4.64-16.79)	0.383 (0.159-0.962)
17.	Munduli	48 (2-230)	81 (68-92)	7.8 (5.2-11.6)	1.031 (0.056-.080)	0.024 (0-0.154)	2.82 (0.56-7.28)	401 (1.8-1300)	188 (154-244)	0.35 (0.19-0.51)	0.089 (0.003-0.388)	114 (96-134)	77 (66-88)	10.3 (4.8-17.3)	10.90 (3.81-17.29)	0.344 (0.180-0.589)

Sl. No.	Sampling Location	Physical parameters				Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		TSS		Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC		EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)	(mg/l)	(mg/l)	(mg/l)	(MP-N/100ml)	(µS/cm)		(mg/l)							
Annual average values (Range of values)																		
18.	Cuttack U/s	45 (1-148)	78 (56-88)	7.6 (5.6-10.5)	0.681 (0.056-1.400)	0.016 (0-0.109)	2.85 (1.12-7.84)	498 (20-3300)	185 (152-216)	0.38 (0.15-0.54)	0.085 (0.006-0.343)	110 (92-138)	76 (64-92)	10.0 (3.8-15.3)	11.36 (3.45-20.02)	0.345 (0.177-0.587)		
19.	Cuttack D/s	36 (1-154)	85 (64-96)	10.3 (6.9-13.0)	0.868 (0.056-1.680)	0.016 (0-0.056)	2.59 (0.84-8.68)	1900 (45-7900)	203 (147-264)	0.45 (0.10-0.75)	0.054 (0.010-0.154)	124 (92-158)	81 (64-100)	12.0 (2.8-21.1)	13.48 (5.12-21.76)	0.34 (0.171-0.636)		
20.	Cuttack FD/s	36 (1-154)	85 (64-96)	10.3 (6.9-13.0)	0.933 (0.280-1.960)	0.021 (0-0.069)	2.59 (0.84-8.68)	1900 (45-7900)	203 (147-264)	0.45 (0.10-0.75)	0.054 (0.010-0.154)	124 (92-158)	81 (64-100)	12.0 (2.8-21.1)	13.48 (5.12-21.76)	0.34 (0.171-0.636)		
21.	Paradeep U/s	31 (4-97)	84 (60-124)	13.3 (5.4-31.0)	0.775 (0.056-2.240)	0.017 (0-0.073)	2.96 (0.84-8.96)	238 (20-790)	4683 (158-13540)	11.12 (0.09-31.11)	0.481 (0.011-1.277)	3040 (104-8700)	605 (60-1800)	1614.3 (2.9-5096.0)	160.8 (7.6-661.7)	0.446 (0.186-0.772)		
22.	Paradeep D/s	86 (6-479)	102 (52-192)	23.9 (9.7-60.3)	0.826 (0.056-3.360)	0.019 (0.001-0.067)	2.75 (0.56-10.64)	132 (1.8-490)	19123 (238-44023)	41.48 (0.52-105.28)	0.516 (0.011-1.277)	14736 (144-37740)	1866 (84-3760)	7888.0 (13.5-18740.0)	907.11 (20.36-1815.88)	0.800 (0.261-1.140)		
Ong River																		
23.	Dharu-alkhaman	31 (2-177)	104 (60-156)	8.8 (4.0-13.6)	1.143 (0.280-3.360)	0.043 (0.001-0.146)	3.36 (1.12-7.84)	42 (1.8-170)	250 (140-336)	0.49 (0.14-0.71)	0.045 (0.005-0.357)	150 (88-192)	96 (60-128)	15.0 (3.8-24.9)	16.64 (5.12-42.91)	0.491 (0.190-0.670)		
Tel River																		
24.	Monmunda	77 (2-316)	78 (52-96)	7.9 (5.2-11.2)	0.723 (0.280-1.400)	0.020 (0-0.056)	2.49 (0.80-5.32)	117 (1.8-790)	180 (118-249)	0.35 (0.09-0.54)	0.051 (0.006-0.402)	110 (72-138)	72 (48-92)	9.8 (1.9-19.2)	10.29 (1.31-30.09)	0.293 (0.218-0.424)		
Kathajodi River																		
25.	Cuttack U/s	48 (2-169)	76 (52-98)	8.6 (5.2-12.2)	0.541 (0.056-1.120)	0.017 (0-0.070)	2.24 (0.56-6.44)	573 (20-1700)	189 (140-283)	0.38 (0.18-0.63)	0.048 (0.005-0.098)	112 (84-164)	74 (60-96)	11.3 (3.8-17.5)	11.72 (4.29-21.90)	0.321 (0.180-0.562)		
26.	Cuttack D/s	50 (1-242)	92 (64-136)	16.8 (7.2-21.2)	0.77 (0.28-1.96)	0.015 (0-0.056)	4.27 (1.12-17.36)	31520 (940-160000)	239 (157-366)	0.53 (0.22-1.04)	0.067 (0.017-0.108)	141 (92-208)	87 (64-116)	16.0 (5.8-34.0)	15.20 (8.33-23.38)	0.292 (0.177-0.458)		

Sl. No.	Sam-pling Location	Physical pa-rameters		Organic pollution Indicators					Bacteri-ological parameter	Mineral constituents							
		TSS	Total alkali-ity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC		EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)						(MP-N/100ml)		(μS/cm)							
27.	Matt-agajpur (Cut tack FD/s)	33 (2-97)	90 (56-132)	14.0 (5.6-24.1)	1.12 (0.28-2.24)	0.024 (0-0.105)	4.61 (0.28-14.0)	6864 (45-54000)	278 (164-380)	0.79 (0.27-1.09)	0.071 (<0.003-0.136)	162 (96-216)	88 (52-122)	25.4 (7.7-40.4)	20.19 (8.05-38.80)	0.258 (0.172-0.416)	
28.	Kamasasan (Cut tack FFD/s)	55 (4-250)	88 (66-114)	9.1 (4.0-11.6)	0.98 (0.28-2.52)	0.014 (0-0.042)	2.94 (0.56-7.28)	484 (1.8-1300)	225 (160-325)	0.53 (0.29-1.01)	0.072 (0.003-0.207)	133 (92-188)	82 (60-104)	15.8 (5.8-30.8)	11.74 (4.88-20.64)	0.294 (0.167-0.469)	
Serua River																	
29.	Sankha-trasa	35 (3-96)	88 (56-126)	12.9 (5.9-19.0)	0.821 (0.056-2.520)	0.010 (0-0.034)	2.85 (0.56-7.00)	4045 (400-35000)	227 (161-369)	0.54 (0.21-1.10)	0.063 (<0.003-0.126)	134 (92-210)	81 (56-106)	16.2 (5.8-36.2)	12.28 (4.88-20.89)	0.328 (0.183-0.462)	
Kuakhai River																	
30.	Bhubane-swar FU/s	33 (2-126)	74 (66-92)	11.1 (7.3-17.3)	0.588 (0.056-1.400)	0.011 (0-0.055)	2.37 (0.84-3.80)	610 (78-1700)	192 (158-253)	0.45 (0.22-0.75)	0.047 (<0.003-0.177)	113 (92-144)	68 (56-80)	11.9 (7.7-21.1)	11.57 (6.07-19.03)	0.248 (0.105-0.459)	
31.	Bhubane-swar U/s	54 (2-358)	77 (66-102)	12.9 (7.3-17.4)	0.756 (0.112-1.400)	0.011 (0-0.028)	2.36 (1.12-3.92)	1203 (230-1700)	188 (150-234)	0.47 (0.12-0.74)	0.044 (0.003-0.140)	114 (88-140)	71 (60-86)	12.2 (3.8-21.2)	11.93 (5.47-20.77)	0.265 (0.166-0.708)	
Daya River																	
32.	Gelapur	37 (3-217)	79 (60-106)	8.6 (5.5-13.2)	0.621 (0.056-1.960)	0.011 (0-0.059)	2.92 (1.12-5.60)	792 (78-2400)	199 (150-269)	0.41 (0.17-0.62)	0.036 (<0.003-0.076)	118 (88-156)	73 (60-102)	11.8 (5.8-21.2)	11.85 (6.43-19.65)	0.292 (0.152-0.575)	
33.	Bhubane-swar D/s	28 (2-60)	82 (48-120)	21.8 (15.2-28.4)	1.199 (0.112-6.160)	0.013 (0-0.092)	4.76 (0.56-25.76)	23617 (1700-160000)	286 (169-446)	1.12 (0.57-2.57)	0.051 (<0.003-0.152)	172 (112-272)	80 (64-104)	33.2 (15.4-85.6)	20.73 (5.35-30.09)	0.324 (0.136-0.724)	
34.	Bhubane-swar FD/s	20 (2-49)	82 (60-120)	18.8 (11.3-28.0)	1.027 (0.280-2.240)	0.012 (0-0.034)	4.18 (0.56-20.16)	20033 (1300-160000)	262 (168-388)	0.86 (0.57-1.56)	0.041 (<0.003-0.076)	149 (108-208)	77 (60-114)	26.6 (15.4-46.8)	13.74 (5.71-24.87)	0.334 (0.129-0.596)	
35.	Kanas	29 (2-100)	89 (52-126)	14.0 (7.8-20.0)	0.826 (0.112-3.360)	0.012 (0-0.034)	3.22 (1.12-8.68)	4040 (490-9200)	298 (179-527)	0.094 (0.36-1.43)	0.053 (0.010-0.179)	178 (112-312)	86 (56-144)	32.5 (9.6-78.7)	22.43 (4.28-47.26)	0.327 (0.229-0.518)	

Sl. No.	Sam-pling Location	Physical pa-rameters				Organic pollution Indicators				Bacteri-ological parameter	Mineral constituents							
		TSS		Total alkal-inity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC		EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)	(mg/l)	(mg/l)	(mg/l)	(MP-N/100ml)	(µS/cm)		(mg/l)							
Annual average values (Range of values)																		
Gangua River																		
36.	Near Rajdhani Engg. College	23 (2-51)	79 (52-124)	41.2 (15.1-81.8)	1.680 (0.280-3.080)	0.011 (0-0.045)	7.63 (1.96-16.80)	138250 (24000-160000)	273 (164-460)	1.03 (0.46-1.81)	0.037 (<0.003-0.084)	158 (96-240)	75 (52-120)	32.6 (15.4-56.4)	15.58 (3.45-42.91)	0.201 (0.099-0.439)		
37.	Palasuni	42 (3-109)	79 (40-120)	45.3 (18.9-90.5)	1.858 (0.280-3.920)	0.016 (0-0.137)	7.82 (0.84-22.96)	148667 (24000-160000)	335 (218-528)	1.53 (0.87-2.96)	0.050 (<0.003-0.171)	190 (124-304)	77 (56-98)	45.9 (28.8-85.6)	20.76 (11.19-42.91)	0.347 (0.113-0.985)		
38.	Samantapur	45 (3-151)	85 (58-122)	51.0 (15.1-100.1)	1.759 (0.112-3.640)	0.025 (0-0.182)	7.19 (0.56-22.96)	151167 (54000-160000)	353 (211-541)	1.31 (0.55-2.39)	0.050 (<0.003-0.099)	203 (132-312)	89 (64-112)	45.5 (21.2-85.6)	23.36 (11.78-47.60)	0.441 (0.144-1.110)		
39.	Vadimula	57 (4-325)	82 (52-154)	28.1 (18.5-48.4)	1.156 (0.112-3.080)	0.003 (0-0.014)	4.65 (1.40-9.80)	103673 (5400-160000)	297 (167-544)	1.07 (0.26-2.14)	0.047 (<0.003-0.111)	173 (104-292)	82 (52-128)	35.7 (12.8-85.6)	18.52 (5.95-34.80)	0.367 (0.144-0.782)		
Birupa River																		
40.	Choudwar D/s	25 (1-131)	77 (64-90)	9.2 (5.2-17.3)	0.793 (0.280-1.400)	0.019 (0-0.087)	1.77 (0.84-3.64)	672 (110-2400)	191 (129-246)	0.45 (0.20-0.99)	0.068 (0.003-0.164)	116 (84-140)	74 (56-84)	12.4 (3.8-28.8)	11.90 (7.96-18.78)	0.324 (0.180-0.419)		
Kushabhadra River																		
41.	Bhingarpur	17 (2-85)	94 (64-146)	10.6 (5.2-15.8)	0.887 (0.280-3.360)	0.066 (0-0.420)	3.09 (1.12-6.72)	1277 (45-3500)	240 (132-363)	0.55 (0.19-0.90)	0.033 (0.003-0.100)	148 (84-232)	89 (56-130)	18.7 (5.8-31.9)	15.85 (7.96-23.88)	0.267 (0.188-0.328)		
42.	Nimapara	31 (5-146)	81 (48-112)	11.9 (8.0-17.6)	0.793 (0.280-2.240)	0.025 (0-0.090)	2.94 (0.84-6.44)	1172 (130-2500)	223 (147-281)	0.61 (0.40-1.00)	0.025 (0.003-0.094)	131 (92-156)	75 (50-90)	17.4 (9.6-26.0)	14.52 (7.46-21.14)	0.254 (0.174-0.332)		
43.	Gop	58 (3-445)	83 (34-108)	10.6 (6.8-14.1)	0.933 (0.280-2.520)	0.032 (0-0.246)	2.78 (0.84-5.32)	1283 (330-2400)	221 (142-291)	0.59 (0.18-0.95)	0.025 (0.003-0.090)	135 (88-184)	74 (40-96)	16.9 (5.8-31.9)	15.45 (7.50-22.63)	0.243 (0.158-0.309)		

Sl. No.	Sam-pling Location	Physical pa-rameters		Organic pollution Indicators					Bacteri-ological parameter	Mineral constituents						
		TSS	Total alkali-ity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC		EC	SAR	B	TDS	TH	Cl	SO ₄
									Annual average values (Range of values)							
		(mg/l)		(mg/l)					(MP-N/100ml)		(mg/l)					
Bhargavi River																
44.	Chandan-pur	45 (1-180)	83 (64-124)	9.6 (5.6-19.3)	0.910 (0.280-2.240)	0.031 (0.0-0.210)	3.06 (1.12-5.60)	1109 (170-2200)	252 (156-580)	0.65 (0.12-1.59)	0.042 (0.003-0.076)	145 (92-310)	81 (64-110)	18.6 (4.8-46.1)	20.61 (8.57-57.10)	0.290 (0.137-0.501)
Mangala River																
45.	Malatipat-pur	48 (6-173)	85 (52-144)	9.5 (5.2-14.1)	0.793 (0.280-3.080)	0.020 (0.0-0.087)	3.22 (0.84-11.20)	1031 (45-2400)	234 (125-412)	0.65 (0.13-2.58)	0.092 (0.021-0.274)	141 (76-232)	81 (48-132)	19.2 (3.8-57.6)	13.07 (4.52-21.76)	0.288 (0.148-0.543)
46.	Golasahi	79 (4-184)	121 (64-276)	25.9 (7.5-64.8)	0.817 (0.280-1.400)	0.028 (0.0-0.140)	2.50 (1.12-4.20)	1628 (1.8-5400)	5030 (180-25530)	11.17 (0.62-53.89)	0.698 (0.038-2.495)	3593 (104-19220)	635 (56-2680)	1921.9 (17.3-10528.6)	108.11 (15.47-394.20)	0.348 (0.140-0.575)
Devi River																
47.	Mach-hagaon	48 (6-98)	90 (56-112)	28.6 (5.4-60.9)	1.055 (0.056-3.360)	0.031 (0.0-0.210)	3.97 (0.28-18.48)	91 (1.8-490)	12445 (147-37240)	22.85 (0.43-64.39)	1.033 (0.027-2.751)	8873 (88-27240)	1478 (56-4680)	4843. (7.7-13826.2)	398.36 (8.33-1691.60)	0.472 (0.212-0.707)
Gobari River																
48.	Kendrapa-ra U/s	25 (2-80)	96 (56-128)	11.1 (5.7-21.2)	0.747 (0.280-1.960)	0.026 (0.0-0.055)	2.05 (0.84-4.20)	953 (45-2400)	560 (146-1128)	2.41 (0.48-6.34)	0.093 (0.006-0.207)	354 (92-752)	118 (52-220)	118.4 (13.5-317.3)	33.11 (3.69-81.12)	0.253 (0.171-0.424)
49.	Kendrapa-ra D/s	30 (5-72)	105 (56-136)	12.8 (7.6-19.3)	1.030 (0.280-2.560)	0.022 (0.0-0.073)	3.78 (1.40-8.12)	1981 (130-9200)	711 (150-1368)	3.23 (0.47-7.01)	0.071 (0.014-0.168)	458 (100-920)	132 (56-212)	170.3 (9.6-346.0)	40.20 (4.40-107.60)	0.236 (0.140-0.382)
Nuna River																
50.	Bijipur	57 (2-165)	93 (52-178)	14.6 (10.3-21.7)	1.027 (0.280-3.360)	0.041 (0.0-0.328)	4.29 (1.68-6.72)	1225 (330-2200)	248 (128-529)	0.61 (0.25-1.07)	0.033 (0.007-0.073)	148 (88-296)	82 (56-136)	18.5 (7.7-28.8)	16.03 (3.33-31.46)	0.329 (0.207-0.413)

Sl. No.	Sam-pling Location	Physical pa-rameters		Organic pollution Indicators				Bacteri-ological parameter	Mineral constituents							
		TSS	Total alkali-ity	COD	NH ₄ -N	Free NH ₃ -N	TKN		FC	Annual average values (Range of values)						
								(mg/l)		(mg/l)	(mg/l)	(mg/l)	(mg/l)	(MP-N/100ml)	EC	SAR
Kusumi River																
51.	Tangi	31 (3-76)	90 (52-182)	12.5 (3.4-35.3)	0.826 (0.112-1.960)	0.021 (0-0.090)	3.08 (0.56-15.40)	1868 (330-3500)	456 (116-452)	0.93 (0.34-2.28)	0.052 (<0.003-0.179)	152 (76-268)	80 (48-148)	28.7 (7.7-91.5)	12.00 (1.74-24.13)	0.268 (0.093-0.522)
Kansari River																
52.	Banapur	47 (5-229)	94 (64-144)	11.4 (7.5-17.5)	0.865 (0.280-2.240)	0.016 (0-0.090)	4.45 (1.12-18.20)	1591 (78-3300)	241 (168-341)	0.62 (0.15-1.28)	0.095 (0.010-0.270)	144 (92-216)	83 (56-134)	18.9 (5.7-55.3)	10.07 (1.62-26.86)	0.159 (0.085-0.305)
Badasankha River																
53.	Lan-galeswar	32 (4-130)	147 (92-260)	13.6 (3.9-27.8)	0.747 (0.280-1.680)	0.009 (0-0.045)	3.69 (1.12-8.96)	1160 (45-2200)	931 (195-5070)	2.49 (0.39-12.02)	0.134 (0.020-0.787)	564 (124-2988)	186 (76-700)	170.9 (10.6-1249.9)	79.64 (5.83-589.00)	0.339 (0.144-0.505)
Sabulia River																
54.	Rambha	27 (5-96)	184 (56-264)	13.7 (7.7-22.2)	0.687 (0.280-1.400)	0.015 (0-0.070)	2.39 (1.12-4.76)	1179 (78-3500)	522 (141-792)	1.07 (0.12-2.53)	0.190 (0.007-1.150)	308 (88-536)	162 (52-228)	53.8 (7.7-110.5)	23.16 (4.17-78.61)	0.382 (0.127-0.689)
Ratnachira River																
55.	Kumardihi	24 (3-89)	78 (48-122)	10.0 (7.2-13.6)	1.050 (0.280-3.080)	0.023 (0-0.091)	2.80 (0.84-5.60)	1184 (45-3500)	252 (146-534)	0.89 (0.51-1.77)	0.053 (<0.003-0.134)	149 (88-298)	76 (48-118)	28.6 (14.4-69.2)	13.85 (5.24-22.26)	0.335 (0.089-1.070)
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												
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻⁻ -P	Cr(VI) ^{##}	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}	Annual Average values (Range of values)					
													(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Ib River																		
1.	Sundargarh	1.77 (0.65-5.62)	0.067 (0.003-0.321)	<0.002	0.010	0.152	0.001	0.002	0.011	0.0028	-	0.003						
2.	Jharsuguda	1.86 (0.46-12.54)	0.058 (0.010-0.216)	<0.002	0.018	0.363	0.004	0.004	0.017	0.0023	-	0.007						
3.	Brajrajnagar U/s	1.11 (0.48-2.35)	0.060 (0.007-0.199)	<0.002	0.015	0.273	0.004	0.007	0.008	0.0018	-	0.007						
4.	Brajrajnagar D/s	0.90 (0.44-1.85)	0.077 (0.005-0.293)	<0.002	0.020	0.145	0.009	0.005	0.014	0.0029	-	0.012						
Bheden river																		
5.	Jharsuguda	0.89 (0.36-2.04)	0.067 (0.007-0.239)	<0.002	0.013	0.202	0.004	0.003	0.012	0.0029	-	0.008						
Hirakud reservoir																		
6.	Hirakud reservoir	1.22 (0.50-4.62)	0.097 (0.002-0.541)	<0.002	0.024	0.151	0.006	0.009	0.012	0.0018	-	0.004						
7.	Power channel U/s	1.96 (0.42-9.39)	0.073 (0.002-0.494)	<0.002	0.020	0.167	0.007	0.005	0.007	0.0024	-	0.008						
8.	Power Channel D/s	1.04 (0.46-2.96)	0.097 (0.003-0.557)	<0.002	0.024	0.323	0.004	0.004	0.007	0.0029	-	0.004						
Mahanadi River																		
9.	Sambalpur U/s	1.01 (0.43-1.67)	0.105 (0.004-0.589)	<0.002	0.027	0.031	0.003	0.002	0.011	0.0018	-	0.002						
10.	Sambalpur D/s	0.99 (0.46-2.06)	0.167 (0.002-1.399)	<0.002	0.030	0.051	0.003	0.003	0.007	0.0017	-	0.003						
11.	Sambalpur FD/s at Shankarmath	1.13 (0.5-2.97)	0.124 (0.002-0.787)	<0.002	0.027	0.128	0.004	0.007	0.017	0.0018	-	0.016						
12.	Sambalpur FD/s at Huma	1.36 (0.57-4.93)	0.096 (0.003-0.589)	<0.002	0.024	0.033	0.008	0.006	0.009	0.0022	-	0.014						

Sl. No.	Sampling Location	Nutrients										Heavy metals											
		Annual Average values (Range of values)										Annual Average values (Range of values)											
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻ P	Cr(VI) ^{##}	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}	Cr(VI) ^{##}	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}		
(mg/l)																							
13.	Sonepur U/s	1.17 (0.44-3.28)	0.164 (0.003-0.769)	<0.002	0.024	0.026	0.009	0.003	0.004	0.0024	-	0.009	0.003	0.004	0.003	0.0024	-	0.009	0.003	0.004	0.0024	-	0.009
14.	Sonepur D/s	2.35 (0.44-14.42)	0.108 (0.001-0.729)	<0.002	0.025	0.021	0.004	0.002	0.002	0.0017	-	0.002	0.002	0.002	0.0017	-	0.002	0.002	0.002	0.0017	-	0.002	
15.	Tikarapada	1.76 (0.54-5.38)	0.068 (0.005-0.239)	<0.002	0.018	0.177	0.002	0.002	0.003	0.0024	-	0.003	0.002	0.003	0.0024	-	0.003	0.002	0.003	0.0024	-	0.003	
16.	Narasinghpur	1.19 (0.38-4.27)	0.306 (0.005-1.947)	0.002	0.030	1.624	0.006	0.010	0.044	0.0029	-	0.010	0.010	0.044	0.0029	-	0.010	0.010	0.044	0.0029	-	0.010	
17.	Munduli	0.93 (0.40-1.52)	0.132 (0.007-0.606)	<0.002	0.027	0.723	0.008	0.012	0.012	0.0024	-	0.008	0.012	0.012	0.0024	-	0.008	0.012	0.012	0.0024	-	0.008	
18.	Cuttack U/s	0.94 (0.47-1.38)	0.109 (0.003-0.659)	<0.002	0.024	0.689	0.007	0.006	0.055	0.0023	-	0.007	0.006	0.055	0.0023	-	0.007	0.006	0.055	0.0023	-	0.004	
19.	Cuttack D/s	1.08 (0.46-1.99)	0.069 (0.006-0.166)	<0.002	0.027	0.760	0.005	0.005	0.071	0.0016	-	0.005	0.005	0.071	0.0016	-	0.005	0.005	0.071	0.0016	-	0.004	
20.	Cuttack FD/s	1.08 (0.46-1.99)	0.069 (0.006-0.166)	<0.002	0.027	0.760	0.005	0.005	0.071	0.0016	-	0.005	0.005	0.071	0.0016	-	0.005	0.005	0.071	0.0016	-	0.004	
21.	Paradeep U/s	0.86 (0.45-1.60)	0.068 (0.007-0.188)	<0.002	0.035	0.160	0.007	0.009	0.016	0.0014	-	0.007	0.009	0.016	0.0014	-	0.007	0.009	0.016	0.0014	-	0.005	
22.	Paradeep D/s	1.24 (0.61-2.75)	0.361 (0.010-1.423)	<0.002	0.027	0.128	0.004	0.007	0.017	0.0018	-	0.004	0.007	0.017	0.0018	-	0.004	0.007	0.017	0.0018	-	0.016	
Ong River																							
23.	Dharuakhaman	1.20 (0.50-3.19)	0.097 (0.002-0.764)	<0.002	0.024	0.213	0.006	0.005	0.011	0.0023	-	0.006	0.005	0.011	0.0023	-	0.006	0.005	0.011	0.0023	-	0.006	
Tel River																							
24.	Monmunda	1.56 (0.58-4.45)	0.178 (0.002-1.662)	<0.002	0.025	0.146	0.004	0.004	0.010	0.0018	-	0.004	0.004	0.010	0.0018	-	0.004	0.004	0.010	0.0018	-	0.004	
Kathajodi River																							
25.	Cuttack U/s	0.83 (0.50-1.33)	0.098 (0.003-0.660)	<0.002	0.024	0.652	0.005	0.011	0.053	0.0024	-	0.005	0.011	0.053	0.0024	-	0.005	0.011	0.053	0.0024	-	0.006	
26.	Cuttack D/s	1.97 (0.58-9.38)	0.142 (0.013-0.590)	<0.002	0.030	0.766	0.008	0.007	0.063	0.0029	-	0.008	0.007	0.063	0.0029	-	0.008	0.007	0.063	0.0029	-	0.004	

Sl. No.	Sampling Location	Nutrients										Heavy metals									
		Annual Average values (Range of values)										Annual Average values (Range of values)									
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻ P	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]
		(mg/l)										(mg/l)									
27.	Mattagajpur (Cutback FD/s)	1.56 (0.71-2.96)	0.108 (0.015-0.245)	<0.002	0.025	0.844	0.005	0.004	0.051	0.0022	-	0.008									
28.	Kamasasan (Cutback FFD/s)	2.04 (0.63-6.05)	0.178 (0.007-0.688)	<0.002	0.018	1.168	0.005	0.011	0.055	0.0023	-	0.003									
Serua River																					
29.	Sankhatrasa (Cutback FD/s)	1.84 (0.566-5.60)	0.221 (0.029-0.828)	<0.002	0.020	0.989	0.004	0.014	0.045	0.0021	-	0.002									
Kuakhai River																					
30.	Bhubaneswar FU/s	1.99 (0.66-5.86)	0.144 (0.005-0.886)	<0.002	0.029	0.239	0.002	0.002	0.011	0.0028	-	0.006									
31.	Bhubaneswar U/s	1.77 (0.50-4.65)	0.223 (0.016-1.673)	<0.002	0.027	0.125	0.003	0.006	0.010	0.0030	-	0.006									
Daya River																					
32.	Gelapur	4.09 (0.61-31.82)	0.218 (0.005-0.910)	<0.002	0.029	0.114	0.003	0.007	0.017	0.0036	-	0.005									
30.	Bhubaneswar FU/s	1.99 (0.66-5.86)	0.144 (0.005-0.886)	<0.002	0.029	0.239	0.002	0.002	0.011	0.0028	-	0.006									
31.	Bhubaneswar U/s	1.77 (0.50-4.65)	0.223 (0.016-1.673)	<0.002	0.027	0.125	0.003	0.006	0.010	0.0030	-	0.006									
Daya River																					
32.	Gelapur	4.09 (0.61-31.82)	0.218 (0.005-0.910)	<0.002	0.029	0.114	0.003	0.007	0.017	0.0036	-	0.005									
33.	Bhubaneswar D/s	9.03 (0.14-9.18)	0.432 (0.005-1.937)	<0.002	0.032	0.083	0.007	0.005	0.047	0.0033	-	0.005									
34.	Bhubaneswar FD/s	9.38 (0.72-59.19)	0.391 (0.028-1.515)	<0.002	0.029	0.450	0.007	0.007	0.020	0.0028	-	0.005									
35.	Kanas	1.27 (0.57-4.16)	0.114 (0.024-0.335)	<0.002	0.024	0.074	0.004	0.004	0.007	0.0023	-	0.005									
Gangua River																					
36.	Near Rajdhani Engg. College	5.51 (0.67-28.94)	0.457 (0.048-1.218)	<0.002	0.040	0.864	0.011	0.009	0.032	0.0035	-	0.005									

Sl. No.	Sampling Location	Nutrients										Heavy metals									
		Annual Average values (Range of values)										Annual Average values (Range of values)									
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻ P	Cr(VI) #	T. Cr ⁺⁺	Fe#	Ni#	Cu#	Zn#	Cd#	Hg#	Pb#	Cr(VI) #	T. Cr ⁺⁺	Fe#	Ni#	Cu#	Zn#	Cd#	Hg#	Pb#
		(mg/l)										(mg/l)									
37.	Palasumi	4.32 (0.46-13.94)	0.369 (0.086-1.009)	<0.002	0.040	0.870	0.008	0.013	0.013	0.0036	-										0.006
38.	Samantraypur	17.44 (0.68-65.46)	0.509 (0.096-1.673)	<0.002	0.047	0.414	0.004	0.005	0.101	0.0041	-										0.012
39.	Vadimula	9.26 (0.46-26.45)	0.329 (0.010-1.199)	<0.002	0.027	0.228	0.003	0.002	0.029	0.0018	-										0.004
Birupa River																					
40.	Choudwar D/s	0.87 (0.52-1.60)	0.073 (0.004-0.162)	<0.002	0.022	1.313	0.008	0.008	0.012	0.0018	-										0.002
Kushabhadra River																					
41.	Bhingarpur	2.81 (0.48-15.78)	0.094 (0.009-0.280)	<0.002	0.020	0.099	0.003	0.003	0.006	0.0014	-										0.004
42.	Nimapara	1.19 (0.38-2.31)	0.103 (0.007-0.302)	<0.002	0.030	0.016	0.002	0.001	0.001	0.0016	-										0.002
43.	Gop	1.31 (0.59-2.70)	0.108 (0.007-0.339)	<0.002	0.029	0.363	0.003	0.005	0.007	0.0015	-										0.003
Bhargavi River																					
44.	Chandanpur	1.32 (0.29-2.14)	0.081 (0.010-0.225)	<0.002	0.024	0.406	0.003	0.003	0.011	0.0023	-										0.004
Mangala River																					
45.	Malatipatpur	1.25 (0.13-2.95)	0.121 (0.013-0.443)	<0.002	0.027	0.442	0.004	0.003	0.007	0.0024	-										0.004
46.	Golasahi	8.83 (0.77-46.65)	0.200 (0.012-1.114)	<0.002	0.030	0.272	0.008	0.007	0.010	0.0015	-										0.004
Devi River																					
47.	Machhagaon	1.09 (0.52-2.06)	0.134 (0.008-0.397)	<0.002	0.030	0.144	0.012	0.007	0.010	0.0028	-										0.004
Gobari River																					
48.	Kendrapara U/s	1.18 (0.64-3.04)	0.115 (0.014-0.448)	<0.002	0.024	0.327	0.005	0.008	0.009	0.0023	-										0.010
49.	Kendrapara D/s	2.38 (0.59-8.13)	0.181 (0.012-0.469)	<0.002	0.025	0.425	0.008	0.004	0.008	0.0020	-										0.006

Sl. No.	Sampling Location	Nutrients		Annual Average values (Range of values)										Heavy metals			
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI) ##	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}	(mg/l)				
Nuna River																	
50.	Bijipur	1.58 (0.53-3.95)	0.195 (0.006-1.092)	<0.002	0.024	0.024	0.002	0.002	0.001	0.0016	-	-	0.002				
Kusumi River																	
51.	Tangi	1.66 (0.67-5.28)	0.060 (0.005-0.288)	<0.002	0.022	0.396	0.005	0.004	0.007	0.0181	-	-	0.002				
Kansari River																	
52.	Banapur	1.08 (0.46-2.78)	0.100 (0.012-0.490)	<0.002	0.013	0.226	0.006	0.006	0.003	0.0021	-	-	0.004				
Badasankha River																	
53.	Langaleswar	1.30 (0.46-5.74)	0.047 (0.012-0.099)	<0.002	0.024	0.853	0.005	0.002	0.101	0.0056	-	-	0.010				
Sabulia River																	
54.	Rambha	2.16 (0.56-6.71)	0.063 (0.014-0.207)	<0.002	0.018	0.218	0.009	0.005	0.007	0.0026	-	-	0.004				
Ratnachira River																	
55.	Kumardihhi	1.38 (0.22-2.55)	0.099 (0.011-0.393)	<0.002	0.018	0.987	0.004	0.003	0.007	0.0021	-	-	0.004				
*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, 2019

(B) Brahmani River System (2019)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators			Bacteriological parameter	Mineral constituents									
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N		TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)			(MP-N/100ml)		(μS/cm)		(mg/l)						
Sankh river																	
1.	Sankh U/s	40 (2-121)	64 (32-128)	8.7 (3.4-27.0)	0.546 (0.112-1.400)	0.006 (0-0.021)	2.89 (0.56-5.04)	631 (20-3300)	152 (108-246)	0.35 (0.21-0.50)	0.018 (0.003-0.052)	93 (68-148)	60 (32-114)	8.0 (3.8-11.7)	9.27 (3.48-15.42)	0.256 (0.171-0.331)	
Koel river																	
2.	Koel U/s	45 (4-164)	77 (48-106)	7.2 (5.2-15.4)	0.639 (0.112-2.800)	0.009 (0-0.056)	2.81 (0.56-6.16)	916 (170-2400)	177 (118-247)	0.33 (0.12-0.67)	0.030 (0.003-0.114)	105 (76-144)	72 (40-108)	10.1 (3.8-19.2)	9.41 (6.21-14.80)	0.248 (0.174-0.369)	
Brahmani river																	
3.	Panposh U/s	44 (3-196)	69 (48-128)	9.0 (3.8-14.0)	0.448 (0.056-1.120)	0.006 (0-0.022)	2.29 (0.28-6.16)	605 (78-1700)	161 (112-246)	0.37 (0.13-0.56)	0.018 (0.003-0.056)	97 (72-148)	64 (40-114)	8.8 (3.8-13.4)	9.24 (3.86-14.30)	0.260 (0.182-0.357)	
4.	Panposh D/s	57 (2-156)	65 (44-102)	27.6 (16.9-36.7)	1.750 (0.280-7.560)	0.011 (0-0.076)	5.18 (1.12-13.16)	10708 (1400-35000)	325 (181-472)	0.71 (0.26-1.12)	0.034 (0.003-0.105)	193 (112-314)	102 (68-140)	23.9 (7.7-40.4)	48.50 (12.68-77.98)	1.279 (0.742-1.660)	
5.	Rourkela D/s	68 (2-275)	68 (32-98)	21.4 (9.4-31.0)	1.353 (0/280-3.920)	0.010 (0-0.078)	4.22 (1.12-12.04)	4294 (640-14000)	237 (137-337)	0.55 (0.18-0.92)	0.030 (<0.003-0.080)	143 (88-212)	81 (44-124)	16.0 (5.8-24.9)	29.68 (9.45-59.10)	0.913 (0.296-1.330)	
6.	Rourkela FD/s (Aitghat)	55 (4-259)	70 (36-88)	14.2 (5.6-23.3)	0.817 (0.280-2.520)	0.008 (0-0.050)	2.80 (0.84-10.64)	703 (78-2200)	212 (125-328)	0.46 (0.11-0.63)	0.037 (0.003-0.112)	126 (76-192)	77 (44-120)	13.2 (3.8-20.2)	21.03 (6.78-48.26)	0.590 (0.196-0.774)	
7.	Rourkela FD/s (Biritola)	36 (4-142)	66 (36-86)	9.5 (5.2-15.5)	0.770 (0.280-1.680)	0.008 (0-0.022)	4.20 (1.12-19.32)	394 (1.8-2200)	184 (117-273)	0.46 (0.26-0.68)	0.036 (<0.003-0.087)	109 (76-152)	67 (44-98)	11.1 (6.7-17.0)	16.73 (6.78-32.58)	0.498 (0.196-0.655)	
8.	Bonaigarh	33 (1-152)	69 (48-98)	7.2 (5.2-11.6)	1.036 (0.112-3.360)	0.011 (0-0.22)	3.94 (0.56-15.96)	636 (1.8-4900)	189 (127-258)	0.45 (0.13-0.77)	0.027 (<0.003-0.027)	112 (76-160)	68 (44-108)	11.4 (3.8-20.2)	15.31 (6.19-23.63)	0.516 (0.207-0.674)	

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators					Bacteriological parameter	Mineral constituents							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC		EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)							(μS/cm)								
9.	Rengali	21 (1-153)	57 (40-96)	8.0 (3.8-13.8)	0.565 (0.280-1.400)	0.020 (0-0.112)	2.38 (0.56-7.84)	80 (14-330)	143 (83-218)	0.37 (0.19-0.57)	0.053 (0.006-0.225)	87 (52-128)	56 (32-104)	8.4 (5.8-15.4)	9.93 (5.71-19.28)	0.222 (0.136-0.376)	
10.	Samal	17 (1-74)	60 (40-102)	8.2 (3.7-17.3)	0.518 (0.280-1.120)	0.013 (0-0.045)	2.77 (1.12-6.72)	200 (20-490)	152 (100-241)	0.40 (0.14-0.90)	0.051 (0.003-0.242)	92 (64-132)	59 (40-112)	9.1 (3.8-24.9)	11.09 (6.67-17.16)	0.262 (0.155-0.482)	
11.	Talcher FU/s	16 (1-99)	58 (42-96)	7.3 (3.7-12.1)	0.663 (0.112-1.400)	0.012 (0-0.022)	2.27 (1.12-4.48)	100 (1.8-330)	151 (114-213)	0.35 (0.18-0.56)	0.109 (0.006-0.498)	93 (72-128)	59 (44-104)	8.0 (3.8-15.4)	13.91 (8.08-20.65)	0.254 (0.165-0.443)	
12.	Talcher U/s	16 (1-100)	54 (40-66)	8.2 (5.6-12.1)	0.765 (0.224-2.240)	0.025 (0-0.179)	3.10 (1.40-5.04)	247 (1.8-790)	152 (114-210)	0.35 (0.18-0.56)	0.055 (0.010-0.154)	91 (72-120)	59 (42-90)	8.3 (4.8-16.3)	14.45 (6.22-35.82)	0.248 (0.159-0.429)	
13.	Mandapal	23 (1-82)	58 (36-80)	11.2 (3.8-10.2)	0.719 (0.224-1.680)	0.016 (0-0.045)	3.43 (1.40-7.84)	838 (45-2400)	150 (119-196)	0.35 (0.23-0.49)	0.073 (0.003-0.310)	93 (76-112)	58 (40-84)	8.2 (3.8-11.7)	13.29 (6.71-21.52)	0.265 (0.159-0.451)	
14.	Talcher D/s	14 (2-86)	70 (48-118)	11.7 (5.7-18.2)	0.817 (0.280-1.680)	0.015 (0-0.056)	4.93 (0.56-20.72)	396 (2-1700)	202 (135-293)	0.47 (0.31-0.69)	0.074 (0.010-0.380)	122 (84-168)	72 (40-114)	11.6 (5.8-18.1)	21.87 (12.26-41.74)	0.425 (0.242-0.843)	
15.	Talcher FD/s	18 (1-102)	79 (64-100)	9.6 (3.1-18.2)	0.509 (0.224-1.120)	0.014 (0.003-0.028)	4.20 (0.56-23.52)	145 (2-490)	202 (176-243)	0.50 (0.25-0.73)	0.093 (0.007-0.560)	123 (108-152)	76 (44-92)	11.7 (8.6-16.3)	16.36 (9.20-23.38)	0.367 (0.277-0.545)	
16.	Dhenkanal U/s	17 (1-105)	67 (52-112)	7.5 (3.1-15.5)	0.798 (0.056-2.240)	0.016 (0.001-0.050)	3.73 (1.12-6.72)	123 (13-490)	173 (121-255)	0.43 (0.29-0.76)	0.070 (0.003-0.251)	104 (76-144)	64 (44-108)	10.4 (5.8-21.2)	13.80 (8.45-22.39)	0.289 (0.181-0.497)	
17.	Dhenkanal D/s	18 (2-109)	73 (56-116)	9.4 (3.1-15.5)	0.733 (0.112-3.080)	0.024 (0-0.108)	3.27 (1.12-9.24)	298 (20-1300)	190 (138-259)	0.47 (0.31-0.70)	0.057 (0.012-0.254)	117 (88-148)	72 (44-114)	12.5 (8.6-21.8)	13.54 (7.33-23.01)	0.292 (0.171-0.482)	
18.	Bhuban	20 (1-94)	63 (44-110)	8.1 (3.1-12.1)	0.957 (0.280-2.240)	0.025 (0-0.091)	3.99 (1.68-7.84)	362 (1.8-1700)	164 (121-248)	0.46 (0.21-1.03)	0.060 (0.009-0.323)	100 (72-144)	60 (40-110)	10.5 (5.8-23.1)	11.93 (7.46-17.78)	0.275 (0.156-0.441)	

Sl. No.	Sampling Location	Physical parameters				Organic pollution Indicators					Bacteriological parameter	Mineral constituents					
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR		B	TDS	TH	Cl	SO ₄	F
		(mg/l)															
19.	Kabat- abandha	40 (1-86)	63 (46- 120)	6.5 (3.9- 10.7)	0.607 (0.280- 1.400)	0.023 (0- 0.105)	2.96 (1.68- 5.04)	205 (1.8-790)	171 (119- 270)	0.52 (0.17- 1.81)	0.071 (<0.003- 0.158)	104 (76- 156)	62 (48- 112)	12.4 (5.8- 45.2)	13.75 (8.08- 20.39)	0.261 (0.144- 0.441)	
20.	Dharmasa- la U/s	29 (2-124)	70 (40- 132)	7.9 95.2- 11.6)	0.653 (0.280- 1.400)	0.021 (0-0.070)	2.80 (0.56- 8.96)	900 (20-3500)	182 (132- 295)	0.46 (0.20- 0.69)	0.299 (<0.003- 2.769)	109 (80- 172)	68 (48- 124)	12.1 (5.8- 19.1)	12.49 (7.46- 19.15)	0.227 (0.178- 0.316)	
21.	Dharmasa- la D/s	28 (1-99)	70 (40- 124)	9.5 (5.4- 16.4)	0.817 (0.280- 2.800)	0.024 (0.003- 0.084)	3.34 (1.40- 5.60)	1170 (20-3500)	189 (123- 286)	0.47 (0.17- 0.67)	0.240 (0.006- 2.349)	113 (84- 168)	71 (48- 120)	12.4 (5.8- 20.2)	13.01 (7.03- 20.77)	0.222 (0.169- 0.347)	
22.	Pottamun- dai	13 (1-49)	83 (56- 146)	6.9 (3.4- 9.6)	0.863 (0.280- 2.240)	0.044 (0.003- 0.146)	3.03 (0.84- 6.72)	928 (1.8-2800)	218 (154- 367)	0.53 (0.36- 0.75)	0.066 (0.006- 0.175)	130 (96- 204)	80 (60- 136)	16.1 (7.7- 24.9)	12.38 (6.31- 17.66)	0.315 (0.178- 0.576)	
Nandira River																	
23.	Nandira U/s	6 (1-21)	164 (120- 208)	9.0 (4.7- 15.2)	1.050 (0.280- 1.960)	0.027 (0-0.045)	4.13 (1.12- 8.96)	335 (20-1300)	554 (468- 688)	1.01 (0.20- 1.62)	0.108 (0.014- 0.485)	323 (272- 394)	180 (146- 200)	46.1 (7.7- 70.2)	56.08 (15.67- 89.80)	1.287 (0.837- 2.480)	
24.	Nandira D/s	11 (1-43)	170 (112- 224)	12.9 (9.1- 19.0)	0.863 (0.280- 2.800)	0.033 (0.003- 0.098)	5.25 (1.12- 12.88)	662 (20-1700)	585 (486- 667)	1.11 (0.56- 1.74)	0.120 (0.019- 0.354)	341 (284- 418)	183 (152- 208)	47.4 (26.9- 71.2)	64.96 (28.36- 105.90)	1.4593 (1.190- 2.430)	
Kisinda Jhor																	
25.	Kisinda- jhor	11 (1-34)	152 (80- 224)	11.1 (6.3- 15.5)	0.910 (0.280- 2.240)	0.034 (0.003- 0.078)	3.78 (0.84- 10.36)	764 (45-2200)	502 (183- 810)	0.94 (0.39- 1.79)	0.088 (0.010- 0.301)	299 (116- 444)	163 (72- 218)	39.5 (10.6- 69.2)	51.47 (15.71- 86.32)	1.778 (0.314- 5.050)	
Kharasota River																	
26.	Khandi- tara	40 (1-137)	67 (52- 134)	6.4 (3.4- 9.7)	0.793 (0.280- 2.240)	0.037 (0.001- 0.146)	3.03 (0.84- 7.00)	351 (40-1300)	172 (111- 290)	0.37 (0.12- 0.62)	0.074 (0.003- 0.350)	103 (72- 164)	65 (40- 132)	9.8 (5.8- 19.2)	13.52 (6.54- 21.64)	0.291 (0.206- 0.497)	
27.	Binjharpur	21 (1-63)	67 (50- 114)	7.0 (3.4- 11.2)	0.607 (0.280- 1.120)	0.015 (0-0.045)	2.87 (0.84- 8.40)	1362 (110-2400)	166 (128- 231)	0.35 (0.16- 0.62)	0.046 (0.003- 0.223)	99 (76- 144)	66 (48- 108)	8.7 (5.8- 11.5)	11.81 (7.21- 15.79)	0.245 (0.172- 0.375)	

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators					Bacteriological parameter		Mineral constituents					
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)							(MP-N/100ml)		(mg/l)					
28.	Aul	27 (2-69)	62 (52-92)	8.0 (5.4-10.7)	0.840 (0.280-2.240)	0.045 (0-0.179)	2.52 (0.84-6.72)	858 (110-2400)	212 (139-301)	0.57 (0.33-0.99)	0.127 (0.003-0.127)	126 (80-168)	71 (48-120)	17.3 (7.7-29.8)	21.38 (7.02-48.26)	0.327 (0.166-0.497)
Guradih nallah																
29.	Guradih nallah	27 (1-62)	71 (42-120)	32.4 (22.2-48.4)	1.960 (0.560-3.360)	0.059 (0-0.429)	6.62 (2.52-12.04)	42633 (1100-160000)	401 (186-531)	0.90 (0.19-1.27)	0.084 (0.003-0.350)	232 (108-320)	125 (84-156)	34.6 (5.8-46.2)	62.96 (19.90-84.05)	1.529 (0.271-1.990)
Badjhor nallah																
30.	Badjhor nallah	17 (1-35)	112 (70-144)	9.7 (5.2-17.4)	0.770 (0.280-2.800)	0.031 (0.004-0.140)	2.57 (0.84-5.04)	773 (110-1700)	301 (211-380)	0.79 (0.45-1.18)	0.067 (0.006-0.192)	179 (128-232)	100 (72-120)	25.3 (11.5-42.3)	18.44 (9.29-42.16)	0.360 (0.227-0.598)
Damsala River																
31.	Dayanabil	35 (3-107)	69 (48-94)	6.7 (5.2-9.8)	0.793 (0.280-1.680)	0.022 (0-0.070)	3.13 (0.56-6.16)	686 (20-2400)	163 (119-214)	0.27 (0.13-0.57)	0.052 (0.007-0.154)	99 (72-124)	70 (48-100)	7.8 (3.8-11.5)	9.71 (3.33-17.40)	0.151 (0.093-0.236)
Ganda nallah																
32.	Marthapur	34 (6-122)	90 (62-120)	12.5 (6.1-19.0)	0.583 (0.280-1.120)	0.014 (0-0.036)	3.17 (0.84-11.20)	382 (45-1300)	349 (153-598)	0.82 (0.17-1.42)	0.076 (0.003-0.175)	209 (96-348)	111 (42-122)	28.2 (6.6-58.5)	42.46 (6.54-106.50)	1.289 (0.443-5.790)
Lingira River																
33.	Angul U/s	6 (2-11)	169 (116-224)	8.4 (3.8-13.0)	0.415 (0.112-0.840)	0.019 (0-0.070)	2.10 (0.56-3.92)	434 (68-1400)	391 (305-512)	0.71 (0.35-1.09)	0.063 (0.010-0.242)	228 (168-296)	144 (88-196)	25.4 (16.3-44.2)	16.14 (10.69-23.51)	0.577 (0.349-1.360)
34.	Angul D/s	5 (1-10)	194 (132-238)	10.5 (3.8-19.3)	0.737 (0.168-2.240)	0.045 (0.007-0.146)	3.41 (0.56-12.32)	676 (130-1700)	464 (359-630)	0.90 (0.53-1.46)	0.074 (0.006-0.224)	277 (212-348)	162 (126-214)	35.4 (18.3-65.4)	20.58 (12.31-40.17)	0.615 (0.281-1.390)
Ramiata River																
35.	Kamakhyanagar	21 (3-70)	63 (40-90)	6.5 (4.7-11.6)	0.915 (0.280-3.360)	0.023 (0-0.067)	3.69 (0.84-10.36)	491 (20-1700)	154 (121-196)	0.40 (0.22-0.77)	0.044 (0.003-0.178)	91 (68-116)	58 (44-92)	9.1 (5.8-13.4)	7.97 (4.72-16.67)	0.217 (0.153-0.325)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators			Bacteriological parameter			Mineral constituents						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)			(MP-N/100ml)			(μS/cm)						
Banguru nallah																
36.	Banguru nallah	10 (2-37)	117 (40-212)	8.0 (3.9-15.2)	1.073 (0.280-3.080)	0.017 (0-0.046)	3.52 (0.84-7.84)	329 (20-1300)	759 (479-1408)	0.080 (0.29-1.59)	0.058 (0.003-0.161)	459 (296-844)	257 (116-350)	36.8 (19.2-57.7)	177.35 (62.68-278.57)	0.622 (0.454-1.040)
Singada jhor																
37.	Singada jhor	24 (3-138)	136 (76-248)	8.3 (3.1-17.4)	0.857 (0.168-2.560)	0.044 (0-0.166)	3.10 (1.12-6.16)	473 (20-1300)	417 (228-635)	0.061 (0.33-1.03)	0.040 (0.005-0.119)	257 (148-428)	156 (80-288)	23.5 (12.5-32.6)	50.23 (20.83-114.68)	0.532 (0.389-0.782)
Tikira River																
38.	Kaniha U/s	67 (3-285)	86 (40-124)	7.1 (4.7-11.4)	0.845 (0.056-3.360)	0.052 (0.002-0.218)	4.57 (0.84-17.92)	396 (2-1300)	209 (162-314)	0.47 (0.34-0.60)	0.047 (0.013-0.221)	127 (92-184)	78 (50-116)	12.2 (7.7-21.5)	13.97 (7.96-24.75)	0.420 (0.232-1.150)
39.	Kaniha D/s	62 (2-220)	89 (44-130)	9.1 (5.7-17.4)	1.008 (0.056-5.320)	0.059 (0-0.426)	4.28 (1.12-18.48)	688 (20-2400)	275 (169-418)	0.57 (0.33-0.81)	0.066 (0.013-0.347)	169 (112-236)	101 (64-130)	17.2 (10.6-27.9)	31.73 (12.56-52.98)	1.104 (0.266-1.460)
Bangurusingada jhor																
40.	Bangurusingada jhor	11 (1-61)	136 (88-208)	7.4 (3.4-11.6)	1.227 (0.168-5.320)	0.033 (0-0.120)	4.32 (1.68-10.64)	491 (20-1300)	357 (193-541)	0.74 (0.20-1.48)	0.046 (0.005-0.105)	219 (128-320)	131 (88-202)	27.5 (5.8-58.5)	28.28 (7.38-42.90)	0.641 (0.353-1.190)
Karo River																
41.	Barbil	58 (1-529)	77 (44-132)	5.6 (3.4-8.9)	0.793 (0.280)	0.019 (0-0.070)	2.54 (1.12-5.32)	191 (14-1100)	178 (126-346)	0.28 (0.07-0.68)	0.052 (0.017-0.119)	111 (84-204)	77 (52-120)	7.6 (5.3-11.5)	11.81 (2.62-61.81)	0.205 (0.094-0.314)
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											
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻ P	Annual Average values (Range of values)											
				Cr(VI) #	T. Cr##	Fe#	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##			
		(mg/l)													
Sankha River															
1.	Sankha U/s	1.80 (0.65-5.55)	0.054 (0.006-0.257)	<0.002	0.020	0.206	0.001	0.001	0.001	0.001	0.001	0.001	0.0014	--	0.001
Koel River															
2.	Koel U/s	1.61 (0.52-3.81)	0.057 (0.009-0.251)	<0.002	0.013	0.523	0.002	0.003	0.003	0.004	0.004	0.0018	--	0.003	
Brahmani river															
3.	Panposh U/s	2.17 (0.71-5.07)	0.075 (0.003-0.409)	<0.002	0.013	0.295	0.003	0.004	0.004	0.005	0.004	0.0014	--	0.003	
4.	Panposh D/s	34.73 (0.70-84.48)	0.056 (0.007-0.153)	<0.002	0.018	0.620	0.004	0.004	0.004	0.029	0.0023	--	0.008		
5.	Rourkela D/s	9.64 (0.90-31.48)	0.065 (0.011-0.251)	<0.002	0.018	0.321	0.003	0.003	0.003	0.016	0.0018	--	0.007		
6.	Rourkela FD/s (Attaghat)	5.22 (0.91-15.26)	0.043 (0.007-0.146)	<0.002	0.020	0.262	0.003	0.005	0.005	0.013	0.0016	--	0.007		
7.	Rourkela FD/s (Britola)	3.04 (0.75-10.48)	0.076 (0.005-0.442)	<0.002	0.018	0.158	0.003	0.004	0.004	0.006	0.0018	--	0.003		
8.	Bonai	4.09 (1.03-15.26)	0.228 (0.007-1.836)	<0.002	0.013	0.334	0.002	0.004	0.004	0.020	0.0014	--	0.004		
9.	Rengali	1.09 (0.58-2.46)	0.059 (0.010-0.182)	<0.002	0.013	0.104	0.003	0.004	0.004	0.001	0.0016	-	0.006		
10.	Samal	1.63 (0.63-8.45)	0.079 (0.014-0.347)	<0.002	0.012	0.096	0.002	0.002	0.002	0.003	0.0015	-	0.003		
11.	Talcher FU/s	1.50 (0.63-6.96)	0.054 (0.005-0.199)	<0.002	0.012	0.122	0.002	0.003	0.003	0.001	0.0020	-	0.006		
12.	Talcher U/s	1.29 (0.42-4.83)	0.114 (0.010-0.567)	<0.002	0.013	0.027	0.011	0.004	0.004	0.003	0.0021	-	0.006		
13.	Mandapal	2.05 (0.56-6.93)	0.082 (0.011-0.444)	<0.002	0.012	0.176	0.003	0.005	0.005	0.008	0.0024	-	0.007		
14.	Talcher D/s	1.68 (0.55-5.47)	0.063 (0.005-0.298)	<0.002	0.024	0.160	0.002	0.005	0.005	0.005	0.0024	-	0.007		

Sl. No.	Sampling Location	Nutrients		Heavy metals										
		Nitrate as NO ₃	PO ₄ -P	Annual Average values (Range of values)										
				Cr(VI) #	T. Cr##	Fe#	Ni#	Cu##	Zn##	Cd#	Hg##	Pb##		
		(mg/l)		(mg/l)										
15.	Talcher FD/s	1.93 (0.48-7.93)	0.040 (0.007-0.166)	<0.002	0.020	0.080	0.003	0.004	0.004	0.004	0.004	0.0021	--	0.007
16.	Dhenkanal U/s	1.83 (0.72-6.17)	0.050 (0.009-0.282)	<0.002	0.018	0.032	0.001	0.003	0.003	0.003	0.023	0.0019	--	0.005
17.	Dhenkanal D/s	2.24 (0.73-6.50)	0.066 (0.015-0.336)	<0.002	0.020	0.155	0.002	0.004	0.004	0.015	0.015	0.0020	--	0.009
18.	Bhuban	2.91 (0.64-8.78)	0.130 (0.010-1.178)	<0.002	0.029	0.520	0.002	0.005	0.005	0.122	0.0015	0.0015	--	0.008
19.	Kabatabandha	2.67 (0.54-17.79)	0.063 (0.014-0.202)	<0.002	0.027	0.521	0.003	0.002	0.002	0.012	0.0014	0.0014	--	0.003
20.	Dharmasala U/s	1.29 (0.58-2.68)	0.045 (0.008-0.113)	<0.002	0.024	0.107	0.002	0.005	0.005	0.025	0.0016	0.0016	--	0.005
21.	Dharmasala D/s	1.82 (0.54-5.76)	0.055 (0.015-0.190)	<0.002	0.020	0.097	0.002	0.007	0.007	0.010	0.0018	0.0018	--	0.008
22.	Pottamundai	0.91 (0.40-1.78)	0.147 (0.013-0.670)	<0.002	0.024	2.249	0.002	0.002	0.002	0.002	0.0020	0.0020	--	0.007
Nandira River														
23.	Nandira U/s	3.37 (0.63-15.10)	0.126 (0.007-0.729)	<0.002	0.020	0.164	0.010	0.007	0.007	0.023	0.0023	0.0023	-	0.013
24.	Nandira D/s	2.30 (0.48-7.84)	0.139 (0.006-0.764)	<0.002	0.027	0.203	0.007	0.005	0.005	0.018	0.0026	0.0026	-	0.016
Kisindajhor														
25.	Kisindajhor	8.34 (0.58-25.90)	0.007-3.644	<0.002	0.027	0.131	0.006	0.006	0.006	0.062	0.0026	0.0026	-	0.014
Kharasrota River														
26.	Khanditara	1.74 (0.74-4.04)	0.045 (0.008-0.204)	<0.002	0.020	0.134	0.004	0.005	0.005	0.009	0.0015	0.0015	-	0.009
27.	Binjharpur	2.13 (0.72-11.82)	0.070 (0.012-0.339)	0.007	0.020	0.477	0.005	0.007	0.007	0.009	0.0018	0.0018	-	0.004
28.	Aul	1.19 (0.32-2.72)	0.154 (0.011-0.529)	<0.002	0.013	0.446	0.003	0.004	0.004	0.006	0.0016	0.0016	-	0.002

Sl. No.	Sampling Location	Nutrients		Heavy metals									
		Nitrate as NO ₃	PO ₄ -P	Annual Average values (Range of values)									
				Cr(VI) #	T. Cr##	Fe#	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##	
		(mg/l)											
Guradh nallah													
29.	Guradh nallah	28.07 (1.57-62.84)	0.096 (0.010-0.249)	<0.002	0.032	1.139	0.006	0.008	0.022	0.0023	--	0.008	
Badjhor nallah													
30.	Badjhor nallah	1.76 (0.52-4.57)	0.118 (0.010-0.595)	<0.002	0.024	0.260	0.004	0.002	0.002	0.0019	--	0.003	
Damsala River													
31.	Dayanabil	3.39 (0.855-24.98)	0.029 (0.007-0.066)	0.003	0.032	0.362	0.005	0.005	0.029	0.0018	--	0.006	
Ganda nallah													
32.	Marthapur	7.97 (0.52-34.19)	0.088 (0.012-0.380)	<0.002	0.020	0.187	0.010	0.009	0.007	0.0015	--	0.006	
Lingra River													
33.	Angul U/s	3.90 (0.52-33.65)	0.104 (0.009-0.647)	<0.002	0.013	0.096	0.006	0.006	0.007	0.0018	--	0.011	
34.	Angul D/s	1.16 (0.57-2.22)	0.130 (0.010-0.764)	<0.002	0.015	0.055	0.002	0.002	0.002	0.0019	--	0.004	
Ramiala River													
35.	Kamakhyanagar	1.08 (0.45-2.22)	0.073 (0.010-0.422)	<0.002	0.018	0.236	0.002	0.004	0.007	0.0023	--	0.005	
Banguru nallah													
36.	Banguru nallah	1.70 (0.69-5.49)	0.053 (0.010-0.177)	<0.002	0.015	0.230	0.011	0.004	0.013	0.0026	--	0.014	
Singada jhor													
37.	Singada jhor	0.96 (0.49-2.01)	0.053 (0.008-0.128)	<0.002	0.013	0.183	0.005	0.003	0.005	0.0023	--	0.008	
Tikira River													
38.	Kaniha U/s	1.88 (0.65-7.78)	0.063 (0.010-0.178)	<0.002	0.018	0.443	0.004	0.003	0.005	0.0022	--	0.003	
39.	Kaniha D/s	1.49 (0.64-6.14)	0.086 (0.012-0.162)	<0.002	0.018	0.414	0.006	0.006	0.008	0.0024	-	0.007	

Sl. No.	Sampling Location	Nutrients		Heavy metals									
		Annual Average values (Range of values)											
		Nitrate as NO ₃	PO ₄ -P	Cr(VI) #	T. Cr##	Fe#	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##	
Bangurusingada Jhor												(mg/l)	
40.	Bangurusingada Jhor	1.31 (0.46-3.66)	0.088 (0.006-0.450)	<0.002	0.018	0.103	0.003	0.003	0.011	0.0023	--	0.003	
Karo River													
41.	Barbil	2.39 (0.43-14.20)	0.055 (0.001-0.235)	<0.002	0.015	0.131	0.00	0.001	0.001	0.0013	--	0.002	
Class 'C'													
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, 2019

(C) Baitarani river system (2019)

Sl. No.	Sampling Location	Physical parameters	Organic pollution Indicators						Bacteriological parameter	Mineral constituents						
			Annual Average values (Range of values)													
			TSS	Total alkalinity (mg/l)	COD	NH ₄ -N	Free NH ₃ -N	TKN		FC	EC	SAR	B	TDS	TH	Cl
Kundra Nallah																
1.	Joda	44 (1-177)	63 (32-116)	7.7 (3.6-10.5)	0.723 (0.280-1.960)	0.008 (0-0.025)	3.3 (0.6-9.5)	788 (68-2400)	144 (88-235)	0.26 (0.13-0.51)	0.081 (0.003-0.357)	87 (52-136)	61 (36-110)	8.4 (4.8-13.5)	5.89 (2.85-10.44)	0.14 (0.07-0.28)
Kusei River																
2.	Deogaon	129 (7-762)	84 (44-152)	8.7 (3.9-15.4)	0.840 (0.280-2.520)	0.020 (0-0.090)	3.7 (0.8-17.1)	1815 (220-7000)	195 (105-341)	0.38 (0.25-0.59)	0.044 (0.005-0.274)	117 (64-214)	75 (40-138)	10.4 (4.8-17.0)	8.52 (1.66-16.17)	0.19 (0.11-0.37)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents								
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN		FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
Annual Average values (Range of values)																	
Baitarani River																	
3.	Naigarh	102 (1-592)	44 (20-92)	7.5 (3.6-15.6)	0.849 (0.112-2.240)	0.013 (0-0.050)	3.5 (1.1-14.6)	311 (20-2200)	109 (78-183)	0.27 (0.15-0.51)	0.034 (0.003-0.118)	67 (48-112)	45 (28-88)	6.3 (2.9-9.6)	8.08 (1.19-17.41)	0.14 (0.07-0.26)	
4.	Unchabali	7 (4-13)	43 (16-88)	6.7 (3.6-12.9)	0.774 (0.112-1.960)	0.008 (0-0.038)	2.1 (0.8-3.4)	398 (20-2400)	110 (73-183)	0.26 (0.05-0.57)	0.032 (0.003-0.135)	67 (48-116)	45 (28-88)	6.4 (3.8-9.7)	7.82 (1.19-15.29)	0.12 (0.05-0.19)	
5.	Champua	30 (1-84)	62 (48-104)	6.9 (4.8-12.2)	0.714 (0.168-1.400)	0.013 (0-0.034)	3.4 (0.6-7.8)	273 (20-1100)	142 (108-239)	0.29 (0.16-0.53)	0.028 (0.003-0.090)	89 (68-144)	60 (36-108)	7.8 (4.8-11.5)	8.63 (2.20-23.0)	0.15 (0.09-0.25)	
6.	Tribindha	50 (1-324)	67 (48-102)	5.8 (3.5-7.8)	0.770 (0.280-2.520)	0.014 (0-0.070)	2.6 (0.6-10.1)	314 (20-1700)	150 (100-241)	0.27 (0.12-0.41)	0.020 (0.005-0.038)	89 (68-144)	60 (36-108)	7.8 (4.8-11.5)	8.63 (2.20-23.0)	0.15 (0.09-0.25)	
7.	Joda	105 (1-519)	58 (40-98)	8.5 (3.5-16.6)	0.910 (0.280-2.520)	0.015 (0-0.050)	3.8 (1.1-9.5)	783 (110-2200)	146 (101-249)	0.28 (0.12-0.68)	0.034 (0.003-0.112)	87 (68-136)	59 (36-112)	8.3 (5.8-16.3)	8.31 (2.24-20.64)	0.14 (0.08-0.21)	
8.	Anandpur	75 (5-228)	69 (38-150)	9.5 (3.6-18.5)	1.003 (0.280-2.800)	0.022 (0-0.057)	3.0 (1.7-4.8)	1282 (78-3300)	164 (96-330)	0.30 (0.13-0.49)	0.030 (0.003-0.086)	98 (56-184)	65 (36-126)	8.3 (3.8-14.4)	9.12 (1.78-12.26)	0.18 (0.11-0.27)	
9.	Jaipur	21 (2-57)	71 (44-96)	10.0 (5.2-17.4)	1.423 (0.280-6.160)	0.042 (0.001-0.216)	6.2 (0.6-23.8)	802 (68-17000)	183 (113-262)	0.56 (0.15-1.35)	0.069 (0.005-0.228)	111 (76-160)	63 (44-96)	14.2 (3.8-38.5)	11.73 (7.58-17.85)	0.23 (0.11-0.42)	
10.	Chandbali U/s	149 (13-518)	79 (50-96)	12.5 (3.9-24.0)	0.621 (0.056-0.420)	0.027 (0-0.130)	2.3 (0.6-3.4)	1091 (170-3500)	6329 (130-19480)	15.37 (0.20-47.08)	0.726 (0.005-1.516)	4485 (76-13920)	764 (50-2480)	2359.7 (3.8-7595.9)	246.5 (10.2-777.4)	0.38 (0.14-0.78)	
11.	Chandbali D/s	180 (18-646)	83 (52-112)	18.9 (8.1-38.5)	0.807 (0.168-1.960)	0.024 (0-0.109)	2.6 (1.1-6.2)	1383 (330-3500)	8318 (151-24419)	23.71 (0.38-111.72)	0.629 (0.005-1.389)	6007 (88-16880)	803 (50-2560)	3285.6 (11.5-9615.0)	260.8 (7.5-842.7)	0.36 (0.14-0.82)	
Salandi River																	
12.	Bhadrak U/s	21 (1-77)	67 (44-96)	8.8 (5.2-12.9)	0.546 (0.112-1.400)	0.024 (0-0.090)	1.9 (0.6-3.4)	724 (45-3500)	164 (89-260)	0.38 (0.14-0.70)	0.042 (0.011-0.070)	101 (56-152)	66 (36-116)	11.3 (2.9-25.9)	10.90 (5.49-24.37)	0.20 (0.12-0.31)	

Sl. No.	Sampling Location	Physical parameters				Organic pollution Indicators				Bacteriological parameter	Mineral constituents						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC		SAR	B	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)		(MPN/100ml)		(µS/cm)		(mg/l)							
13.	Bhadrak D/s	25 (1-110)	72 (44-124)	12.1 (5.2-20.3)	0.630 (0.280-1.120)	0.017 (0-0.039)	2.1 (1.1-4.2)	1533 (78-3500)	189 (129-284)	0.47 (0.29-1.15)	0.033 (0.005-0.091)	114 (76-172)	72 (48-132)	14.0 (6.7-38.4)	13.21 (5.59-26.61)	0.19 (0.11-0.28)	
Dhamra River																	
14.	Dhamra	167 (2-492)	114 (76-180)	35.5 (9.7-60.3)	0.439 (0.112-1.120)	0.013 (0-0.056)	2.4 (0.8-5.3)	416 (1.8-1600)	24069 (259-44340)	48.87 (1.33-98.53)	1.510 (0.010-3.022)	17409 (168-30188)	2336 (68-5200)	9459 (37-13707)	724.5 (18.7-1806.6)	0.50 (0.12-0.67)	
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)										Annual Average values (Range of values)												
		Nitrate as NO ₃		PO ₄ ³⁻ -P		Cr(VI)#		T. Cr#		Fe#		Ni#		Cu#		Zn#		Cd#		Hg#		Pb#		
		(mg/l)		(mg/l)		(mg/l)		(mg/l)		(mg/l)		(mg/l)		(mg/l)		(mg/l)		(mg/l)		(mg/l)				
Kundra nallah																								
1.	Joda	1.407 (0.462-2.694)	0.125 (0.007-0.523)	<0.002	0.018	0.458	0.005	0.004	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.003
Kusei River																								
2.	Deogaon	1.186 (0.432-3.394)	0.068 (0.010-0.202)	<0.002	0.018	1.328	0.007	0.004	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.006
Baitarani river																								
3.	Naigarh	1.196 (0.395-2.388)	0.052 (0.007-0.139)	<0.002	0.024	2.810	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.003

Sl. No.	Sampling Location	Nutrients		Annual Average values (Range of values)											Heavy metals			
		Nitrate as NO ₃ ⁻ (mg/l)	PO ₄ ³⁻ -P (mg/l)	Cr(VI)#	T. Cr##	Fe##	Ni#	Cu##	Zn##	Cd##	Hg##	Pb##	(mg/l)					
													Cr(VI)#	T. Cr##	Fe##	Ni#	Cu##	Zn##
4.	Unchabali	1.032 (0.523-2.134)	0.052 (0.007-0.171)	<0.002	0.024	4.358	0.009	0.008	0.012	0.0017	-	0.005						
5.	Champua	1.156 (0.450-2.825)	0.071 (0.001-0.159)	<0.002	0.020	1.531	0.005	0.003	0.006	0.0018	-	0.003						
6.	Tribindha	1.043 (0.480-1.784)	0.074 (0.007-0.203)	<0.002	0.024	1.365	0.005	0.004	0.007	0.0023	-	0.003						
7.	Joda	1.290 (0.334-2.501)	0.077 (0.007-0.296)	<0.002	0.013	1.126	0.003	0.003	0.006	0.0018	-	0.002						
8.	Anandpur	1.720 (0.401-4.898)	0.084 (0.006-0.400)	<0.002	0.002	1.858	0.005	0.005	0.009	0.0018	-	0.005						
9.	Jajpur	1.432 (0.565-4.102)	0.101 (0.010-0.589)	<0.002	0.022	0.194	0.002	0.005	0.007	0.0022	-	0.002						
10.	Chandbali U/s	1.313 (0.499-3.289)	0.085 (0.008-0.293)	<0.002	0.024	0.217	0.007	0.009	0.012	0.0017	-	0.003						
11.	Chandbali D/s	1.304 (0.553-3.446)	0.062 (0.010-0.234)	<0.002	0.029	0.283	0.009	0.012	0.013	0.0020	-	0.004						
Salandi river																		
12.	Bhadrak U/s	1.077 (0.499-2.536)	0.052 (0.002-0.202)	<0.002	0.018	0.559	0.003	0.003	0.021	0.0018	-	0.002						
13.	Bhadrak D/s	1.227 (0.656-2.694)	0.064 (0.003-0.211)	<0.002	0.018	0.474	0.004	0.005	0.016	0.0024	-	0.002						
Dhamra River																		
14.	Dhamra	0.972 (0.455-1.994)	0.052 (0.002-0.177)	<0.002	0.030	0.230	0.011	0.017	0.017	0.0023	-	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, 2019

(D) Rushikulya river System (2019)

Sl. No.	Sam-pling Location	Physical param-eters		Organic pollution Indicators				Bacteri-ological parameter	Mineral constituents									
		TSS	Total alkal-inity	COD	NH ₄ -N	Free NH ₃ -N	TKN		FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F	
								Annual Average values (Range of values)										
		(mg/l)				(mg/l)		(MPN/100 ml)	(µS/cm)							(mg/l)		
Russelkunda Reservoir																		
1.	Rus-selkunda	23 (5-89)	96 (70-140)	11.4 (5.5-17.1)	0.933 (0.280-2.520)	0.035 (0.0-0.164)	3.52 (0.84-10.36)	586 (1.8-2200)	208 (144-288)	0.44 (0.23-0.78)	0.064 (0.003-0.154)	124 (88-168)	94 (64-112)	13.4 (7.7-22.1)	6.23 (2.14-12.81)	0.289 (0.112-0.626)		
Bada Nadi																		
2	Aska	79 (4-326)	118 (72-154)	9.7 (4.0-16.2)	0.700 (0.280-1.120)	0.027 (0.003-0.082)	3.31 (0.56-8.96)	1365 (45-3500)	268 (199-368)	0.45 (0.15-0.66)	0.069 (0.007-0.140)	153 (112-222)	102 (64-130)	15.0 (5.8-20.2)	8.32 (3.48-18.90)	0.288 (0.219-0.394)		
Rushikulya river																		
3.	Aska	143 (5-650)	123 (64-164)	11.4 (5.7-19.1)	0.863 (0.280-2.240)	0.037 (0-0.109)	3.22 (0.84-6.72)	1714 (490-3500)	267 (202-366)	0.51 (0.28-0.79)	0.062 (0.003-0.129)	161 (116-212)	104 (60-124)	18.3 (7.7-35.3)	8.17 (2.73-17.85)	0.269 (0.192-0.350)		
4.	Nalaban-ta	45 (6-209)	125 (76-146)	12.2 (4.0-22.1)	0.602 (0.224-1.400)	0.033 (0.003-0.070)	5.65 (0.84-29.12)	2428 (1.8-16000)	298 (209-444)	0.60 (0.28-1.21)	0.078 (0.021-0.165)	172 (120-238)	109 (64-136)	19.7 (11.5-49.9)	9.65 (1.62-16.79)	0.304 (0.201-0.422)		
5.	Madhop-ur	85 (9-350)	120 (72-152)	9.0 (4.0-15.2)	0.943 (0.112-3.360)	0.067 (0.003-0.420)	3.34 (0.84-10.08)	1054 (45-3500)	679 (184-4878)	2.34 (0.31-20.66)	0.110 (0.010-0.306)	402 (108-2932)	118 (56-280)	139.8 (7.7-1442.3)	24.81 (4.52-171.20)	0.320 (0.203-0.428)		
6.	Potagarh	115 (8-273)	121 (76-144)	27.1 (10.5-52.2)	0.803 (0.112-1.680)	0.038 (0.004-0.175)	3.10 (0.56-6.44)	633 (1.8-2800)	10521 (248-41410)	18.74 (0.64-71.09)	0.828 (0.041-2.405)	7442 (148-35140)	1448 (64-4800)	4096.5 (11.5-20191.5)	403.12 (7.14-1411.70)	0.374 (0.110-0.678)		
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										
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻ -P	Annual Average values (Range of values)										
				Cr(VI) ^{##}	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}		
(mg/l)		(mg/l)												
Russelkunda Reservoir														
1.	Russelkunda	5.67 (0.64-47.62)	0.063 (0.003-0.223)	<0.002	0.015	0.623	0.004	0.004	0.004	0.004	0.009	0.0017	-	0.003
Bada Nadi														
2.	Aska	1.84 (0.59-7.90)	0.100 (0.002-0.433)	<0.002	0.013	0.955	0.005	0.004	0.004	0.007	0.0016	-	0.005	
Rushikulya river														
3.	Aska	2.46 (0.53-8.14)	0.083 (0.009-0.277)	<0.002	0.015	1.065	0.005	0.005	0.005	0.009	0.0018	-	0.005	
4.	Nalabanta	1.78 (0.67-7.35)	0.093 (0.010-0.375)	0.002	0.012	0.881	0.004	0.004	0.004	0.006	0.0014	-	0.003	
5.	Madhopur	2.14 (0.60-6.62)	0.063 (0.002-0.154)	<0.002	0.018	2.059	0.006	0.005	0.005	0.012	0.0016	-	0.005	
6.	Potagarh	2.46 (0.55-11.67)	0.062 (0.002-0.261)	<0.002	0.015	0.268	0.009	0.008	0.008	0.009	0.0018	-	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, 2019

(E) Nagavali river System (2019)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN		FC	EC	SAR	B	TDS	TH	Cl	SO ₄
Annual Average values (Range of values)																
		(mg/l)		(mg/l)				(MPN/100 ml)	(µS/cm)	(mg/l)						
Nagavali river																
1.	Penta	92 (2-286)	86 (601-24)	8.8 (3.4-13.3)	0.821 (0.056-2.240)	0.028 (0-0.105)	2.38 (0.56-7.56)	566 (20-1700)	232 (148-428)	0.59 (0.19-1.55)	0.086 (0.007-0.206)	131 (84-184)	79 (56-96)	16.9 (8.6-36.5)	10.18 (2.86-23.00)	0.274 (0.180-0.350)
2.	Jaykaypur D/s	99 (16-437)	90 (60-122)	12.6 (7.6-18.5)	1.129 (0.112-3.640)	0.037 (0-0.210)	3.90 (1.12-11.48)	1016 (45-2400)	220 (85-329)	0.53 (0.22-1.18)	0.054 (0.010-0.099)	144 (96-192)	88 (56-116)	16.0 (7.4-38.4)	19.20 (5.00-30.59)	0.229 (0.073-0.291)
3.	Rayagada D/s	10 (3-470)	90 (48-128)	12.0 (5.2-19.3)	1.027 (0.560-2.240)	0.032 (0-0.112)	3.31 (1.40-10.92)	520 (20-1300)	244 (174-315)	0.48 (0.21-0.70)	0.058 (0.003-0.155)	146 (108-196)	95 (68-116)	15.8 (7.7-26.9)	20.38 (7.84-29.47)	0.245 (0.176-0.289)
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									
		Nitrate as NO ₃		Annual Average values (Range of values)									
		PO ₄ -P	(mg/l)	T. Cr ^{##}	Cr(VI) ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}	
Nagavali river													
1.	Penta	2.06 (0.70-6.44)	0.102 (0.006-0.277)	<0.002	0.015	0.198	0.003	0.006	0.007	0.0018	-	-	0.003
2.	Jaykaypur D/s	3.26 (0.57-17.18)	0.469 (0.022-3.527)	<0.002	0.020	0.214	0.009	0.006	0.019	0.0020	-	-	0.004
3.	Rayagada D/s	2.78 (0.91-5.59)	0.354 (0.013-2.099)	<0.002	0.018	3.102	0.006	0.009	0.064	0.0021	-	-	0.009
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, 2019

(F) Subarnarekha river system (2019)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter	Mineral constituents							
		Annual Average values (Range of values)		Annual Average values (Range of values)					Annual Average values (Range of values)							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN		FC	EC	SAR	B	TDS	TH	Cl	SO ₄
Subarnarekha river																
1.	Raighat	25 (2-66)	84 (68-100)	9.5 (5.2-20.3)	0.705 (0.056-1.120)	0.037 (0-0.090)	3.56 (0.84-8.12)	375 (20-1700)	327 (142-539)	1.95 (0.33-2.75)	0.093 (0.014-0.182)	197 (96-328)	98 (68-136)	37.6 (7.7-105.8)	34.76 (7.09-80.10)	0.49 (0.23-0.85)
Class 'C'		-	-	-	-	-	-	-	-	-	-	1500	-	600	400	1.5
Class 'E'		-	-	-	-	-	-	2250	26	-	-	2100	-	600	1000	-

(F) Contd..

Sl. No.	Sampling Location	Nutrients		Annual Average values (Range of values)										Heavy metals				
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]						
Subarnarekha river																		
1.	Rajghat	1.211 (0.450-2.003)	0.050 (0.010-0.197)	<0.002	0.018	1.259	0.006	0.007	0.017	0.0018	-	0.010						
	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, 2019

(G) Budhabalanga River System (2019)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators			Bacteriological parameter	Annual Average values (Range of values)										Mineral constituents				
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N		TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F					
Budhabalanga river																						
1.	Baripada D/s	64 (4-209)	87 (52-128)	10.3 (5.8-15.5)	0.873 (0.112-2.240)	0.023 (0-0.090)	2.52 (4.12-4.20)	1698 (490-3500)	226 (138-346)	0.517 (0.083-1.263)	0.054 (0.007-0.153)	137 (84-208)	84 (40-116)	19.4 (3.8-48.1)	12.74 (3.73-2.65)	0.279 (0.125-0.545)						
2.	Balasore U/s	94 (5-626)	81 (48-152)	9.6 (5.2-14.8)	1.003 (0.280-3.640)	0.026 (0.003-0.109)	2.82 (0.84-8.68)	1189 (700-2400)	195 (119-321)	0.47 (0.18-0.68)	0.033 (0.003-0.126)	119 (76-188)	76 (48-152)	13.7 (3.8-22.4)	12.30 (3.98-22.88)	0.196 (0.116-0.321)						

Sl. No.	Sampling Location	Organic pollution Indicators					Bacteriological parameter	Mineral constituents								
		Physical parameters		Annual Average values (Range of values)				Annual Average values (Range of values)								
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N		TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄
3.	Balasore D/s	52 (1-131)	93 (50-144)	11.9 (7.0-16.6)	1.097 (0.280-3.640)	0.024 (0+0.109)	3.73 (1.40-10.92)	2521 (450-7900)	315 (118-509)	1.11 (0.19-2.96)	0.051 (0.003-0.143)	191 (76-288)	86 (56-132)	34.6 (5.8-92.2)	21.56 (7.97-33.95)	0.195 (0.113-0.342)
Sone River																
4.	Hatigond	95 (9-366)	86 (58-126)	10.0 (5.7-19.3)	0.887 (0.280-1.680)	0.017 (0+0.034)	2.50 (1.40-7.00)	777 (68-2200)	245 (128-343)	0.78 (0.22-1.87)	0.047 (0.003-0.153)	145 (80-196)	76 (52-116)	21.1 (5.8-46.2)	16.23 (3.36-36.56)	0.209 (0.134-0.361)
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

(G) Contd..

Sl. No.	Sam-pling Location	Nutrients										Heavy metals					
		Annual Average values (Range of values)										Annual Average values (Range of values)					
		Nitrate as NO ₃	PO ₄ ³ -P	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]					
Budhabalanga river																	
1.	Baripada D/s	1.470 (0.474-5.143)	0.050 (0.002-0.143)	<0.002	0.027	2.507	0.009	0.007	0.020	0.0023	-	0.011					
2.	Balasore U/s	0.921 (0.420-1.889)	0.040 (0.003-0.167)	<0.002	0.024	0.117	0.005	0.003	0.008	0.0016	-	0.006					

Sl. No.	Sam-pling Location	Nutrients										Heavy metals					
		Annual Average values (Range of values)										Annual Average values (Range of values)					
		Nitrate as NO ₃ ⁻ (mg/l)	PO ₄ ³ -P	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]					
3.	Balasore D/s	2.009 (0.481-8.567)	0.099 (0.014-0.380)	<0.002	0.027	3.429	0.014	0.008	0.021	0.0018	-	0.017					
Sone River																	
4.	Hatigond	2.291 (0.499-6.044)	0.068 (0.013-0.316)	<0.002	0.018	3.371	0.009	0.005	0.117	0.0018	-	0.008					
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, 2019

(H) Kolab river system (2019)

Sl. No.	Sam-pling Location	Organic pollution Indicators										Mineral constituents									
		Annual Average values (Range of values)										Annual Average values (Range of values)									
		TSS	Total alkalinity (mg/l)	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F					
Kerandi river																					
1.	Sunabeda	113 (4-711)	46 (20-86)	10.2 (5.4-14.8)	0.658 (0.056-2.520)	0.036 (0-0.315)	2.82 (0.84-7.84)	251 (1.8-1100)	132 (70-222)	0.46 (0.14-0.97)	0.063 (0.007-0.128)	81 (48-136)	47 (24-74)	10.4 (5.7-24.9)	9.06 (2.74-20.27)	0.163 (0.089-0.222)					
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)										Annual Average values (Range of values)					
		Nitrate as NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]					
(mg/l)												(mg/l)					
Kerandi river																	
1.	Sunabeda	2.296 (0.499-6.507)	0.142 (0.003-0.499)	<0.002	0.018	0.931	0.002	0.004	0.025	0.0018	-	-	-	0.002			
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, 2019

(I) Vansadhara river system (2019)

Sl. No.	Sampling Location	Physical parameters	Organic pollution Indicators						Bacteriological parameter	Mineral constituents								
			Annual Average values (Range of values)							Annual Average values (Range of values)								
			TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN		FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F
(mg/l)												(µS/cm)			(mg/l)			
Vansadhara river																		
1.	Muniguda	25 (2-66)	84 (68-100)	9.5 (5.2-20.3)	0.705 (0.056-1.120)	0.014 (0-0.056)	3.56 (0.84-8.12)	375 (20-1700)	327 (142-539)	1.95 (0.33-2.75)	0.093 (0.014-0.182)	197 (96-328)	98 (68-136)	37.6 (7.7-105.8)	34.76 (7.09-80.10)	0.49 (0.23-0.85)		
2.	Gunupur	25 (2-66)	84 (68-100)	9.5 (5.2-20.3)	0.705 (0.056-1.120)	0.019 (0-0.070)	3.56 (0.84-8.12)	375 (20-1700)	327 (142-539)	1.95 (0.33-2.75)	0.093 (0.014-0.182)	197 (96-328)	98 (68-136)	37.6 (7.7-105.8)	34.76 (7.09-80.10)	0.49 (0.23-0.85)		
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									
		Nitrate as NO ₃ ⁻ (mg/l)	PO ₄ ³⁻ P (mg/l)	Cr(VI) [#]	T. Cu [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]	
Vansadhara river													
1.	Muniguda	1.562 (0.456-3.534)	0.187 (0.007-0.756)	<0.002	0.013	0.415	0.003	0.003	0.022	0.0019	--	0.002	
2.	Gunupur	1.998 (0.638-9.044)	0.147 (0.006-0.670)	0.002	0.015	0.816	0.003	0.004	0.008	0.0023	--	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, 2019

(J) Indravati river system (2019)

Sl. No.	Sampling Location	Physical parameters	Organic pollution Indicators				Bacteriological parameter	Mineral constituents									
			TSS (mg/l)	Total alkalinity (mg/l)	COD	NH ₄ -N		Free NH ₃ -N	TKN	FC (MP-N/100ml)	EC (µS/cm)	SAR	B	TDS (mg/l)	TH	Cl	SO ₄
Annual Average values (Range of values)																	
Indravati river																	
1.	Nawarangpur	218 (4-2038)	49 (24-98)	9.2 (5.7-21.2)	0.527 (0.056-1.120)	0.014 (0-0.067)	1.98 (0.28-3.36)	347 (20-2200)	141 (86-227)	0.42 (0.19-0.76)	0.034 (<0.003-0.073)	86 (52-140)	50 (32-68)	10.3 (4.8-24.9)	9.39 (2.36-20.89)	0.166 (0.108-0.194)	
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)										Annual Average values (Range of values)							
		Nitrate as NO ₃	PO ₄ -P	Cr (VI)#	T. Cr#	Fe#	Ni#	Cu#	Zn#	Cd#	Hg#	Pb#							
Indravati river														(mg/l)					
1.	Nawarangpur	1.485 (0.542-3.402)	0.220 (0.014-0.756)	<0.002	0.013	1.315	0.005	0.006	0.012	0.0014	-	-	-	0.002					
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, 2019

(K) Bahuda river system (2019)

Sl. No.	Sampling Location	Physical parameters						Organic pollution Indicators						Bacteriological parameter						Mineral constituents															
		Annual Average values (Range of values)						Annual Average values (Range of values)						Annual Average values (Range of values)						Annual Average values (Range of values)															
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	FC	EC	SAR	B	TDS	TH	Cl	SO ₄	F																			
Bahuda river																		(mg/l)						(µS/cm)						(mg/l)					
1.	Damodar-pally	66 (12-205)	140 (68-208)	13.9 (6.1-33.8)	1.095 (0.280-3.920)	0.054 (0-0.140)	3.71 (0.84-10.92)	694 (1.8-3500)	411 (219-607)	1.21 (0.43-3.56)	0.106 (0.038-0.168)	248 (132-396)	133 (80-238)	44.1 (14.4-163.5)	20.66 (2.50-57.96)	0.473 (0.252-0.673)																			
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									
		Nitrate as NO ₃	PO ₄ ³⁻ -P	Annual Average values (Range of values)									
				T. Cr##	Cr(VI)##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##	
		(mg/l)											
Bahuda river													
1.	Damodarpally	1.920 (0.577-5.558)	0.051 (0.002- 0.135)	0.015	<0.002	0.453	0.004	0.007	0.004	0.007	0.0020	-	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, 2019

(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 barrage 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 Taladanda 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 2019 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. So far the bathing water quality is concerned, total coliform organisms and fecal 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 2019, whereas BOD values exceeded the tolerance limit only once at Jobra, Ranihat, Chhatrabazar, Nuabazar and Atharabanki.

Puri canal originates from Munduli barrage on Mahanadi near 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. 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 2019.

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 2019 (January-December)

Sl. No	Sam-pling Location	No. of Obs.	Annual average values (Range of values)				Frequency of violation (Percentage of violation) from designated criteria value				Existing Class	Parameters responsible for grading 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*	4	7.2 (7.1-7.3)	7.3 (6.8-7.7)	1.9 (0.8-3.8)	13500 (3500-25000)	2900 (700-4900)	0	1 (25)	2 ^s (50) 4 ^{ss} (100)	2 (50)	Does not conform to Class B,C	BOD, TC, FC	Human activities
2.	Ranihat*	4	7.4 (7.2-7.5)	7.3 (7.0-7.6)	2.1 (1.2-3.7)	19300 (4300-54000)	7125 (1700-22000)	0	1 (25)	3 ^s (75) 4 ^{ss} (100)	1 (25)	Does not conform to Class B & C	BOD, TC, FC	Human activities and waste water of Cuttack town
3.	Chatra-bazar*	4	7.3 (6.8-7.7)	6.7 (5.4-7.8)	2.3 (1.3-4.7)	39075 (4900-92000)	14300 (1700-35000)	0	1 (25)	3 ^s (75) 4 ^{ss} (100)	3 (75)		BOD, TC, FC	
4.	Nuaba-zar*	4	7.3 (6.7-7.7)	7.0 (6.4-7.4)	1.8 (0.6-3.4)	56550 (2800-160000)	30950 (1700-92000)	0	1 (25)	3 ^s (75) 4 ^{ss} (100)	2 (50)	Does not conform to Class B & C	BOD, TC, FC	
5.	Biribati*	4	7.6 (7.4-7.8)	7.0 (6.2-7.6)	1.8 (1.0-2.3)	18125 (1100-35000)	7745 (490-17000)	0	0	2 ^s (50) 4 ^{ss} (100)	2 (50)		TC, FC	
6.	Athara-banki	12	7.6 (7.0-8.2)	6.3 (0.4-8.4)	1.5 (0.3-5.6)	4610 (330-17000)	1925 (140-7900)	1 (8)	1 (8)	10 ^s (82) 11 ^{ss} (92)	2 (17)	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 August, September, October and November, 2019

** Tolerance limits for Inland Surface water bodies (IS-2296-1982)^s for Class C and ^{ss} for Class B

Contd..

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						DO	BOD	TC	FC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)									
(b) Puri canal																
1.	Hansapal	12	7.8 (6.9-8.4)	8.1 (6.2-11.8)	1.0 (0.5-1.8)	2508 (220-3900)	1063 (78-2200)	0	0	0 [§]	0	Does not conform to Class B	TC	Human activities		
2.	Jagannathpur	12	7.7 (6.9-8.3)	7.1 (5.5-9.3)	1.4 (0.6-2.4)	3005 (460-5400)	1237 (170-2400)	0	0	1 [§] (8) 7 ^{§§} (58)	0	Does not conform to Class B	TC	Human activities		
3.	Chandanpur	12	7.4 (6.5-8.3)	6.5 (3.1-7.8)	1.2 (0.6-2.8)	1797 (230-4700)	612 (45-1700)	1 [§] (8) 1 ^{§§} (8)	0	0 [§] 8 ^{§§} (73)	0	Does not conform to Class B, C	DO, TC			
**Class 'C'																
**Class 'B'																
Drinking water source with conventional treatment followed by disinfection																
Outdoor bathing																
Water quality criteria for bathing water																
2500 (Maximum Permissible)																
Water use for organised outdoor bathing (MOEF Notification G.S.R. No. 742(E) Dt. 25.09.2000)																

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)				Frequency of violation (Percent of violation) from designated criteria value			Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				EC	SAR	B			
			pH	EC (micro-Siemens /cm)	SAR	B (mg/l)						
(a) Taladanda canal												
1.	Jobra*	4	7.2 (7.1-7.3)	172 (151-192)	0.30 (0.13-0.47)	0.205 (<0.003-0.061)	0	0	0	Conform to Class E		
2.	Ranihat*	4	7.4 (7.2-7.5)	163(131-193)	0.23 (0.12-0.34)	0.014 (0.005-0.027)	0	0	0			
3.	Chatrabazar*	4	7.3 (6.8-7.7)	164 (142-193)	0.21 (0.13-0.34)	0.027 (<0.003-0.079)	0	0	0			
4.	Nuabazar*	4	7.3 (6.7-7.7)	163 (131-192)	0.32 (0.19-0.41)	0.023 (0.007-0.037)	0	0	0			
5.	Biribati*	4	7.6 (7.4-7.8)	158(134-176)	0.20 (0.12-0.32)	0.016 (0.008-0.027)	0	0	0			
6.	Atharabanki	12	7.6 (7.0-8.2)	215 (147-297)	0.50 (0.24-0.60)	0.060 (0.005-0.175)	0	0	0			
Puri Canal												
1.	Hansapal	12	7.8 (6.9-8.4)	204 (172-296)	0.44 (0.10-0.74)	0.045 (0.003-0.240)	0	0	0	Conform to Class E		
2.	Jagannathpur	12	7.7 (6.9-8.3)	194 (137-280)	0.40 (0.19-0.57)	0.044 (0.003-0.168)	0	0	0			
3.	Chandanpur	12	7.4 (6.5-8.3)	225 (142-448)	0.56 (0.13-1.46)	0.069 (0.005-0.354)	0	0	0			
**Class 'E'							2250 or less	26 or less	2.0 or less	Irrigation, industrial cooling, controlled waste disposal		
* Data for the period August, September, October and November, 2019												

Table- 5.21(a) Water Quality of Taladanda Canal with respect to other parameters during 2019 (January-December)

Sl. No.	Sam-pling Location	Physical pa-rameters		Organic pollution Indicators				Mineral constituents				
		Annual average values (Range of values)										
		TSS	Total alka-linity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)				(mg/l)				
1.	Jobra*	91 (15-164)	73 (64-92)	15.7 (9.1-27.9)	0.49 (0.28-0.56)	0.004 (0.003-0.007)	7.21 (1.96-14.84)	104 (84-120)	70 (60-84)	7.0 (3.8-9.6)	14.87 (10.95-24.37)	0.251 (0.176-0.295)
2.	Rani-hat*	112 (20-188)	70 (64-84)	18.0 (12.6-24.2)	1.19 (0.28-3.36)	0.023 (0.003-0.067)	8.19 (1.96-22.68)	98 (80-112)	67 (56-80)	7.0 (3.8-9.6)	13.32 (9.88-22.63)	0.249 (0.184-0.284)
3.	Chhatra-bazar*	98 (14-162)	72 (62-92)	16.1 (11.6-24.2)	1.40 (0.84-3.08)	0.024 (0-0.062)	10.92 (2.52-24.36)	99 (84-112)	68 (56-84)	5.3 (3.8-7.7)	14.49 (10.00-23.25)	0.271 (0.253-0.287)
4.	Nuaba-zar*	96 (28-149)	71 (64-88)	16.6 (10.9-24.2)	1.40 (0.28-3.92)	0.019 (0-0.049)	5.83 (1.20-15.96)	102 (88-116)	68 (60-82)	7.7 (5.8-9.6)	13.49 (10.35-21.14)	0.284 (0.232-0.328)
5.	Biribati*	70 (23-98)	74 (68-84)	16.7 (7.2-23.2)	0.84 (0.28-1.68)	0.018 (0.004-0.029)	4.97 (1.68-8.68)	100 (92-112)	72 (64-84)	6.5 (5.8-7.7)	13.97 (9.70-22.02)	0.291 (0.232-0.379)
6.	Athara-banki	21 (1-99)	83 (64-108)	16.0 (9.1-40.4)	0.98 (0.28-2.24)	0.031 (0-0.056)	4.29 (1.12-17.92)	130 (96-178)	78 (60-100)	14.5 (8.7-19.2)	15.0 (6.0-34.2)	0.358 (0.199-0.598)
**Class 'C'		-	-	-	-	-	-	1500	-	600	400	1.5
**Class 'E'		-	-	-	-	-	-	2100	-	600	1000	-

* Data for the period August, September, October and November, 2019

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

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Sl. No.	Sam-pling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr (VI) ^{##}	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}
		(mg/l)		(mg/l)								
1.	Jobra*	1.106 (0.840-1.684)	0.185 (0.024-0.455)	Not analysed								
2.	Ranihat*	1.219 (1.006-1.599)	0.084 (0.015-0.222)	Not analysed								
3.	Chhatra-bazar*	1.809 (0.980-3.940)	0.068 (0.012-0.192)	Not analysed								
4.	Nuabazar*	1.716 (0.784-3.466)	0.126 (0.021-0.241)	Not analysed								

Sl. No.	Sam-pling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO ₃ ⁻	PO ₄ ^{3--P}	Cr (VI) ^{##}	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}
		(mg/l)		(mg/l)								
5.	Biribati*	1.640 (0.997-2.311)	0.221 (0.062-0.343)	Not analysed								
6.	Athara-banki	1.136 (0.429-3.971)	0.190 (0.024-0.659)	<0.002	0.024	0.691	0.005	0.005	0.010	0.0021	-	0.003
**Class 'C'		50	-	0.05	-	50	-	1.5	15.0	0.01	-	0.10
**Class 'E'		-	-	-	-	-	-	-	-	-	-	-

* Data for the period August, September, October and November, 2019

Data for the period April, 2019 ** Tolerance limits for Inland Surface water bodies (IS-2296-1982)

DO : Dissolved Oxygen, BOD : Biochemical Oxygen Demand, TC : Total Coliform, TSS : Total Suspended Solids; COD : Chemical Oxygen Demand, NH₄-N : Ammonical nitrogen, TKN : Total Kjeldahl Nitrogen; FC : Fecal Coliform, EC : Electrical Conductivity, TDS : Total Dissolved Solids, B : Boron ; SAR : Sodium Absorption Ratio, TH : Total hardness; Cl : chloride, SO₄ : sulphate; F : Fluoride; PO₄³⁻ : phosphate, : Cr(VI) : Hexavalent Chromium; T.Cr : total Chromium, Fe : Iron, Ni : Nickel, Cu : Copper, Zn : Zinc; Cd : cadmium; Hg : Mercury; Pb : Lead

Table -5.21(b) Water Quality of Puri Canal with respect to other parameters during 2019 (January-December)

Sl. No.	Sam-pling Location	Physical pa-rameters		Organic pollution Indicators				Mineral constituents				
		Annual average values (Range of values)										
		TSS	Total alka-linity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TDS	TH	Cl	SO ₄	F
		(mg/l)		(mg/l)				(mg/l)				
1.	Hansapal	30 (1-161)	83 (68-132)	8.9 (5.2-16.1)	1.097 (0.280-3.080)	0.059 (0-0.385)	4.36 (0.56-12.32)	124 (104-168)	79 (64-124)	12.5 (5.5-20.1)	12.25 (4.80-23.25)	0.305 (0.234-0.407)
2.	Jagannath-pur	33 (2-168)	84 (68-126)	11.9 (5.5-28.0)	1.210 (0.240-3.360)	0.058 (0-0.328)	4.36 (1.12-9.80)	118 (92-174)	76 (56-112)	10.7 (5.8-17.3)	10.88 (4.85-16.54)	0.328 (0.251-0.420)
3.	Chandan-pur	85 (4-570)	84 (62-120)	10.2 (5.4-21.2)	0.775 (0.112-1.400)	0.018 (0-0.109)	2.75 (1.12-4.76)	136 (84-260)	80 (56-126)	19.9 (2.9-62.7)	12.67 (5.95-26.12)	0.296 (0.147-0.486)
**Class 'C'		-	-	-	-	-	-	1500	-	600	400	1.5
**Class 'E'		-	-	-	-	-	-	2100	-	600	1000	-

Sl. No.	Sampling Location	Nutrients		Heavy metals								
		Annual average values (Range of values)										
		NO ₃ ⁻	PO ₄ ³⁻ -P	Cr(VI) ^{##}	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}
		(mg/l)		(mg/l)								
1.	Hansapal	2.037 (0.536-9.962)	0.158 (0.010-0.642)	<0.002	0.020	0.130	0.002	0.004	0.010	0.0013	-	0.003
2.	Jagannathpur	0.791 (0.438-1.163)	0.110 (0.011-0.416)	<0.002	0.027	0.308	0.002	0.004	0.011	0.0018	-	0.004
3.	Chandanpur	3.327 (0.704-26.505)	0.069 (0.001-0.448)	<0.002	0.035	0.154	0.003	0.003	0.010	0.0020	-	0.002
**Class 'C'		50	-	0.05	<0.002	50	-	1.5	15.0	0.01	-	0.10
**Class 'E'		-	-	-	-	-	-	-	-	-	-	-

Data for the period April, 2019

** 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 2019 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 2019. Frequent deviations in pH values in the ponds in Puri town and Raniguda pond in Angul have been observed to be not within the tolerance limit of 6.5-8.5. 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 Satapada), 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 2019 are given in Table-5.24 and Table-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 all the monitored locations of Anshupa and 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 at three locations near Puri town (Swargadwara, Baliapanda and Bankimuhan), one location at Gopalpur and one location at Paradeep 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 2019 are given in Tables -5.26 and Table-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 at Puri 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. 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 2019 (January- December)

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	BOD	TC	FC	Does not conform to Class B			
			DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)	DO	BOD									
(a) Bindusagar Pond in Bhubaneswar City																	
1.	Lingaraj Temple side	12	7.5 (6.7-8.3)	7.8 (5.4-10.4)	2.1 (1.0-2.9)	16856 (170-92000)	7927 (45-54000)	0	0	0	11 (92)	7 (58)	Does not conform to Class B	TC,FC	Human activities		
2.	Ananta Vasudev	12	7.7 (7.1-8.4)	8.1 (5.1-11.4)	1.9 (0.8-3.3)	10715 (110-35000)	5498 (20-35000)	0	0	1 (8)	10 (83)	4 (33)		BOD, TC,FC			
3.	Gyananagar	12	7.7 (7.2-8.2)	7.3 (5.5-10.2)	2.4 (0.8-4.2)	43841 (110-160000)	26383 (20-160000)	0	0	3 (25)	11 (92)	7 (58)		BOD, TC,FC			
4.	Near Kedarath Research Centre	12	7.7 (7.1-8.4)	8.2 (4.7-11.8)	2.0 (0.6-3.7)	20759 (20-54000)	7303 (20-22000)	0	0	1 (8)	11 (92)	7 (58)		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)

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	BOD	TC	FC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)									
(b) Ponds (Puri)																
1.	Narendra	12	8.2 (7.2-8.8)	7.2 (2.4-11.8)	5.3 (1.6-8.7)	3448 (20-16000)	2300 (1.8-16000)	4 (33)	3 (25)	11 (92)	6 (50)	2 (17)	Does not conform to Class B	pH, DO, BOD, TC, FC	Human activities	
2.	Markanda	12	8.1 (7.2-9.0)	8.7 (3.9-17.5)	6.1 (2.1-10.1)	7763 (1.8-54000)	3365 (1.8-17000)	2 (17)	3 (25)	10 (83)	8 (67)	3 (25)		pH, DO, BOD, TC, FC		
3.	Indradyumna	12	8.1 (7.2-8.5)	7.2 (2.2-10.6)	4.6 (2.5-6.8)	4615 (78-17000)	2130 (20-16000)	0	3 (25)	11 (92)	11 (92)	2 (17)		DO, BOD, TC, FC		
4.	Swetaganaga	12	8.2 (6.9-9.2)	8.5 (2.0-17.1)	8.3 (1.9-21.6)	3105 (45-16000)	599 (20-2400)	4 (33)	3 (25)	10 (83)	10 (83)	0		pH, DO, BOD, TC		
5.	Parvati sagar	12	8.0 (7.0-8.5)	7.3 (2.4-15.2)	11.2 (2.4-29.9)	5477 (220-22000)	2602 (130-16000)	0	3 (25)	11 (92)	11 (92)	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)					Frequency of violation (Percent of violation) from designated criteria value					Existing Class	Parameters responsible for downgrading the water quality	Possible Reason	
			Parameters					pH	DO	BOD	TC	FC				
			pH	DO (mg/l)	BOD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)									
(c) Pond in Jeypore town																
1.	Jagannath-sagar	12	7.6 (7.2-8.4)	7.0 (6.0-9.4)	2.1 (1.4-5.5)	2967 (68-160000)	1954 (20-160000)	0	0	1 (8)	9 (75)	1 (8)	Does not conform to Class B	BOD, TC, FC	Human activities	
(d) Pond in Angul Town																
1.	Raniguda Pond	12	7.5 (7.0-8.7)	7.5 (3.2-10.8)	4.5 (1.3-9.8)	1458 (78-3500)	421 (20-1100)	1 (8)	1 (8)	7 (58)	10 (82)	0	Does not conform to Class B	pH, DO, BOD, TC	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 2019 (January- December)

Sl. No.	Sampling Location	Physical parameters					Organic pollution Indicators					Mineral constituents						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	EC	SAR	B	TDS	TH	Cl	SO ₄	F	Annual average values (Range of values)		
																(mg/l)	(mg/l)	(µS/cm)
(a) Bindusagar Pond in Bhubaneswar City																		
1.	Lingaraj Temple side	14 (3-51)	108 (88-124)	17.8 (9.5-32.1)	1.003 (0.280-1.680)	0.030 (0-0.137)	4.48 (1.68-9.24)	397 (334-560)	1.70 (1.35-2.25)	0.071 (0.025-0.201)	239 (192-364)	84 (70-106)	54.3 (42.7-75.9)	15.13 (9.82-22.26)	0.257 (0.155-0.365)			
2.	Ananta Vasudev	12 (3-25)	105 (86-120)	15.7 (10.3-23.2)	0.770 (0.280-1.960)	0.033 (0.001-0.157)	3.64 (1.68-11.48)	366 (318-410)	1.61 (0.92-2.33)	0.067 (<0.003-0.278)	216 (188-262)	85 (72-112)	51.8 (34.5-65.4)	15.82 (10.94-23.12)	0.289 (0.151-0.413)			
3.	Gyananagar	16 (2-42)	109 (86-128)	19.1 (9.4-27.8)	1.027 (0.280-2.240)	0.039 (0.006-0.179)	4.55 (1.12-14.56)	392 (340-426)	1.70 (1.06-2.34)	0.043 (<0.003-0.101)	228 (196-268)	87 (70-108)	55.2 (43.3-73.1)	18.31 (11.19-36.19)	0.300 (0.179-0.491)			
4.	Near Kedar-nath research Centre	24 (6-90)	107 (82-136)	18.6 (8.6-32.0)	0.887 (0.280-2.240)	0.035 (0.001-0.109)	4.46 (1.68-10.08)	383 (338-406)	1.69 (0.98-2.24)	0.040 (0.010-0.077)	226 (192-256)	85 (64-102)	56.6 (44.2-65.4)	16.93 (10.57-27.10)	0.326 (0.150-0.987)			
*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								
		NO ₃	PO ₄ ³⁻ -P	Annual average values (Range of values)								
				Cr(VI)#	T. Cr#	Fe#	Ni#	Cu#	Zn#	Cd#	Hg#	Pb#
(a) Bindusagar Pond in Bhubaneswar City												
1.	Lingaraj Temple side	7.257 (0.517-43.374)	0.203 (0.027-0.612)	<0.002	0.018	0.295	0.005	0.006	0.012	0.0020	-	0.002
2.	Ananta Vasudev	3.841 (0.663-30.298)	0.186 (0.010-0.688)	<0.002	0.024	0.358	0.005	0.003	0.008	0.0018	-	0.007

Sl. No.	Sampling Location	Nutrients										Heavy metals						
		Annual average values (Range of values)										Annual average values (Range of values)						
		NO ₃ ⁻	PO ₄ ^{3--P}	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]	(mg/l)					
3.	Gyananagar	1.530 (0.480-4.335)	0.185 (0.014-0.740)	<0.002	0.013	0.375	0.002	0.007	0.018	0.0017	-	0.003						
4.	Near Kedarnath Research Centre	1.273 (0.541-4.093)	0.148 (0.012-0.775)	<0.002	0.018	0.309	0.004	0.003	0.007	0.0013	-	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, 2019

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)					Annual average values (Range of values)					Annual average values (Range of values)									
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	EC (µS/cm)	SAR	B	TDS	TH	Cl	SO ₄	F	(mg/l)					
Ponds in Puri town																					
1.	Narendra	11 (3-25)	199 (164-228)	34.1 (21.4-54.1)	0.924 (0.056-2.240)	0.035 (0-0.157)	3.20 (1.12-6.44)	895 (707-1317)	3.44 (2.69-5.57)	0.463 (0.088-2.955)	549 (420-828)	178 (136-220)	176.0 (120.1-346.1)	38.83 (17.04-58.21)	0.162 (0.070-0.283)						
2.	Markanda	22 (6-83)	189 (150-224)	33.1 (13.1-67.9)	0.667 (0.056-1.400)	0.074 (0.004-0.286)	2.80 (0.56-6.16)	702 (604-796)	1.56 (0.89-2.02)	0.170 (0.062-0.374)	412 (348-480)	198 (144-256)	90.5 (69.2-149.9)	45.02 (30.84-61.43)	0.136 (0.043-0.569)						
3.	Indradyumna	10 (2-19)	111 (88-180)	24.3 (16.8-33.9)	0.653 (0.112-1.400)	0.052 (0.009-0.217)	2.82 (0.56-6.16)	500 (278-653)	2.36 (0.80-3.31)	0.320 (0.041-2.479)	298 (184-412)	99 (64-184)	81.4 (25.0-116.2)	26.70 (10.05-69.90)	0.130 (0.059-0.198)						

Sl. No.	Sampling Location	Physical parameters				Organic pollution Indicators					Mineral constituents							
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	EC (µS/cm)	SAR	B	TDS	TH	Cl	SO ₄	F	Annual average values (Range of values)		
																(mg/l)	(mg/l)	(mg/l)
4.	Swetanganga	19 (4-38)	178 (108-256)	43.8 (15.5-104.8)	0.859 (0.224-3.360)	0.108 (0-0.378)	3.29 (0.84-7.28)	889 (246-1368)	3.47 (1.29-5.71)	0.173 (0.056-0.358)	522 (136-788)	168 (76-266)	168.9 (72.1-288.5)	36.76 (10.05-51.99)	0.137 (0.044-0.569)			
5.	Parvati sagar	34 (5-92)	111 (70-224)	57.3 (26.8-133.4)	1.307 (0.560-3.360)	0.104 (0-0.260)	4.11 (0.84-8.40)	474 (260-1330)	2.02 (1.12-4.60)	0.091 (0.024-0.223)	286 (168-760)	102 (68-208)	80.6 (31.7-274.9)	22.17 (6.66-48.01)	0.121 (0.037-0.217)			
*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)										Annual average values (Range of values)						
		NO ₃	PO ₄ ³⁻⁻ P	Cr(VI) #	T. Cr#	Fe#	Ni#	Cu#	Zn#	Cd#	Hg#	Pb#						
		(mg/l)										(mg/l)						
Ponds in Puri town																		
1.	Narendra	3.233 (0.493-12.672)	0.573 (0.120-2.344)	<0.002	0.020	0.223	0.009	0.007	0.010	0.0029	-	0.009						
2.	Markanda	13.171 (0.888-46.114)	1.027 (0.098-3.352)	<0.002	0.013	0.213	0.008	0.006	0.012	0.0022	-	0.008						
3.	Indradyumna	2.152 (0.411-7.868)	0.534 (0.003-3.690)	<0.002	0.015	1.299	0.006	0.004	0.018	0.0018	-	0.003						

Sl. No.	Sampling Location	Nutrients										Heavy metals					
		Annual average values (Range of values)										Annual average values (Range of values)					
		NO ₃ ⁻	PO ₄ ^{3--P}	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]					
		(mg/l)										(mg/l)					
4.	Swetaganga	8.460 (0.578-38.665)	0.454 (0.033-0.956)	<0.002	0.024	0.262	0.005	0.005	0.025	0.0024	--	0.004					
5.	Parvati sagar	3.129 (0.542-7.503)	0.128 (0.009-0.298)	<0.002	0.015	0.121	0.004	0.003	0.010	0.0017	-	0.002					
	*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, 2019

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)					Annual average values (Range of values)					Annual average values (Range of values)														
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	EC (µS/cm)	SAR	B	TDS	TH	Cl	SO ₄	F											
		(mg/l)															(mg/l)									
Pond in Jeypore town																										
1.	Jagannathsagar	20 (3-46)	124 (80-198)	19.8 (10.7-40.4)	0.840 (0.280-2.800)	0.023 (0.003-0.073)	3.17 (1.40-4.76)	362 (166-789)	1.03 (0.15-1.86)	0.085 (<0.003-0.310)	211 (104-502)	110 (76-206)	41.5 (4.8-95.1)	12.44 (3.60-59.58)	0.221 (0.109-0.645)											
Pond in Angul town																										
1.	Raniguda	20 (4-56)	208 (138-254)	31.9 (16.4-57.7)	1.167 (0.280-3.360)	0.020 (0-0.076)	5.69 (1.12-22.68)	690 (372-1049)	1.68 (0.58-3.84)	0.063 (0.003-0.202)	407 (224-692)	189 (110-286)	87.7 (27.7-284.6)	36.76 (13.81-48.75)	0.573 (0.129-0.793)											
	*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) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##	
Pond in Jeypore town													
1.	Jagannathsagar	1.899 (0.651-6.201)	0.1147 (0.001-0.562)	<0.002	0.018	0.227	0.006	0.006	0.038	0.0016	-	0.006	
Pond in Angul town													
1.	Raniguda	4.749 (0.645-20.720)	0.255 (0.001-0.589)	<0.002	0.027	0.150	0.004	0.005	0.009	0.0019	-	0.004	
	*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, 2019

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

Table-5.24 Water Quality of Lakes with respect to Criteria parameters during 2019 (January-December)

(a) Brackish Water Lake

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	BOD	FC	DO				BOD	FC
			pH	DO (mg/l)	BOD (mg/l)	Turbidity, NTU	FC (MPN/100 ml)										
Chilika lake																	
1.	Rambha	12	8.1 (7.4-8.4)	7.1 (6.2-8.5)	1.7 (1.2-2.5)	4.9 (1.2-11.0)	179 (1.8-1100)	0	0	0	5 (42)	Does not conform to Class-SW-II	FC	Human activities			
2.	Salpada	12	7.7 (6.6-8.2)	7.2 (6.4-8.4)	1.5 (0.8-2.2)	24.7 (1.8-95.0)	363 (20-1700)	0	0	0	6 (50)	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)				Frequency of violation from designated criteria value				Existing Class	Parameters responsible for downgrading the water quality	Possible Reason
			Parameters				pH	DO	Free ammonia	EC			
			pH	DO (mg/l)	Free ammonia (mg/l)	EC (micro Siemens /cm)							
(a) Anshupa Lake													
1.	Katalibari	12	7.3 (6.6-8.4)	6.5 (4.9-8.1)	0.013 (0-0.070)	135 (80-234)	0	0	0	0	D	-	-
2.	Bishnupur	12	7.1 (6.5-7.8)	7.2 (5.2-8.6)	0.007 (0-0.049)	133 (108-203)	0	0	0	0	D	-	-
3.	Subarnapur	12	7.2 (6.6-8.0)	7.0 (5.6-7.9)	0.007 (0-0.025)	141 (104-213)	0	0	0	0	D	-	-
4.	Sarandagarh	12	7.2 (6.6-7.8)	7.3 (5.6-9.2)	0.008 (0-0.049)	136 (102-215)	0	0	0	0	D	-	-
(b) Tampara Lake													
5.	Tampara	12	8.0 (6.7-8.4)	6.5 (3.5-10.0)	0.095 (0-0.280)	677 (364-1385)	0	1	0	0	D	-	-
*Class 'D'		Fish Culture and Wild life propagation											

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

Table-5.25 Water Quality of Lakes with respect to other parameters during 2019 (January-December)
(a) Brackish Water Lake

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological Parameter		Mineral constituents						
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TC	EC	SAR	TDS	B	TH	Cl	SO ₄	F
Annual average values (Range of values)																
		(mg/l)		(mg/l)				(MPN/ 100 ml)	(µS/cm)	(mg/l)						
Chilika lake																
1.	Rambha	56 (16-91)	147 (120-196)	32.2 (18.6-48.1)	0.723 (0.280-1.960)	0.060 (0.008-0.210)	2.68 (0.56-5.88)	773 (1.8-4900)	17755 (9842-32150)	39.82 (18.30-76.55)	13067 (6508-26172)	1.137 (0.657-1.616)	1934 (660-3200)	7008.4 (3785.8-14903.3)	643.6 (207.7-1075.9)	0.466 (0.271-0.689)
2.	Satapada	104 (2-370)	122 (94-180)	30.9 (5.4-57.7)	0.658 (0.056-1.400)	0.025 (0-0.067)	2.89 (0.56-6.16)	1047 (78-3500)	25341 (1606-44390)	53.10 (8.57-100.57)	20781 (960-38660)	1.763 (0.017-3.678)	2750 (162-6480)	11375.4 (432.7-20738.3)	968.7 (52.1-2512.4)	0.447 (0.202-0.710)

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Sl. No.	Sampling Location	Nutrients							Heavy metals						
		NO ₃	PO ₄ ³⁻ -P	Cr(VI) [#]	T. Cr [#]	Fe [#]	Ni [#]	Cu [#]	Zn [#]	Cd [#]	Hg [#]	Pb [#]			
Annual average values (Range of values)															
		(mg/l)							(mg/l)						
Chilika lake															
1.	Rambha	3.547 (0.551-16.653)	0.074 (0.003-0.264)	<0.002	0.013	0.288	0.009	0.011	0.009	0.0016	-	0.005			
2.	Satapada	1.606 (0.827-3.308)	0.147 (0.016-0.449)	<0.002	0.018	0.230	0.010	0.009	0.012	0.0017	-	0.006			

Data for the period April, 2019

(b) Fresh Water Lake

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameters		Mineral constituents						
		TSS	Total alkalinity (mg/l)	BOD	COD	NH ₄ -N (mg/l)	TKN	TC (MPN/ 100 ml)	FC (MPN/ 100 ml)	TDS (mg/l)	B	SAR	TH	Cl	SO ₄	F
(a) Anshupa Lake																
1.	Kadalibari (3-70)	20	54 (32-98)	1.5 (0.8-2.1)	14.1 (7.6-23.1)	0.817 (0.200-2.240)	3.40 (1.12-12.60)	1532 (170-5400)	644 (20-3500)	81 (48-128)	0.074 (<0.003-0.143)	0.38 (0.16-0.61)	52 (36-92)	9.2 (4.8-13.8)	6.72 (2.74-14.80)	0.276 (0.116-0.361)
2.	Bishnupur (3-69)	15	55 (44-102)	1.2 (0.3-2.6)	13.3 (6.9-24.8)	0.705 (0.056-1.400)	3.38 (1.12-8.40)	3393 (210-7000)	1573 (40-4600)	79 (64-116)	0.066 (0.003-0.168)	0.34 (0.23-0.48)	55 (46-94)	8.2 (5.8-11.5)	5.00 (1.62-11.07)	0.264 (0.122-0.369)
3.	Subarnapur (3-72)	19	57 (44-106)	1.2 (0.7-1.9)	12.0 (9.0-15.0)	0.840 (0.280-1.960)	3.48 (1.68-7.00)	2131 (490-4300)	684 (20-1400)	86 (64-128)	0.077 (<0.003-0.271)	0.40 (0.19-0.60)	56 (44-102)	10.3 (4.8-16.3)	6.97 (2.14-16.29)	0.272 (0.110-0.380)
4.	Sarandagarh (5-31)	15	58 (32-102)	1.4 (0.6-1.9)	14.4 (7.7-20.7)	0.789 (0.280-2.240)	4.74 (0.56-21.56)	2017 (130-4600)	828 (20-4600)	83 (64-124)	0.089 (0.003-0.407)	0.40 (0.13-0.59)	52 (40-94)	9.0 (1.9-13.5)	6.72 (1.86-13.31)	0.276 (0.109-0.366)
(b) Tampara Lake																
5.	Tampara (3-63)	25	156 (104-192)	4.6 (1.8-6.6)	38.9 (17.1-80.6)	0.980 (0.280-2.240)	3.20 (0.84-8.12)	1588 (1.8-5400)	630 (1.8-3500)	418 (224-844)	0.135 (0.059-0.227)	2.80 (0.49-7.67)	139 (92-208)	153.8 (29.8-573.1)	17.50 (3.93-42.91)	0.515 (0.240-0.684)
* 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) ##	T. Cr##	Fe##	Ni##	Cu##	Zn##	Cd##	Hg##	Pb##		
(a) Anshupa Lake														
1.	Kadalibari	1.123 (0.462-4.303)	0.061 (0.008-0.167)	<0.002	0.018	1.621	0.0018	0.003	0.005	0.010	-	0.002		
2.	Bishnupur	1.525 (0.438-6.287)	0.089 (0.010-0.208)	<0.002	0.013	0.751	0.0014	0.002	0.002	0.005	-	0.002		
3.	Subarnapur	1.532 (0.517-5.108)	0.136 (0.010-0.526)	<0.002	0.015	0.821	0.0016	0.006	0.002	0.004	-	0.002		
4.	Sarandagarh	1.814 (0.525-13.504)	0.072 (0.008-0.183)	<0.002	0.018	1.098	0.0015	0.006	0.007	0.005	-	0.003		
(b) Tampara Lake														
5.	Tampara	1.846 (0.468-5.649)	0.052 (0.002-0.127)	<0.002	0.029	0.228	0.0019	0.007	0.003	0.018	-	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, 2019

Table-5.26 Coastal Water Quality with respect to Criteria parameters during 2019 (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
			pH	DO (mg/l)	BOD (mg/l)	Turbidity, NTU	FC (MPN/100 ml)	BOD			
1.	Puri										
(a)	Swargadwara	12	7.9 (7.3-8.2)	6.8 (6.0-8.1)	0.8 (0.2-1.6)	14.9 (1.4-59.0)	54 (1.8-350)	0	2 (17)	SW-II	
(b)	Bankimuhan	12	7.7 (6.5-8.3)	6.5 (5.5-7.5)	1.4 (0.3-2.3)	12 (2-29)	3167 (1.8-16000)	0	6 (50)	Does not confirm to Class-SW-II	FC
(c)	Baliapanda	12	7.9 (6.7-8.2)	6.5 (5.8-7.6)	0.9 (0.3-1.6)	10 (2-55)	174 (1.8-1600)	0	2 (17)	SW-II	
2.	Gopalpur	12	8.0 (7.5-8.2)	7.3 (6.5-8.8)	0.9 (0.2-2.5)	8.5 (1.0-23.0)	41 (1.8-330)	0	2 (17)	SW-II	
3.	Paradeep	12	7.9 (7.1-8.2)	6.9 (5.8-8.4)	0.9 (0.3-1.4)	8.9 (1.2-22.0)	1.8 (1.8-1.8)	0	0	SW-II	
	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.

Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values)				Frequency of violation (Percent of violation) from designated criteria value		Ex-isting Class	Parameters responsible for downgrading the water quality	Possible Reason		
			pH	DO (mg/l)	BOD (mg/l)	O&G, mg/l	BOD	O&G				FC	
1.	Gopalpur	12	8.0 (7.5-8.2)	7.3 (6.5-8.8)	0.9 (0.2-2.5)	1.5 (1.2-2.8)	41 (1.8-330)	0	0	0	0	SW-IV	

Sl. No	Sampling Location	No. of Obs.	Annual average value (Range of values)						Frequency of violation (Percent of violation) from designated criteria value			Ex-isting Class	Parameters responsible for downgrading the water quality	Possible Reason	
			Parameters						BOD	O&G	FC				
			pH	DO (mg/l)	BOD (mg/l)	O&G, mg/l	FC (MPN/100 ml)	BOD	O&G	FC					
2.	Paradeep	12	7.9 (7.1-8.2)	6.9 (5.8-8.4)	0.9 (0.3-1.4)	0.9 (0.3-1.5)	1.8 (1.8-1.8)	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 2019 (January- December)

Sl. No.	Sampling Location	Physical parameters	Organic pollution Indicators						Bacteriological parameter	Mineral constituents					
			Annual average values (Range of values)							Annual average values (Range of values)					
		TSS (mg/l)	COD	NH ₄ -N	Free NH ₃ -N	TKN	TC	EC	SAR	B	TDS	TH	CI	SO ₄	F
1.	Puri														
(a)	Swargadwara	143 (88-196)	43.7 (29.3-58.0)	0.593 (0.056-1.120)	0.031 (0.002-0.090)	2.54 (0.56-5.88)	1432 (1.8-16000)	40957 (31390-49630)	61.36 (52.39-77.79)	3.174 (2.057-4.138)	32817 (26172-40100)	4900 (3100-6200)	17316 (13461-20738)	2380.6 (1803.4-3181.0)	0.615 (0.366-0.767)
(b)	Bankimuhan	133 (104-180)	47.2 (38.6-56.6)	0.72 (0.28-1.40)	0.034 (0-0.137)	2.43 (1.12-5.60)	4554 (45-16000)	40353 (28680-47860)	62.92 (51.04-80.56)	2.81 (1.61-4.23)	32235 (23520-40500)	4708 (3100-6160)	17207 (12496-21153)	2060 (1294-3103)	0.542 (0.319-0.715)
(c)	Baliapanda	128 (88-196)	44.3 (38.1-58.0)	0.83 (0.17-1.96)	0.019 (0.001-0.067)	2.64 (0.56-6.16)	494 (1.8-3500)	41522 (29420-49740)	64.05 (51.58-82.16)	3.15 (1.97-3.95)	33670 (24340-40500)	4833 (3050-6120)	17705 (13461-23076)	2278 (1269-3138)	0.611 (0.351-0.798)

Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriological parameter		Mineral constituents								
		TSS	Total alkalinity	COD	NH ₄ -N	Free NH ₃ -N	TKN	TC	EC	SAR	B	TDS	TH	Cl	SO ₄	F		
																	Annual average values (Range of values)	
		(mg/l)						(MPN/100 ml)		(µS/cm)		(mg/l)						
2.	Gopalpur	166 (18-387)	127 (108-168)	45.7 (34.5-57.2)	0.756 (0.112-1.960)	0.048 (0.004-0.157)	2.82 (1.40-6.72)	98 (1.8-790)	40668 (32470-48264)	59.80 (51.86-71.96)	2.706 (0.925-3.390)	32425 (25992-35780)	5107 (2700-6080)	17334 (13942-20672)	2176.6 (1069.6-2885.5)	0.641 (0.362-0.809)		
3.	Paradeep	203 (23-328)	122 (100-184)	47.7 (28.8-58.3)	0.700 (0.280-1.120)	0.033 (0.003-0.073)	2.17 (0.84-4.76)	17 (1.8-140)	41011 (32160-48750)	59.30 (52.82-71.67)	2.599 (0.052-4.018)	32387 (25492-38640)	5066 (2650-6200)	17286 (13942-20191)	2158.8 (1268.6-2804.8)	0.714 (0.506-0.833)		

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Sl. No.	Sampling Location	Nutrients										Heavy metals									
		Annual average values (Range of values)										Annual average values (Range of values)									
		NO ₃		PO ₄ ³⁻ P		Cr(VI)		T. Cr		Fe		Ni		Cu		Zn		Cd		Hg	
		(mg/l)																			
1.	Puri																				
(a)	Swargadwara	0.936 (0.529-1.514)	0.067 (0.011-0.138)	<0.002	0.013	0.282	0.010	0.007	0.018	0.0011	-	<0.001									
(b)	Bankimuhan	5.217 (0.565-20.819)	0.086 (0.002-0.188)	<0.002	0.015	0.260	0.007	0.008	0.013	0.0013	-	<0.001									
(c)	Baliapanda	1.013 (0.464-2.882)	0.092 (0.006-0.276)	<0.002	0.015	0.320	0.011	0.007	0.014	0.0016	-	<0.001									
2.	Gopalpur	1.834 (0.802-4.408)	0.051 (0.002-0.199)	<0.002	0.024	0.351	0.009	0.011	0.015	0.0012	--	<0.001									
3.	Paradeep	1.441 (0.565-4.093)	0.314 (0.013-2.755)	<0.002	0.018	0.384	0.005	0.005	0.012	0.0015	--	<0.001									

Data for the period April, 2019

(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 river also acts as a receiving water body for treated effluent and surface runoff from M/s Paradeep Phosphates Limited and M/s IFFCO operating at Paradeep.

Annual average and range values of the water quality parameters of the creek during the year 2019 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 with the range 1.12-3.35 mg/l with an annual average value of 2.26 mg/l.

Table-5.28 Water Quality of Atharabanki Creek during 2019 (January-December)

Sl. No	Sam-pling Loca-tion	No. of Obs.	Annual averagevalue (Range of values)					Frequency of violation (Percent of violation) from designated criteria value				Ex-isting Class	Param-eters respon-sible for down-grading the water quality	Pos-sible Rea-son
			Parameters					pH	DO	BOD	FC			
			pH	DO (mg/l)	BOD (mg/l)	Tur-bidity, NTU	FC (MPN/100 ml)							
1.	Athar-abanki Creek	12	7.5 (6.9-8.1)	6.0 (4.4-7.8)	2.8 (1.3-4.4)	11.0 (2.8-33.0)	1670 (330-5400)	0	0	3 (25)	12 (100)	Does not confirm to Class-SW-II	BOD, FC	Human activi-ties
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		

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Sl. No.	Sampling Location	Physical parameters		Organic pollution Indicators				Bacteriolo-gical parameter	Mineral constituents																			
		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)	(µS/cm)	(mg/l)					
1.	Atharaban-ki Creek	88 (22-194)	161 (70-268)	35.4 (27.8-39.5)	0.880 (0.208-2.800)	0.028 (0-0.112)	5.69 (1.96-18.20)	4263 (940-9200)	11761 (896-25710)	27.32 (5.71-49.74)	0.878 (0.173-2.056)	5943 (104-13196)	1289 (84-2360)	4069.1 (308.0-7111.4)	803.2 (65.5-1890.5)	2.26 (1.12-3.35)												

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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) ^{##}	T. Cr ^{##}	Fe ^{##}	Ni ^{##}	Cu ^{##}	Zn ^{##}	Cd ^{##}	Hg ^{##}	Pb ^{##}
		(mg/l)		(mg/l)								
1.	Atharabanki Creek	9.607 (0.551 -49.277)	1.18 (0.29- 3.53)	<0.002	0.027	0.283	0.008	0.006	0.012	0.0021	-	0.007

Data for the period April, 2019

(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 25 selected stations during 2019. 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 nine stations conform to the Class 'B-C' (slight to moderate pollution), at two stations conform to Class B (slight pollution) and at fourteen stations conform to Class C (moderate pollution) water quality.

Table-5.30 - Biomonitoring of River Bodies (2019)

Station		Annual Average value (Range of values)		Existing Biological Water Quality Class
		Saprobity Index	Diversity Index	
(A) Mahanadi				
1.	Brajarajnar D/s	6.05 (5.80-6.20)	0.66 (0.60-0.70)	B-C
2.	Sambalpur D/s	4.96 (5.60-5.57)	0.66 (0.50-0.79)	C
3.	Cuttack U/s	5.60 (5.50-5.70)	0.60 (0.50-0.70)	C
4.	Cuttack D/s	5.70 (5.50-5.80)	0.65 (0.60-0.70)	C
5.	Cuttack U/s (Kathajodi)	5.70 (5.60-5.80)	0.65 (0.55-0.75)	C
6.	Cuttack D/s (Kathajodi)	5.27 (5.00-5.50)	0.63 (0.60-0.70)	C
7.	Bhubaneswar U/s (Kuakhai)	4.80 (4.60-5.00)	0.58 (0.56-0.59)	C
8.	Bhubaneswar D/s (Daya)	5.19 (4.90-5.40)	0.65 (0.57-0.76)	C
9.	Choudwar D/s (Birupa)	5.77 (5.50-6.10)	0.72 (0.59-0.80)	B-C
(B) Brahmani				
10.	Panposh D/s	5.18 (4.54-5.50)	0.56 (0.48-0.65)	C
11.	Rourkela D/s	5.60 (5.00-6.00)	0.56 (0.47-0.70)	C
12.	Talcher U/s	5.50 (5.25-5.80)	0.55 (0.50-0.64)	C
13.	Talcher D/s	5.47 (5.00-5.80)	0.64 (0.60-0.70)	C
(C) Rushikulya				
14.	Madhopur	5.78 (5.26-6.30)	0.53 (0.48-0.58)	B-C
15.	Potagarh	5.18 (5.10-5.25)	0.44 (0.40-0.47)	C
(D) Nagavali				
16.	Penta U/s	6.03 (5.29-6.60)	0.67 (0.61-0.71)	B-C
17.	J. K. Pur D/s	6.35 (5.86-6.70)	0.69 (0.57-0.80)	B-C
18.	Rayagada D/s	6.43 (6.28-6.70)	0.60 (0.59-0.60)	B
(E) Subarnarekha				
19.	Rajghat	5.25 (5.00-5.50)	0.65 (0.63-0.66)	C
(F) Budhabalnga				
20.	Baripada D/s	5.40 (4.70-6.40)	0.69 (0.62-0.80)	B-C
21.	Balasore U/s	5.98 (5.43-6.40)	0.68 (0.54-0.80)	B-C
22.	Balasore D/s	5.75 (5.60-5.90)	0.72 (0.63-0.80)	C
(G) Kerandi				
23.	Sunabeda	6.0	0.48	B
(H) Vansadhara				
24.	Muniguda	5.75 (5.40-6.10)	0.70 (0.69-0.70)	B-C
25.	Gunupur	5.70 (5.40-6.00)	0.69 (0.68-0.70)	B-C

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), Jharsuguda, Puri, Sambalpur and Talcher. Ground water quality status during the year 2019 at these 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 (Oct), Capital Hospital Area (April) and Secretariate Governor House-Old Bus Stand area (April) in Bhubaneswar, Jagatpur (Oct) in

Cuttack and Budhipadar (April) in Jharsuguda 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) and Chakulia (October) 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 at some of the monitored locations.

Table-5.31 Ground water Quality Status (Tube well) (2019)

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 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
1. ANGUL (2 stations)																
1. Angul Township	April	7.2	1184	0.2	1.6	1.7	592	564	242	208	60.92	2.67	153.8	70.52	4.282	<0.28
	Oct	7.9	776	0.4	3.7	1.9	484	428	292	308	70.54	3.29	57.7	80.24	36.004	0.84
2. NALCO township	April	7.6	608	0.3	3.1	0.8	316	300	192	184	46.49	2.80	59.6	26.49	0.784	<0.28
	Oct	7.6	551	0.1	1.8	1.2	348	308	212	200	36.87	3.13	65.4	28.92	8.901	0.28
2. BALASORE (3 stations)																
3. Naigo-palpur	April	6.6	198	0.2	5.2	2.9	116	100	56	62	16.83	2.08	21.2	14.4	1.798	<0.28
	Oct	7.1	93	0.3	5.5	5.6	56	44	36	32	9.62	1.66	7.7	5.95	1.550	0.28
4. Kuanr-pur	April	7.8	308	0.7	1.7	1.5	168	148	74	56	16.03	1.97	41.3	12.19	0.053	0.28
	Oct	6.6	180	0.2	3.7	3.5	116	100	72	84	24.05	2.17	9.6	12.62	27.856	0.28
5. Chakulia	April	6.6	303	0.7	1.7	3	188	168	82	80	24.85	2.02	49	20.39	1.187	<0.28
	Oct	7.6	217	0.2	3.7	4	128	104	32	24	8.02	1.40	40.4	10.59	0.620	0.56
3. BERHAMPUR(4 stations)																
6. Near Railway station	Apr	7.6	988	0.3	5.2	4.8	546	516	196	174	48.10	2.64	192.3	13.93	25.686	<0.28
	Oct	7.8	1338	0.2	5.5	3	904	856	224	76	22.44	2.08	332.7	75.72	23.649	0.28
7. MKCG Medical College	Apr	7.8	1250	0.2	5.2	3.7	672	652	272	220	51.30	3.01	240.4	26.9	0.620	<0.28
	Oct	8.2	670	0.2	5.5	8	412	384	188	172	41.68	2.80	98.07	45.72	2.214	0.56
8. Bus stand	Apr	7.4	1283	0.3	5.2	2.3	692	624	252	184	46.49	2.80	240.4	27.36	0.926	<0.28
	Oct	8	1397	0.5	9.2	3.9	864	804	312	220	54.51	2.94	284.6	61.19	3.144	0.28
9. Badaba-zar	Apr	6.8	777	0.6	3.4	4.5	436	416	114	140	36.87	2.57	144.2	49.75	25.686	<0.28
	Oct	7.6	1291	0.6	3.7	2.8	764	724	260	172	51.30	2.51	226.9	84.29	23.649	0.56
Drinking water specification (IS : 10500 (2012))																
Accept-able Limit		6.5-8.5	-	-	-	1	500	-	200	200	75	30	250	200	45	0.5
Permissi-ble limit		No relax	-	-	-	5	2000	-	600	600	200	100	1000	400	No relax	No relax
4. BHUBANESWAR (6 stations)																
10. Khand-agiri Area	April	6.2	652	0.3	3.8	4.2	448	428	126	114	33.67	2.29	153.8	41.6	0.500	<0.28
	Oct	6.7	133	0.9	14.9	125	92	76	36	48	16.03	1.66	15.4	24.05	1.594	0.56

Monitoring Station	Month of Monitoring	pH	Cond., $\mu\text{S}/\text{cm}$	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	$\text{NH}_4\text{-N}$, mg/l
11. Old town-Samantara-pur Area	April	6.7	408	0.4	1.7	2.1	236	216	102	106	26.45	2.46	45.2	41.17	0.571	<0.28
	Oct	7.8	530	1.0	14.9	15	304	276	228	218	46.49	3.09	51.9	9.52	3.986	0.56
12. Kalpana-Laxmisagar Area,	April	6.3	261	0.3	1.7	2.9	172	148	82	76	20.84	2.17	27.9	28.6	0.492	<0.28
	Oct	5.9	284	0.2	5.6	8.8	168	152	20	32	11.22	1.40	57.7	17.38	50.397	0.28
13. Chandrasekharpur	April	7.1	216	0.3	1.7	2.6	148	128	84	80	24.05	2.08	26.9	9.95	0.549	<0.28
	Oct															
14. Capital Hospital Area	April	6.0	351	0.6	1.7	47	192	160	46	68	19.24	2.08	59.6	29.85	0.589	<0.28
	Oct															
15. Secretariate-Governor House-Old bus stand Area	April	6.4	357	0.2	1.7	3.1	196	180	94	90	23.25	2.33	48.1	16.17	0.957	<0.28
	Oct	7.4	228	0.7	5.6	8.3	148	128	86	84	25.65	2.08	24.9	12.74	22.497	0.28
5. CUTTACK (5 stations)																
16. Jagatpur	April	7.5	539	0.1	1.7	1.4	268	248	160	176	48.10	2.67	40.4	33.95	9.694	0.56
	Oct	6.1	504	0.2	3.7	1.3	292	264	112	144	41.68	2.46	59.6	51.54	32.284	<0.28
17. Mangalabag	April	8.2	263	0.4	3.4	4	148	128	110	104	28.86	2.33	15.4	7.96	3.149	<0.28
	Oct	6.5	418	0.1	9.3	8.4	248	228	178	184	48.10	2.76	11.5	38.09	42.027	0.56
18. Madhupatna-Kalyan Nagar Area	April	7.9	297	0.4	3.4	1.9	156	128	120	102	30.46	2.21	16.3	7.09	0.926	<0.28
	Oct	6.5	370	0.2	1.9	3.4	216	196	124	104	33.67	2.08	46.1	14.28	0.797	<0.28
19. Badambadi Area	April	8.4	216	0.9	3.4	4.8	132	112	80	64	18.44	2.02	19.23	3.48	3.795	<0.28
	Oct	6.7	393	0.4	5.6	1.6	228	200	76	84	22.44	2.25	65.4	28.21	6.466	0.56
20. Bidanasi-Tulsi-pur Area	April	8.0	160	0.2	3.4	0.9	92	76	70	60	17.64	1.97	11.5	3.98	1.085	<0.28
	Oct	6.5	420	0.2	1.9	3.6	244	220	202	180	44.89	2.80	15.4	25.95	7.351	0.28
6. PARADEEP (JAGATSINGHPUR)(2 stations)																
21. Musadiha	Apr	8.4	698	0.3	3.4	1.6	388	368	236	184	48.08	15.60	76.9	9.95	16.806	<0.28
	Oct	7.6	2468	1.5	15.4	0.6	1512	1420	233	180	36.86	21.45	765.3	16.43	28.635	0.28
22. Badapadia	Apr	8.2	913	0.8	5.2	1.2	504	488	308	248	56.10	26.32	110.57	17.54	4.805	<0.28
	Oct	7.3	948	1.1	17.3	1.1	576	540	314	248	38.47	37.04	154	14.64	32.554	0.56
7. SUKINDA (JAJPUR)(4 stations)																
23. TISCO	April	7.9	284	0.3	3.4	2.2	160	140	128	98	24.04	9.26	18.3	1.86	0.779	<0.28
	Oct	6.8	196	0.4	9.3	16	116	100	92	96	25.64	7.80	9.6	9.64	1.151	0.28
24. Saruabil	April	6.5	237	0.4	6.9	1.2	136	116	80	60	16.03	4.87	26	6.84	0.505	<0.28
	Oct	6.6	245	0.3	1.9	9.1	148	128	96	92	25.64	6.82	21.2	14.28	12.666	0.28

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 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
25. Kalia-pani	April	7.8	343	0.2	1.7	4.8	192	172	166	138	41.67	8.29	13.5	3.6	0.540	<0.28
	Oct	6.7	500	0.1	3.7	5.7	288	276	204	188	49.69	15.60	32.7	28.69	6.599	0.56
26. Kamar-da	April	7.4	387	0.3	1.7	2.5	220	204	208	168	51.29	9.75	10.6	0.75	0.744	<0.28
	Oct	6.9	269	0.1	1.9	5.3	156	132	132	128	38.47	7.80	9.6	5.95	27.280	0.28
8. JHARSUGUDA (8 stations)																
27. Thelkoi	April															
	Oct															
28. Bhur-khamunda	April	7.1	196	0.2	1.7	1.5	116	100	54	52	16.83	2.44	28.8	6.23	1.909	<0.28
	Oct	7.4	190	0.2	3.7	2	116	96	56	48	14.43	2.92	17.3	14.28	21.169	0.56
29. Badamal Industrial Estate	April	6.8	215	0.9	5.2	1.1	128	108	56	56	17.63	2.92	22.1	11.06	2.839	<0.28
	Oct	7.2	106	0.4	1.8	12	72	60	36	40	11.22	2.92	7.7	10.48	13.109	1.12
30. Budhi-padar	April	6.4	170	0.6	1.7	2.6	112	96	54	52	16.83	2.44	18.3	10.57	3.357	<0.28
	Oct	6.6	187	0.4	1.8	8	116	96	64	56	16.03	3.90	23.07	10.38	2.214	1.12
31. Braja-rajnagar Mining Belt	April	5.8	150	0.9	1.7	2.5	92	72	24	36	11.22	1.95	18.3	18.6	1.873	<0.28
	Oct	7.3	262	0.3	3.6	42	148	128	44	48	14.43	2.92	42.3	17.98	30.469	0.28
32. Ram-pur (water tank)	April	6.8	286	0.5	1.7	2.2	188	160	120	104	30.45	6.82	29.2	12.31	0.828	<0.28
	Oct	6.6	241	0.1	3.6	1.6	152	136	84	64	22.44	1.95	28.8	11.31	1.639	0.56
33. Ib thermal power station	April	6.9	315	0.4	1.7	1.7	168	152	144	114	32.06	8.29	14.4	2.86	0.766	<0.28
	Oct	6.6	219	0.4	1.8	3	140	124	116	96	24.04	8.77	13.5	3.45	2.126	0.56
34. Belpa-har Area	April	6.8	199	0.3	1.7	4.9	128	108	64	58	16.03	4.39	27.9	7.96	0.704	<0.28
	Oct	6.9	195	0.2	1.8	1.2	120	108	84	88	25.64	5.85	17.3	6.66	2.657	0.84
9. PURI (4 stations)																
35. Hospital-Busstand -Mausima temple area	April	8.1	504	0.2	1.7	7.8	288	268	110	114	28.05	10.72	88.4	25	1.182	<0.28
	Oct	7.9	975	0.2	1.9	1.3	584	544	240	268	68.92	23.40	186.5	24.76	28.919	0.56
36. Near Jagannath Temple	April	7.8	701	0.3	3.4	3.6	388	372	202	150	40.87	11.70	103.8	18.65	3.742	<0.28
	Oct	8.1	808	0.4	1.9	4.1	524	488	224	160	38.47	15.60	173.1	17.74	1.151	0.84
37. Near Sea Beach,	April	8.2	600	0.3	3.4	5.4	368	352	160	124	32.86	10.24	111.5	21.64	0.602	<0.28
	Oct	8.2	1175	0.5	3.8	3.3	668	612	356	240	51.29	27.29	187.5	21.67	1.196	0.56
38. Balia-panda	April	7.9	442	0.6	1.7	8.5	284	252	132	118	28.05	11.70	88.4	7.21	0.492	<0.28
	Oct	8.1	350	0.1	1.9	4.5	216	188	96	44	12.82	2.92	61.5	7.38	1.373	0.56
10. SAMBALPUR(3 stations)																
39. Near Panthani-vas	April	8.1	366	0.8	1.6	1.2	224	208	92	86	26.45	4.87	43.3	29.73	18.875	<0.28
	Oct	6.6	282	0.5	9.3	9	172	148	68	96	27.25	6.82	34.6	31.78	6.731	0.28

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 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
40. Near Railway station	April	7.6	1738	0.6	3.1	0.5	1028	988	274	290	83.35	19.98	346.1	137.8	28.175	<0.28
	Oct	7	606	0.1	3.7	1.4	348	312	140	208	49.69	20.47	42.3	101.54	30.469	0.56
41. Near VSS Medical College, Burla	April	8.1	602	0.9	1.6	1.3	320	292	248	214	54.50	19.01	37.5	21.39	1.072	<0.28
	Oct	7.5	422	0.1	3.7	1.8	256	228	226	220	32.06	34.12	15.4	24.05	1.329	0.28
11. TALCHER (7 stations)																
42. Mahanadi Coal Field Area	April	6.9	403	0.8	1.6	2.2	236	216	92	128	34.46	10.24	25	70.39	0.819	<0.28
	Oct	7.8	412	1.1	7.4	39	236	204	100	140	36.86	11.70	21.4	75.59	8.591	0.28
43. Kaniha	April	7.5	511	0.4	1.6	3.6	260	240	220	172	44.88	14.62	17.3	14.93	0.717	<0.28
	Oct	7.9	527	0.1	3.7	13	312	288	272	216	49.69	22.42	23.07	13.21	1.196	0.56
44. Talcher town	April	7.6	704	0.4	3.1	4.1	372	364	170	196	48.08	18.52	67.3	69.03	11.284	<0.28
	Oct	7.7	614	0.5	1.8	12	372	352	308	304	67.32	33.14	11.5	59.76	1.329	0.84
45. Meramundali Area	April	7.2	220	1.0	3.1	1.1	124	108	82	60	17.63	3.90	12.5	15.05	1.603	<0.28
	Oct	8.0	878	0.2	5.5	1.8	488	476	320	340	73.73	38.02	38.5	99.05	3.941	0.56
46. Talcher Thermal Area	April	7.3	1404	0.6	1.6	4.6	852	820	376	280	75.33	22.42	202	99.64	0.877	<0.28
	Oct	7.9	922	0.5	3.7	80	528	488	296	256	57.70	27.29	84.6	75.12	1.506	0.28
47. Banarpal	April	7.5	1078	0.4	6.3	0.6	704	672	344	240	62.51	20.47	134.6	92.41	2.201	<0.28
	Oct	7.6	1138	0.3	5.5	9.5	748	704	300	240	54.50	25.34	178.8	110	1.594	0.84
48. Kulad	April	7.7	1444	0.8	9.4	4.2	848	824	278	246	62.51	21.93	211.5	145.9	23.130	<0.28
	Oct	8.3	1008	0.4	1.8	8.2	612	584	244	160	49.69	8.77	140.4	86.19	2.347	0.28
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

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	Chromium Total, 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	3.08	0.363	0.22	111	35.8	0.028	<0.002	0.027	-	0.0014	0.009	0.007	0.018	0.018	0.167	1.8	1.8	
	Oct	5.88	0.35	0.01	39.41	13.11	0.05										17	1.8	
2. NALCO township	April	4.48	0.44	0.027	36.6	12.36	0.01	<0.002	0.029	-	0.0015	0.008	0.007	0.009	0.114	0.098	17	1.8	
	Oct	3.64	0.46	0.02	41.62	12.75	0.18										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	Chromium Total, 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
2. BALASORE(3 stations)																		
3. Naigo-palpur	April	1.4	0.269	0.022	13.98	1.66	0.056	<0.002	0.013	-	0.0014	0.005	0.008	0.014	0.013	1.996	8	1.8
	Oct	1.68	0.12	0.03	5.93	1.1	0.03										70	17
4. Kuanr-pur	April	2.8	5.39	0.185	39.05	0.74	0.456	<0.002	0.010	-	0.0008	0.003	0.003	0.004	0.009	0.816	1.8	1.8
	Oct	2.52	0.73	0.05	6.5	1.29	0.06										1.8	1.8
5. Chakulia	April	3.36	0.175	0.021	31.25	0.86	0.024	<0.002	0.015	-	0.0013	0.003	0.003	0.014	0.012	0.904	1.8	1.8
	Oct	2.24	5.48	0.03	32.73	7.7	0.41										46	1.8
3. BERHAMPUR (4 stations)																		
6. Berham-pur near Railway station	Apr	1.4	0.222	0.23	125.7	20.14	0.052	<0.002	0.013	-	0.0009	0.011	0.007	0.013	0.062	2.012	23	1.8
	Oct	1.68	0.24	0.08	271.6	51.8	0.21										13	1.8
7. MKCG medical College	Apr	0.56	0.776	0.023	158.6	22.29	0.277	<0.002	0.010	-	0.0012	0.006	0.008	0.009	0.105	3.324	1600	540
	Oct	3.08	0.74	0.02	60.61	31.39	0.24										23	1.8
8. Bus stand	Apr	1.96	0.618	0.169	167.7	23.09	0.042	<0.002	0.013	-	0.0011	0.007	0.005	0.012	0.122	0.969	1.8	1.8
	Oct	0.84	0.64	0.04	202.6	50.55	0.22										79	13
9. Badaba-zar	Apr	1.4	0.658	0.186	96.1	14.56	0.056	<0.002	0.015	-	0.0010	0.009	0.008	0.014	0.052	0.443	1.8	1.8
	Oct	1.96	0.64	0.05	183.6	44.49	0.17										1.8	1.8
Drinking water specification (IS : 10500 (2012))																		
Acceptable Limit		-	1.0	-	-	-	0.5	-	0.05	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	No relax	1.5	No relax	No relax	15.0	No relax	No relax	
4. BHUBANESWAR (6 stations)																		
10. Khand-agiri Area	April	3.664	0.312	0.111	106	23.2	0.066	<0.002	0.013	-	0.0015	0.005	0.004	0.004	0.008	0.100	1.8	1.8
	Oct	2.52	0.06	0.02	9.1	2.72	0.09										1.8	1.8
11. Old town-Sa-mantara-pur Area	April	3.92	0.372	0.022	33.26	12.62	0.049	<0.002	0.015	-	0.0017	0.007	0.007	0.012	0.116	0.094	23	1.8
	Oct	1.68	0.56	0.04	22.33	8.29	0.32										23	23
12. Kalpa-na-Laxmis-agar Area	April	2.8	0.146	0.27	22.16	10.63	0.056	<0.002	0.024	-	0.0009	0.004	0.003	0.005	0.143	0.101	23	2
	Oct	2.24	0.08	0.02	39.59	10.16	0.15										1.8	1.8
13. Chandrasekhar-pur	April	2.24	0.366	0.048	16.01	8.26	0.073	<0.002	0.013	-	0.0016	0.005	0.007	0.009	0.004	0.050	1.8	1.8
	Oct																	
14. Capital Hospital Area	April	3.08	0.175	0.221	41.05	1.32	0.059	<0.002	0.018	-	0.0016	0.012	0.003	0.004	0.007	0.638	1.8	1.8
	Oct																	
15. Secretaria teGovernor House-Old bus stand Area	April	2.8	0.149	0.022	29.21	13.03	0.028	<0.002	0.018	-	0.0018	0.004	0.008	0.008	0.057	0.114	540	130
	Oct	1.68	0.10	0.05	16.97	5.29	0.11										130	33

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	Chromium Total, 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	
5. CUTTACK (5 stations)																			
16. Jagatpur	April	1.12	0.164	0.055	25.16	5.95	0.045	<0.002	0.024	-	0.0015	0.004	0.009	0.008	0.011	0.345	2	1.8	
	Oct	4.2	0.15	0.07	38.1	7.21	0.02										1.8	1.8	
17. Mangalabag	April	3.08	0.278	0.07	10.38	2.81	0.003	0.014	0.024	-	0.0013	0.006	0.006	0.005	0.057	2.368	1.8	1.8	
	Oct	2.8	0.11	0.08	10.59	4.02	0.01										1.8	1.8	
18. Madhupatna-Kalyan Nagar Area	April	2.8	0.232	0.047	10.91	4.38	0.024	<0.002	0.015	-	0.0010	0.004	0.006	0.005	0.020	0.417	1.8	1.8	
	Oct	1.4	0.23	0.07	30.81	5.46	0.01										1.8	1.8	
19. Badambadi Area	April	3.36	0.528	0.066	15.61	15.26	0.035	<0.002	0.013	-	0.0007	0.010	0.008	0.007	0.139	3.696	1.8	1.8	
	Oct	4.2	0.22	0.14	43.5	9.52	0.08										1.8	1.8	
20. Bidanasi-Tulsipur Area	April	0.28	0.2	0.057	5.75	1.68	0.033	<0.002	0.015	-	0.0018	0.002	0.003	0.003	0.010	0.481	1.8	1.8	
	Oct	2.8	0.09	0.05	10.4	3.24	<0.005										5	5	
6. PARADEEP (JAGATSINGHPUR) (2 stations)																			
21. Musadiha	Apr	5.32	0.606	0.127	54.3	25.5	0.947	<0.002	0.020	-	0.0018	0.005	0.007	0.018	0.014	0.216	23	1.8	
	Oct	4.76	0.41	0.04	500.4	15.86	0.79										1.8	1.8	
22. Badapadia	Apr	2.24	1.11	0.172	77.25	13.7	0.484	<0.002	0.018	-	0.0014	0.005	0.008	0.008	0.018	0.842	1.8	1.8	
	Oct	3.08	0.70	0.36	94.2	29.65	0.25										1.8	1.8	
7. SUKINDA (JAJPUR) (4 stations)																			
23. TISCO	April	9.8	0.149	0.124	15.19	5.83	0.119	0.013	0.035	-	0.0013	0.004	0.008	0.005	0.010	0.120	1.8	1.8	
	Oct	1.12	0.16	0.01	3.66	1.06	0.01										13	1.8	
24. Saruabil	April	4.76	0.132	0.019	22.26	6.79	0.094	0.024	0.049	-	0.0011	0.004	0.004	0.009	0.033	0.514	1.8	1.8	
	Oct	0.56	0.15	0.01	14.47	4.23	0.09										1600	170	
25. Kalia-pani	April	2.52	0.139	0.022	10.69	2.06	0.049	0.038	0.045	-	0.0010	0.005	0.006	0.009	0.007	0.271	33	1.8	
	Oct	0.84	0.14	0.02	22.15	9.12	0.06										540	11	
26. Kamarada	April	2.52	0.131	0.026	10.65	2.11	0.042	0.006	0.018	-	0.0012	0.002	0.003	0.013	0.066	0.232	2	1.8	
	Oct	1.96	0.14	0.02	4.34	1.11	0.04										130	49	
8. JHARSUGUDA (8 stations)																			
27. Thelkoi	April																		
	Oct																		
28. Bhurkhamunda	April	3.08	0.342	0.132	19.09	5.29	0.033	<0.002	0.018	-	0.0018	0.006	0.009	0.005	0.083	0.060	1.8	1.8	
	Oct	6.44	0.33	0.07	19.78	6.22	0.08										49	17	
29. Badamal Industrial Estate	April	1.68	0.205	0.145	16.32	5.09	0.026	<0.002	0.025	-	0.0015	0.004	0.009	0.008	0.113	0.775	1.8	1.8	
	Oct	9.8	0.22	0.04	8.23	3.33	0.01										1.8	1.8	
30. Budhipadar	April	2.24	0.203	0.055	15.16	5.16	0.049	<0.002	0.015	-	0.0013	0.007	0.009	0.011	0.125	0.862	1.8	1.8	
	Oct	9.52	0.21	0.04	15.29	8.16	<0.005										1.8	1.8	
31. Brajarajagar Mining Belt	April	1.96	0.216	0.065	14.19	6.12	0.042	<0.002	0.018	-	0.0017	0.016	0.005	0.011	0.106	0.360	1.8	1.8	
	Oct	3.36	0.24	0.03	25.07	9.81	0.05										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	Chromium Total, 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
32. Rampur (water tank)	April	3.08	0.389	0.169	20.63	8.36	0.038	<0.002	0.015	-	0.0014	0.005	0.009	0.007	0.079	0.406	23	1.8
	Oct	1.96	0.37	0.02	24.14	8.69	0.04										13	1.8
33. Ib thermal power station	April	3.64	0.249	0.159	12.12	4.19	0.031	<0.002	0.029	-	0.0014	0.003	0.009	0.005	0.008	0.071	1.8	1.8
	Oct	4.48	0.23	0.01	12.09	3.78	0.10										1.8	1.8
34. Belpahar Area	April	2.52	0.193	0.095	17.81	6.69	0.035	<0.002	0.024	-	0.0017	0.004	0.006	0.003	0.056	0.479	1.8	1.8
	Oct	3.08	0.18	0.02	6.53	1.46	0.05										1.8	1.8
9. PURI(4 stations)																		
35. Hospital-Busstand-Mausi- ma temple area	April	1.4	1.25	0.314	58.6	5.78	0.579	<0.002	0.030	-	0.0013	0.002	0.001	0.004	0.132	0.680	1.8	1.8
	Oct	4.76	1.19	1.78	81.5	42.44	0.15										240	13
36. Near Jagannath Temple	April	3.64	0.17	0.026	74.45	9.19	0.196	<0.002	0.027	-	0.0016	0.007	0.007	0.013	0.049	2.048	1.8	1.8
	Oct	1.96	0.21	0.04	124.2	18.92	0.18										1.8	1.8
37. Near Sea Beach	April	1.68	0.3	0.121	76.9	12.76	0.393	<0.002	0.018	-	0.0014	0.003	0.002	0.005	0.116	1.391	23	1.8
	Oct	3.36	0.32	0.01	139.2	22.18	0.27										79	8
38. Balia-panda	April	1.68	0.989	0.379	58.2	4.01	0.47	<0.002	0.010	-	0.0010	0.010	0.005	0.005	0.042	1.558	1.8	1.8
	Oct	2.8	0.96	0.04	56.75	13.23	0.14										11	1.8
10. SAMBALPUR(3 stations)																		
39. Near Panthani-vas	April	12.6	0.256	0.055	30.8	22.11	0.098	<0.002	0.015	-	0.0012	0.002	0.008	0.004	0.007	0.057	1.8	1.8
	Oct	1.68	0.10	0.03	20.34	4.05	0.40										220	7
40. Near Railway station	April	16.8	0.369	0.034	256	11.63	0.112	<0.002	0.020	-	0.0015	0.004	0.008	0.013	0.002	0.057	1.8	1.8
	Oct	2.24	0.19	0.02	35.21	1.29	0.50										1.8	1.8
41. Near VSS Medical College	April	17.64	0.509	0.05	19.91	10.92	0.021	<0.002	0.018	-	0.0016	0.004	0.009	0.009	0.024	0.056	1.8	1.8
	Oct	2.8	0.32	0.01	7.29	2.93	0.10										20	1.8
11. TALCHER (7 stations)																		
42. Mahanadi Coal Field Area	April	3.36	0.238	0.038	23.01	10.92	0.017	<0.002	0.024	-	0.0016	0.011	0.008	0.009	0.138	0.903	2	1.8
	Oct	1.68	0.25	0.01	19.02	4.49	0.05										1.8	1.8
43. Kaniha	April	2.24	0.335	0.124	17.12	9.16	0.031	<0.002	0.018	-	0.0011	0.003	0.005	0.003	0.019	0.065	5	1.8
	Oct	2.52	0.34	0.02	25.56	6.19	0.05										1.8	1.8
44. Talcher town	April	3.08	0.35	0.173	36.6	22.26	0.024	<0.002	0.027	-	0.0009	0.017	0.008	0.011	0.116	0.785	1.8	1.8
	Oct	1.96	0.37	0.03	8.82	3.13	0.22										1.8	1.8
45. Meramundali Area	April	2.52	0.353	0.087	12.21	5.41	0.028	<0.002	0.029	-	0.0011	0.011	0.007	0.004	0.082	0.595	1.8	1.8
	Oct	1.12	0.34	0.04	30.09	10.19	0.04										1.8	1.8
46. Talcher Thermal Area	April	1.12	0.509	0.103	159	63.1	0.101	<0.002	0.030	-	0.0016	0.006	0.008	0.012	0.142	1.037	1.8	1.8
	Oct	1.96	0.48	0.04	73.45	26.31	0.12										920	130
47. Banar-pal	April	3.08	0.808	0.117	121	57.15	0.112	<0.002	0.029	-	0.0013	0.006	0.009	0.013	0.124	0.979	1.8	1.8
	Oct	3.36	0.79	0.05	139.2	51.15	0.10										13	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	Chromium Total, 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
48. Kulad	April	1.4	0.531	0.167	166	65.45	0.073	<0.002	0.032	-	0.0011	0.014	0.009	0.015	0.119	1.056	5	1.8
	Oct	1.4	0.52	0.06	128.6	49.36	0.10										1.8	1.8
Drinking water specification (IS : 10500 (2012))																		
Acceptable Limit		-	1.0	-	-	-	0.5	-	0.05	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	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 PM₁₀ (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), Sulphur dioxide (SO₂) and Oxides of Nitrogen (NO_x) are being regularly monitored at all stations. Beside these, additional parameters like NH₃, O₃, CO, Pb & Ni are monitored at Bhubaneswar. At Konark & Puri parameters like NH₃, O₃, Pb & Ni are monitored, whereas at Angul, Balasore, Berhampur, Cuttack, & Sambalpur parameters like NH₃ & O₃ are monitored and in Kalinganagar & Keonjhar only NH₃ is measured. The monitoring is carried out for 24 hours (24-hourly sampling for PM_{2.5}, 8-hourly sampling for PM₁₀, Pb & Ni and 4-hourly sampling for gaseous pollutants like SO₂ & NO_x) and 1-hourly monitoring for NH₃ & O₃ with a frequency of twice in a week not in a consecutive day, 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 & CO
		(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	
		(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	
6.	Cuttack	(xiv) Hotel Bishal Inn, Near Badambadi	
		(xv) RO, SPCB office building, Surya Vihar	
		(xvi) PHED Office, Barabati	

Sl. No.	Name of the areas	Monitoring stations	Parameters monitored
7.	Jharsuguda	(xvii) RO, SPCB office building, Babubagicha,	PM ₁₀ , PM _{2.5} , SO ₂ & NO ₂
		(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
		(xx) RO, SPCB Office building, Kalinganagar	
		(xxi) DET Hostel, Tata Steel (Previously at NINL)	
9	Keonjhar	(xxii) RO, SPCB Office building, Baniapat	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ & NH ₃
10	Konark	(xxiii) Konark Police Station	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , NH ₃ , O ₃ , Pb & Ni
11	Paradeep	(xxiv) PPL Guest House	PM ₁₀ , PM _{2.5} , SO ₂ & NO ₂
		(xxv) IFFCO STP	
		(xxvi) PPT Colony	
12	Puri	(xxvii) Sadar Police Station	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , NH ₃ , O ₃ , Pb & Ni
		(xxviii) Town Police Station	
13	Rayagada	(xxix) RO, SPCB Office building, Indiranagar	PM ₁₀ , PM _{2.5} , SO ₂ & NO ₂
		(xxx) Jakaypur	
14	Rajgangpur	(xxxi) DISR, Rajgangpur	PM ₁₀ , PM _{2.5} , SO ₂ & NO ₂
15	Rourkela	(xxxii) RO, SPCB Office building, Sector-5	
		(xxxiii) IDL Outpost, Sonaparbat	
		(xxxiv) IDCO Water Tank, IDC Kalunga	
		(xxxv) Kuanmunda Out Post, Kuanmunda	
16	Sambalpur	(xxxvi) PHED Office, Modipara	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , NH ₃ & O ₃
17	Talcher	(xxxvii) TTPS, Talcher	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂
		(xxxviii) M.C.L., Talcher	

Ambient air quality status with respect to the four criteria parameters at these 38 stations and additional parameters like (NH₃, O₃ & Pb) at Bhubaneswar, Konark & Puri, (NH₃ & O₃) at Angul, Balasore, Berhampur, Cuttack, & Sambalpur and (NH₃) at Kalinganagar & Keonjhar during the year 2019 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 PM₁₀) at all monitoring locations remained above the prescribed limit i.e., 60 (µg/m³). While, the annual average value of PM_{2.5} remained below the limit i.e., 40 µg/m³ at 14 locations out of 31 monitoring locations monitored.

Comparing 24-hrly average data with the prescribed standard, the percentage (%) of violation of data were calculated. No violation was observed for gaseous pollutants.

The range of PM₁₀ violation varied from 0.96% to 85.1%. Similarly for PM_{2.5} no violation occurred at 04 places i.e., Capital Police station, Unit-1, Patrapada and Palasuni water works in Bhubaneswar and Regional Office building in Keonjhar. The range of violation varies from 0.94% to 38.2%

Air Quality Index (AQI)

AQI value of 17 areas during the year 2019 with prominent pollutant and categorization 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, 09 areas are falling under Moderate category & 08 areas are under Satisfactory category. The prominent pollutant was PM₁₀ in all 17 areas. The highest AQI value i.e., 133 w.r.t PM₁₀ has been observed at Rajgangpur area and lowest in Berhampur i.e., 64.

Table-5.33 Ambient Air Quality Status of different cities & towns of Odisha during -2019

Sl. No.	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24-hourly range) except O ₃ 1-hourly range)						% of violation of data from 24-hourly standard		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	102	107 (48-189)	55 (21-87)	11.3 (5.9-19.4)	26.6 (17.9-32.6)	27.1 (16.8-40.6)	25.0 (17.8-33.8)	Not Monitored	57.8%	38.2%	105 (PM ₁₀)	98 (PM ₁₀)
	2. NALCO Nagar, Angul	102	91 (34-223)	40 (15-64)	9.8 (8.4-15.5)	26.3 (21.7-34.2)	Not Monitored	Not Monitored	36.2%	3.9%	91 (PM ₁₀)		
2	Talcher												
	3. TTPS, Talcher	104	93 (35-209)	44 (12-125)	10.6 (5.8-14.0)	28.5 (23.6-33.3)	Not Monitored	Not Monitored	32.6%	23.0%	93 (PM ₁₀)	102 (PM ₁₀)	
	4. MCL, Talcher	104	118 (54-207)	49 (19-93)	9.7 (7.6-13.8)	27.9 (22.0-35.0)	Not Monitored	Not Monitored	69.2%	32.6%	112 (PM ₁₀)		
3	Balasore												
	5. R.O, SPCB, Ganeswarpur	104	84 (69-103)	45 (30-62)	BDL (BDL- BDL)	10.8 (10.1-12.2)	30.4 (25.0-44.0)	26.5 (23.0-34.9)	Not Monitored	0.96%	0.96%	84 (PM ₁₀)	86 (PM ₁₀)
	6. DIC office, Angaragadia	104	84 (69-113)	43 (30-70)	BDL (BDL- BDL)	10.7 (10.1-12.9)	30.7 (25.0-45.1)	26.4 (22.0-35.4)	Not Monitored	0.96%	0.96%	84 (PM ₁₀)	
	7. Rasalpur, Industrial Estate	104	89 (76-115)	50 (34-75)	7.4 (6.4-9.0)	11.4 (10.5-13.6)	32.4 (26.0-50.5)	28.1 (23.0-39.8)	Not Monitored	1.9%	4.8%	89 (PM ₁₀)	
4	Berhampur												
	8. R.O, SPCB, Brahamanagar	106	64 (34-151)	26 (11-70)	BDL (BDL- 10.5)	19.1 (13.0-45.6)	39.3 (25.0-58.7)	35.7 (22.2-48.5)	Not Monitored	7.5%	0.94%	64 (PM ₁₀)	64 (PM ₁₀)

Sl. No.	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24-hourly range) except O ₃ 1-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			
(values expressed in Microgram per cubic meter)													
5	Bhubaneswar											97 (PM ₁₀)	Satisfactory
	9. SPCB Office Building, Unit-VI-II	104	99 (47-218)	29 (14-110)	BDL (BDL-4.3)	15.6 (11.4-22.0)	40.1 (29.3-65.9)	23.8 (20.5-30.7)	0.027 (BDL-0.095)	41.3%	1.9%	99 (PM ₁₀)	
	10. I.R.C. Village, Nayapalli	105	104 (41-234)	33 (10-129)	BDL (BDL-4.9)	16.5 (11.5-23.5)	41.9 (26.9-66.7)	24.5 (21.4-33.4)	0.027 (BDL-0.097)	40.3%	5.7%	103 (PM ₁₀)	
	11. Capital Police Station, Unit-I	104	109 (67-206)	26 (16-37)	BDL (BDL-7.1)	19.3 (10.7-36.6)	44.3 (29.6-69.6)	23.7 (BDL-37.9)	0.018 (BDL-0.047)	53.8%	Nil	106 (PM ₁₀)	
	12. Chandrase-kharpur	99	95 (42-244)	30 (12-83)	BDL (BDL-5.7)	15.0 (12.6-22.0)	38.6 (27.3-56.4)	24.6 (20.7-30.6)	0.022 (BDL-0.121)	28.2%	1.01%	95 (PM ₁₀)	
	13. Patrapada	102	95 (38-237)	29 (14-56)	BDL (BDL-4.3)	14.5 (11.6-28.0)	42.6 (25.6-71.0)	23.7 (21.0-32.7)	0.015 (BDL-0.04)	40.1%	Nil	95 (PM ₁₀)	
	14. Palasumi water works	87	86 (43-126)	29 (10-59)	BDL (BDL-6.9)	15.6 (10.2-28.7)	49.9 (37.7-85.9)	26.3 (21.5-31.0)	0.026 (BDL-0.124)	25.2%	Nil	86 (PM ₁₀)	
6	Bonaigarh												
	15. Bonai Govt. Hospital	105	118 (58-209)	51 (24-89)	9.0 (5.3-17.0)	15.6 (10.6-28.8)	Not Monitored	Not Monitored	Not Monitored	60.0%	23.8%	112 (PM ₁₀)	Moderate

Sl. No	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O ₃ 1-hourly range)						% of violation of data from 24 hourly standard		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)													
7	Cuttack												
	16. Hotel Bishal Inn, Near Badambadi	70	98 (51-235)	37 (18-97)	5.3 (BDL-8.1)	19.4 (13.9-31.1)	29.9 (17.9-64.4)	25.7 (19.7-32.5)	Not Monitored	30.0%	1.4%	98 (PM ₁₀)	Satisfactory
	17. R.O. SPCB Building, Surya Vihar	103	98 (54-224)	48 (24-106)	5.2 (BDL-9.2)	21.4 (14.1-37.5)	29.4 (BDL-83.2)	25.8 (20.6-30.1)	Not Monitored	63.4%	20.3%	98 (PM ₁₀)	
	18. PHD office, Barabati	103	106 (58-362)	45 (25-113)	BDL (BDL-8.9)	17.8 (13.2-33.0)	23.9 (BDL-35.7)	22.0 (BDL-28.8)	Not Monitored	32.0%	13.5%	104 (PM ₁₀)	
8	Jharsuguda												Moderate
	19. RO Building, Cox Colony, Babubagicha,	108	106 (79-160)	51 (35-93)	7.1 (5.6-30)	12.7 (10.6-43.5)	Not Monitored		69.0%	19.0%	104 (PM ₁₀)		
	20. Inside TRL Colony Premises	105	102 (92-145)	39 (29-71)	7.9 (4.8-22.8)	17.3 (10.6-27.4)			57.0%	1.0%	101 (PM ₁₀)		
9	Kalinga Nagar												Moderate
	21. BRPL Guest House (Near TATA Guest House)	81	105 (27-438)	Not Monitored	BDL (BDL-4.9)	16.3 (10.5-27.2)	Not Monitored		62.9%	Nil	103 (PM ₁₀)		
	22. RO SPCB, building	63	117 (46-226)		BDL (BDL-4.8)	17.6 (10.5-26.8)	48.7 (44.1-53.2)	Not Monitored	63.4%	Nil	111 (PM ₁₀)		
	23. DET Hostel Tata Steel (Previous at NINL)	02	93 (67-118)		BDL (BDL- BDL)	16.6 (16.1-17.0)	Not Monitored		50%(1/2)	Nil	93 (PM ₁₀)		
10	Keonjhar												Moderate
	24. R.O. SPCB, Baniapat	99	104 (24-216)	29 (20-40)	BDL (BDL- BDL)	14.3 (11.6-25.1)	61.1 (36.6-99.2)	Not Monitored	59.5%	Nil	103 (PM ₁₀)		

Sl. No	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O ₃ 1-hourly range)						% of violation of data from 24 hourly standard		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}
11	Konark 25. Konark Police station	103	70	Not Monitored	BDL (BDL-BDL)	13.1 (10.9-18.6)	39.6 (29.7-55.2)	23.4 (21.7-27.9)	0.008 (BDL-0.025)	0.97%	Nil	70 (PM ₁₀)	Satisfactory
			147 (76-342)	Not Monitored	18.0 (9.2-26.0)	9.4 (BDL-20.4)	56.3 (43.6-69.6)	22.0 (21.4-23.0)	0.007 (BDL-0.021)	76.0%	Nil	107 (PM ₁₀)	
			137 (69-316)	Not Monitored	19.2 (14.4-26.9)	9.1 (BDL-12.2)	60.1 (41.3-78.1)	22.2 (21.2-26.5)	0.012 (BDL-0.023)	60.5%	1.3%	105 (PM ₁₀)	
12	Paradeep 26.PPL Guest House 27. IFFCO STP 28. Paradeep port trust	101	144	54 (23-169)	18.2 (9.6-30.1)	10.2 (BDL-15.8)	Not Monitored	Not Monitored	85.1%	13.8%	129 (PM ₁₀)	Moderate	
			147 (76-342)	Not Monitored	18.0 (9.2-26.0)	9.4 (BDL-20.4)	56.3 (43.6-69.6)	22.0 (21.4-23.0)	0.007 (BDL-0.021)	76.0%	Nil		131 (PM ₁₀)
			137 (69-316)	Not Monitored	19.2 (14.4-26.9)	9.1 (BDL-12.2)	60.1 (41.3-78.1)	22.2 (21.2-26.5)	0.012 (BDL-0.023)	60.5%	1.3%		125 (PM ₁₀)
13	Puri 29. Sadar police Station 30. Town police Station	76	108	21 (12-91)	BDL (BDL-5.3)	15.2 (12.6-22.4)	60.1 (41.3-78.1)	22.2 (21.2-26.5)	0.012 (BDL-0.023)	60.5%	1.3%	105 (PM ₁₀)	Moderate
			111 (87-141)	Not Monitored	BDL (BDL-BDL)	15.3 (13.2-17.5)	56.3 (43.6-69.6)	22.0 (21.4-23.0)	0.007 (BDL-0.021)	76.0%	Nil	107 (PM ₁₀)	
			108 (87-163)	21 (12-91)	BDL (BDL-5.3)	15.2 (12.6-22.4)	60.1 (41.3-78.1)	22.2 (21.2-26.5)	0.012 (BDL-0.023)	60.5%	1.3%	105 (PM ₁₀)	
14	Rayagada 31.R.O.SPCB Building, Indiranagar 32. LPS High School, Jaykaypur	104	63 (18-112)	66 (15-118)	32 (10-91)	BDL (BDL-11.6)	16.7 (11.2-21.6)	Not Monitored	2.8%	1.9%	63 (PM ₁₀)	Satisfactory	
			63 (18-112)	66 (15-118)	32 (10-91)	BDL (BDL-11.6)	16.7 (11.2-21.6)	Not Monitored	2.8%	1.9%	63 (PM ₁₀)		
			66 (15-118)	66 (15-118)	35 (09-66)	BDL (BDL-9.4)	16.9 (11.5-21.2)	Not Monitored	0.96%	0.96%	66 (PM ₁₀)		
15	Rajgangpur 33. DISIR, Rajgangpur	105	149 (73-278)	149 (73-278)	59 (31-93)	11.5 (5.6-22.6)	19.2 (10.8-37.2)	Not Monitored	77.1%	38.0%	133 (PM ₁₀)	Moderate	
			149 (73-278)	149 (73-278)	59 (31-93)	11.5 (5.6-22.6)	19.2 (10.8-37.2)	Not Monitored	77.1%	38.0%	133 (PM ₁₀)		

Sl. No	Area / Stations	No. of Obs (24 hrs)	Annual Average Value (24hourly range) except O ₃ 1-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}
16	Rourkela													
	34. R.O.SPCB building, Sector-5	105	87 (52-178)	37 (20-88)	7.6 (BDL-15.9)	14.4 (BDL-21.9)				5.71%	1.90%	87 (PM ₁₀)	113 (PM ₁₀)	Moderate
	35. IDL Outpost	106	89 (73-160)	51 (40-93)	6.0 (5.4-14.5)	10.9 (9.7-22.7)				12.2%	9.4%	89 (PM ₁₀)		
	36. IDCO Water Tank, IDC Kalunga	105	174 (78-242)	47 (17-79)	12.3 (6.3-15.8)	17.5 (9.5-26.3)				84.7%	27.6%	149 (PM ₁₀)		
	37. Kuarmunda Out Post, Kuarmunda	105	142 (55-213)	52 (24-93)	7.6 (4.4-13.6)	12.0 (9.5-21.9)				80.9%	36.1%	128 (PM ₁₀)		
17	Sambalpur													
	38. PHD Office, Modipara	105	92 (29-266)	48 (19-165)	5.5 (BDL-35.6)	23.9 (18.0-46.2)	19.5 (BDL-39.6)	15.6 (BDL-37.1)	Not Monitored	41.9%	14.2%	92 (PM ₁₀)	92 (PM ₁₀)	Satisfactory
	Prescribed Standard (24 hrly)		100	60	80	80	400	180 (1Hourly)	0.5					
	Standard for Annual Avg. Value		60	40	50	40	100	100 (8Hourly)	1.0					

N.B:BDL- Below Detectable Limit, PM₁₀ - Particulate Matter ≤ 10 μ size, PM_{2.5} - Particulate Matter ≤ 2.5 μ size SO₂ - Sulphur Dioxide, NO₂ - Oxides of Nitrogen, NH₃ → Ammonia, O₃ - Ozone & Pb-Lead, NM-Not Monitored

- » BDL Value for SO₂ ≤ 4 μg/m³, NO₂ ≤ 9 μg/m³, NH₃ ≤ 10 μg/m³, O₃ ≤ 10 μg/m³, Pb ≤ 0.0022 μg/m³, PM₁₀ ≤ 5 μg/m³, PM_{2.5} ≤ 2 μg/m³
- » NO percentage of violation of data from 24 hourly average for all monitored gaseous like SO₂, NO₂, NH₃, O₃ & Pb

Table-5.34 Annual Air Quality Index of Different monitored Stations in Odisha during the year 2019

Monitoring Locations	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	98	78	13	33	7	25	Nil	98.0 (PM ₁₀)	Satisfactory
2. NALCO Nagar									
2. Talcher									
3.TTPS , Talcher	102	77	13	35	-	-	-	102.0 (PM ₁₀)	Moderate
4.MCL, Talcher									
3. Balasore									
5. R.O, SPCB, Ganeswarpur	86	77	3	14	8	27	-	86.0 (PM ₁₀)	Satisfactory
6.DIC office, Angaragadia									
7.Rasalpur,I.E									
4. Berhampur									
8.R.O, SPCB Brahamanagar	64	43	3	24	10	36	-	64.0 (PM ₁₀)	Satisfactory
5. Bhubaneswar									
9.SPCB Office Building, Unit-VIII	97	48	3	20	11	24	2.0	97.0 (PM ₁₀)	Satisfactory
10.I.R.C. Village, Nayapalli									
11.Capital Police Station, Unit-I									
12.Chandrasekharpur									
13.Patrapada									
14.Palasuni water works									
6. Bonaigarh	112	85	11	20	-	-	-	112.0 (PM ₁₀)	Moderate
15.Bonai Govt. Hospital									
7. Cuttack									
16.Traffic Tower Badambadi,	100	72	5	24	7	25	-	100.0 (PM ₁₀)	Satisfactory
17.R.O.Building, Surya Vihar									
18.PHD office ,Barabati									
8. Jharsuguda									
19.RO Building,Cox Colony, Babubagicha,	102	75	9	18	-	-	-	102.0 (PM ₁₀)	Moderate
20. Inside TRL Colony Premises									
9. Kalinganagar									
21.Over the roof of BRPL Guest House(Near TATA Guest House)	102	NM	3.0	21	12	-	-	102.0 (PM ₁₀)	Moderate
22.Roof of Regional Office Building,									
10. Keonjhar									
23.R.O, Baniapat	103	48	3	18	15	-	-	103.0(PM ₁₀)	Moderate
11. Konark									
24.Konark Police Station	70	NM	3	16	10.0	23.0	0.8	70.0 (PM ₁₀)	Satisfactory
12. Paradeep									
25.PPL Guest House	128	90	23	12	-	-	-	128.0(PM ₁₀)	Moderate
26.On the roof of IFFCO STP									
27.On the roof of Paradeep port trust									

Monitoring Locations	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		
13. Puri									
28. Sadar police Station	106	NM	3	18	15	22	0.9	106.0 (PM ₁₀)	Moderate
29. Town police Station									
14. Rayagada									
30. RO Building, Indiranagar	64	55	3	21	-	-	-	64.0 (PM ₁₀)	Satisfactory
31. LPS High School, Jaykaypur									
15. Rajgangpur									
32. DISR Rajgangpur	133	98	14	24	-	-	-	133.0 (PM ₁₀)	Moderate
16. Rourkela									
33. Regional Office Building, Sector-5	113	78	10	17	-	-	-	113.0 (PM ₁₀)	Moderate
34. IDL Outpost									
35. IDCO Water Tank, IDC Kalunga									
36. Kuarmunda Out Post, Kuarmunda									
17. Sambalpur									
37. PHD Office, Modipara	92	80	7	30	5	16	-	92.0 (PM ₁₀)	Satisfactory

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

The Board has analysed following samples. The status of inspection and monitoring during the year 2019-20 is given in Table-5.36.

Table - 5.36 Inspection and Monitoring of Water, Air and Solid Waste

Nos. of In- spec-tions	Samples under NWMP, SWMP & NRCP	Nos. of Industrial samples	Nos. of other water samples	Nos. of Soil/solid waste/ Plant sam- ples	Nos. of Stack emission samples	Ambient Air Quality studies			Ambient Noise
						Industrial premises	SAMP / NAMP	Others	
7134	4277	3064	2173	32	873	1517	11,715	315	675

5.9 PUBLIC GRIEVANCES

The status of various public complaints received and redressed on following matters during 2019-20 is given in Table 5.37.

- 17 categories of highly polluting industries
- Disposal of hazardous chemicals and hazardous wastes
- Stone crusher
- Brick Kiln
- Other industries
- Mines
- Iron Crushers
- Public nuisance
- Other miscellaneous issues

Table - 5.37 Status of Public Complaints

No. of complaint received	Disposal	Under investigation
544	341	203

5.10 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.

According to Section 6 of this Act, any person who desires to obtain any information under this Act can apply in Form A specifying the particulars of the information sought by him or her in writing or electronically in English or in local official language. The application should be accompanied with the requisite fee, prescribed under the Act.

As per the Act, the State Pollution Control Board, Odisha is providing available information as and when sought through proper application. Mrs. Kainta Tudu, Env. Scientist of the Board has been declared as the Public Information Officer under the provisions of the Act. 705 no. of requests were received under RTI during 2019-20 (Table-5.38). The total amount collected for RTI requests during 2019-20 is ₹ 9,521/-.

Table - 5.38 Status of Applications under RTI Act

SL. No.	Details of the Application	Nos.
01.	Total no. of applications received	705
02.	No. of applications on which Information provided	601
03	No. of applications on which request rejected	47
04.	No. of requests transferred to other public Authorities	28
05.	No. of applications under evaluation	29

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 entailing violation of norms and directives, in spite of repeated persuasion and after having received adequate opportunity.

The Board has filed/counter filed 152 cases and 122 cases have been disposed off by the respective Courts during 2019-2020. 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	01
B	High Court		
1.	PIL	16	25
2.	Writ	60	47
C	Supreme Court		
1.	PIL	02	Nil
2.	Writ	01	Nil
D	Other Court		
1.	Civil Suit	04	Nil
2.	Consumer Dispute Cases	Nil	Nil
3.	Lokpal Cases	Nil	Nil
4.	N.H.R.C. / O.H.R.C.	14 (NHRC-09+ OHRC-05)	25 (NHRC-21+ OHRC-04)
5.	Cases U/S-133 of CrPC	03	Nil
6.	Cases before the State Appellate Authority	03	04
7.	Cases before the National Green Tribunal	49	20
8.	Misc. Cases	Nil	Nil
	Total	152	122

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

CHAPTER - VII

FINANCE AND ACCOUNTS

The estimated and the actual receipts during 2019-20 are given in Table-7.1.

Table-7.2 reflects the details of budget provision and actual expenditure incurred during the year 2019-20.

Table - 7.1

RECEIPT FOR F.Y.- 2019-20 (Rs. in Lakhs)			
Sl No.	Head of Receipt	Budget for 2019-20	Actual Receipt for 2019-20
1	Consent to operate fees		
	a) Received during the year for 2019-20	210.87	195.53
	b) Received in advance in Previous Years for 2019-20	3398.44	
	c) Received during the year as advance for comming Years.	0	4006. 51
2	Consent to Establish	707.70	761.89
3	Misc Receipts(PWM, Reg.under Batteries, Empanelment of Consultants,RTI, Hrd board, auction sale)	3.00	32.83
4	Analysis Charges	3.50	3.49
5	Recovery of Loans & Others	40.00	32.55
6	Public Hearing	15.00	19,50
7	Hazardous Waste Auth	18.00	27.56
8	Aut.Bio.Med. Fees	5.00	25.40
9	Interest on Savings/Advances	1800.00	6018.73
	Sub-Total	6201.51	11123.99
10	Pollution Charges /Penalty(NGT)	1.55	10.10
11	Forfeiture of Bank Guarentee	252.22	252.22
	Sub-Total	253.77	262.32
(ii)	GRANT-IN-AID FOR SCHEME "CONTROL OF POLLUTION"	304.91	304.91
(C)	Receipt of Scheme	965.20	1087.55
	Sub-Total	1270.11	1392.46
	Grand Total	7725.39	12778.77

Table - 7.2

Expenditure for F.Y.- 2019-20				
Sl. No.	Source of Funding	Head of Account	Budget for 2019-20	Expenditure for 2019-20
1	Board's Own Fund	i) Salary	1860.00	1625.72
		ii) Recurring Exp.	598.49	484.75
		iii) Loans & advances	20.00	17.40
		iv) Non Recurring	96.00	18.57
		v) Transfer of Fund to OEMFT	125.00	0.00
		vi) State level committee on solid waste management	40.00	34.61
		vii) Contribution to Chief Minister's relief fund	200.00	200.00
		Sub Total		2939.49
2	Grant-in-Aid of CPCB	i) Salary & Establishment Expenditure	152.45	152.45
		ii) E-governance & IT Operations	41.00	17.75
		iii) Pollution Assessment and R& D Activities	104.70	75.93
		iv) Laboratory Development	11.10	9.10
		v) Management of Polluting sources	31.44	28.10
		vi) Training & Mass Awareness	22.56	21.59
		Sub Total		363.25
3	Sponsored Scheme		992.16	333.22
		Total	4294.90	3019.18
4	Others	i) Deposit of Income Tax for the F.Y 2012-13/A.Y-2013-14		3600.81
		ii) Tax Deducted at Source from Bank Interest		66.41
		iii) Bank Charges on B.G		10.62
	Grand Total			6697.02

CHAPTER - VIII

OTHER IMPORTANT ACTIVITIES

8.1 INTEGRATED COASTAL ZONE MANAGEMENT PROJECT (ICZMP)

Coastal Water Monitoring and Analysis has been made regularly since April 2014 on quarterly/seasonal basis by the PEA from the assigned monitoring area i.e. from Paradeep (20°10'02.67°N; 86°31'22.63°E) to Dhamara coast (20°5'58.96N; 86°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). As given in the protocol, seventy three (73) sampling locations have been selected for the entire monitoring area (Mahanadi transect-32 points, Dhamara transect-17 points and Gahirmatha-Bhitarkanika transect- 24 points).

The details of monitoring conducted during 2019-20 by the ICZMP Cell are given in table below.

Table- 8.1

Year/ Monitoring Quarter	Period	Duration of sam- pling	Name of Stretch/Zone	No. of Water samples collected	No. of Sedi- ment samples collected
2019-20/Q4	December-February	January-2020	Paradeep (Z-1)	562	28
2019-20/Q4	December-February	January-2020	Paradeep (Z-1)	250	22
2019-20/Q4	December-February	February-2020	Paradeep (Z-1)	118	15
2019-20/Q4	December-February	February-2020	Gahirmatha-Bhitarkanika (Z-2)	236	21
2019-20/Q4	December-February	February-2020	Gahirmatha-Bhitarkanika (Z-2)	255	Nil
2019-20/Q4	December-February	February-2020	Dhamara (Z-3)	312	Nil
Total no. of samples collected				1733	86

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:



» **Blue Flag Beach Certification of Beach along coastal stretch of Odisha:**

As per Blue Flag standards, a beach must be plastic-free and equipped with a waste management system. Clean water shall be available for tourists, apart from international amenities. The beach shall have facilities for studying the environmental impact around the area.

The drive for the Blue Flag certification; which is the tag given to environment-friendly and clean beaches, equipped with amenities of international standards for tourists; has been initiated for a few coastal stretches in the State of Odisha. In this connection, twelve more beaches in the country are being developed by the Society for Integrated Coastal Management (SICOM), which is the Environment Ministry's body working for the management of coastal areas in accordance with the Blue Flag standards. As per the proposal of Govt. of Odisha and MoEF & CC, GoI; the OSPCB has been involved in conducting detail survey of environmental status of the coast as desired.

SICOM has monitored five coastal stretches of Odisha i.e., one stretch at Chandrabhaga, two in Paradeep and two at Puri. Out of these stretches a stretch of 435 meters in Puri beach ($19^{\circ}47'60''\text{N}-85^{\circ}50'20''\text{E}$) from Rajbhawan to Hotel Mayfair has been certified as Pilot Blue Flag Beach. A total of 334 water samples from five different locations of Puri Beach have been collected during the period from April, 2019 to March, 2020 and analyzed in respect of the parameters i.e., Colour, Odour, pH, Turbidity, Dissolved Oxygen, Biochemical Oxygen Demand, Fecal coliform, Fecal Streptococci and Oil & Grease under the guidelines of Foundation for Environmental Education (FEE), required for the Blue Flag certification.



(Sampling Location at Puri Stretch under Blue Flag Certification)



Photographs of Puri Beach during monitoring under Blue Flag Certification

Other Activities of ICZMP, SPCB, Odisha:

- **Monitoring and sampling of sea water at Rajhansa, Chilika in and around the grounded Malaysian tug Boat**

Inspection has been conducted near the grounded Malaysian tug boat (JIN HWA 32) and towed barge (JINHA 42) landed off near Rajahansa Island in Chilika lake and necessary sampling was made. Analysis result indicated no sign of pollution due to berthing of this tug boat and barge along the coast.

FEW PHOTOGRAPHS OF GROUNDED MALAYSIAN TUG BOAT JIN HWA 32 & TOWING BOAT JN HWA 42 NEAR CHILIKA AT RAJHANSA



View of JN HWA32



Towing boat JN HWA42

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 2019-20, about 31330076 MT of fly ash has been generated, out of which about 89.91% 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 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 has been identified as one of the five States in the Country (Other States are Maharashtra, Gujarat, Punjab, Karnataka) for implementing UNIDO-GEF-Funded MoEF Project on Biomedical Waste Management. SPC Board has been designated by the 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. 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 to exclusively deal with Bio-medical Waste Management.
- After deployment of Project Officers, regular training has been imparted to waste handlers and due to regular surveillance, the Bio-medical Waste Management practice in the aforesaid 9 Govt. HCEs has been improved considerably, particularly the practice of segregation of bio-medical wastes.

- Colour-coded bins (3360 nos.) and waste collection trolleys (241 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.
- Seven workshops have been conducted throughout the State involving Doctors, Nodal Officers, Paramedical Staff, Nurses and Waste Handlers as participants.
- Standard Operating Procedure(SOP) and Training Manuals, prepared by MS Ramaiah Medical College, Bangalore have been distributed to the Board, Health and Family Welfare Department, CBWTF and all identified HCEs.
- The training manuals have been translated into Odia language and circulated among all stakeholders.
- Microwaves 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.

8.4 OBSERVATIONS DURING DIFERENT 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 publish public notices in two Odia and one English newspaper on dtd:-23.10.2019 to create public awareness on ill effects of noise and bursting of fire crackers. Copies of the public notices are enclosed as Annexure I & II.

Further the Board has conducted monitoring of Noise Level in pre- and on the day of Dussehra and Deepavali at 14 towns/cities of the State. The Board also conducted ambient air monitoring with respect to PM_{10} , $PM_{2.5}$, SO_2 & NO_2 in 17 towns/cities to assess the impact on ambient air quality in pre- and on the day of Dussehra. The findings of the monitoring are summarized below and results are presented in Table-8.2 and 8.3.

IMPACT OF DUSSEHRA FESTIVAL CELEBRATION ON AMBIENT NOISE LEVEL

State Pollution Control Board, Odisha has conducted ambient noise monitoring at 52 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 prior to and during Dussehra to assess the impact of Dussehra festival on the ambient noise level. Out of 52 locations of noise monitoring, 10 are in Industrial zone, 14 each are in commercial, residential and silence zones.

I. Industrial Zone

The noise level at all locations in pre & on the day of Dussehra are below the prescribed limit for day time i.e., 75 dB (A) Leq except at two locations at Khapuria Industrial Estate and Jesco, Rayagada on pre Dussehra and at Kalinganagar Industrial Estate, Jajpur during Dussehra.

During night time the noise level are below the limit i.e. 70 dB (A) Leq at all locations except at four locations i.e., Khapuria Industrial Estate, Cuttack, Bombay chowk, Jharsuguda, Kalinganagar Industrial Estate and Jesco Industrial Estate at Rayagada on the day of Dussehra and Khapuria Industrial Estate, Cuttack in pre Dussehra.

II. Commercial Zone

The noise level in day time on pre & during Dussehra at all locations are above the limit i.e., 65 dB (A) Leq except at two locations in pre Dussehra at Sahidnagar Bhubaneswar and at Ambagan, Rourkela. The maximum noise occurred at Motiganj, Balasore i.e., 91.0 dB (A) Leq on the day of Dasher. The noise level in night time exceeds the limit i.e., 55 dB (A) Leq at all locations in pre & on the day of Dussehra except at Sahidnagar Bhubaneswar on pre-Dussehra. The maximum noise level occurred i.e. 84.9 dB (A) Leq at Motiganj, Balasore.

III. Residential Zone

The noise level in the day time exceed the limit i.e. 55 dB (A) Leq in both pre & during Dussehra at all locations except at Nayapalli, Bhubaneswar, Madhipur at Konark on pre Dussehra, Brahmanagar during Dussehra and Ainthapalii, Sambalpur on both Pre & During Dussehra. The maximum noise level occurred at Indiranagar, Rayagada i.e., 84.1 dB (A) Leq in day time on the day of Dussehra.

During night time the noise level in pre & during Dussehra are more than the limit i.e., 45 dB (A) Leq at all locations except at one location in pre Dussehra i.e., Nayapalli, Bhubaneswar. The maximum noise level occurred i.e., 75.6 dB (A) Leq at COX colony, Jharsuguda during Dussehra in night time.

IV. Silence Zone

The noise level in day time & night time at all locations are above their respective limit i.e., 50 dB (A) Leq & 40 dB (A) Leq respectively except at Capital Hospital Unit-6, Bhubaneswar during day time in both pre and on the day of Dussehra and IGH Steel Township in Day time in pre Dussehra. The Maximum noise level i.e., 78.2 dB (A) Leq in day time occurred at District Head Quarter Hospital, Paradeep on the day of Dussehra & at night time and the maximum noise level i.e., 70.4 dB (A) Leq occurred at SCB medical college is observed in pre Dussehra.

Table-8.2 Noise level in dB(A) Leq at different locations on pre and on Dasher day during the year 2019

Sl. No	Towns/Cities	Monitoring Locations	Pre Dasher		Dasher Day	
			D	N	D	N
1.	Angul	1.Amalapada(R)	61.7	53.9	69.4	56.3
		2.Bazar chhak(C)	66.6	58.8	83.6	60.4
		3.District Head Quarter Hospital(S)	61.4	48.9	63.0	50.9
		4.Hakimpada(I)	64.3	54.7	65.8	59.4
2.	Balasore	5.Sahadevkhunta(R)	66.5	53.6	73.5	58.4
		6.Motiganj Bazar(C)	78.2	64.7	91.0	84.9
		7.District Head Quarter Hospital(S)	60.1	47.6	58.3	66.1
		8.Balasore Industrial Estate(I)	61.3	54.0	61.5	52.9
3.	Berhampur	9.Brahmanagar(R)	62.6	57.0	53.5	54.4
		10.Girija market square(C)	70.8	80.5	77.3	74.6
		11.MKCG Medical & Hospital(S)	53.0	50.0	68.3	54.5
		12.Ankuli(I)	64.0	50.8	68.2	59.0
4.	Bhubaneswar	13.Nayapalli(R)	48.7	43.2	58.0	56.6
		14.Sahidnagar(C)	61.0	49.4	68.3	65.4
		15.Capital Hospital(S)	43.7	41.7	44.0	42.4
		16.Rasulgarh(I)	56.7	45.7	70.4	65.8

Sl. No	Towns/Cities	Monitoring Locations	Pre Dasher		Dasher Day	
			D	N	D	N
5.	Cuttack	17.Suryavihar(R)	66.0	71.3	71.6	68.2
		18.Badambadi(C)	76.0	76.8	79.6	73.2
		19.SCB Medical College & Hospital(S)	65.7	70.4	73.5	65.9
		20.Khapuria(I)	76.5	70.8	72.5	70.3
6.	Jharsuguda	21.Cox Colony(R)	72.6	60.6	76.8	75.6
		22.Jhanda Chowk(C)	69.6	70.6	74.2	72.3
		23.District Head Quarter Hospital(S)	65.1	70.2	73.2	67.1
		24.Bombay Chowk(I)	68.1	67.7	74.5	72.7
7.	Kalinganagar	25.Sapagadia(R)	72.8	70.1	77.9	64.2
		26.Gopabandhu Chowk(C)	73.9	66.4	86.2	83.1
		27.CHC Hospital, Jajpur Road(S)	64.2	60.2	68.5	64.6
		28.Kalinganagar Industrial Estate(I)	67.7	69.7	75.7	84.7
8.	Keonjhar	29.Baniapat Chowk(R)	69.6	64.2	73.7	68.9
		30.Punjabi Chowk(C)	72.0	71.1	79.7	71.1
		31.Govt.Hospital(S)	62.2	60.8	62.7	52.6
9.	Konark	32.Madhipur(R)	52.5	45.1	53.0	50.7
		33.NAC Market(c)	69.3	59.4	72.0	69.9
		34.Public Health Centre(S)	52.0	46.8	58.8	47.6
10.	Paradeep	35.Near Police Colony(R)	69.1	71.0	70.9	70.1
		36.LIC Building Jagatsinghpur(C)	77.3	70.8	81.8	71.3
		37.District Head Quarter Hospital(S)	67.2	66.9	78.2	69.5
11.	Puri	38.Kumutisahi, Old Sadar lane(R)	62.1	54.5	63.5	59.2
		39.Sri Mandir(C)	75.5	68.2	81.0	71.1
		40.District Head Quarter Hospital(S)	62.0	57.1	66.3	55.1
12.	Rayagada	41.Indira Nagar(R)	74.7	65.2	84.1	74.8
		42.Near Main Market(C)	76.0	72.0	81.9	73.8
		43. District Head Quarter Hospital (S)	73.1	70.3	69.3	65.3
		44.Near Jesco (I)	75.1	60.9	70.9	80.5
13.	Rourkela	45.Sector-6(R)	55.1	57.8	48.9	37.4
		46.Ambagan(C)	63.0	62.6	75.4	65.4
		47.IGH steel Township(S)	43.9	43.3	53.0	44.7
		48.RSP Sail(I)	58.3	57.6	58.3	52.8
14.	Sambalpur	49.Ainthapali(R)	53.0	57.0	53.8	54.9
		50.Golebazar(C)	75.3	66.8	72.9	69.5
		51.District Head Quarter Hospital(S)	59.9	55.5	55.0	47.5
		52.Bareipali(I)	63.6	66.5	65.2	59.9

Ambient Noise Standard (In Leq dB(A))

Category of area zone	Day Time	Night Time
Industrial area(I)	75	70
Commercial area(C)	65	55
Residential area(R)	55	45
Sience area(S)	50	40

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

IMPACT OF DEEPAVALI 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 town/cities covering Industrial, Commercial, Residential and Silence Zone in the day and night time to assess the impact of noise during celebration of Deepawali as well as in the pre Deepawali period to assess the impact. Out of 53 locations 11 locations are in Industrial zone, 14 locations are in commercial zone, 14 locations are in residential zone and 14 locations are in 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 are found below the prescribed standard of 75dB (A) Leq at all locations except 5 locations at Khapuria Industrial Estate, Cuttack, Kalinganagar Industrial Estate, IFFCO Ltd, Paradeep, Jesco Industrial Estate, Rayagada, and Bareipali Industrial estate, Sambalpur during Deepawali.

In night time the noise level in pre and during Deepawali are within the prescribed standard of 70dB (A) Leq at all locations except 5 locations at Khapuria Industrial Estate, Cuttack, Bombay chowk, Jharsuguda, Kalinganagar Industrial Estate, Kalinganagar, IFFCO Ltd, Paradeep, and Bareipali Industrial estate, Sambalpur during Deepawali.

II. Commercial Zone

The day time noise level in pre & on the day of Deepawali were remained above the prescribed standard of 65 dB(A) Leq at all the locations except at Sahidnagar, Bhubaneswar, Biju memorial Hospital, Paradeep and Bisra Chowk, Rourkela in 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.

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 Sector-6, Rourkela in pre Deepawali.

The night time noise level in residential zone exceeded the standard of 45 dB (A) Leq at all locations in pre & during Deepawali.

IV. Silence Zone

The day time noise level were found to be exceeded the prescribed standard of 50 dB (A) Leq at all locations in pre & During Deepawali.

In night time noise level in pre & during Deepawali were found to be exceeded the prescribed standard of 40 dB (A) Leq at all locations.

Table-8.3 Noise level in dB(A) Leq at different location in pre Deepawali & Deepawali day during the year 2019

Sl.No	Towns/Cities	Monitoring Locations	Pre Deepawali		Deepawali Day	
			D	N	D	N
1	Angul	1.Amalapada(R)	64.1	56.3	70.5	60.3
		2.Bazar chhak(C)	73.1	62.0	75.6	67.3
		3.District Head Quarter Hospital(S)	66.3	55.4	67.3	55.2
		4.Hakimpada(I)	62.0	55.8	67.4	59.3

Sl.No	Towns/Cities	Monitoring Locations	Pre Deepawali		Deepawali Day	
			D	N	D	N
2	Balasore	5.Sahadevkhunta (R)	61.5	54.2	77.0	58.5
		6.Motiganj Bazar (C)	79.9	71.2	87.5	75.6
		7.District Head Quarter Hospital (S)	60.7	51.65	66.9	61.0
		8.Balasore Industrial Estate (I)	52.7	57.5	73.3	66.4
3	Berhampur	9.Brahmanagar (R)	55.2	52.4	72.9	61.8
		10.Girija market square (C)	76.2	67.1	76.4	71.1
		11.MKCG Medical & Hospital (S)	65.3	57.5	67.7	59.1
		12.Ankuli (I)	66.3	57.5	67.7	60.6
4	Bhubaneswar	13.Nayapalli (R)	66.3	58.0	67.3	60.5
		14.Sahidnagar (C)	61.3	58.5	70.2	61.1
		15.Capital Hospital (S)	52.3	54.4	64.2	59.2
		16.Rasulgarh (I)	58.6	51.5	69.1	61.3
5	Cuttack	17.Suryavihar (R)	66.0	65.3	73.8	70.6
		18.Badambadi (C)	74.8	73.7	75.8	77.0
		19.SCB Medical College (S)	68.2	62.9	68.8	67.2
		20.Khapuria (I)	70.9	67.6	75.2	75.2
6	Jharsuguda	21.Cox colony (R)	64.9	66.3	77.6	83.2
		22.Jhanda Chowk (C)	69.5	68.7	73.1	84.1
		23.Mangala Bazar (S)	66.2	66.5	75.1	80.8
		24.Bombay Chowk (I)	71.4	68.8	74.5	80.0
7	Kalinganagar	25.Sapagadia (R)	69.1	71.4	83.3	83.1
		26.Gopabandhu Chowk (C)	75.1	77.0	83.9	76.7
		27.CHC Hospital (S)	68.2	68.3	73.8	79.4
		28.Kalinga nagar industrial estate (I)	67.6	67.5	76.9	74.9
8	Keonjhar	29.Baniapat Chowk (R)	70.4	73.4	76.0	69.8
		30.Punjabi Chowk (C)	74.6	75.1	79.8	76.0
		31.Govt.Hospital (S)	66.0	62.8	71.5	63.8
9	Konark	32.Madhipur (R)	58.4	47.0	60.0	56.6
		33.NAC Market (C)	74.4	63.3	68.8	56.7
		34.Public Health Centre (S)	59.0	51.9	57.4	51.8
10	Paradeep	35.PPT Colony (R)	58.0	66.1	71.2	67.0
		36.Badapadia Market (C)	70.1	70.3	74.8	68.8
		37.Bijumemorial Hospital (S)	57.6	54.4	71.5	63.5
		38.IFFCO Ltd (I)	67.3	64.9	76.4	70.2
11	Puri	39.Kumutisahi, Old Sadar lane (R)	71.1	62.9	77.3	68.3
		40.Near Sri Mandir (C)	77.7	69.6	82.0	75.7
		41.District Head Quarter Hospital (S)	65.9	60.3	73.9	65.9
12	Rayagada	42.Indiranagar (R)	68.9	46.8	83.5	63.7
		43.Main market (C)	74.6	71.9	76.9	61.3
		44.District Head Quarter Hospital (S)	71.6	69.7	77.1	75.9
		45.Jesco (I)	67.6	66.4	79.5	66.8

Sl.No	Towns/Cities	Monitoring Locations	Pre Deepawali		Deepawali Day	
			D	N	D	N
13	Rourkela	46.Sector-6(R)	51.0	49.1	70.1	56.6
		47.Bisra Chowk(C)	63.3	64.0	73.3	60.5
		48.IGH steel Township(S)	50.4	51.5	60.7	63.7
		49.RSP Sail(I)	64.6	40.2	67.3	69.3
14	Sambalpur	50.Ainthapali(R)	57.2	57.9	71.0	65.4
		51.Golebazar(C)	75.3	72.3	79.9	82.6
		52.District Head Quarter Hospital(S)	52.7	51.0	67.3	72.8
		53.Bareipali(I)	65.2	62.7	75.1	72.8
Ambient Noise Standard(In Leq dB(A))						
Category of area zone		Day Time	Night Time			
Industrial area(I)		75	70			
Commercial area(C)		65	55			
Residential area(R)		55	45			
Sience area(S)		50	40			

N.B:-D-Day Time monitoring period (6PM to 10PM), N-Night Time monitoring period (10PM to12 AM)

IMPACT OF DEEPAWALI CELEBRATION ON AMBIENT AIR QUALITY

State Pollution Control Board, Odisha has monitored the Ambient Air Quality on pre & during Deepawali at 38 locations in 17 town/cities 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 SO₂, NO₂, PM₁₀ (at 38 locations) & PM_{2.5} (at 30 locations) to assess the impact of bursting of fire crackers on the surrounding ambient air quality.

The SO₂ & NO₂ values on pre & during Deepawali remained below the prescribed limit i.e 80 µg/m³ (for both SO₂ & NO_x on 24-hourly average basis) at all 38 locations. The maximum SO₂ value i.e., 35.6 µg/m³ observed at Modipara, Sambalpur and maximum NO₂ value i.e., 48.5 µg/m³ observed at Girija market square, Berhampur. The respirable particle matter (PM₁₀) values were below prescribed limit 100 µg/m³ on 24-hourly average basis at 04 locations on the day of Deepawali and at 28 locations on pre Deepawali out of 38 locations whereas PM_{2.5} values were below prescribe limit 60 µg/m³ on 24- hourly average basis at 10 locations on the day of Deepawali and at 25 locations on pre Deepawali out of 30 monitoring locations (08 locations were not monitored on pre and during Deepawali). On the day of Deepawali, maximum PM₁₀ & PM_{2.5} value i.e., 266 µg/m³ and 164 µg/m³ respectively observed at Modipada, Sambapur. The concentration of gaseous pollutants SO₂ & NO₂, Respirable particulate matter (PM₁₀) & fine particulate matter (PM_{2.5}) were shown higher value on the day of Deepawali than the corresponding pre Deepawali value of the monitoring at all locations shows the impact of bursting of fire crackers on the air quality.

The monitoring results are given in following Table no-8.4.

Table-8.4 Ambient Air Quality status of major cities/towns in the pre & during Deepawali-2019

Sl.no	Towns/cities	Monitoring Locations	Parameter Monitored							
			SO ₂		NO ₂		PM ₁₀		PM _{2.5}	
			PRE	DURING	PRE	DURING	PRE	DURING	PRE	DURING
Values are expressed in microgram per cubic meter										
1	Angul	1. RO SPCB Building	9.2	19.1	26.3	31.2	86	189	48	84
		2. Nalco Township	9.9	15.4	21.6	34.1	102	222	41	60

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
2	Balasore	3.Ganeswarpur	BDL	BDL	11.0	12.0	85.0	103.0	33.0	62.0
		4.DIC Office Angar-agadia	BDL	BDL	10.6	12.9	81.0	113.0	30.0	70.0
		5.Rasalpur Industrial Estate	7.3	9.0	11.3	13.6	87.0	115.0	42.0	75.0
3	Berhampur	6.Brahmanagar	4.5	10.5	25.6	45.6	52	92	24	45
		7.Girija market square	7.4	14.2	30.2	48.5	72	110	31	55
		8.MKCG Medical College& Hospital	BDL	8.5	22.2	40.2	62	88	28	44
		9.Industrial Estate, Ankuli	5.2	10.2	28.2	50.2	65	104	20	65
4	Bhubaneswar	10.SPCB Office Building	BDL	4.3	18.5	20.2	86	218	29	110
		11.IRC Nayapalli	BDL	4.9	13.7	22.1	86	234	27	129
		12.Capital Police Station	BDL	7.1	15.8	25.0	82	206	21	37
		13.Patrapada	BDL	4.3	14.4	26.0	70	164	21	34
		14.Chandrasekharpur	BDL	5.7	14.2	21.2	97	244	29	83
		15.Palasuni water works	BDL	6.9	13.7	21.2	80	110	17	40
5	Bonaigarh	16.Govt. Hospital Bonai	8.8	12.1	13.6	19.6	123	177	70	83
6	Cuttack	17. PHD Office near Barabati Stadium	BDL	4.2	18.6	19.1	73	112	NM	NM
		18. RO SPCB BuildingSuryanagar	BDL	9.9	24.4	42.3	75	159	38	94
		19.Hotel Bishal Inn near Traffic Tower Badambadi	4.2	8.1	19.6	31.1	87	235	34	97
7	Jharsuguda	20. RO Building, Cox Colony, Babubagicha	8.1	30.6	13.2	44.8	75	167	34	97
8	Kalinganagar	21. RO SPCB Building	BDL	4.8	16.7	26.8	116.1	226	NM	NM
		22. BRPL Guest House	BDL	4.9	16.5	25.9	71.0	179	NM	NM
9	Keonjhar	23 RO SPCB Building	BDL	BDL	15.1	25.1	108	212	NM	NM
10	Konark	24. Konark Police Station	BDL	BDL	12.9	13.8	68.0	77	nm	nm
11	Paradeep	25. STP Building, IFFCO,	18.9	26.2	10.0	18.1	119.0	139	NM	NM
		26. PPL Guest House,	16.2	24.9	9.9	17.9	97.0	134	NM	NM
		27. PPT Staff Quarters,	15.8	26.6	9.9	19.2	91.0	139	NM	NM
12	Puri	28.Town Police Station	BDL	5.3	14.9	22.4	91.0	163	13.0	91
13	Rayagada	29. RO SPCB Building	4.9	11.6	13.1	21.6	26	112	13	91
		30.LPS High School	4.2	9.4	12.3	20.5	32	83	16	61

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
14	Rajgangpur	31.DISIR Rajgangpur	13.7	18.0	18.9	22.1	108	132	72	93
15	Rourkela	32. RO SPCB Building	10.6	15.9	18.9	21.9	123	178	69	88
		33.IDL Police Outpost	6.0	10.3	10.8	16.3	90	160	72	93
		34.IDC Kalunga	11.9	15.4	22.9	24.8	110	124	33	45
		35. Kuarmunda Hospital,	10.2	13.6	15.8	21.9	143	199	72	93
16	Sambalpur	36.Modipara	5.5	35.6	22.5	46.2	38.0	266	29	164
17	Talcher	37.Talcher Thermal	8.8	13.9	28.2	31.9	79	116	42	53
		38 MCL area, Talcher	9.1	13.7	27.0	35.0	117	130	46	51
Standard on 24hrly avg. basis			80		80		100		60	

N.B-BDL-Below Detection Limit,BDL value for SO₂ ≤4 µg/m³, NM-Not Monitored

8.4.2 Impact of Immersion of Idols in Water Bodies

Durga Puja is celebrated in a big way in most of the cities of Odisha. Generally the idols are immersed on a single day at the designated sites of the rivers flowing along the cities. To minimize the impact of idol immersion on the water quality, the Board has taken following steps as recommended in the Guideline for idol immersion.

- Informed 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 jurisdiction.
- Created public awareness through public notice on safe idol immersion practices in local newspapers and in Board’s website and through public address system.
- Made several meetings with the local bodies / authorities, Puja Committee Organizers to create awareness on ill impacts of idol immersion in water bodies.
- Coordinated with the local bodies/ authorities for construction of temporary immersion ponds near rivers as prescribed in the Guideline.
- Idols are generally immersed in flowing water which makes the rivers as the ideal choice. In such



Fig. 1 Appeal to Public to observe pollution free Ganesh puja, Durga Puja, Laxmi Puja and Kali Puja through Public Notice on Newspapers

cases, as per the Guideline, either temporary ponds having earthen bunds along the river bank for use as idol immersion spots had been constructed or a part of the river bed had been cordoned to demarcate it as idol immersion site. The bottom of the pond in either cases had been lined with removable synthetic liner well in advance of the idol immersion. The said liner along with remains of the idols were removed within 48 hours of idol immersion by the local bodies and disposed in the municipal dumpsites. The water of the temporary ponds was then treated with lime and allowed to settle prior to discharge into rivers.

- In some urban local bodies, though temporary immersion ponds were not constructed specifically for idol immersion purposes, the left-overs of idol immersion were removed by the local peoples within 48 hours of idol immersion and disposed at the municipal dumpsites.

Temporary Idol immersion pond created on the bank of Kuakhai river along Bhubaneswar.



- Conducted water quality assessment of Kuakhai river and Daya river along Bhubaneswar city, Kathajodi river along Cuttack city and Mangala river along Puri city,
- 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. The variation in concentration of different parameters at the immersion sites are 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.

- Turbidity and Suspended solids in Kathajodi river along Cuttack city and in Daya river along Bhubaneswar during-immersion period are observed to be higher in comparison to the pre- and post-immersion period. This may be attributed to the increase in suspended materials on the water body during immersion of idols whereas, no significant change was observed in case of turbidity and Suspended solid values in Kuakhai river along Bhubaneswar and Mangala river along Puri city.
- Dumping of puja materials and left-overs into the water body depletes the oxygen level of water body and therefore there was increase in BOD and COD values at the immersion site on the day of idol immersion. During post-immersion monitoring, the river water rejuvenated itself due to

continuous flow of water, which is reflected by lower BOD values and other parameters in Kuakhai and Daya rivers along Bhubaneswar city. However, BOD values of the river water at all these monitoring locations remained well within the tolerance limit of 3.0 mg/l during all the three phases of monitoring.

- During immersion period, increase in the conductivity and total dissolved solids at the immersion site in comparison to the upstream and downstream stations may be ascribed to the leaching of puja materials and idols immersed in the water body.
- Variation in concentrations of heavy metals such as cadmium, lead, copper and hexavalent chromium during the period of study was not significant.
- Concentration of heavy metals such as cadmium, chromium, iron, lead, zinc and copper in both during-immersion and post-immersion period remain much below the tolerance limit for most beneficial uses of water. This may be correlated to the very slow leaching process of heavy metals from the synthetic paints and other materials used in the idols in natural conditions of water bodies.
- Further, 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 well within the tolerance limits of the designated use.

From the study, it may 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 excepting few cases. Concentration of heavy metals such as cadmium, chromium, iron, lead, zinc and copper remain much below the tolerance limits and no significant impact is exerted on the heavy metal concentration of the water bodies due to immersion of idols. Though some of the physical and chemical parameters like Turbidity, electrical conductivity, TDS and BOD show higher values during-immersion period in comparison to the pre-and post-immersion period, but still remained much below the tolerance limit. Further, immersion of idols in the temporary immersion ponds has minimized the probability of contamination of the main course of river water.

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

To assess the impact of mass bathing during Kartika Purnima on water quality of river Mahanadi and Kathajodi along the Cuttack city, the Board had conducted a water quality monitoring study at the major bathing ghats on Pre- (07.11.2019), During- (12.11.2019) and Post-(26.11.2019) Kartika Purnima. 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 has been 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.

Though an increase in BOD level at the bathing ghats are observed during the Kartika Purnima, still it is within prescribed limit of 3.0 mg/l during the post- Kartika Purnima period. However, significant impact on the bacteriological quality with respect to total coliform and fecal coliform are observed at the bathing ghats of Mahanadi river and Kathajodi river on the day of Kartika Purnima due to mass bathing and other human activities. Water quality data with respect to BOD, TC and FC in Pre-, During- and post-Kartika Purnima period is given in Table-8.5.

Table-8.5 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 -2019

Sl. No.	Location	BOD (mg/l)			TC (MPN/100ML)			FC (MPN/100ML)		
		Pre (07.11.2019)	During (12.11.2019)	Post (26.11.2019)	Pre (07.11.2019)	During (12.11.2019)	Post (26.11.2019)	Pre (07.11.2019)	During (12.11.2019)	Post (26.11.2019)
Mahanadi River										
1	Mundali	0.4	0.8	0.7	490	790	790	68	170	170
2	Chahata Ghat	1.1	1.8	0.9	160000	160000	92000	92000	92000	35000
3	Gadagadia Ghat	0.8	1.9	1.2	24000	160000	92000	4900	160000	24000
4	Zobra	0.4	0.8	0.9	28000	54000	43000	6400	17000	14000
5	Kanehipur	0.8	1.3	0.8	2200	3300	2400	1100	1300	1300
Kathajodi River										
6	Naraj	0.9	0.7	1.0	1700	2200	490	490	490	130
7	Puri Ghat	1.1	1.4	1.2	160000	160000	54000	24000	92000	13000
8	Khan Nagar	1.2	1.8	1.9	4900	17000	17000	2200	4900	4600
9	Urali	1.8	1.8	2.0	4900	7900	4600	2200	2200	2100
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 PROJECTS

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

The Board has 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 2019, surface water sample were collected from Atharabanki creek from different locations around 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 within 0.418 – 8.28 mg/l. As the flow of Atharabanki creek depends upon 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 0.643-6.25 mg/l. The fluoride concentration in creek water at Bhim Bhoi colony varies within 1.42 - 6.25 mg/l, near entrance gate to Paradeep Port Township varies within 1.61 - 4.84 mg/l, near conveyor belt of IFFCO varies within 1.83 – 4.15 mg/l. Whereas, the fluoride concentration in the creek water near fishing jetty varies within 0.643 - 1.77 mg/l. Near fishing jetty the water quality is 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 2.09 – 7.11 mg/l, whereas, Fluoride concentration in the surface run-off drain near Loknath colony varied within 0.445 -0.82 mg/l.

The test wells around M/s IFFCO exhibit fluoride concentration within 0.141-3.09 mg/l, whereas, those around M/s PPL exhibit fluoride concentration 0.241- 1.06mg/l.

Fluoride content in ground water samples collected from outside of the plant area i.e. at Badapadia, varies within 1.31-1.47 mg/l, whereas in Musadiha, the fluoride concentration varies within 0.340 – 0.430 mg/l and inside the Shiv temple, it varies within 0.765 – 1.10 mg/l. Fluoride content in ground water monitored at public locations remained within the acceptable limit of 1.5 mg/l.

8.6 LIBRARY AND INFORMATION SERVICE

Board's Library acts as a document repository and referral centre for dissemination of information in the field of environmental science and engineering and its associated areas. Apart from Board employees, the Library is also used by research scholars of different Universities and technical Colleges, institutions in Orissa, various NGOs and Social activists. The Library has a collection of Books, Reports, Audio Visual materials, Maps, Photographs, Topo sheets, River Basin Atlas and soft copies of different aspects of environmental science and engineering. During 2019-20, the library has received 58 Books, 78 Reports, 18 Journals, 11 Newspaper and 02 Magazines. 1500 News clippings on environmental issues from various sources of information have been collected for reference of the users. 03 nos of outside scholars have been enrolled as library members on payment basis during the period. Besides news clipping, 493 pages of reprographic service to different outside members have been provided on payment basis.

8.7 TRAINING ATTENDED BY BOARD OFFICIALS

The Board has deputed its officials on various training programmes, seminars and workshops for the up-gradation of their knowledge and exposure to recent technological advancements in the field of pollution control and environment protection issues.

The list of officials of the Board along with name of training programmes / workshops / seminars in various institutions attended during 2019-20 is given in Table - 8.6.

Table - 8.6 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 (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
1	Dr. P. K. Prusty, Chief Env. Engineer (Resource Person)	15 th April, 2019	One-day workshop on Environmental Social Management System	Odisha Forestry Sector Development Project, SFTRI Campus, Ghatikia, Bhubaneswar	Odisha Forestry Sector Development Project, SFTRI Campus, Ghatikia, Bhubaneswar
2	Dr. N. R. Sahoo, Chief Env. Engineer (Resource Person)	15 th April, 2019	One-day workshop on Environmental Social Management System	Odisha Forestry Sector Development Project, SFTRI Campus, Ghatikia, Bhubaneswar	Odisha Forestry Sector Development Project, SFTRI Campus, Ghatikia, Bhubaneswar
3	Dr. B. N. Bhol, Chief Env. Engineer (Resource Person)	15 th April, 2019	One-day workshop on Environmental Social Management System	Odisha Forestry Sector Development Project, SFTRI Campus, Ghatikia, Bhubaneswar	Odisha Forestry Sector Development Project, SFTRI Campus, Ghatikia, Bhubaneswar

Sl. No.	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
4	S. S. Mishra, Env. Scientist	6 th – 7 th June, 2019	Training programme & Exposure Visit on “Framing Strategies for Construction and Demolition (C & D) Waste and Dust Management for Clean Air in the Non-attainment Cities”	Centre for Science & Environment (CSE), New Deldi	Centre for Science & Environment (CSE), New Deldi
5	Er. Narottam Behera, Env. Engineer, RO, Bhubaneswar	6 th – 7 th June, 2019	Training programme & Exposure Visit on “Framing Strategies for Construction and Demolition (C & D) Waste and Dust Management for Clean Air in the Non-attainment Cities”	Centre for Science & Environment (CSE), New Deldi	Centre for Science & Environment (CSE), New Deldi
6	Dr. N. R. Sahoo, Chief Env. Engineer (Resource Person)	29 th June, 2019	Seminar on “Responsible Mining”	Bhubaneswar-Sukinda Chapter, The Mining Engineering Association of India	Hotel Pal Heights, Jayadev Vihar, Bhubaneswar
7	Dr. N. R. Sahoo, Chief Env. Engineer (Resource Person)	29 th June, 2019	Workshop of OFSDP-II on Environmental & Social Management System Framework (ESMSF) and Schedule Tribe and Forest Department Planning Framework	Odisho Forestry Sector Development project (OFSDP), Ghatikia, Bhubaneswar	Odisho Forestry Sector Development project (OFSDP), Ghatikia, Bhubaneswar
8	Bhabagrahi Jena, SSA, Central Laboratory	10 th – 12 th July, 2019	Workshop on “Design, Organise and Management of Water Quality Monitoring”	Central Pollution Control Board, Regional Directorate (South), Bengaluru	Central Pollution Control Board, Regional Directorate (South), Bengaluru
9	Dr. (Mrs.) U. R. Pattnaik, Env. Scientist, Central Laboratory	26 th August, 2019	Training Programme on “Quick Hygienic Survey of Rivers”	CPCB, New Delhi	BITS Pilani, Hyderabad Campus
10	Dr. (Mrs.) U. R. Pattnaik, ES, Central Laboratory	11 th - 14 th September, 2019	Training programme on “Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025-2017 (Latest Revision)”	CIPET : Institute of Plastics Technology (IPT), Patia, Bhubaneswar-751024	CIPET : Institute of Plastics Technology (IPT), Patia, Bhubaneswar-751024
11	Dr. S. K. Mohanty, ES, Central Laboratory	11 th - 14 th September, 2019	Training programme on “Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025-2017 (Latest Revision)”	CIPET : Institute of Plastics Technology (IPT), Patia, Bhubaneswar-751024	CIPET : Institute of Plastics Technology (IPT), Patia, Bhubaneswar-751024
12	Dr. S. S. Pati, AES, ICZMP	11 th - 14 th September, 2019	Training programme on “Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025-2017 (Latest Revision)”	CIPET : Institute of Plastics Technology (IPT), Patia, Bhubaneswar-751024	CIPET : Institute of Plastics Technology (IPT), Patia, Bhubaneswar-751024

Sl. No.	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
13	Dr. (Mrs.) S. Mishra, AES, ICZMP	11 th - 14 th September, 2019	Training programme on "Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025-2017 (Latest Revision)"	CIPET : Institute of Plastics Technology (IPT), Patia, Bhubaneswar-751024	CIPET : Institute of Plastics Technology (IPT), Patia, Bhubaneswar-751024
14	Dr. Nihar Ranjan Sahoo, Chief Env. Engineer	13 th – 21 st September, 2019	Training Programme on "Best Practices in Environmental Governance"	Centre for Science and Environment, New Delhi-110062	New Delhi and Sweden
15	Er. Rajat Kumar Sethi, Asst. Env. Engineer, Regional Office, Bhubaneswar	16 th – 20 th September, 2019	Training Programme on "Design, Operation, Maintenance and Performance of STP & CB-MWTFs"	Engineering Staff College of India (ESCI), Hyderabad sponsored by CPCB	Engineering Staff College of India (ESCI), Hyderabad
16	Er. R. N. Prusty, Sr. Env. Engineer (L-I)	19 th September, 2019	Interactive Indo-European Meet on Resource Efficiency in the Aluminium Industry with a Focus on Effective Utilization of Red Mud (Bauxite Residue)	MoEF&CC, JNARDDC & EU	Hotel Taj Mansingh (Taj Mahal), New Delhi
17	Dr. L. D. Pal, Env. Scientist	23 rd – 27 th September, 2019	Training Programme on "Planning, Designing, Monitoring and Inspection of WWTPs and APC measures"	National Productivity Council, Chennai sponsored by CPCB	National Productivity Council, Chennai
18	Dr. S. S. Pati, Asst. Env. Scientist, Central Laboratory	23 rd – 27 th September, 2019	Training Programme on "Analysis of Pesticides & Other Organic Chemicals in Environmental Samples"	CSIR-IITR, Lucknow, Uttar Pradesh sponsored by CPCB	CSIR-IITR, Lucknow, Uttar Pradesh
19	Soumya Ranjan Mallick, Sr. Scientific Asst., Central Lab, Bhubaneswar	23 rd – 27 th September, 2019	Training Programme on "Analysis of Pesticides & Other Organic Chemicals in Environmental Samples"	CSIR-IITR, Lucknow, Uttar Pradesh sponsored by CPCB	CSIR-IITR, Lucknow, Uttar Pradesh
20	Dr. A. K. Swar, Chief Env. Engineer	24 th – 26 th September, 2019	International Environmental Monitoring Event – CEM India Conference 2019	Energy Policy Institute at the University of Chicago (EPIC), New Delhi	New Delhi
21	Dr. A. K. Mallick, Env. Scientist, Regional Officer, Angul	24 th – 26 th September, 2019	International Environmental Monitoring Event – CEM India Conference 2019	Energy Policy Institute at the University of Chicago (EPIC), New Delhi	New Delhi
22	H. N. Nayak, Env. Scientist, Regional Officer, Rourkela	24 th – 26 th September, 2019	International Environmental Monitoring Event – CEM India Conference 2019	Energy Policy Institute at the University of Chicago (EPIC), New Delhi	New Delhi
23	Er. Subhadarshini Das, Env. Engineer	14 th – 18 th October, 2019	Training Programme on "Air Quality Monitoring (Ambient & Source) and CAAQM"	ICMR-Regional Occupational Health Centres(S), Bengaluru sponsored by CPCB	Regional Occupational Health Centre (ICMR), Bengaluru

Sl. No.	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
24	Er. Babita Singh, Env. Engineer, Regional Office, Rourkela	14 th – 18 th October, 2019	Training Programme on “Air Quality Monitoring (Ambient & Source) and CAAQM”	ICMR-Regional Occupational Health Centres(S), Bengaluru sponsored by CPCB	Regional Occupational Health Centre (ICMR), Bengaluru
25	Manoranjan Pradhan, SSA, Regional Office, Sambalpur	14 th – 18 th October, 2019	Training Programme on “Monitoring of PM _{2.5} and Other Notified Air Pollutants as per revised NAAQS, 2009”	CSIR-Indian Institute of Toxicology Research Lucknow, Lucknow, Uttar Pradesh sponsored by CPCB	CSIR-Indian Institute of Toxicology Research Lucknow, Lucknow, Uttar Pradesh
26	Er. P. K. Behera, Regional Officer, Kalinganagar	14 th – 18 th October, 2019	Training Programme on “Effective Management of Hazardous Waste Including E-waste-Co-Processing and Co-Incineration-Hazardous Waste Rules & Field Visits”	International Institute of Waste Management (IIWM), Bengaluru sponsored by CPCB	International Institute of Waste Management (IIWM), Bengaluru
27	Er. B. K. Sethi, Env. Engineer	14 th – 18 th October, 2019	Training Programme on “Effective Management of Hazardous Waste Including E-waste-Co-Processing and Co-Incineration-Hazardous Waste Rules & Field Visits”	International Institute of Waste Management (IIWM), Bengaluru sponsored by CPCB	International Institute of Waste Management (IIWM), Bengaluru
28	Er. R. Priyadarshini, Env. Engineer, Regional Office, Cuttack	21 st – 23 rd October, 2019	Training Programme on “Noise Pollution, Measurement, Regulation & Implementation”	ICMR-Regional Occupational Health Centres(S), Bengaluru sponsored by CPCB	Regional Occupational Health Centre (ICMR), Bengaluru
29	Ms. Anusha Ekka, Asst. Env. Scientist, Regional Office, Jharsuguda	21 st – 23 rd October, 2019	Training Programme on “Noise Pollution, Measurement, Regulation & Implementation”	ICMR-Regional Occupational Health Centres(S), Bengaluru sponsored by CPCB	Regional Occupational Health Centre (ICMR), Bengaluru
30	Er. Narottam Behera, Env. Engineer, Regional Office, Bhubaneswar	11 th – 15 th November, 2019	Training Programme on “Occupational Health & Safety Management System (OHSMS) 18001: 2007 - Audit Training”	National Institute of Occupational Health, Ahmedabad sponsored by CPCB	NIOH, Ahmedabad
31	Er. Twinkle Mohanty, Asst. Env. Engineer, Regional Office, Paradeep	11 th – 15 th November, 2019	Training Programme on “Occupational Health & Safety Management System (OHSMS) 18001: 2007 - Audit Training”	National Institute of Occupational Health, Ahmedabad sponsored by CPCB	NIOH, Ahmedabad
32	Er. R. K. Mohanty, Asst. Env. Engineer, Regional Office, Angul	18 th – 22 nd November, 2019	Training Programme on “Integrated Waste Management – Municipal Waste, Plastic Waste, Bio-Medical Waste, Bio Composting, Landfill Gas Management & Control and Waste to Energy with Field Visit”	Engineering Staff College of India, Hyderabad sponsored by CPCB	Engineering Staff College of India, Hyderabad

Sl. No.	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
33	Er. C. S. Chauhan, Asst. Env. Engineer, Regional Office, Angul	18 th – 22 nd November, 2019	Training Programme on “Integrated Waste Management – Municipal Waste, Plastic Waste, Bio-Medical Waste, Bio Composting, Landfill Gas Management & Control and Waste to Energy with Field Visit”	Engineering Staff College of India, Hyderabad sponsored by CPCB	Engineering Staff College of India, Hyderabad
34	Er. P. C. Rauta, Sr. Env. Engineer	20 th – 22 nd November, 2019	Training Programme on “Identification and Assessment of Contaminated Sites”	The Energy and Resources Institute (TERI), New Delhi sponsored by CPCB	TERI-Retreat, Gurugram, Haryana
35	Er. Deepesh Biswal, Asst. Env. Engineer	20 th – 22 nd November, 2019	Training Programme on “Identification and Assessment of Contaminated Sites”	The Energy and Resources Institute (TERI), New Delhi sponsored by CPCB	TERI-Retreat, Gurugram, Haryana
36	Dr. A. K. Swar, Chief Env. Engineer (C) (Panel Discussion & Presentation)	21 st – 23 rd November, 2019	Training Programme on “Capacity Building & Awareness Programme on Aluminium”	Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDC), Nagpur	Hotel Mayfair, Bhubaneswar
37	Er. R. N. Prusty, Sr. Env. Engineer (L-I)	21 st – 23 rd November, 2019	Training Programme on “Capacity Building & Awareness Programme”	Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDC), Nagpur	Hotel Mayfair, Bhubaneswar
38	Dr. Anup Kumar Mallick, Regional Officer, Angul	4 th – 6 th December, 2019	Training Programme on “Indoor & Outdoor Air Pollution, Standards and Impact on Human Health – Case Studies”	Postgraduate Institute of Medical Education & Research, Chandigarh sponsored by CPCB	PGIMER, Chandigarh
39	Dr. Sohan Giri, Regional Officer, Cuttack	4 th – 6 th December, 2019	Training Programme on “Indoor & Outdoor Air Pollution, Standards and Impact on Human Health – Case Studies”	Postgraduate Institute of Medical Education & Research, Chandigarh sponsored by CPCB	PGIMER, Chandigarh
40	Dr. C. P. Das, Env. Scientist	9 th – 11 th December, 2019	Training Programme on “Global Warming, Climate Change and Disaster Management – Future Perspective”	TERI School of Advanced Studies, New Delhi sponsored by CPCB	TERI School of Advanced Studies, New Delhi
41	Er. Soumendra Mohanty, Asst. Env. Engineer, Regional Office, Angul	9 th – 11 th December, 2019	Training Programme on “Global Warming, Climate Change and Disaster Management – Future Perspective”	TERI School of Advanced Studies, New Delhi sponsored by CPCB	TERI School of Advanced Studies, New Delhi
42	Er. B. K. Bhoi, Asst. Env. Engineer, Regional Office, Rourkela	9 th – 11 th December, 2019	Training Programme on “Sampling and Analysis of Hazardous and other Wastes listed under HOWM Rules, 2016”	SGGSI&T, Nanded, Maharashtra sponsored by CPCB	Shri Guru Gobind Singhji Institute of Engineering & Technology, Nanded, Maharashtra

Sl. No.	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
43	Er. D. K. Sahoo, Asst. Env. Engineer, Regional Office, Rourkela	9 th – 11 th December, 2019	Training Programme on “Sampling and Analysis of Hazardous and other Wastes listed under HOWM Rules, 2016”	SGGSI&T, Nanded, Maharashtra sponsored by CPCB	Shri Guru Gobind Singhji Institute of Engineering & Technology, Nanded, Maharashtra
44	Er. Simanchal Dash, Sr. Env. Engineer(L-I)	11 th – 13 th December, 2019	Training Programme on “Air Quality Modelling and Source Apportionment”	The Energy and Resources Institute (TERI), New Delhi sponsored by CPCB	TERI-Retreat, Gurugram, Haryana
45	Er. D. K. Dash, Regional Officer, SPC Board, Sambalpur	12 th - 14 th December, 2019	2 nd International Conference on Processing and Characterization of Materials	National Institute of Technology, Rourkela sponsored by CPCB	National Institute of Technology, Rourkela
46	Er. D. Sethi, Dy. Env. Engineer, Regional Office, Berhampur	January, 2020	Training Programme on “Carbon Sequestration Estimation and Nitrogen Footprint Assessment”	Indian Institute of Technology, Roorkee sponsored by CPCB	Indian Institute of Technology, Roorkee
47	Dr. P. K. Mohapatra, Regional Officer, Balasore	13 th - 17 th , January, 2020	Training Programme on “Environmental Management in Tanneries, Sponge Iron Plants, Slaughter Houses, Pharma and Chemical Sector”	Indian Institute of Technology Roorkee sponsored by CPCB	Indian Institute of Technology, Roorkee
48	Er. S. Marandi, Asst. Env. Engineer, Regional Office, Balasore	20 th – 24 th January, 2020	Training Programme on “Cleaner Technologies & Waste Minimization for Prevention of Industrial Pollution and Four R’s – Reduce, Reuse, Recycle and Recover – Case Studies”	National Sugar Institute (NSI), Kanpur sponsored by CPCB	National Sugar Institute (NSI), Kanpur
49	Dr. (Mrs.) U. R. Pattnaik, Env. Scientist, Central Laboratory	30 th January, 2020	Workshop on “Restoration of Polluted Water Bodies”	Central Pollution Control Board, Delhi	Indian Habitat Centre (IHC), Delhi
50	Er. Biswakanta Pradhan. Asst. Env. Engineer, Regional Office, Sambalpur	3 rd – 7 th February, 2020	Training Programme on “Environmental Data Interpretation, Compilation, Analysis, Presentation and Reporting-Hands-on Training and Case Study”	Indian Statistical Institute (ISI), Delhi sponsored by CPCB	Indian Statistical Institute (ISI), Delhi
51	Er. R. N. Prusty, Sr. Env. Engineer(L-I)	3 rd – 7 th February, 2020	Training Programme on “Environmental Legislations, Interpretation, Enforcement, Legal and Statutory Requirements – Case Studies”	National Law School of India University (NLSIU), Bangalore sponsored by CPCB	National Law School of India University (NLSIU), Bangalore
52	Shri B. P. Pattajoshi, Sr. Law Officer	3 rd – 7 th February, 2020	Training Programme on “Environmental Legislations, Interpretation, Enforcement, Legal and Statutory Requirements – Case Studies”	National Law School of India University (NLSIU), Bangalore sponsored by CPCB	National Law School of India University (NLSIU), Bangalore

Sl. No.	Name (Sh/Shri) & Designation	Date	Title of the Training / Workshop / Seminar	Conducted by	Venue
53	Er. Maheswar Behera, Asst. Env. Engineer, Regional Office, Berhampur	13 th – 14 th February, 2020	Training Programme on “Inspection and Monitoring of Brick Kilns” scheduled to be held during at CSE, New Delhi	Centre for Science and Environment, New Delhi	Centre for Science and Environment, New Delhi
54	Er. Sandhyayani Marandi, Asst. Env. Engineer, Regional Office, Balasore	13 th – 14 th February, 2020	Training Programme on “Inspection and Monitoring of Brick Kilns” scheduled to be held during at CSE, New Delhi	Centre for Science and Environment, New Delhi	Centre for Science and Environment, New Delhi
55	Dr. P. K. Mohapatra, Regional Officer, Balasore	25 th – 28 th February, 2020	Training Programme on “Urban Air Quality Management : Understanding and Preparing Industry-Specific Action Plans”	Centre for Science and Environment, New Delhi	Anil Agarwal Environment Training Institute (AAETI), Nimli, Alwar, Rajasthan
56	Er. C. S. Chauhan, Asst. Env. Engineer, Regional Office, Angul	25 th – 28 th February, 2020	Training Programme on “Urban Air Quality Management : Understanding and Preparing Industry-Specific Action Plans”	Centre for Science and Environment, New Delhi	Anil Agarwal Environment Training Institute (AAETI), Nimli, Alwar, Rajasthan
57	Shri Ashok Kumar Bhoi, AES, Regional Office, Rayagada	24 th – 28 th February, 2020	Training Programme on “Water Quality Monitoring of Surface, Ground, Wastewater / Effluents, Data Interpretation and Quality Assurance	Central Pulp & Paper Research Institute (CPPRI), Saharanpur sponsored by CPCB	Central Pulp & Paper Research Institute (CPPRI), Saharanpur
58	Er. D. L. Mohapatra, AEE, Regional Office, Keonjhar	24 th – 28 th February, 2020	Training Programme on “Water Quality Monitoring of Surface, Ground, Wastewater / Effluents, Data Interpretation and Quality Assurance	Central Pulp & Paper Research Institute (CPPRI), Saharanpur sponsored by CPCB	Central Pulp & Paper Research Institute (CPPRI), Saharanpur
59	Mrs. Sumitra Nayak, Asst. Env. Scientist, ICZMP	28 th February - 1 st March, 2020	National Conference on “Coastal Ocean-Atmosphere Science & Technology (COAST-2020)”	Berhampur University, Bhanjabihar, Berhampur-760007 & SPCB, Odisha	Berhampur University, Bhanjabihar, Berhampur-760007
60	Mrs. Sangeeta Mishra, Asst. Env. Scientist, ICZMP	28 th February - 1 st March, 2020	National Conference on “Coastal Ocean-Atmosphere Science & Technology (COAST-2020)”	Berhampur University, Bhanjabihar, Berhampur-760007 & SPCB, Odisha	Berhampur University, Bhanjabihar, Berhampur-760007

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

Sl. No.	Training Programme	Duration	Venue	Organised / Sponsored by
1	Air Quality Action Plan (AQAP) for six Non-attainment cities (Angul, Balasore, Bhubaneswar, Cuttack, Rourkela & Talcher) in Odisha	04-06-2019	Hotel Crown, Bhubaneswar	Centre for Science and Environment (CSE), Delhi in association with Forest and Environment Department, Govt. of Odisha, and State Pollution Control Board, Odisha

Sl. No.	Training Programme	Duration	Venue	Organised / Sponsored by
2	National Conclave on Climate Change and Water	19 th – 20 th October, 2019	Bhubaneswar	Indian Chambers of Commerce and Industry Federation House, New Delhi & SPC Board, Odisha
3	9 th International Conference on Sustainable Waste Management towards Circular Economy (Icon-SWM-CE)	27 th – 30 th November, 2019	KIIT University, Bhubaneswar	KIIT University, Bhubaneswar, Jadavpur University, WB and State Pollution Control Board, Odisha
4	2 nd International Conference on Processing and Characterization of Materials	12 th – 14 th December, 2019	NIT, Rourkela	NIT, Rourkela and State Pollution Control Board, Odisha
5	Innovation in Waste Management in Smart Cities (IWSC-2019)	17 th – 21 st December, 2019	Gandhi Institute for Technology (GIFT), Bhubaneswar	Gandhi Institute for Technology (GIFT), Bhubaneswar & SPC Board, Odisha
6	Conference on Cost Effective Improvement in Existing Pollution Control & Waste Management Systems in Odisha Industry	19 th – 20 th December, 2019	Hotel Swosti, Bhubaneswar	Indian Chambers of Commerce and Industry Federation House, New Delhi & SPC Board, Odisha
7	One day workshop on “Pollution Control in Iron & Steel Industry – Digital Transformation with the power of IoT”	8 th January, 2020	Hotel Swosti Premium, Bhubaneswar	Biju Patnaik National Steel Institute (BPNSI), Odisha & SPC Board, Odisha
8	Conference on “Water Infrastructure for Urban Areas & Industries”	13 th -14 th February, 2020	KIIT Convention Centre, Bhubaneswar	Consulting Engineers Association of India, CEAI Centre, OCF Plot No.2, Pocket-9, Sector-B, Vasanta Kunj, New Delhi & SPC Board, Odisha
9	National Conference on “Climate Change Initiatives” – Impacts, Resilience & Adaptations for Sustainable Resource Utilization	29 th February, 2020	Hotel Swosti Premium, Bhubaneswar	Indian Chamber of Commerce (ICC) Odisha State Council, BDA-HIG 23, In Front of Pal Heights, Behind Aditya Birla, Jayadev Vihar, Bhubaneswar

8.8 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	Mr. Sabyasachi Behera M.Sc.	Dept. of Ecology & Environment Sciences, Pondichery University, R. V. Nagar, Kalapet, Puducherry	02.12.2019 to 28.02.2020	Shri Anupam Behera, Sr. Env. Scientist, Central Laboratory
2	Miss Sugyanee Kuanr (Roll No.051901008)	Birla School of Law, Birla Global University, IDCO Plot No.2, Institutional Area, Gothapana, Bhubaneswar	05.12.2019 to 26.12.2019	Shri B. P. Pattajoshi, Sr. Law Officer
3	Shri Pradosh Mahapatra (Roll No.051901021)	Birla School of Law, Birla Global University, IDCO Plot No.2, Institutional Area, Gothapana, Bhubaneswar	05.12.2019 to 26.12.2019	Shri B. P. Pattajoshi, Sr. Law Officer
4	Miss Loni Lipsa Sahoo (Roll No.051901044)	Birla School of Law, Birla Global University, IDCO Plot No.2, Institutional Area, Gothapana, Bhubaneswar	05.12.2019 to 26.12.2019	Shri B. P. Pattajoshi, Sr. Law Officer
5	Miss Simran Samal (Roll No.051901045)	Birla School of Law, Birla Global University, IDCO Plot No.2, Institutional Area, Gothapana, Bhubaneswar	05.12.2019 to 26.12.2019	Shri B. P. Pattajoshi, Sr. Law Officer
6	Shri Amruta Padhi (Roll No.051901052)	Birla School of Law, Birla Global University, IDCO Plot No.2, Institutional Area, Gothapana, Bhubaneswar	05.12.2019 to 26.12.2019	Shri B. P. Pattajoshi, Sr. Law Officer

Sl. No.	Name of the Students	Name of the Educational Institutions	Duration of the Internship	Internship Taken Under
7	Miss Subhashree Priyadarshini, M. Sc.	Dept. of Ecology & Environment Sciences, Pondichery University, R. V. Nagar, Kalapet, Puducherry	15.12.2019 to 31.03.2020	Shri Anupam Behera, Sr. Env. Scientist, Central Laboratory
8	Shri Bhubhudatta Behera	M. Sc. Environmental Sciences (Env. Technology), Banaras Hindu University (BHU), Ajagara, Varanasi, Uttar Pradesh-221005	January to April, 2020	Dr. N. R. Sahoo, Chief Env. Engineer
9	Ms. B. M. Subhalaxmi Roll No.18ENV.Sc 012	M. Sc. Course in Env. Science, PG Department of Botany, Utkal University, Vani Vihar, Bhubaneswar	January to April, 2020	Dr. S. K. Mohanty, Env. Scientist, Central Laboratory
10	Ms. Subhashree Subhadarsinee Bal, Roll No.18ENV.Sc 015	M. Sc. Course in Env. Science, PG Department of Botany, Utkal University, Vani Vihar, Bhubaneswar	January to April, 2020	Dr. S. K. Mohanty, Env. Scientist, Central Laboratory
11	Ms. Saheba Khanam Roll No.180705270001	School of Applied Sciences, Centurion University of Technology and Management, Bhubaneswar	January, 2020	Dr. S. K. Mohanty, Env. Scientist, Central Laboratory
12	Ms. Pallabi Bal Roll No.180705270002	School of Applied Sciences, Centurion University of Technology and Management, Bhubaneswar	January, 2020	Dr. S. K. Mohanty, Env. Scientist, Central Laboratory
13	Ms. Komal Panch, M. Sc.	Department of Ecology and Environmental Sciences, Pondichery University, Puduchery	January to March, 2020	Mrs. Sumitra Nayak, AES, ICZMP, SPC Board, Odisha

8.9 OTHER ACTIVITIES

8.9.1. Training on Pollution Control and Environmental Protection

Workshop on “Can Citizen engagement contribute towards cleaner air in Non-attainment cities” organised by the Board with EPIC India on 12.03.2020 at NOCCI Residency, Balasore involving local college students.

8.9.2 Human Resource Development

- The Board has conducted various programmes through the Centre for Excellence for imparting training to various stakeholders on pollution control and environment protection and also deputed its officials on exposure training and to acquire knowledge in the above field.
- Imparted training on “Ambient air quality monitoring” to 65 B.Sc Nursing (Hons) students and 33 numbers of MBBS students of All India Institute of Medical Science, Bhubaneswar.
- Imparted training on “Prevention & control of Vehicular Pollution” to 309 numbers of traffic personnel at Traffic Training Institute, Bhubaneswar.
- The Board in association with Centre for Science and Environment (CSE), Delhi and Forest and Environment Govt. of Odisha had organized a stake holder workshop in Air Quality Action Plan (AQAP) for 6 non attainment cities (Angul, Balasore, Bhubaneswar, Cuttack, Rourkela and Talcher) in Odisha on 4th June, 2019.
- Board officials were deputed as resource persons in three different training programmes such as “Environment Impact Assessment”, “ETP/STP operation and maintenance” and “Waste Management” under “Green Skill Development Programme (GSDP)” organized by Centre for Environmental Studies (CES). In each training programme 60 participants in three different batches

were given demonstration and hands-on training for sampling and analysis of water, wastewater, ambient air monitoring & analysis, soil and hazardous waste sampling & analysis.



8.9.3 Observation of Important Days

- ❖ World Environment Day
- ❖ Observation of World Environment Day by Regional Offices of SPCB

The State Pollution Control Board, Odisha observed World Environment Day on 5th June, 2019 through 12 Regional Offices. The theme of the World Environment Day for the year 2019 was **“Beat Air Pollution”**. In this context, several programmes such as plantations, organizing debate / quiz/ rally / seminar /painting competitions followed by distribution of prizes, beach clean-up activities involving public /industries/ Govt. sectors /NGOs /students of schools & colleges were conducted by all the Regional Offices of State Pollution Control Board to create awareness for protection of environment.

WORLD ENVIRONMENT DAY OBSERVATION BY REGIONAL OFFICES



RAYAGADA



BERHAMPUR



ROURKELA



KEONJHAR



BHUBANESWAR



KALINGANAGAR



PARADEEP



BALASORE



ANGUL



SAMBALPUR



CUTTACK



JHARSUGUDA

❖ Observation of the World Environment Day in Partnership with EPIC-India

- On the occasion of World Environment Day, 2019 a State level awareness workshop was organized by SPC Board, Odisha in partnership with Energy Policy Institute at the University of Chicago (EPIC India) at Odisha Maritime Museum, Cuttack involving academicians, doctors, researchers, students, civil society and the intelligentsia of Cuttack with two broader aspects of Air Pollution in the cities of Odisha. First objective was to make aware about the current status of pollution in the city and its impacts on health and day to day life. The second objective was to create awareness about the public disclosure programs like Star Rating of Industries and to convince the public about how increased citizen engagement can be a key in achieving cleaner air goal not only for the city but also for the entire state of Odisha.
- Cuttack is one of the six 'non-attainment' cities in Odisha out of the 102 cities in the country that have failed to maintain the National Ambient Air Quality Standards fixed by the Central Pollution Control Board. University of Chicago's Air Quality Life Index suggests that residents in Cuttack could live 2.7 years longer if the city had met WHO air quality standards. Along with the Chowdwar- Jagatpur industrial belt in its periphery, the oldest city of Odisha is also one of the cities facing vehicular air pollution in the State.
- More than 70 participants were part of the World Environment Day Awareness Workshop with a theme **"To Counter Air Pollution, We Need to Know it First"** Prof. Dr. Ishan Kumar Patro, Vice Chancellor, Ravenshaw University delivered the opening speech on "Air Pollution and Cuttack- From an academicians' point of View". Dr. Prafulla Kumar Das, Professor and Head of Dept. Acharya Harihar Regional Cancer Centre, Cuttack made an info-graphic presentation on "Harmful Impacts of Particulate Matter Emission on Human Health". Prof. Mrinal Chatterjee, Director IIMC, Dhenkanal delivered his speech on 'Pollution is not a myth'. Dr. Bibekananda Bhol, Chief Environmental Scientist, SPCB Odisha talked on "Ambient Air Pollution in cities of Odisha". Dr. Akhila Kumar Swar, Chief Environmental Engineer, SPCB Odisha gave a talk on "Air Pollution is a mighty challenge, but can be handled- Measurement and Mitigation". Mr. Vaibhav Chowdhary, Senior Associate Director (Strategy & Operations), EPIC-India talked about "Public Disclosure- A game changer tool to tackle air pollution".

The participants interacted with the experts on different aspects of air pollution, how public disclosure can be helpful in better environmental performance and about different initiatives of State Pollution Control Board, Odisha to counter air pollution.

❖ 36th Foundation Day of SPC Board

State Pollution Control Board, Odisha observed its 36th Foundation Day on 18th September, 2019 at Jayadev Bhawan, Bhubaneswar. Sri Bikram Keshari Arukha, Cabinet Minister, Forest & Environment, Parliamentary Affairs, Govt. of Odisha graced the occasion as Chief Guest. Dr. Mona Sharma, IAS, Principal Secretary, F & E Department, Govt. of Odisha and Dr. K Murugesan, IFS, Director Environment-cum-Special Secretary to Govt., F & E Department, Govt. of Odisha were the Guests of Honour. Sri D. Biswal, IFS, Member Secretary, State Pollution Control Board, Odisha delivered the key note address on the occasion. Prof. Binaya K Dutta, Former Chairman of West Bengal Pollution Control Board and Visiting Professor, School of Environmental Science and Engineering, IIT, Kharagpur, West Bengal delivered Prof. M. K. Rout Memorial Lecture on **"Remediation of Contaminated Soil"** on the occasion. Distinguished guests from various sectors like Government, Industries, Officers & Staff from Regional Offices & Head Office of the Board attended the function.



SHRI BIKKRAM KESHARI ARUKHA, HON'BLE MINISTER, FOREST & ENVIRONMENT, PARLIAMENTARY AFFAIRS DELIVERING HIS ADDRESS DURING 36TH FOUNDATION DAY



PROF. BINAYA KUMAR DUTTA, FORMER CHAIRMAN, WEST BENGAL POLLUTION CONTROL BOARD DELIVERING PROF. M.K. ROUT MEMORIAL LECTURE

The Newsletter 'Paribesh Samachar' (April – June 2019) and a book entitled “**Status and Trends of Coastal Parameters 2013-2018 Paradeep-Gahirmatha-Dhamra Coastal Environment**”, published by ICZMP, SPCB were released on the occasion.



RELEASE OF NEWSLETTER OF THE STATE POLLUTION CONTROL BOARD, ODISHA “PARIBESH SAMACHAR” (APRIL-JUNE, 2019)



RELEASE OF BOOK ON “STATUS AND TRENDS OF COASTAL PARAMETERS 2013-2018 PARADEEP- GAHIRMATHA - DHAMRA COASTAL ENVIRONMENT”

The Board has instituted pollution control excellence/appreciation awards to encourage the industries/ mines / health care units for adoption of adequate pollution control measures. The list of awardees for this year is as follows:

1. Industries Caegory:

Pollution Control Excellence Award - M/s. J. K Paper Limited, At/PO: Jaykaypur, Dist : Rayagada.

Pollution Control Appreciation Award - M/s. GMR Kamalanga Energy Limited, At/PO; Kamalanga, Dist : Dhenkanal..

2. Mines Category:

Pollution Control Appreciation Award - M/s. Sukinda Chromite Mines of IMFA, Kaliapani, Sukinda, Dist : Jajpur.

3. Health Care Unit Category :

Pollution Control Appreciation Award - Sardar Vallabhbhai Patel Post Graduate Institute of Paediatrics, At: Sishubhawan, Dist : Cuttack.

POLLUTION CONTROL EXCELLENCE AWARD AND APPRECIATION AWARD IN INDUSTRIES CATEGORIES



**M/S. J. K. PAPER LTD.,
AT/PO-JAYKAYPUR, DIST: RAYAGADA**



**M/S. GMR KAMALANGA ENERGY LTD.,
AT: KAMALANGA, MERAMANDALI,
DIST: DHENKANAL**

POLLUTION CONTROL APPRECIATION AWARD IN MINES AND HEALTH CARE UNIT



**M/S. SUKINDA CHROMITE MINES OF
M/S IMFA, KALIAPANI, SUKINDA,
DIST: JAJPUR**



**M/S. SARDAR VALLABHBHAI PATEL POST
GRADUATE INSTITUTE OF PAEDIATRICS,
SISHU BHAWAN, DIST: CUTTACK**

❖ International Coastal Clean-up Day

The International Coastal Clean-up Day, 2019 was observed by the Board on the Sea Beach of Puri, Konark, Chandipur, Gopalpur & Paradeep on 21st September 2019 for creation of mass awareness on the protection and management of coastal environment involving District Administration, NGOs, volunteers and public etc.

OBSERVATION OF INTERNATIONAL COASTAL CLEAN-UP DAY



Puri Sea Beach



Konark Sea Beach



Gopalpur Sea Beach



Paradeep Sea Beach



Chandipur Sea Beach

❖ **World Ozone Day**

The World Ozone Day was observed by the Board through Regional Offices on 16th September 2019 involving stake holders of different industries, NGOs and students from different Institutes to spread awareness on depletion of Ozone layer with this year’s theme “ **32 years and healing**“ by conducting meetings, workshops etc.

OBSERVATION OF WORLD OZONE DAY BY REGIONAL OFFICES, SPC BOARD



BERHAMPUR



SAMBALPUR



KEONJHAR



JHARSUGUDA



PARADEEP



KALINGANAGAR



ROURKELA



ANGUL

❖ National Pollution Prevention Day

The National Pollution Prevention Day was observed by the Regional Offices on 2nd December, 2019 by conducting mass rally, meeting and workshop etc. involving students from different institutions, NGOs and volunteers.

8.10 AWARENESS ACTIVITIES

- For creation of awareness amongst general public, the Board regularly publishes advertisements relating to environmental issues in different periodicals / newspapers / souvenirs.
- The Board observed the World Environment Day on 5th June' 2019 through 12 Regional Offices to create awareness on environmental protection. Messages on protection of environment were given to the public through meetings, mass campaign, paintings, debates & plantations etc.
- The 36th Foundation Day of the Board was observed on 18th Sept, 2019 at Jaydev Bhawan, Bhubaneswar followed by release of newsletters and books. Prof. Binay Kumar Dutta, Former Chairman of West Bengal Pollution Control Board and Visiting Professor, School of Environmental Science and Engineering, IIT Kharagpur delivered Prof. M.K. Rout Memorial Lecture on **“Remediation of Contaminated Soil”**.
- The International Coastal Clean-up Day was observed by the Board on the Sea Beaches of Puri, Konark, Chandipur, Gopalpur & Paradeep on 21st Sept, 2019 for creation of mass awareness on protection and management of environment involving District Administration, different NGOs & Volunteers.
- The World Ozone Day was observed by the Board through Regional Offices on 16th September, 2019 involving stake holders of different industries, NGOs and students from different Institutes to spread awareness on depletion of Ozone layer.
- During Deepawali festival awareness campaign was organized in & around Bhubaneswar and Cuttack for creating awareness among the public on effect of crackers on air pollution & noise pollution.
- An awareness program was conducted during first week of December, 2019 on method of control of air pollution in Non-attainment city, Cuttack.
- Out of 7 non-attainment cities (Angul, Balasore, Bhubaneswar, Cuttack, Kalinga Nagar, Rourkela and Talcher) in Odisha, State Pollution Control Board Odisha in association with Energy Policy Institute at the University of Chicago organized 4 citizen engagement workshops at 4 non-attainment cities such as Angul, Balasore, Kalinga Nagar and Rourkela under National Clean Air Program (NCAP).



Awareness workshop at Angul



Awareness workshop at Kalinganagar



Awareness workshop at Rourkela



Awareness workshop at Balasore

- An awareness workshop titled “Air Pollution in Non-attainment Cities” was conducted by Regional Office, SPC Board, Kalinga Nagar on 03.03.2020 at KNDA Mandap, Jajpur Road, Jajpur in collaboration with the Energy Policy Institute at University of Chicago.
- An awareness programme on “Plastic Waste Clean and Green Drive” was organized by Regional Office, SPC Board, Keonjhar on 17.10.2019 to spread the message “Say no to Plastic”.
- Regional Office, SPC Board, Jharsuguda conducted Plastic Waste Free Campaign on 02.10.2019 to create public awareness on Plastic Waste Management.

8.11 PUBLICATIONS

The Board has published the following Book & Reports during April, 2019 to March, 2020.

- » Newsletters “Paribesh Samachar” i.e. (April-June, 2019, July – September, 2019, October-December, 2019).
- » Book on “**Status and Trends of coastal parameters 2013-2018**” by ICZMP, SPCB, Odisha was released during 36th Foundation Day of SPCB on 18th September, 2019 at Rabindra Mandap.

8.12 EMPANELLED ENVIRONMENTAL CONSULTANTS

In the year 2019-20, total 16 nos. of consultants were empanelled as environmental consultant with the Board. Out of these 16 consultants, 09 consultants were empanelled under ‘A’ Category and 07 consultants under ‘B’ category. The name and address of these consultants, category under which they have been empanelled and validity period of their empanelment certificate are given in Table-8.7.

Table-8.7 Status of Environmental Consultants for the Year 2019-20

Category-A

Sl. no	Name of the Consultant	Category	Validity Period
1	M/s Kalyani Laboratories Pvt. Ltd Plot No-78/944, Near Nissan Show Room Baliana, Pahala, Bhubaneswar-752101 Phone – 06742460891/9437306091 E-mail – kalyanilab@yahoo.co.in	A	09.04.2019 to 08.04.2022
2	M/s Vardan Envirolab Samaspur, Opposite Amity School Sector-51, Gurgaon-122001, Haryana Phone –0124-4291036 E-mail –lab@vardanenvironet.com	A	09.05.2019 to 08.05.2022

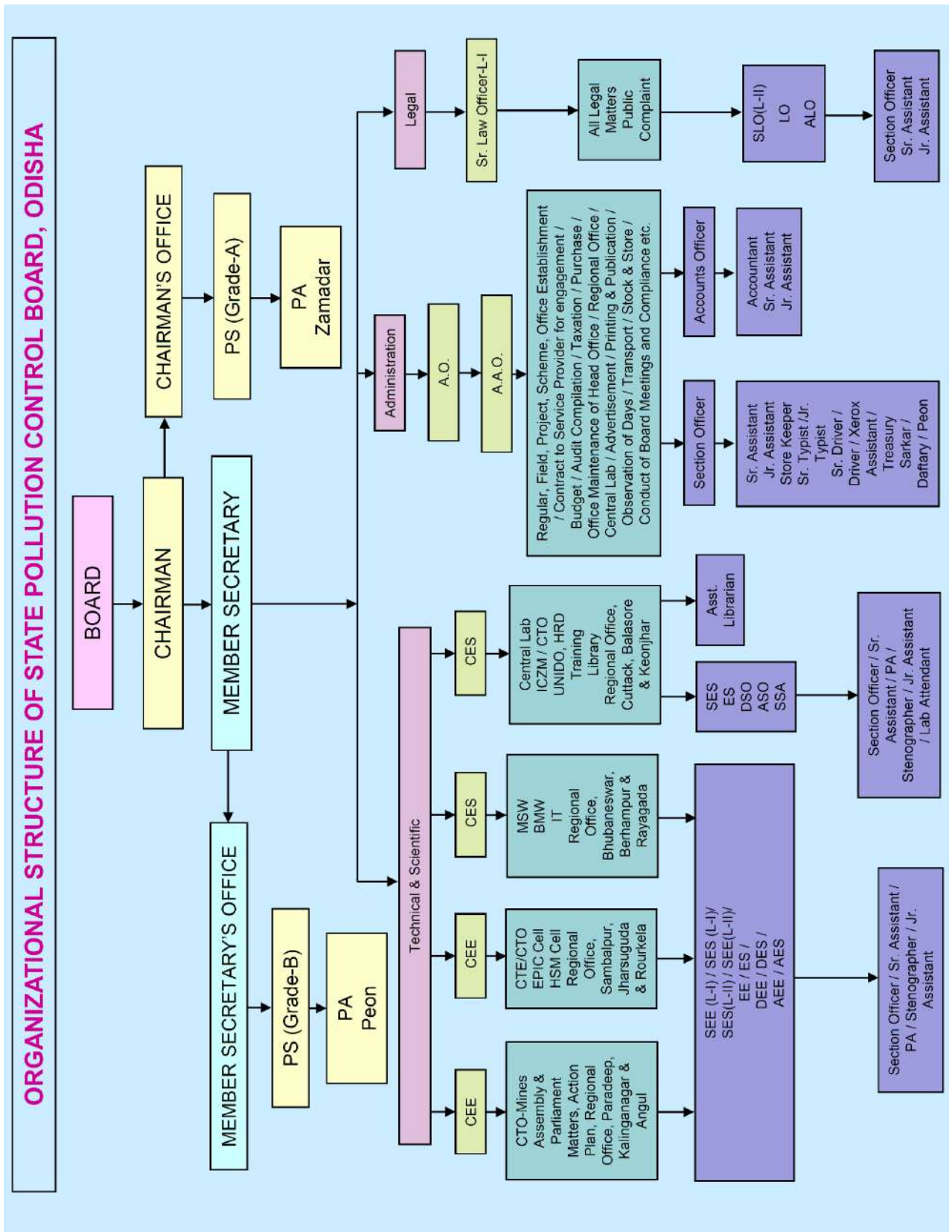
Sl. no	Name of the Consultant	Category	Validity Period
3	M/s R.V.Briggs & CO. Private Ltd 8-9, Bentinck Street, 1 st Floor Taher Mansion, Kolkata -700001 E-mail – rvbriggs.kolkata@gmail.com Phone – 2248-3661/7803	A	05.07.2019 to 04.07.2022
4	M/s Pollution and Project Consultants P-145, Bangur Avenue Block-A, Kolkata-700055 E-mail – ppconsultants@awsppc.in Phone – 033-2574-3418	A	22.07.2019 To 21.07.2022
5	M/s ABC Techno Labs India Private Limited No-400, 13 th Street, SIDCO Industrial Estate North Phase Ambattur, Chennai-600098 Phone –044-26257788 E-mail –lab@abctechnolab.com	A	09.08.2019 to 08.08.2022
6	M/s Sophisticated Industrial Material Analytic Labs Pvt. Ltd A-3/7, Mayapuri Industrial Area, Phase-II New Delhi-110064 E-mail – qa@simalab.co.in Phone – 011-43854300	A	30.08.2019 to 29.08.2022
7	M/s Superintendence Company of India (P) Ltd Plot No-Y-23, Block-EP, Sector-V Salt Lake, Kolkata-700091 Phone – (033)2357-1492/4670/4671 E-mail –supind50@yahoo.co.in	A	27.12.2019 to 26.12.2022
8	M/s Ecomen Laboratories Pvt. Ltd. Flat No-5-8, 2 nd Floor Arif Chamber-V, Sector-H, Aliganj, Lucknow-226024 Phone – 0522-2746282 E-mail – ravi.bhargava@gmail.com	A	17.01.2020 to 16.01.2023
9	M/s Envomin Consultant Pvt. Ltd., Plot No- 3054/9625, Pandra Bhubaneswar – 751010 Phone – 06742394518 E-mail – envomin@yahoo.com	A	05.02.2020 to 04.02.2023

Category-B

Sl. no	Name of the Consultant	Category	Validity Period
1	M/s Trident Academy of Technology Envirotech Centre Plot No-F2/A, Chandaka Industrial Estate, InfocityArea, Chandrasekharapur, Bhubaneswar-751024 Phone-0674-6649003/6649008/6649036 E-mail – info@trident.ac.in	B	22.04.2019 to 21.04.2022
2	M/s. Biosphere Scientific Research Centre Flat-204, 2 nd Floor, Ratna Lifestyle Sikharchandi Nagar, Near KIIT Campus Patia, Bhubaneswar-751024 Phone – 9090980498 E-mail – bsrc.research@gmail.com	B	09.05.2019 to 08.05.2022
3	M/s Nature Care, Qtr No-05, Ekamra villa Nayapalli, Bhubaneswar-751015 E-mail:rb_panda07@rediffmail.com Phone-0674-2553314	B	21.09.2019 to 20.09.2022

Sl. no	Name of the Consultant	Category	Validity Period
4	M/s Indicative Consultant India HPL Link Road, Basudevapur Khanjanchak, Haladia Purba Medinipur-721602 <i>Phone No:- 03224-275765</i> <i>E-mail – indicativeconsultantindia@gmail.com</i>	B	<i>08.11.2019</i> <i>to</i> <i>07.11.2022</i>
5	M/s Good Earth Enviro Care S.D.Park, Kusumba PO-Narendrapur, Kolkata-700103 <i>Phone No:- 033-2434-1105/1107</i> <i>Email Id: -geec.debasish@gmail.com</i>	B	<i>08.01.2020</i> <i>to</i> <i>07.01.2023</i>
6	M/s N.D. International 17,Jnan Goswami Sarani, 107 B, Block-F, New Alipore, Kolkata -700053 Phone No:- 033-4021-6600 Email Id: -ndinternational@gmail.com	B	<i>08.01.2020</i> <i>to</i> <i>07.01.2023</i>
7	M/s Utkal Ecotech Private Ltd. Plot No-5F/786, Sector-9, CDA, Cuttack-753014 <i>Phone No:- 0671-2506210</i> <i>Email Id: -utkalecotech@gmail.com</i>	B	<i>24.02.2020</i> <i>to</i> <i>23.02.2023</i>

ANNEXURE-I



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:	
	Composite sampling/source/place upto 8 hrs.	1800.00
	-do- upto 16 hrs.	3500.00
	-do- upto 24 hrs.	5300.00
	For every additional composite sampling/same place but different source upto 8 hrs.	960.00
	-do- upto 16 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, Toluene, Xylene (BTX)	1800.00
4	Carbon Monoxide	1050.00
5	Chlorine	1050.00
6	Fluoride (gaseous)	1050.00
7	Fluoride (particulate)	1050.00
8	Hydrogen Chloride	1050.00
9	Hydrogen Sulphide	1050.00

Sl. No	Parameters (Air)	Analysis charges per sample in Rs.
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, Tellurium, Tin, Titanium, Tungsten, Vanadium, Ytterbium and Zinc	5300.00 Per filter paper
20	Water extractable ions in air particulate matter using Ion Chromatograph (IC) Processing / pretreatment charge per sample (filter paper) 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

Sl.No	Parameters	Analysis charges per sample in Rs.
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
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

Sl.No	Parameters	Analysis charges per sample in Rs.
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
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

Sl.No	Parameters	Analysis charges per sample in Rs.
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
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

Sl.No	Parameters	Analysis charges per sample in Rs.
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
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

Sl. No.	Parameters	Analysis charges per test in Rs.
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, 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	7000.00
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 Kjeldhal 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	1	1
2	Senior Environmental Scientist (L-I)	3	0	3
3	Senior Environmental Scientist (L-II)	3	3	0
4	Environmental Scientist	48	20	17
5	Deputy Environmental Scientist		4	
6	Assistant Environmental Scientist		7	
	Total	56	35	21
(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	13	13
11	Deputy Environmental Engineer		6	
12	Assistant Environmental Engineer		14	
	Total	54	41	13
(C)	Cadre of Laboratory Officials			
13	Assistant Scientific Officer	7	6	1
14	Senior Scientific Assistant	15	8	7
	Total	22	14	8
(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	7	1
19	Accountant	5	0	5
20	Senior Assistant	13	12	1
21	Junior Assistant	18	7	11
	Total	48	28	20
(E)	Legal Personnel Cadre			
22	Senior Law Officer (L-I)	1	1	0
23	Senior Law Officer (L-II)	1	1	0
24	Law Officer	1	0	1
25	Assistant Law Officer	1	0	1
	Total	4	2	2
(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

Sl. No.	Name of the Post	No. of Post Sanctioned	No. of Post filled up	Post lying vacant
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	Store Keeper	1	1	0
33	Sr. Typist	2	2	0
34	Jr. Typist	8	5	3
35	Head Driver	1	0	1
36	Sr. Driver	3	3	0
37	Driver	9	6	3
38	Record Supplier	1	1	0
39	Diarist	1	1	0
40	Xerox Asst.	1	1	0
41	Daftary	1	1	0
42	Lift Operator	1	1	0
43	Laboratory Attendant	10	8	2
44	Library Attendant	1	1	0
45	Tresury Sarkar	1	1	0
46	Zamadar	1	1	0
47	Peon	21	18	3
48	Watchman	2	2	0
49	Watchman-cum-Sweeper	5	3	2
	Sub-Total	71	57	14
GRAND TOTAL (A+B+C+D+E+F+G)		282	192	90



STATE POLLUTION CONTROL BOARD, ODISHA

A/118, NILAKANTHA NAGAR, UNIT - VIII

BHUBANESWAR