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Status of Water Quality in India-2008

CPCB

Monitoring of Indian Aquatic Resources Series:
MINARS/32/2009-10

STATUS OF WATER QUALITY IN INDIA- 2008

CENTRAL POLLUTION CONTROL BOARD
Ministry of Environment & Forests
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DECEMBER, 2009

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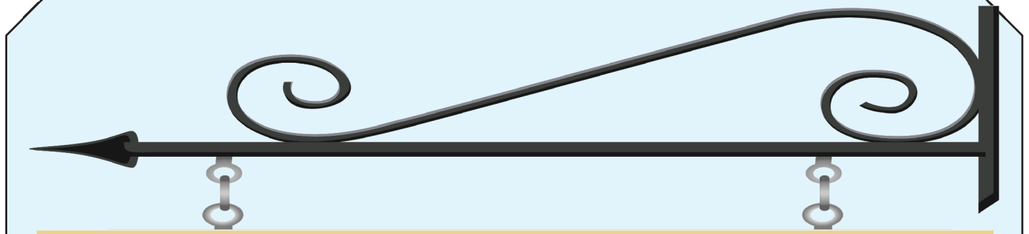

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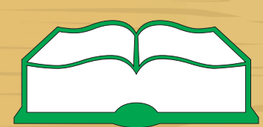

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FOREWORD

Monitoring of water quality of water bodies in the country lays/forms the basis of effective planning and execution of programme on water pollution control. Thus generated data helps in assessing the nature and magnitude of pollution level and consequently designing the abatement measures. Considering the above, CPCB envisaged a National Water Quality Monitoring Programme (NWQMP) with 1429 water quality monitoring stations, located on all important rivers, lakes including some wells for groundwater studies. The generated data is scrutinized, analysed and loaded on CPCB website.

The data collected during 2008 indicates that organic pollution, as indicated by Biochemical Oxygen Demand (BOD) and Coliform counts, continue to be the major water quality issues in our country. Out of 6000 observations, 67 % samples showed BOD and faecal coliform within the acceptable range of 3 mg/l and less than 500 MPN/ 100 ml respectively. Based on these results the polluted stretches are identified and restoration plans are conceived by the concerned State Pollution Control Boards / Pollution Control Committees.

The contribution of Ms. Sandhya Shrivastava, Ms. Shweta Gaur (Junior Research Fellows), Ms. Garima Dublish (Senior Research Fellow) and Shri R.M.Bhardwaj, Scientist,'C' in compilation of data and preparation of this Report under the supervision of Dr.D.D.Basu, Senior Scientist and Shri J.S. Kamyotra, Member Secretary is worthy of appreciation. The co-operation extended by State Pollution Control Boards, Pollution Control Committees and Zonal Offices of Central Pollution Control Board in this national endeavor is gratefully acknowledged.

Hopefully, this Report will be useful to all concerned with water quality management and its restoration to pristine purity.

December, 2009

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CONTENTS

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EXECUTIVE SUMMARY

The water quality data on rivers, lakes, ponds, tanks and groundwater locations being monitored under the network is evaluated against the water quality criteria and the monitoring locations in exceedence with respect to one or more parameters are identified as polluted and require action for restoration of water quality. The locations on rivers, lakes, ponds, tanks and groundwater not meeting the criteria are summarized briefly in this chapter.

The monitoring results obtained during 2008 indicate that organic pollution continues to be the predominant pollution of aquatic resources. The organic pollution measured in terms of bio-chemical oxygen demand (BOD) & Coliform bacterial count gives the indication of extent of water quality degradation in different parts of our country. It is observed that nearly 67% of the observations are having BOD less than 3 mg/l, 18% between 3-6 mg/l & 15% above 6 mg/l. Similarly Total & Faecal coliform which indicate presence of pathogens in water are also a major concern. About 50% observations are having Total Coliforms and 67% observations are having Faecal Coliform less than 500 MPN /100 ml.

Water Body Wise Status - Rivers

- Water quality of river Beas at D/s Mandi & D/s Pong Dam in Himachal Pradesh and river Satluj at U/s & D/s of Budhanala in Ludhiana, at Boat Bridge Dharmkotnakodar Road and at D/s of East Bein in Jalandhar found deteriorated and degraded as compared to stipulated requirement.

- River Ganga at Kanpur U/s & D/s, Bhagirathi B/c with Alaknanda, Alkananda B/c and A/c to Bhagirathi at Devprayag, Alkananda B/c to Mandakini at Rudraprayag, Rishikesh U/s, Haridwar D/s, Narora, Garhmukteshwar, Kannauj U/s and D/s, Bithoor, Dalmau (Raibareilly), Allahabad U/s & D/s, Varanasi U/s & D/s, Ghazipur (Trighat), Dakshineshwar , Diamond Harbour and Uluberia is not meeting the desired water quality for bathing as well as organized water supply for drinking purpose. The water quality of river Yamuna is deteriorated at Shyama Chatti, Dak Patthar, Kalanaur, Sonepat, Nizamuddin Bridge, Okhla, Mazawali, Agra U/s & D/s, Mathura U/s & D/s, Bateshwar, Etawah and Juhika. After the intake point of Wazirabad Barrage river Yamuna does not confirm to criteria for beneficial uses for over 500 km that extends beyond Etawah. Water quality at Okhla, Nizammudin Bridge is worst affected due to high BOD and Ammonia in the river Yamuna. Other tributaries having

higher concentration of pollutants are Kalinadi at Kannauj and U/s of Gulaothi Town in Bulandsahar; Kali (W) at Mujaffarnagar; Hindon at Ghaziabad, Renukut & Meerut; Ramganga at Kannauj; Gomti at Lucknow, Jaunpur &Varanasi; Sai at Unnao; Saryu at Ayodhya; Rihand at Renukut; Daha at Siwam; Chambal at Nagda, Etawah, Rameshwarghat near Sawaimadhopur & Kota D/s; Damodar at Dishergarh, Dhena village, Mujher mana, Haldia & Narainpur; Mahananda at Siliguri; Barakar at Asansol; Betwa at Nayapur D/s Mandideep, Bhojpur & Vidisha; Kshipra at Ujjain, Trivenisangam & Siddhawat; River Jumar at Kanke Dam; Bokaro at Jarandi; River Churni at Santipur town & Gade Border; River Kaliasot at Mandideep; Khan at Sakkar Khadi, Kabit Khedi & Sanwer are also not meeting the desired criteria.

- The mainstream of River Brahmaputra is exceeding the criteria at Kherghat, Pandu, Dhenukapahar, Chandrapur, Kacharighat (Guwahati), Nimaighat, Dhubri and Jogijhoga. The tributary streams Bharalu, Dhansiri, Digboi, Deeparbil, Disang, Burhiding, Mora Bharali, Kolong, Manas, Teesta, Dikchu, Ranichu, Maney Khola, Kundli, Dzu, Mora Bharali and Kathakal are also polluted and not conforming to the desired criteria.

- River Mahi is conforming to the desired water quality at most of the monitoring locations except A/c Anas at Pardi (Banaswad), Near Rajasthan Border at Kadana Dam, Mujpur, Virpur and Vasad in Gujarat.

- River Sabarmati is grossly polluted at Kheroj Bridge, Village Miroli Taluka, V.N.Bridge, and in the reach of Ahmedabad to Vautha. Water quality data indicates that the tributary stream Khari is grossly polluted with respect to BOD, Total and Faecal Coliforms and very high dissolved solid content in terms of Conductivity where as water quality of Shedi is not meeting the desired criteria in respect of DO and BOD.

- The mainstream of River Narmada and tributary streams are confirming to water quality for all the criteria parameters except BOD which is exceeding at Sethanighat, Hoshangabad U/s & D/s, Chandod, Bharuch (Zadeshwar) and Korighat. The tributary stream Kunda is also not meeting the desired criteria in respect of BOD.

- The water quality of mainstream of river Tapi is exceeding criteria limits at Uphad village, Ajnad village, Bhusawal U/s, Ukai Sherula Bridge, Mandavi,

Kathore (NH-8 Bdg), U/s Kathore, Rander Bridge and ONGC Bridge, Surat, Near Bardoli (Kapp Bdg.) and tributary stream Girna at Malegaon & Jalgaon, Rangavali at Navapur and Kim at Sahol Bridge.

- The water quality of mainstream of Mahanadi does not meet the criteria with respect to BOD at Cuttack D/s and Sambhalpur D/s in Orissa due to discharge of untreated sewage from cities. The Water Quality of tributary streams Hasdeo, Arpa, Kelo, Ib and Birupa are complying with the water quality criteria. Other streams such as Seonath, Kharoon, Kuakhai and Kathajodi are not meeting the criteria limit in respect of BOD.

- The water quality of mainstream of Brahmani with respect to BOD is exceeding the criteria limit at downstream of Panposh, downstream of Rourkela and Kamalanga due to wastewater discharges from the industrial and residential complexes of Rourkela, Talcher, Bhuban and Dharamashala. The water quality of tributary streams Koel, Karo and Sankh is not complying the desired criteria with respect to BOD. The water quality of major tributary stream Baitarni is complying with the criteria limit at all locations in all respects except conductivity at Chandbali.

- In river Subarnarekha, BOD is exceeding the criteria limit at Ranchi Tatisilwai and Namkum.

- The water quality of river Godavari in respect of BOD does not meet the criteria in Maharashtra at all locations due to proximity of large cities. In Andhra Pradesh water quality of mainstream of Godavari is exceeding the criteria limit with respect to BOD at Mancherial, Rajahmundry D/s, B/c of Ragavallu, Ramagundam U/s & D/s, Godavarikhani, Bhadrachalam D/s and Burgampahad. Manjira at D/s Bidar & Near Ganapathi Sugars; Nira at Pulgaon cotton mill, Kolar before confluence to Kanhan at Kamptee, Kanhan at U/s & D/s Sinora & D/s of Nagpur, Wardha at Rajura Bridge, Confluence Point of River Penganga and Wardha at Juad & D/s of ACC Ghuggus, Purna at Dhupeshwar, Wainganga at Ashti, A/c with Kanhan, U/s & D/s of Ellora Paper Mills and U/s & D/s of Gaurav Paper Mills in Maharashtra and Maner at Warangal U/s & Somnapalli, Manjera at Raipallu & Gowdicharla A/c with Nakkavagu and Sabari at Kunavaram, Khammam in Andhra Pradesh are not meeting the criteria for BOD.

- River Krishna does not meet the water quality criteria at Krishna Bridge-Karad, Mahabaleshwar (Dhom dam near Koyna dam), Rajapur weir, Kurundwad (Kolhapur), Hamsala Devi (Guntur), D/s Of Narayanpura Dam, D/s of Islampur, Gadwal Bridge, Thanagadi at Mahaboobnagar, Tintini Bridge, Wadapally, Krishna-Venna Sangam at Mahuli, Ankali Bridge, Devsagar Bridge, Kshetra Mahuli, Wai, A/c Tungabhadra at Sangameshwaram, Amravati and U/s of Ugarkhurd barrage. River Bhima at Pune U/s (Vitthalwadi), D/s of Bundgarden(Pune), Pargaon A/c with Mula Mutha, A/c with Daunt, Narsinghpur D/s after confluence with river Nira and Takli; Panchganga at Shirol and D/s Kolhapur Town; Malprabha at D/s of Khanpur; Nira at Sarole bridge on Pune-Bangalore highway and D/s of Jublient Organosis; Tunghabhadra at Ullanur and Kurnool U/s; Bhadra at D/s of KIOCL Road Bridge near Holehunnur & D/s of Bhadrawati; Chandrabhaga U/s & D/s of Padharpur Town; Musi at Nagole and U/s & D/s of Hyderabad; Kagina D/s of Sewage disposal Point; Venna at Satara; Koyna at Karad; Mutha at Ganapathy Ghat; Mula-Mutha at Mundhawa Bridge; Mula at Aundh Bridge and Harrison Bridge; Pawana at Sangavigaon; Indrayani at D/s of Alandigaon; Nakkavagu at Bachugudem; Hundri at Joharpur (Kurnool); Kundu at Nandyal (Kurnool) and Kinnersani A/c KTPS Ash Pond Effluents (Khammam) are potentially polluted locations having higher BOD levels.

- River Pennar is meeting the desired water quality criteria at all locations except Puspagini A/c Papagni.

- The Water Quality of River Cauvery is not meeting the desired water quality criteria at Napokulu Bridge D/s Mettur, 1 Km D/s of Bhavani River Confluence, Pallipalayam, Erode near Chirapallayam, Pitchavaram and Trichy at Grand Anaicut whereas the tributary streams not meeting the criteria are Bhavani at Bhavani Sagar and Bhavani; Kabbani at Water Intake of KIADB, Nanjangud and Lakshamantirtha at D/s of Hunsoor Town.

- Damanganga at Kanchgaon D/s; Kolak at Patiala Bridge & Vapi; Ambika at Billimora; Amlakhadi A/c of wastewater from Ankleshwar; Baleshwar Khadi at N.H. No. 8; River Purna on Bridge at Surat-Navsari Highway; Dhadar at Kothada; Mindhola at State Highway Bridge; Bhogavo at Surendranagar D/s and Triveni Sangam near Somnath Temple at Veraval, Junagadh in Gujarat are exceeding the criteria limit for BOD. River Mandovi at Tonca and Bicholim at Varzan Nagar in Goa is not meeting the criteria limit. River Patalganga at Shilphata and near intake of MIDC water works; Kundalika at Roha city and

Are Khurd; river Ulhas at U/s of Badlapur, Jhambul water works and U/s of NRC Bund at Mohane; Bhatsa at D/s of Pise Dam; Kalu at Atale village and Mithi River in Maharashtra are not meeting the criteria due to higher level of BOD in these rivers. The rivers in Kerala are meeting the criteria limit for BOD except Karmana at Moonnattumukku; Puzhackal at Puzhackal Bridge; Kadambyar at Brahmapuram & Manckakadavu and Periyar at Pathalam. BOD is observed more than the criteria limit in river Tambiraparani at Rail Bridge Ambasanudam, Arumuganeri, Muraepanadu & Tirunelveli and Palar at Vaniyambadi water supply Headworks in Tamil Nadu. River Nagavalli at Jaykypur D/s in Orissa and Kali D/s of West Coast Paper Mill in Karnataka are also exceeding the criteria limit in respect of BOD. The river Ghaggar is grossly polluted at majority of monitoring locations such as D/s Patiala, Moonak, U/s & D/s Sardulgarh, Ratanheri D/s of Patiala Nadi, D/s of Chhatbir, Derabassi, Mubarakpur Rest House, U/s & D/s of Jharmal nadi, Chandrapur Syphon, U/s & D/s of Dhakansu nallah, GH-1 at road bridge in Sirsa and before Ottu weir due to the discharge of municipal and industrial wastewater. River Sukhna at Parwanoo; Kodra Dam at Mount Abu and Markanda at D/s of Kala Amb are grossly polluted locations. River Nambul at Hump Bridge and at Heirangoithong (Manipur), River Gumti D/s of South Tripura and Haora River at Chandrapur (Agartala) are observed as polluted due to high level of BOD.

Water Quality Status – Creeks/ Canals/ Lakes/Tanks

- The creeks in Gujarat and (Mumbai) Maharashtra and sea water in the vicinity of Mumbai are having high concentration of BOD due to discharge of waste water from metropolitan region and high conductivity due to effect of sea water.

- The Western Yamuna Canal downstream of Yamuna Nagar at 100 m D/s and at Damla is grossly polluted due to municipal and industrial waste water disposal. Similarly Pragati Vidhya Bhawan Canal in Agartala and Narmada Main Canal in Dist. Gandhinagar is also not meeting the criteria limits with respect to BOD.

  Lakes and Tanks having high concentration of organic matter and not complying to the standard limits for BOD are Thol Tank (Dist. Mehasana), Nalsarovar Lake, Lakhota Talav, Kankoria Lake, Chandola Lake, Ajwah Lake, Bindusarovar, Siddhpur (Dist.Patan), Sursagar Lake Jamnagar, Narsimehta Talav- Junagadh, City Lake of Nadiad, Dharoi Dam Dist-Mehsana, Moticher Lake Dist. Surat, Kuwadava Lake Dist. Rajkot, Olpad Village Pond and Dhudhia Talav at Navsari in Gujarat; Udaisagar lake, Pushkar Lake and Nakki

lake at Mt.Abu in Rajasthan; Upper Lake, Lower lake and Shahpura Lake of Bhopal, Bilawali Talab at Indore and Janunia Talab near W/s in MP.

Water Quality Status – Groundwater

- The groundwater monitoring locations with high conductivity and exceeding the water quality criteria for irrigation are observed at Bore well Nagaram (Khammam); Navlok Gardens (Nellore); Nandayal(Kurnool); Nagiri (Chittoor); near Ckm College (Enumamula (V)- Warangal) ; Open well near Pratap Nagar bridge (Kakinada) and Rama Temple (Visakhapatnam -Andhra Pradesh); Bore well of Santej village; Sachin GIDC; STP Madhapar (Rajkot); SNR. Vinayak Jal Suddhikaran Sahakari Mandali Ltd (Bavla); Pirana Terminal Pumping Station (Pirana) near V.N.Bridge in Gujarat. Conductivity is observed high in well at Jagiroad near HPC effluent discharge point; near MSW dumping site at Garchuk; in Panchgram market near Cachar Paper Mill; at Raipur region in Chhatissgarh; Mehatwas (Nagda); Pratal nagar (Dewas); Trenching ground in the premises of M/s Rishabh Masala Udhyog and M/s Lakhani Foot Wear in Madhya Pradesh. Mira-Bhayander; Palghar; Raipur(Nagpur); Sangera (Gondia); Parvati Industrial Estate- Sherole; Savali(Sangli); Rasulwadi-Sambalwadi (Sangli) in Maharashtra. Rajkot; Surendranagar; Palanpur; Siddhpur (Dist. Patan), Pandesara Indl.(Surat); Olpad in Gujarat; Loomji Chaudhary near Nayagaon (Pali), Bhopal Singh 24 Km from Pali Town, U/s from Jodhpur Town; village Bagar Rajput (Alwar); village Santhla near (Bhiwadi Industrial Area);Pabupura road near civil Airport(Jodhpur); Hand pump near Kansua Nallah (Secondary School-Kota) and Vidhani village Goner road(Jaipur); Village Vinayakia (Jodhpur); Near Rana Pratap Nagar railway station(Udaipur); Hotel Orient Place (Subhash Nagar-Udaipur); In side Shiv temple near Air Force Station(Ajmer Road- Jaipur); Near Shri Kalyaneshwar Mahadev Temple Jaisingh Pura Khurd (Jaipur); Opp. Private Bus Stand & Near Khanpura Talav(Ajmer) in Rajasthan; Roadways Bus Station Unnao in Uttar Pradesh.

  Groundwater locations with BOD levels higher than the criteria are Bore well Nagaram (Pavocha-Khammam); Navlok Gardens (Nellore); Swarnamukhi river, Srikalahasti (Chittor) in Andhra Pradesh; Karbi Anglong, Sibsagar, Silchar and Guwahati in Assam; Groundwater from Silapathar and in Panchgram Market near Cachar paper mill; at Raipur region in Chhatissgarh; Shimla D/s of MSW Dumping Site in Himachal Pradesh; bore well near Chunmbar River in Pondicherry; Somnath Indl. Estate in Daman; Mira Bhayander, Dahanu, Vasai, Palghar, BMW site Burudgaon (Ahmednagar), MSW site Pathardi (Nasik),

MSW site Pimpri- Chinchwad (Pune), Phandarpur- Gangapur (Aurangabad), Khaperkheda, Koradi, Raipur, Bhamni- Kamleshwar and Bhandewari in Nagpur, Sukali (Amravati), Akot(akola), Sawargaon(Yavatmal), Bore well at Katpur near Z.P. school, Dug well at Ranjangaon, Hand pump near Zilla Parishad Primary School, Surendranagar, Palanpur, Mehasana, Nadiad, Vadodara(Indl.– Nandesar), Bore well Palsana village, Someshwar rice mill Nr. Bavla Eco Project,(CETP) and Pirana Terminal Pumping Station Nr. V.N. bridge (Ahmedabad) in Gujarat ; Loomji Chaudhary near Nayagaon (Pali), Bhopal Singh 24 Km from Pali Town, U/s from Jodhpur Town; village Gattal near Bhiwadi Indl area (Bhiwadi), Pabupura road near civil Airport(Jodhpur) in Rajasthan and Captain Ganj in Uttar Pradesh.

The nitrate concentration is observed higher than the desired criteria at Open well near Rama Temple, Mindi (Visakhapatnam) in Andhra Pradesh; at Bilaspur region in Chhatissgarh; well at Somnath Industrial Estate in Daman. Total Coliform is not meeting the desired criteria in ground water at Gabheni village, Surat (Industrial) in Gujarat. pH is observed below 6.5 at Sibsagar, Jorhat, Silchar and Bonaigaon in Assam; Groundwater from Ledo(Margherita), Near BPRL(Dhaligaon), from Kokrajhar (HS School), Dhubri- College nagar, Goalpara- Goalpara college, Hialkandi near ASTC Bus stand, Ramhlum (Northern Part) in Mizoram; Kunjban & A.D.Nagar, Agartala in Tripura; Dharamshala Kangra D/s of MSW dumping site in Himachal Pradesh; Eloor, Chungapally, Pappanamkode & Nedumangad in Thiruvananthpuram, Kundra in Kollam, Edayar & Kalamassery in Ernakulam, Punkunnam Trissur Distt., Malapuram, Kannur(Municipality) & Payyannur in Kunnur, Mavoor, Kozhikkode, Fathmapuram (Changanassery), Karoor(Pala), Vaikom, Vadavathoor(Kottayam), Chellora trenching ground (Kannur), Manjeri, Laloor & Ollur,Thrissur and Brahmapuram MSW dumpark(Ernakulam) in Kerala; Well at Kalapet in Pondicherry Univ. Admn. Block , Kurumbapet & Mettupalayam in Pondicherry; Sangera Gondia, Savali & Rasulwadi- Sambarwadi in Maharashtra and M/s Kanoria Chemical, Sonbhadra in Uttar Pradesh.

Extreme Levels of water quality in Rivers & Lakes/ponds/tanks

During 2008 the highest BOD (one of the most important indicators of pollution) levels observed in rivers are arranged in descending order are summarised in Table–I. The relatively low values of BOD are measured in river(s) Brahmaputra, Mahanadi, Pennar, Baitarni and Brahmani.

Table –I: Highest observed BOD levels in polluted rivers

Rivers	BOD (mg/l)
Markanda	590
Kalinadi (W)	364
Kalinadi (E)	183
Yamuna	70
Nakkavagu, Mula, Mithi, Khan, Bhogavo, Kundalika & Ghaggar	50
Sabarmati	48
Amlakhadi	46
Bhima	40
Indrayani, Pawana, Mula-Mutha & Hindon	36
Koyna	35.5
Musi	34
Mutha	32
Bharalu	31.5
Damanganga	30
Nambul	26
Cauvery	23
Nira (Krishna)	21.2
Tapi & Ganga	21
Godavari	20
Satluj	18
Shedi	19
Krishna	17.6
Manjira & Ramganga	16
Gomti	14
Wardha	13
Venna, Chandrabhaga, Kolak & Mindhola	12
Nira (Godavari)	11.8
Narmada	11.4
Karamana	11
Subarnarekha & Wainganga	10.5
Purna (Tapi)	10.2
Girna	10
Kanhan	9.8
Dhadar, Patalganga & Khari	9

Rivers	BOD (mg/l)
Purna (Godavari)	8.8
Rangavalli	8.4
Deepar Bill	8.2
Kshipra	8
Bhavani & Beas	7.6
Ulhas & Kalu	7.5
Burhidihing, Kolar, Kali-Karnataka & Kharkhala	7
Betwa, Damodar & Mahi	6.8
Kathajodi, Chambal & Sankh (Brahmani)	6.2
Maner	6.1

Lakes, Ponds and Tanks having very high values of Biochemical Oxygen Demand (BOD) are arranged in descending order are summarised in Table –II.

Table-II: Highest observed BOD levels in polluted lakes/tanks/ponds

Lakes/Tanks/Ponds	BOD (mg/l)
Gandigudem Tank, Saroonagar lake, Noor Md. Kunta Lake, Sai Chevuru Pond, Asani Kunta Pond, Premajipet Tank, Kajipally Tank in Andhra Pradesh & Elangabeel System Pond	50
Thol Tank (Kalol) (Dist. Mehasana)	49
Nalsarovar Lake (Sanand), Ahmedabad	47
Pedda Chevuru	44
Kistareddypet Tank, Medak	33
Hussain Sagar Lake	29
City Lake Of Nadiad	26.4
Botodriva Satra Pond	24.5
Nalla Chevuru	21
Pushkar Lake	20
Mallapur Tank	19
Deepar Beel	18
Kankoria Lake	16
Bindu Sarovar at Siddhpur, Patan	15
Rajadinia Pukhuri	14.8
Mahamaya Mandir Pukhuri	13.2
Chandola Lake	13
Udaisagar Lake	11.8
Rajapukhuri at Gauripur	10.8
Dharoi Dam	11
Bishnu Puskar Pukhuri	10.2

The level of DO is observed more than 4 in river Narmada, Brahmani, Baitarni, Subernarekha and Pennar throughout the year to sustain aquatic life whereas, the values less than 4 are observed in stretches of rivers at a number of locations downstream of urban settlements due to discharge of untreated/partially treated municipal wastewater which is responsible for high oxygen demand. During 2008 the lowest DO (one of the most important indicators of pollution) levels observed in rivers are arranged in ascending order are summarised in Table –III.

Table III: Lowest observed DO levels in polluted rivers

Rivers	DO (mg/l)
Kalinadi (E), Kalinadi (W), Yamuna, Mula, Mithi, Khan, Sabarmati, Amlakhadi, Indrayani, Mula Mutha, Mutha, Hindon, Musi, Karmana, Dhadar, Ulhas & Bhatsa	0.0
Pawana	0.3
Manjira, Kadambayar & Markanda	0.4
Bhima & Cauvery	0.6
Khari & Lakshmantirtha	0.7
Mahanadi & Gomti	0.8
Mindhola	1
Krishna	1.1
Godavari , Damanganga & Ghaggar	1.2
Ganga & Satluj	1.6
Koyna	1.7
Kabbani	1.8
Irumpanam & Ayroor	1.9
Tapi	2.1
Sukhna	2.2
Korayar	2.3
Dhansiri	2.4
Nambul & Churni	2.5
Betwa	2.7
Nira (Krishna) & Kshipra	2.8
Bhogavo	3.1
Dzu & Chambal	3.2
Brahmaputra	3.3
Rushikulya, Kolak & Pamba	3.4
Kundalika & Sai	3.5
Digboi & Mapusa	3.6
Shedi	3.7
Beas	3.8
Panchaganga & Bhadra	3.9

Total Coliform and Faecal Coliform count (one of the most important indicators of pollution) are observed very high in rivers at a number of locations. The river Mahi, Subernarekha, Pennar, Beas, Cauvery and Narmada are relatively clean rivers as the number of Total Coliform and Faecal Coliform count are respectively less than criteria limit of 5000 MPN/100 ml and 2500 MPN/100 ml respectively. The highest TC &FC levels observed in rivers are summarised in Table –IV.

Table-IV: Highest observed Total Coliform & Fecal Coliform levels in polluted Rivers

Rivers	Total Coliform (MPN/100ml)	Fecal Coliform (MPN/100ml)
Kali	$14X10^7$	$51X10^4$
Yamuna	$103X10^6$	$109X10^5$
Kalinadi (W	$67X10^6$	$24X10^5$
Alaknanda	$101X10^5$	$65X10^3$
Mandakini	$51X10^5$	$48X10^3$
Hindon	$44X10^5$	$78X10^4$
Tons (H.P.)	$39X10^5$	$43\ X10^4$
Ghaggar	$25X10^5$	$7X10^4$
Sabarmati	$21X10^5$	$15X10^2$
Kathajodi	$16X10^5$	$16X10^4$
Ganga	$14X10^5$	$85X10^4$
Mindhola	$11X10^5$	$46X10^4$
Chambal	$88X10^4$	$36X10^3$
Damodar	$7X10^5$	$35X10^4$
Bhagirathi	$47X10^4$	2800
Baleshwar Khadi	$46X10^4$	$21X10^4$
Tapi	$46X10^4$	$24X10^4$
Mahananda	$3X10^5$	$11X10^4$
Brahmaputra	$24X10^4$	$24X10^3$
Purna	$24X10^4$	$93X10^3$
Ambika	$21X10^4$	$15X10^4$
Gomti	$17X10^4$	$14X10^4$
Mahanadi	$16X10^4$	$54X10^3$
Barakar	$16X10^4$	$17X10^3$
Bhima	$16X10^4$	$9X10^4$
Rupnarayan	$16X10^4$	$105X10^3$

Rivers	Total Coliform (MPN/100ml)	Fecal Coliform (MPN/100ml)
Churni	$14X10^4$	$7X10^4$
Teesta	$13X10^4$	$8X10^4$
Bharalu	$11X10^4$	$24X10^3$
Tungabhadra	$92\ X10^3$	$54\ X10^3$
Ramganga	$75\ X10^3$	$15\ X10^3$
Karmana	$56X10^3$	$44X10^3$
Kim	$46\ X10^3$	$24\ X10^3$
Kaveri	$46X10^3$	$93X10^2$
Khari	$43X10^3$	$23X10^3$
Kagina	$3X10^4$	$9X10^3$
Godavari	$28X10^3$	800
Nagavalli	$24X10^3$	600
Kuakhai	$22X10^3$	$13X10^3$
Musi	$21X10^3$	220
Brahmani	$21X10^3$	$14X10^3$
Satluj	$2X10^4$	$3X10^3$
Krishna	$16X10^3$	3000
Manas	$15X10^3$	1500
Amlakhadi	$9X10^3$	$3X10^3$
Manjira	$9X10^3$	2400
Malprabha	$9X10^3$	900
Daha	$9X10^3$	2400
Saryu	7100	4700
Rihand	$7X10^3$	$3X10^3$
Bicholim	5400	1300
Baitarni	5400	3500
Periyar	5240	1100
Kadambyar	5200	2080

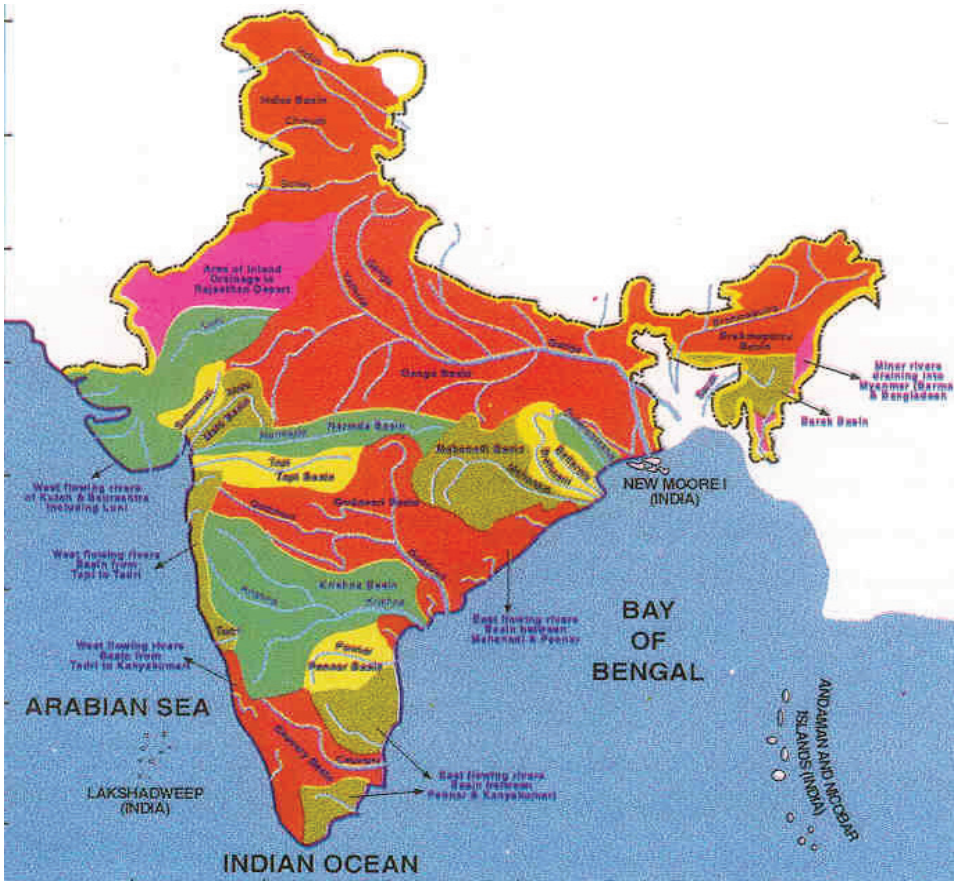
CHAPTER - I

Introduction and Methodology of National Water Quality Monitoring Programme

1.1 Introduction

In order to perform the functions laid down under the Water (Prevention and Control of Pollution) Act, 1974, Central Pollution Control Board (CPCB) and State Pollution Control Boards/Pollution Control Committees (SPCBs/PCCs) need adequate knowledge on nature and extent of pollution control required in different parts of the country. In addition to above, Pollution control have to evaluate performance of the pollution control devices.To achieve this, a continuous water quality monitoring is required. Realising so CPCB in collaboration with concerned SPCBs/PCCs established a wide network of water quality monitoring.

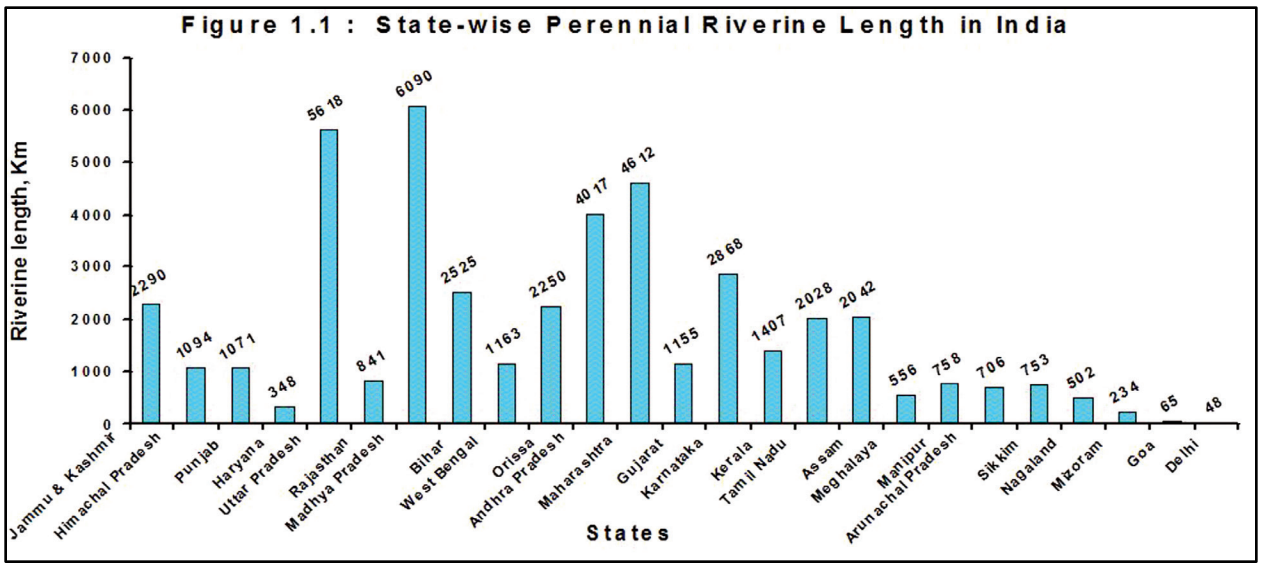
1.2 Water Resources of India



India receives 4000 Km^3 of water through rainfall. Of this 3/4 part occurs only during monsoon. The surface flow is estimated as 1880 Km^3. The annual replenishable ground water resources are assessed to be about 600 Km^3 of which the annual usable resources are estimated at 420 Km^3. Inland water resources of the country are classified as rivers and canals; reservoirs; tanks and ponds; beels, oxbow lakes, derelict water; and brackish water. Other than rivers and canals, total water bodies cover an area of about 7 million hectare. Statewise details of inland water resources are given in table 1; there are few desert rivers, which flow for some distance and get lost in deserts. There are complete arid areas where evaporation equals rainfall and hence no surface-flow. The medium and minor river basins are coastal rivers. The Brahmaputra, Ganga, Indus and Godavari putting together cover more than half of the area of the country. The whole of the west coast stretching 1500 km between Surat in Gujarat and Cape Comorin in Tamilnadu are fed by fourteen medium and eighteen minor river basins leaving important cities like Bombay, Panaji, Cochin, Trivandrum out of major river basins. On the east coast of Peninsular India there are three areas, which are out of any major river basins. These three areas are: the area south of River Cauvery starting from Madurai to Cape Comorin; the area between Pennar and Cauvery basin wherein Chennai and Pondicherry are located; and the area between Mahanadi and Godavari basins in Orissa coast. There is a significant variation both in the quantity of discharge from a major basin to minor one and also in the quality of discharge from region to region.

1.2.1 Surface Water

All the major river basins are not perennial. Only four of the thirteen major basin posses areas of high rainfall, i.e. Brahmaputra, Ganga, Mahanadi and Brahamani having annual average discharge of a minimum of 0.47 million cubic meter per Km^2, and they are perennial. Six basins (Krishna, Indus, Godavari, Narmada, Tapi and Subarnarekha) occupy the area of medium rainfall and have annual average discharge of a minimum of 0.26 million cubic meter per Km^2, and the remaining four (Cauvery, Mahi, Sabarmati and Pennar) occupy the area of low rainfall and have annual average discharge between of 0.06 and 0.24 million cubic meter per Km^2. Thus, many of the major river basins also go dry during summer leaving no available water for dilution of waste water discharged in them. State wise perennial riverine length in India is given in figure 1.1. The riverine length in Uttar Pradesh is inclusive of Uttarakhand. Similarly, the Chattisgarh is covered under Madhya Pradesh; and Jharkhand under Bihar.



1.2.2 Ground Water

Replenishable ground water potential of the country, has been estimated by Ministry of Water Resources as 431 Km^3 cubic kilometre per year. The potential available for irrigation is 360 Km^3 per year and 16 percent is for drinking, industrial and other purpose.The figure for net draft of ground water considering the present utilisation indicates that substantial portion of total potential (about 68 percent) is still remaining untapped.

Table-1.1 State wise Details of Inland Water Resources (Lakh Hectares)

S. No.	Name of the State/UT	Rivers/ Canals (Length, Kms)	Reservoir	Tanks, Lakes & Ponds	Beels, Oxbow Lakes & Derelict Water	Brackish Water	Total Water Bodies
1.	Andhra Pradesh	11514	2.34	5,17	-	0.64	8.15
2	Arunachal Pradesh	2000	-	0.01	0.03	-	0.04
3.	Assam	4820	0.02	0.23	1.10	-	1.35
4.	Bihar	3200	0.60	0.95	0.05	-	1.60
5.	Goa	250	0.03	0.03	-	-	0.06
6.	Gujarat	3865	2.43	0.71	0.12	3.76	7.02
7.	Haryana	5000	NEG	0.10	0.10	-	0.20

S. No.	Name of the State/UT	Rivers/ Canals (Length, Kms)	Reservoir	Tanks, Lakes & Ponds	Beels, Oxbow Lakes & Derelict Water	Brackish Water	Total Water Bodies
8.	Himachal Pradesh	27781	0.07	0.17	0.06	-	0.30
9.	Jammu and Kashmir	3000	0.42	0.01	-	-	0.43
10.	Karnataka	9000	2.20	4.14	-	0.08	6.42
11.	Kerala	3092	0.30	0.30	-	2.43	3.03
12.	Madhya Pradesh	20661	2.94	1.19	-	-	4.13
13.	Maharashtra	16000	2.79	0.50	-	0.10	3.39
14.	Manipur	3360	0.01	0.05	0.40	-	0.46
15.	Meghalaya	5600	0.08	0.02	NEG	-	0.10
16.	Mizoram	1395	-	0.02	-	-	0.02
17.	Nagaland	1600	0.17	0.50	NEG	-	0.67
18.	Orissa	4500	2.56	1.14	1.80	4.17	9.67
19.	Punjab	15270	NEG	0.07	-	-	0.07
20.	Rajasthan	N.A.	1.20	1.80	-	-	3.00
21.	Sikkim	900	-	-	-0.03	-	0.03
22.	Tamil Nadu	7420	0.52	6.91	N.A.	C.56	7.99
23.	Tripura	1200	0.05	0.12	-	-	0.17
24.	Uttar Pradesh	31200	1.50	1.62	1.33	-	4.45
25.	West Bengal (P)	2526	0.17	2.76	0.42	2.10	5.45
UNION TERRITORIES							
26	Andaman & Nicobar Islands	115	0.01	0.03	-	0.37	0.41
27	Chandigarh	2	-	NEG	NEG	-	-
28.	Dadra & Nagar Naveli	54	0.05	-	-	-	0.05
29.	Daman & Diu	12	-	-	-	-	-
30.	Delhi	150	0.04	-	-	-	0.04
31	Lakshadweep	-	-	-	-	-	-
32.	Pondicherry	247	-	NEG	0.01	0.01	0.02
	Total	**185734**	**20.50**	**28.55**	**5.45**	**14.22**	**68.72**

Source: Fisheries Division, Dept. of Agriculture & Co-operation, Ministry of Agriculture; N.A. : Not Available; (P) : Provisional; NEG: Negligible : Included in brackish water area

1.3 Water Quality Monitoring Programme

1.3.1 Objectives

The preamble of Water (prevention and control of pollution) Act, 1974 stated that pollution control board both at States and Central level to restore and maintain the wholesomeness of water bodies in India.Water quality monitoring is therefore an imperative prerequisite in order to assess the extent of maintainance and restoration of water bodies are required.The water quality monitoring is performed with following main objectives in mind.

- For rational planning of pollution control strategies and their prioritisation;
- To assess nature and extent of pollution control needed in different water bodies or their part;
- To evaluate effectiveness of pollution control measures already is existence;
- To evaluate water quality trend over a period of time;
- To assess assimilative capacity of a water body thereby reducing cost on pollution control;
- To understand the environmental fate of different pollutants.
- To assess the fitness of water for different uses.

1.3.2 Monitoring Network

The Central Pollution Control Board (CPCB) has established a network of monitoring stations on rivers across the country. The present network comprises of 1429 stations in 27 States and 6 Union Territories spread over the country. The frequency of monitoring is on monthly or quarterly basis in surface waters and on half yearly basis in case of ground water. The monitoring network covers 293 Rivers, 94 Lakes, 9 Tanks, 41 Ponds, 8 Creeks, 23 Canals, 18 Drains and 411 Wells. Among the 1429 stations, 810 are on rivers, 102 on lakes, 18 on drains, 23 on canals, 9 on tank, 15 on creeks/seawater, 41 on pond and 411 are groundwater stations (Figure 1). Presently the inland water quality-monitoring network is operated under a three-tier programme i.e. Global Environmental Monitoring System (GEMS), Monitoring of Indian National Aquatic Resources System (MINARS) and Yamuna Action Plan (YAP). Water samples are being analyzed for 28 parameters consisting of physico-chemical and bacteriological parameters for ambient water samples apart from the field observations. Besides this, 9 trace metals and 28 pesticides are analyzed in selected samples. Biomonitoring is also carried out on specific locations. In view of limited resources, limited numbers of organic pollution related parameters

are chosen for frequent monitoring i.e. monthly or quarterly and major cations, anions, other inorganic ions and micro pollutants (Toxic Metals & POP's) are analyzed once in a year to keep a track of water quality over large period of time. The water quality data are reported in Water Quality Status Year Book.Water body wise number of stations is depicted in Fig 1.2.State wise and water body wise distribution of water quality monitoring network is summarized in Table 1.2.

Fig 1.2: Water body wise number of stations

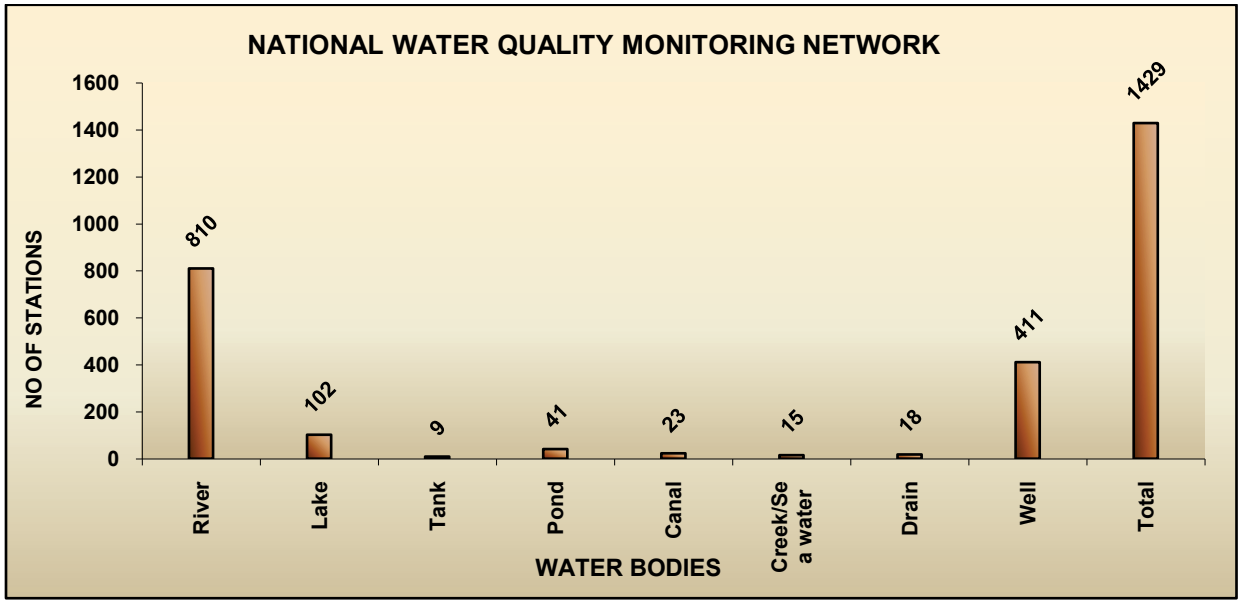


Table-1.2 State wise and water body wise Distribution of Water Quality Monitoring Stations

State	River	Lake	Tank	Pond	Canal	Creek/Sea water	Drain	Well	Total
ANDHRA PRADESH	49	8	7	6	2	-	-	24	96
ASSAM	43	2	1	23	-	-	-	32	101
BIHAR	16	-	-	-	-	-	-	20	36
CHANDIGARH	-	1	-	-	-	-	3	7	11
CHHATISSGARH	23	-	-	-	-	-	-	4	27
DAMAN DIU,	11	-	-	-	-	-	-	13	24
DADRA AND NAGAR HAVELI									
DELHI	4	-	-	-	2	-	9	-	15
GOA	17	2	-	-	3	1	-	6	29

State	River	Lake	Tank	Pond	Canal	Creek/Sea water	Drain	Well	Total
GUJARAT	49	15	1	2	2	2		42	113
HARYANA	8	2	-	-	11	-	2	-	23
HIMACHAL PRADESH	31	3	-	-	-	-	-	20	54
JAMMU & KASHMIR	7	2	-	-	-	-	-	-	9
JHARKHAND	31	4	-	1	-	-	-	-	36
KARNATAKA	43	2	-	-	-	-	-	-	45
KERALA	64	15	-	1	-	-	-	30	110
LAKSHDWEEP	-	-	-	1	-	-	-	15	16
MADHYA PRADESH	69	18	-	-	-	-	-	18	105
MAHARASHTRA	83	-	-	-	-	9	1	30	123
MANIPUR	11	4	-	-	-	-	-	5	20
MEGHALAYA	5	3	-	-	-	-	-	5	13
MIZORAM	4	-	-	-	-	-	-	2	6
NAGALAND	8	-	-	-	-	-	-	-	8
ORISSA	64	2	-	7	2	3	-	15	93
PONDICHERRY	5	2	-	-	-		-	15	22
PUNJAB	35	2	-	-	-	-	-	6	43
RAJASTHAN	7	7	-	-	-	-	-	37	51
SIKKIM	14	-	-	-	-	-	-	-	14
TAMIL NADU	27	3	-	-	-	-	-	2	32
TRIPURA	3	2	-	-	1	-	-	7	13
UTTAR PRADESH	46	1	-	-	-	-	3	25	75
UTTRANCHAL	13	1	-	-	-	-	-	1	15
WEST BENGAL	20	1	-	-	-	-	-	30	51
Total	**810**	**102**	**9**	**41**	**23**	**15**	**18**	**411**	**1429**

1.3.3 Parameters observed

The water samples are analysed for 9 core parameters and 19 general parameters. The monitoring agencies have also analysed the trace metals at few locations. The list of parameters identified under the National Water Quality Monitoring Programme is given in Table 1.3. In the present report data on core parameters is incorporated for interpretation and drawing inferences based on primary water quality criteria.

Table-1.3 List of Parameters under National Water Quality Monitoring Programme

Core Parameters (9)	Field Observations (7)
PH	Weather
Temperature	Depth of main stream/depth of water table
Conductivity, µmhos/cm	Colour and intensity
Dissolved Oxygen, mg/L	Odour
BOD, mg/L	Visible effluent discharge
Nitrate – N , mg/L	Human activities around station
Nitrite – N, mg/L	Station detail
Faecal Coliform, MPN/100 ml	**Trace Metals (9)**
Total Coliform, MPN/100 ml	Arsenic, µg/L
General Parameters (19)	Cadmium, µg/L
Turbidity, NTU	Copper, µg/L
Phenolphthalein Alkalinity, as $CaCO_3$	Lead, µg/L
Total Alkalinity, as $CaCO_3$	Chromium (Total) , µg/L
Chlorides, mg/L	Nickel, µg/L
COD, mg/L	Zinc, µg/L
Total Kjeldahl - N, as N mg/L	Mercury, µg/L
Ammonia - N, as N mg/L	Iron (Total) , µg/L
Hardness, as $CaCO_3$	**Pesticides (15)**
Calcium, as $CaCO_3$	Alpha BHC, µg/L
Sulphate, mg/L	Beta BHC, µg/L
Sodium, mg/L	Gama BHC (Lindane) , µg/L
Total Dissolved Solids, mg/L	O P DDT, µg/L
Total Fixed Dissolved Solids, mg/L	P P DDT, µg/L
Total suspended Solid, mg/L	Alpha Endosulphan, µg/L
Phosphate, mg/L	Beta Endosulphan, µg/L
Boron, mg/L	Aldrin, µg/L
Magnesium, as $CaCO_3$	Dieldrin, µg/L
Potassium, mg/L	Carboryl(Carbamate) , µg/L
Fluoride, mg/L	2-4 D, µg/L
Bio-Monitoring (3)	Malathian, µg/L
Saprobity Index	Methyl Parathian, µg/L
Diversity Index	Anilophos, µg/L
P/R Ratio	Chloropyriphos, µg/L

1.3.4 Frequency of monitoring

The frequency of monitoring stations in each State is given in Table 1.4. It is observed from the table that 30% stations have the frequency on monthly basis, 28 % on half yearly basis and 40.7 % on quarterly basis.

Table-1.4 Frequency of Water Quality Monitoring Stations

State	Monthly	Half yearly	Quarterly	Yearly	Total
ANDHRA PRADESH	50	23	23	-	96
ASSAM	6	32	63	-	101
BIHAR	6	20	10	-	36
CHANDIGARH	-	7	4	-	11
CHHATTISGARH	7	4	16	-	27
DAMAN, DIU, DADRA AND NAGAR HAVELI	11	12	1	-	24
DELHI	14	-	1	-	15
GOA	11	6	12	-	29
GUJARAT	36	42	35	-	113
HARYANA	5	18	-	-	23
HIMACHAL PRADESH	-	20	33	1	54
JAMMU & KASHMIR	-	-	9	-	9
JHARKHAND	23	-	13	-	36
KARNATAKA	23	-	22	-	45
KERALA	16	15	79	-	110
LAKSHADWEEP	-	15	1	-	16
MADHYA PRADESH	51	17	37	-	105
MAHARASHTRA	72	30	21	-	123
MANIPUR	-	5	15	-	20
MEGHALAYA	-	5	8	-	13
MIZORAM	-	2	4	-	6
NAGALAND	-	-	8	-	8
ORISSA	20	15	58	-	93
PONDICHERRY	4	15	3	-	22
PUNJAB	-	6	37	-	43
RAJASTHAN	4	37	10	-	51
SIKKIM	-	-	14	-	14
TAMIL NADU	20	2	10	-	32
TRIPURA	-	6	7	-	13
UTTAR PRADESH	43	25	7	-	75
UTTARAKHAND	2	1	9	3	15
WEST BENGAL	9	30	12	-	51
Total	**433**	**410**	**582**	**4**	**1429**

1.3.5 River basin wise distribution of Water Quality Monitoring Stations

The number of water quality monitoring stations on each river, its tributary, sub tributary, lake, ponds, tanks, canals, creeks and on groundwater are summarized in Table 1.5. Close examination to table 1.5 reveals that

- 623 stations i.e. 43.5 % are located in major River basins.Out of which Ganga is dominating nearly 25% of major river basin. Ganga basin is as a whole houses 10 % stations.
- Medium rivers have 190 stations i.e. 13 % where as 102 lakes, 9 tanks and 41 ponds have 151 stations nearly 10 % of total stations.
- Creeks, canals, drains have only 54 stations.
- Next to major river basin, the major locations of monitoring stations are in Groundwater i.e.411 and accounts for 29%.

Table-1.5 River Basin wise distribution of Water Quality Monitoring Stations- 2008

River (main stream), Tributaries and Sub-Tributaries, Lake, Ponds, Tanks, Canals, Creeks and Groundwater Stations	Total Stations
Baitarni (5**)** **Tributaries**- Kusei(1)	**6**
Brahmani (16) **Tributaries**-Karo (1), Koel (5), Sankh (1), Kharasrota(2)	**25**
Brahmaputra (10) **Tributaries**-Burhidihing (3), Dhansiri (7), Disang (2), Jhanji (1), Subansiri (1), Bhogdoi (1), Bharalu (1), Borak (2), Deepar Bill (1), Digboi (1), Mora Bharali (1), Teesta (5), Dickhu (1), Maney (2), Ranchu (2), Rangit (5), Jai Bharali (1), Kathakal (1), Kharsang (1), Kolong (2), Manas(1), Pagldia (1), Chathe (1), Dzu (1), Kapili(1), Beki(1), Kundli(1), Kushiara(1), Panchnai(1), Sankosh(1), Sonai(1), Kohara(1), Ranga(1), Boginadi(1), Dikhow(1)	**66**
Cauvery (20) **Tributaries-**Arkavati (1), Amravati (1), Bhawani (5), Kabini (4), Laxmantirtha (1), Shimsa (2), Hemavati (1), Yagachi (1)	**36**
Ganga (34) **Tributaries-**Alakananda-Upper Ganga (4), Mandakini-Upper Ganga (1)**,** Barakar (2), Betwa (10), Chambal (8), Damodar (11), Gandak (1), Saryu-Ghaghra (3), Gomti (5), Hindon (3), Kali (West) (2), Kali Nadi (2), Khan (3), Kshipra (3), Mahananda (1), Mandakini (Madhya Pradesh) (1), Parvati (2), Ramganga (1), Rapti (1), Rihand (2), Rupanarayan (1), Sai (1), Sone (5), Tons (Madhya Pradesh) (2), Yamuna (23), Sindh (1), Johila (1), Sankh(1), Gohad (1), Kolar (1), Churni (2), Tons (Himachal Pradesh) (1), Sikrana (1), Daha (1), Sirsa (1), Dhous (1), Farmer (1), Kali sot(1), Bihar(1), Bichia(1), Ajay (1), Nalkari (1), Konar (3), Bokaro (1)	**154**

River (main stream), Tributaries and Sub-Tributaries, Lake, Ponds, Tanks, Canals, Creeks and Groundwater Stations	Total Stations
Godavari (35) **Tributaries**- Manjara (Manjira) (5), Maner (2), Nira (1), Wainganga (8), Wardha (3), Kolar (1), Kanhan (3), Purna (2), Indravati (2), Sankhani (1), Nakkavagu (1), Vamsadhara (1)	**65**
Indus **Tributaries-**Beas (19), Chenab (1), Jhelum (3), Largi (1), Parvati (3), Ravi (3), Sutlej (21), Tawi (1), Gawkadal (1), Chuntkol (1), Sirsa (3), Swan (1)	**58**
Krishna (22) **Tributaries-** Bhadra (3), Bhima (10), Ghataprabha (2), Malprabha (3), Muneru (1), Musi (3), Nira (2), Paleru (1), Tunga (1), Tungabhadra (6), Panchganga (4), Chandrabhaga (2), Kagina(1), Koyna(1), Mula(2), Mutha(1), Mula-Mutha(1), Venna(1), Pawana(1), Indrayani(1), Hundri (1), Kundu (1), Kinnersani (1), Sabari (1)	**73**
Mahi (9) **Tributaries-**Anas (1), Panam (1) , Jammer(1), Malei(1), Shivna(1), Chillar(1)	**15**
Mahanadi (22) **Tributaries-**Ib (4), Hasdeo (2), Kathajodi (1), Kharoon (4), Kuakhai (3), Sheonath (3), Birupa (1), Arpa (1), Kelo (2), Bheden(1), Tel(1), Serua(1), Daya(1), Sankha(1), Taladanda canal(3)	**51**
Narmada (21) **Tributaries-**Chhota Tawa (1), Gour(1), Katni(1), Kunda(1)	**25**
Pennar (5)	**5**
Sabarmati (9) **Tributaries**-Meswa (1), Shedhi (1), Khari (1)	**12**
Subarnarekha (12) **Tributaries-** Jumar (1)	**13**
Tapi (14) **Tributaries-**Girna (2), Rangavali (1), Denwa(1), Kim(1)	**19**
Medium rivers Ambika (1), Ulhas (3), Ulhas-Bhatsa (1), Ulhas-Kalu (1), Imphal (4), Mandovi (2), Palar (1), Pamba (3), Pariyar (7), Rushikulya (2), Tambiraparani (7), Achankoil (2), Chalakudy (1), Damanganga (14), Ghaggar (19), Kallada (1), Kali-Karnataka (1), Manimala (2), Mindhola (1), Nagavalli (4), Amlakhadi (2), Chaliyar (2), Iril (2), Kharkhala (1), Karmana (1), Kolak (2), Kundalika (2), Meenachil (1), Muvattupuza (1), Patalganga (2), Umtrew (1), Vamanpuram(1), Zuari(2), Gumti(2), Kalna (1),Valvant (1), Madai (1), Khandepar (2), Asanora (1), Bhadar (1), Neyyar (1), Ithikkara (2), Kadalundy (1), Kuttiyady (1), Mahe (2), Kuppum (1), Neelsvaram (2), Karingoda (1), Chandergiri (1), Chitrapuzha (1), Nambul (2), Ganol (1), Simsang (1), Myntdu (1), Arasalar (1), Kodra (1), Haora (1), Khuga (1), Khujairok (1), Sekmai (1), Markanda (1), Sukna (1), Baleshwar Khadi (1), Netravati (1), Kumardhara (1), Purna (1), Kaveri (1), Dhadar (1), Tlawng (2), Tuirial (2), Talpona (1), Bhogavo(1), Triveni sangam(1), Mapusa(1), Bicholim(1), Chapora(1), Kushawati(1), Sal(2), Meethi(1), Savitri(1), Vashisti(1), Neyyar (1), Mamom (1), Ayroor(1), Pallickal (1), Karuvannurr (1), Puzhackal (1), Keecheri (1), Thirur (1), Kadalundi (1), Kallai (1), Korapuzha (1), Thallassery (1), Ancharakandy(2), Kuppam (1), Ramapuram (1), Peruvamba (1), Kavvai (1), Pullur (1), Mogral (1), Shriya (1), Uppala (1), Manjeswar (1), Korayar (1), Bharathapuzha (2), Kadambayar (2), Gautami-Godavari (2), Coringa (1), Budhabalanga (2), Vanshadhara (2), Kerandi (1)	**190**

River (main stream), Tributaries and Sub-Tributaries, Lake, Ponds, Tanks, Canals, Creeks and Groundwater Stations	Total Stations
Lakes (102) Hussainsagar (1), Saroornagar (1), Himayatsagar (1), Pulicate (1), Salaulim (1), Kankoria (1), Chandola (1), Ajwah (1), Sursagar (1), Brahamsarovar (1), Sukhna (2), Govindsagar (1), Pongdam (1), Renuka (1), Wuller (1), Dal (1), Ulsoor (1), HebbalaValley (1), Oruvathikotta (1), Sasthamcotta (1), Ashthamudi (1), Paravur (1), Vembanad (1), Periyar (1), Kodumgallor (1), Kayamkula (1), Punnamadakayal (1), Pookotekayal (1), UpperLake (4), LowerLake (1), MultaiLake (1), Loktak (4), Umiam (1), Ward (1), Thadlaskena (1), Osteri (1), Bahour (1), Harike (2), Pichola (1), Udaisagar (1), Ramgarh Jaipur (1), Pushkar (1), Fatehsagar (1), Kalyana (1), Nakki (1), Udhagamadalam (1), Kodaikanal (1), Yercaud (1), Lakshminarayan Baridigh (1), Rudrasagar (1), Ramgarh-UttarPradesh (1), Naini (1), Rabindrasarovar (1), Nalsarovar (1), Bindusaraovar (1), Sahastrling Sarovar (1), Lakhota Talav (1), Narsimehta Talav (1), Nadiad city Lake (1), Ranjitnagar Talav (1), Ankleshwar reservoir(1), Dharoi dam(1), Kuwadava(1),Moticher lake(1), Mayem lake(1), Janunia talav(1), Yashwant sagar(1), Sirpur talav(1), Kali sindh reservoir(1), Periat tank(1), Shahpura (1), Madhav lake(1), Nagchun(1), Karwa dam(1), Khandari reservoir(1), Daloni Beel(1), Mer Beel(1), Govindgarh tank(1), Bilawali talav(1), Bhoothathankettu reservoir(1), Dimna lake(1), Edamalayar reservoir(1), Hazaribagh Meethajheel(1), Kondacharala- aava lake(1), Laxminarayan Chevuru(1), Malampuzha reservoir(1), Miralam lake(1), Noor Md. Kunta(1), Pazhassi reservoir(1), Ranchi lake(1), Topchachi lake(1), Vembanadu lake(1), Chilka lake(1), Anshupa lake(1)	**151**
Tanks (9) **Dharamsagar (1), Bibinagar (1), Kistrapetrareddy (1), Goysagar (1), Thol (1), Gandigudem(1), Kajipally Tank(1), Mallapur Tank(1), Premajipet Tank(1)**	
Ponds (41) Elangabeel System (1), Lakshadweep (1), Olpad village pond (1),Bishnu Pushkar pukhuri(1), Bor Beel(1), Bor pukhuri(1), Botodriva pond(1), Chand dubi Beel(1), Deepar Beel(1), Dighali pukhuri(1), Dhudia talav(1), Baskandi pond(1), Galabeel(1), Ganga pukhuri(1), Gaurisagar(1), Gopur tank(1), Padum pukhuri(1), Hordai pukhuri(1), Jaipal pukhuri(1), Mahamaya mandir pukhuri(1), Rajadinia pukhuri(1), Raja pukhuri(1), Rajmaw pukhuri(1), Saranbeel(1), Sivasagar tank(1), Subhagya kund(1),Sai Chevuru(1), Asani Kunta(1), Durgam Chevuru(1), Pedda Chevuru(1), Nalla Chevuru(1), Bhadrakali Chevuru(1), Shiv Ganga Pond(1), Padmanabha Swamy Temple Pond(1), Bindusagar(1), Narendra pokhari(1), Markanda pokhari(1), Indradyumna (1), Swetaganga(1), Parvatisagar(1)	
Creeks, Canals and Drains Creeks (8),Sea Water(7), Agra Canal (1), Gurgaon Canal (1), Western Yamuna Canal (11), Agartala Canal (1), Cuncolim canal (2), Panoli canal (1), Narmada canal (1), Cumbarjua canal (1), Samarla Kota Canal (1), Tulje Bagh Canal (1), Drains (18)	**54**
Groundwater	**411**
Total	**1429**

G-GEMS - *Global Environmental Monitoring System*
M-MINARS - *Monitoring of Indian National Aquatic Resources*
YAP - *Yamuna Action Plan*

1.4 Approach to Water Quality Management

The water quality management in India is accomplished under the provision of Water (Prevention and Control of Pollution) Act, 1974. The basic objective of this Act is to maintain and restore the wholesomeness of national aquatic resources by prevention and control of pollution.It was considered ambitious to maintain or restore all natural water body at pristine level. Planning pollution control activities to attain such a goal is bound to be deterrent to developmental activities and cost prohibitive. Since the natural water bodies have got to be used for various competing as well as conflicting demands, the objective is aimed at restoring and/or maintaining natural water bodies or their parts to such a quality as needed for their best uses. Thus, a concept of "designated best use" (DBU) was developed. According to this concept, out of several uses a water body is put to, the use which demands highest quality of water is termed as "designated best use", and accordingly the water body is designated. Primary water quality criteria for different uses have been identified. A summary of the use based classification system is presented in table 1.6.

Table-1.6 Use based classification of surface waters in India

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	1. Total Coliforms OrganismMPN/100ml shall be 50 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 6mg/l or more 4. Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organised)	B	1. Total Coliforms Organism MPN/100ml shall be 500 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 5mg/l or more 4. Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	1.Total Coliforms Organism MPN/100ml shall be 5000 or less 2. pH between 6 to 9 3. Dissolved Oxygen 4mg/l or more 4. Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	D	1. pH between 6.5 to 8.5 2. Dissolved Oxygen 4mg/l or more 3. Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	1. pH between 6.0 to 8.5 2. Electrical Conductivity at 25°C micro mhos/cm Max.2250 3. Sodium absorption Ratio Max. 26 4. Boron Max. 2mg/l

The water resources of the country were classified according to their designated best uses and a "Water Use Map" was prepared. For identification of the water bodies or their parts where water quality is at variance with water quality criteria, it was felt important to measure water quality of that water body or its part. It would help in preparation of "Water Quality Map" of India. The idea was to superimpose "Water Quality Map" on "Water Use Map" to identify the water bodies or their parts, which are in need of improvement (restoration). Subsequently through a wide network of water quality monitoring, water quality data are acquired. A large number of water bodies were identified as polluted stretches for taking appropriate measures to restore their water quality. Today almost all policies and programmes on water quality management are based on this concept including the Ganga Action Plan and National River Action Plans.

1.4.1 Water Quality Criteria for Bathing Reaches in River

Water Quality Criteria for bathing reaches in Rivers is notified by Ministry of Environment & Forests (MoEF) and is given in Table 1.7.

Table-1.7 Primary Water Quality Criteria for Bathing

CRITERIA	RATIONALE
1.Faecal Coliform : 500 (desirable) MPN/100ml : 2500 (Maximum Permissible)	To ensure low sewage contamination. Faecal coliform and faecal streptococci are considered as they reflect the bacterial pathogenicity.
2.Faecal Streptococci : 100 (desirable) MPN/100ml : 500 (Maximum Permissible)	The desirable and permissible limits are suggested to allow for fluctuation inenvironmental conditionssuch as seasonal changes, changes in flow conditions etc.
3. pH: Between 6.5-8.5	The range provides protection of the skin and delicate organs like eyes, nose, ears etc. which are directly exposed during outdoor bathing.
5. Dissolved Oxygen: 5 mg/l or more	The minmum dissolved oxygen concentration of 5 mg/l ensures reasonable freedom from oxygen consuming organic pollution immediately U/s which is necessary for preventing production of anaerobic gases (obnoxious gases) from sediments
6. Biochemical Oxygen Demand 3 day, 27°C 3 mg/l or less	The Biochemical Oxygen Demand of 3 mg/l or less of the water ensures reasonable freedom from oxygen demanding pollutants and prevent production of obnoxious gases.

CHAPTER II

Water Quality Trend in India

2.1 Water Quality Trend 2008

The water quality monitoring results obtained during 2008 indicate that the organic and bacterial contamination are continued to be critical in water bodies. This is mainly due to discharge of domestic wastewater mostly in untreated form from the urban centres of the country. The municipal corporations at large are not able to treat the increasing load of municipal sewage flowing into water bodies. Secondly the receiving water bodies also do not have adequate water for dilution. Therefore, the oxygen demand and bacterial pollution is increasing day by day. This is mainly responsible for water borne diseases.

The organic pollution measured in terms of bio-chemical oxygen demand (BOD) & coliform bacterial count gives the indication of extent of water quality degradation in different parts of our country. It is observed that nearly 67% of the observations are having BOD less than 3 mg/l, 18% between 3-6 mg/l & 15% above 6 mg/l. Similarly Total & Faecal coliform which indicate presence of pathogens in water are also a major concern. Nearly 50% observations are having Total Coliforms and 67% observations are having Faecal Coliform less than MPN 500/100 ml; criteria designated for bathing.

2.2 Biochemical Oxygen Demand (BOD)

The numbers of observed BOD values less than 3 mg/l were between 57-69% during year 1995 to 2008. The maximum value of 69% was observed during 2007. It was observed that there was a gradual decrease in number of observations having BOD<3.

The number of observed BOD values ranges from 3-6 mg/l was between 17-28% during year 1995 to 2008, the maximum value of 28% was observed in the year 1998. It was observed that the number of observations remain unchanged and followed constant trend in percentage of observations having BOD between 3-6 mg/l.

The numbers of observed BOD value> 6 mg/l were between 13 and 19% during year 1995-2008 and the maximum value of 19% was observed in the year 2001

and 2002. It was observed that there was a gradual decrease and in 2008 the percentage observation was 15 % having BOD>6.

2.3 Total Coliform (TC)

The numbers of observed TC values < 500 MPN/100 ml were between 44-63% during 1995-2008. The highest percentage of observations was observed as 63% in year 1999 which decreases to 50% during 2008.

The numbers of observed TC values ranges from 500-5000 were between 28-37% during year 1995-2008 the maximum value of 37% was observed in 1997 and this % was decreased to 34% in 2008.

The numbers of observed TC values > 5000 were between 9-24% during year 1995-2008. Minimum value of 9% was observed during the year 1999. The maximum value of 24% was observed in the year 2006. During 2008 it was observed as 16%, indicating decreasing trend.

2.4 Faecal Coliform (FC)

The numbers of observed FC values <500 MPN/100 ml was between 48-67% during year 1995-2008. The maximum value of 67% was observed in the year 1998 and similar trend is followed in 2008.

The numbers of observed FC values ranges from 500-5000 MPN/100 ml was between 22-35% during year 1995 to 2008. The maximum value of 35% was observed in the year 1999, which decreases to 20% in the year 2008.

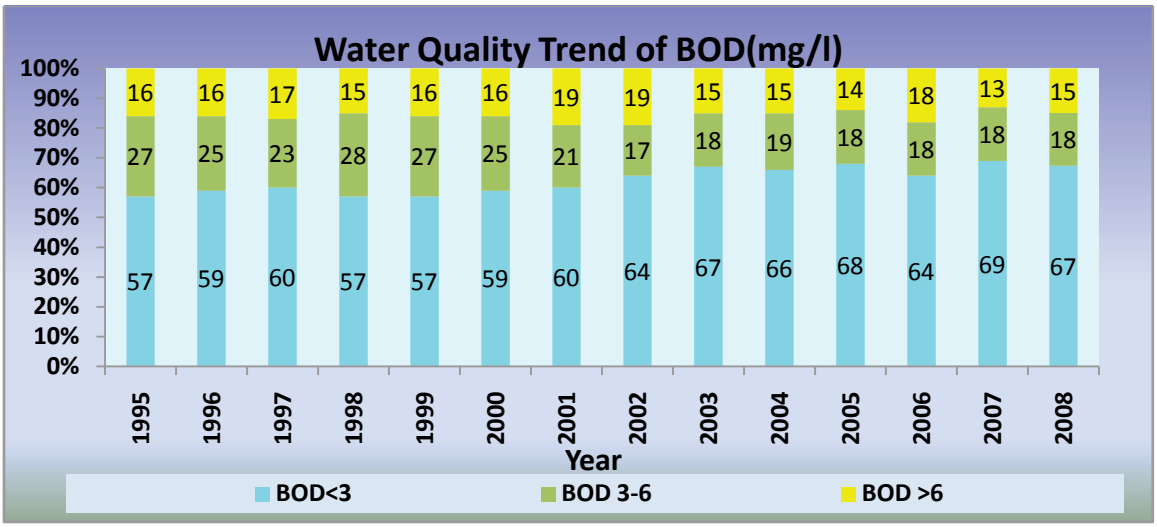
The numbers of observed FC values > 5000 MPN/100 ml was between 7-21% during year 1995-2008. The maximum value of 21% was observed in 2006, which gradually decreases to 11% in the year 2007 and again increased to 13% in 2008.

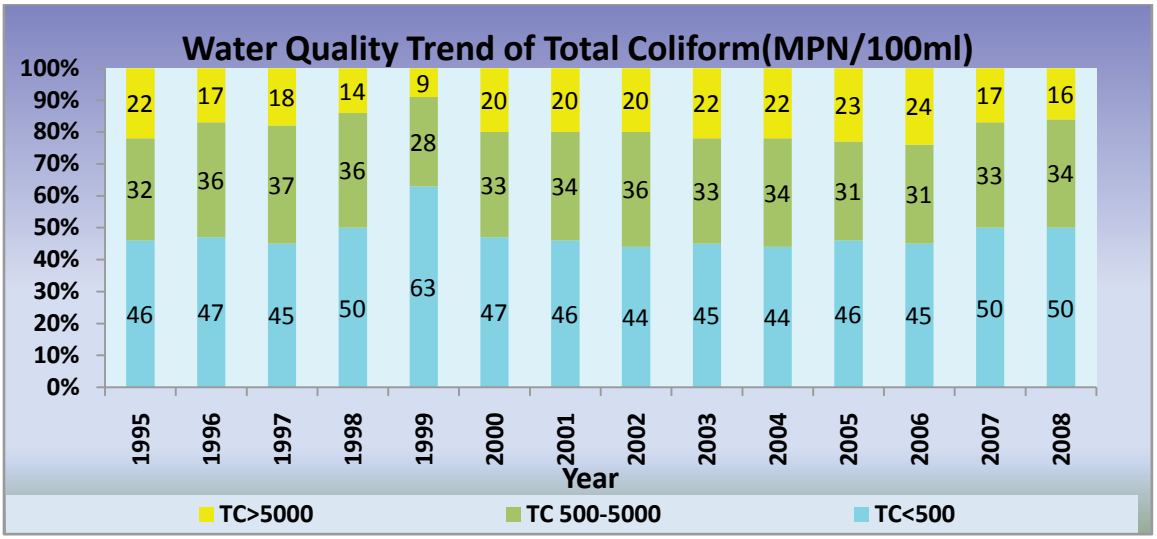
2.5 Water Quality Trend (1995 -2008)

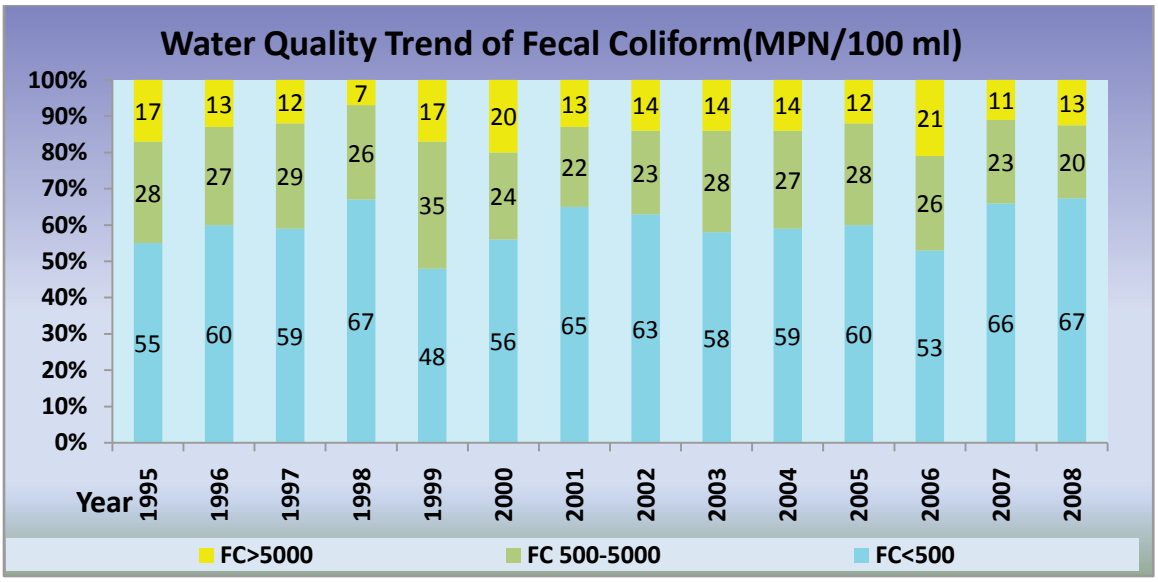
The water quality monitoring results were analysed with respect to indicator of oxygen consuming substances (Bio-chemical Oxygen Demand) and indicator of pathogenic bacteria (Total coliform and Faecal coliform).The result of such analysis shows that the trend of water quality remains constant with some fluctuation. This

clarifies that the number of observations have more than 6 mg/l, 3-6 mg/l and < 3 mg/l are more or less same. So in the case of total coliform and pathogens the number of observations having BOD < 3 mg/l and Coliform density < 500 MPN/100ml has increased during 1995 to 2008. The water quality status for the period 1995 to 2008 in terms of number of observations in percentage having values of parameters in different ranges is given in the figure 2.1.

Figure 2.1: Water Quality Trend of BOD (mg/l), Total Coliform (MPN/100ml) & Fecal Colliform (MPN/100 ml)







2.6 Water Quality trend of BOD in Rivers

The Water Quality trend of BOD in River Ganga, Yamuna, Sabarmati, Mahi, Tapi, Narmada, Godavari, Krishna, Cauvery, Mahanadi, Brahmani, Baitarni, Subarnarekha, Brahmaputra, Satluj, Beas, Pennar and Ghaggar depicting the data from 2002 to 2008 is presented in figure 2.2 to 2.19.

Figure 2.2: Water Quality Trend of BOD in River Ganga

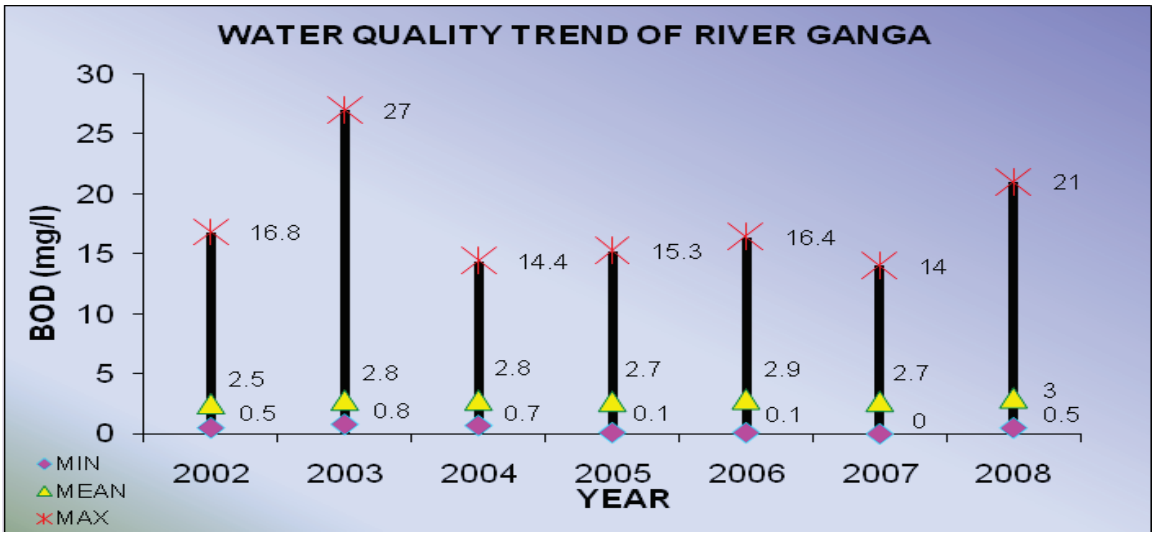


Figure 2.3: Water Quality Trend of BOD in River Yamuna

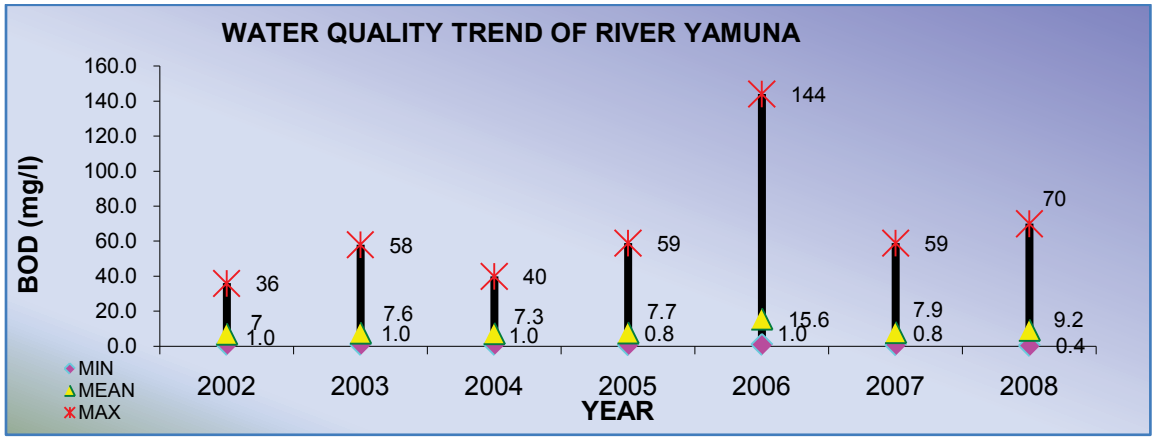


Figure 2.4: Water Quality Trend of BOD in River Sabarmati

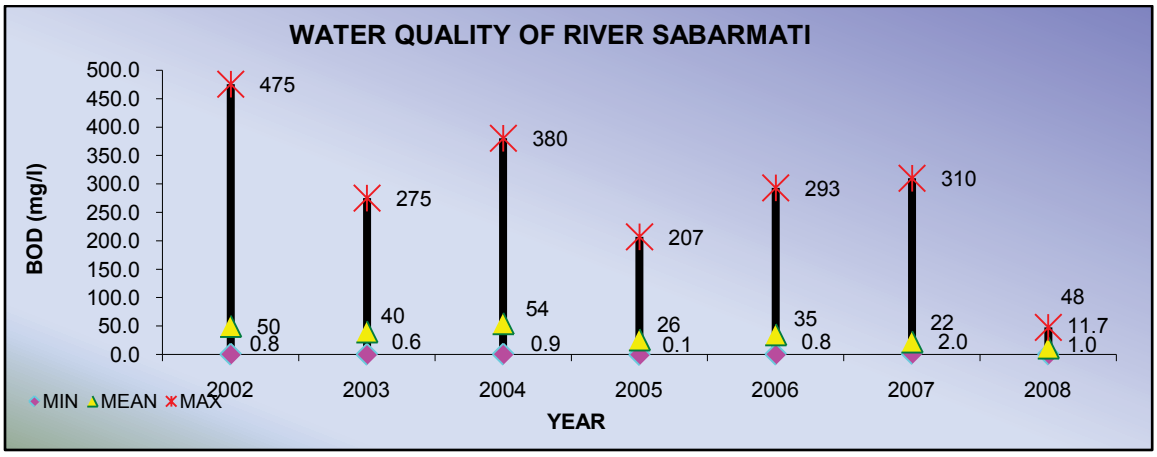


Figure2.5: Water Quality Trend of BOD in River Mahi

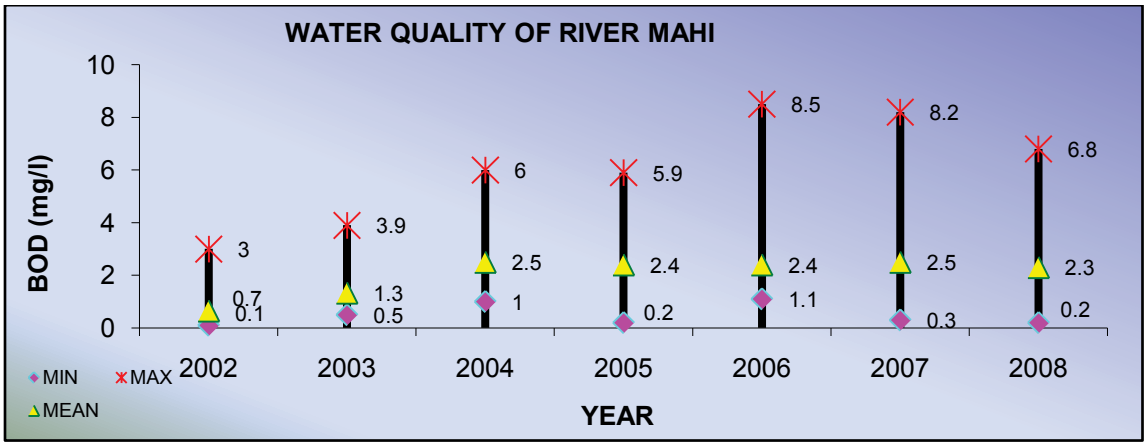


Figure 2.6: Water Quality Trend of BOD in River Tapi

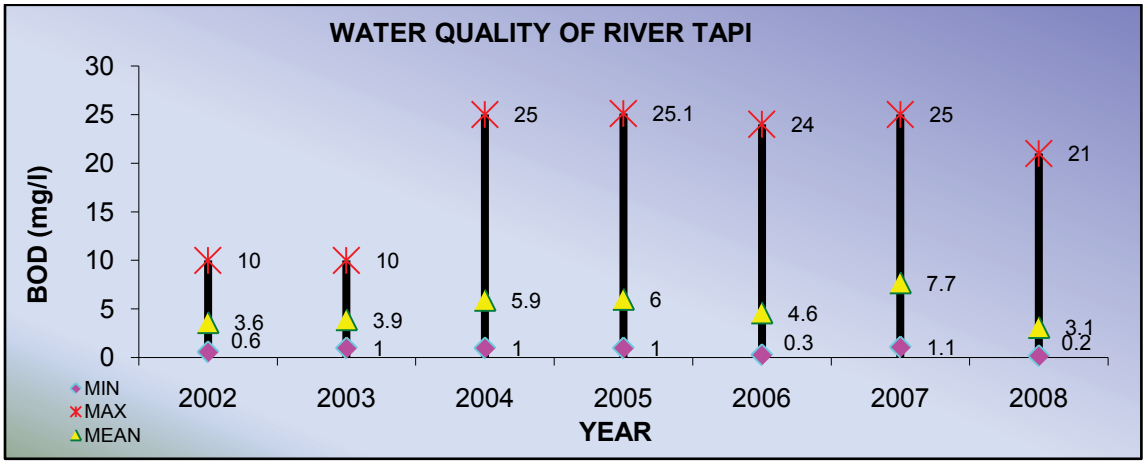


Figure 2.7: Water Quality Trend of BOD in River Narmada

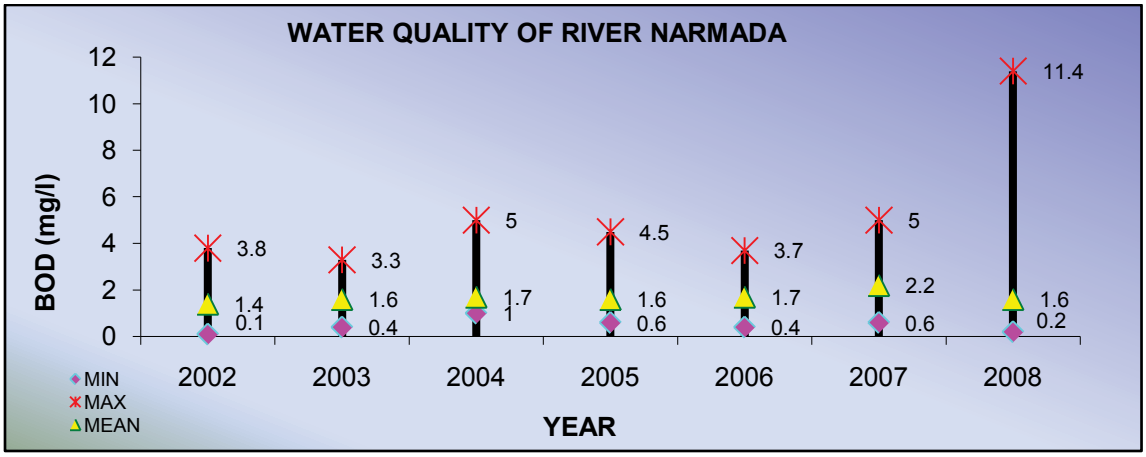


Figure 2.8: Water Quality Trend of BOD in River Godavari

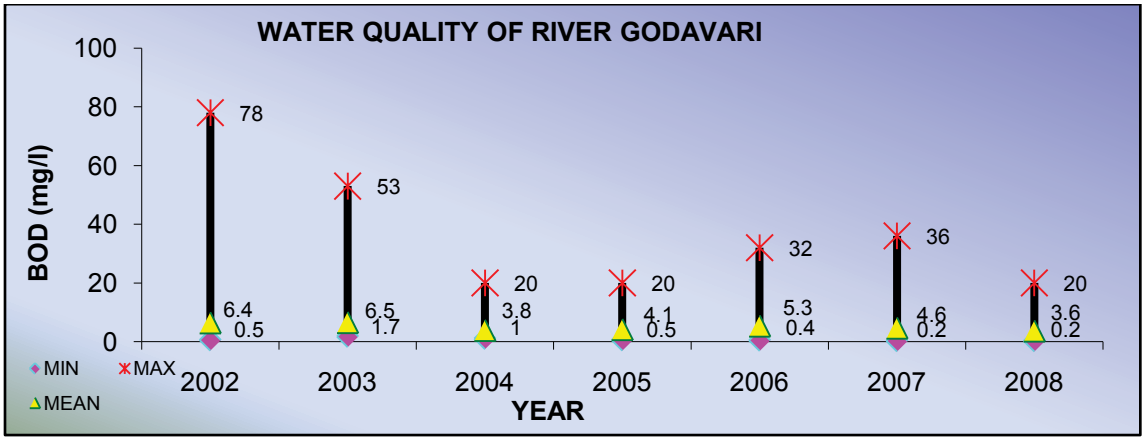


Figure 2.9: Water Quality Trend of BOD in River Krishna

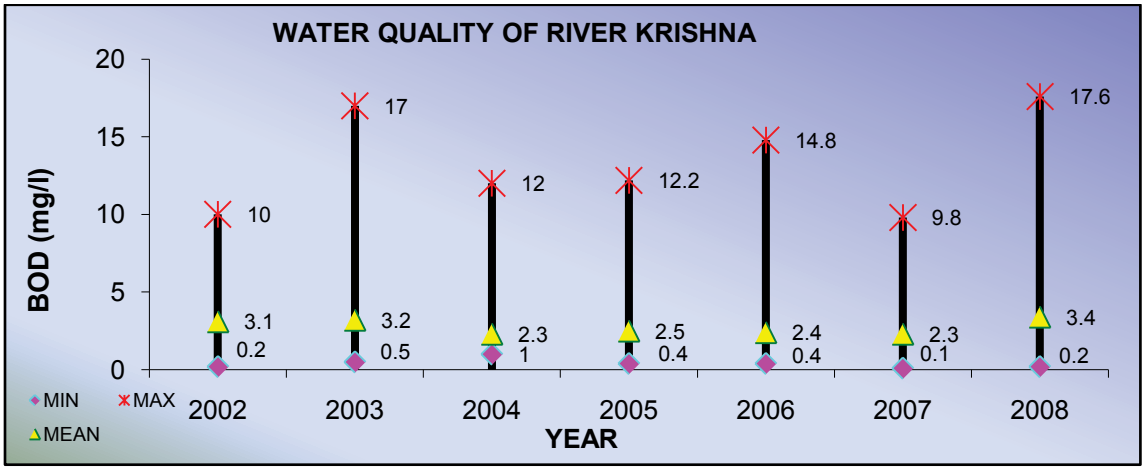


Figure 2.10: Water Quality Trend of BOD in River Cauvery

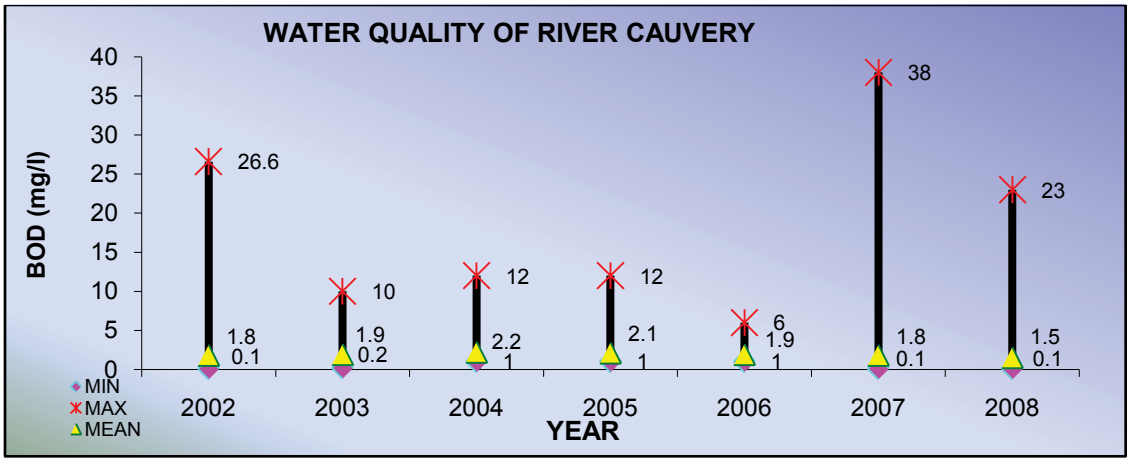


Figure 2.11: Water Quality Trend of BOD in River Mahanadi

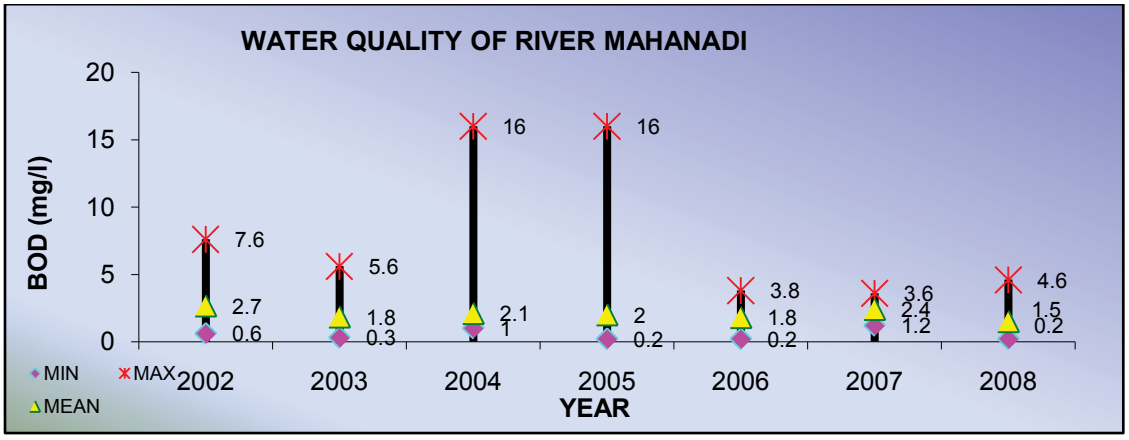


Figure 2.12: Water Quality Trend of BOD in River Brahmani

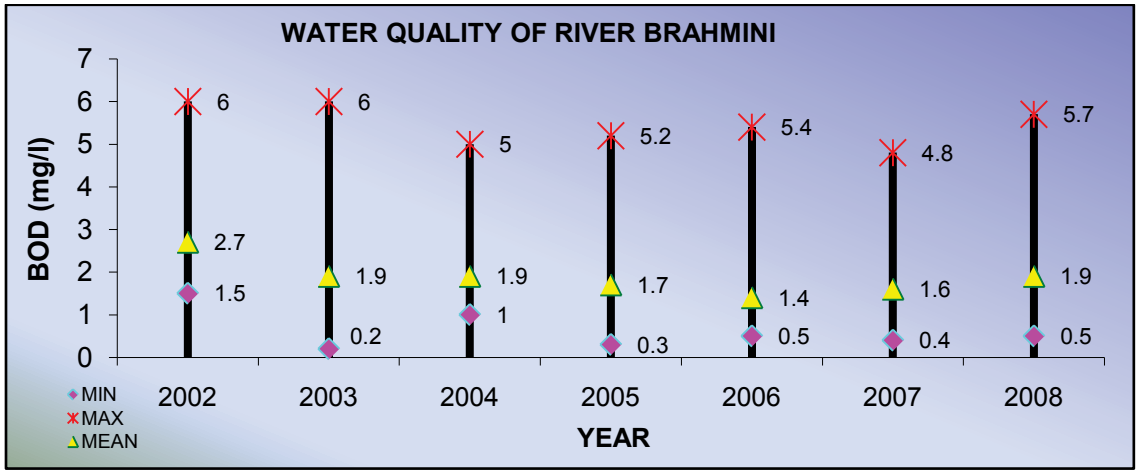


Figure 2.13: Water Quality Trend of BOD in River Baitarni

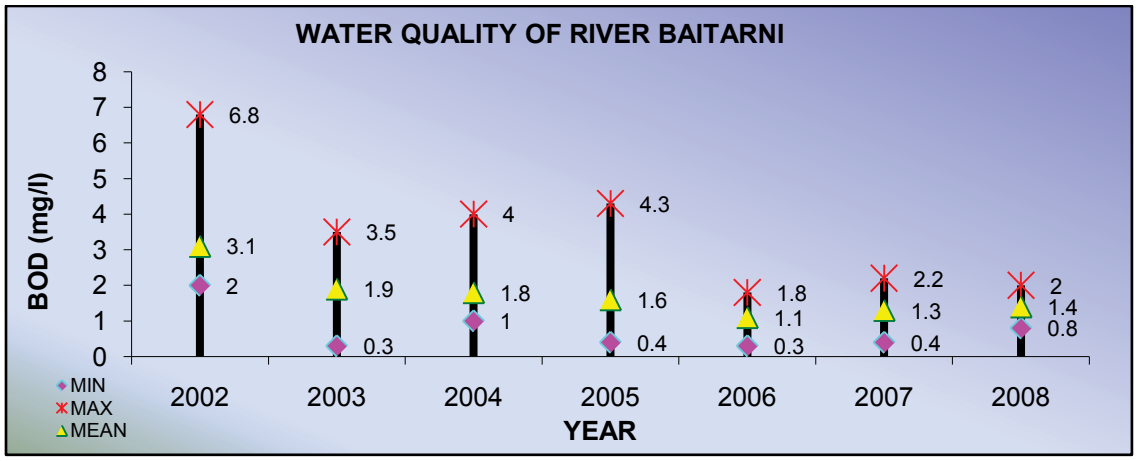


Figure 2.14: Water Quality Trend of BOD in River Subarnarekha

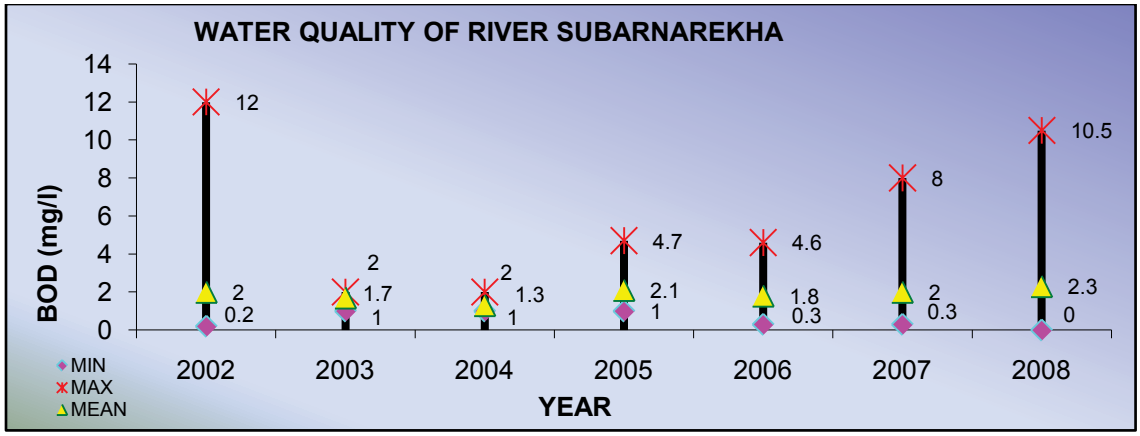


Figure 2.15: Water Quality Trend of BOD in River Brahmaputra

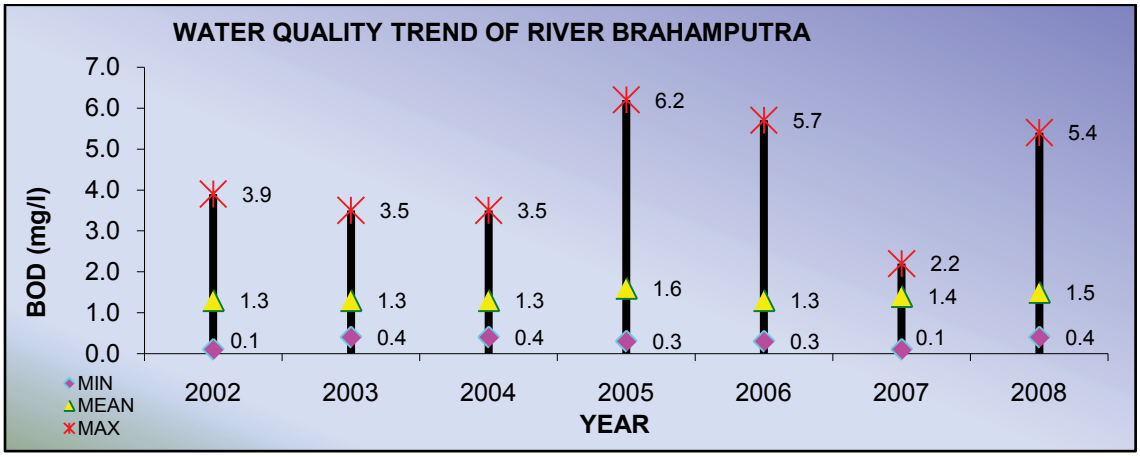


Figure 2.16: Water Quality Trend of BOD in River Satluj

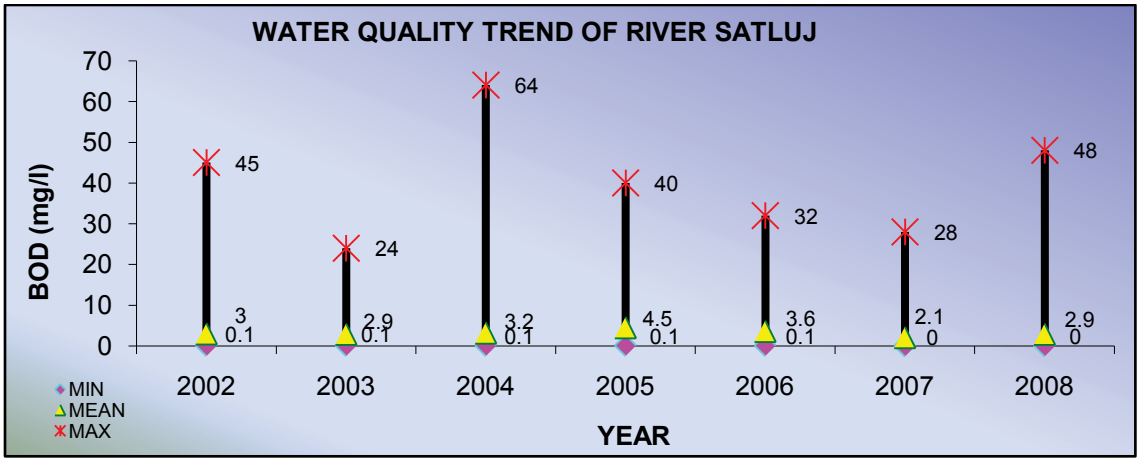


Figure 2.17: Water Quality Trend of BOD in River Beas

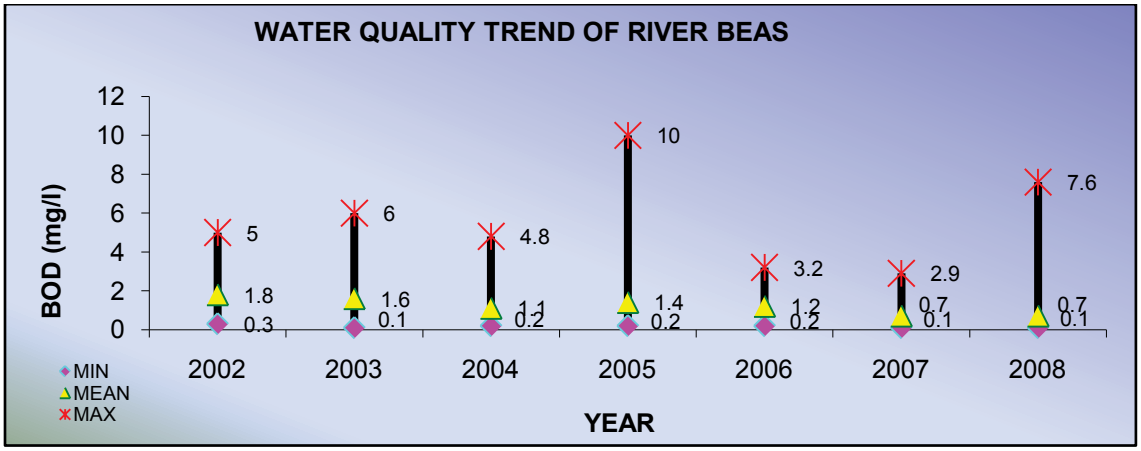


Figure 2.18: Water Quality Trend of BOD in River Pennar

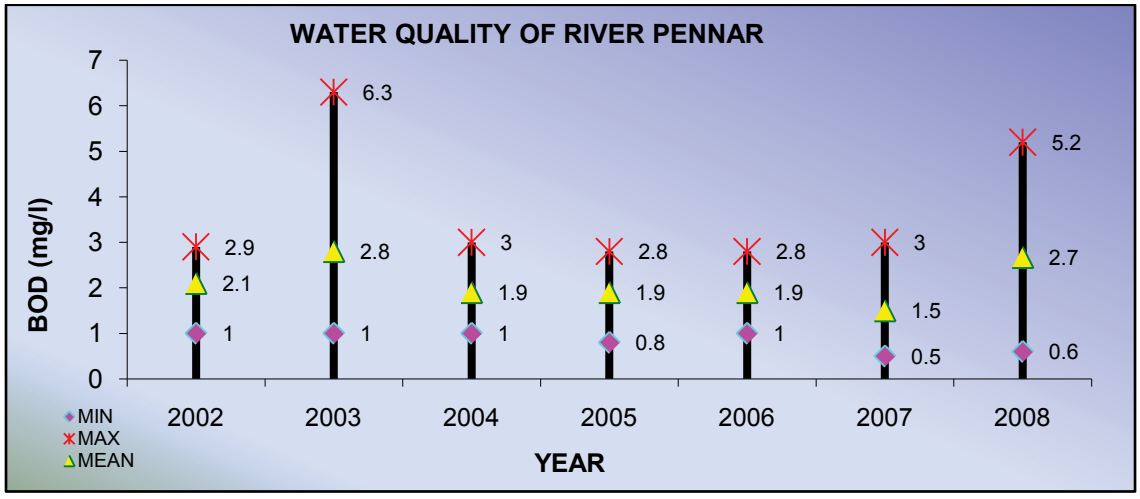
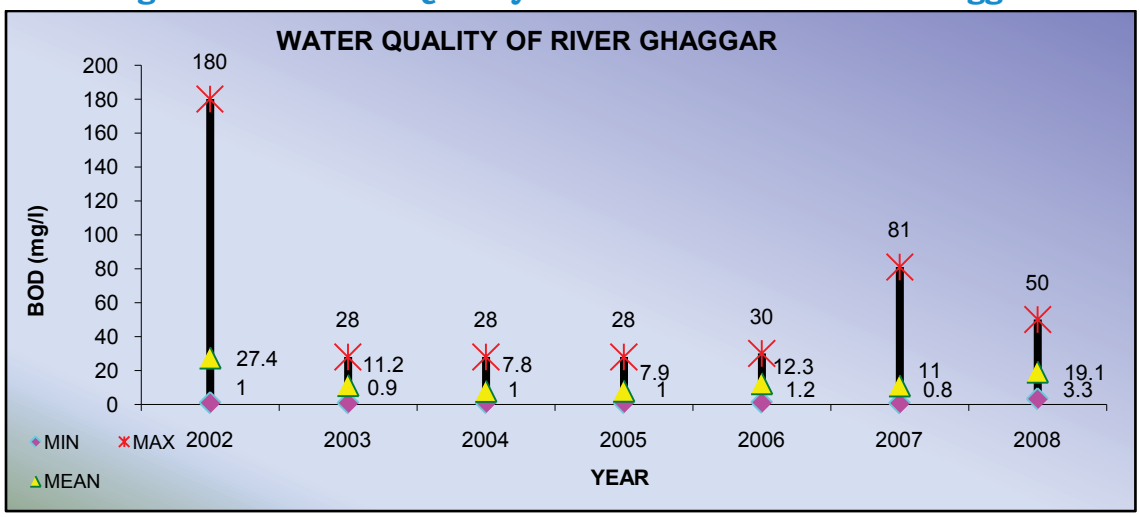


Figure 2.19: Water Quality Trend of BOD in River Ghaggar



CHAPTER III

Water Quality of Rivers at a Glance

3.1 Observed Water Quality

The monitoring results obtained during 2008 under National Water Quality Monitoring Programme reflect that organic matter & bacterial population of Faecal origin continue to dominate the water pollution problem in India. The major water quality concerns as revealed from the monitoring results are pathogenic pollution as reflected through indicators i.e. Total Coliforms (TC) & Faecal Coliform (FC), organic matter as reflected through Biochemical Oxygen Demand (BOD) and salinity as reflected through conductivity. The observed range of water quality parameters in major Indian rivers for the year 2008 along with summary for the year 2002, 2003, 2004, 2005, 2006 and 2007 is given in Table 3.1 for comparative assessment of water quality trend between the years. A brief overview of these pollution related parameters is provided below.

3.2 Organic and Pathogenic Pollution

The Organic pollution as measured through Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) is considerably high; water bodies are saprobic and eutrophicated near large urban centres due to the discharge of partly treated or untreated wastewater. This results in depletion of oxygen in these stretches of water bodies. The rivers and lakes in hilly part of the country are not affected significantly by such pollution, as there are no large urban centres. Although, high BOD is associated with low Dissolved Oxygen (DO), but many times the DO measurement does not reflect such conclusion due to the fact that the DO is measured during daytime when the photosynthetic effects are prominent. In such stretches of water bodies, the diurnal variation in dissolved oxygen is quite large. The dissolved oxygen during daytime increases to super saturation level (sometimes as high as 300% saturation) whereas at night at the same place the dissolved oxygen goes as low as zero mg/l. The pathogenic pollution is one of the major causes for water borne disease. The majority of surface water monitoring locations are found contaminated with high levels of Faecal Coliform bacteria, which are indicators of pathogenic pollution.

The water quality of major rivers varied widely with respect to DO, BOD, Total Coliform (TC) and Faecal Coliform (FC). The level of DO is observed more than 4 mg/l in River Narmada, Brahmani, Baitarni and Subarnarekha throughout the year to sustain aquatic life whereas, the values less than 4 mg/l are observed in

stretches of river Kalinadi (E), Kalinadi (W), Yamuna, Mula, Mithi, Khan, Sabarmati, Amlakhadi, Indrayani, Mula Mutha, Mutha, Hindon, Musi, Karmana, Dhadar, Ulhas & Bhatsa (0.0 mg/l); Pawana (0.3 mg/l); Manjira, Kadambayar & Markanda (0.4 mg/l); Bhima & Cauvery (0.6 mg/l); Khari & Lakshmantirtha (0.7 mg/l); Mahanadi & Gomti (0.8 mg/l); Mindhola (1 mg/l); Krishna (1.1 mg/l); Godavari , Damanganga & Ghaggar (1.2 mg/l); Ganga & Satluj (1.6 mg/l); Koyna (1.7 mg/l); Kabbani (1.8 mg/l); Irumpanam & Ayroor (1.9 mg/l); Tapi (2.1 mg/l); Sukhna (2.2 mg/l); Korayar (2.3 mg/l); Dhansiri (2.4 mg/l); Nambul & Churni (2.5 mg/l); Betwa (2.7 mg/l); Nira (Krishna) & Kshipra (2.8 mg/l), Bhogavo (3.1 mg/l); Dzu & Chambal (3.2 mg/l); Brahmaputra (3.3 mg/l); Rushikulya, Kolak & Pamba (3.4 mg/l); Kundalika & Sai (3.5 mg/l); Digboi & Mapusa (3.6 mg/l); Shedi (3.7 mg/l); Beas (3.8 mg/l); Panchaganga & Bhadra (3.9 mg/l) and at few locations D/s of urban settlements due to discharge of untreated/partially treated municipal wastewater, which is responsible for high oxygen demand.

Very high values of Biochemical Oxygen Demand (BOD) are observed in rivers Markanda (590 mg/l), Kalinadi (W) (364 mg/l); Kalinadi (E) (183 mg/l); Yamuna (70 mg/l); Nakkavagu, Mula, Mithi, Khan, Bhogavo, Kundalika & Ghaggar (50 mg/l); Sabarmati (48 mg/l); Amlakhadi (46 mg/l); Bhima (40 mg /l); Indrayani, Pawana, Mula-Mutha & Hindon (36 mg/l); Koyna (35.5 mg/l); Musi (34 mg/l); Mutha (32 mg/l); Bharalu (31.5 mg/l); Damanganga (30 mg/l); Nambul (26 mg/l); Cauvery (23 mg/l); Nira (Krishna) (21.2 mg/l); Tapi & Ganga (21 mg/l); Godavari (20 mg/l); Satluj (18 mg/l); Shedi (19 mg/l); Krishna (17.6 mg/l); Manjira & Ramganga (16 mg/l); Gomti (14 mg/l); Wardha (13 mg/l); Venna, Chandrabhaga, Kolak & Mindhola (12 mg/l); Nira (Godavari) (11.8 mg/l); Narmada (11.4 mg/l); Karamana (11mg/l); Subarnarekha & Wainganga (10.5 mg/l); Purna (Tapi) (10.2 mg/l); Girna (10 mg/l); Kanhan (9.8 mg/l); Dhadar, Patalganga & Khari (9 mg/l); Purna (Godavari) (8.8 mg/l); Rangavalli (8.4 mg/l); Deepar Bill (8.2 mg/l); Kshipra (8 mg/l); Bhavani & Beas(7.6 mg/l); Ulhas & Kalu (7.5 mg/l); Burhidihing, Kolar, Kali-Karnataka & Kharkhala (7 mg/l); Betwa, Damodar & Mahi (6.8 mg/l); Kathajodi, Chambal & Sankh (Brahmani) (6.2 mg/l); Maner (6.1 mg/l). The relatively low values of BOD are measured in river(s) Brahmaputra, Mahanadi, Pennar, Baitarni and Brahmani.

In respect of Total Coliform and Faecal Coliform Numbers, River Kalinadi (E) is leading with highest count of $14X10^7$ MPN/100 ml and $51X10^4$ MPN/100 ml respectively followed by Yamuna ($103X10^6$ MPN/100 ml and $109X10^5$ MPN/100 ml), Kalinadi (W) ($67X10^6$ MPN/100 ml and $24X10^5$ MPN/100 ml), Alaknanda ($101X10^5$ MPN/100 ml and $65X10^3$ MPN/100 ml), Mandakini ($51X10^5$ MPN/100

ml and 48X10^3 MPN/100 ml), Hindon (44X10^5 MPN/100 ml and 78X10^4 MPN/100 ml), Tons (H.P.) (39X10^5 MPN/100 ml and 43 X10^4 MPN/100 ml), Ghaggar (25X10^5 MPN/100 ml and 7X10^4 MPN/100 ml), Sabarmati (21X10^5 MPN/100 ml and 15X10^2 MPN/100 ml), Kathajodi (16X10^5 MPN/100 ml and 16X10^4 MPN/100 ml), Ganga (14X10^5 MPN/100 ml and 85X10^4 MPN/100 ml), Mindhola (11X10^5 MPN/100 ml and 46X10^{4}MPN/100 ml),Chambal (88X10^4 MPN/100 ml and 36X10^3 MPN/100 ml), Damodar (7X10^5 MPN/100 ml and 35X10^4 MPN/100 ml), Bhagirathi (47X10^4 MPN/100 ml and 2800 MPN/100 ml), Baleshwar Khadi (46X10^4 MPN/100 ml and 21X10^4 MPN/100 ml), Tapi (46X10^4 MPN/100 ml and 24X10^4 MPN/100 ml), Mahananda (3X10^5 MPN/100 ml and 11X10^4 MPN/100 ml), Brahmaputra (24X10^4 MPN/100 ml and 24X10^3 MPN/100 ml), Purna (24X10^4 MPN/100 ml and 93X10^3 MPN/100 ml), Ambika (21X10^4 MPN/100 ml and 15X10^4 MPN/100 ml), Gomti (17X10^4 MPN/100 ml and 14X10^4 MPN/100 ml), Mahanadi (16X10^4 MPN/100 ml and 54X10^3 MPN/100 ml), Barakar (16X10^4 MPN/100 ml and 17X10^3 MPN/100 ml), Bhima (16X10^4 MPN/100 ml and 9X10^4 MPN/100 ml), Rupnarayan (16X10^4 MPN/100 ml and 105X10^3 MPN/100 ml), Churni (14X10^4 MPN/100 ml and 7X10^4 MPN/100 ml), Teesta (13X10^4 MPN/100 ml and 8X10^4 MPN/100 ml), Bharalu (11X10^4 MPN/100 ml and 24X10^3 MPN/100 ml), Tungabhadra (92 X10^3 MPN/100 ml and 54 X10^3 MPN/100 ml), Ramganga (75 X10^3 MPN/100 ml and 15 X10^3 MPN/100 ml), Karmana (56X10^3 MPN/100 ml and 44X10^3 MPN/100 ml), Kim (46 X10^3 MPN/100 ml and 24 X10^3 MPN/100 ml), Kaveri (46X10^3 MPN/100 ml and 93X10^2 MPN/100 ml), Khari (43X10^3 MPN/100 ml and 23X10^3 MPN/100 ml), Kagina (3X10^4 MPN/100 ml and 9X10^3 MPN/100 ml), Godavari (28X10^3 MPN/100 ml and 800 MPN/100 ml), Nagavalli (24X10^3 MPN/100 ml and 600 MPN/100 ml), Kuakhai (22X10^3 MPN/100 ml and 13X10^3 MPN/100 ml), Musi (21X10^3 MPN/100 ml and 220 MPN/100 ml), Brahmani (21X10^3 MPN/100 ml and 14X10^3 MPN/100 ml), Satluj (2X10^4 MPN/100 ml and 3X10^3 MPN/100 ml), Krishna (16X10^3 MPN/100 ml and 3000 MPN/100 ml), Manas (15X10^3 MPN/100 ml and 1500 MPN/100 ml), Amlakhadi (9X10^3 MPN/100 ml and 3X10^3 MPN/100 ml), Manjira (9X10^3 MPN/100 ml and 2400 MPN/100 ml), Malprabha (9X10^3 MPN/100 ml and 900 MPN/100 ml), Daha (9X10^3 MPN/100 ml and 2400 MPN/100 ml), Saryu (7100 MPN/100 ml and 4700 MPN/100 ml), Rihand (7X10^3 MPN/100 ml and 3X10^3 MPN/100 ml), Bicholim (5400 MPN/100 ml and 1300 MPN/100 m), Baitarni (5400 MPN/100 ml and 3500 MPN/100 ml), Periyar (5240 MPN/100 ml and 1100 MPN/100 ml) and Kadambyar (5200 MPN/100 ml and 2080 MPN/100 ml) at certain other locations. The river Mahi, Subarnarekha, Pennar, Beas, Cauvery and Narmada are relatively clean rivers as the number of Total Coliform and Faecal Coliform count are relatively less than 4300 MPN/100 ml and 1700 MPN/100 ml respectively.

3.3 Other parameters

The results of conductivity measurement revealed that it is conforming to the irrigation requirement in most of the rivers except estuarine parts. The level of conductivity observed in the mainstream of major river basins ranging between 27-68700 µmhos/cm and the higher values are in the estuarine region due to tidal influence. The conductivity values observed as high as 68880 in Thane Creek, 68730 in Mahim Creek, 62430 in Bassein Creek, 56740 in Vashi Creek at Vashi Bridge & 51820 in Vashi Creek at Airoli Bridge whereas in sea water it is observed high at Worli Sea Face (62720 µmhos/cm), Charni Road Choupathy (62500 µmhos/cm), Gateway of India (62270 µmhos/cm) and Varsova (61770 µmhos/cm) in Mumbai region. The hardness varies between 6-1000 mg/L in most of the rivers in the freshwater zones and the highest value is observed in river Godavari at Polavaram. Total Alkalinity ranges between 0-1820 mg/L and the highest value is observed in River Markanda. The observed range of Boron in surface waters is 0.01-8.0 mg/l with a highest value in River Lilong in Manipur. The concentration of Fluoride observed is 0.01-1.9 mg/L during the year and the higher value is observed in River Musi in Andhra Pradesh.

3.4 Groundwater Quality

- **Andhra Pradesh** -Conductivity varies from 164 to 4700 µmhos/cm. Except few locations, conductivity is meeting the criteria limit for drinking as well as irrigation purposes. The highest value of nitrate is observed in Open well near Rama Temple, Mindi, Visakhapatnam (55.5 mg/l).

- **Assam, Meghalaya, Mizoram and Tripura-** Conductivity varies from 20-3940 µmhos/cm and is meeting the criteria limit for drinking as well as irrigation purposes at majority of monitoring locations. The concentration of Nitrate (NO_3^-) is observed in the range of 0.03-11.8 mg/l.

- **Chattisgarh and Madhya Pradesh-** Conductivity varies from 82 - 4772 µmhos/cm whereas the concentration of Nitrate (NO_3^-) is observed in the range of 0.1- 50 mg/l and the highest value is observed at Bilaspur region in Chattisgarh.

- **Himachal Pradesh, Chandigarh and Punjab-** Conductivity varies from 180 - 1750 µmhos/cm and the level of Nitrate (NO_3^-) is observed in the range of 1.6 - 19 mg/l.

- **Kerala-** Conductivity varies from 50 - 952 µmhos/cm and is meeting the criteria limit for drinking as well as irrigation purposes. The concentration of Nitrate (NO_3^-) is observed in the range of 0.1-16 mg/l.

- **Orissa-** Conductivity varies from 91-1147 µmhos/cm. The concentration of Nitrate (NO_3^-) is observed in the range of 0.2- 35.2 mg/l.

- **Pondicherry and Tamil Nadu-** Conductivity varies from 159-2240 µmhos/cm and the higher values are due to sea water ingress in coastal tract. Nitrate is observed in the range of 0.1-12.9 mg/l.

- **Daman, Maharashtra and Gujarat**- Conductivity varies from 331 - 11490 µmhos/cm and higher values are attributed to concentrated industrial activities. The concentration of Nitrate is observed in the range of 0.1-82.6 mg/l. The highest value of nitrate is observed in Well at Somnath Industrial Estate, Daman.

- **Rajasthan-** The conductivity varies from 560 - 31000 µmhos/cm and the salinity is attributed to saline soils. The concentration of Nitrate (NO_3^-) is observed in the range of 0.1- 21.7 mg/l.

- **Uttar Pradesh and Uttarakhand-** Conductivity varies from 152 - 6550 µmhos/cm whereas the concentration of Nitrate (NO_3^-) is observed in the range of 3.2 - 11.4mg/l.

- **Bihar-**Conductivity varies from 352-954 µmhos/cm whereas the concentration of Nitrate (NO_3^-) is observed in the range of 0.1- 2.1 mg/l.

- **West Bengal-** Conductivity varies from 133-2470 µmhos/cm and the higher concentrations are in the vicinity of estuarine zone. The concentration of Nitrate (NO_3^-) is observed in the range of 0.1- 11.1 mg/l.

Table 3.1: Water Quality in Indian Rivers during the years – 2002, 2003, 2004, 2005, 2006, 2007 and 2008.

Name of the River	Length (Km)	No of Monitoring locations	Year	Observed Range of Water Quality Parameters							
				Temp. (°C)	pH	Conductivity (μmhos/cm)	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
Ganga	2525	34	2002	3-34	6.4-9.0	19-2720	2.7-11.5	0.5 – 16.8	1-30	300-25x10^5	**20-11x10^5**
		34	2003	4-34	6.8-8.9	49-1323	4-11	0.8-27	2-47.2	47-45x10^5	**26-12x10^5**
		34	2004	5-35	7-8.8	72-4080	0.3-13.2	0.7-14.4	-	11-45x10^5	**11-7x10^5**
		39	2005	4-39	6.1-9	23-1696	3.2-12.8	0.1-15.2	1.0-37.6	13-45x10^5	**13-11x10^5**
		39	2006	9-33	7.0-8.88	97-5620	2.2-11.9	0.1-16.4	4-38.4	1-25x10^5	**17-11x10^5**
		39	2007	4-33	6.1-8.8	23-5040	1.4-11	0-14	2.6-30	0-28x10^5	**0-7 x10^5**
		39	**2008**	2.5-35.5	6.1-8.9	39-6320	1.2 - 11.6	0.5-21.0	1-34	0- 101 x10^5	**0 - 85 x10^4**
Yamuna	1376	23	2002	3-34	6.7-9.8	56-1959	0.1-22.7	1.0 – 36	1-112	27-26.3x10^6	**11-17.2x10^5**
		23	2003	2-38	6.6-10	45-3500	0.3-22.8	1-58	1-187	110-171x10^7	**40-203x10^6**
		23	2004	7-35	6.8-9	76-2150	0.3-19.5	1-40	-	21-1103x10^6	**18-62x10^6**
		23	2005	11-37	6.8-9.1	90-2290	0.5-17.3	0.8-59	1-180	14-307x10^6	**11-52x10^5**
		23	2006	4-34	7.14-9.5	220-1876	1.3-18.8	1.0-144	4-240	7-231x10^7	**2-13x10^6**
		23	2007	6.5-34	5-8.4	57-1940	0-17.7	0-93	1.0-407	0-32 x10^7	**0-23 x10^6**
		23	**2008**	7.5-32	6.8 - 9.5	40-3340	0.0 - 20.6	0.4-70.0	1-224	0 - 103x10^6	**11 -109x10^5**
Sabarmati	371	8	2002	12-32	2.9-8.6	269-13530	0.6-7.9	0.8 – 475	4-1794	210-28x10^5	**28-28x10^5**
		8	2003	22-33	5.6-8.5	278-7270	1.2-9.8	0.6-275	4-803	9-11x10^6	**4-46X10^5**
		8	2004	26-35	6.6-8.8	286-4090	0.7-10.2	0.9-380	-	28-46X10^4	**20-24X10^4**

Name of the River	Length (Km)	No of Monitoring locations	Year	Observed Range of Water Quality Parameters							
				Temp. (°C)	pH	Conductivity (µmhos/cm)	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
		9	2005	24-33	6.4-8.5	154-4290	0.3-11.5	0.1-207	12-95	15-11x10^5	**9-11x10^5**
		9	2006	20-34	6.79-8.67	256-3970	0.2-14.7	0.8-293	9-825	9-110x10^5	**4-11x10^5**
		9	2007	23-29	4.0-7.56	292-2920	0-8.0	2-310	16-203	43-75 x10^3	**15-15 x10^3**
		9	**2008**	22-33	6.9-8.7	191-3200	0-11.8	1-48	4-166	15- 21 x10^5	**4-43 x10^3**
Mahi	583	7	2002	19-34	7.1-9.2	175-5720	0.2-8.5	0.1 – 3.0	9-163	3-2400	**3-75**
		7	2003	18-34	7-8.8	97-750	2.9-10.1	0.5-3.9	7-38	4-2400	**2-28**
		7	2004	20-34	7.4-9.2	166-650	2.7-8.7	0.3-4.9	-	4-1600	**2-28**
		9	2005	20-32	7.5-9	182-7080	4.1-11.1	0.2-5.9	3-18	3-14x10^3	**2-1x10^3**
		9	2006	16-28	7.2-8.9	263-580	7.3-12.1	1.1-8.5	-	3-180	**2-9**
		9	2007	20-31	7.6-8.89	234-3720	0.4-10.7	0.3-5.7	2.5-20	4-160	**0-11**
		9	**2008**	20- 32	7.2-8.9	225-1660	4.6-13	0.2-6.8	7- 14	0-210	**0- 18**
Tapi	724	10	2002	20-40	7.4-9.0	76-700	4.8-8.8	0.6 – 10.0	8-40	40-2100	**2-210**
		10	2003	18-36	3.1-9.2	119-1130	3.1-10.4	1-10	10-44	30-930	**2-230**
		10	2004	13-39	3.1-9.5	190-790	1.2-8.7	0.7-36	-	3-5X10^5	**2-9X10^4**
		13	2005	26-30	7.2-9.4	186-1084	4-8.4	1-25.1	-	2-46X10^4	**2-15X10^4**
		13	2006	14-31	7.7-9.28	161-923	4.6-9.7	0.3-24	5-47	5-11X10^4	**2-11X10^4**
		14	2007	23-39	7.3-8.5	210-581	3.7-8.7	1.1-25	9-36	17-46 x10^3	**7-15 x10^3**
		14	**2008**	19-41	6.6-8.9	132-26000	2.1- 8.8	0.1-21	7-28	0-46 X10^4	**0-24 X10^4**
Narmada	1312	14	2002	-	6.9-9.3	102-1341	5.8-9.8	0.1 – 3.8	6-47	9-2400	**2-64**
		14	2003	12-31	7.1-8.5	95-441	4.5-9.5	0.4-3.3	7-29	4-1600	**1-110**
		14	2004	15-34	7-8.6	181-815	5.5-9.6	0.2-3.8	-	3-2400	**2-15**
		15	2005	21-30	3.3-9	190-1746	4.8-10.9	0.6-4.5	12-18.3	3-2400	**2-210**
		15	2006	9-32	7.1-8.6	188-682	6.2-11	0.4-3.7	3-50	3-2400	**0-39**
		15	2007	19-31	7.5-8.8	244-1629	6.2-10.4	1.2-3.5	3.0-19. 3	7-1600	**0-15**
		21	**2008**	14-32	6.8-10	180-853	4.9- 13	0.2 -11.4	5- 46	0-2400	**0-140**
	1465	11	2002	22-35	7.0-9.0	118-1400	3.1-10.9	0.5 –	3-96	8-5260	**2-3640**

Name of the River	Length (Km)	No of Monitoring locations	Year	Observed Range of Water Quality Parameters							
				Temp. (°C)	pH	Conductivity (µmhos/cm)	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
Godavari								78.0			
		11	2003	22-37	7.1-8.7	115-1350	3.2-9.3	1.7-53	5-188	70-68200	**3-1400**
		11	2004	21-35	6.5-9	86-1290	2.4-9.2	0.2-15	-	4-22 x 10^4	**2-5 x 10^4**
		18	2005	23-32	6.7-9.1	121-1300	0.8-8.7	0.5-20	4.0-80	2-33 x 10^3	**1-10 x 10^3**
		18	2006	19-34	6.65-9.11	75-691	1.1-9.6	1.2-32	3-36	2-31 x 10^3	**2-6 x 10^3**
		18	2007	20-37	5.9-8.9	126-918	3.2-7.5	0.2-36	2-16	0-2200	**5-36 x10^3**
		35	**2008**	13-35	5.2-9.6	114-3994	1.2-11.3	0.2-20	4.0-24	3-28 x10^3	**0-800**
Krishna	1401	17	2002	18-33	6.8-9.5	28-11050	2.9-10.9	0.2 – 10.0	3-88	17-33300	**3-1 x 10^3**
		17	2003	18-35	6.7-8.9	36-40000	0.7-12.6	0.5-17	10.5-68	6-7 x 10^4	**2-2 x 10^4**
		17	2004	18-38	6.7- 9	71-44000	0.4-9.2	0.3-9	-	15-124 x 10^3	**3-28 x 10^3**
		21	2005	24-37	6.5-9.9	69-43300	1.4-8.8	0.4-40	4-44	17-84 x 10^3	**1-34 x 10^3**
		19	2006	15-40	6.32-9.30	76-2580	3.0-8.5	0.4-14.8	4-32.4	4-86 x 10^3	**1-6 x 10^3**
		19	2007	13-38	6.2-9.1	69-23400	3.0-10	0.1-9.8	4.0-48	0-71x10^3	**0-1600**
		22	**2008**	17.3-39	5.8-8.9	44-14290	1.1-9.8	0.2-17.6	4.0-40	8-16 x 10^3	**0-3 x 10^3**
Cauvery	800	20	2002	21-37	2.0-9.2	31-53100	0.1-12.6	0.1 – 26.6	30	39-16 x 10^3	**2-28 x 10^3**
		20	2003	8-34	7-9.2	42-57200	2.1-13.5	0.2-10	16-128	4-22 x 10^3	**2-4 x 10^3**
		20	2004	19- 35	6.6-9	35-39720	3.3-9.9	1-9	-	2-5 x 10^4	**2-17 x 10^3**
		20	2005	20-37	6.2-9.5	28-48700	0.3-9.8	1-12	16-96	2-9500	**1-3 x 10^3**
		20	2006	20-34	7.0-9.3	26-1694	2.7-8.9	1-6	8-24	90-3500	**3-1400**
		20	2007	19-32	6.5-8.8	28-56500	0-12.4	0.1-38	8-45	40-28 x10^3	**4-17 x10^3**
		20	**2008**	20-35	6.5-8.8	27-28700	0.6-14	0.1-23	10-35	27-5400	**0-3500**
Mahanadi	851	16	2002	18-38	7.3-8.9	114-15940	1.3-10.4	1.0 – 7.6	7-39	15-30000	**50-17000**
		16	2003	17-37	6.5-8.6	77-83600	4.7-10.1	0.3-5.6	10-70	4-35X10^3	**50-28X10^3**
		16	2004	17- 34	6.3-8.8	105-20700	4.4- 9.4	0.2-4	-	3-92X10^3	**27-24X10^3**
		21	2005	22-34	6.1-8.7	75-36279	4.5-10	0.2-16	4-150	3-92X10^3	**78-54X10^3**
		21	2006	20-32	6.97-8.9	113-34587	4.7-8.5	0.2-3.8	20-40	14-92X10^3	**68-54X10^3**

Name of the River	Length (Km)	No of Monitoring locations	Year	Observed Range of Water Quality Parameters							
				Temp. (°C)	pH	Conductivity (µmhos/cm)	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
		21	2007	26-33	7.3-8.54	102-813	6.2-8.9	1.2-3.6	2.8-30	27-35 x10^3	**700-17 x10^3**
		22	**2008**	18-36	6.7-8.8	109-29400	0.8-8.9	0.2-4.6	3-87.4	15-16 x10^4	**310-54 x10^3**
Brahamani	799	11	2002	20-38	7.0-8.4	81-376	5.2-9.8	1.5 – 6.0	8-13	80-90000	**40-60000**
		11	2003	17-35	6.6-8.4	69-501	6.1-10.2	0.2-6	4.2-4.2	90-24x10^3	**60-14x10^3**
		11	2004	16-28	6.3-8.4	47-402	6-9.6	0.2-7	-	490-28x10^3	**22-13x10^3**
		11	2005	16-34	6.3-8.7	65-850	5.1-13.8	0.3-5.2	4-32.6	490-16x10^4	**330-16x10^4**
		11	2006	18-32	6.9-8.4	102-380	4.6-8.9	0.3-5.4	8-20.2	940-5400	**630-2400**
		15	2007	20-40	6.7-8.5	91-582	1.9-8.9	0.3-4.9	5.1-64	210-54 x10^3	**110-22 x10^3**
		16	**2008**	18-38	6.4-8.4	93- 664	5.3- 9.7	0.4-6.2	3.9-84.2	750-21 x10^3	**110-14 x10^3**
Baitarni	-	5	2002	24-36	7.3-8.3	54-78400	6.8-9.3	2.0 – 6.8	7	900-22000	**700-11000**
		5	2003	18-36	6.7-7.8	75-54802	5.4-11.3	0.3-3.5	-	330-16x10^3	**230-9x10^3**
		5	2004	18-32	6.6-8.1	64-29118	5.9-9.8	0.4-2.6	-	640-92000	**310-35x10^2**
		5	2005	24-34	7-8.6	68-42257	5.2-8.8	0.4-4.3	12.9-20.4	790-24x10^3	**3330-11x10^3**
		5	2006	15-25	7.6-8.4	90-2287	7.4-8.0	0.3-1.8	-	1400-4300	**790-1700**
		5	2007	22-35	7.3-8.2	136-19450	5.6-8.8	0.4-2.2	6-20.9	330-5400	**170-2200**
		5	**2008**	22-36	7.5-8.2	75-48400	6.3-9.2	0.8-2	5.9-19.9	940-5400	**700-3500**
Subarnarekha	395	6	2002	18-36	6.5-8.0	113-355	5.2-8.5	0.2 – 12.0	4-96	150-1800	**70-540**
		6	2003	***22-35***	7.3-8.3	133-346	6.4-8.4	1-2	-	300-7900	**130-3300**
		6	2004	***24-28***	7.8-8.3	152-623	7.1-7.5	0.4-2.5	-	470-2200	**270-700**
		6	2005	***20-36***	6.8-8.3	130-405	5.5-8.6	1.0-4.7	4-38	110-1400	**78-700**
		6	2006	***19-34***	6.9-7.9	192-15013	5.8-8.2	0.3-4.6	8.0-68	2200	**1300**
		6	2007	***19-37***	6-8.1	134-740	4.6-8.7	0.9-8.0	4-100	540-2400	**200-920**
		12	**2008**	***19-35.5***	6.5-8.0	119-332	5.1-8.9	0.0-10.5	3.9-102	540-3500	**200-1700**
		6	2002	15-32	6.5-9.0	104-684	1.1-10.5	0.1 – 3.9	6-11	360-	**300-24000**

Name of the River	Length (Km)	No of Monitoring locations	Year	Observed Range of Water Quality Parameters							
				Temp. (°C)	pH	Conductivity (µmhos/cm)	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
Brahmaputra	916									240000	
		6	2003	14-32	6.4-8.4	77-570	1.2-11.5	0.4-3.5	4.8-27.4	360-24x10^4	**300-24x10^4**
		6	2004	15-34	5.2-9	91-445	1.1-9.4	0.4-4.3	-	360-24x10^4	**300-24x10^4**
		10	2005	-	5.9-7.6	20-408	2-10.5	0.3-6.2	-	300-24x10^4	**150-24x10^4**
		10	2006	18-30	6.9-8.0	55-485	4.2-10.2	0.3-5.7	3.0-47.2	1-24x10^4	**300-24x10^4**
		10	2007	18-32	5.9-7.9	76-645	5.1-10	0.1-3.4	3.1-15.4	0-24 x10^4	**0-24 x10^4**
		10	**2008**	12-32	6.1-8.1	75-460	3.3-9.6	0.4-5.4	6.1-12.1	1-24 x10^4	**0-24 x10^3**
Pennar	597	4	2002	-	7.5-8.7	364-978	6.0-9.3	1.0 – 2.9	14-16	-	**-**
		4	2004	23-33	7.6-8.4	401-1035	3.3-8.8	0.6-4.8	14-16	120-2400	**3-3**
		5	2005	27-30	7.8-8.8	447-2340	3.8-8	0.8-2.8	12-13.2	16-2790	**2-35**
		5	2006	20-30	6.9-8.2	438-1933	3.0-6.8	10-2.8	-	20-62x10^3	**1-960**
		5	2007	21-31	7-8.7	250-1916	2.8-7.8	0.5-3.0	10-12	14-50x10^3	**2-110**
		5	**2008**	24-33	7-8.7	226-1173	5-10.5	0.6-5.2	5-16	22-3500	**4-140**
Satluj	1078	20	2002	9-32	6.8-8.8	131-819	3.8-11.4	0.1 – 45.0	1-80	8-35000	**2-3500**
		20	2003	5-30	6.9-8.9	164-1226	3.4-11.5	0.1-24	0.8-61	3-3x10^4	**1-1300**
		20	2004	9-29	7.1-8.3	144-694	1.6-10.3	0.1-64	-	7-2x10^5	**2-9x10^4**
		21	2005	10-28	7.1-8.3	150-818	2.8-14.2	0.1-40	2.8-60	1-35x10^4	**1-11x10^4**
		21	2006	7-28	7.1-8.26	160-958	2.8-10.6	0.1-32	1.6-68	1-17x10^4	**1-5x10^4**
		21	2007	2-26	7-8.6	145-865	3.2-11.9	0-28	1.6-76	3-17 x10^4	**0-9 x10^4**
		21	**2008**	4.5-23	7.0-8.5	162-843	1.2 - 12.4	0.0-48	1.0-172	12- 11 x10^4	**0 - 10 x10^3**
Beas	460	19	2002	3-32	7.1-8.7	53-517	5.2-11.5	0.3 – 5.0	1-13	2-2400	**2-1600**
		19	2003	4-29	7.3-8.9	76-559	7-12	0.1-6	1-18	2-2400	**2-1600**
		19	2004	2-29	6.9-8.5	60-396	6.8-11.8	0.2-4.8	-	2-5x10^4	**2-3500**
		19	2005	4-27	7-8.8	54-395	4.8-13	0.2-10	1.8-22	2-11x10^3	**2-1100**
		19	2006	4-27	7.0-8.2	94-395	5.8-11.0	0.2-3.2	2-6.9	2-11x10^3	**2-1100**
		19	2007	2-22	6.2-8.9	86-470	5.9-12.8	0.1-2.9	1.2-38	0-2400	**0-2400**

Name of the River	Length (Km)	No of Monitoring locations	Year	Observed Range of Water Quality Parameters							
				Temp. (°C)	pH	Conductivity (µmhos/cm)	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
		19	**2008**	1.5-22	7.0-8.4	53-432	3.8-12.5	0.1-7.6	1-28	2-1600	**2-1600**
Ghaggar	291	15	2002	11-33	7.0-9.5	320-1012	2.6-9.6	1-180	4-560	43-14000	**9-2500**
		15	2003	18-30	6.5-8.1	280-1477	3.5-7.9	0.9-28	9.6-251.2	28-6000	**9-600**
		15	2004	16-29	7.2-8.5	188-1390	0.8-8	0.5-28	-	500-17x10^4	**28-9x10^4**
		19	2005	14-29	7-9	21-2682	2.2-8.9	1-626	96-1600	43-15x10^4	**14-5x10^4**
		19	2006	14-22	7.1-7.9	230-1156	1.8-7.3	1.2-30	7.8-90	600-24x10^4	**170-11x10^4**
		19	2007	10-34	6.5-8.8	50-4260	0.3-8.6	0.2-218	4.6-200	7-35 x10^5	**3-23 x10^4**
		19	**2008**	10-41	4.5-8.6	257-3640	0.4-8.8	0.4-50	4-1572	21-25 x10^5	**7-5 x10^5**
Amlakhedi	-	1	2002	27-32	1.7-7.2	7160-16770	0-0	485 – 1561.6	1821-3860	28-1100	**3-28**
		1	2003	27-32	3.1-7.4	3070-3070	-	33-1463	-	3-3	**3-3**
		1	2004	20-32	2.2-7.4	7020-13400	0.4-0.4	247-947	-	9-93	**2-4**
		1	2005	27-27	2.4-7.5	300-11810	3.9-3.9	35-714	1548-1548	7-15	**2-4**
		1	2006	27-29	6.83-7.60	14440-16720	-	281-582	1678-1678	7-9	**6-7**
		1	2007	26-28	7.3-7.9	316-9470	-	73-522	1750-1750	4-28	**2-4**
		2	**2008**	30	71	3080	0	46	-	9000	**3000**
Kali East	-	2	2002	15-30	7.2-8.7	24-1930	6.7-11.9	1.9 – 67.0	66-421	2100-48x10^6	**10 x10^4-36 x10^4**
		2	2003	16-32	6.4-8.3	225-1590	4.9-8.6	2-149	357-552	2800-19x10^7	**40-46x10^6**
		2	2004	15-31	7-8.3	273-1704	0.1-7.9	1.8-165	-	2300-29x10^6	**200-95x10^5**
		2	2005	17-25	7.4-8.4	23-1730	1.7-10.6	2-136	48-492	7500-18x10^6	**2300-122x10^4**
		2	2006	15-23	7.48-8.90	236-1623	4.9-14.7	3.6-160	501-501	9300-26x10^5	**7500-161x10^4**
		2	2007	25-30	7.1-7.4	53-296	6.9-7.8	1-3	8.0-	140-1800	**80-550**

Name of the River	Length (Km)	No of Monitoring locations	Year	Observed Range of Water Quality Parameters							
				Temp. (°C)	pH	Conductivity (µmhos/cm)	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
									8.0		
		2	**2008**	15-34	7.0-9.0	61-2570	0.0-10.6	3.1-183	76	1100-11x10^7	**400 -51x10^4**
Chambal	-	7	2003	2-36	7-9.3	181-8800	1-10.8	0.3-10	2-28	28-145x10^5	**9-22x10^4**
		7	2004	16-33	7-9.2	150-10900	4.3-11.1	0.7-24	-	28-39x10^4	**11-41x10^3**
		8	2005	16-39	6.9-9.5	170-10400	2.8-14.3	0.3-25	2-172.6	14 -5x10^4	**3 -7100**
		8	2006	16-28.5	7.6-8.8	290-9200	4.2-9.5	0.6-20	4-14	4 -20x10^4	**4 -3x10^4**
		8	2007	14-33	6.8-8.8	220-10680	0-13.3	0.2-34	1.7-64	4 -87 x10^5	**3-22 x10^3**
		8	2008	**13-35.5**	**6.8-8.7**	**270-9340**	**3.2-12.4**	**0.1-6.2**	**2.4-77.6**	**4 -88 x10^4**	**3 -36000**

CHAPTER IV

IDENTIFICATION OF POLLUTED RIVER STRETCHES

4.1 Concept of water quality management

The natural water bodies are used for various competing as well as conflicting purposes viz. drinking water source; religious bathing; propagation of wild life and fisheries; irrigation, industrial cooling and controlled waste disposal. The uses of rivers for various purposes require specific physiochemical and bacteriological characteristics. The ambient water in environment is not recommended to use directly for drinking purposes unless treated and disinfected by an organised water supply system. However for religious bathing, masses are advised to use specified stretches. The critical parameters for maintenance of water quality with respect to public health are coliform group of bacteria and organic matter. Thus the organic matter in terms of Biochemical Oxygen Demand is the most critical parameter representing municipal sewage pollution and industrial pollution from agro based industries. The organised water supplies with high organic matter in ambient water may cause formation of chlorinated compounds in the process of disinfection using chlorine. The presence of high organic matter from municipal origin account for higher number of coliform group of bacteria including faecal coliforms. Therefore the need for water quality management in river is broadly concentrated on control of organic matter (in terms of BOD) by providing infrastructure for sewage treatment as first priority. Other aspects of water quality management from inorganic components of geogenic nature as well as water quality degradation due to effluents discharged by specific group of industrial sources will be addressed selectively.

The rivers in its entire length are not polluted and generally meet the water quality criteria for various beneficial uses. Water quality degradation is observed after large scale abstraction and point source of waste water disposal from municipal areas and industrial establishments.

The water quality monitoring over the years provided information on river stretches having higher concentration of BOD and are identified as polluted. The water quality deterioration of aquatic resources is a matter of concern, as it affects public health and aquatic life. Therefore corrective actions are required to be taken to prevent and control pollution in the identified polluted stretches.

4.2 Methodology and criteria for identification of polluted river stretches

The stretches of rivers not meeting the water quality criteria and having BOD above 3 are identified as polluted stretches. These polluted stretches are further classified under different priority levels on the basis of extent of pollution.
The water quality data for the years 2002-2008 is analysed and monitoring locations exceeding the water quality criteria are identified as polluted locations with respect to risk. Priority levels of polluted stretch are based on the risk. Risk is defined as;

RISK= FREQUENCY OF VIOLATION OF CRITERIA X CONSEQUENCE (MAGNITUDE)

The degree of violation is with respect to water quality criteria for drinking water source with conventional treatment with respect to BOD. The polluted locations in a continuous sequence are defined as polluted river stretches.

Criteria for Priority 1

- Monitoring locations exceeding BOD concentration 30 mg/l has been considered as it is the standard of sewage treatment plant and in river it appears without dilution.(River locations having water quality exceeding discharge standards for BOD to fresh water sources)
- All monitoring locations exceeding BOD concentration 6 mg/l on all occasions.
- Monitoring locations exceeding 3 mg/l BOD are not meeting desired water quality criteria but does not affect to Dissolved Oxygen level in water bodies. If BOD exceeds 6mg/l in water body, the Dissolved Oxygen is reduced below desired levels.
- The raw water having BOD levels upto 5 mg/l are does not form complex chemicals on chlorination for municipal water supplies. Hence the water bodies having BOD more than 6 mg/l are considered as polluted and identified for remedial action.

Criteria for Priority 2

- Monitoring locations having BOD between 20-30 mg/l.
- All monitoring locations exceeding BOD concentration 6 mg/l on all occasions.

Criteria for Priority 3

- Monitoring locations having BOD between 10-20 mg/l.
- All monitoring locations exceeding BOD concentration 6 mg/l on all occasions.

Criteria for Priority 4

- Monitoring locations having BOD between 6-10 mg/l.

Criteria for Priority 5

- Monitoring locations having BOD between 3-6 mg/l.
- The locations exceeding desired water quality of 3mg/l BOD.

4.3 Identification of polluted river stretches

The criteria formulated for Identification of polluted river stretches for priority 1 to 5 is applied on the water quality data sets and rivers falling in each priority class are segregated. The number of polluted stretches in all the five priority classes is 150.The possible sources of pollution in terms of urban centres and industrial are listed out in the polluted stretch. Polluted rivers stretches in the States and Union Territory for each priority class are presented in Table 4.1 to 4.5.

Table 4.1: POLLUTED RIVER STRETCHES (BOD>30mg/l and BOD exceeding 6mg/l on all occassion)

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
ANDHRA PRADESH				
1. Musi	D/s Hyderabad & Rangareddy	Hyderabad & Secundrabad	1.Nagole, Rangareddy	34
			2. Hyderabad D/s	23
2. Nakkavagu	D/s Medak	Medak	1.Bachugudem, Medak	50
ASSAM				
3. Bharalu	D/S Guwahati	Guwahati Sewage	1.D/S Guwahati	31.5
4. Kalong	D/s of Nagaon (Elangabeel System)	Nagaon- Sewage	1. Elangabeel System Pond	50
CHANDIGARH				
5. Patiala ki Rao	Patiala Ki Rao	Chandigarh	1.Patiala Ki Rao	50
6. Attawa Choe	Attawa Choe (N-Choe)	Chandigarh	2.Attawa Choe (N-Choe)	50

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
7. Sukhna Choe	Sukhna Choe	Chandigarh	3.Sukhna Choe	50
DELHI				
8. Yamuna	Wazirabad to Okhla	Industrial & Domestic Waste from Delhi	1.Nizamuddin	55
			2.Okhla Bridge	32
			3.D/S Of Okhla A/C Shahdara Drain	70
GUJARAT				
9. Sabarmati	Ahmedabad to D/S of Vautha	Discharge from Meshwa & Ahemdabad	1. After Conf. With Meshwa At Vautha (Near Dhokla),	48
			2. At Ahmedabad At V.N. Bridge,	31
			3. At Vill. Miroli Taluka Dascroi, Ahmedabad	103
			4. At railway Bridge,Ahmedabad	29
			5. At Kheroj Bridge	12
			6. At Hansol Bridge	15
10. Amlakhadi	Along Ankeshwar	Industrial & Domestic waste from Ankeshwar	1.Amlakhedi after confluence of wastewater from Ankleshwar	46
11. Bhogavo	Surendranagar		1.D/s of Surendranagar	50
12. Daman Ganga	Vapi D/S to Confl. with sea	Industrial & Domestic waste from Vapi,Salvas,Daman & Kachigaon	1.Kachi Gaon D/s	30
HARYANA				
13. Ghaggar	Interstate border of Punjab & Haryana to Ottu wier at Sirsa	Industrial & Municipal waste from Patiala, Derabassi, Sirsa	1. Before Ottu Weir (Before Mixing Of Satluj Canal Water)	50
			2. Gh-1 At Road Brdg. Sirsa,Debwali Road	33.2
			3. Gh-2 At Chandarpur Syphon,	40
			4. Near Bankarpur, Dera Bassi	22
			5. U/S Dhakansu Nallah	21
14. Markanda	Kala Amb to Narayan Garh	Industrial & Domestic waste from Kala Amb	1.Kala Amb D/S	590
15. Western Yamuna Canal	D/s of Yamuna Nagar	Yamuna Nagar Industrial & Domestic wastewater	1.100 metre D/s after receiving Industrial & Sewage effluent	247
			2.At Damla d/s of	188

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
			Yamuna Nagar	
HIMACHAL PRADESH				
16. Sukhna	D/s Parwanoo	Parwanoo sewage	1.At Parwanoo, Solan	36
MADHYA PRADESH				
17. Khan	Indore	Indore Sewage	1.Sakkar Khadi (Near Indore)	50
			2.Sanwer	50
			3.Kabit Khedi	50
18. Chambal	Nagda D/s	Industrial & domestic wastewater of Grasim Township & Nagda	1.Nagda D/s	34
MAHARASHTRA				
19. Bhima	Vithalwadi to Takli	Pune – Sewage	1. Pune, D/S Of Bundgarden	40
		Daunt -Sewage	2. Pune U/S Vithalwadi	28.2
			3. Pargaon (After confluence with Mule Martha)	16
20. Godavari	Nashik D/s to Paithan	Nasik Sewage	1.Nashik D/s	36
			2.Jayakwadi Dam, Raher	6.5
			3.U/S Of Gangapur Dam, Nasik	6
			4.U/s of Paithan, Jayakwadi	6.8
			5.D/s of Paithan, Pathegaon	7.4
			6.Near Someshwar Temple	7.5
			7.Hanuman Ghat, Nashik	9
			8. Nasik D/S	18
			9.Panchavati At Ramkund	12
			10.KapilaGodavari, confl.Point, Tapovan	14
			11.Saikheda	16
			12. Tapovan	20
21. Mula & Mutha	D/s Pune city	City Sewage of Pune	1.Mula-Mutha River at Mundhawa Bridge	36
			2.Mula at Aunth Bridge	
			3.Mula –Harrison Bridge	50
			4.Mutha at sangam Bridge	32
22. Pawana	Pune-Sangavi Gaon	Pune Sewage	1.Pune-Sangavi Gaon	36

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
23. Indrayani	Alandi to confluence with Bhima	Pune Sewage	1.Alandi Gaon	36
24. Koyna	Karad D/s	Karad Sewage	1.At Karad	35.5
25. Mithi	Mumbai Stretch	Mumbai	1. Mithi river	50
26. Kundalika	Are Khurd	Roha sewage	1.Are Khurd	50
			2. Kundalika At Roha city	6.5
PUNJAB				
27. Satluj	D/S of Zenith Paper Mill to Bridge Harike, Amritsar	Sewage from Ludhiana & Jalandhar	1.100m D/S Budha Nala Confl.,Ludhiana	48
			2. D/S East Bein	6.2
			3.Boat Bdg. Dharmkotnakodar Road, Jalandhar	18
			4. 1 Km. D/S of Zenith	22
28. Ghaggar	Mubarkpur to Sardulgarh (Entire length in Punjab)	Municipal & Industrial discharge from Patiala, Chandigarh, Sukhna paper mills & Derra Bassi, Sardulgarh, Moonak,	1.D/S Dhakansu Nallah	32
			2.D/S Jharmal Nadi	32
			3.D/S Sardulgarh	45
			4.100m D/S Conf. With R. Saraswati (Patiala)	40
			5.Ratanheri, D/S Of Patiala Nadi (After Confl.)	50
			6.Moonak	38
			7.U/S Jharmal Nadi,	40
			8.U/S Sardulgarh,	45
			9.D/s Chhatbir	10
			10. Mubarakpur Rest House(Patiala)	10
			11. Near Bankarpur, Dera Bassi	12
			12. U/s Dhakanshu Nallah	18
TAMIL NADU				
29. Adyar	Along Chennai	Chennai-Industrial & Municipal Wastewater	Nandambakkam, Ekattuthangal, Jaferkhanpet, Maraimalai bridge, Kotturpuram bridge, Boat club	43
30. Coovum	Along Chennai	Chennai-Industrial & Municipal wastewater	Annanagar, Arumbakkam, Amanjikarai, Poonamalle, College Road, Central Jail, Napier Bridge	105

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
31. Cauvery	Erode D/s	Erode Sewage	1.Erode near Chirapalayam	38
UTTAR PRADESH				
32. Yamuna	Kosi Kalan to Juhika	Sewage from Agra, Mathura, Bateshwar, Vrindavan & Etawah	1.D/S Of Agra, U.P.	33
			2.Mazawali	37
			3.Bateswar, U.P	26
			4.Etawah, U.P.	27
			5.Mathura U/S , U.P.	20
33. Hindon	Saharanpur to confluence with River Yamuna	Sewage & Industrial effluent from Ghaziabad, Saharanpur & Muzaffarnagar	1.Ghaziabad D/S, U.P.	36
			2. Confl. With R. Krishni & Kali Near Binauli Town, Meerut	36
			3.Pura mahadev	34
			4. Saharanpur D/s	24
34.Western Kali	Muzaffar Nagar to Confluence with Hindon	Sewage & Industrial effluents from Muzaffar nagar & Mansoorpur	1.Kalinadi At U/S Of Muzaffar Nagar	32
			2.Kalinadi At D/S Of Muzaffar Nagar	364
35. Kali Nadi Eastern	Kannauj	Industrial and Municipal sewage from Meerut,Modinagar, Bulandsahar, Hapur, Gulaothi and Kannauj	1. At Kannauj (Before Conf.)	120
			2. U/S Of Gulaothi Town In Bulandsahar	183

Table 4.2: POLLUTED RIVER STRETCHES (BOD between 20 & 30 mg/l)

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
KARNATAKA				
1. Bhadra	D/s of Bhadravathi to confluence with Tunga	Industrial & Domestic	1.D/S Of Bhadravathi	22.5
		Waste water from Bhadravathi	2. D/s of KIOCL Road Bridge, Near Holehunnur	7.8
MAHARASHTRA				
2. Tapi	M.P. Border to Bhusaval	Bhusaval Sewage	1.Ajnand Village	21
			2.Uphad Village	22
			3. Bhusawal U/s	19
3. Girna	Malegaon to Jalgaon	Malegaon Sewage	1.Malegaon (Manmad)	23
		Jalgaon Sewage	2. Jalgaon	10
4. Nira	D/s of Jubilant Organosis, Pune	Industrial wastewater	1. D/s of Jubilant Organosis, Pune	21. 2

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
MANIPUR				
5.Nambul	Hump Bridge to Heirangoithong	Sewage	1. Heirangoithong	24
			2. Hump Bridge	26
RAJASTHAN				
6. Jojari	Along Jodhpur	Industrial & Domestic waste from Jodhpur	1.D/S Jodhpur	10.5-25.1
7. Bandi	Along Pali	Industrial & Domestic waste from Pali	1.D/S Pali	30-141
8.Berech	D/S of Udaipur	Industrial & Domestic waste from Udaipur and Chittorgarh	1.D/S Udaipur	6.2-22.1
9. Khetri	Along Khetri	Industrial & Domestic waste from Khetri	1.D/S Khetri Complex	8.1-31.2
TAMIL NADU				
10. Noyyal	Along coimbatoor, Tirupur, Palyanakotti	Industrial & domestic wastewater from coimbatoor, Tirupur, Palyanakotti	1.Vicinity of Tirupur	>26
UTTAR PRADESH				
11. Bagad	D/S of Gajraula	Industrial effluent of Jubilant organics	1.D/s of Jubilant Organics	BOD - >26
12. Ganga	Kannauj D/S to Kanpur D/s(Jajmau Pumping station	Industrial effluent from Kanpur	1.Kanpur D/S(Jajmau Pumping Station	21
			2. Kannauj D/s, U.P.	6
			3.Kanpur U/s(Ranighat), U.P.	6.4
UTTARAKHAND				
13. Kosi	D/S of Kashipur	Sewage & Industrial waste from Kashipur	1.D/S of Kahsipur	13
14.Dhela & Kichha	D/S of Kashipur	Sewage & Industrial waste from Kashipur	1.Dhela D/S of Kashipur	187
			2.Kichha D/S of Kashipur	17
15.Bahalla	D/S of Kashipur	Sewage & Industrial waste from Kashipur	1.D/S of Kashipur	15-22

Table 4.3: POLLUTED RIVER STRETCHES (BOD between 10 & 20 mg/l)

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
ANDHRA PRADESH				
1. Manjira	D/s Gowdicharla	Industrial effluent of Ganpati sugar & Impact of Nakavagu	1.Gowdicharla a/c with Nakavagu	16
			2.Near Ganpati sugars	18
ASSAM				
2. Deepar Bill	D/s Guwahati	Guwahati	1.Deepar Bill	11
GUJARAT				
3. Khari	Lali village, Ahemdabad	Municipal & Industrial waste from Ahemdabad	1.Lali Village Near Ahmedabad	19
4. Kolak	D/s Patalia.		1.At Patalia Bdg.	12
			2. At Railway Bridge No. 313 Vapi,Valsad	8
5. Mindhola	D/s State Highway Bridge Sachin		1.Mindhola At State Highway Bridge Sachin	12
6. Shedi	Along Kheda	Kheda Sewage	1. At Kheda	19
HARYANA				
7. Gurgaon Canal	D/s of Delhi	Delhi	1. GC-1 Near Badarpur Border	24
JHARKHAND				
8. Subarnrekha	D/s of Ranchi (Tatisilwal)	Industrial & domestic waste from Ranchi	1.Ranchi(tatisilwal)	10. 5
			2. Namkum Road bridge	6.8
KARNATAKA				
9. Tunga	D/S of Shimoga	Shimoga Sewage	1.D/S Of Shimoga Town	13.5
10. Tungabhadra	Harihar D/S to Hara eahalli Bridge. & Ullanur	Harihar Sewage & Grasim waste	1.Haralahalli Bridge	16.5
11. Laxmantirtha	D/s of Hunsur Town	Hunsur Sewage	1.D/s of Hunsur town	10
KERALA				
12.Karamana	Karamana At Moonnattumukku		1.Karamana At Moonnattumukku	11
MADHYA PRADESH				
13.Kshipra	Ujjain to confluence with Chambal	Ujjain- sewage	1.Ramghat At Ujjain,	15
			2.Trivenisangam (1 Km. D/S Of Sangam)	14
			3.Siddhawat D/S of Ujjain	8
14.Narmada	Hoshangabad	Industrial & Domestic Wastewater	1.Hoshangabad D/s	11.4

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
MAHARASHTRA				
15.Weinganga	D/S Ashti	Municipal sewage of Ashti town	1.At Ashti	10.5
			2.After Confluence of Kanhan	9
			3. D/s of Ellora Paper mill	9.4
			4.U/s of Ellora paper mill	8.6
			5.U/s of Gaurav paper mills, Jackwell	9
			6. D/s of Gaurav paper mills, Jackwell	7.8
16.Wardha	Along Rajura village	Paper mill waste	1.Rajura Bridge	11
			2.D/s of ACC Ghuggus	13
			3.At confluence point of Pangange & Wardha at Jaud	8.5
17. Bhima	Narsinghpur D/s	Nira – discharge	1. Narsinghpur,(D/ SAfter.Confl.With R.Nira),	16.2
18.Krishna	Dhomdam to Kolhapur	Sewage & Industrial waste from Karad & Sangli	1. Krishna Bridge, Karad,	11. 6
			2. At Kshetra Mahuli	12
			3. Krishna Vennasangam at Mahuli	17.6
			4. At Wai	12.6
			5. Mahabaleshwar Dhom Dam Near Koina Dam,	8.6
19.Purna	Andura village		1. D/s of confl. of Morna & Purna, Andura village	10.2
			2. Purna at Dhupeshwar	
20.Nira	Along Pulgaon	Pulgaon Cotton Mill	1.Pulgaon Cotton Mill, Wardha	11.8
			2.Sarole Bdg.On Pune-Banglore Highway	
21.Chandrabhaga	Along Pandharpur Town	Sewage Of Pandharpur Town	1. D/S Of Pandharpur Town	12
			2. U/S Of Pandharpur Town	10.5

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
22.Venna River	Varye, Satara		1. Satara D/s	12
TRIPURA				
23. Agartala Canal	D/s Agartala	Agartala sewage	1.Near Pragati Vidyabhawan, Agartala,	14.6
UTTAR PRADESH				
24. Gomti	Lucknow to Jaunpur	Sewage & Industrial effluent from Lucknow and Jaunpur.	1. Jaunpur D/S, U.P.	12
			2. Lucknow D/S, U.P.	14
25. Ganga	Varanasi D/S	Discharge through Kalinadi & Ramganga sewage & Industrial effluent from Kannauaj and Kanpur	1.Varanasi D/S (Malviya Bridge)	14
26. Ramganga	Upstream Kannauj	Sewage & Industrial waste water from Ramnagar & Moradabad	1.Ramganga At Kannauj (Before Conf.)	16

Table 4.4: POLLUTED RIVER STRETCHES (BOD Between 6-10 mg/l)

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
ANDHRA PRADESH				
1. Krishna	Wadepally		1.Krishna at Wadepally A/c with River Musi	8
2. Godavari	D/S of Rajamundary	Rajamundary	1.Rajamundary D/S	6
3. Maner	Warangal U/S	Warangal	1.Warangal U/s	6.1
ASSAM				
4. Burhidihing	Margherita to Duliajan	Margherita	1.Burhidihing At Margherita	7.9
			2.Burhidihing at Duliajan	7
BIHAR				
5. Sikrana	Sikrana At Chanpatiya	Chanpatiya	1.Chanpatiya	8
CHATTISGARH				
6. Arpa	Arpa river D/S of Bilaspur	Bilaspur	1.D/S Bilaspur	7
7. Seonath	U/S Rajnandgaon		1.U/S Rajnandgaon	7.1

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
GUJARAT				
8. Mahi	D/s Sevalia and Vasad	Municipal waste from Sevalia & Vasad	1.Vasad	6.8
			2.Near Rajasthan border at Kadana Dam	8.2
9. Dhadar	D/s Kothada	Kothada	1.River Dhadar At Kothada	9
10. Tapi	Rander Bridge to Surat	Municipal & Industrial waste from Surat	1.Rander Bridge, Surat	7.4
			2.Tapi at ONGC bridge, Surat	6
11. Kim	D/s Surat	Municipal Sewage	1.Sahol Bridge, Olpad Hansol Road, Surat	6
HIMACHAL PRADESH				
12. Markanda	D/S of Paonta Sahib	Water from Paonta Sahib	1.Markanda At Paonta, Distt. Sirmour	8.2
13. Beas	D/S of Mandi	Domestic waste from Mandi	1. D/s Mandi	7.6
JHARKHAND				
14. Sankh	Along Bolba	Municipal Sewage	1.Bolba	6.2
KARNATAKA				
15. Kali	Along Dandeli Town	West Coast Paper Mill waste	1.D/S West Coast Paper Mill	7
16. Krishna	U/S Of Ugarkhurd Barrage		1. U/S Of Ugarkhurd Barrage	9.8
MADHYA PRADESH				
17. Tons	Tons Along Madhavgarh	Sewage	1.Tons At Madhavgarh	8
18. Kalisot	Mandideep	Sewage & industrial effluent	1.Near road bridge, Mandideep	6
19. Betwa	Raisen	Sewage from Raisen	1.At Nayapur D/s, Mandideep Industrial Area No.1, Raisen	6.8
MAHARASHTRA				
20. Kalu	Atale village to Confl. with Ulhas	Municipal & Industrial waste water	1.Atale village	7.5
21. Kanhan	D/S Nagpur	Industrial & Domestic Waste of Nagpur	1.D/S of Nagpur	8.8
			2.U/s of M/s Vidharbha paper mill, Sinora	8.8
			3.D/s of M/s Vidharbha	9.8

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
			paper mill, Sinora	
22. Kolar	Along Kamptee	Municipal waste water	1.Before Confluence To Kanhan At Kamptee	7
23. Ulhas	Mohane	Industrial & Domestic runoff Ulhasnagar	1.U/S Of Nrc Bund At Mohane	6
			2.Jhambul Water Works	7.5
24. Panchganga	Kolhapur	Industrial & Municipal sewage of Kolhapur	1.D/S Of Kolhapur Town	6.4
25. Patalganga	Khopoli to Esturaine region	Industrial & Municipal sewage from khopoli, Rasayani & Paundh	1. Shilphata	6
			2. Near Intake Of Midc W/W	9
26. Rangavali	Along Navapur	Sewage of Navapur	1.D/S Of Navapur	8.4
MEGHALAYA				
27. Kharkhala	Near Sutnga Khlieri,Jaintia Hills		1.Near Sutnga Khlieriat,Jaintia Hills Dt.	7
28. Umtrew	Umtrew At Byrnihat East		1.Umtrew At Byrnihat East	7.7
ORISSA				
29. Kathjodi	Along Cuttack	Cuttack Sewage	1.Cuttack D/S	6.4
PONDICHERRY				
30. Arasalar	Along Karaikal	Domestic waste of Karaikal	1.Arasalar River Karaikal Region,	7
RAJASTHAN				
31. Chambal	D/S Kota city	Industrial & Domestic waste from Kota	1.Kota D/S (2 Km. From City)	6.2
TAMIL NADU				
32. Vaigai	Along Madurai	Madurai-Industrial & domestic wastewater	1.Vicinity of Madurai	>6
33. Tambiraparani	Along Ambasamudam	Madura Coats Indusitrial waste	1.Rail Bdg. Nr. Ambasamudam	6

River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
34. Cauvery	Tiruchirapalli to Grand Anaicut	Municipal sewage of Erode, Tiruchirapalli	1.Tiruchirappalli D/S	6
			2.Trichy,Grand Anaicut	7.8
			3.1Km D/s of Bhavani river confluence	7.3
35. Bhavani	Bhavani	Municipal sewage	1.Bhavani Sagar Bhavani	7.6
			2..Bhavani at Bhavani	6.8
UTTAR PRADESH				
36. Ganga	D/s of Haridwar		1.D/s of Haridwar	7.6
WEST BENGAL				
37. Damodar	D/s Asansol		1.Narainpur After Confl. Of Nunia Nallah	6.8
			2.Near Mujher Mana Village After Conf. of Tamla Nallah	6.8
38. Ganga	D/s Dakshineshwar	Industrial waste & sewage from Dakshineshwar	1.Dakshineshwar	6

Table 4.5: POLLUTED RIVER STRETCHES (BOD between 3& 6 mg/l)

River	Polluted Stretch	Monitoring Location	BOD (mg/l)
ANDHRA PRADESH			
1. Tungabhadra	D/s Manthralayam	1. Manthralayam , Kurnool	3.3
2. Krishna	Thangadi , Mahaboobnagar	1. Thangadi, Mahaboobnagar	3.1
3. Pennar	Puspagini,	1. A/C Papagni, Puspagini	3.2
CHHATTISGARH			
4. Mahanadi	Rajim U/s to interstate boundary with Orissa	1.U/s Rajim	3.2
		2.Interstate Boundry	3.1
GUJARAT			
5. Mahi	D/s Mujpur	1. At Umeta Bridge	3.1
		2. At Mujpur	3.2
6. Panam	D/s Lunawada	1. At Lunawada	3.7
7. Sabarmati	Dharoi Dam to Mahudi jain Temple	1. Dharoi Dam	3
		2. At Mahudi Jain Temple	3.5
8. Ambika	D/s Bilimora	1. At Bilimora	4.2
9. Anas	D/s Dahod	1. Anas At Dahod, (Kushalgarh), Dist. Panchmahal	3.8
10. Baleshwar Khadi		1. Baleshwar Khadi At N.H. No. 8	4.5
11. Kaveri		1. Bridge At Billimora-Valsad	3

River	Polluted Stretch	Monitoring Location	BOD (mg/l)
		Road	
HARYANA			
12. Yamuna	Kalanaur to Sonepat	1.Hathnikund	3
		2. At Kalanaur	4
		3. At Sonepat	5
		4. U/s Paonta Sahib	3
KARNATAKA			
13. Tungabhadra	Ullanur D/s	1. At Ullanur	3.1
14. Hundri	Joharpur D/s	1. Joharpur(V), Near Temple, Kurnool	3.1
15. Kundu	Nandayal D/s	1. Nandyal, Near Over Bdg., Kurnool	3.1
16. Arkavati	D/s of Kanakapura	1. D/S of Kanakapura Town	5
17. Malprabha	D/s of Khanapur	1. D/S of Khanapur Village	4.1
KERALA			
18. Puzhackal		1. At Puzhackal Bridge	4
19. Kadambayar	D/s Brahmapuram	1. At Brahmapuram	3
MADHYA PRADESH			
20. Narmada	Hoshangabad D/s	1.at Sethanighat	3.1
		2. at Hoshangabad	3.2
21. Mandakini	D/s Chitrakut	1. At Chitrakut	5
MAHARASHTRA			
22. Ulhas	Along Badlapur	1. U/s of Badlapur,	3.4
23. Bhatsa	Along Pise village	1. D/s of Pise Dam Near Pise Village (Ulhas)	3.3
NAGALAND			
24. Dhansiri	Along Dimapur	1. Near Check Gate (Dimapur Khutkhuti Road)	3.2
		2. Full Nagarjan	3.6
		3. Nuton Basti	4.8
		4. Town Boundary Bridge (Diphu Road)	3.2
ORISSA			
25. Brahmani	Panposh to Rourkela	1.D/s Panposh	4.6
		2.Rourkela D/s	3
26. Mahanadi	Cuttack D/s	1.Cuttack D/s	4.6
27. Kuakhai	Along Bhubaneshwar	1. At Bhubaneshwar	3.2
SIKKIM			
28 .Teesta	D/s Gangtok	1. After confluence with River Ranichu at Singtam	3

River	Polluted Stretch	Monitoring Location	BOD (mg/l)
		2. After confluence with Rangichu after meeting the industrial effluents from the Town Ranichu	3.1
		3. At Melli downstream	3.2
29. Ranichu	D/s Gangtok	1. Before confluence with River Teesta at Singtam	3.5
		2. After confluence of Ranichu and Rorachu at Ranipool	3.2
30. Dikchu	D/s Gangtok	1. Before confiuence with River Teesta Near NHPC Hydroelectric Power Project	3.4
31. Maney Khola	D/s Gangtok	1. After Confluence with Ray Khola at Adampool after meeting waste of STP	3.2
		2. At Burtuk near Army Base Camp, 4 Km U/s of Gangtok	3.2
TAMILNADU			
32. Palar	Along Vellore	1. Vaniyambadi Water Supply Head Work	4
TRIPURA			
33. Haora	Agartala D/s	1. Chandrapur, Agartala D/s of Haora	3.5
UTTAR PRADESH			
34. Saryu	Along Ayodhya	1. At Ayodhya at main Bathing Ghat	3
35. Rihand	Along Renukut	1. Renukut U/S	3.3
		2. Renukut D/S	3.2
WEST BENGAL			
36. Barakar	D/s Asansol	1. At Asansol (Water Intake Point)	3.8

CHAPTER V

Water Quality of Rivers in Indus Basin

5.1 Indus River System

The Indus Basin is bounded on the east by the Great Himalayas, on the north by the Karakoram and Haramosh ranges, on the west by the Sulaiman and Kirthar ranges and on the south by the Arabian Sea. The basin in Indian Territory has a maximum east-west length of about 855 km and maximum north south width of about 560 km.

The Indus rises near Manasarowar Lake in Tibet Plateau (China). The river has five tributaries in India; they are the Jhelum, the Chenab, the Ravi, the Beas, and the Sutlaj. The Jhelum, the Ravi and the Sutluj rivers each have a considerable length running along the international boundary.

The basin area of Indus is covering the States of Jammu & Kashmir, Haryana, Himachal Pradesh, Punjab, Chandigarh and Rajasthan., The important urban centres in these States are Ambala, Shimla, Jalandhar, Moga, Pathankot, Ludhiana, Batala, Patiala, Hoshiarpur, Amritsar, Bathinda, Abohar, Ganganagar,

Chandigarh, Barnala, Faridkot, Fazilka, Firozpur, FirozpurCantt., Gurdaspur, Kapurthala, Khanna, KotKapura, Malerkotla, Malout, Mansa, Muktsar, Phagwara, Rajpura, S.A.S.Nagar, (Mohali), Sangrur, Nabha, Panchkula Urban Estate, Hanumangarh.

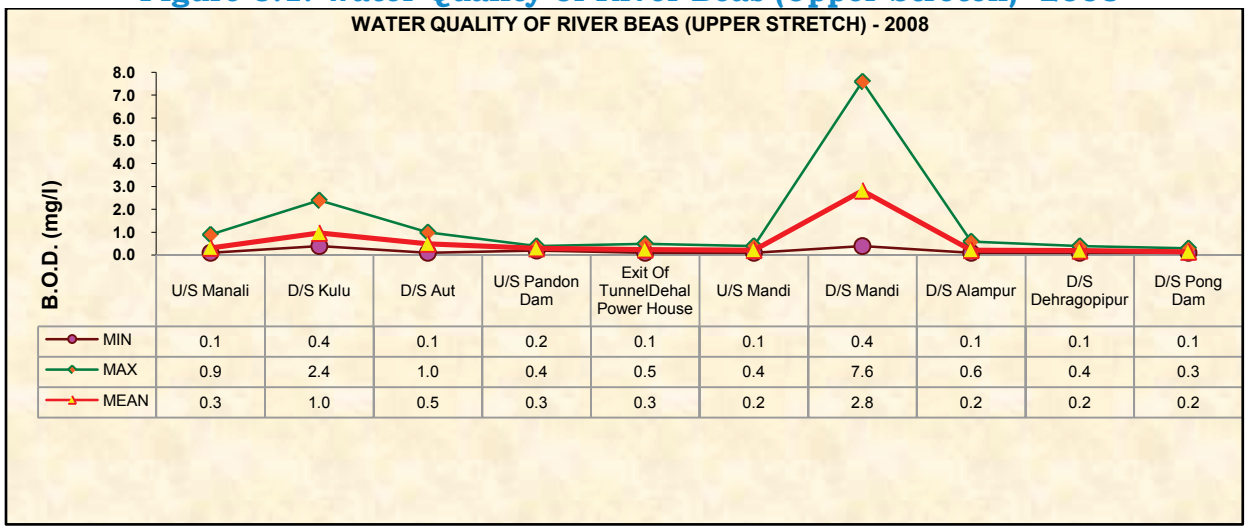
5.2 Water Quality Monitoring in Indus Basin

The State Pollution Control Boards of Himachal Pradesh, Punjab, Haryana and Rajasthan at 58 locations carry out the water quality monitoring of tributaries of River Indus in the basin. The ranges of water quality observed in rivers Beas, Satluj, Sirsa, Swan, Largi, Parvati, Tawi, Gawkadal, Chuntaol, Jhelum, Chenab and Ravi with respect to Temperature, pH, Conductivity, DO, BOD, COD, Nitrite, Nitrate, Ammonia-N, Total Coliforms (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

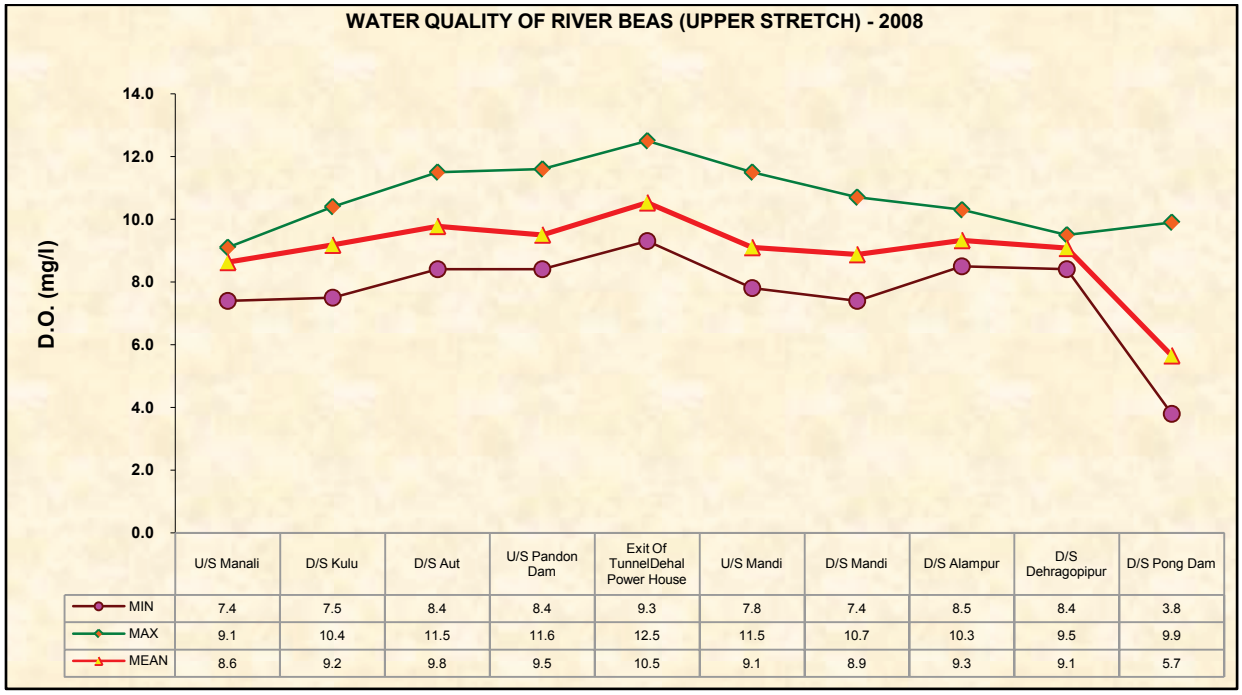
5.2.1 Water Quality of River Beas

The Water quality of River Beas indicates that pH, conductivity, BOD, DO and TC are meeting the water quality criteria at all locations except BOD at D/s Mandi (7.6 mg/l). With respect to Faecal Coliform the river is complying with the permissible limit of water quality criteria for bathing. The BOD value ranges from 0.1-7.6 mg/l. The count of Faecal Coliforms ranges from 2 to 1600 MPN/100ml whereas Total Coliforms ranges from 7-2400 MPN/100ml. The Water Quality of River Beas is given in Annexure-I (Table 5.1). The water quality status of River Beas with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is presented in Fig.5.1 & 5.2.

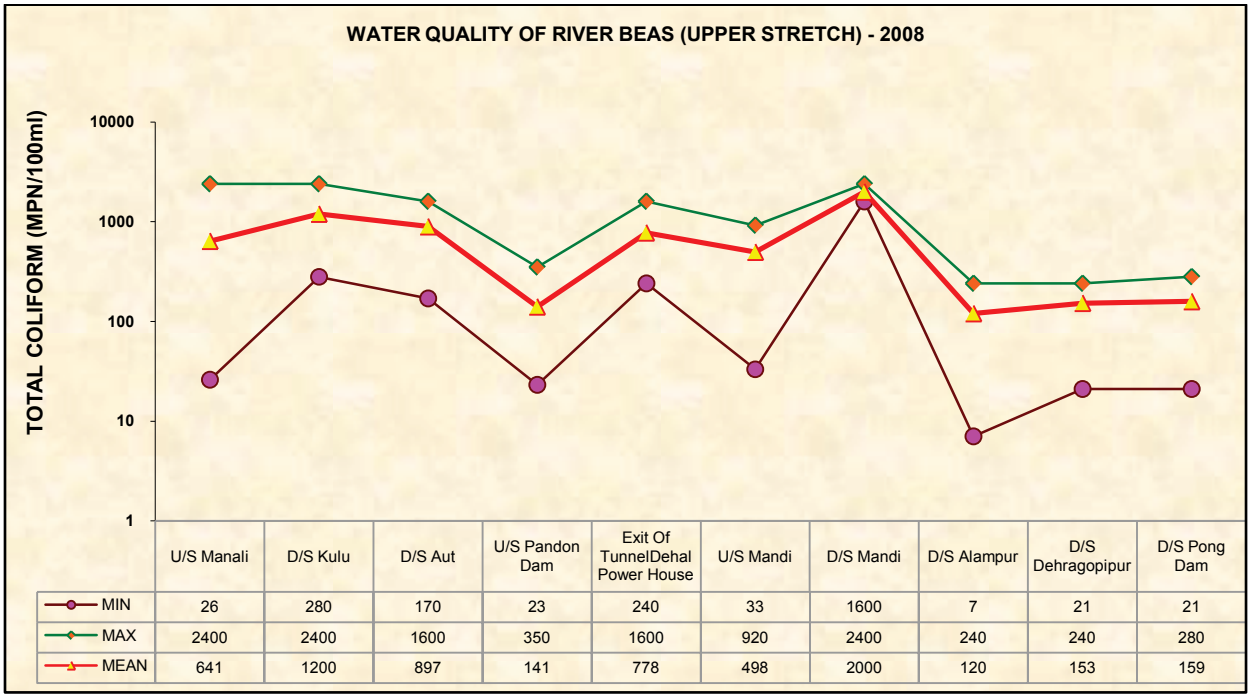
Figure 5.1: Water Quality of River Beas (Upper Stretch) -2008



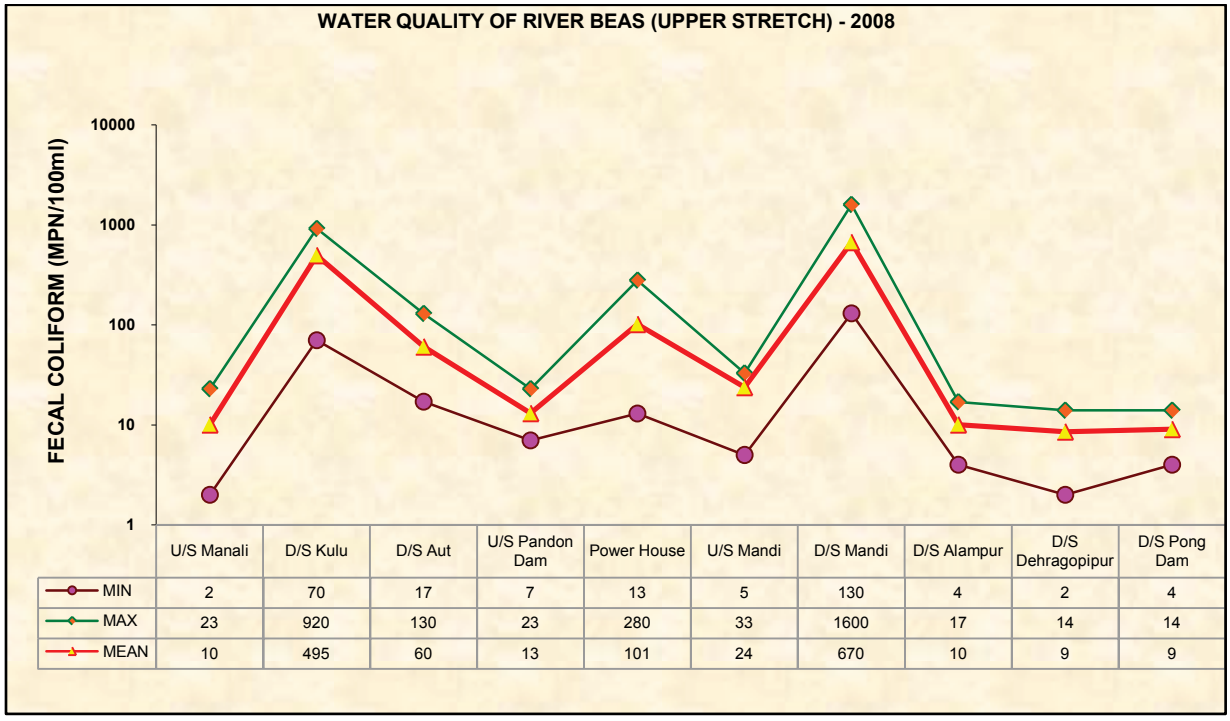
	U/S Manali	D/S Kulu	D/S Aut	U/S Pandon Dam	Exit Of TunnelDehal Power House	U/S Mandi	D/S Mandi	D/S Alampur	D/S Dehragopipur	D/S Pong Dam
MIN	0.1	0.4	0.1	0.2	0.1	0.1	0.4	0.1	0.1	0.1
MAX	0.9	2.4	1.0	0.4	0.5	0.4	7.6	0.6	0.4	0.3
MEAN	0.3	1.0	0.5	0.3	0.3	0.2	2.8	0.2	0.2	0.2



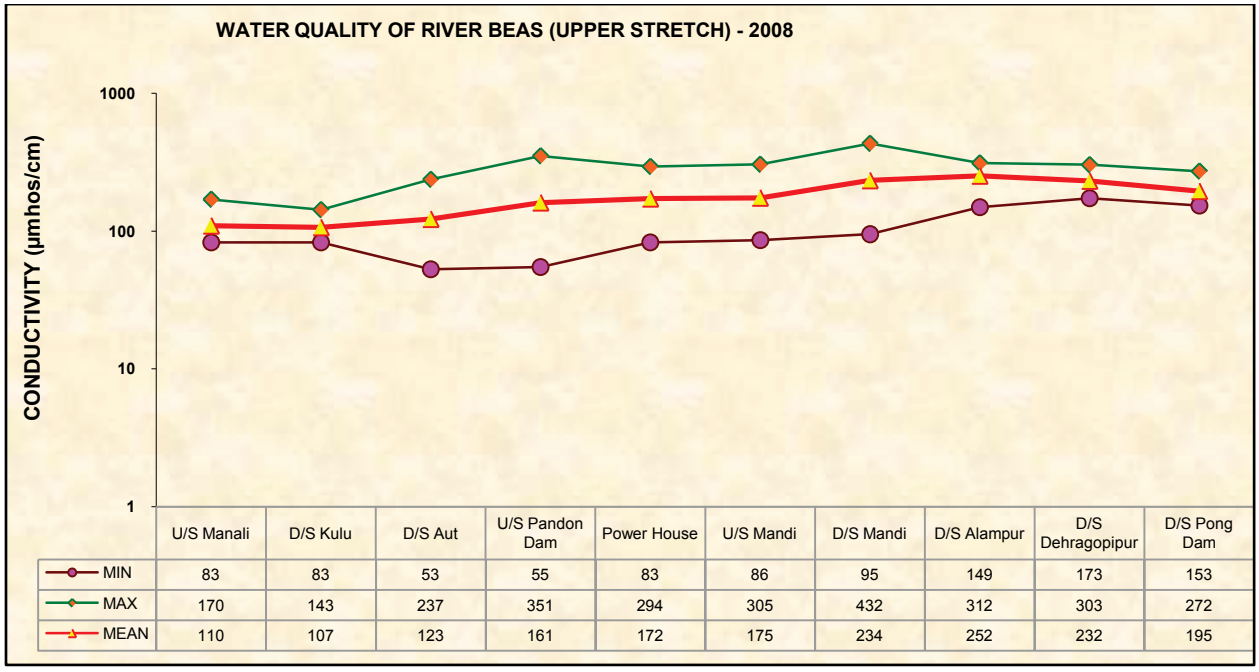
	U/S Manali	D/S Kulu	D/S Aut	U/S Pandon Dam	Exit Of TunnelDehal Power House	U/S Mandi	D/S Mandi	D/S Alampur	D/S Dehragopipur	D/S Pong Dam
MIN	7.4	7.5	8.4	8.4	9.3	7.8	7.4	8.5	8.4	3.8
MAX	9.1	10.4	11.5	11.6	12.5	11.5	10.7	10.3	9.5	9.9
MEAN	8.6	9.2	9.8	9.5	10.5	9.1	8.9	9.3	9.1	5.7



	U/S Manali	D/S Kulu	D/S Aut	U/S Pandon Dam	Exit Of TunnelDehal Power House	U/S Mandi	D/S Mandi	D/S Alampur	D/S Dehragopipur	D/S Pong Dam
MIN	26	280	170	23	240	33	1600	7	21	21
MAX	2400	2400	1600	350	1600	920	2400	240	240	280
MEAN	641	1200	897	141	778	498	2000	120	153	159

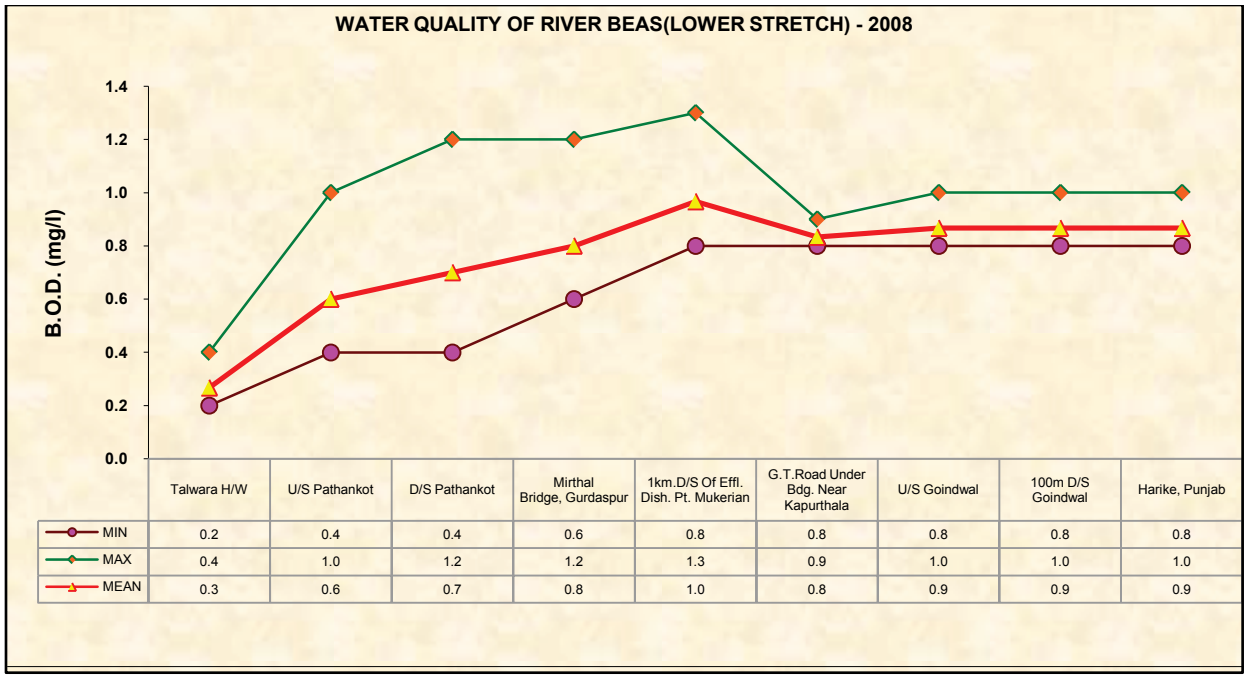


	U/S Manali	D/S Kulu	D/S Aut	U/S Pandon Dam	Power House	U/S Mandi	D/S Mandi	D/S Alampur	D/S Dehragopipur	D/S Pong Dam
MIN	2	70	17	7	13	5	130	4	2	4
MAX	23	920	130	23	280	33	1600	17	14	14
MEAN	10	495	60	13	101	24	670	10	9	9

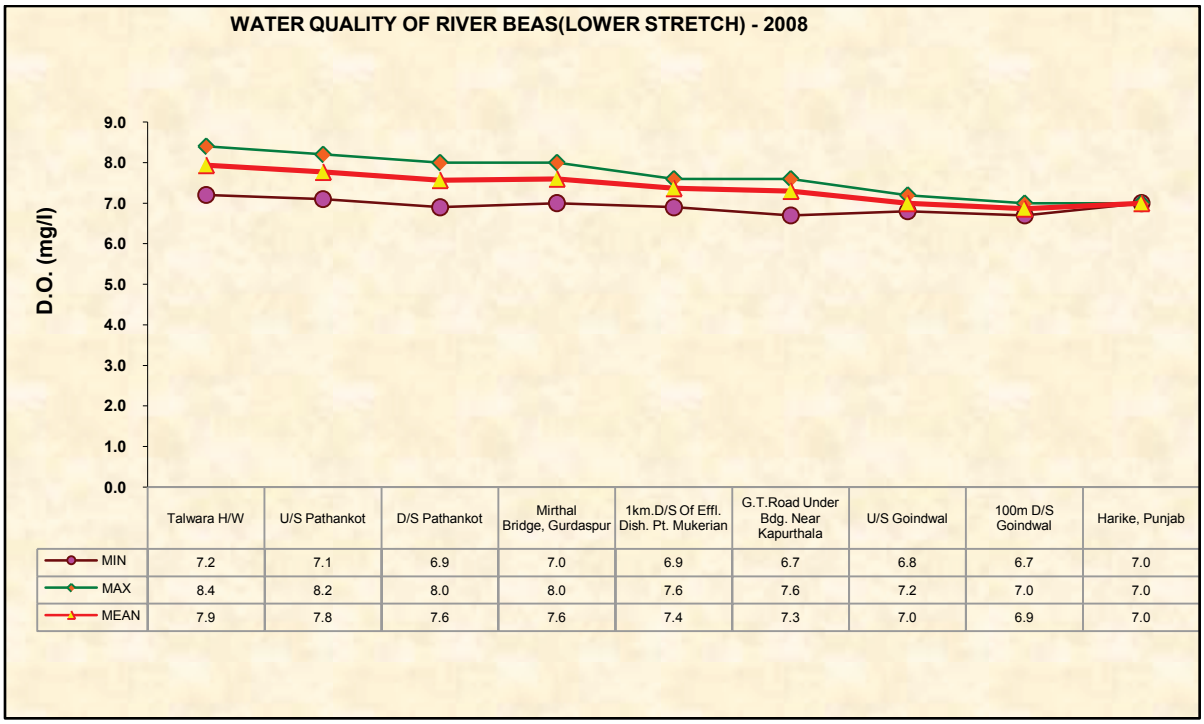


	U/S Manali	D/S Kulu	D/S Aut	U/S Pandon Dam	Power House	U/S Mandi	D/S Mandi	D/S Alampur	D/S Dehragopipur	D/S Pong Dam
MIN	83	83	53	55	83	86	95	149	173	153
MAX	170	143	237	351	294	305	432	312	303	272
MEAN	110	107	123	161	172	175	234	252	232	195

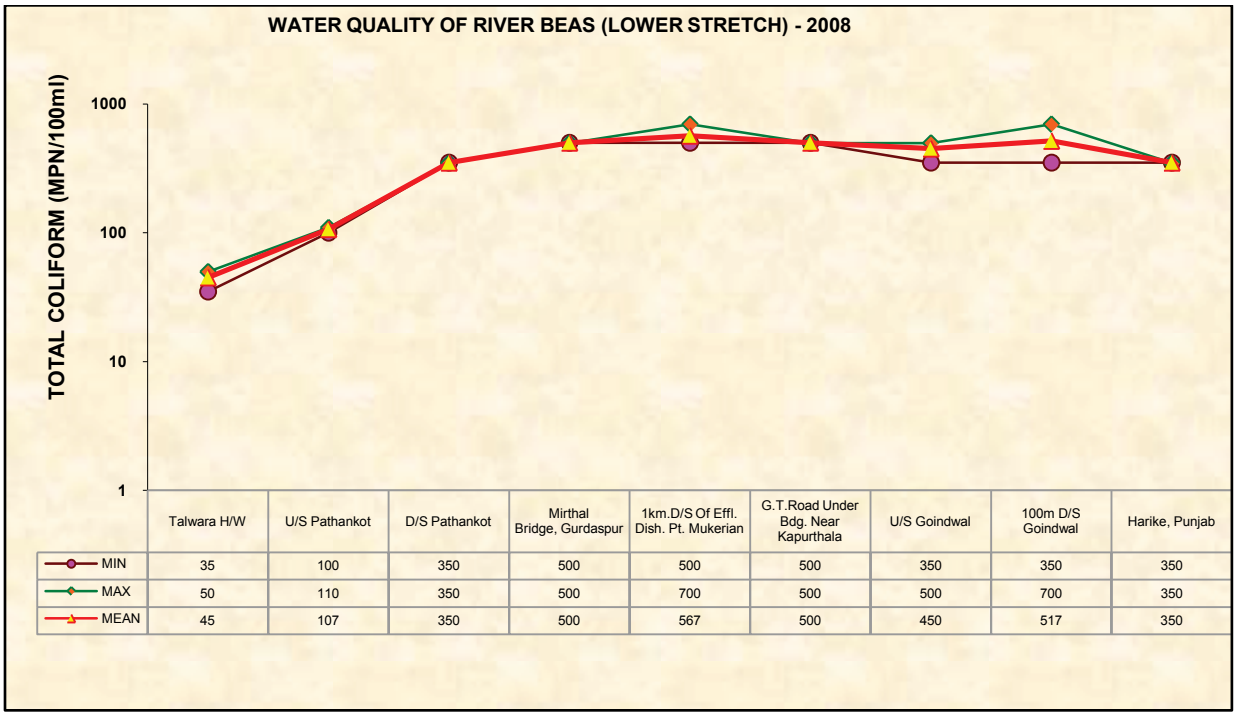
Figure 5.2: Water Quality of River Beas (Lower Stretch)



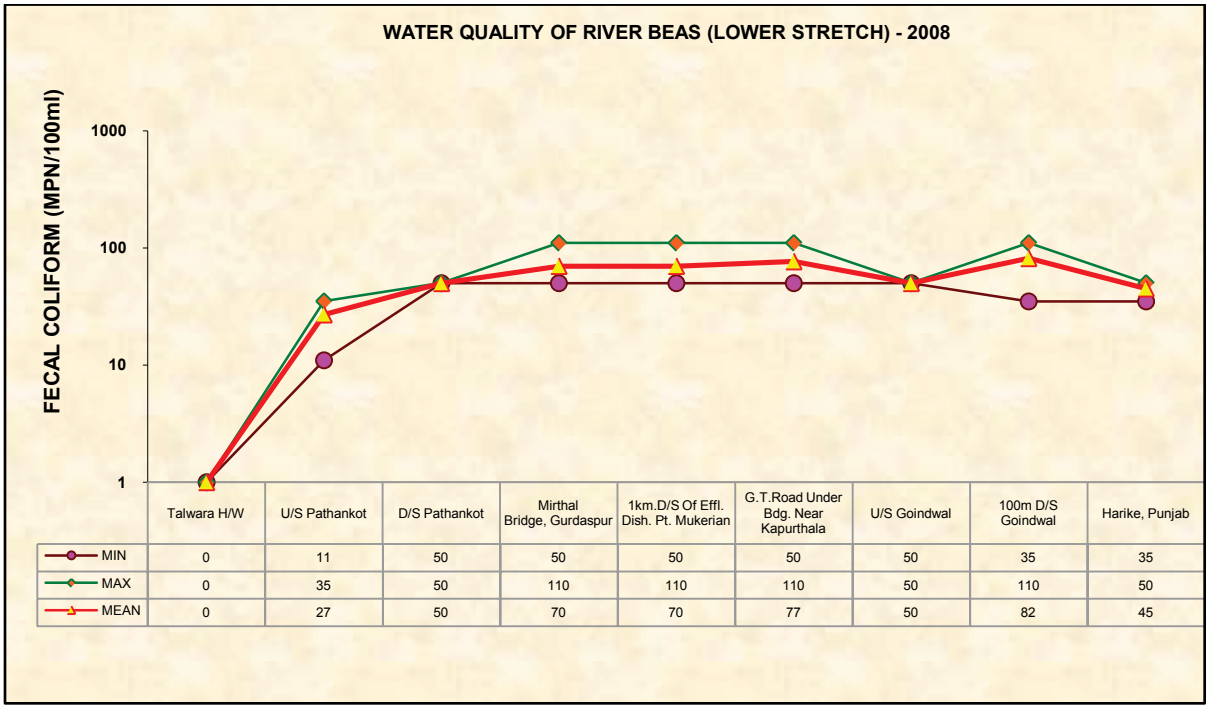
	Talwara H/W	U/S Pathankot	D/S Pathankot	Mirthal Bridge, Gurdaspur	1km.D/S Of Effl. Dish. Pt. Mukerian	G.T.Road Under Bdg. Near Kapurthala	U/S Goindwal	100m D/S Goindwal	Harike, Punjab
MIN	0.2	0.4	0.4	0.6	0.8	0.8	0.8	0.8	0.8
MAX	0.4	1.0	1.2	1.2	1.3	0.9	1.0	1.0	1.0
MEAN	0.3	0.6	0.7	0.8	1.0	0.8	0.9	0.9	0.9



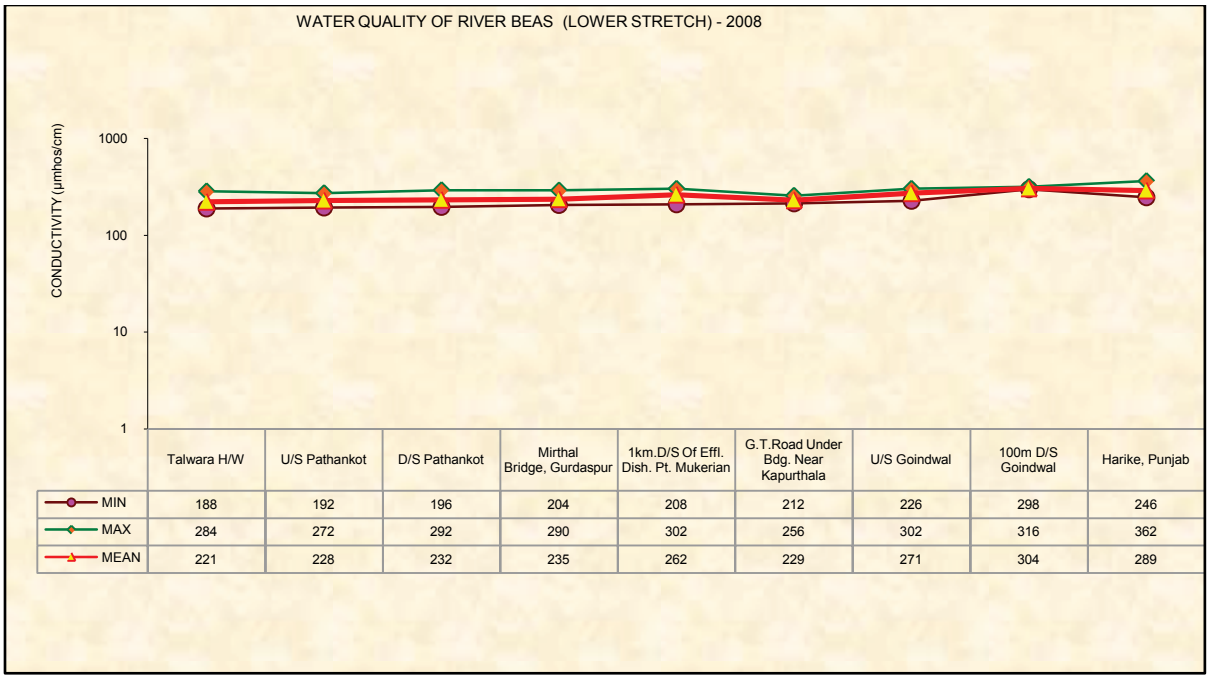
	Talwara H/W	U/S Pathankot	D/S Pathankot	Mirthal Bridge, Gurdaspur	1km.D/S Of Effl. Dish. Pt. Mukerian	G.T.Road Under Bdg. Near Kapurthala	U/S Goindwal	100m D/S Goindwal	Harike, Punjab
MIN	7.2	7.1	6.9	7.0	6.9	6.7	6.8	6.7	7.0
MAX	8.4	8.2	8.0	8.0	7.6	7.6	7.2	7.0	7.0
MEAN	7.9	7.8	7.6	7.6	7.4	7.3	7.0	6.9	7.0



	Talwara H/W	U/S Pathankot	D/S Pathankot	Mirthal Bridge, Gurdaspur	1km.D/S Of Effl. Dish. Pt. Mukerian	G.T.Road Under Bdg. Near Kapurthala	U/S Goindwal	100m D/S Goindwal	Harike, Punjab
MIN	35	100	350	500	500	500	350	350	350
MAX	50	110	350	500	700	500	500	700	350
MEAN	45	107	350	500	567	500	450	517	350



	Talwara H/W	U/S Pathankot	D/S Pathankot	Mirthal Bridge, Gurdaspur	1km.D/S Of Effl. Dish. Pt. Mukerian	G.T.Road Under Bdg. Near Kapurthala	U/S Goindwal	100m D/S Goindwal	Harike, Punjab
MIN	0	11	50	50	50	50	50	35	35
MAX	0	35	50	110	110	110	50	110	50
MEAN	0	27	50	70	70	77	50	82	45



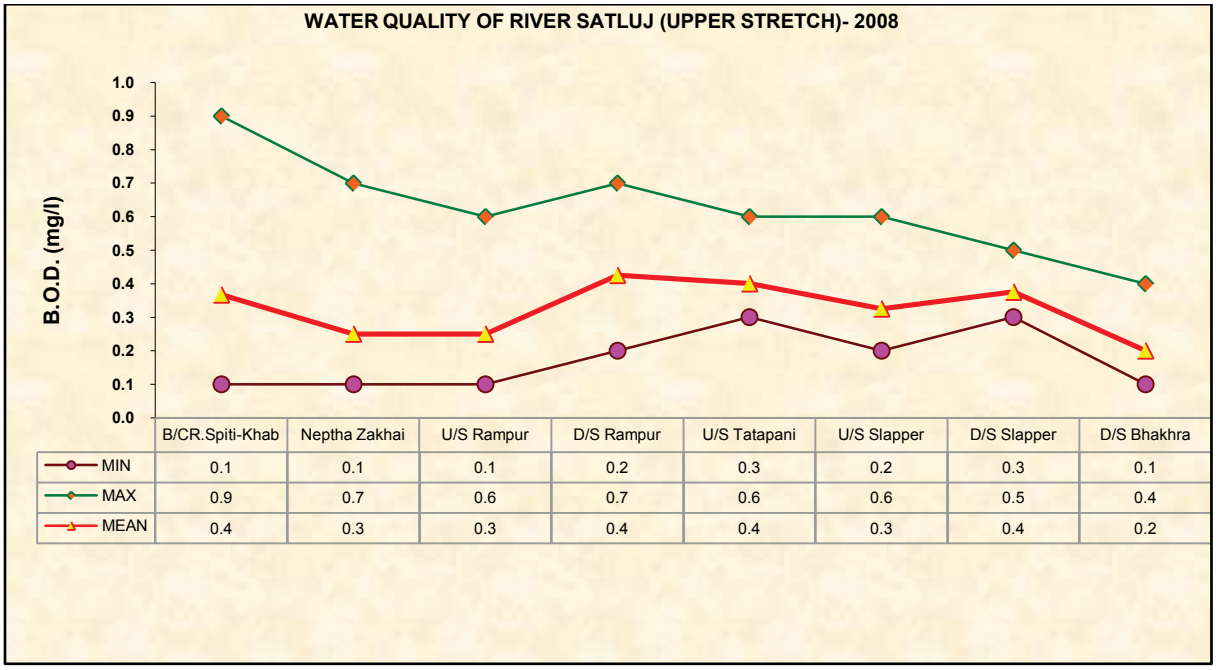
	Talwara H/W	U/S Pathankot	D/S Pathankot	Mirthal Bridge, Gurdaspur	1km.D/S Of Effl. Dish. Pt. Mukerian	G.T.Road Under Bdg. Near Kapurthala	U/S Goindwal	100m D/S Goindwal	Harike, Punjab
MIN	188	192	196	204	208	212	226	298	246
MAX	284	272	292	290	302	256	302	316	362
MEAN	221	228	232	235	262	229	271	304	289

5.2.2 Water Quality of River Satluj

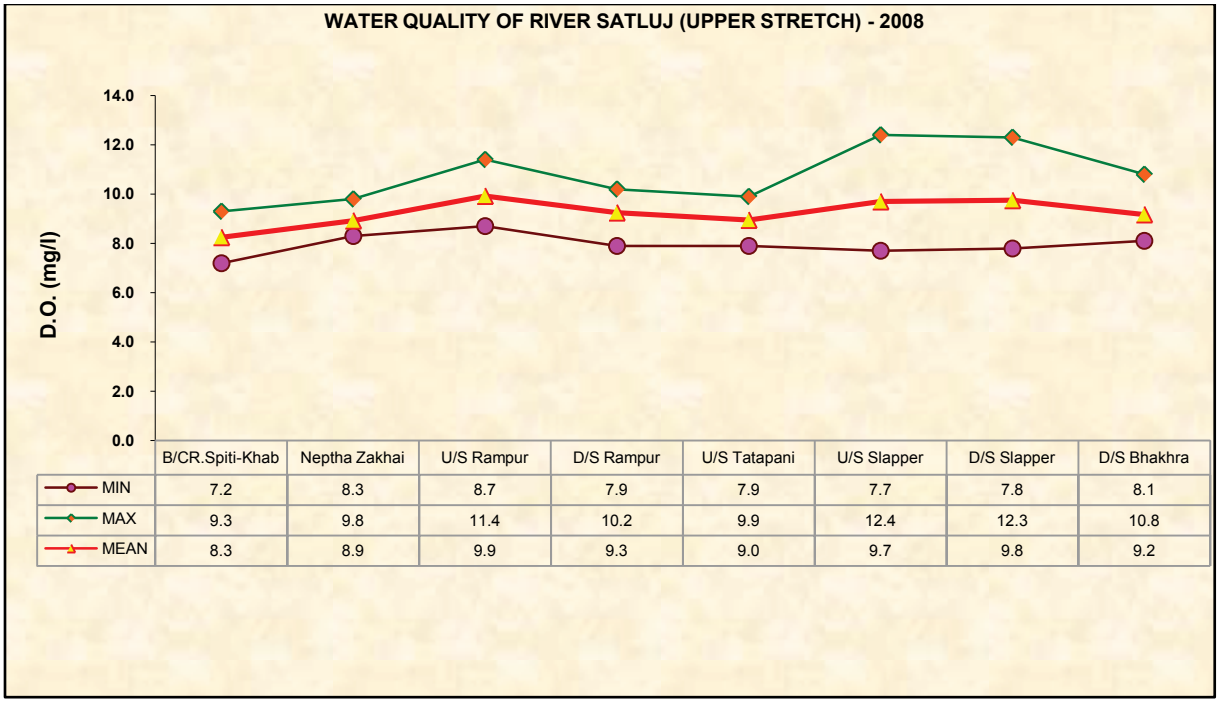
The water quality of River Satluj is conforming to water quality criteria with respect to pH, conductivity and DO except at 100m D/s Budha Nala Confl., Ludhiana and at Boat Bdg. Dharmkotnakodar Road, Jalandhar where DO is observed less than the desired criteria. The DO varies from 1.2 to 12.4 mg/l and the BOD ranges from 0.0-48 mg/l. The maximum value 48 mg/l of BOD is observed at D/s Budhanala Confluence at Ludhiana. The other locations having high level of BOD are at Boat Bridge Dharmkotnakodar Road of Jalandhar (18 mg/l), D/s of East Bein (6.2 mg/l) and U/s Budhanala (4.5 mg/l) in Punjab. The Faecal coliform value ranges from 0 to 10,000 MPN/100ml whereas the Total Coliform value ranges from 2 to 1, 10,000 MPN/100ml. The Faecal Coliform is not complying with the permissible limit of water quality criteria for bathing at D/s Budha Nala Confl., Boat Bridge Dharmkotnakodar Road of Jalandhar and D/s of East Bein. The Total Coliforms count is considerably high and does not meet the criteria at number of locations such as at U/s & D/s of Budhanala confl. in Ludhiana, Boat Bridge at Dharmkotnakodar in Jalandhar and D/s of East Bein in Punjab. The concentration of Nitrate (NO_3^-) is observed in the range of 0.6 – 5.20 mg/l, whereas Ammonical Nitrogen (NH_4-N) is in the range of 0.2-6.0 mg/l. The Ammonical nitrogen is observed high than the desired water quality criteria for Propagation of Wild life and Fisheries at many locations. The water quality of River Satluj is given in Annexure–I (Table 5.2). The water quality status of River Satluj

with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is presented in Fig. 5.3 & 5.4.

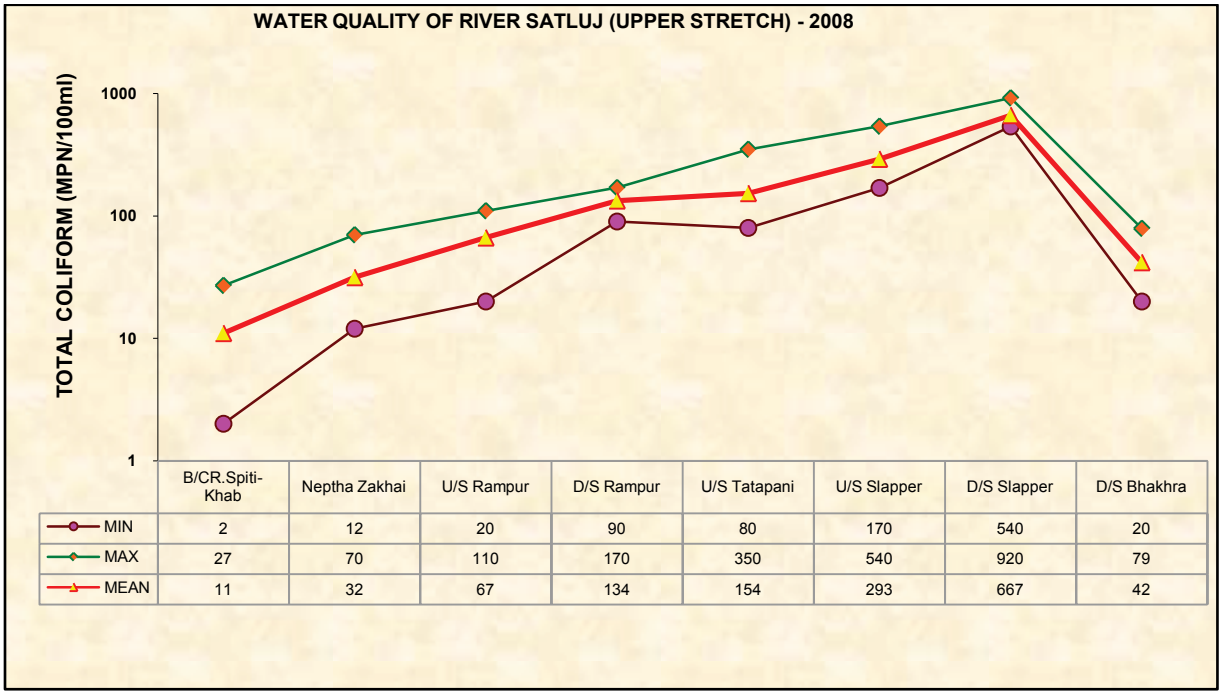
Figure 5.3: Water Quality of River Satluj (Upper Stretch)



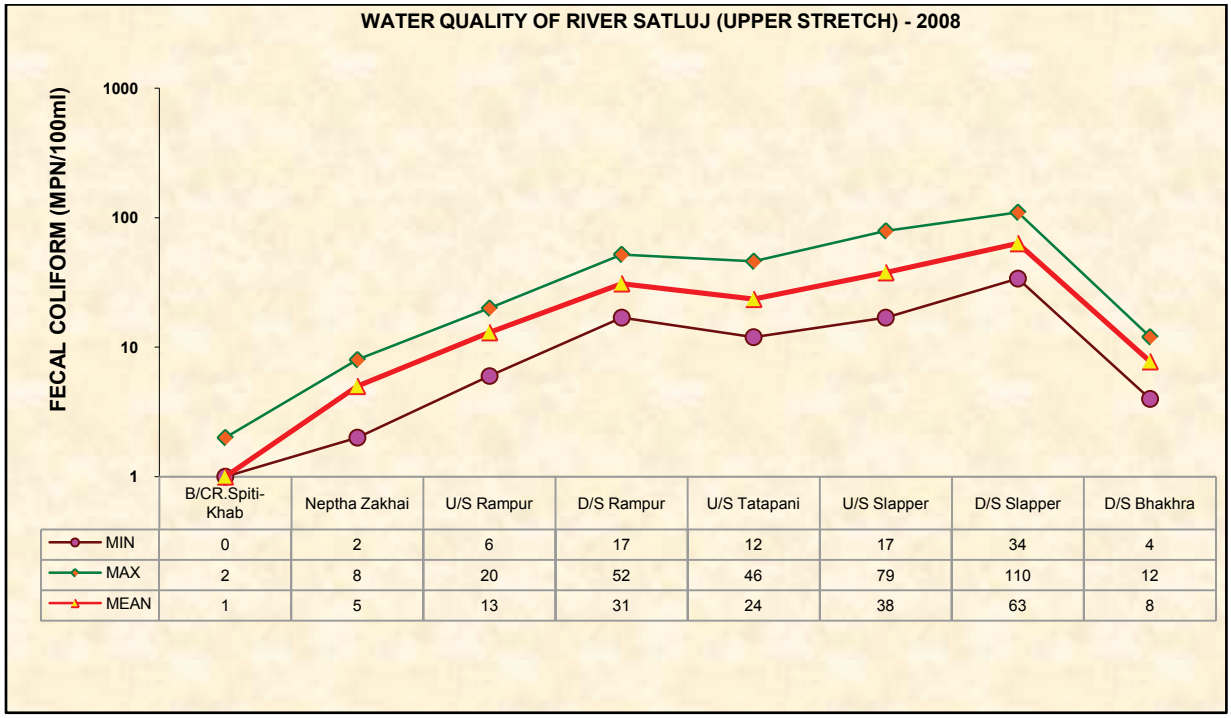
	B/CR.Spiti-Khab	Neptha Zakhai	U/S Rampur	D/S Rampur	U/S Tatapani	U/S Slapper	D/S Slapper	D/S Bhakhra
MIN	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.1
MAX	0.9	0.7	0.6	0.7	0.6	0.6	0.5	0.4
MEAN	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.2



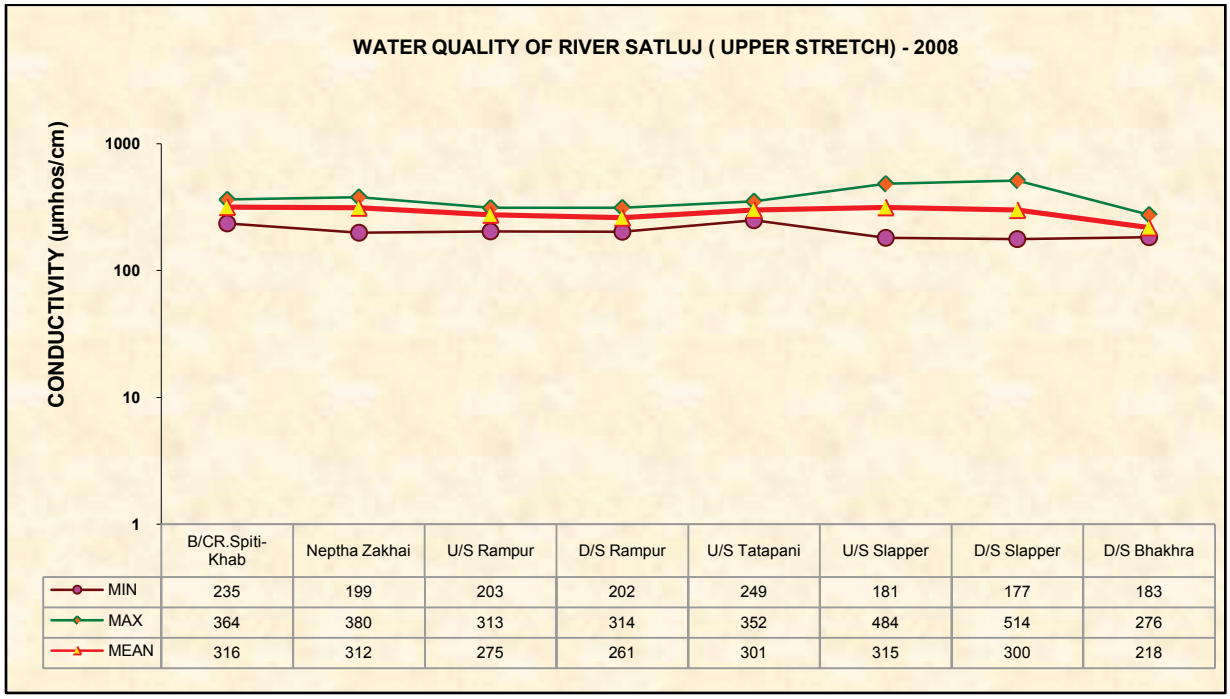
	B/CR.Spiti-Khab	Neptha Zakhai	U/S Rampur	D/S Rampur	U/S Tatapani	U/S Slapper	D/S Slapper	D/S Bhakhra
MIN	7.2	8.3	8.7	7.9	7.9	7.7	7.8	8.1
MAX	9.3	9.8	11.4	10.2	9.9	12.4	12.3	10.8
MEAN	8.3	8.9	9.9	9.3	9.0	9.7	9.8	9.2



	B/CR.Spiti-Khab	Neptha Zakhai	U/S Rampur	D/S Rampur	U/S Tatapani	U/S Slapper	D/S Slapper	D/S Bhakhra
MIN	2	12	20	90	80	170	540	20
MAX	27	70	110	170	350	540	920	79
MEAN	11	32	67	134	154	293	667	42

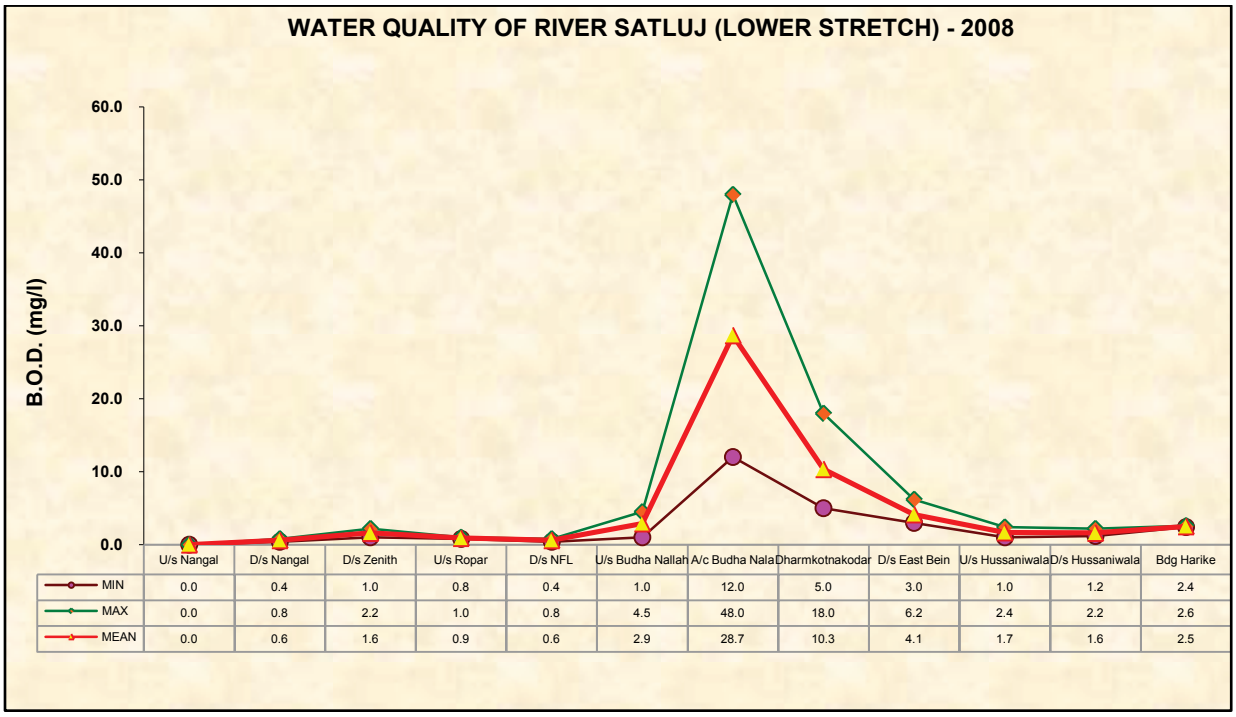


	B/CR.Spiti-Khab	Neptha Zakhai	U/S Rampur	D/S Rampur	U/S Tatapani	U/S Slapper	D/S Slapper	D/S Bhakhra
MIN	0	2	6	17	12	17	34	4
MAX	2	8	20	52	46	79	110	12
MEAN	1	5	13	31	24	38	63	8

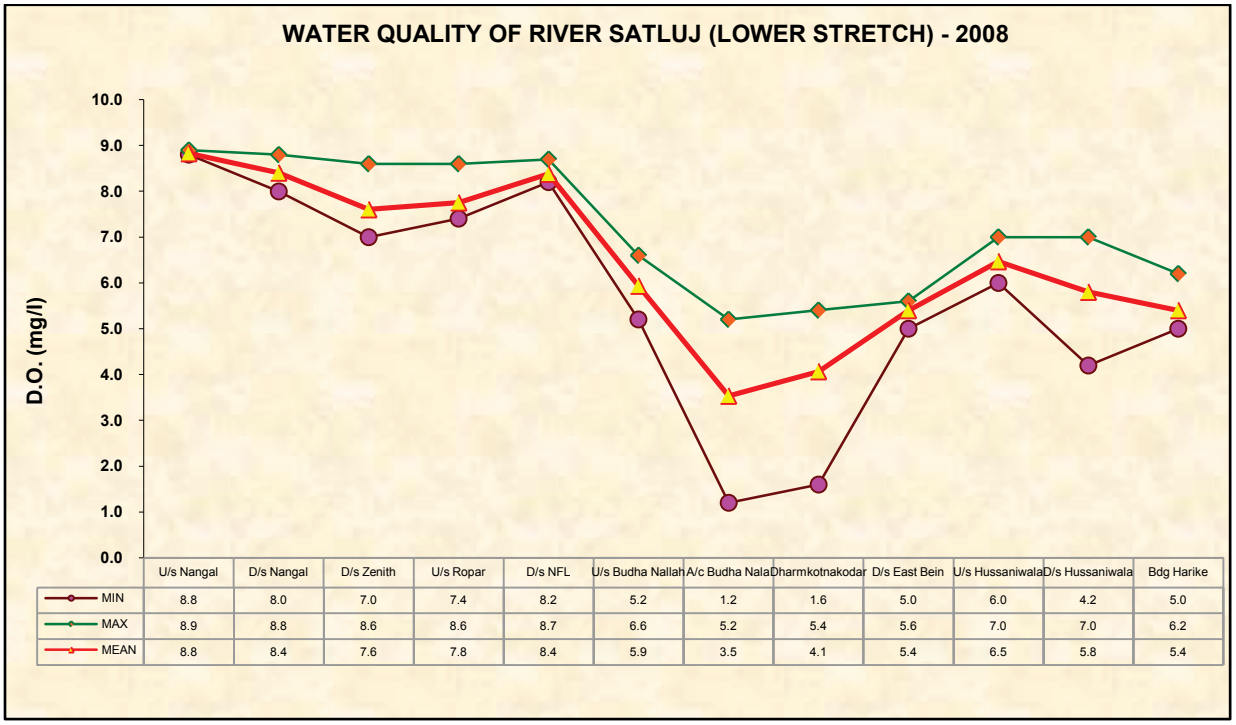


	B/CR.Spiti-Khab	Neptha Zakhai	U/S Rampur	D/S Rampur	U/S Tatapani	U/S Slapper	D/S Slapper	D/S Bhakhra
MIN	235	199	203	202	249	181	177	183
MAX	364	380	313	314	352	484	514	276
MEAN	316	312	275	261	301	315	300	218

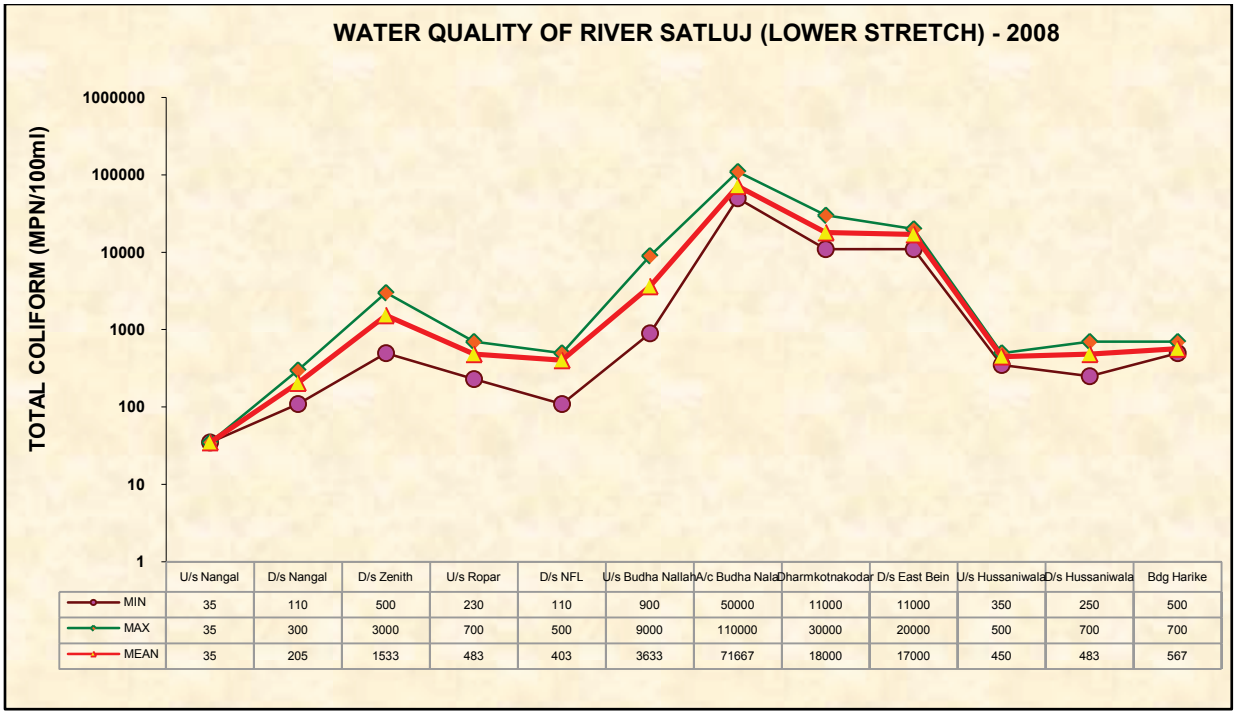
Figure 5.4: Water Quality of River Satluj (Lower Stretch)



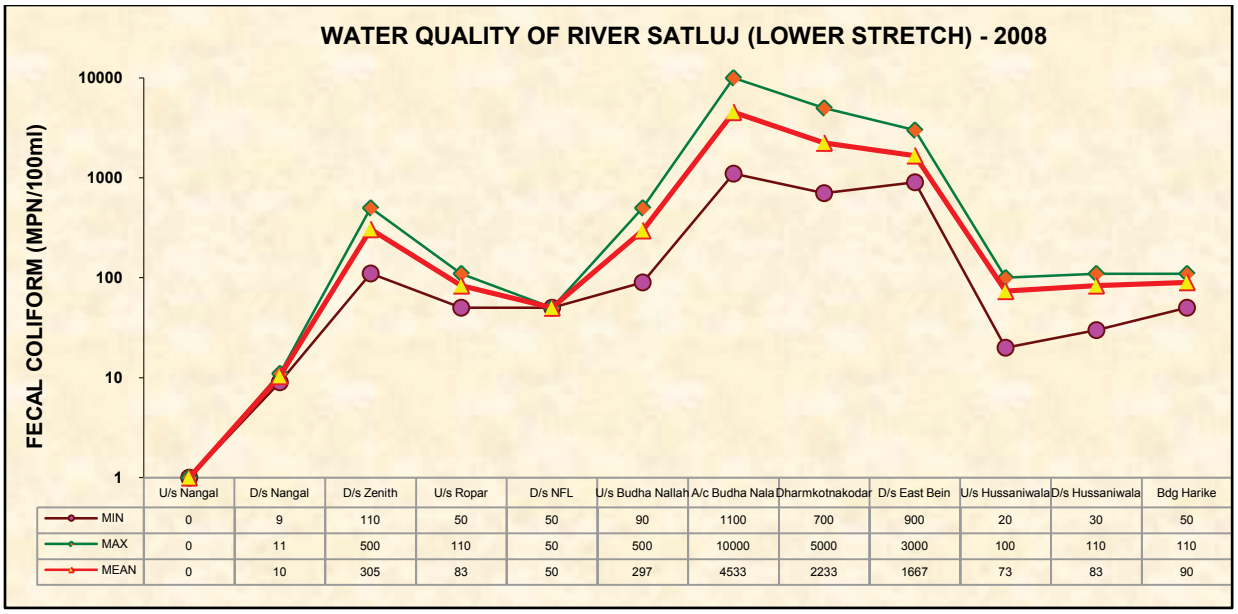
	U/s Nangal	D/s Nangal	D/s Zenith	U/s Ropar	D/s NFL	U/s Budha Nallah	A/c Budha Nala	Dharmkotnakodar	D/s East Bein	U/s Hussaniwala	D/s Hussaniwala	Bdg Harike
MIN	0.0	0.4	1.0	0.8	0.4	1.0	12.0	5.0	3.0	1.0	1.2	2.4
MAX	0.0	0.8	2.2	1.0	0.8	4.5	48.0	18.0	6.2	2.4	2.2	2.6
MEAN	0.0	0.6	1.6	0.9	0.6	2.9	28.7	10.3	4.1	1.7	1.6	2.5



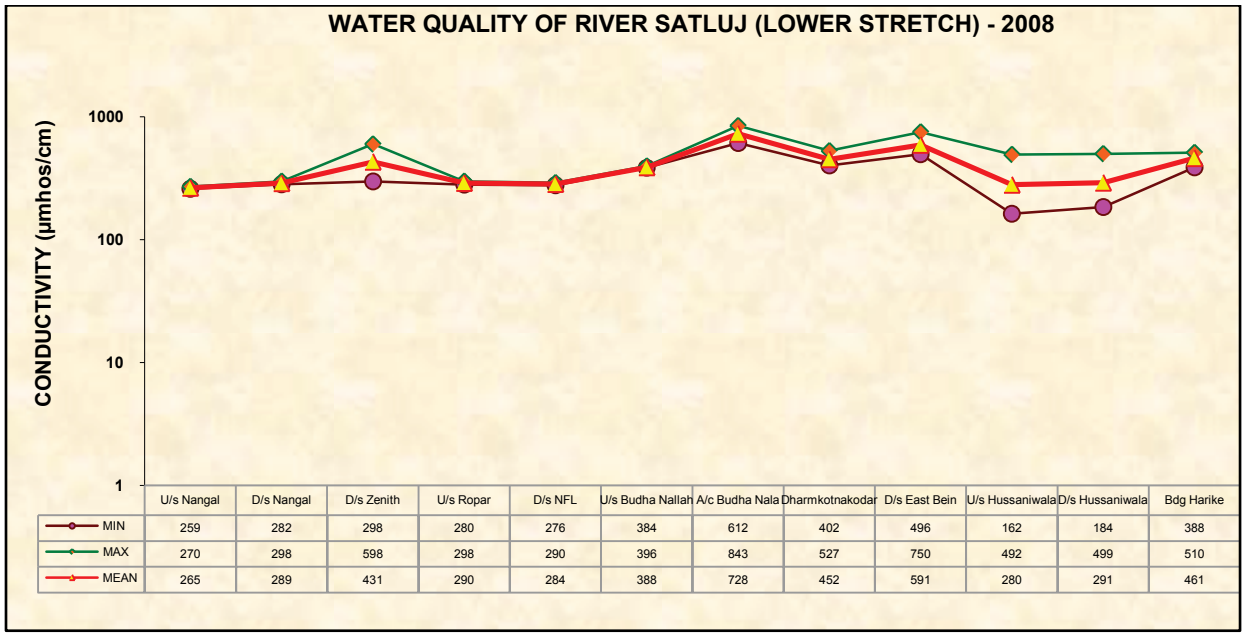
	U/s Nangal	D/s Nangal	D/s Zenith	U/s Ropar	D/s NFL	U/s Budha Nallah	A/c Budha Nala	Dharmkotnakodar	D/s East Bein	U/s Hussaniwala	D/s Hussaniwala	Bdg Harike
MIN	8.8	8.0	7.0	7.4	8.2	5.2	1.2	1.6	5.0	6.0	4.2	5.0
MAX	8.9	8.8	8.6	8.6	8.7	6.6	5.2	5.4	5.6	7.0	7.0	6.2
MEAN	8.8	8.4	7.6	7.8	8.4	5.9	3.5	4.1	5.4	6.5	5.8	5.4



	U/s Nangal	D/s Nangal	D/s Zenith	U/s Ropar	D/s NFL	U/s Budha Nallah	A/c Budha Nala	Dharmkotnakodar	D/s East Bein	U/s Hussaniwala	D/s Hussaniwala	Bdg Harike
MIN	35	110	500	230	110	900	50000	11000	11000	350	250	500
MAX	35	300	3000	700	500	9000	110000	30000	20000	500	700	700
MEAN	35	205	1533	483	403	3633	71667	18000	17000	450	483	567



	U/s Nangal	D/s Nangal	D/s Zenith	U/s Ropar	D/s NFL	U/s Budha Nallah	A/c Budha Nala	Dharmkotnakodar	D/s East Bein	U/s Hussaniwala	D/s Hussaniwala	Bdg Harike
MIN	0	9	110	50	50	90	1100	700	900	20	30	50
MAX	0	11	500	110	50	500	10000	5000	3000	100	110	110
MEAN	0	10	305	83	50	297	4533	2233	1667	73	83	90



	U/s Nangal	D/s Nangal	D/s Zenith	U/s Ropar	D/s NFL	U/s Budha Nallah	A/c Budha Nala	Dharmkotnakodar	D/s East Bein	U/s Hussaniwala	D/s Hussaniwala	Bdg Harike
MIN	259	282	298	280	276	384	612	402	496	162	184	388
MAX	270	298	598	298	290	396	843	527	750	492	499	510
MEAN	265	289	431	290	284	388	728	452	591	280	291	461

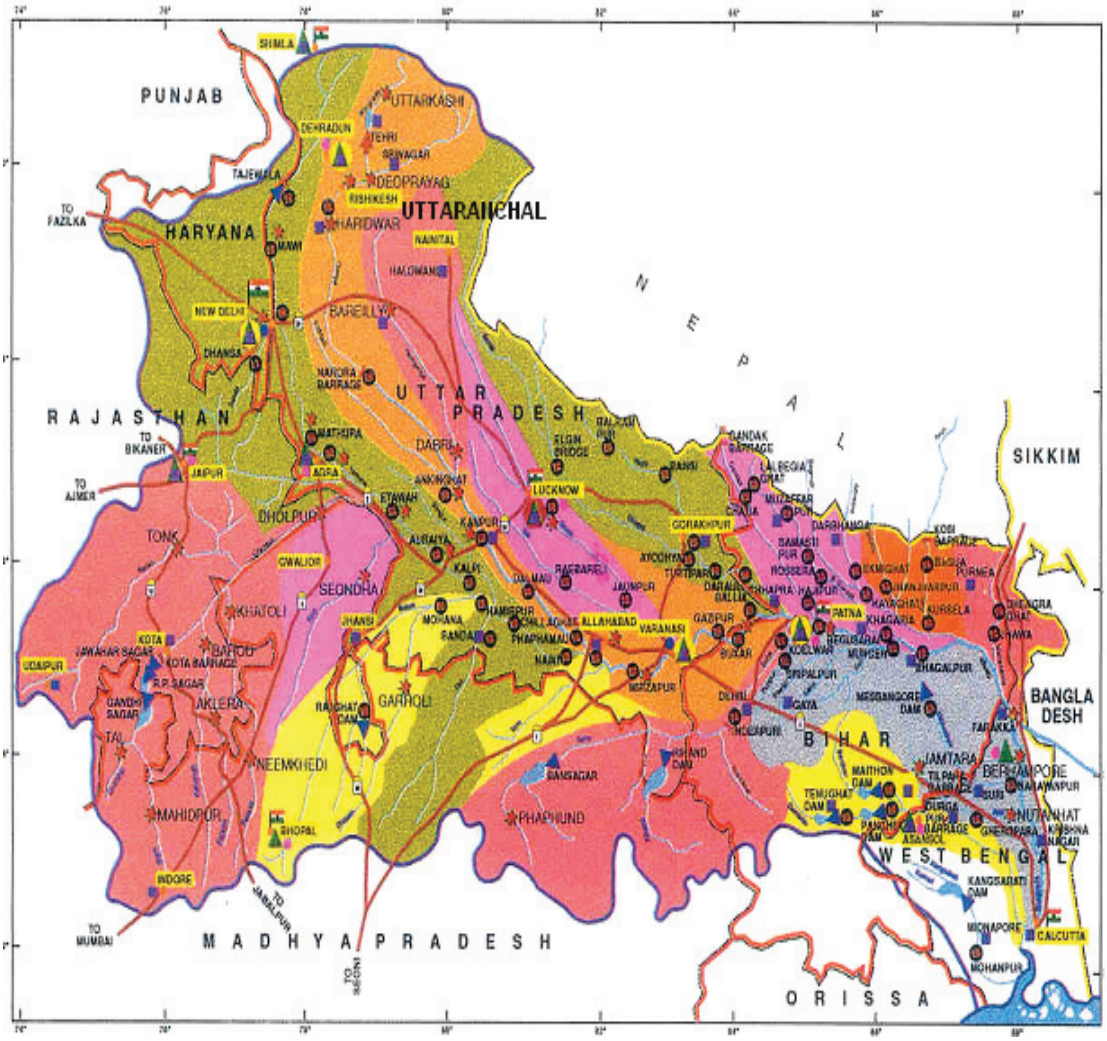
5.2.3 Water Quality of River Ravi, Parvati, Largi, Swan and Sirsa

The water quality of River Ravi, Parvati, Largi, Swan and Sirsa are meeting the water quality criteria for pH, DO, Conductivity, BOD, TC and FC at all locations in the year during the period of monitoring. The Water Quality of river(s) Ravi, Parvati, Largi, Swan and Sirsa is given in Annexure-I (Table 5.3).

CHAPTER VI

Water Quality of Rivers in Ganga Basin

6.1 Ganga River System



The Ganga basin covers slightly more than one-fourth (26.3 per cent) of the country's total geographical area, and is the biggest river basin. In India the basin covers the whole of Uttarakhand, Uttar Pradesh, Bihar and the Union Territory of Delhi and parts of Punjab, Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh and West Bengal. The main river, rising in the northern most part of Uttarakhand, flows through Uttar Pradesh, Bihar and West Bengal and finally falls into the Bay of Bengal. The Ganga Basin is bound on the north by the Himalayas

and on the south by the Vindhyas. The ridge between the Indus system and the Ganga system, the Great desert of Rajasthan and the Aravalli hills form the boundary on the west. After traversing a length of 1450 km in Uttarakhand and Uttar Pradesh and 110 km in the boundary between U.P. and Bihar the river then enters Bihar and flows 445 km more or less through the middle of the State. The length of the river measured along the Bhagirathi and the Hugli during its course in West Bengal is about 520 km.

The Ganga has a large number of tributaries. Some of these are of Himalayan origin having considerably large water wealth. The important tributaries within India are the Kali, the Ramganga, the Yamuna, the Gomti, the Ghaghara, the Gandak and the Kosi. The Yamuna although a tributary of the Ganga, is virtually a river by itself. Its major tributaries are the Chambal, the Sind, the Betwa and the Ken. The main plateau tributaries of the Ganga are the Tons, the Son, the Damodar and the Kasai-Haldi.

6.2 Water Quality Monitoring in Ganga Basin

The water quality monitoring of the River Ganga and its several tributaries are being done in the basin by the State Pollution Control Boards of Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh and Central Pollution Control Board at 154 locations. The ranges of water quality observed in rivers in Ganga Basin with respect to pH, Conductivity, DO, BOD, Total Coliform and Faecal Coliform are calculated and presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

6.2.1 Water Quality of River Ganga

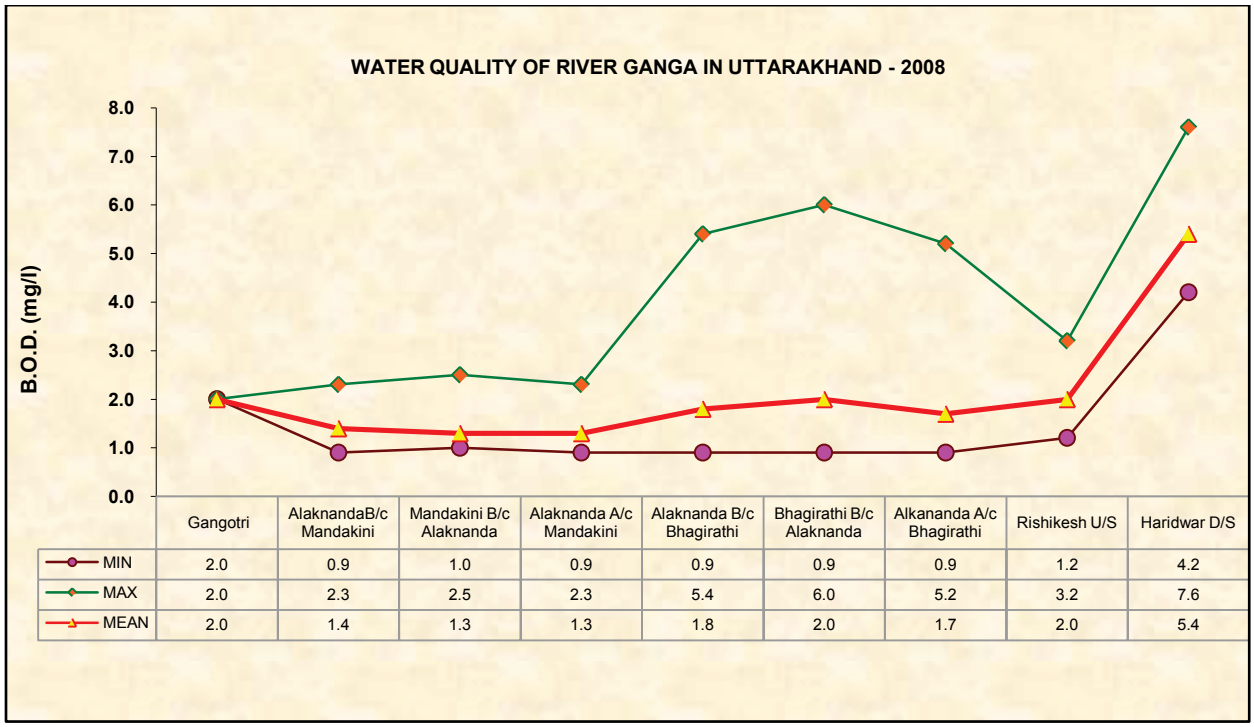
The Water quality of River Ganga indicates that pH, conductivity and DO are meeting the water quality criteria at majority of locations. Dissolved Oxygen ranges from 1.6 to 11.6 mg/l. The lowest value of 1.6 mg/l DO is observed at Kanpur D/s (Jajmau Pumping Station) in Uttar Pradesh. High value of conductivity is observed at Diamond Harbour (6320 µmhos/cm) due to intrusion of sea water in the estuary.

The BOD value ranges from 0.5-21.0 mg/l. The highest value of 21.0 mg/l of BOD is observed at Kanpur D/s. The other locations observed with maximum BOD level

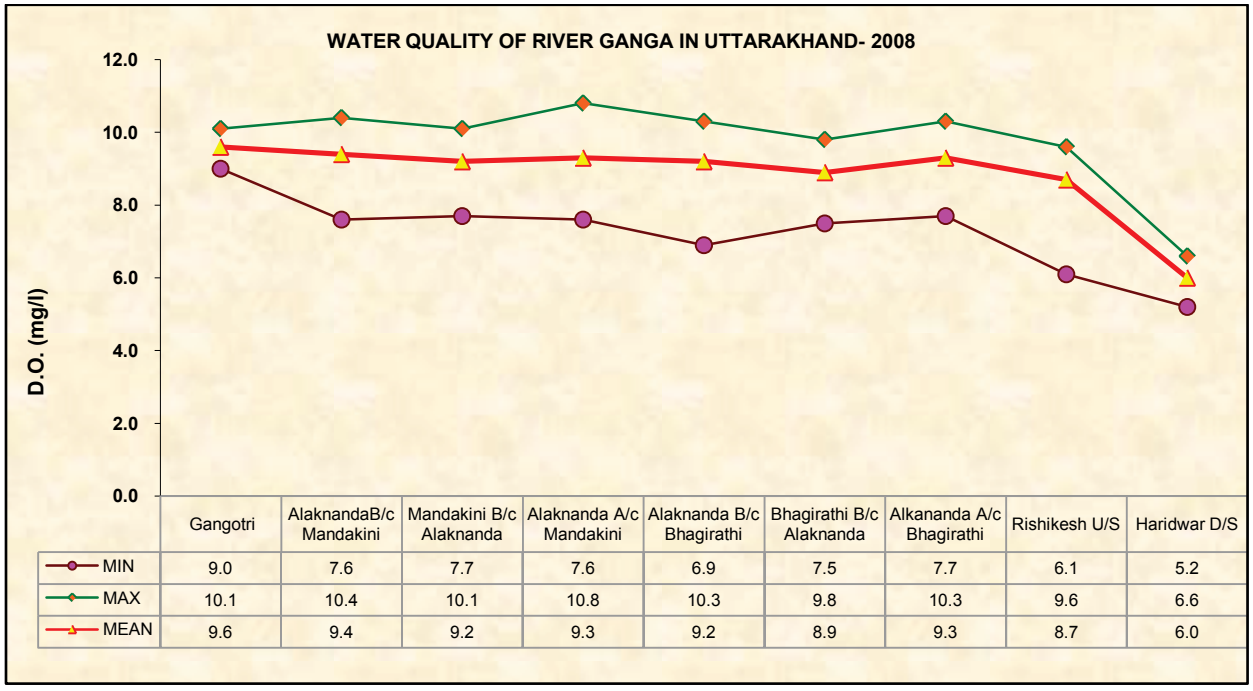
exceeding the criteria are Bhagirathi B/c with Alaknanda Alkananda B/c and A/c to Bhagirathi at Devprayag, Rishikesh U/s, Haridwar D/s, Narora, Garhmukteshwar, Kannauj U/s and D/s, Bithoor, Kanpur U/s, Dalmau, Allahabad D/s, Varanasi U/s, Ghazipur (Trighat), Dakshineshwar and Uluberia.

The count of Faecal Coliform (FC) ranges from 0 to 8,50,000 MPN/100ml whereas Total Coliform (TC) ranges from 0 to 1,01,00,000 MPN/100ml. The maximum Total Coliform (TC) and Faecal Coliform (FC) level is not meeting the desired water quality criteria at most of the locations. The highest value of Total Coliform is observed in Alkananda B/c to river Mandakini at Rudraprayag and of Faecal Coliform at Dakshineshwar. The concentration of Nitrate (NO_3^-) varies from 0.1-3.8 mg/l whereas Nitrite (NO_2^-) ranges from 0.1-2.8 mg/l and the Ammonical Nitrogen (NH_4-N) are observed in the range of 0.0-1.4 mg/l. The water quality of River Ganga with respect to pH, Conductivity, D.O, BOD, FC and TC, Nitrite, Nitrate and Ammonical Nitrogen is given in Annexure-I (Table 6.1). The state-wise water quality status of mainstream of River Ganga with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in Figure 6.1 to 6.4.

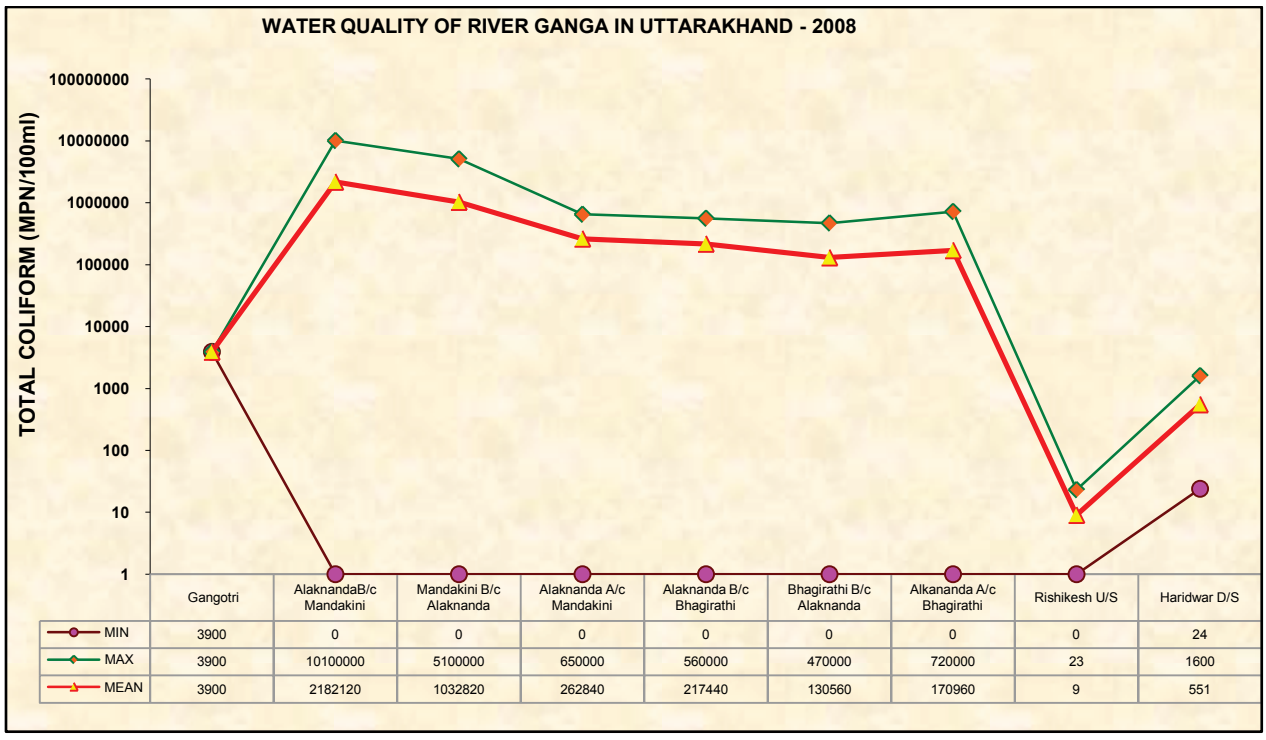
Figure 6.1: Water Quality of River Ganga in Uttarakhand



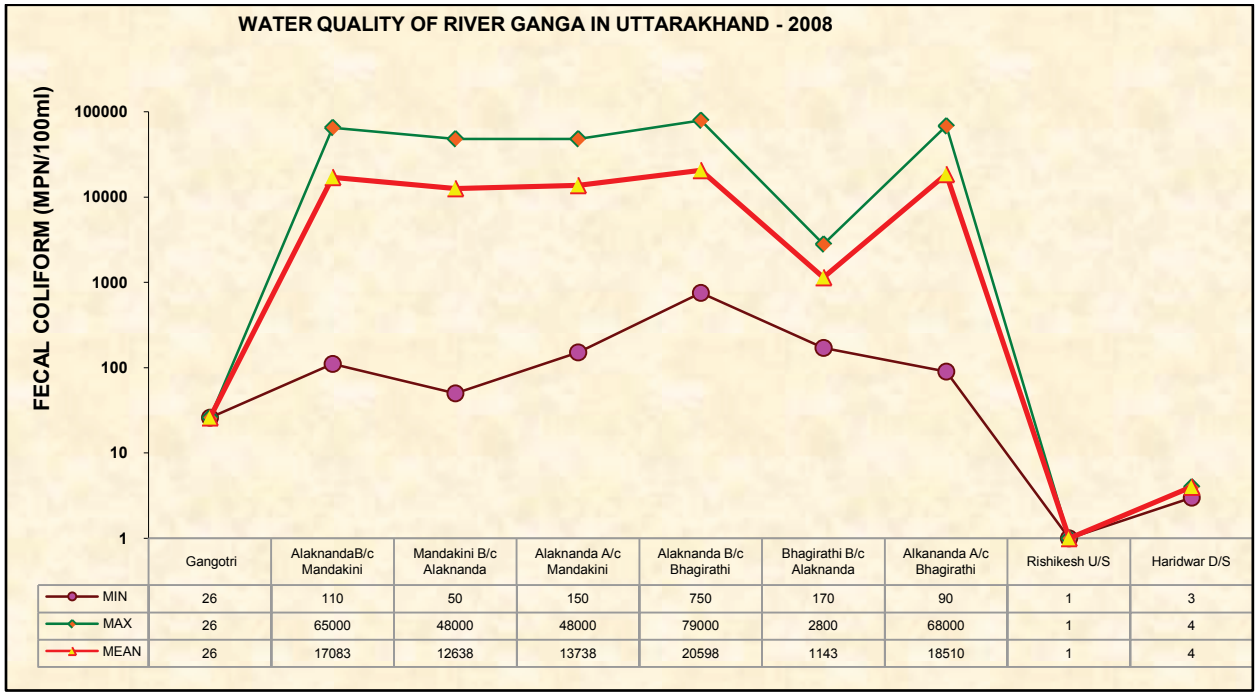
	Gangotri	AlaknandaB/c Mandakini	Mandakini B/c Alaknanda	Alaknanda A/c Mandakini	Alaknanda B/c Bhagirathi	Bhagirathi B/c Alaknanda	Alkananda A/c Bhagirathi	Rishikesh U/S	Haridwar D/S
MIN	2.0	0.9	1.0	0.9	0.9	0.9	0.9	1.2	4.2
MAX	2.0	2.3	2.5	2.3	5.4	6.0	5.2	3.2	7.6
MEAN	2.0	1.4	1.3	1.3	1.8	2.0	1.7	2.0	5.4



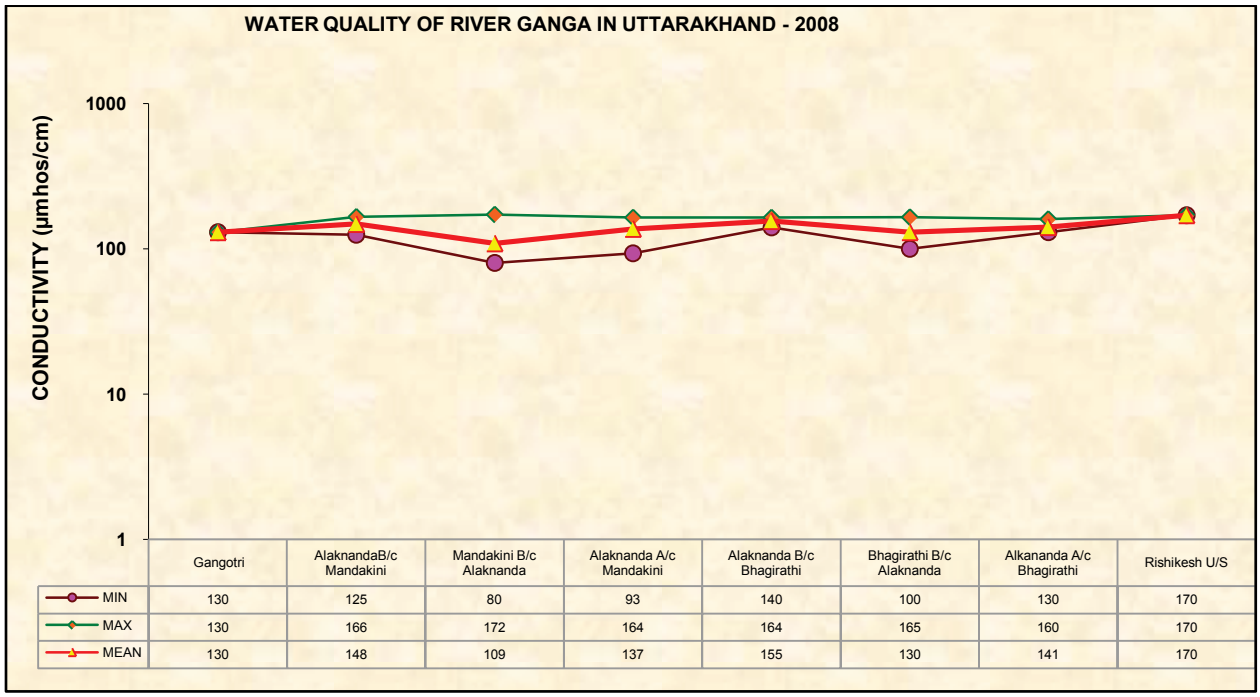
	Gangotri	AlaknandaB/c Mandakini	Mandakini B/c Alaknanda	Alaknanda A/c Mandakini	Alaknanda B/c Bhagirathi	Bhagirathi B/c Alaknanda	Alkananda A/c Bhagirathi	Rishikesh U/S	Haridwar D/S
MIN	9.0	7.6	7.7	7.6	6.9	7.5	7.7	6.1	5.2
MAX	10.1	10.4	10.1	10.8	10.3	9.8	10.3	9.6	6.6
MEAN	9.6	9.4	9.2	9.3	9.2	8.9	9.3	8.7	6.0



	Gangotri	AlaknandaB/c Mandakini	Mandakini B/c Alaknanda	Alaknanda A/c Mandakini	Alaknanda B/c Bhagirathi	Bhagirathi B/c Alaknanda	Alkananda A/c Bhagirathi	Rishikesh U/S	Haridwar D/S
MIN	3900	0	0	0	0	0	0	0	24
MAX	3900	10100000	5100000	650000	560000	470000	720000	23	1600
MEAN	3900	2182120	1032820	262840	217440	130560	170960	9	551

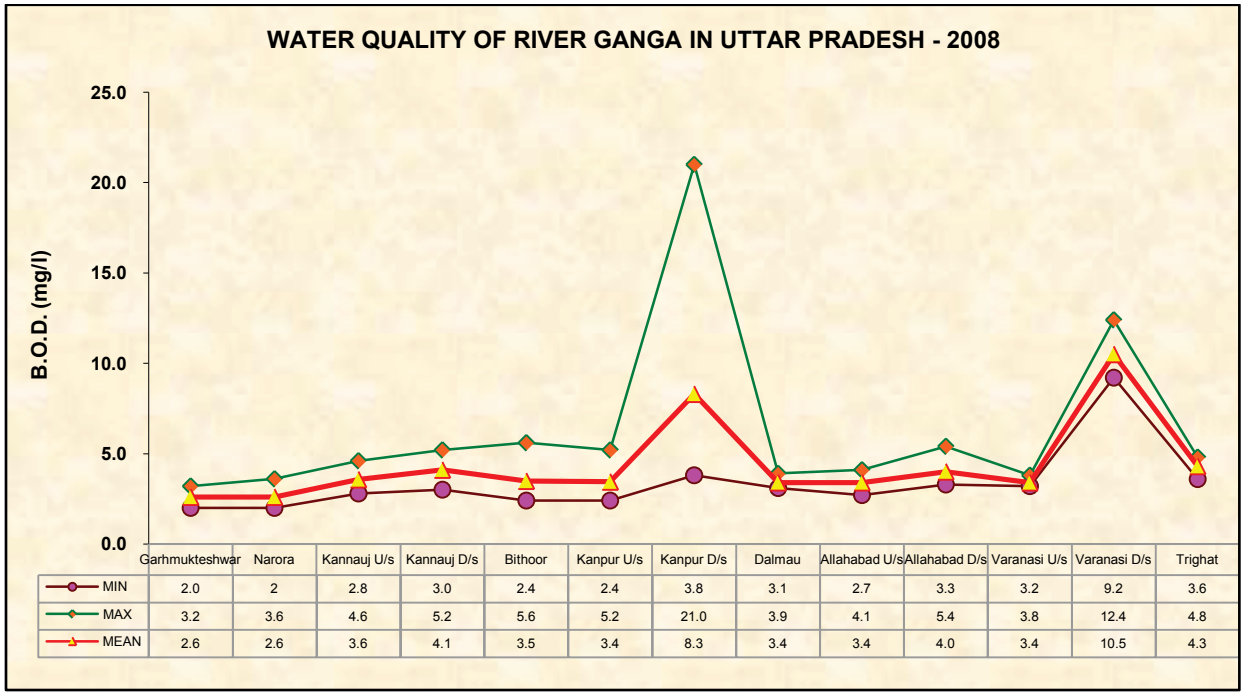


	Gangotri	AlaknandaB/c Mandakini	Mandakini B/c Alaknanda	Alaknanda A/c Mandakini	Alaknanda B/c Bhagirathi	Bhagirathi B/c Alaknanda	Alkananda A/c Bhagirathi	Rishikesh U/S	Haridwar D/S
MIN	26	110	50	150	750	170	90	1	3
MAX	26	65000	48000	48000	79000	2800	68000	1	4
MEAN	26	17083	12638	13738	20598	1143	18510	1	4

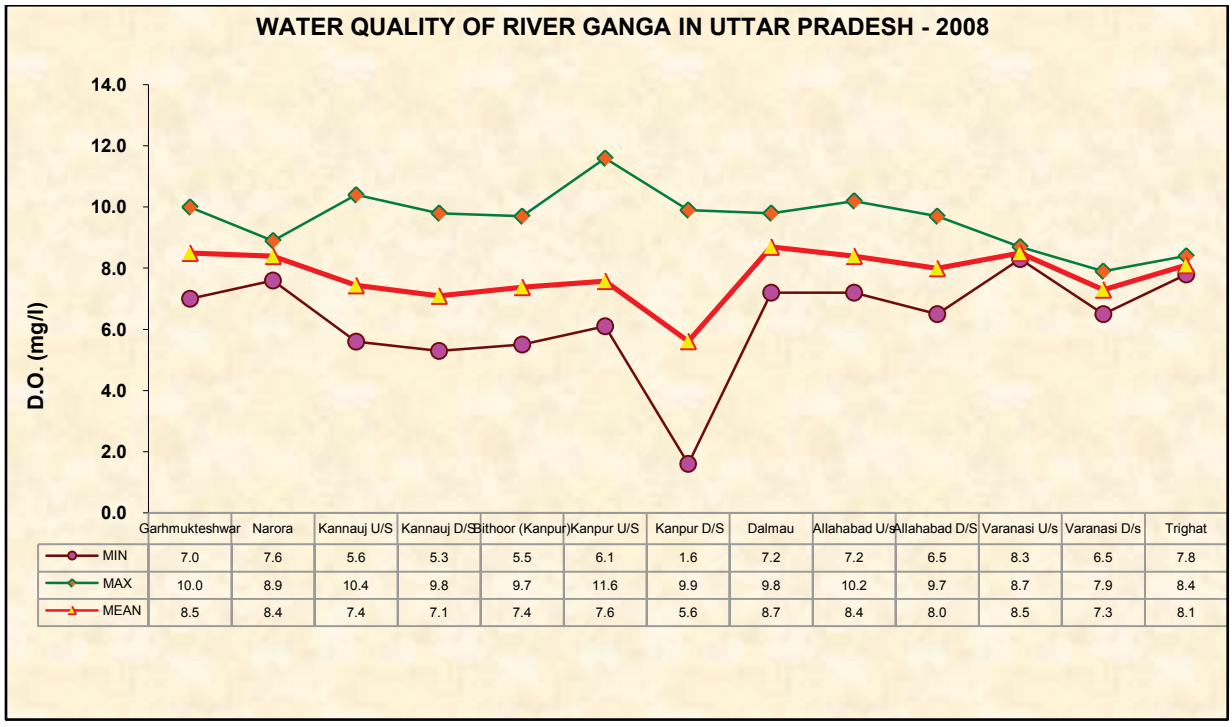


	Gangotri	AlaknandaB/c Mandakini	Mandakini B/c Alaknanda	Alaknanda A/c Mandakini	Alaknanda B/c Bhagirathi	Bhagirathi B/c Alaknanda	Alkananda A/c Bhagirathi	Rishikesh U/S
MIN	130	125	80	93	140	100	130	170
MAX	130	166	172	164	164	165	160	170
MEAN	130	148	109	137	155	130	141	170

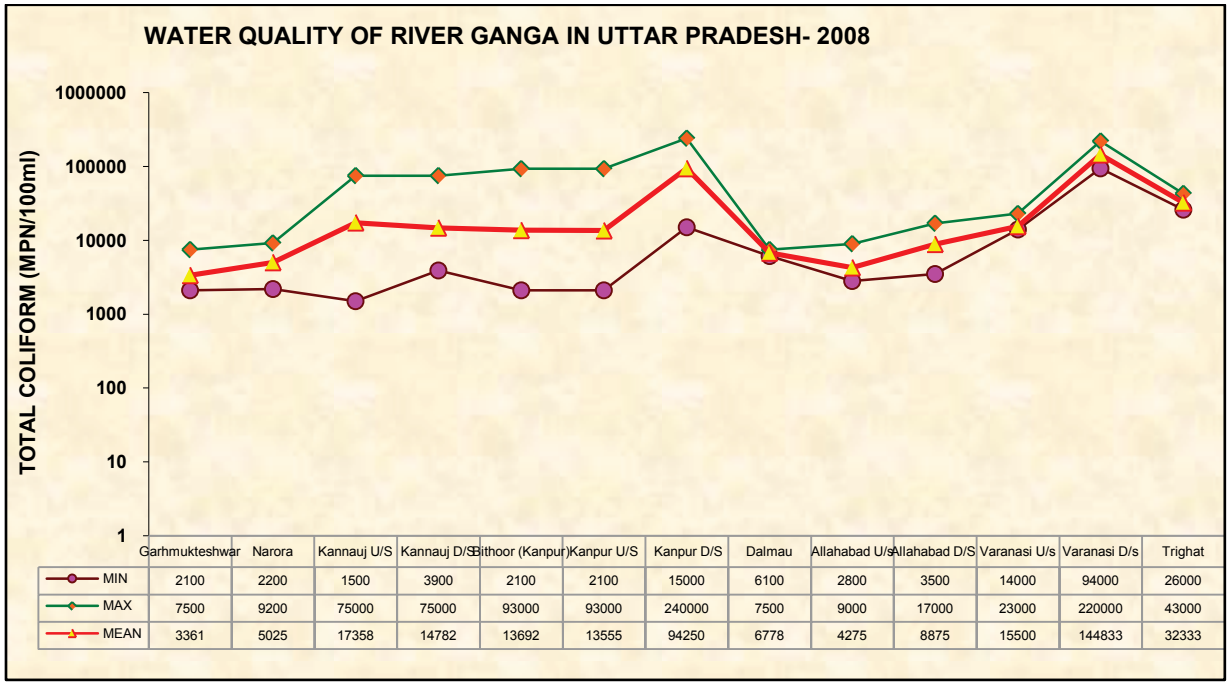
Figure 6.2: Water Quality of River Ganga in Uttar Pradesh



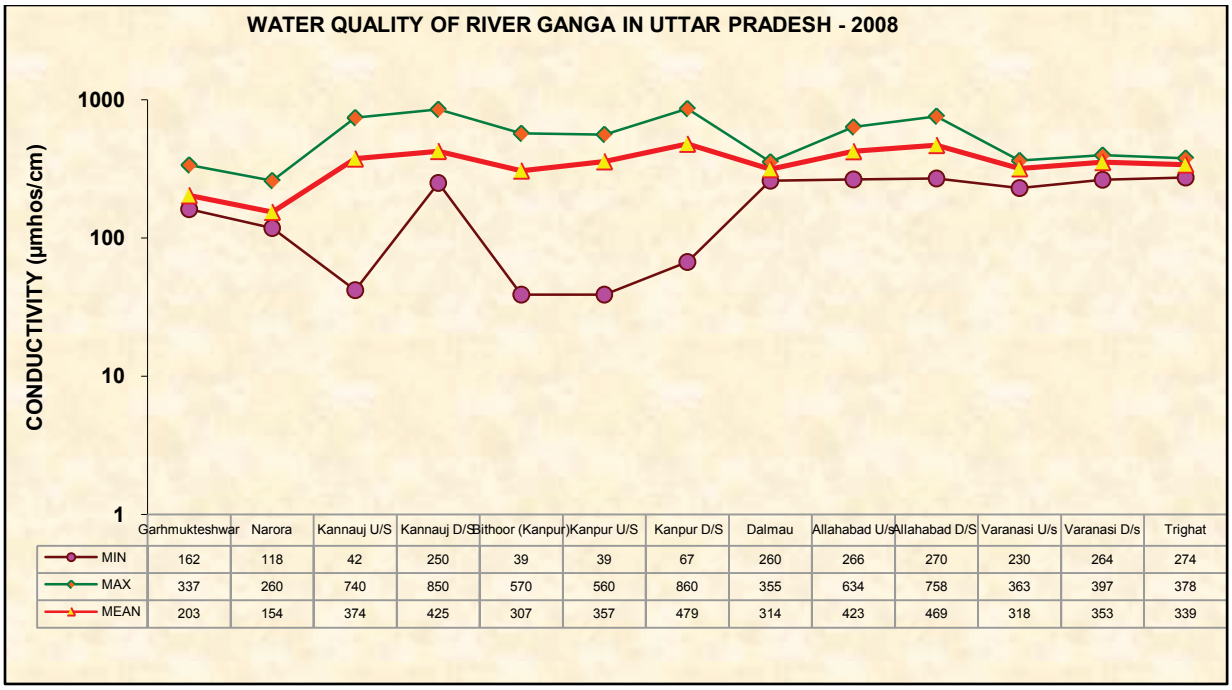
	Garhmukteshwar	Narora	Kannauj U/s	Kannauj D/s	Bithoor	Kanpur U/s	Kanpur D/s	Dalmau	Allahabad U/s	Allahabad D/s	Varanasi U/s	Varanasi D/s	Trighat
MIN	2.0	2	2.8	3.0	2.4	2.4	3.8	3.1	2.7	3.3	3.2	9.2	3.6
MAX	3.2	3.6	4.6	5.2	5.6	5.2	21.0	3.9	4.1	5.4	3.8	12.4	4.8
MEAN	2.6	2.6	3.6	4.1	3.5	3.4	8.3	3.4	3.4	4.0	3.4	10.5	4.3



	Garhmukteshwar	Narora	Kannauj U/S	Kannauj D/S	Bithoor (Kanpur)	Kanpur U/S	Kanpur D/S	Dalmau	Allahabad U/s	Allahabad D/S	Varanasi U/s	Varanasi D/s	Trighat
MIN	7.0	7.6	5.6	5.3	5.5	6.1	1.6	7.2	7.2	6.5	8.3	6.5	7.8
MAX	10.0	8.9	10.4	9.8	9.7	11.6	9.9	9.8	10.2	9.7	8.7	7.9	8.4
MEAN	8.5	8.4	7.4	7.1	7.4	7.6	5.6	8.7	8.4	8.0	8.5	7.3	8.1

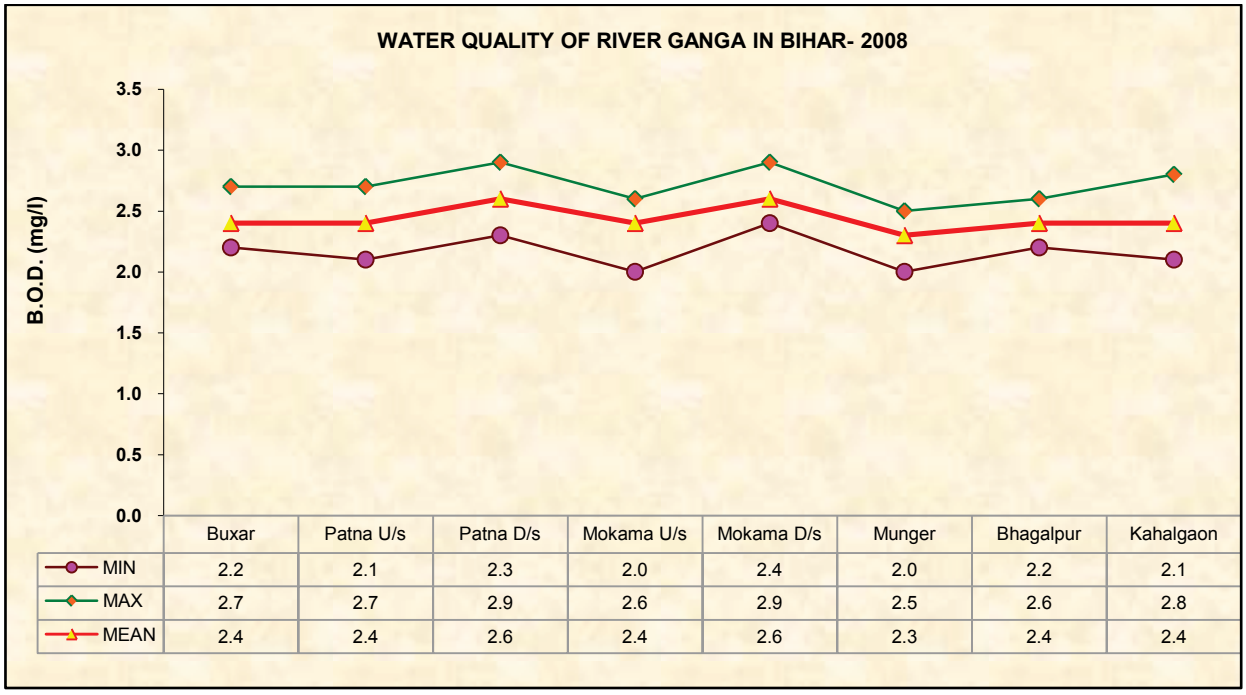


	Garhmukteshwar	Narora	Kannauj U/S	Kannauj D/S	Bithoor (Kanpur)	Kanpur U/S	Kanpur D/S	Dalmau	Allahabad U/s	Allahabad D/S	Varanasi U/s	Varanasi D/s	Trighat
MIN	2100	2200	1500	3900	2100	2100	15000	6100	2800	3500	14000	94000	26000
MAX	7500	9200	75000	75000	93000	93000	240000	7500	9000	17000	23000	220000	43000
MEAN	3361	5025	17358	14782	13692	13555	94250	6778	4275	8875	15500	144833	32333

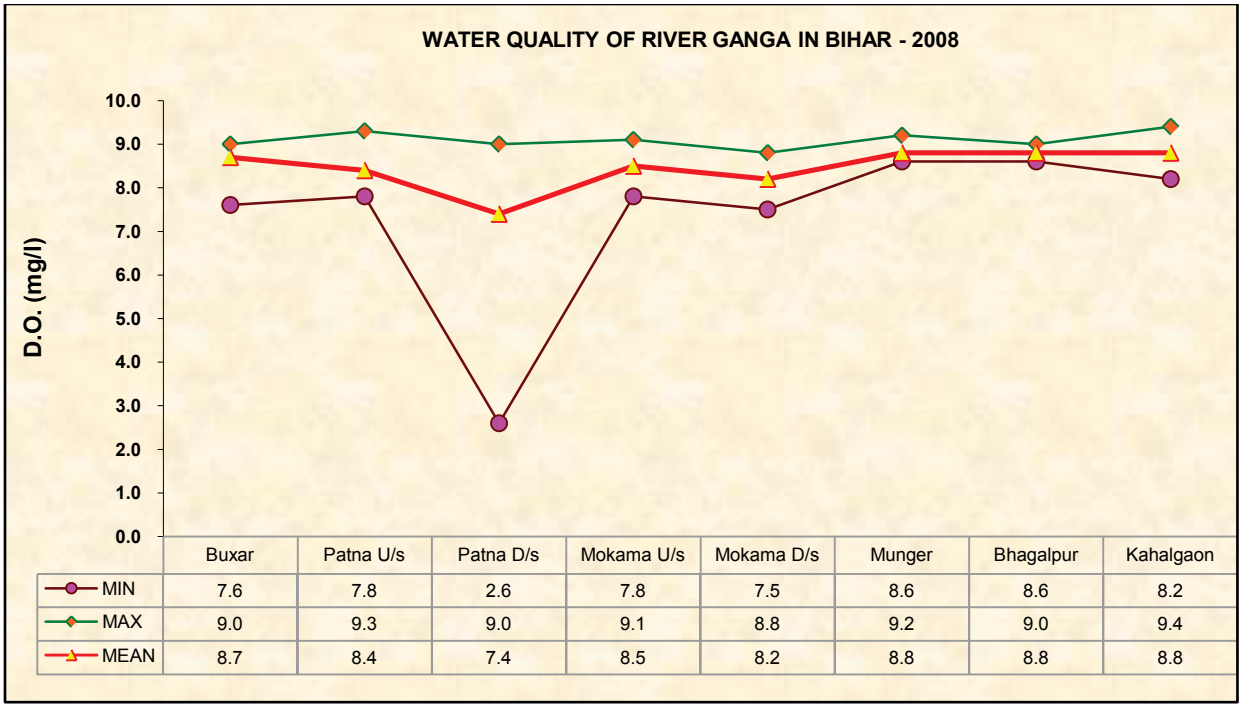


	Garhmukteshwar	Narora	Kannauj U/S	Kannauj D/S	Bithoor (Kanpur)	Kanpur U/S	Kanpur D/S	Dalmau	Allahabad U/s	Allahabad D/S	Varanasi U/s	Varanasi D/s	Trighat
MIN	162	118	42	250	39	39	67	260	266	270	230	264	274
MAX	337	260	740	850	570	560	860	355	634	758	363	397	378
MEAN	203	154	374	425	307	357	479	314	423	469	318	353	339

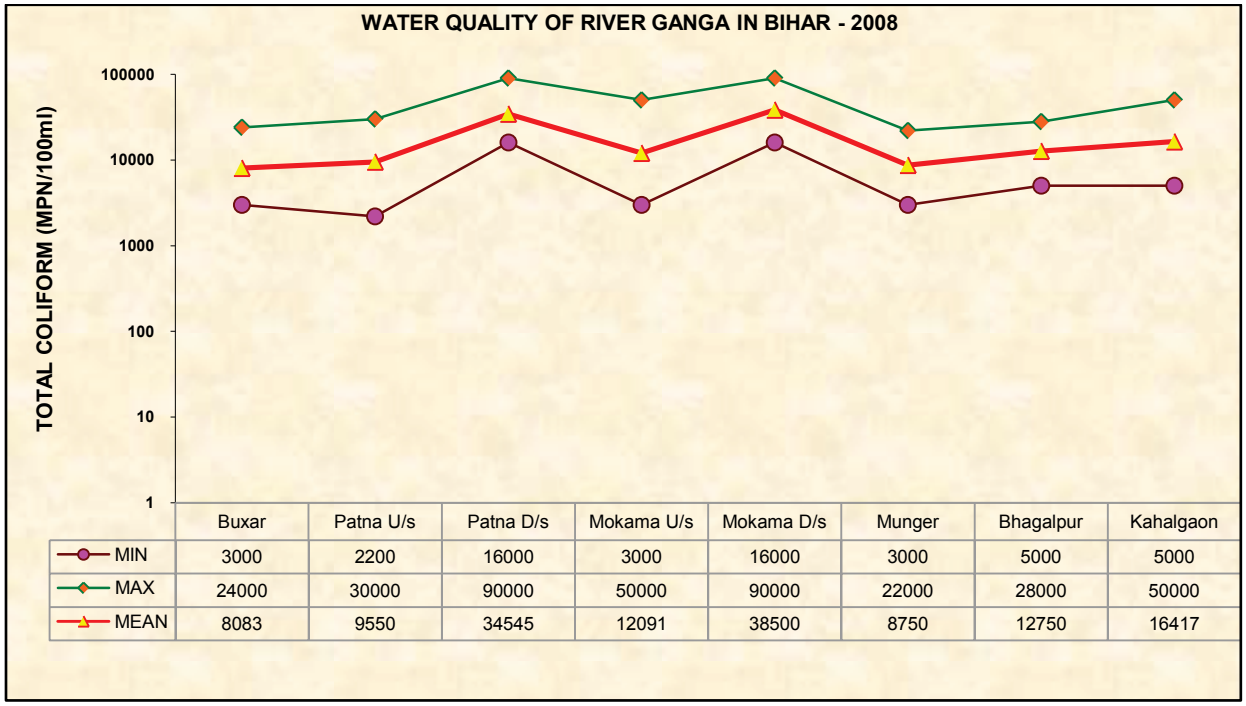
Figure 6.3: Water Quality of River Ganga in Bihar



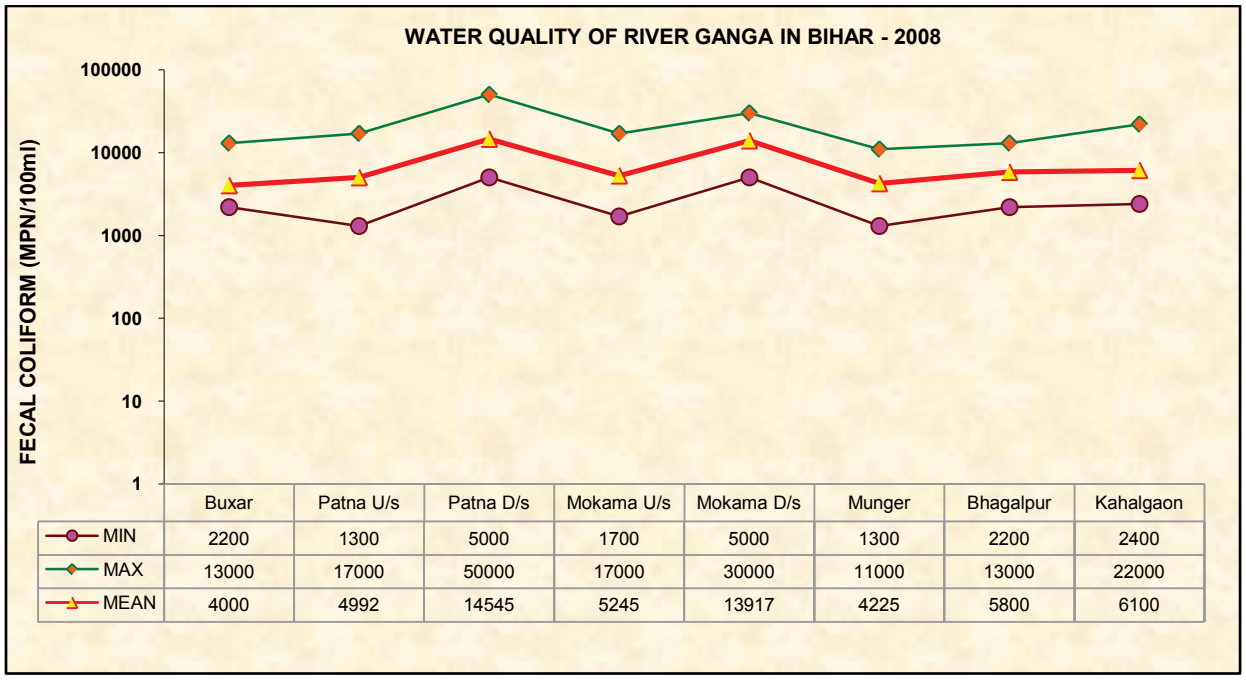
	Buxar	Patna U/s	Patna D/s	Mokama U/s	Mokama D/s	Munger	Bhagalpur	Kahalgaon
MIN	2.2	2.1	2.3	2.0	2.4	2.0	2.2	2.1
MAX	2.7	2.7	2.9	2.6	2.9	2.5	2.6	2.8
MEAN	2.4	2.4	2.6	2.4	2.6	2.3	2.4	2.4



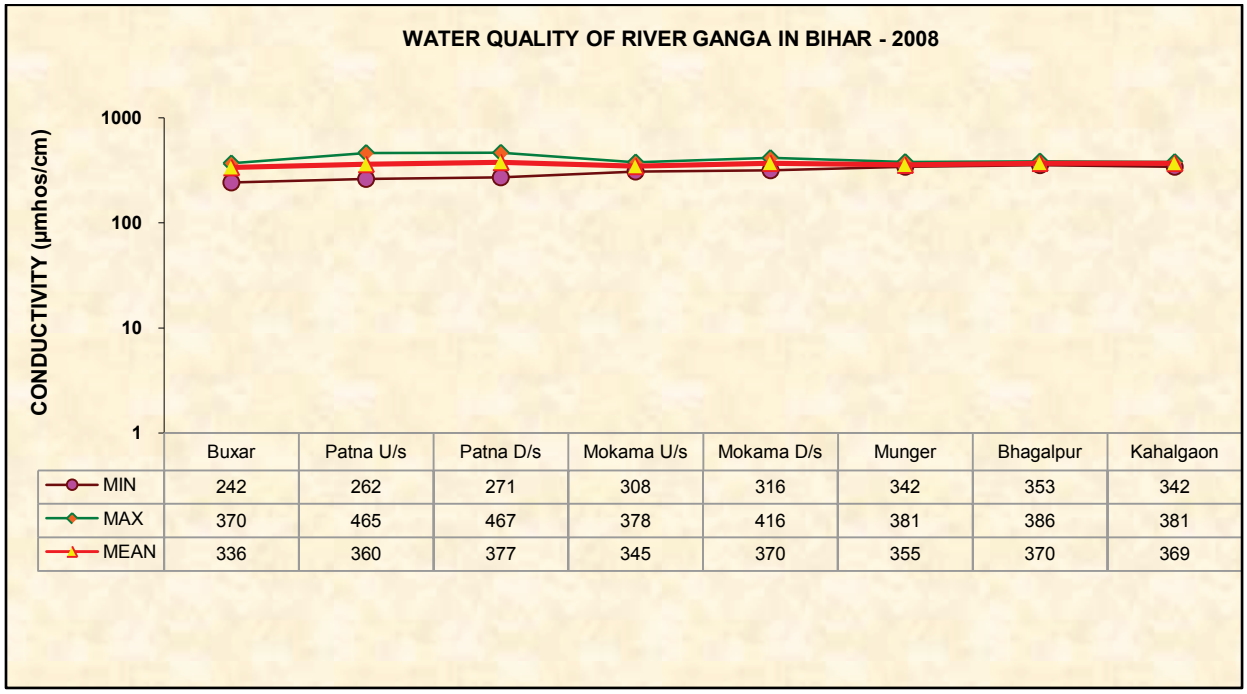
	Buxar	Patna U/s	Patna D/s	Mokama U/s	Mokama D/s	Munger	Bhagalpur	Kahalgaon
MIN	7.6	7.8	2.6	7.8	7.5	8.6	8.6	8.2
MAX	9.0	9.3	9.0	9.1	8.8	9.2	9.0	9.4
MEAN	8.7	8.4	7.4	8.5	8.2	8.8	8.8	8.8



	Buxar	Patna U/s	Patna D/s	Mokama U/s	Mokama D/s	Munger	Bhagalpur	Kahalgaon
MIN	3000	2200	16000	3000	16000	3000	5000	5000
MAX	24000	30000	90000	50000	90000	22000	28000	50000
MEAN	8083	9550	34545	12091	38500	8750	12750	16417

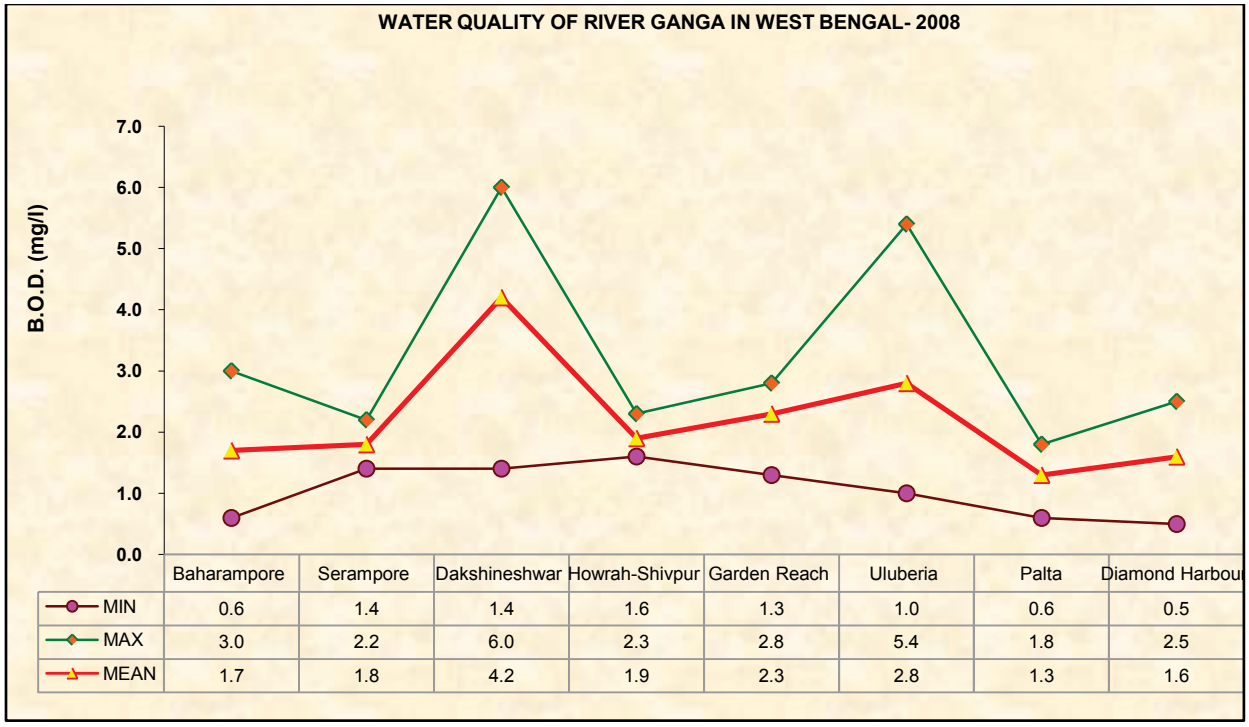


	Buxar	Patna U/s	Patna D/s	Mokama U/s	Mokama D/s	Munger	Bhagalpur	Kahalgaon
MIN	2200	1300	5000	1700	5000	1300	2200	2400
MAX	13000	17000	50000	17000	30000	11000	13000	22000
MEAN	4000	4992	14545	5245	13917	4225	5800	6100

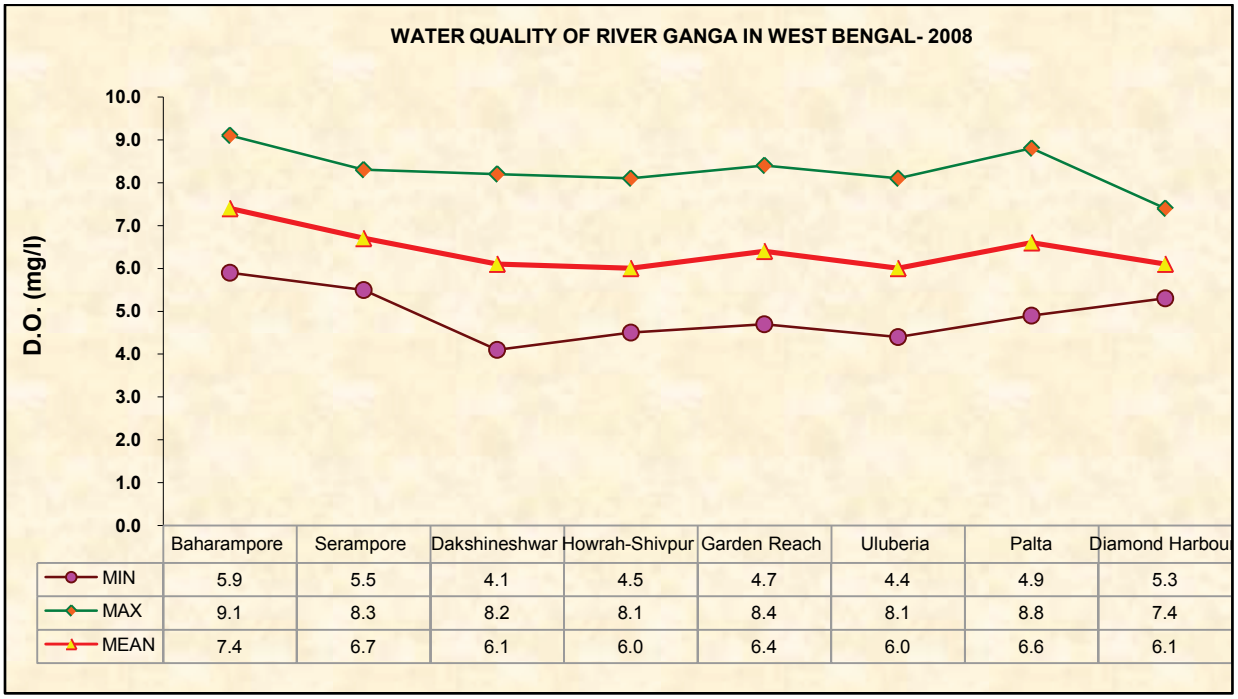


	Buxar	Patna U/s	Patna D/s	Mokama U/s	Mokama D/s	Munger	Bhagalpur	Kahalgaon
MIN	242	262	271	308	316	342	353	342
MAX	370	465	467	378	416	381	386	381
MEAN	336	360	377	345	370	355	370	369

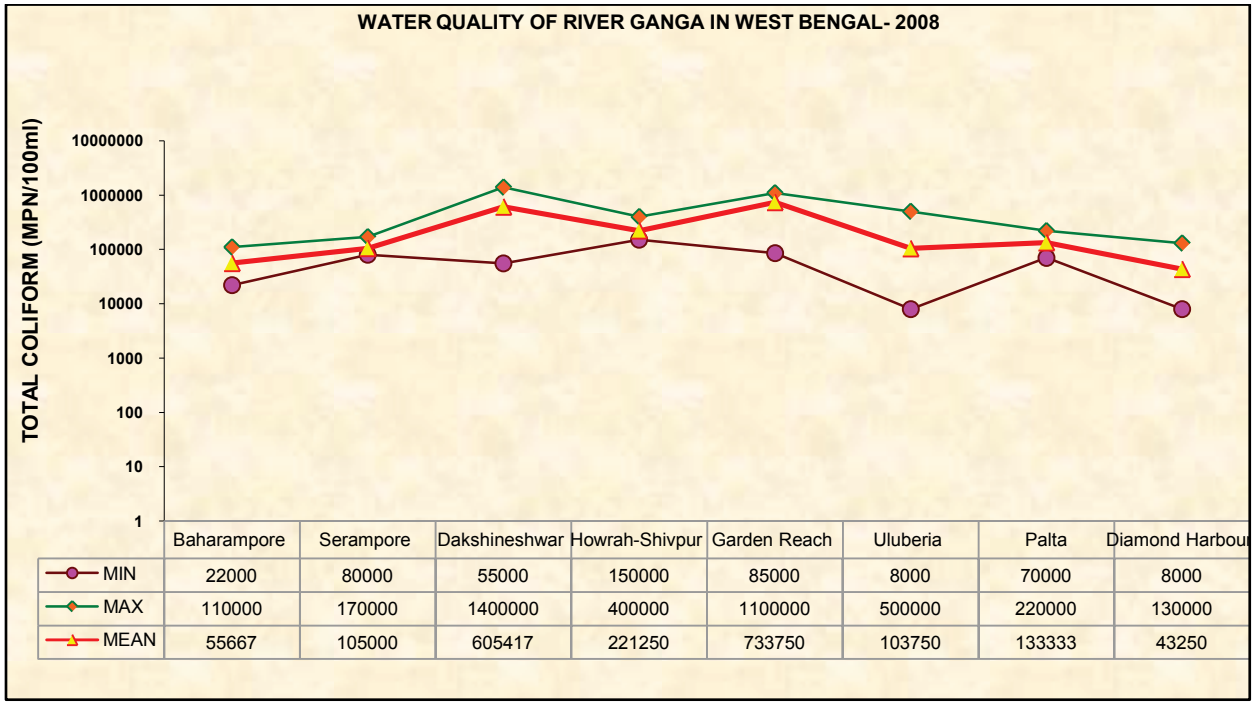
Figure 6.4: Water Quality of River Ganga in West Bengal



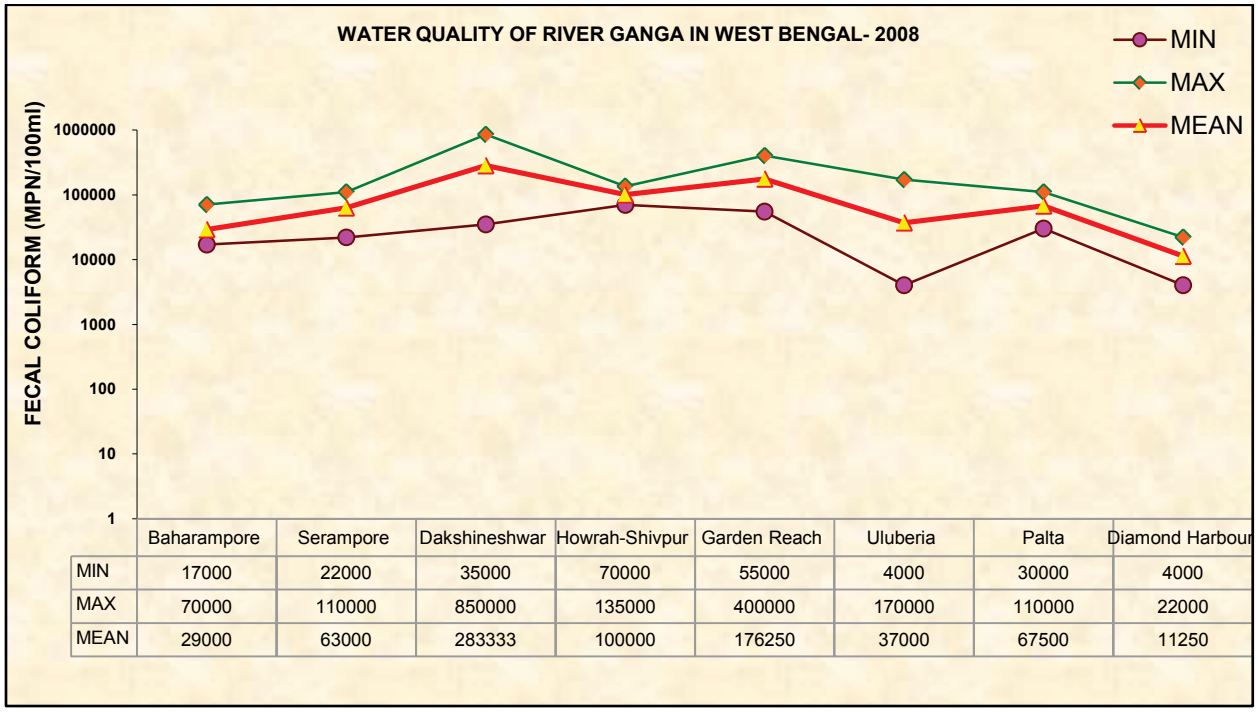
	Baharampore	Serampore	Dakshineshwar	Howrah-Shivpur	Garden Reach	Uluberia	Palta	Diamond Harbou
MIN	0.6	1.4	1.4	1.6	1.3	1.0	0.6	0.5
MAX	3.0	2.2	6.0	2.3	2.8	5.4	1.8	2.5
MEAN	1.7	1.8	4.2	1.9	2.3	2.8	1.3	1.6



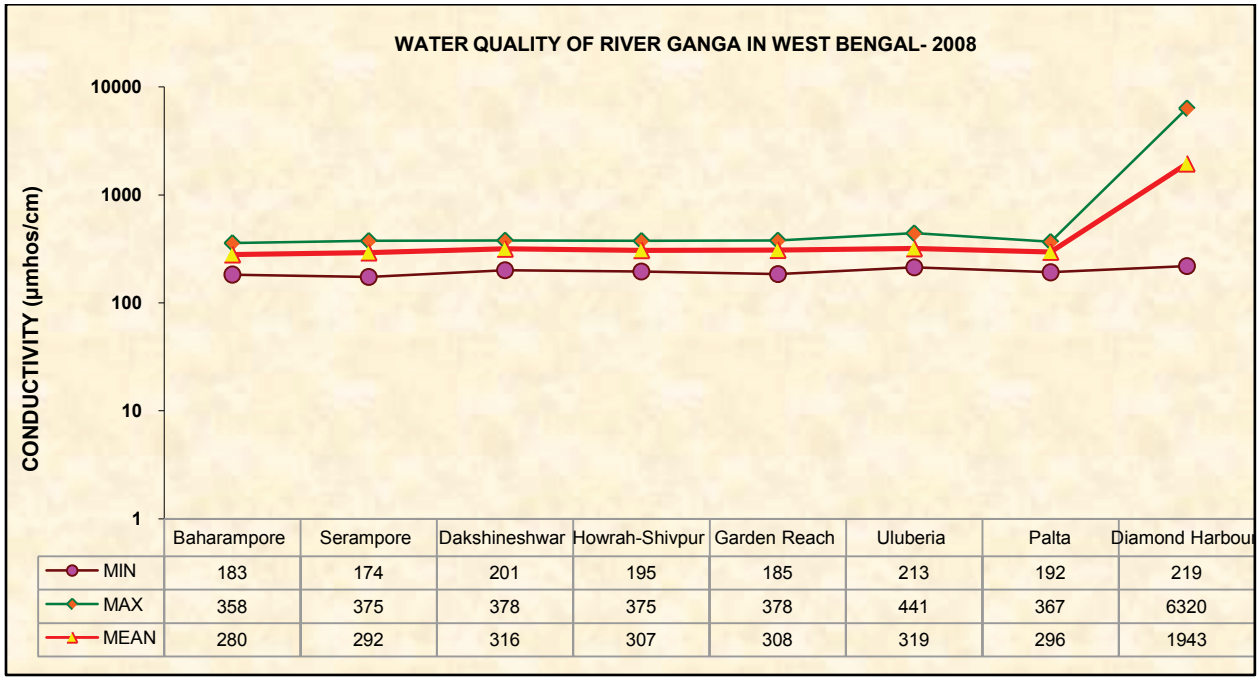
	Baharampore	Serampore	Dakshineshwar	Howrah-Shivpur	Garden Reach	Uluberia	Palta	Diamond Harbou
MIN	5.9	5.5	4.1	4.5	4.7	4.4	4.9	5.3
MAX	9.1	8.3	8.2	8.1	8.4	8.1	8.8	7.4
MEAN	7.4	6.7	6.1	6.0	6.4	6.0	6.6	6.1



	Baharampore	Serampore	Dakshineshwar	Howrah-Shivpur	Garden Reach	Uluberia	Palta	Diamond Harbou
MIN	22000	80000	55000	150000	85000	8000	70000	8000
MAX	110000	170000	1400000	400000	1100000	500000	220000	130000
MEAN	55667	105000	605417	221250	733750	103750	133333	43250



	Baharampore	Serampore	Dakshineshwar	Howrah-Shivpur	Garden Reach	Uluberia	Palta	Diamond Harbour
MIN	17000	22000	35000	70000	55000	4000	30000	4000
MAX	70000	110000	850000	135000	400000	170000	110000	22000
MEAN	29000	63000	283333	100000	176250	37000	67500	11250



	Baharampore	Serampore	Dakshineshwar	Howrah-Shivpur	Garden Reach	Uluberia	Palta	Diamond Harbour
MIN	183	174	201	195	185	213	192	219
MAX	358	375	378	375	378	441	367	6320
MEAN	280	292	316	307	308	319	296	1943

6.2.2 Water Quality of River Yamuna

The River Yamuna is a major tributary of River Ganges. In the upper course of 200 km stretch it draws water from several major streams namely Rishi-Ganga, Unta and Hanuman Ganga, Tons, Giri, and Ashan. The combined stream flows through the shivalik range of hills of Uttarakhand, Himachal Pradesh, and Uttar Pradesh and enters into the plains in the Dak Phatthar in Haryana where this river regulated through weir and diverted into canal for power generation. From Tajewala barrage in Yamunanagar district of Haryana, river again diverted into Western Yamuna Canal and Eastern Yamuna Canal for irrigation. River regain its water from ground water accrual and feeding canal through Somnadi (seasonal stream) just U/s of Kalanaur and traverses a route of about 1150 km through three states i.e. Haryana, Delhi and U.P. and finally to its confluence with Ganges at Allahabad. It receives major tributaries like Chambal, Betwa, Sindh and Ken from right bank and Hindon from left bank.

The availability of water in River Yamuna is greatly varied with time and space. Precipitation is confined to only three months in a year and varies greatly. Most of the water flows in the Yamuna (nearly 80%) in monsoon period (July, August and September) only. Whatever water flows in non-monsoon period (October to June) is extensively used for irrigation and drinking leaving very little or no water in the river to flow.

It is observed that about 500 km long stretch of the river is in bad shape, having water quality, most of the time, below desired level for "designated best use". In the dry season four distinct gradients of pollutional load can be discerned in the river stretch between Wazirabad and Etawah. The stretch between Wazirabad and Okhla is the most heavily polluted one, carrying the massive input of wastewater from Delhi. This input has sets off a progressive series of chemical and biological events in the D/s water. This stretch is characterised by high bacterial population, cloudy appearance high BOD and strong disagreeable odour - all indicating general depletion of oxygen. Masses of gaseous sludge rising from the bottom are often noticed floating near the surface of the water. During monsoon due to flood the sludge deposited in this stretch is flushed and stay in suspension causes rise in oxygen uptake in the D/s. This causes heavy fish mortality every year during first flushing after onset of monsoon.

Though there are number of bathing "Ghats along the river in Delhi stretch, the quality of water is far below the bathing standards. Even in this short stretch, remarkable purification takes place due to high temperature and long retention

time in this stretch due to the two barrages one at Okhla and another at ITO (nearly 10 km U/s of Okhla Barrage). The ITO Barrage is used divert the Yamuna water for cooling purpose of the two Thermal Power Plants located near ITO. In the stretch between Okhla and Agra the same assimilative capacity can be observed after the sewage input at Okhla, Mathura and Agra. After a few kilometers the repeated additions of sewage are mainly noticeable by a higher state of eutrophication leading to the formation of algal mats in the River. Excessive algal can cause problems associated with the oxygen balance in the water (daytime super saturation and nighttime oxygen depletion). The water quality from DO, BOD, and bacterial point of view is not fit for designated best uses of this stretch. The Agra Water Works is drawing its raw water from this only.

The stretch from Agra to the confluence with the River Chambal at Etawah is characterized by self- purification processes of the Agra effluents. The confluence with relatively clean Chambal River is of great value in diluting the pollution load of River Yamuna before it joins the Ganga at Allahabad.

During the monsoon period due to huge mass of water flows in the river the barrages are opened leading to a more or less continuous system. The high load of untreated biodegradable material (domestic sewage) leads several gradients in saprobic and eutrophic conditions; major part of the Yamuna can hardly fulfill the designated uses.

6.2.2.1 Major Water Quality Segments

The Yamuna is classified into 5 distinct segments due to characteristic Hydrological and Ecological conditions. These segments are:

Himalayan Segment	**From origin to Tajewala Barrage (172 kms.)**
Upper Segment	Tajewala Barrage to Wazirabad Barrage (224 kms.)
Delhi Segment	Wazirabad Barrage to Okhla Barrage (22 kms.)
Eutrophicated Segment	Okhla Barrage to Chambal Confluence (490 kms.)
Diluted Segment	Chambal Confluence to Ganga Confluence (468 kms.)

6.2.2.2 Critical Segments

The water quality in the Himalayan Segment and the Diluted Segment is comparatively good. However, due to heavy abstraction from and discharge of pollutants into the river system, there are critical segments, which require

pollution abatement measures to improve the water quality of the river. These segments with the causes of pollution are:

Wazirabad to Okhla	**Domestic and industrial waste water of Delhi.**
Okhla to Vrindavan	Domestic wastewater from Delhi and industrial effluent from Saharanpur, Muzaffarnagar, Ghaziabad, Noida, etc.
Vrindavan to Mathura	Domestic wastewater and industrial effluent from dyeing and printing industry of Vrindavan and Mathura
Mathura to Etawah	Domestic wastewater from Agra and Etawah.

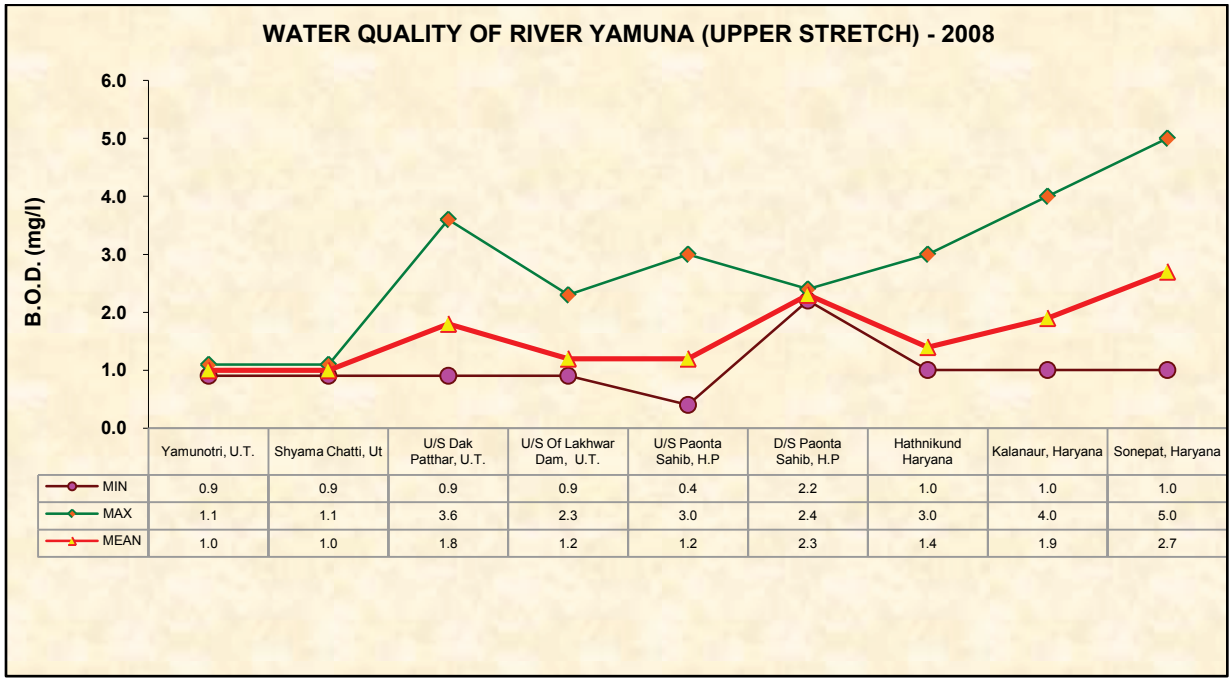
6.2.2.3 Water Quality of River Yamuna

The water quality of River Yamuna is conforming to water quality criteria with respect to pH only throughout its length which ranges from 6.8 to 9.5. The conductivity is complying with desired water quality criteria at all locations except at Sonepat (3340 µmhos/cm). The DO varies from 0.0 to 20.6 mg/l. Supersaturation of DO indicate that the river is highly septic or eutrophicated at a number of locations. The low values of DO and not meeting the desired criteria are observed in the stretch of Nizamuddin to Etawah.

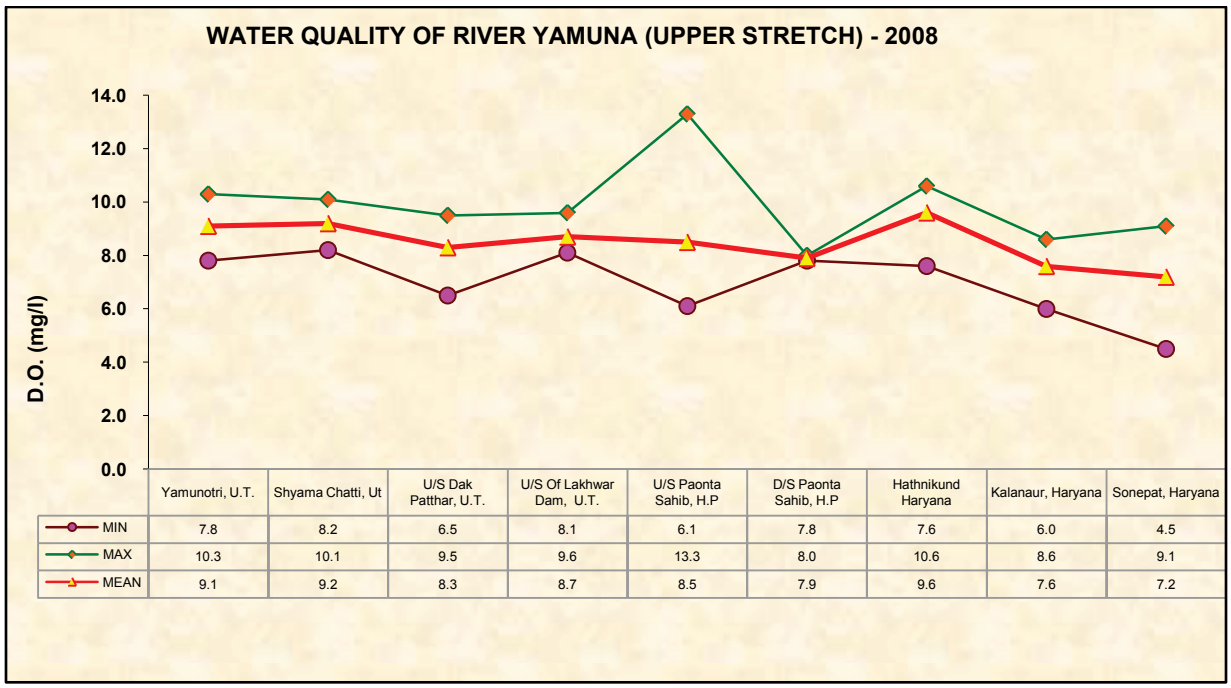
The BOD ranges from 0.4-70.0 mg/l in the entire length of river. The maximum value of 70 mg/l of BOD is observed at Okhla after meeting Shahdara drain. The other locations observed maximum BOD are at Nizamuddin (55 mg/l), Okhla Bridge (32 mg/l) Mazawali (28 mg/l), Agra D/s (24 mg/l), Agra U/s (17 mg/l), Mathura D/s (18 mg/l), Mathura U/s (17 mg/l), Bateshwar (26 mg/l), Etawah (27 mg/l), Juhika B/C with Chambal at Etawah (8 mg/l), Palla (6.0 mg/l), Sonepat D/s (5.0 mg/l), Kalanaur Yamuna Nagar (4.0 mg/l) and Dak Patthar U/s (3.6 mg/l).

Faecal Coliform value ranges from 11 to $109x10^5$ MPN/100ml whereas the Total Coliform value ranges from 0 to $103x\ 10^6$ MPN/100ml. The Total and Faecal Coliforms count is considerably high and does not meet the criteria at most of the monitoring locations. The concentration of Nitrate (NO_3^-) varies from 0.09- 13.9 mg/l whereas Nitrite (NO_2^-) ranges from 0.01-2.98 mg/l. The Ammonical Nitrogen (NH_4-N) is observed in the range of 0.1-31.4 mg/l and does not meet the criteria at number of locations in Haryana, Delhi and D/s reach of Delhi upto Etawah D/s. The water quality of River Yamuna is presented in Annexure-I Table 6.2. The water quality status of mainstream of River Yamuna with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in Figure 6.5 & 6.6.

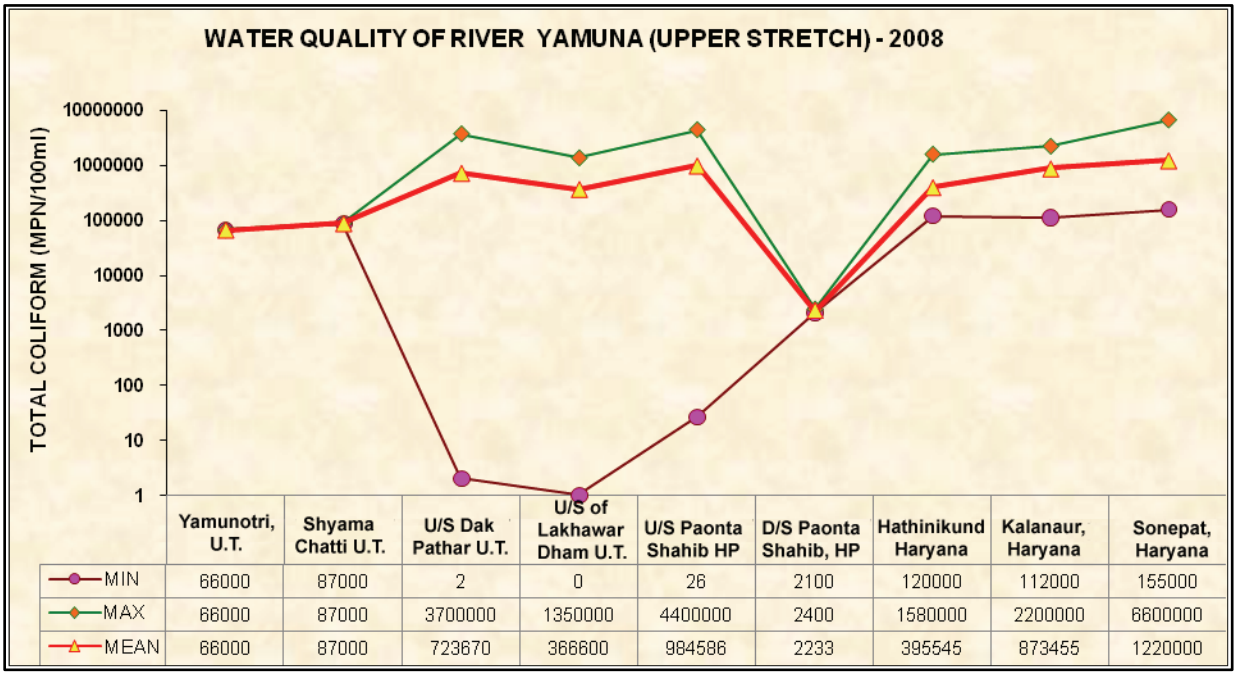
Figure 6.5: Water Quality of River Yamuna (Upper Stretch)



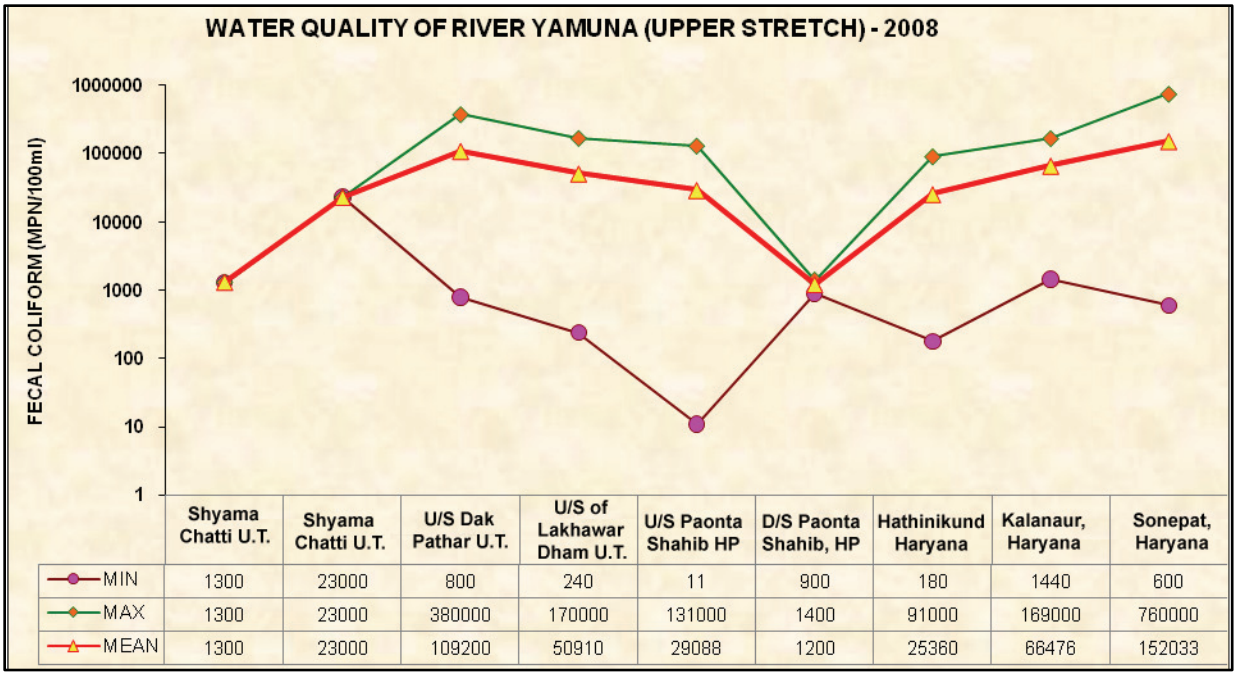
	Yamunotri, U.T.	Shyama Chatti, Ut	U/S Dak Patthar, U.T.	U/S Of Lakhwar Dam, U.T.	U/S Paonta Sahib, H.P	D/S Paonta Sahib, H.P	Hathnikund Haryana	Kalanaur, Haryana	Sonepat, Haryana
MIN	0.9	0.9	0.9	0.9	0.4	2.2	1.0	1.0	1.0
MAX	1.1	1.1	3.6	2.3	3.0	2.4	3.0	4.0	5.0
MEAN	1.0	1.0	1.8	1.2	1.2	2.3	1.4	1.9	2.7



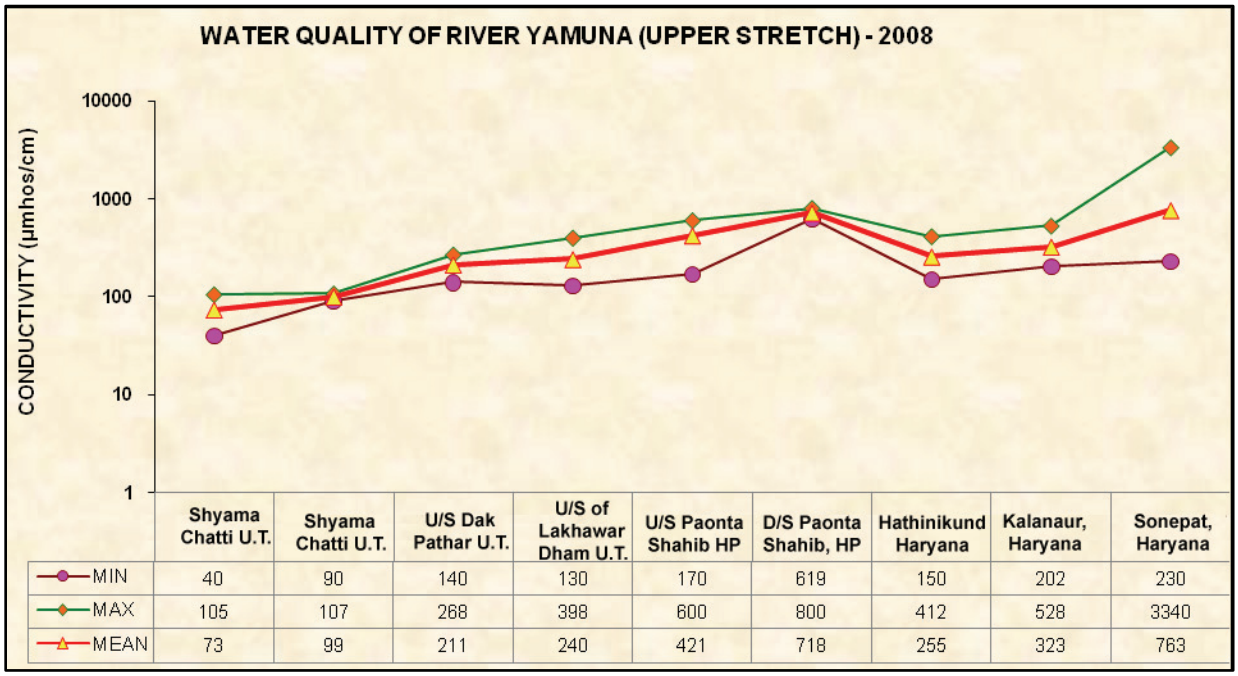
	Yamunotri, U.T.	Shyama Chatti, Ut	U/S Dak Patthar, U.T.	U/S Of Lakhwar Dam, U.T.	U/S Paonta Sahib, H.P	D/S Paonta Sahib, H.P	Hathnikund Haryana	Kalanaur, Haryana	Sonepat, Haryana
MIN	7.8	8.2	6.5	8.1	6.1	7.8	7.6	6.0	4.5
MAX	10.3	10.1	9.5	9.6	13.3	8.0	10.6	8.6	9.1
MEAN	9.1	9.2	8.3	8.7	8.5	7.9	9.6	7.6	7.2



	Yamunotri, U.T.	Shyama Chatti U.T.	U/S Dak Pathar U.T.	U/S of Lakhawar Dham U.T.	U/S Paonta Shahib HP	D/S Paonta Shahib, HP	Hathinikund Haryana	Kalanaur, Haryana	Sonepat, Haryana
MIN	66000	87000	2	0	26	2100	120000	112000	155000
MAX	66000	87000	3700000	1350000	4400000	2400	1580000	2200000	6600000
MEAN	66000	87000	723670	366600	984586	2233	395545	873455	1220000

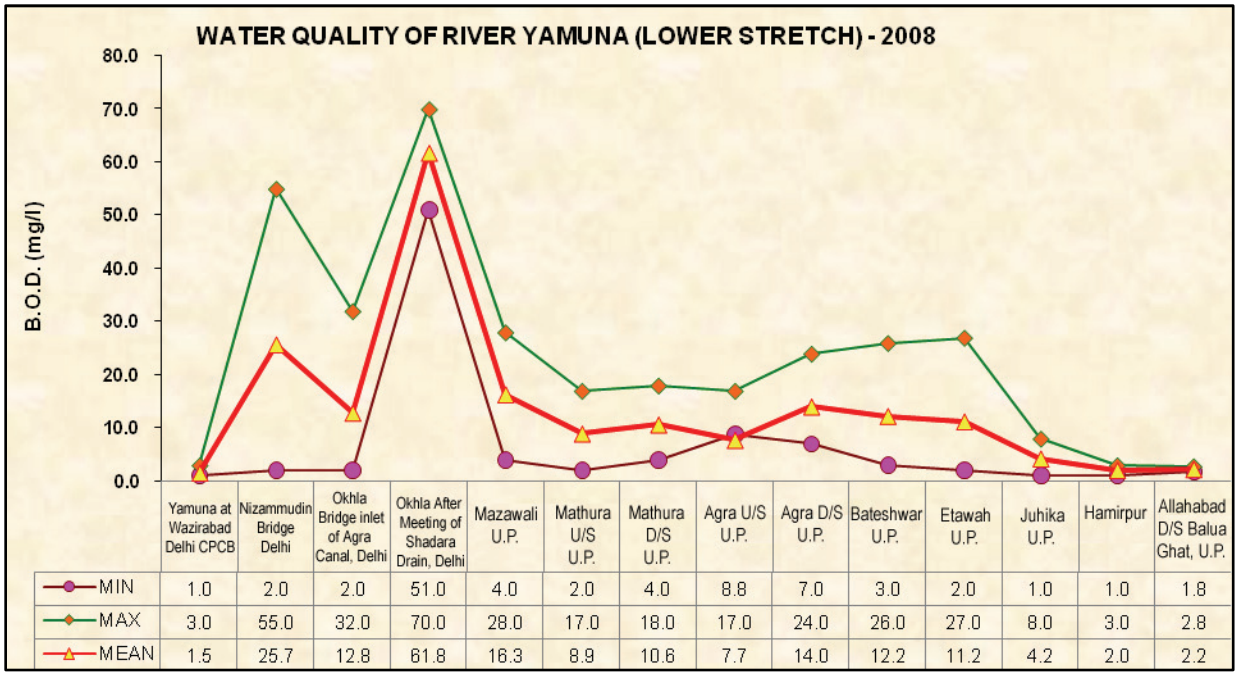


	Shyama Chatti U.T.	Shyama Chatti U.T.	U/S Dak Pathar U.T.	U/S of Lakhawar Dham U.T.	U/S Paonta Shahib HP	D/S Paonta Shahib, HP	Hathinikund Haryana	Kalanaur, Haryana	Sonepat, Haryana
MIN	1300	23000	800	240	11	900	180	1440	600
MAX	1300	23000	380000	170000	131000	1400	91000	169000	760000
MEAN	1300	23000	109200	50910	29088	1200	25360	66476	152033

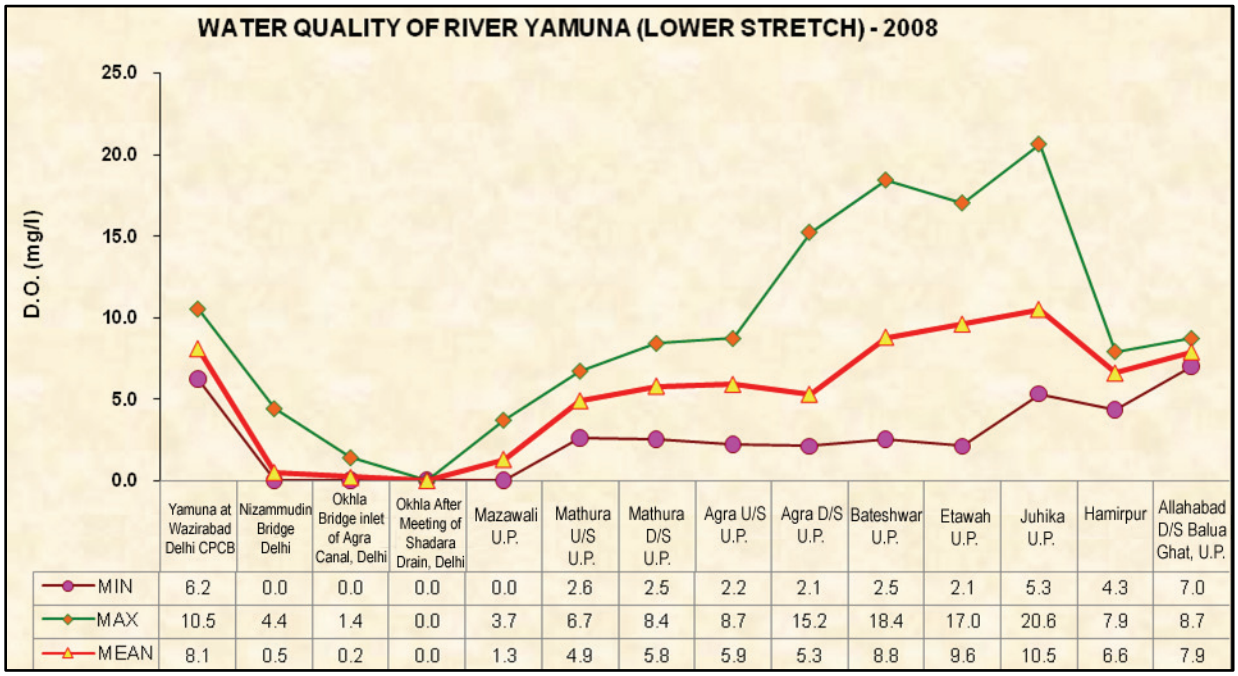


	Shyama Chatti U.T.	Shyama Chatti U.T.	U/S Dak Pathar U.T.	U/S of Lakhawar Dham U.T.	U/S Paonta Shahib HP	D/S Paonta Shahib, HP	Hathinikund Haryana	Kalanaur, Haryana	Sonepat, Haryana
MIN	40	90	140	130	170	619	150	202	230
MAX	105	107	268	398	600	800	412	528	3340
MEAN	73	99	211	240	421	718	255	323	763

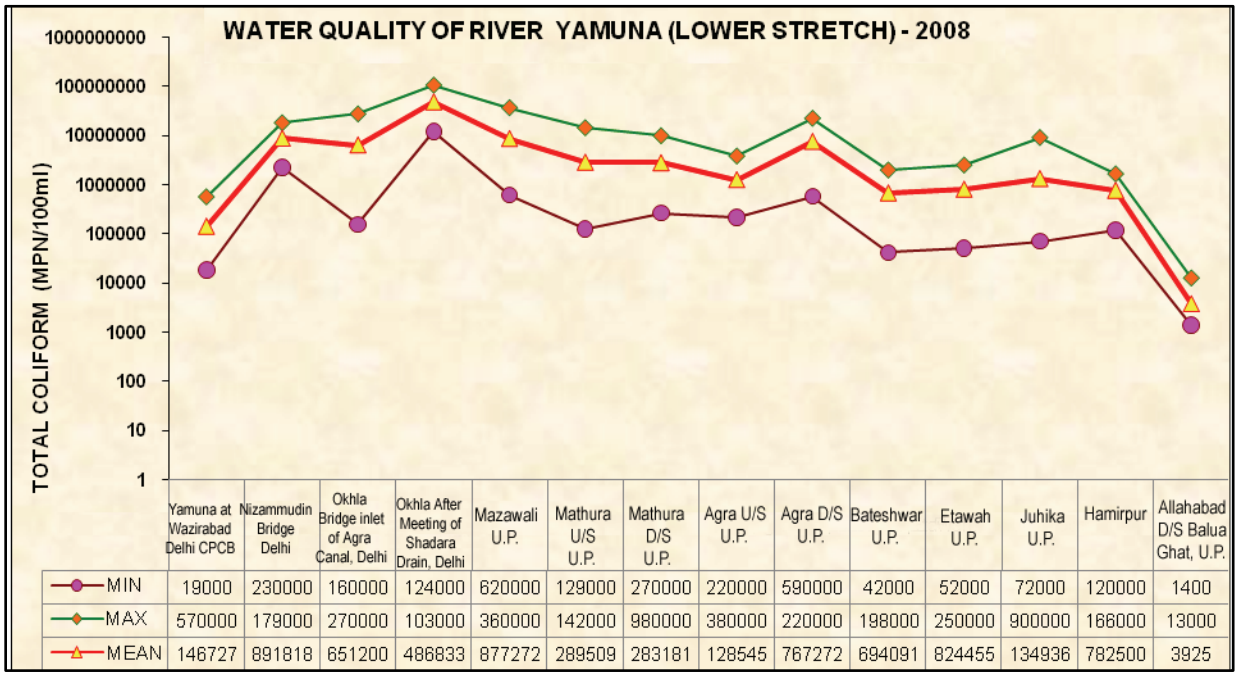
Figure 6.6: Water Quality of River Yamuna (Lower Stretch)



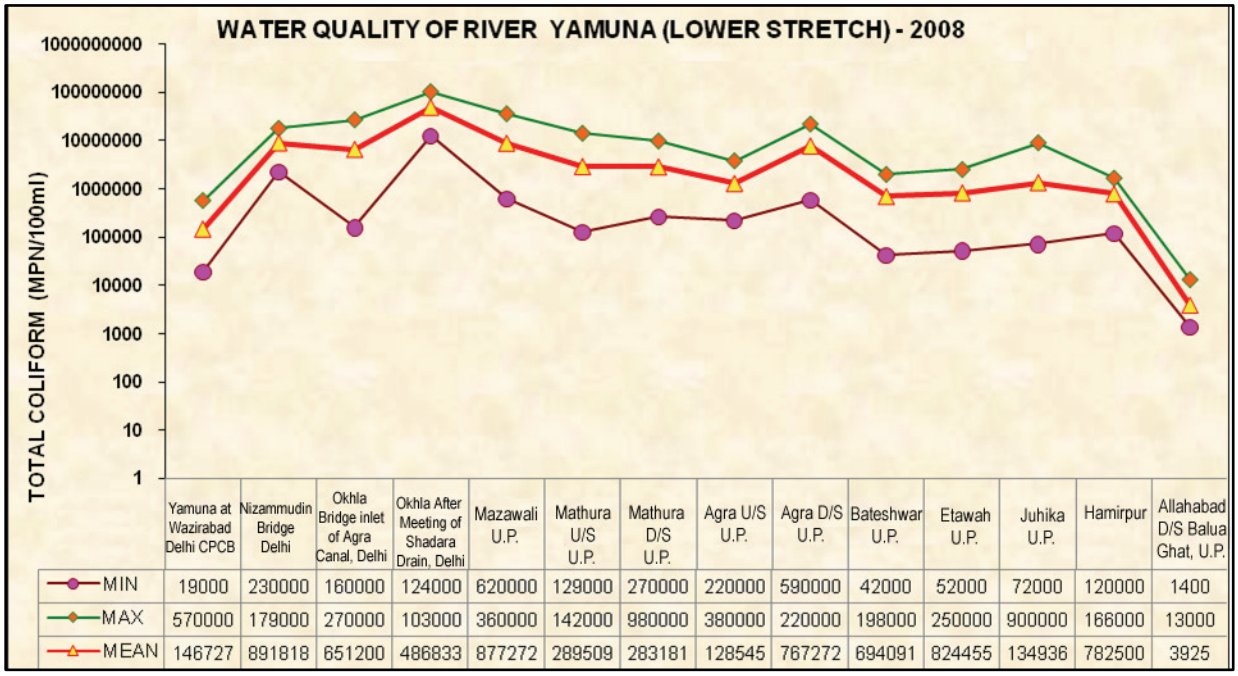
	Yamuna at Wazirabad Delhi CPCB	Nizammudin Bridge Delhi	Okhla Bridge inlet of Agra Canal, Delhi	Okhla After Meeting of Shadara Drain, Delhi	Mazawali U.P.	Mathura U/S U.P.	Mathura D/S U.P.	Agra U/S U.P.	Agra D/S U.P.	Bateshwar U.P.	Etawah U.P.	Juhika U.P.	Hamirpur	Allahabad D/S Balua Ghat, U.P.
MIN	1.0	2.0	2.0	51.0	4.0	2.0	4.0	8.8	7.0	3.0	2.0	1.0	1.0	1.8
MAX	3.0	55.0	32.0	70.0	28.0	17.0	18.0	17.0	24.0	26.0	27.0	8.0	3.0	2.8
MEAN	1.5	25.7	12.8	61.8	16.3	8.9	10.6	7.7	14.0	12.2	11.2	4.2	2.0	2.2



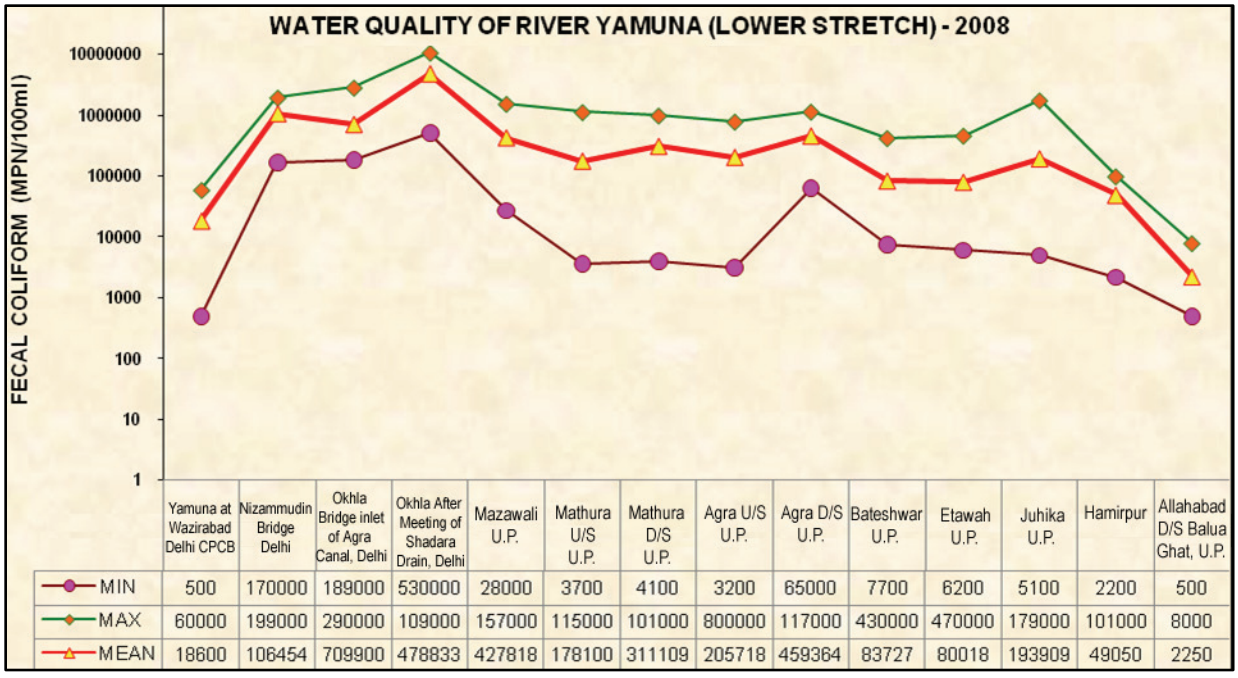
	Yamuna at Wazirabad Delhi CPCB	Nizammudin Bridge Delhi	Okhla Bridge inlet of Agra Canal, Delhi	Okhla After Meeting of Shadara Drain, Delhi	Mazawali U.P.	Mathura U/S U.P.	Mathura D/S U.P.	Agra U/S U.P.	Agra D/S U.P.	Bateshwar U.P.	Etawah U.P.	Juhika U.P.	Hamirpur	Allahabad D/S Balua Ghat, U.P.
MIN	6.2	0.0	0.0	0.0	0.0	2.6	2.5	2.2	2.1	2.5	2.1	5.3	4.3	7.0
MAX	10.5	4.4	1.4	0.0	3.7	6.7	8.4	8.7	15.2	18.4	17.0	20.6	7.9	8.7
MEAN	8.1	0.5	0.2	0.0	1.3	4.9	5.8	5.9	5.3	8.8	9.6	10.5	6.6	7.9



	Yamuna at Wazirabad Delhi CPCB	Nizammudin Bridge Delhi	Okhla Bridge inlet of Agra Canal, Delhi	Okhla After Meeting of Shadara Drain, Delhi	Mazawali U.P.	Mathura U/S U.P.	Mathura D/S U.P.	Agra U/S U.P.	Agra D/S U.P.	Bateshwar U.P.	Etawah U.P.	Juhika U.P.	Hamirpur	Allahabad D/S Balua Ghat, U.P.
MIN	19000	230000	160000	124000	620000	129000	270000	220000	590000	42000	52000	72000	120000	1400
MAX	570000	179000	270000	103000	360000	142000	980000	380000	220000	198000	250000	900000	166000	13000
MEAN	146727	891818	651200	486833	877272	289509	283181	128545	767272	694091	824455	134936	782500	3925



	Yamuna at Wazirabad Delhi CPCB	Nizammudin Bridge Delhi	Okhla Bridge inlet of Agra Canal, Delhi	Okhla After Meeting of Shadara Drain, Delhi	Mazawali U.P.	Mathura U/S U.P.	Mathura D/S U.P.	Agra U/S U.P.	Agra D/S U.P.	Bateshwar U.P.	Etawah U.P.	Juhika U.P.	Hamirpur	Allahabad D/S Balua Ghat, U.P.
MIN	19000	230000	160000	124000	620000	129000	270000	220000	590000	42000	52000	72000	120000	1400
MAX	570000	179000	270000	103000	360000	142000	980000	380000	220000	198000	250000	900000	166000	13000
MEAN	146727	891818	651200	486833	877272	289509	283181	128545	767272	694091	824455	134936	782500	3925



	Yamuna at Wazirabad Delhi CPCB	Nizammudin Bridge Delhi	Okhla Bridge inlet of Agra Canal, Delhi	Okhla After Meeting of Shadara Drain, Delhi	Mazawali U.P.	Mathura U/S U.P.	Mathura D/S U.P.	Agra U/S U.P.	Agra D/S U.P.	Bateshwar U.P.	Etawah U.P.	Juhika U.P.	Hamirpur	Allahabad D/S Balua Ghat, U.P.
MIN	500	170000	189000	530000	28000	3700	4100	3200	65000	7700	6200	5100	2200	500
MAX	60000	199000	290000	109000	157000	115000	101000	800000	117000	430000	470000	179000	101000	8000
MEAN	18600	106454	709900	478833	427818	178100	311109	205718	459364	83727	80018	193909	49050	2250

6.2.3 Water Quality of tributaries-Kalinadi (E), Ramganga, Gomti, Saryu, Ghaghara, Hindon, Kali-Hindon, Rihand, Sai, Sirsa, Daha, Farmar & Gandak

The water quality of tributaries namely Kalinadi (E), Ramganga, Gomti, Saryu, Ghaghara, Hindon, Kali-Hindon, Rihand, Sai, Sirsa, Daha, Farmar and Gandak is conforming to water quality criteria with respect to pH and conductivity throughout its length except in Kalinadi at U/s of Gulaothi Town in Bulandsahar where conductivity is observed higher than the desired criteria (2570 µmhos/cm). The DO varies from 0.0 to 11.6 mg/l in mentioned rivers. The DO is observed Nil in the River Kali (E), Kali-Hindon and Hindon at various locations.

The BOD ranges from 1.0-364 mg/l in River Kalinadi. The high BOD values were observed in Kali (W) D/s Mujaffarnagar (364 mg/l) and U/s (32 mg/l), Kali (E) at Gulaothi (183 mg/l) at Kannauj (8.8 mg/l); Hindon at Ghaziabad D/s (36 mg/l) and Puramahadev (36 mg/l); Ramganga at Kannauj (16 mg/l); Gomti at Lucknow U/s (3.4 mg/l) & D/s (14 mg/l), at Jaunpur D/s (12 mg/l), at Varanasi (3.7 mg/l); Sai at Unnao (3.6 mg/l), Saryu at Ayodhya (3.3 mg/l); Rihand at Renukut U/s (3.3 mg/l) and D/s (3.2 mg/l).

The Faecal Coliform (FC) value ranges from 0 to $158x10^4$ MPN/100ml, whereas the Total Coliform (TC) value ranges from 330 to $14x10^7$ MPN/100ml. The highest count of TC is observed in Kali (E) at Gulaothi and of Faecal Coliform (FC) at Kali (W) Mujaffar nagar D/s. The other locations which are not complying with the water quality criteria with respect to TC and FC are Hindon at Pura Mahadev and at Ghaziabad D/s; Kali (E) at Kannuaj; Kalinadi (W) at U/s and D/s of Muzaffar Nagar; Gomti at Lucknow U/s, at Varanasi and Jaunpur D/s. The locations Rihand at Renukut D/s and U/s; Daha at Siwam are also not complying the desired water quality with respect to TC.The water quality of the tributaries Kalinadi (E), Ramganga, Gomti, Saryu, Ghaghara, Hindon, Kali-Hindon, Rihand, Sai, Sirsa, Daha, Farmar and Gandak is presented in Annexure-I, Table 6.3.

6.2.4 Water Quality of tributaries - Chambal, Khan, Kshipra, Parvati, Betwa, Tons, Sind, Sone, Sankh, Dhous and Churni.

The water quality of Chambal, Khan, Kshipra, Parvati, Betwa, Tons, Sind, Sone, Sankh, Dhous and Churni tributary streams is conforming to water quality criteria with respect to pH and conductivity at all the locations except Chambal at Nagda D/s, Betwa at Nayapur D/s Mandideep and Khan at Sanwer in Madhya Pradesh where the high conductivity 9340 µmhos/cm, 3700 µmhos/cm and 2362 µmhos/cm respectively is observed.

The Dissolved oxygen ranges from Nil to 16.0 mg/l. A very high value of DO is observed in River Betwa near road bridge Bhojpur. The low value of DO is observed in River Betwa at Nayapur D/s Mandideep Indl. Area(2.7 mg/l); River Chambal at Kota D/s (2 Km. from city) (3.2 mg/l) in Rajasthan and at Etawah B/c River Yamuna(3.8 mg/l) in UP; River Khan at Sakkar Khadi Indore (0.0 mg/l), Sanwer (2.1 mg/l) and Kabit Khedi near Indore (0.0 mg/l) in Madhya Pradesh; Kshipra at Trivenisangam (3.9 mg/l) and Siddhawat (2.8 mg/l) in MP and River Churni D/s of Santipur town inWest Bengal (2.5 mg/l).

The BOD ranges from 0.1 to 50.0 mg/l. The maximum value (50.0 mg/l) of BOD is observed in River Khan at its all monitoring locations in Madhya Pradesh. Other locations having high BOD are River Betwa at its most of the monitoring locations and BOD in River Betwa ranges from 0.2-6.8 mg/l; Chambal at Kota D/s (6.2 mg/l) and Rameshwarghat near Sawaimadhopur (3.9 mg/l); River Kaliasot near road bridge Mandideep (6.0 mg/l) and River Kshipra at Ramghat at Ujjain (7.0 mg/l), at Trivenisangam (5.0 mg/l) and at Siddhawat (8.0 mg/l).

The Faecal Coliform value ranges from 0 to 4, 30,000 MPN/100ml, whereas the Total Coliform (TC) value ranges from 0 to 39, 00,000 MPN/100ml. The highest values of Faecal Coliform and Total Coliform count are observed in River Tons in HP. The other locations which are not complying with water quality criteria with respect to TC and FC are River Chambal at Etawah B/c to Yamuna in UP and River Churni D/s of Santipur town and at Gade Border (Bangladesh-India Border) West Bengal.

The concentration of Nitrate (NO_3^-) varies from 0.1-40.0 mg/l whereas Nitrite (NO_2^-) ranges from 0.0-22.1 mg/l. The maximum value of nitrate (40.0 mg/l) is observed in River Khan at Sakkar Khadi Indore. The Ammonical Nitrogen (NH_4-N) is observed in the range of 0.0 - 44.4 mg/l and does not meet the criteria in River Betwa, Khan and Kshipra at their all monitoring locations; River Chambal at Gandhi Sagar Dam, at Nagda U/s and D/s; River Kaliasot at Mandideep and Kolar Dam. The water quality of tributaries discussed above is presented in Annexure-I Table 6.4.

6.2.5 Water Quality of tributaries – Damodar, Barakar, Mahananda, Jumar, Bokaro, Konar and Rupnarayan

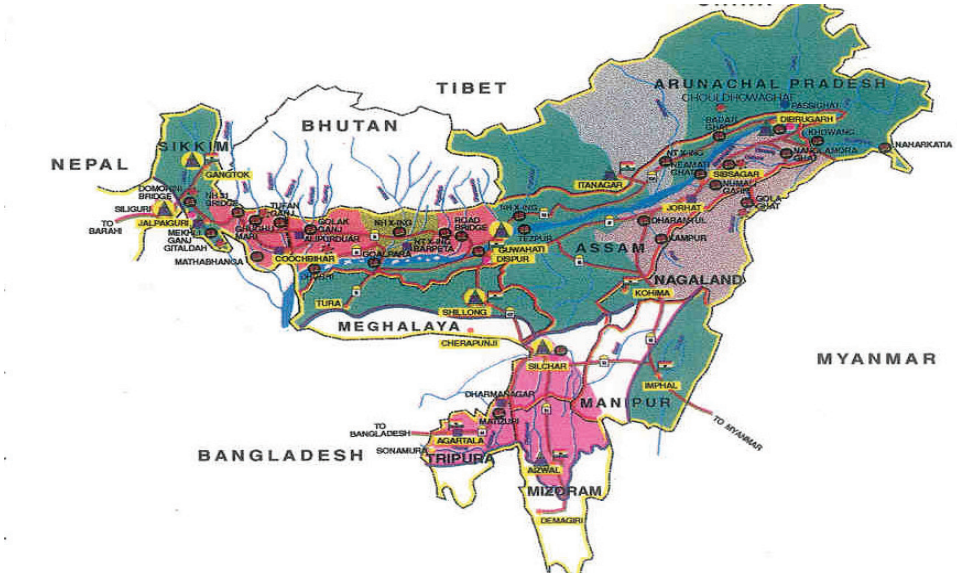
The water quality of the tributary streams Damodar, Barakar, Mahananda, Jumar, Bokaro, Konar and Rupnarayan are meeting the water quality criteria with respect to

pH, DO and conductivity except Damodar at Haldia D/s where conductivity is observed 68700 µmhos/cm. The BOD ranges from 0.4 to 6.8 mg/l. The highest value of BOD (6.8 mg/L) is observed in Damodar near Mujher mana village A/c of Tamla Nallah and at Narainpur after Confl. of Nunia Nallah in West Bengal. All monitoring locations of River Damodar in West Bengal; River Mahananda and Barakar are exceeding the maximum level of BOD with respect to desired water quality criteria. The Faecal Coliform (FC) value ranges from 400 to $35x10^4$ MPN/100ml, whereas the Total Coliform (TC) value ranges from 1300 to $7x10^5$ MPN/100ml. The Total Coliform values are above the criteria level at all monitoring locations in River Damodar, Rupnarayan, Barakar and Mahananda in West Bengal. Ammonical Nitrogen (NH_4-N) values ranges from 0.0-13.4 mg/l. The highest concentration of ammonical nitrogen is observed at Damodar near Mujher mana village A/c of Tamla Nallah in West Bengal. River Damodar is also not meeting the desired water quality criteria for Ammonical Nitrogen at Haldia D/s. The water quality of these tributaries is presented in Annexure-I Table 6.5.

CHAPTER VII

Water Quality of Rivers in Brahmaputra Basin

7.1 Brahmaputra River System



The Brahmaputra basin extends over an area of nearly 5, 80,000 sq km and traverses a distance of about 2900 km through Tibet (China), India and Bangladesh. In India, the basin lies in the states of Arunachal Pradesh, Assam, Nagaland, Meghalaya and West Bengal. The river rises in the Great glacier in the northern-most chain of the Himalayas in the Kailash range at an elevation of about 5,510 m. It enters India across the Sadiya frontiers tract, west of Sadiya town into the Assam valley. Here it is joined by two more tributaries viz. the Dibang or Sikang and the Lohit, from here onwards the river is known as the Brahmaputra. The river then descends down into the Assam valley from east to west for a distance of about 720 km with its channels meandering from side to side and forming several islands, one of these islands, Majuli covers an area of 1,250 sq. Km. during its course the river receives many more tributaries both from the north and the south while some of them are trans-Himalayan rivers with considerable discharges.

The Brahmaputra has the highest discharge of all the rivers, in India, because of heavy annual average rainfall in the catchment area. The river has eight significant tributaries in India, three from the north are the Manas, the Kameng (or the Jia Bharali) and the Subansiri and three from the east are the Dibang or

Sikang, the lohit and the Buri Dihing and two from the North West are the Tista and the Jaldhaka.

The basin area of Brahmaputra is covering the States of Arunachal Pradesh, Assam, Nagaland, Meghalaya, Sikkim and West Bengal. The important urban centres in these States are Shillong (Meghalaya), Guwahati, Jorhat Dilbrugarh, Siliguri, Alipurduar, Dhubri, Nagaon, Tezpur, Tinsukia (Assam), Dimapur (Nagaland), Kohima (Sikkim), Darjeeling, Dabgram Jalpaiguri, Koch-Bihar (West Bengal).

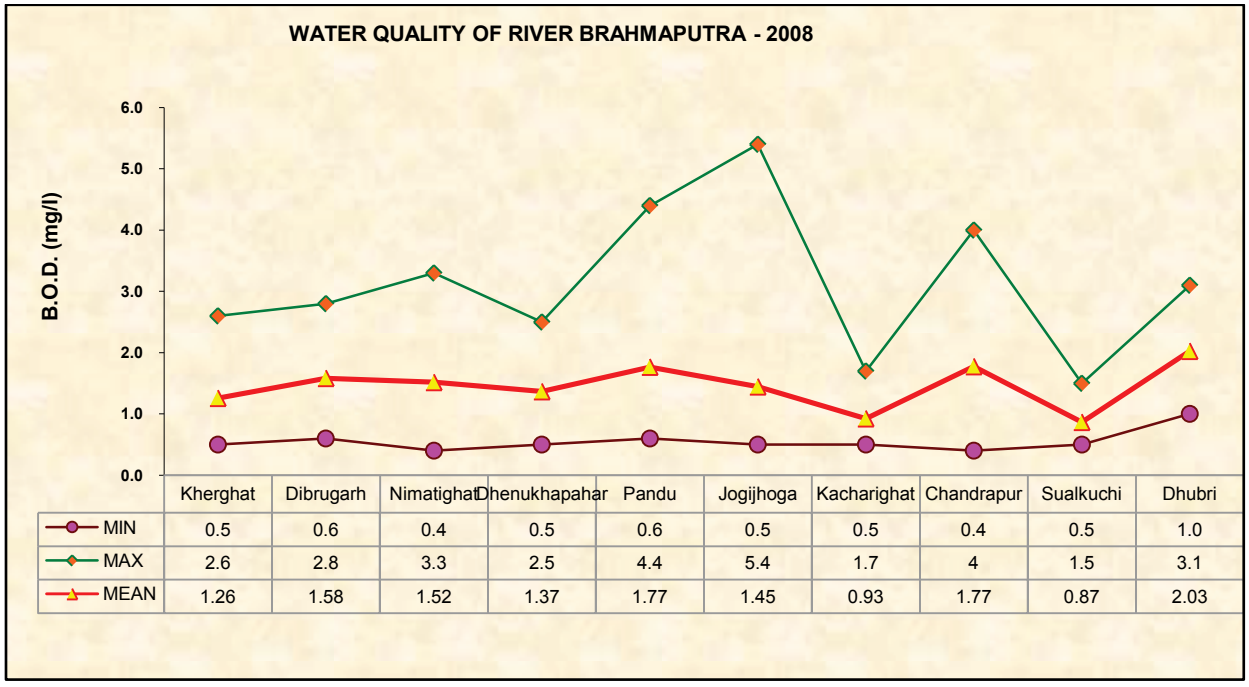
7.2 Water Quality Monitoring in Brahmaputra Basin

The State Pollution Control Boards of Assam, Nagaland and Sikkim at 66 locations are doing the water quality monitoring of the River Brahmaputra and its several tributaries in the basin. The tributary streams covered under the monitoring programme are Burhidihing, Dhansiri, Disang, Jhanji, Subansiri, Bhogdoi, Bharalu, Borak, Deepar Bill, Digboi, Mora Bharali, Teesta, Dickhu, Maney Khola, Ranichu, Rangit, Jai Bharali, Kathakal, Kharsang, Kolong, Manas, Pagldia, Chathe, Dzu, Kapili, Beki, Kundli, Kushiara, Panchnai, Sankosh, Sonai, Kohara, Ranga, Boginadi and Dikhow. The ranges of water quality observed in the mainstream and tributaries with respect to pH, Conductivity, DO, BOD, Nitrate, Nitrite, Ammonical Nitrogen, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

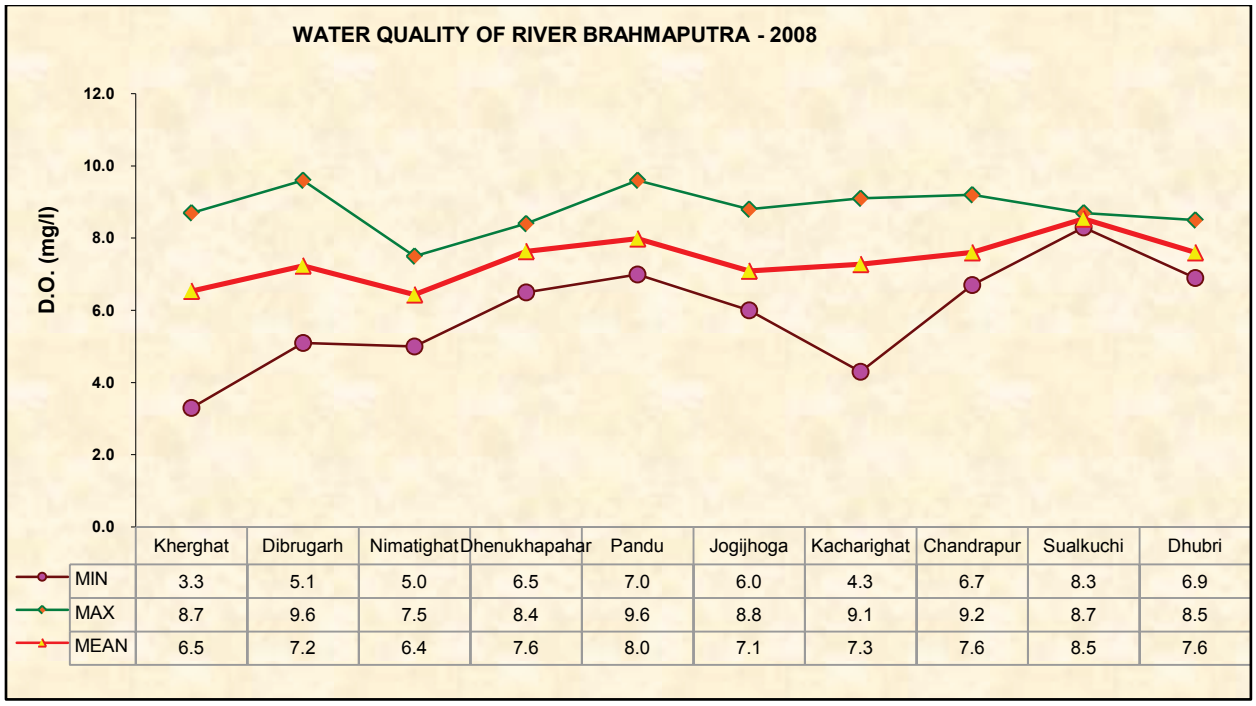
7.2.1 Water Quality of River Brahmaputra

The water quality of River Brahmaputra is conforming to water quality criteria with respect to pH, Conductivity and DO except at Kherghat where the DO is found 3.3 mg/l. The BOD value ranges from 0.4-5.4 mg/l. The highest value of BOD (5.4 mg/l) is observed at Jogijhoga near Bridge. The other locations having high value of BOD are at Pandu (4.4 mg/l), Nimaighat (3.3 mg/l and Dhubri (3.1 mg/l) in Assam. The Faecal Coliform (FC) ranges from 0 to 24,000 MPN/100ml and the higher values are observed at Pandu (24000 MPN/100ml), Kacharighat (4300 MPN/100ml), Dhenukapahar & Jogijhoga (2400 MPN/100ml) whereas the maximum number of Total Coliform observed 2, 40,000 MPN/100ml at Pandu. The TC is not meeting the water quality criteria at many locations under monitoring programme. The water quality of River Brahmaputra is presented in Annexure-I Table 7.1. The water quality status of River Brahmaputra with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is presented in Figure 7.1.

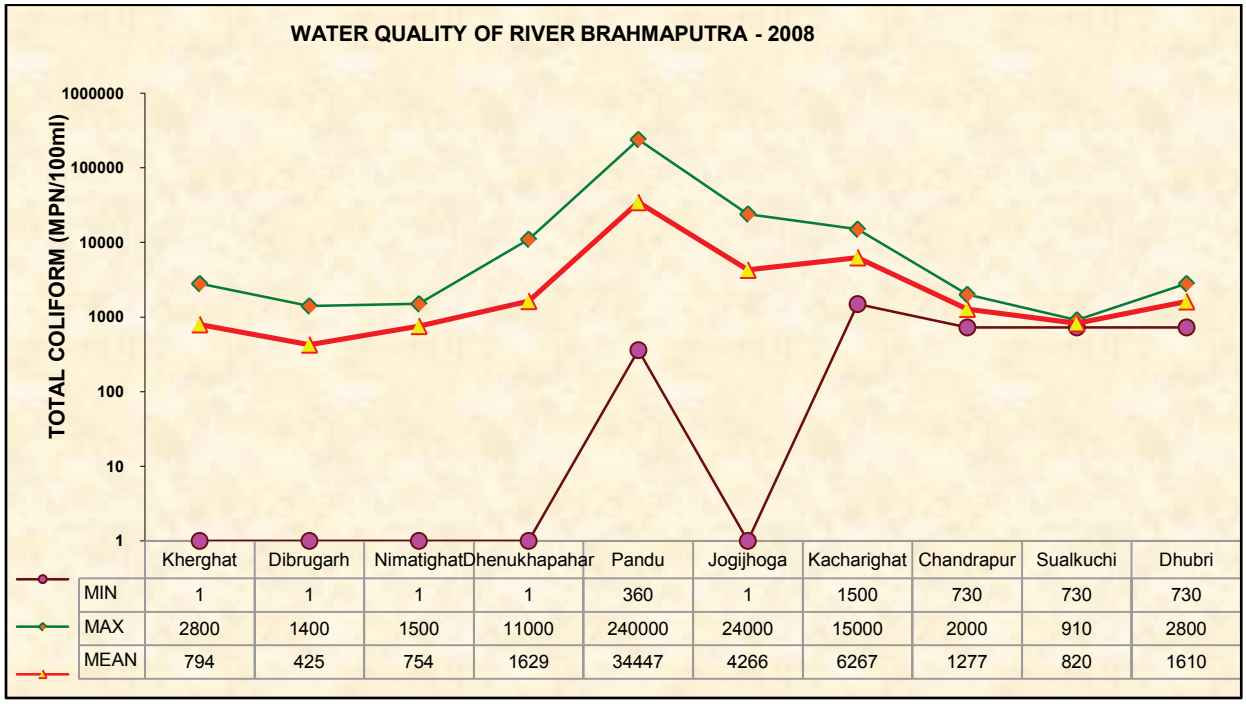
Figure 7.1: Water Quality of River Brahmaputra



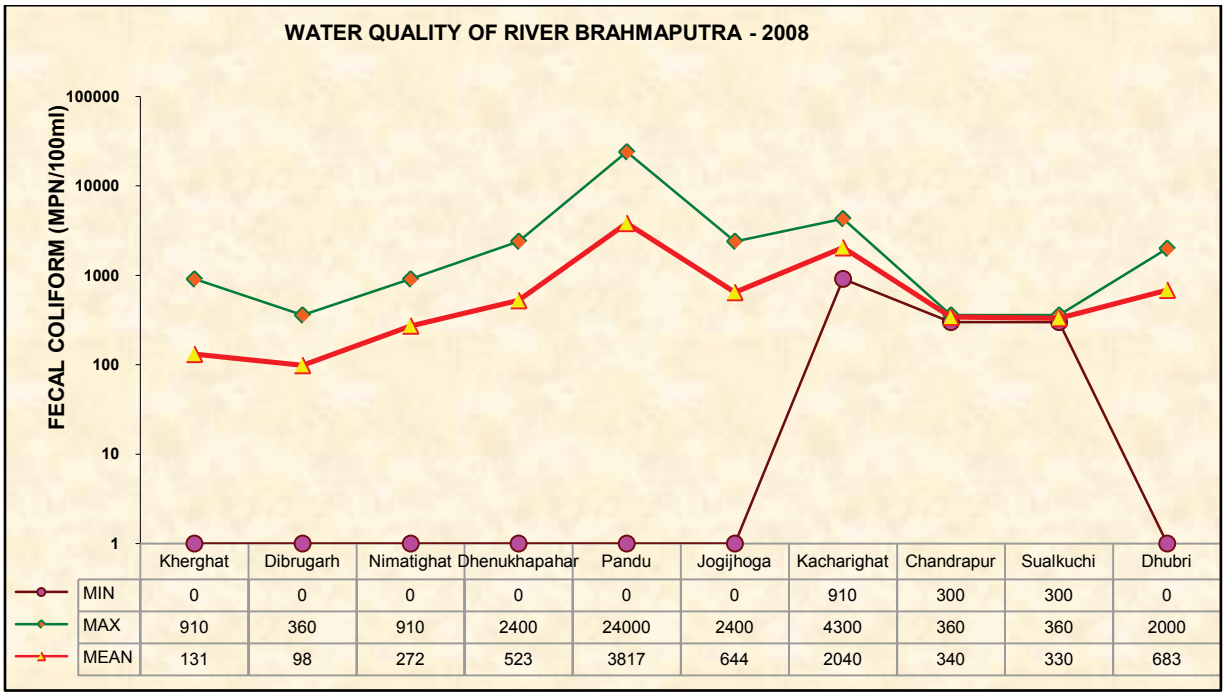
	Kherghat	Dibrugarh	Nimatighat	Dhenukhapahar	Pandu	Jogijhoga	Kacharighat	Chandrapur	Sualkuchi	Dhubri
MIN	0.5	0.6	0.4	0.5	0.6	0.5	0.5	0.4	0.5	1.0
MAX	2.6	2.8	3.3	2.5	4.4	5.4	1.7	4	1.5	3.1
MEAN	1.26	1.58	1.52	1.37	1.77	1.45	0.93	1.77	0.87	2.03



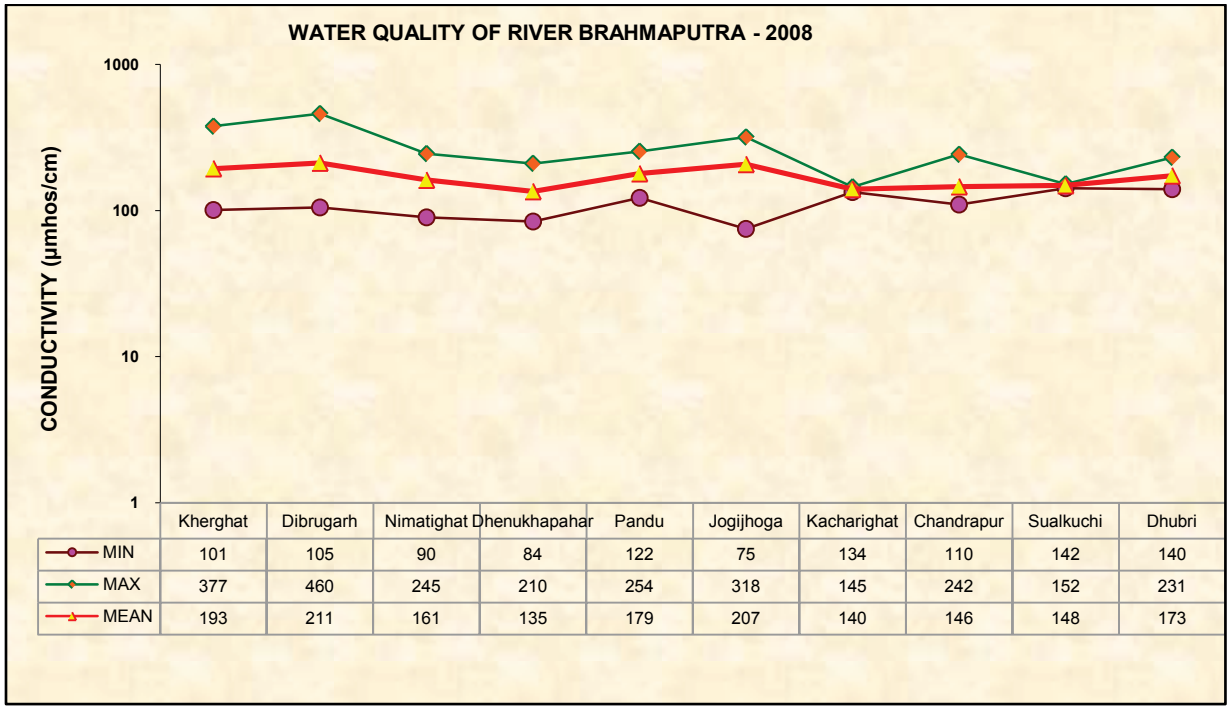
	Kherghat	Dibrugarh	Nimatighat	Dhenukhapahar	Pandu	Jogijhoga	Kacharighat	Chandrapur	Sualkuchi	Dhubri
MIN	3.3	5.1	5.0	6.5	7.0	6.0	4.3	6.7	8.3	6.9
MAX	8.7	9.6	7.5	8.4	9.6	8.8	9.1	9.2	8.7	8.5
MEAN	6.5	7.2	6.4	7.6	8.0	7.1	7.3	7.6	8.5	7.6



	Kherghat	Dibrugarh	Nimatighat	Dhenukhapahar	Pandu	Jogijhoga	Kacharighat	Chandrapur	Sualkuchi	Dhubri
MIN	1	1	1	1	360	1	1500	730	730	730
MAX	2800	1400	1500	11000	240000	24000	15000	2000	910	2800
MEAN	794	425	754	1629	34447	4266	6267	1277	820	1610



	Kherghat	Dibrugarh	Nimatighat	Dhenukhapahar	Pandu	Jogijhoga	Kacharighat	Chandrapur	Sualkuchi	Dhubri
MIN	0	0	0	0	0	0	910	300	300	0
MAX	910	360	910	2400	24000	2400	4300	360	360	2000
MEAN	131	98	272	523	3817	644	2040	340	330	683



	Kherghat	Dibrugarh	Nimatighat	Dhenukhapahar	Pandu	Jogijhoga	Kacharighat	Chandrapur	Sualkuchi	Dhubri
MIN	101	105	90	84	122	75	134	110	142	140
MAX	377	460	245	210	254	318	145	242	152	231
MEAN	193	211	161	135	179	207	140	146	148	173

7.2.2 Water Quality of tributary stream Dhansiri

The water quality of River Dhansiri is conforming to water quality criteria with respect to pH, Conductivity and DO at all the locations except Dhansiri at Nuton Basti in Nagaland and Dzu D/S Kohima Town, where the DO is found 2.4 & 3.2 mg/l respectively. The BOD ranges from 0.4-3.9 mg/l. The highest value of BOD (3.9 mg/l) is observed at Dhansiri at Golaghat in Assam. The water quality of Dhansiri is presented in Annexure-I Table 7.2.

7.2.3 Water Quality of tributary streams Subansiri,Kharsang, Burhidihing, Pagldia, Digboi, Jai Bharali, Kolong, Manas, Disang, Jhanji, Bhogdoi, Mora Bharali, Borak, Bharalu, Deepar Bill & Kathakal

The Water quality of other tributary streams Subansiri, Kharsang, Burhidihing, Pagldia, Digboi, Jai Bharali, Kolong, Manas, Disang, Jhanji, Bhogdoi, Mora Bharali, Borak, Bharalu, Deepar Bill & Kathakal is meeting the desired criteria for pH, Faecal Coliform, Conductivity and DO except River Digboi at Lakhipathe, Digboi (3.6 mg/l) and Jhanji at N.H. Crossing Jorhat (18.0 mg/l) in Assam. BOD ranges from 0.4 – 31.5 mg/l/. The highest value of BOD (31.5 mg/l) is observed in

River Bharalu at Guwahati. High values of BOD are also observed in Deeparbill (8.2 mg/l), Burhidihing at Duliajan (7.0 mg/l), Disang at Dillighat (5.5 mg/l) & Gundamghat (5.0 mg/l), Mora Bharali At Tezpur (4.0 mg/l), Digboi at Lakhipathe, Reserve Forest, Digboi (3.7 mg/l), Kalong at U/s of Anandaram Dekial Phukan Bridge, Nagaon (3.6 mg/l & Marigaon (3.3 mg/l) in Assam. The Total Coliform count varies from 1- 1, 10,000 MPN/100 ml. The Faecal Coliform count varies from 0–24,000 MPN/100 ml. The Faecal & Total Coliform values are exceeding in River Bharalu at Guwahati. Water quality of Subansiri, Kharsang, Burhidihing, Pagldia, Digboi, Jai Bharali, Kolong, Manas, Disang, Jhanji, Bhogdoi, Mora Bharali, Borak, Bharalu, Deepar Bill & Kathakal is presented in Annexure-I Table 7.3.

7.2.4 Water Quality of tributary streams Teesta, Dikchu, Maney Khola, Ranichu, Kundli, Dikhow, Kohora, Boginadi, Ranga Nadi, Panchnai, Kapili, Beki, Sankosh, Barak, Sonai & Kushiyara

The Water quality of other tributary streams Teesta, Dikchu, Maney Khola, Ranichu, Kundli, Dikhow, Kohora, Boginadi, Ranga Nadi, Panchnai, Kapili, Beki, Sankosh, Barak, Sonai & Kushiyara is meeting the desired criteria for Faecal Coliform, Conductivity and DO except Teesta at Siliguri where DO is observed 15.2 mg/l and Faecal coliform is found 80,000 MPN/100ml. BOD ranges from 0.3-3.8 mg/l. High values of BOD are observed in River Teesta at Melli D/S (3.8 mg/l), A/c River Ranichu at Singtam (3.5 mg/l) & A/c Ranichu after meeting the industrial effluents from the town Ranichu (3.6 mg/l), River Dikchu B/C River Teesta near NHPC Hydroelectric Power Project (3.4 mg/l), River Maney Khola at Burtuk U/s of Gangtok, A/c Ray Khola at Adampool after meeting Waste of STP, Gangtok D (3.2) & A/c of Ranichu and Rorachu at Ranipool (3.2 mg/l at each) and Ranichu B/c River Teesta at Singtam (3.2). The Total Coliform count varies from 1- 1,30,000 MPN/100 ml. The Faecal Coliform count varies from 0–80,000 MPN/100 ml. The Total & Faecal Coliform values are observed higher than the criteria in River Teesta at Siliguri. Water quality of Teesta, Dikchu, Maney Khola, Ranichu, Kundli, Dikhow, Kohora, Boginadi, Ranga Nadi, Panchnai, Kapili, Beki, Sankosh, Barak, Sonai & Kushiyara is presented in Annexure-I Table 7.4.

CHAPTER VIII

Water Quality of Rivers in Mahi Basin

8.1 Mahi River System

The Mahi basin extends over an area of 34,842 sq. km. The interstate river Mahi is 583 km long, originating in Madhya Pradesh, passing through Rajasthan and Gujarat and draining into the Gulf of Khambhat. The Mahi flows northwards initially entering into Banswara district and then turning southward flowing through Udaipur and Dungarpur districts before entering into Gujarat. In Gujarat, it flows through Panchmahal, Kheda, Vadodara and Bharuch districts before draining into the Gulf. The principal tributaries of the river are the Som from the right and the Anas and the Panam from the left. The important urban centres in

the watershed of Mahi are Godhra, Vadodara, Dohad and Dadhoi in Gujarat; Ratlam, Jaora in Madhya Pradesh; and Banswara in Rajasthan.

Vadodara is a metropolitan city as well as a centre for industrial activity. In Vadodara majority of industrial units are pharmaceutical and petrochemicals, besides units of caustic soda; distillery, fertilizer, dyes and pesticides also exist. The wastewater generated by IPCL, GSFC, Gujarat refinery, GIDC, Indian Dye stuff (P) Ltd. are being discharged into the Gulf of Khambhat through the Vadodara effluent channel. Although the large Vadodara industrial complex has extended considerably to the west of the small Dhadhar creek and discharges large quantity of effluent into the tidal segment of the river Mahi, the Dhadhar has its own independent catchment area (outside Mahi Basin) inclusive of its tiny tributary Viswamitri which is extremely polluted by the effluent generated from Vadodara.

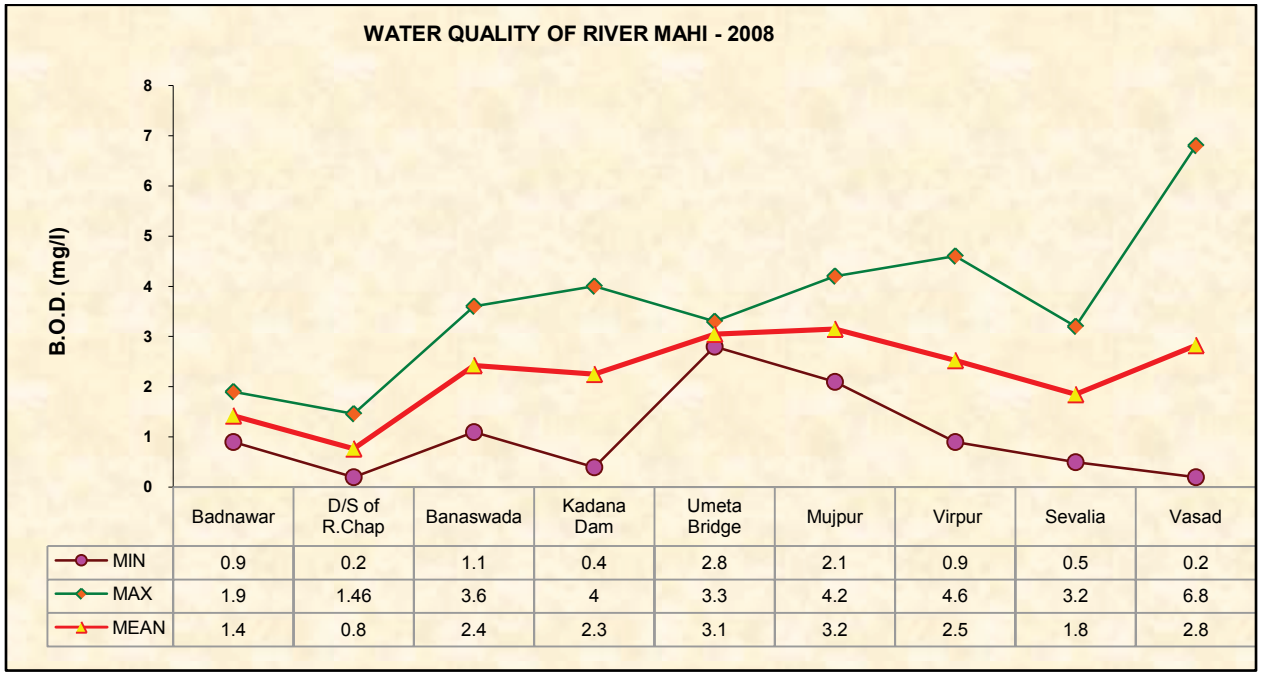
8.2 Water Quality Monitoring in Mahi Basin

The State Pollution Control Boards of Gujarat and Rajasthan at 15 locations are doing the water quality monitoring of the River Mahi and several tributaries in the basin. The monitoring locations are on mainstream of River Mahi (9) and tributaries- Anas (1), Panam (1), Jammer(1), Malei(1), Shivna(1) and Chillar(1). The ranges of water quality observed in River Mahi, Panam and Anas with respect to pH, Conductivity, DO, BOD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

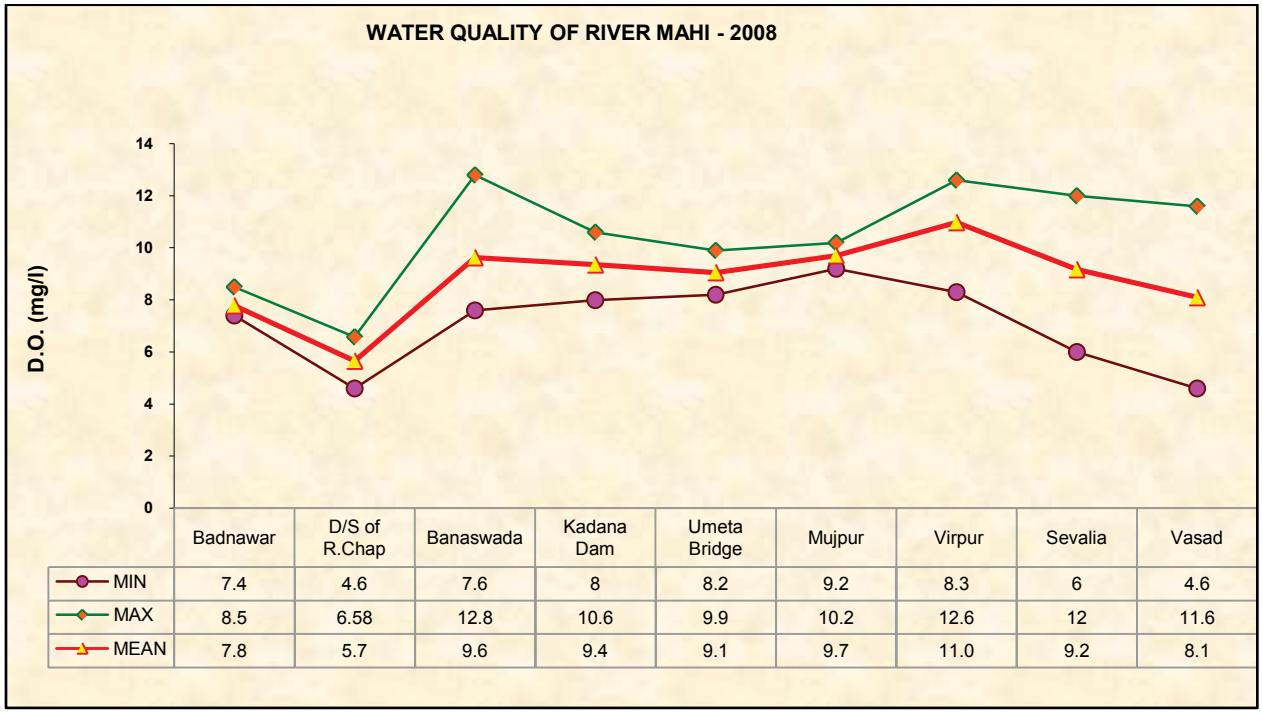
8.2.1 Water Quality of River Mahi and its tributaries

The water quality of River Mahi with respect to pH, Conductivity, DO, BOD, Total Coliform and Faecal Coliform is meeting the desired criteria. pH is observed in the range of 7.2-8.9. The Conductivity lies in the range of 225-1660 µmhos/cm. The DO lies in the range of 4.6-12.8 mg/l. The BOD was observed in the range of 0.2-6.8 mg/l with maximum at Vasad in Gujarat. The Faecal Coliform ranges from 0-18 MPN/100ml and the Total Coliform is in the range of 0-210 MPN/100ml. TC found in the desired range at all the places. The water quality data of River Mahi and its tributaries is presented in Annexure-I Table 8.1. The water quality status of River Mahi with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is presented in Figure 8.1.

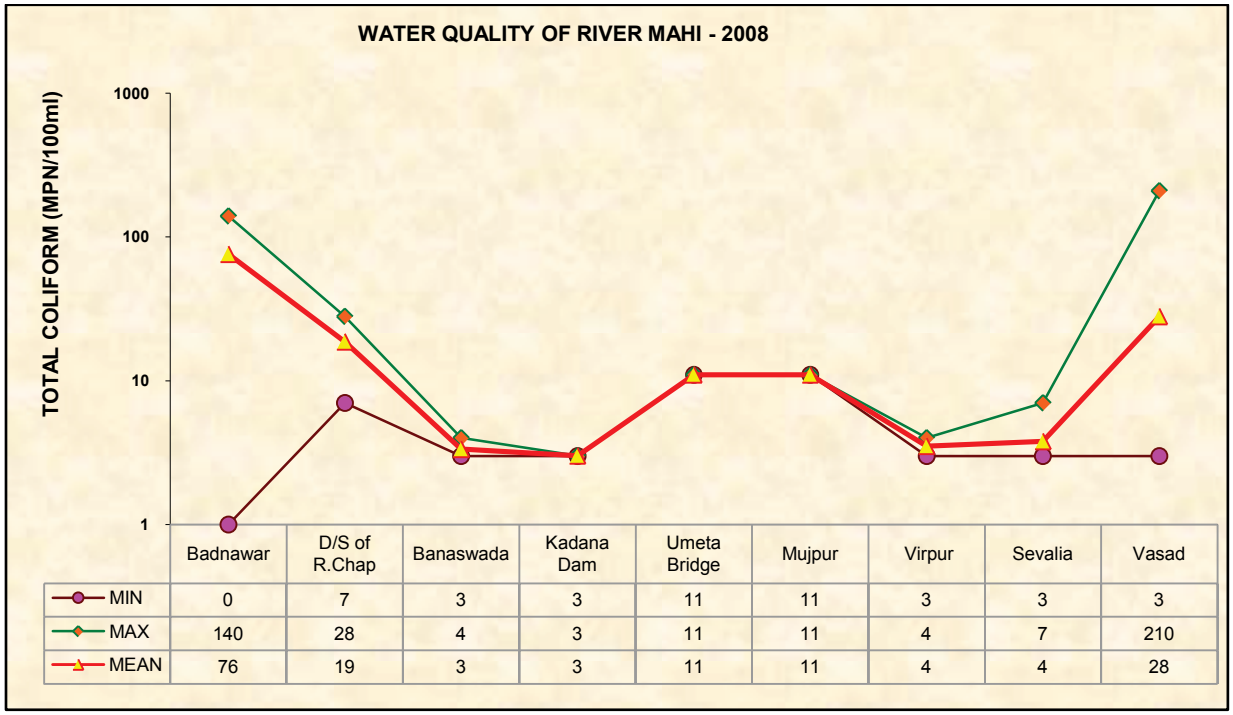
Figure 8.1: Water Quality of River Mahi



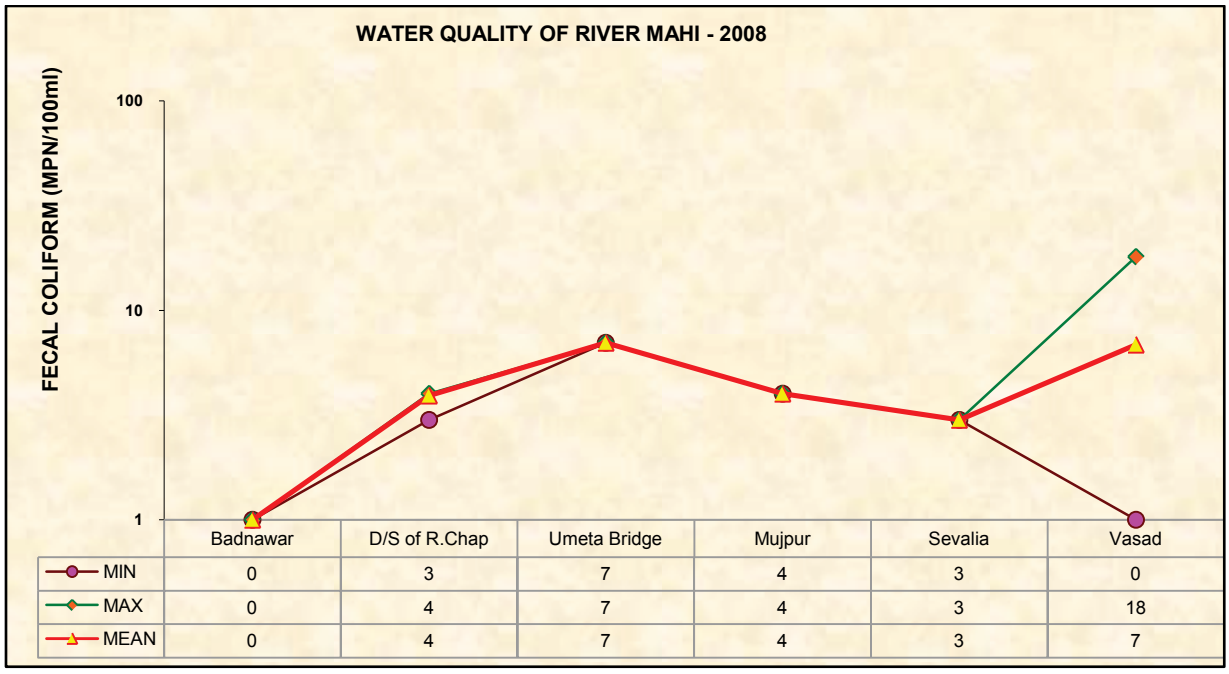
	Badnawar	D/S of R.Chap	Banaswada	Kadana Dam	Umeta Bridge	Mujpur	Virpur	Sevalia	Vasad
MIN	0.9	0.2	1.1	0.4	2.8	2.1	0.9	0.5	0.2
MAX	1.9	1.46	3.6	4	3.3	4.2	4.6	3.2	6.8
MEAN	1.4	0.8	2.4	2.3	3.1	3.2	2.5	1.8	2.8



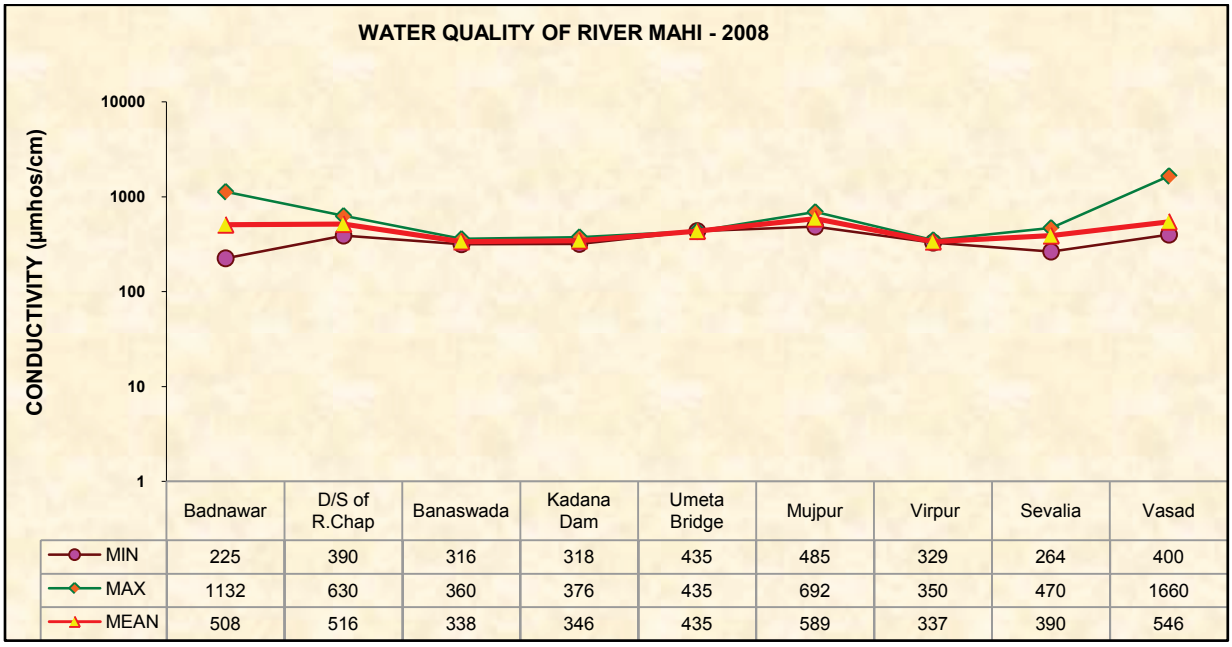
	Badnawar	D/S of R.Chap	Banaswada	Kadana Dam	Umeta Bridge	Mujpur	Virpur	Sevalia	Vasad
MIN	7.4	4.6	7.6	8	8.2	9.2	8.3	6	4.6
MAX	8.5	6.58	12.8	10.6	9.9	10.2	12.6	12	11.6
MEAN	7.8	5.7	9.6	9.4	9.1	9.7	11.0	9.2	8.1



	Badnawar	D/S of R.Chap	Banaswada	Kadana Dam	Umeta Bridge	Mujpur	Virpur	Sevalia	Vasad
MIN	0	7	3	3	11	11	3	3	3
MAX	140	28	4	3	11	11	4	7	210
MEAN	76	19	3	3	11	11	4	4	28



	Badnawar	D/S of R.Chap	Umeta Bridge	Mujpur	Sevalia	Vasad
MIN	0	3	7	4	3	0
MAX	0	4	7	4	3	18
MEAN	0	4	7	4	3	7

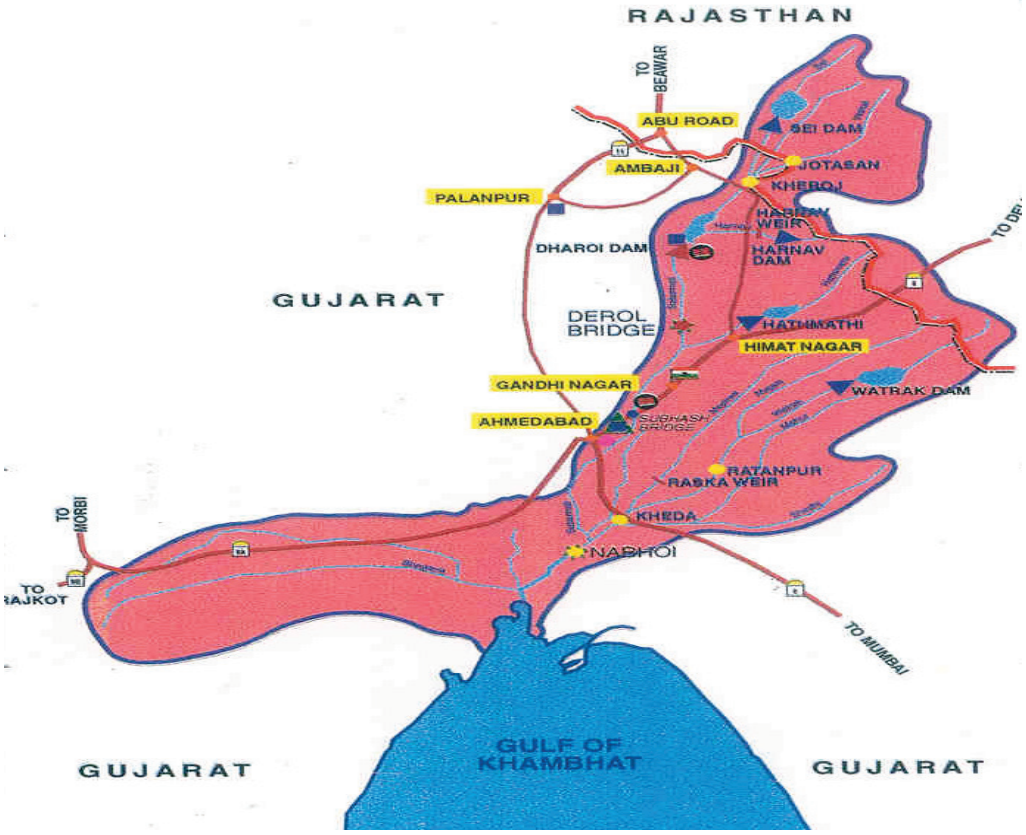


	Badnawar	D/S of R.Chap	Banaswada	Kadana Dam	Umeta Bridge	Mujpur	Virpur	Sevalia	Vasad
MIN	225	390	316	318	435	485	329	264	400
MAX	1132	630	360	376	435	692	350	470	1660
MEAN	508	516	338	346	435	589	337	390	546

CHAPTER IX

Water Quality of Rivers in Sabarmati Basin

9.1 Sabarmati River System



The Sabarmati basin extends over an area of 21,674 sq km. Located in Western India, the basin covers areas in the States of Rajasthan and Gujarat. It rises in the Aravalli hills. The total length of the river from the head to its outfall into the sea is 371 km. The principal tributaries of the river are the Sei, the Wankal, the Harnay, the Hathmati, and the Vatrak and the Meshwa. The river Sabarmati and its tributaries are all rain-fed. The rainfall being fairly low in the basin, its water wealth potential is one of the two lowest in India. The lower part of the basin has become a haven for industries and GIDC has encouraged a new gene of small and medium industries many of them being engineering and chemical units generating significant water pollution. The textile industry continues to dominate the industrial scene in Ahmedabad. In the recent times about 100 km long 30 km

wide Gandhinagar-Vadodara belt is a prosperous and fast developing urban industrial area.

The river is one of the most polluted rivers in the country although it is the lifeline of the State of Gujarat. Intensive agricultural practices coupled with intensive withdrawal of water for cropping had left the river absolutely dry after it entered the Ahmedabad city limits. The river is in a very serious state and deserves urgent attention. Large number of industrial units is located in Ahmedabad. Besides this there are thousands of small scale industries (SSI) units engaged in diversified products mostly concentrated in various industrial states like Naroda, Odhar, Vatva, Pilas and Chandola etc. All these industries are discharging their waste waters D/s (D/s) of Sabarmati Ashram whereas thermal power plant is discharging U/s (U/s) of Sabarmati Ashram.

The river Sabarmati U/s of Ahmedabad city to Sabarmati Ashram and from Sabarmati Ashram to Vautha have been identified as polluted stretches. The immense urban and industrial growth combined with growing demand of irrigation water has taken their toll as observed by the deteriorating water quality recorded particularly from Ahmedabad city to Vautha. The total length of the stretch from Ahmedabad city to Vautha is of 52 km and in the polluted river stretch; the main contributing outfalls are the Maninagar (mixed effluent) and river Khari (industrial).

The basin area of Sabarmati is covering the States of Rajasthan, Madhya Pradesh and Gujarat. The important urban centres in Gujarat are Gandhi Nagar, Junagadh, Ahmadabad, Surendranagar, Gandhidham, Anand, Dholka, Himatnagar, Kalol, Unjha, Viramgam and Visnagar.

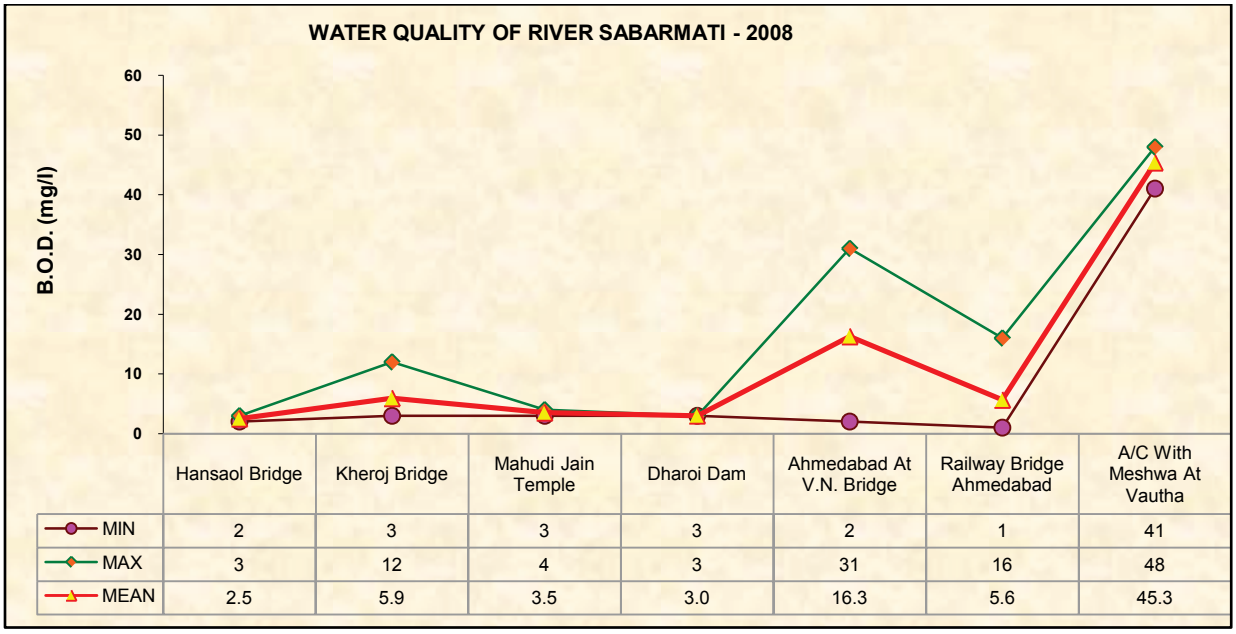
9.2 Water Quality Monitoring in Sabarmati Basin

The water quality monitoring of the River Sabarmati and its tributaries are being done in the basin by the State Pollution Control Boards of Gujarat. The monitoring locations are on mainstream of River Sabarmati and tributaries- Shedi and Khari. The ranges of water quality observed in Sabarmati Basin with respect to pH, Conductivity, DO, BOD, COD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

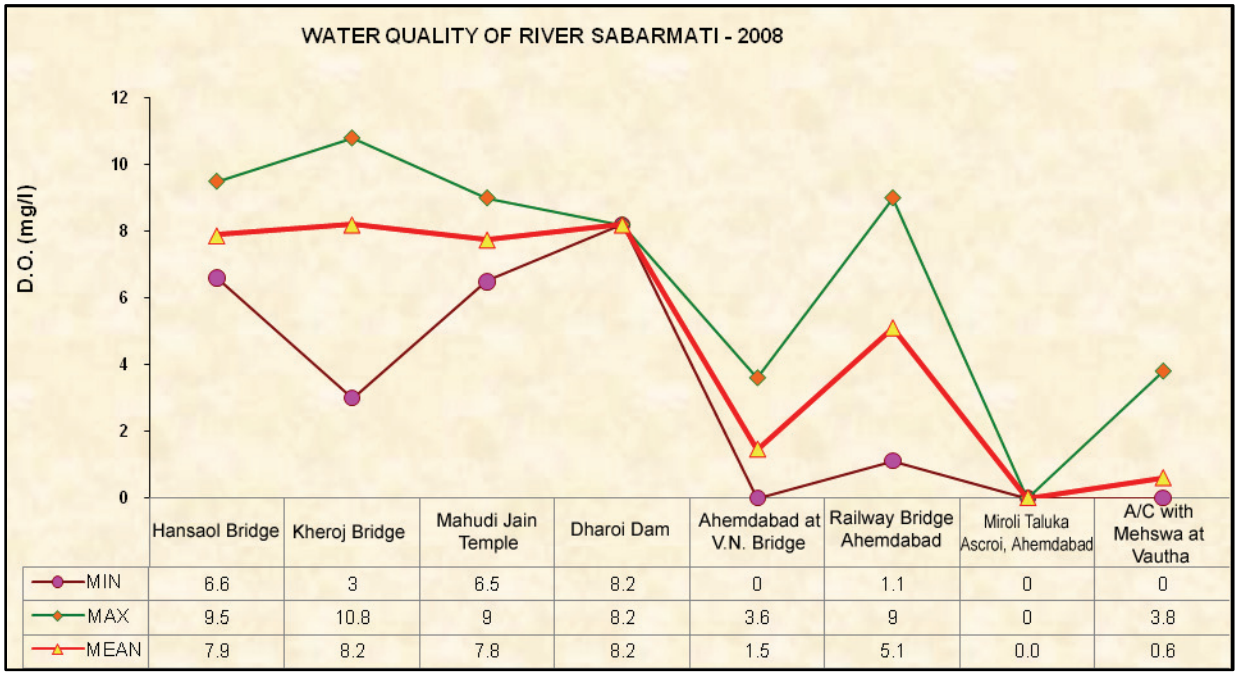
9.2.1 Water Quality of River Sabarmati

The water quality meets the desired water quality criteria with respect to pH at all locations. The Dissolved Oxygen ranges from 0-10.8 mg/l. The low value of DO is observed at V.N.Bridge, village Miroli Taluka Ascroi, A/c with Meshwa at Vautha (0 mg/l), Railway Bridge (1.1 mg/l) and Kheroj Bridge (3.0 mg/l) in Gujarat. The value of conductivity ranges from 191- 3200 µmho/cm and exceeds the limit even for irrigation at Village Miroli Taluka (3200 µmho/cm), A/c with Meshwa at Vautha (2940 µmho/cm) and V.N.Bridge (2320 µmho/cm).The BOD ranges from 1- 48 mg/l and is not meeting the criteria at all the locations except at Hansol Bridge and Dharoi Dam. The high values of BOD are observed at A/c with Meshwa at Vautha (48 mg/l), V.N.Bridge (31 mg/l), Railway Bridge at Ahemdabad (16 mg/l), Kheroj Bridge at Ahmedabad (12 mg/l) and Mahudi Jain Temple (4 mg/l) in Gujarat. The high concentration of BOD is attributed to the discharge of untreated wastewater into the river. The Total Coliform count in the river ranges from 15-21, 00000 MPN/100ml whereas the Faecal Coliform count varies from 4 - 43000 MPN/100ml. The highest count of Total Coliform is observed at Kheroj Bridge. The Ammonical-Nitrogen lies in the range of 0.1-23.5 mg/l. The water quality of River Sabarmati is given in Annexure-I Table 9.1. The water quality status of River Sabarmati with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in figure 9.1.

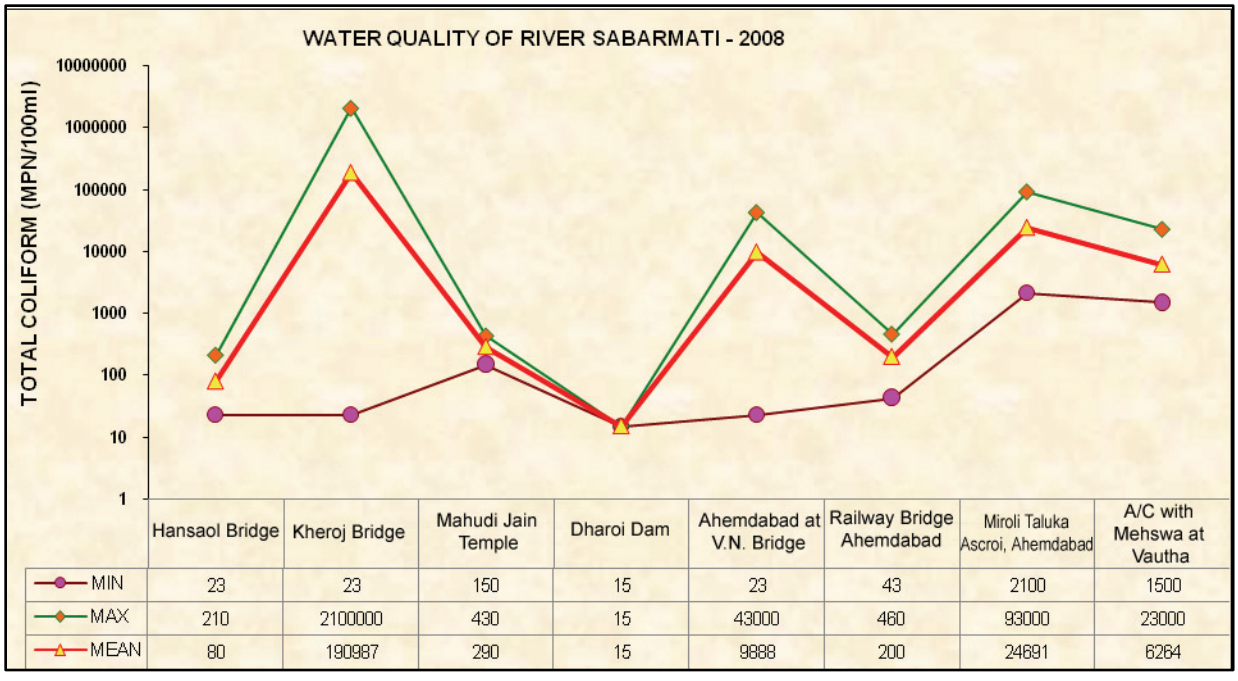
Figure 9.1: Water Quality of River Sabarmati



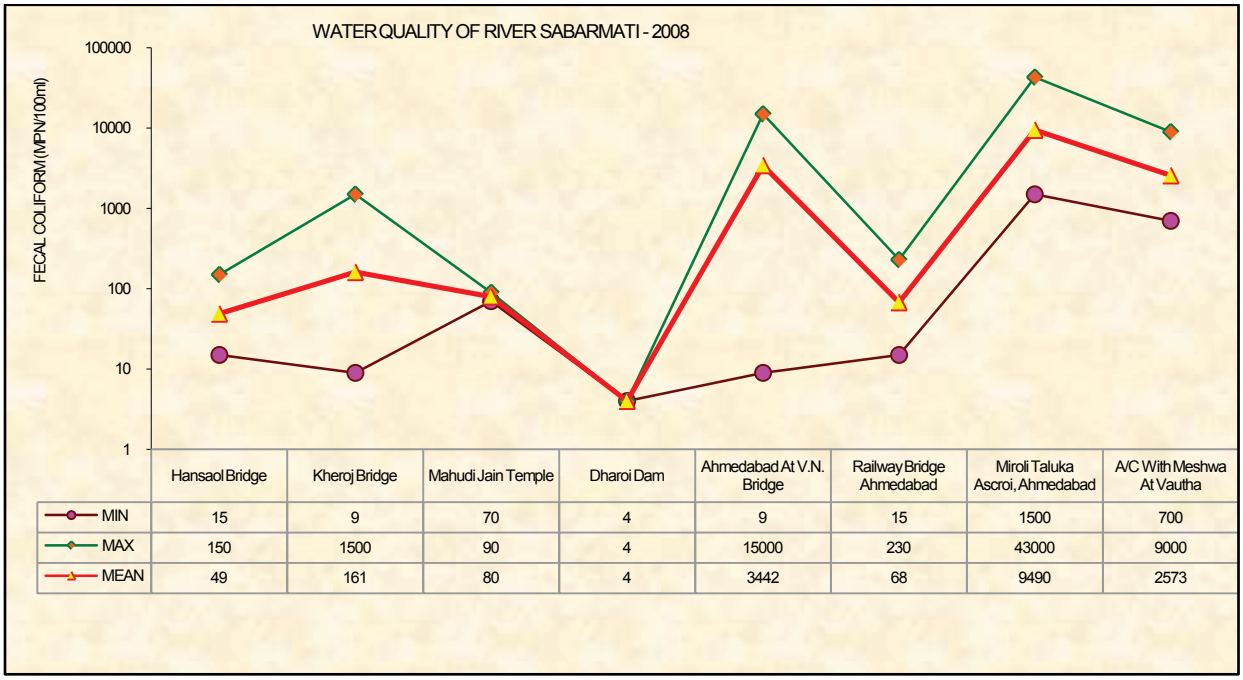
	Hansaol Bridge	Kheroj Bridge	Mahudi Jain Temple	Dharoi Dam	Ahmedabad At V.N. Bridge	Railway Bridge Ahmedabad	A/C With Meshwa At Vautha
MIN	2	3	3	3	2	1	41
MAX	3	12	4	3	31	16	48
MEAN	2.5	5.9	3.5	3.0	16.3	5.6	45.3



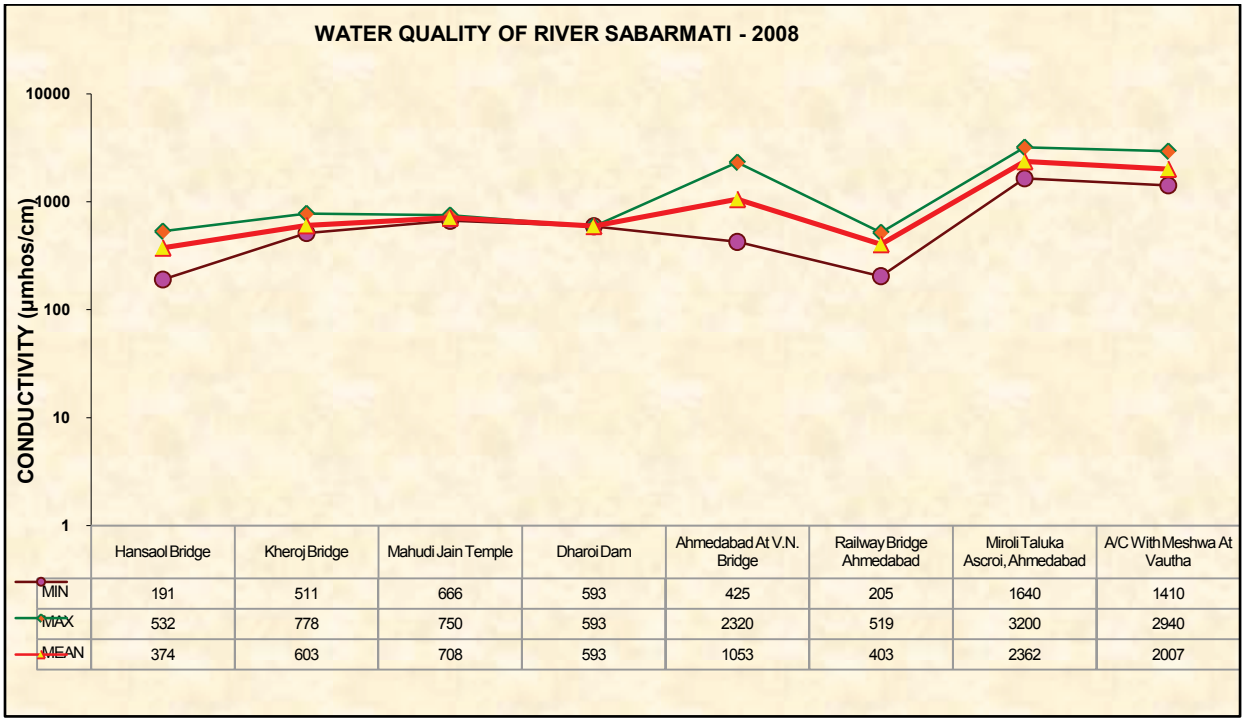
	Hansaol Bridge	Kheroj Bridge	Mahudi Jain Temple	Dharoi Dam	Ahemdabad at V.N. Bridge	Railway Bridge Ahemdabad	Miroli Taluka Ascroi, Ahemdabad	A/C with Mehswa at Vautha
MIN	6.6	3	6.5	8.2	0	1.1	0	0
MAX	9.5	10.8	9	8.2	3.6	9	0	3.8
MEAN	7.9	8.2	7.8	8.2	1.5	5.1	0.0	0.6



	Hansaol Bridge	Kheroj Bridge	Mahudi Jain Temple	Dharoi Dam	Ahemdabad at V.N. Bridge	Railway Bridge Ahemdabad	Miroli Taluka Ascroi, Ahemdabad	A/C with Mehswa at Vautha
MIN	23	23	150	15	23	43	2100	1500
MAX	210	2100000	430	15	43000	460	93000	23000
MEAN	80	190987	290	15	9888	200	24691	6264



	Hansaol Bridge	Kheroj Bridge	Mahudi Jain Temple	Dharoi Dam	Ahmedabad At V.N. Bridge	Railway Bridge Ahmedabad	Miroli Taluka Ascroi, Ahmedabad	A/C With Meshwa At Vautha
MIN	15	9	70	4	9	15	1500	700
MAX	150	1500	90	4	15000	230	43000	9000
MEAN	49	161	80	4	3442	68	9490	2573



	Hansaol Bridge	Kheroj Bridge	Mahudi Jain Temple	Dharoi Dam	Ahmedabad At V.N. Bridge	Railway Bridge Ahmedabad	Miroli Taluka Ascroi, Ahmedabad	A/C With Meshwa At Vautha
MIN	191	511	666	593	425	205	1640	1410
MAX	532	778	750	593	2320	519	3200	2940
MEAN	374	603	708	593	1053	403	2362	2007

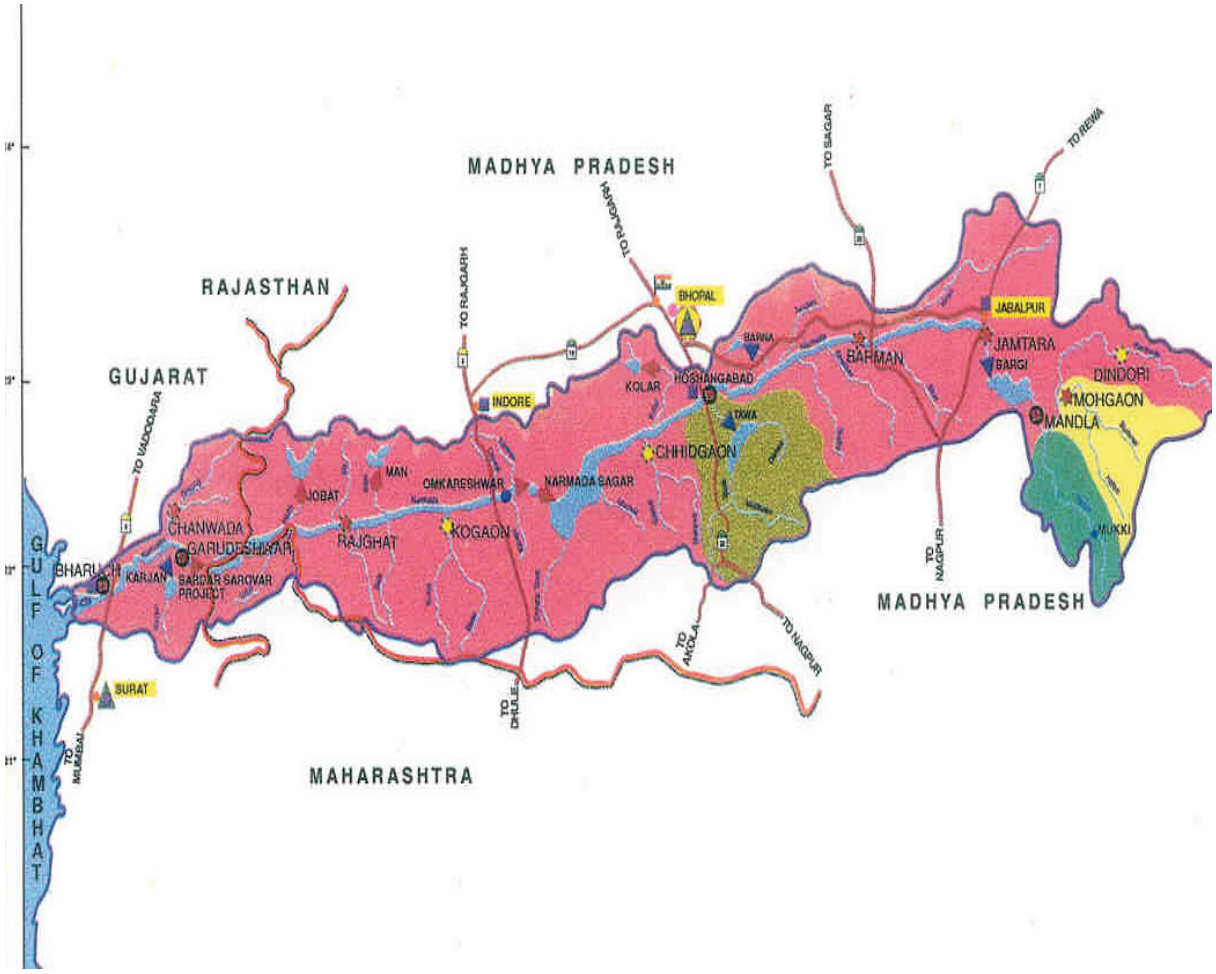
9.2.2 Water Quality of Tributary Streams Shedi and Khari

The water quality of tributary stream Khari is not meeting the desired water quality criteria with respect to DO, BOD, conductivity and coliforms where as DO does not meet the criteria in River Shedi and varies from (3.7-11.8 mg/l). BOD varies from 0.8- 19 mg/l in River Shedi and is observed 9.0 mg/l in River Khari. The Total Coliform and Faecal Coliform count ranges from 15-43 MPN/100ml and 9-15 MPN/100ml respectively in River Shedi whereas this count ranges from 2100-43000 MPN/100ml and 1500-23000 MPN/100 ml respectively in River Khari. The water quality status of River Shedi and Khari is given in Annexure-I Table 9.1.

CHAPTER X

Water Quality of Rivers in Narmada Basin

10.1 Narmada River System



The Narmada basin extends over an area of 98,796 sq km. Lying in the northern extremity of the Deccan plateau, the basin covers large areas in the Madhya Pradesh and Gujarat and a comparatively smaller area in Maharashtra. The Narmada Basin is bounded on the north by the Vindhya, on the east by the Maikala range, on the south by the Satpura and on the west by the Arabian Sea.

Narmada is the largest west-flowing river of the Indian peninsula. Narmada rises from Amarkantak, in the Shahdol district of Madhya Pradesh. The total length of

the river from the head to its outfall into the Gulf of Khambhat is 1,312 km. Although entirely rain fed, the Narmada has a fairly heavy discharge because of moderately heavy annual average rainfall in the basin, particularly in the upper catchment area.

Urbanisation unlike in other basins has been going on in a slow pace in this basin mainly due to the river passing through hilly terrain that has made it inaccessible in most places. The major urbanisation centres are Jabalpur, Dewas and Khandwa besides Bharuch in Gujarat State.

The industrial development in the Narmada basin is lower as compared to other river basins. The industrialized districts of the Narmada basin are Dhar, Jabalpur and Bharuch consisting of clusters of pharmaceuticals, pesticides, dyes & distilleries, leather & fertilizer units whereas in Jabalpur, Khandwa and Hoshangabad the main industrial activity are the paper mills. In most of the other districts the industries are almost non-existent.

The basin area of Narmada is covering the States of Madhya Pradesh, Gujarat and Maharashtra. The important urban centres in these States are Bharuch and Ankleshwar in Gujarat; Murwara (Katni), Jabalpur, Khandwa, Betul, Hoshangabad, Itarsi and Khargone in Madhya Pradesh.

10.2 Water Quality Monitoring in Narmada Basin

The State Pollution Control Boards of Madhya Pradesh and Gujarat are doing the water quality monitoring of the River Narmada at 21 locations and its tributary streams Chota Tawa, Gour, Katni and Kunda at one location each. The ranges of water quality observed in River Narmada and tributary streams Chota Tawa, Gour, Katni and Kunda with respect to pH, Conductivity, DO, BOD, COD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

10.2.1 Water Quality of River Narmada and its tributaires

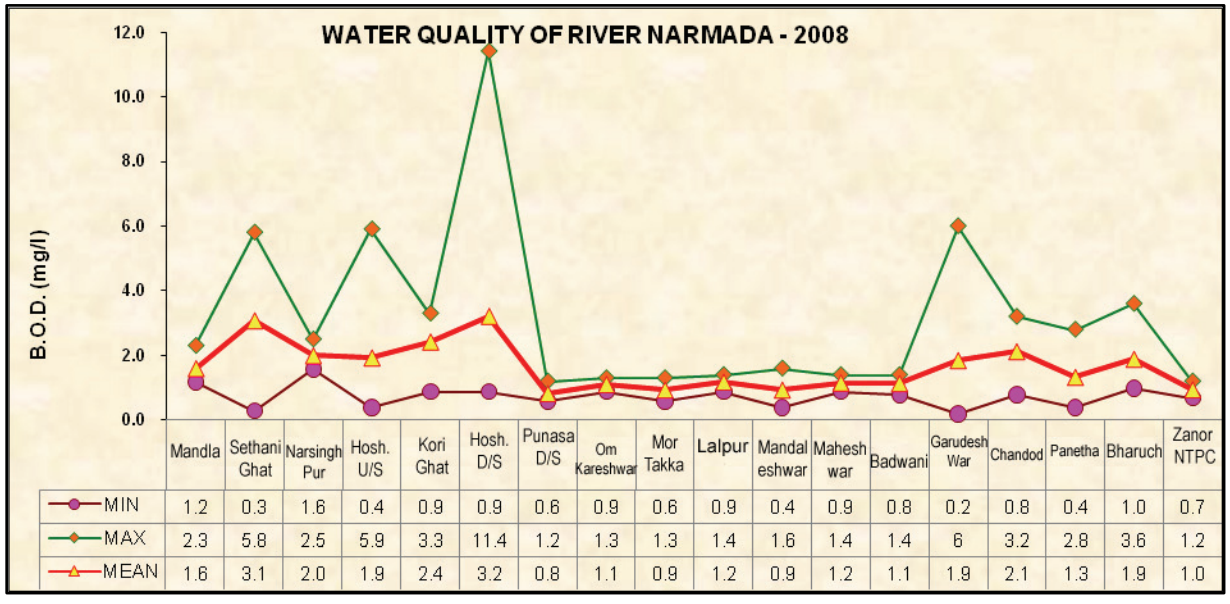
The water quality of mainstream of Narmada with respect to pH ranges from 6.8-10. The conductivity ranges from 180-615 µmhos/cm. The DO varies from 4.9-13.2 mg/l. The BOD ranges from 0.2- 11.4 mg/l that indicates about the

moderately polluted river. The Total Coliform count in the river ranges from Nil-2400 MPN/100ml whereas the Faecal Coliform count varies from Nil-140 MPN/100ml which indicates relatively low level of pollution from human waste. The water quality of River Narmada is broadly meeting the criteria for beneficial uses.

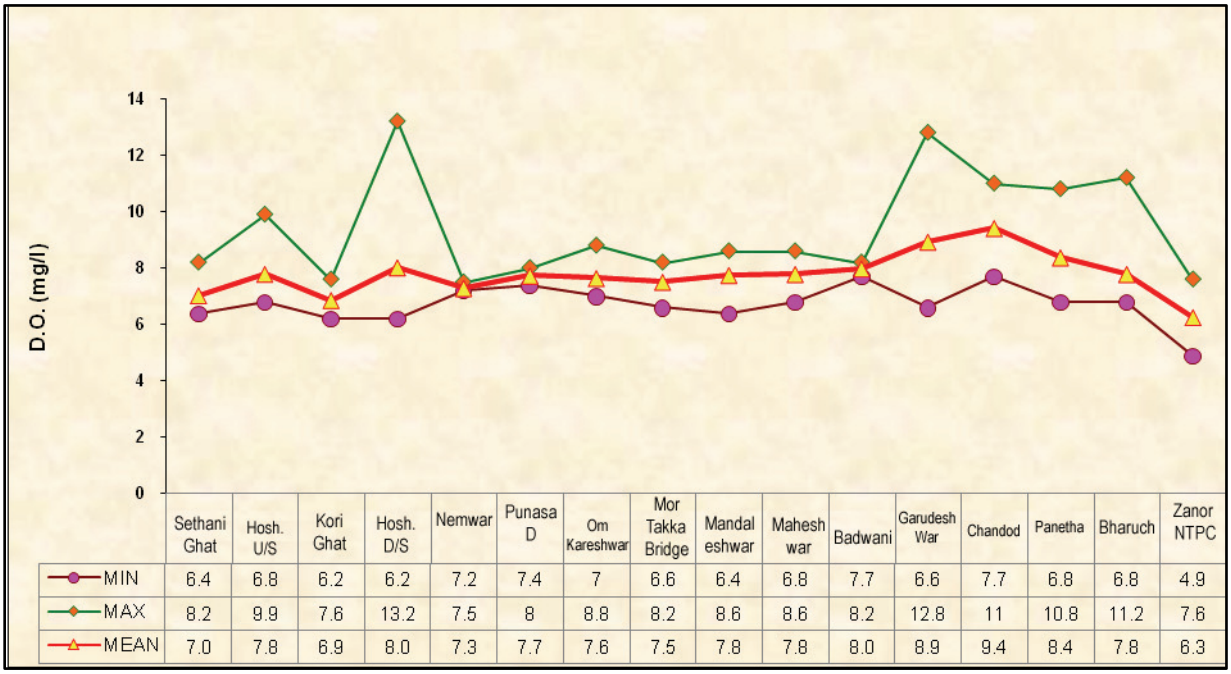
The Water Quality of the tributary stream Chota Tawa with respect to DO is observed 7.8 mg/l, pH ranging from 7.5-7.6, Conductivity is in the range of 310-328 µmhos/cm and BOD ranges from 0.8-1.2 mg/l. The number of Total Coliform and Faecal Coliform are observed in the range of 60-70 MPN/100ml and Nil respectively where as the tributary streams Gour and Katni are meeting the desired criteria in all respects however high value of BOD is observed in River Kunda at Khargone.

The water quality observation indicates that all the parameters are by and large meeting the water quality criteria at all locations. The ranges of water quality observed in River Narmada and its tributary streams Chota Tawa, Gour, Katni and Kunda with respect to pH, Conductivity, DO, BOD, COD, Total Coliform and Faecal Coliform is given in Annexure-I Table 10.1. The water quality status of River Narmada with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is presented in figure 10.1.

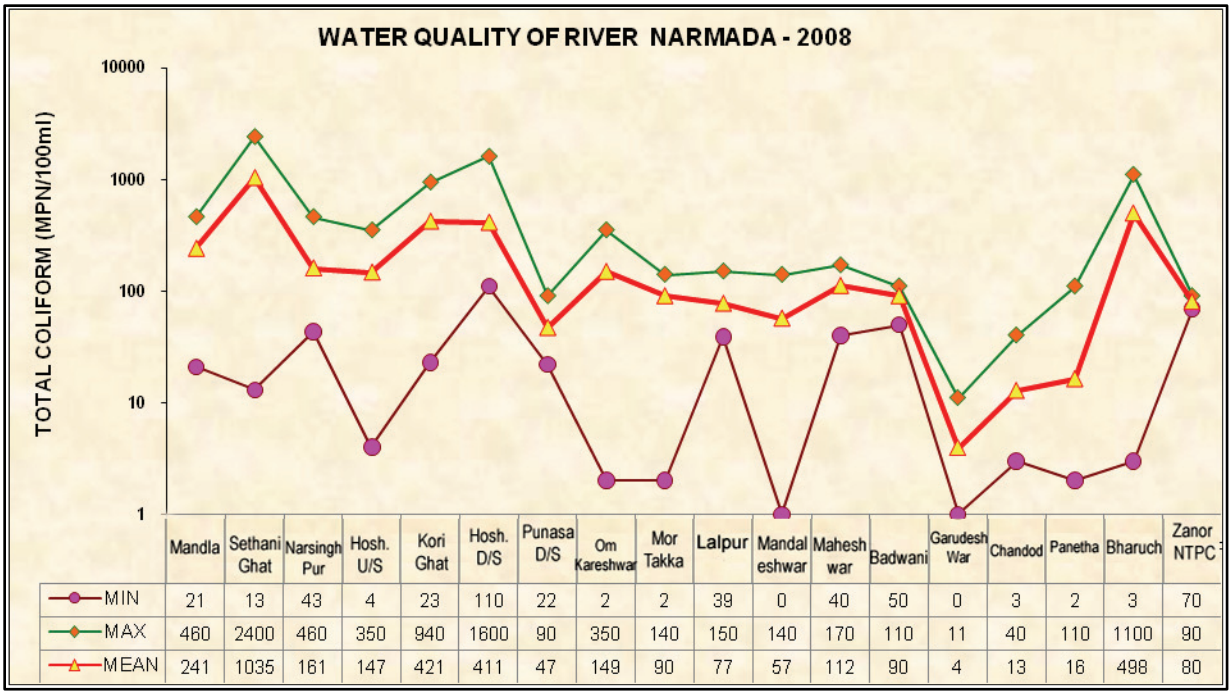
Figure 10.1: Water Quality of River Narmada



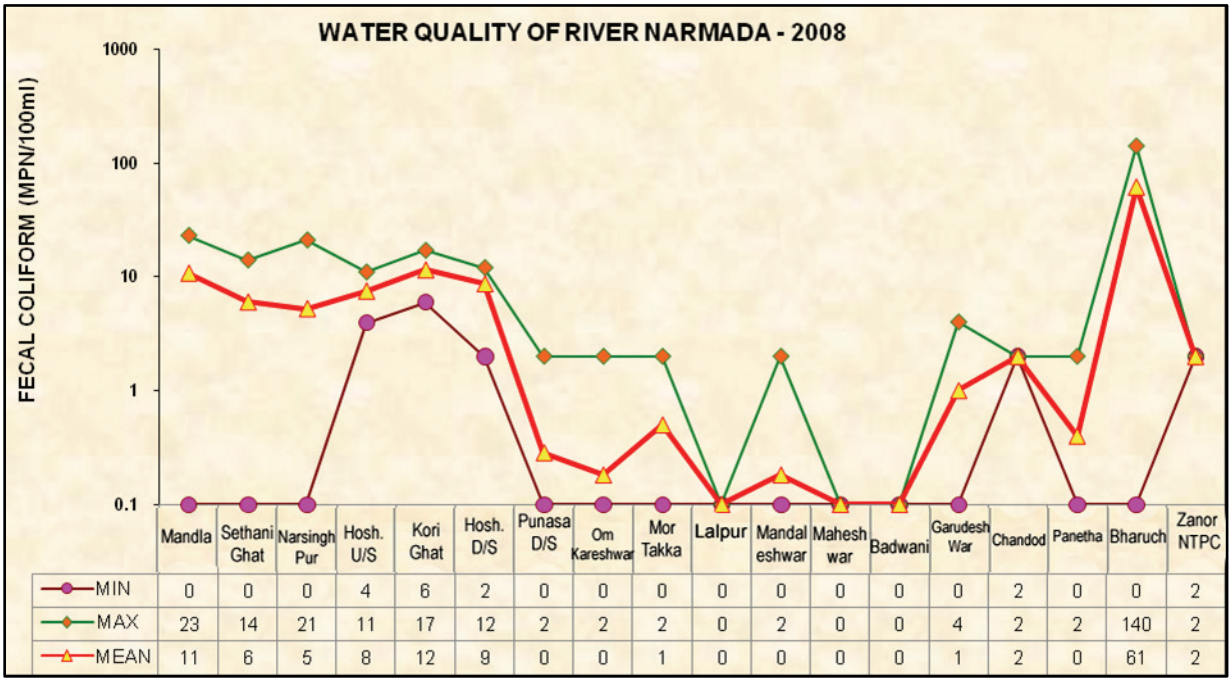
	Mandla	Sethani Ghat	Narsingh Pur	Hosh. U/S	Kori Ghat	Hosh. D/S	Punasa D/S	Om Kareshwar	Mor Takka	Lalpur	Mandal eshwar	Mahesh war	Badwani	Garudesh War	Chandod	Panetha	Bharuch	Zanor NTPC
MIN	1.2	0.3	1.6	0.4	0.9	0.9	0.6	0.9	0.6	0.9	0.4	0.9	0.8	0.2	0.8	0.4	1.0	0.7
MAX	2.3	5.8	2.5	5.9	3.3	11.4	1.2	1.3	1.3	1.4	1.6	1.4	1.4	6	3.2	2.8	3.6	1.2
MEAN	1.6	3.1	2.0	1.9	2.4	3.2	0.8	1.1	0.9	1.2	0.9	1.2	1.1	1.9	2.1	1.3	1.9	1.0



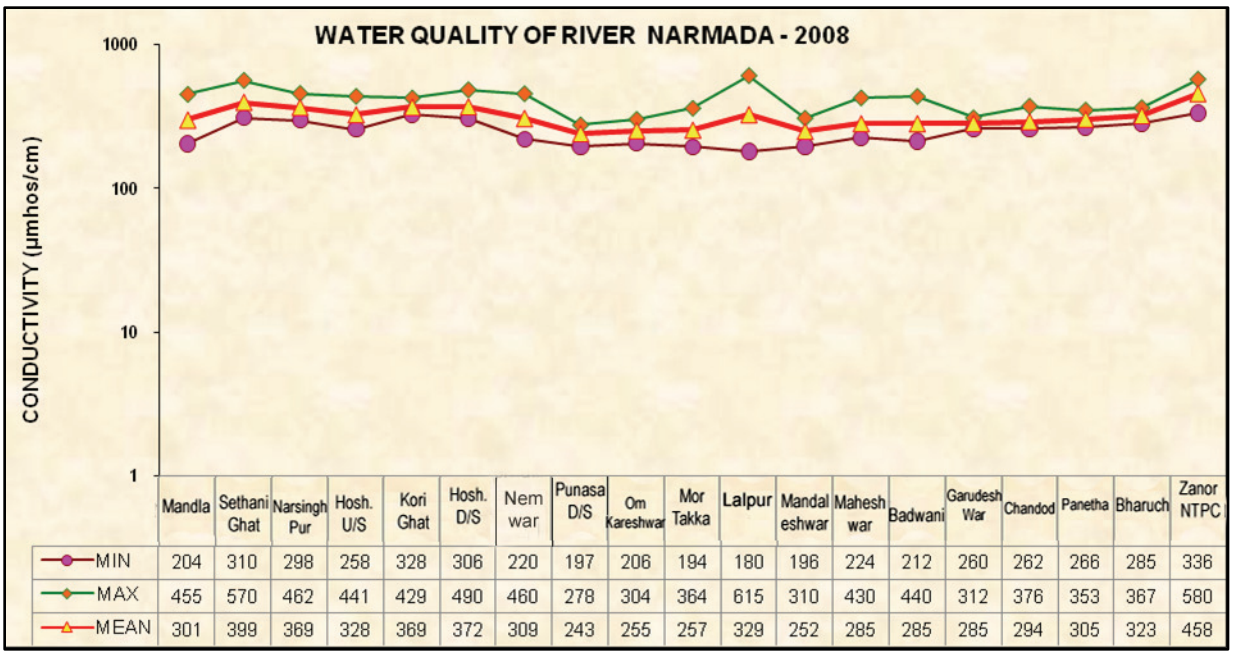
	Sethani Ghat	Hosh. U/S	Kori Ghat	Hosh. D/S	Nemwar	Punasa D	Om Kareshwar	Mor Takka Bridge	Mandal eshwar	Mahesh war	Badwani	Garudesh War	Chandod	Panetha	Bharuch	Zanor NTPC
MIN	6.4	6.8	6.2	6.2	7.2	7.4	7	6.6	6.4	6.8	7.7	6.6	7.7	6.8	6.8	4.9
MAX	8.2	9.9	7.6	13.2	7.5	8	8.8	8.2	8.6	8.6	8.2	12.8	11	10.8	11.2	7.6
MEAN	7.0	7.8	6.9	8.0	7.3	7.7	7.6	7.5	7.8	7.8	8.0	8.9	9.4	8.4	7.8	6.3



	Mandla	Sethani Ghat	Narsingh Pur	Hosh. U/S	Kori Ghat	Hosh. D/S	Punasa D/S	Om Kareshwar	Mor Takka	Lalpur	Mandal eshwar	Mahesh war	Badwani	Garudesh War	Chandod	Panetha	Bharuch	Zanor NTPC
MIN	21	13	43	4	23	110	22	2	2	39	0	40	50	0	3	2	3	70
MAX	460	2400	460	350	940	1600	90	350	140	150	140	170	110	11	40	110	1100	90
MEAN	241	1035	161	147	421	411	47	149	90	77	57	112	90	4	13	16	498	80



	Mandla	Sethani Ghat	Narsingh Pur	Hosh. U/S	Kori Ghat	Hosh. D/S	Punasa D/S	Om Kareshwar	Mor Takka	Lalpur	Mandal eshwar	Mahesh war	Badwani	Garudesh War	Chandod	Panetha	Bharuch	Zanor NTPC
MIN	0	0	0	4	6	2	0	0	0	0	0	0	0	0	2	0	0	2
MAX	23	14	21	11	17	12	2	2	2	0	2	0	0	4	2	2	140	2
MEAN	11	6	5	8	12	9	0	0	1	0	0	0	0	1	2	0	61	2

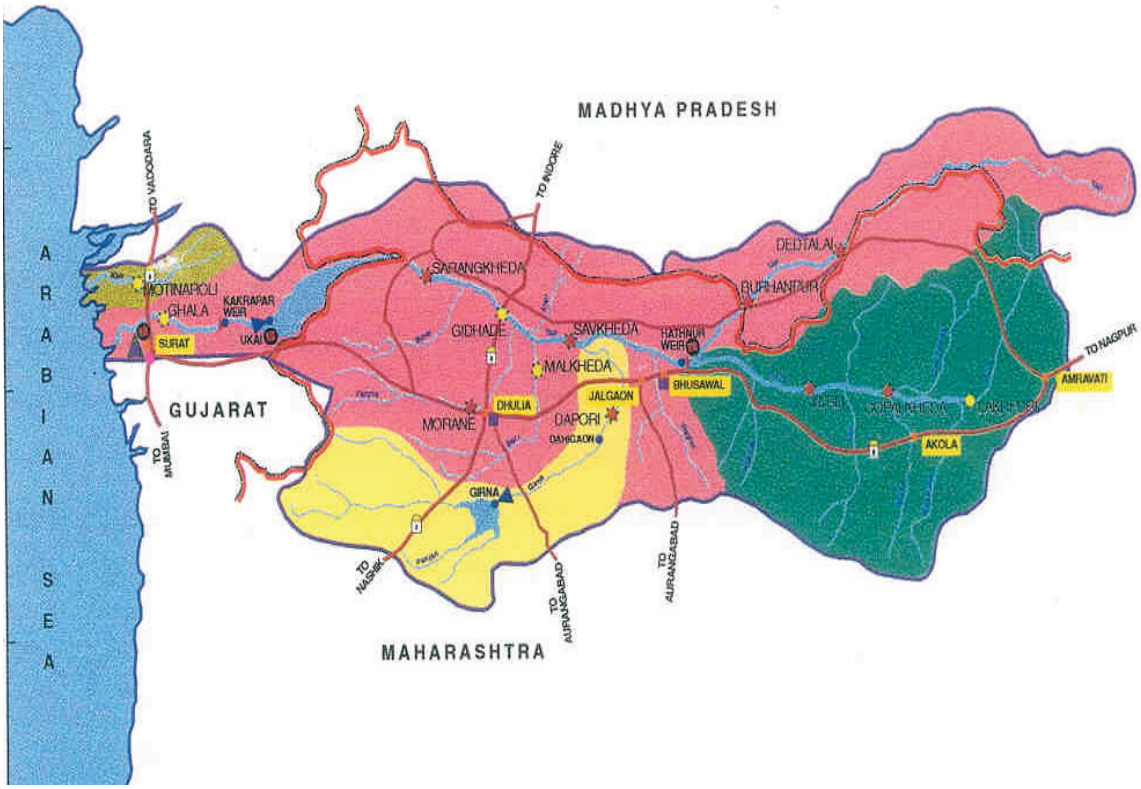


	Mandla	Sethani Ghat	Narsingh Pur	Hosh. U/S	Kori Ghat	Hosh. D/S	Nem war	Punasa D/S	Om Kareshwar	Mor Takka	Lalpur	Mandal eshwar	Mahesh war	Badwani	Garudesh War	Chandod	Panetha	Bharuch	Zanor NTPC
MIN	204	310	298	258	328	306	220	197	206	194	180	196	224	212	260	262	266	285	336
MAX	455	570	462	441	429	490	460	278	304	364	615	310	430	440	312	376	353	367	580
MEAN	301	399	369	328	369	372	309	243	255	257	329	252	285	285	285	294	305	323	458

CHAPTER XI

Water Quality of Rivers in Tapi Basin

11.1 Tapi River System



The Tapi basin extends over an area of 65,145 sq km. Situated in the Deccan plateau, the basin covers large areas in the States of Madhya Pradesh, Maharashtra and Gujarat.

The Tapi basin is bounded on the north by the Satpura range, on the east by the Mahadeo hills, on the south by the Ajanta range and Satmala hills and on the west by the Arabian Sea. The total length of the river from the head to its outfall into the sea is 724 km of which 228 km is in Madhya Pradesh. 228 km in Maharashtra, 214 km in Gujarat and the remaining 54 km from the common boundary between Madhya Pradesh and Maharashtra.

The Tapi receives several tributaries on both its banks. The Bhokar, the Suki, the Mor, the Harki, the Guli, the Aner, the Arunavati, the Gomai, the Gomati and the Valer join it from the right and the Puma, the Bhogvati, the Vaghur, the Girna, the Bori, the Panjhra, the Amarvati, the Shiva, the Rengavati and the Nesu join from the left. The river basin is moderately rain fed and flows through intensively farmed black cotton-soil area.

The urban population has been observed to be higher in the tail reaches of the river compared to the Upper reaches of the basin, although the proportion of the geographical areas covered to these two reaches are in reverse order. The most populous town in Tapi basin is Surat followed by Amravati and Dhule in Maharashtra.

Major part of the upper Tapi basin is predominantly agricultural but in the lower basin area industrialisation has fairly developed in M.P. the industries are centred only in one district-East Nimar (Khandwa) while in Maharashtra Jalgaon is the most industrialised area. Distillery units contribute the largest share in Maharashtra where as textile occupies the predominant activity in Gujarat followed by food & beverages and chemical industries.

The Tapi receives several tributaries on both its banks. The Bhokar, the Suki, the Mor, the Harki, the Guli, the Aner, the Arunavati, the Gomai, the Gomati and the Valer join it from the right and the Puma, the Bhogvati, the Vaghur, the Girna, the Bori, the Panjhra, the Amarvati, the Shiva, the Rengavati and the Nesu join from the left. The river basin is moderately rain fed and flows through intensively farmed black cotton-soil area.

The basin area of Tapi is covering the States of Madhya Pradesh, Gujarat and Maharashtra. The important urban centres in these States are Burhanpur and Sarni in Madhya Pradesh; Akola, Malegaon, Bhusawal, Jalgon, Amaravati, Dhule, AchalpurAkot Khamgaon Malkapur in Maharashtra; and Surat in Gujarat.

11.2 Water Quality Monitoring in Tapi Basin

The water quality monitoring of the River Tapi and tributary streams Girna, Rangavali, Kim, Denwa and Purna is being done in the basin by the State Pollution Control Boards of Gujarat, Madhya Pradesh and Maharashtra. The ranges of water quality observed in River Tapi and its tributary streams Girna, Rangavali, Kim,

Denwa and Purna with respect to pH, Conductivity, DO, BOD, COD, Total Coliform and Faecal Coliform are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

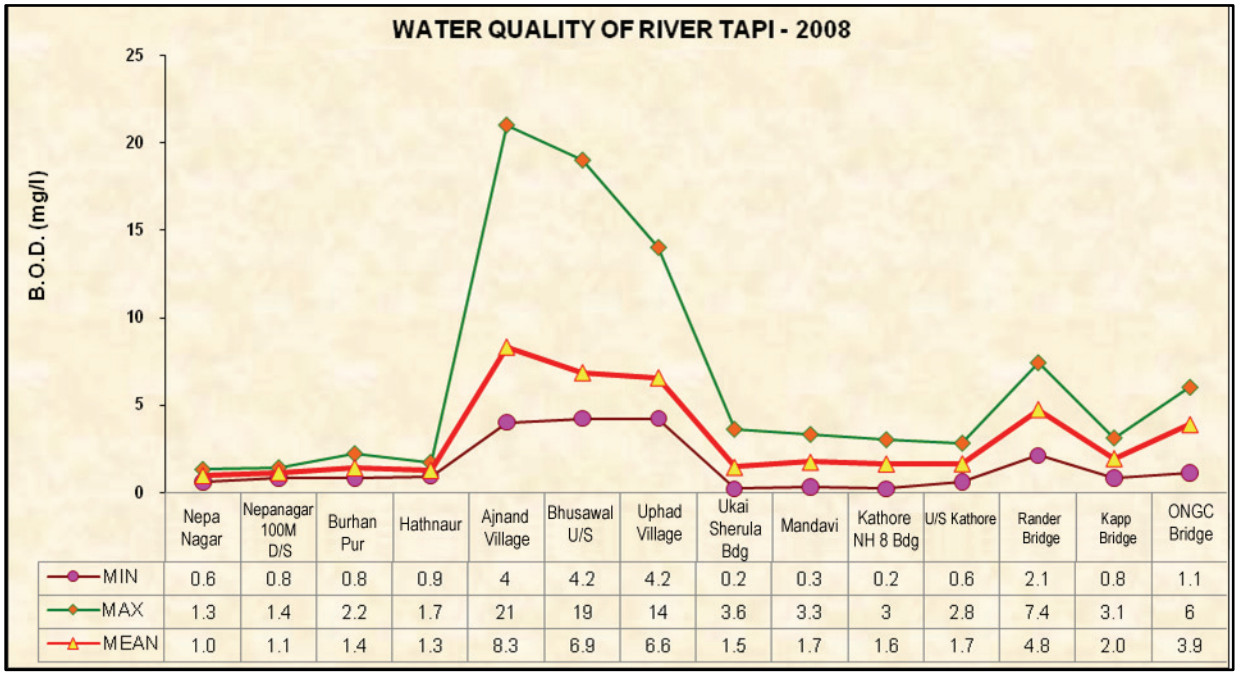
11.2.1 Water Quality of River Tapi & its tributaries Girna, Rangavali, Kim, Denwa and Purna

The water quality of River Tapi with respect to pH ranges from 6.6-8.9. The conductivity varies from 137-26000 µmhos/cm. The DO ranges from 2.1-8.8 mg/l. The lowest value of DO is observed at ONGC Bridge (2.1 mg/l) & Rander Bridge (3.3 mg/l), Surat in Gujarat and Ajnand village (3.8 mg/l) in Maharashtra. The BOD varies from 0.2-21 mg/l and the values higher than the desired criteria are observed at Ajnand Village (21.0 mg/l), Bhusawal U/s (19.0 mg/l) and Uphad village (14.0 mg/l) in Maharashtra; at Rander Bridge (7.4 mg/l), ONGC Bridge(6.0 mg/l), Ukai Sherula Bridge (3.6 mg/l), Mandavi(3.3 mg/l) and Near Bardoli at Kapp Bridge(3.1 mg/l) in Gujarat. The Total Coliform count in the river ranges from 7-46, 0000 MPN/100ml whereas the Faecal Coliform count varies from Nil–24, 0000 MPN/100ml.

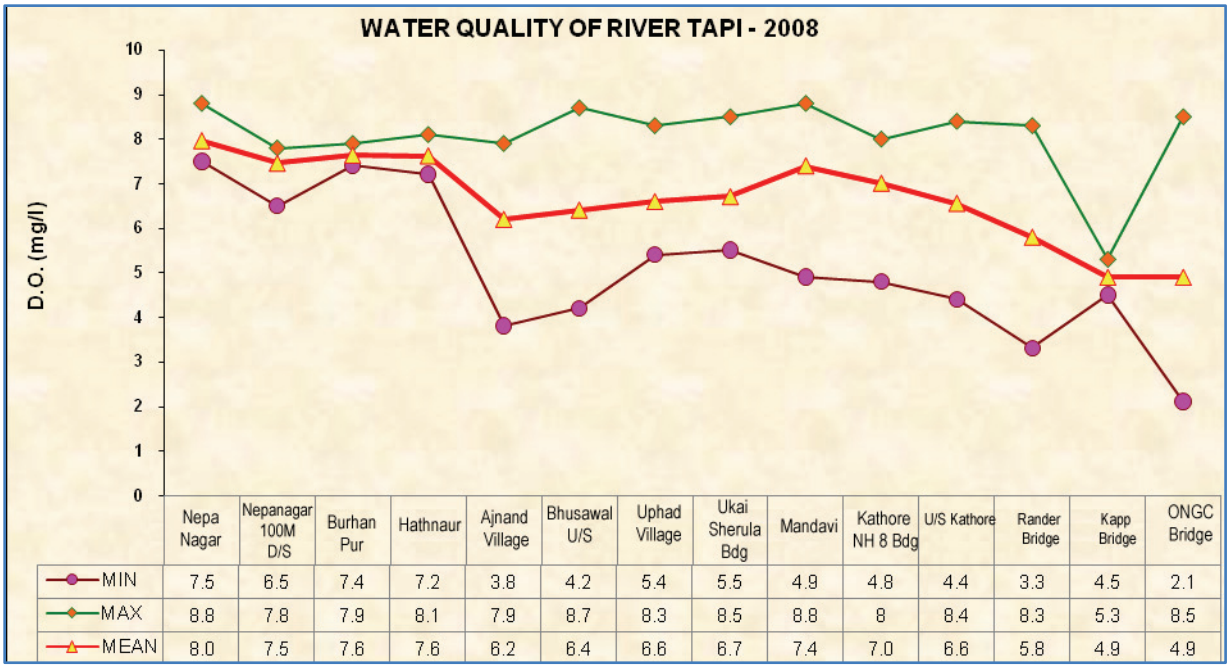
The water quality of tributary stream Girna with respect to pH, Conductivity, DO and Total Coliform is meeting the desired criteria. The BOD is observed in the range of 4.0-10.0 mg/l which indicates that the river is moderately polluted at Malegaon (Manmad) (8.5 mg/l) and Jalgaon (10 mg/l) with respect to BOD. River Rangavali D/s of Navapur is also meeting the desired criteria in respect of pH, Conductivity, DO, Total Coliform and Faecal Coliform whereas high value of BOD (8.4 mg/l) is observed in River Rangavali at Navapur D/s. The tributary stream Kim is moderately polluted as indicators of organic and bacterial pollution as BOD, Total coliform and Faecal coliform does not meet desired criteria.

The tributary streams Denwa and Purna are meeting the desired water quality criteria in all respects except BOD which is observed 4.0 mg/l and 10.2 mg/l respectively.The ranges of water quality observed in River Tapi and its tributary streams Girna, Rangavali, Kim, Denwa and Purna with respect to pH, Conductivity, DO, BOD, COD, Total Coliform and Faecal Coliform is given in Annexure-I Table 11.1. The water quality status of River Tapi with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is presented in figure 11.1.

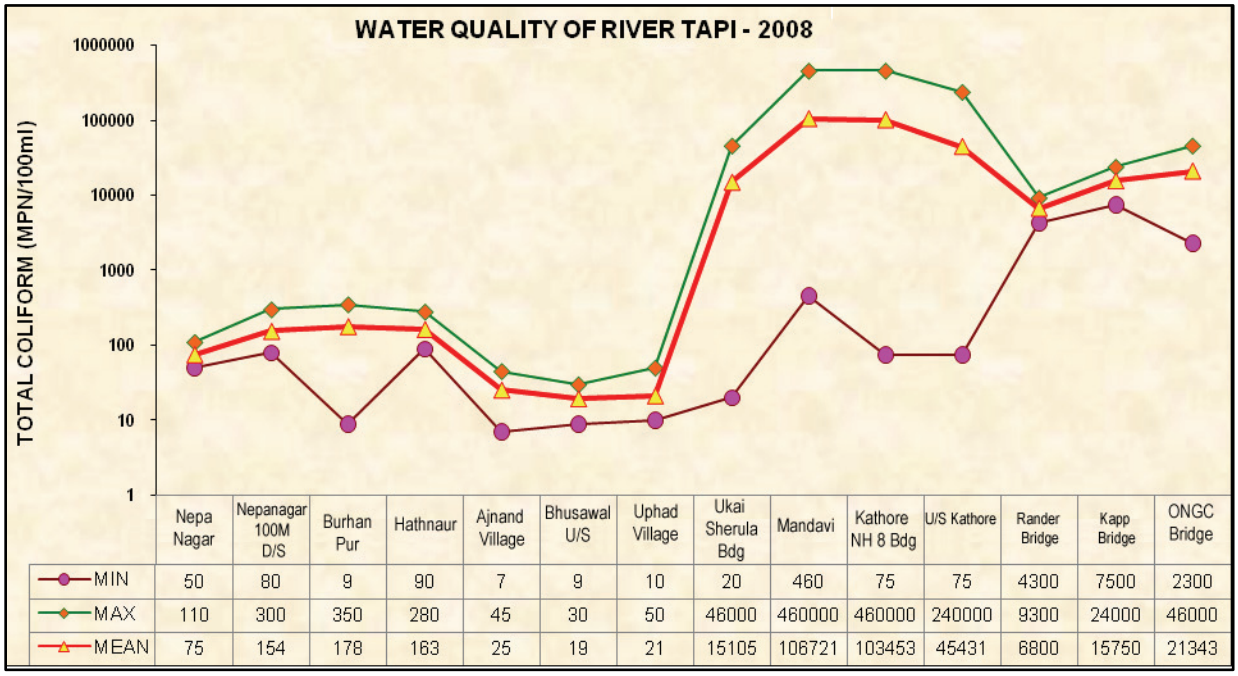
Figure 11.1: Water Quality of River Tapi



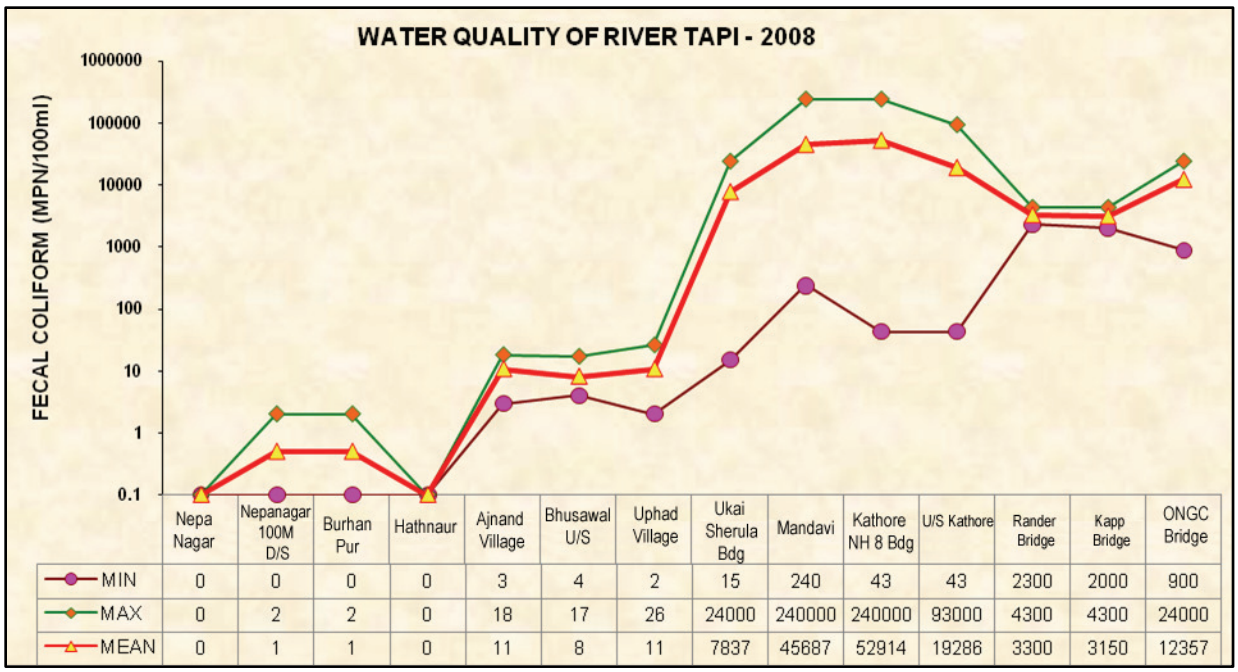
	Nepa Nagar	Nepanagar 100M D/S	Burhan Pur	Hathnaur	Ajnand Village	Bhusawal U/S	Uphad Village	Ukai Sherula Bdg	Mandavi	Kathore NH 8 Bdg	U/S Kathore	Rander Bridge	Kapp Bridge	ONGC Bridge
MIN	0.6	0.8	0.8	0.9	4	4.2	4.2	0.2	0.3	0.2	0.6	2.1	0.8	1.1
MAX	1.3	1.4	2.2	1.7	21	19	14	3.6	3.3	3	2.8	7.4	3.1	6
MEAN	1.0	1.1	1.4	1.3	8.3	6.9	6.6	1.5	1.7	1.6	1.7	4.8	2.0	3.9



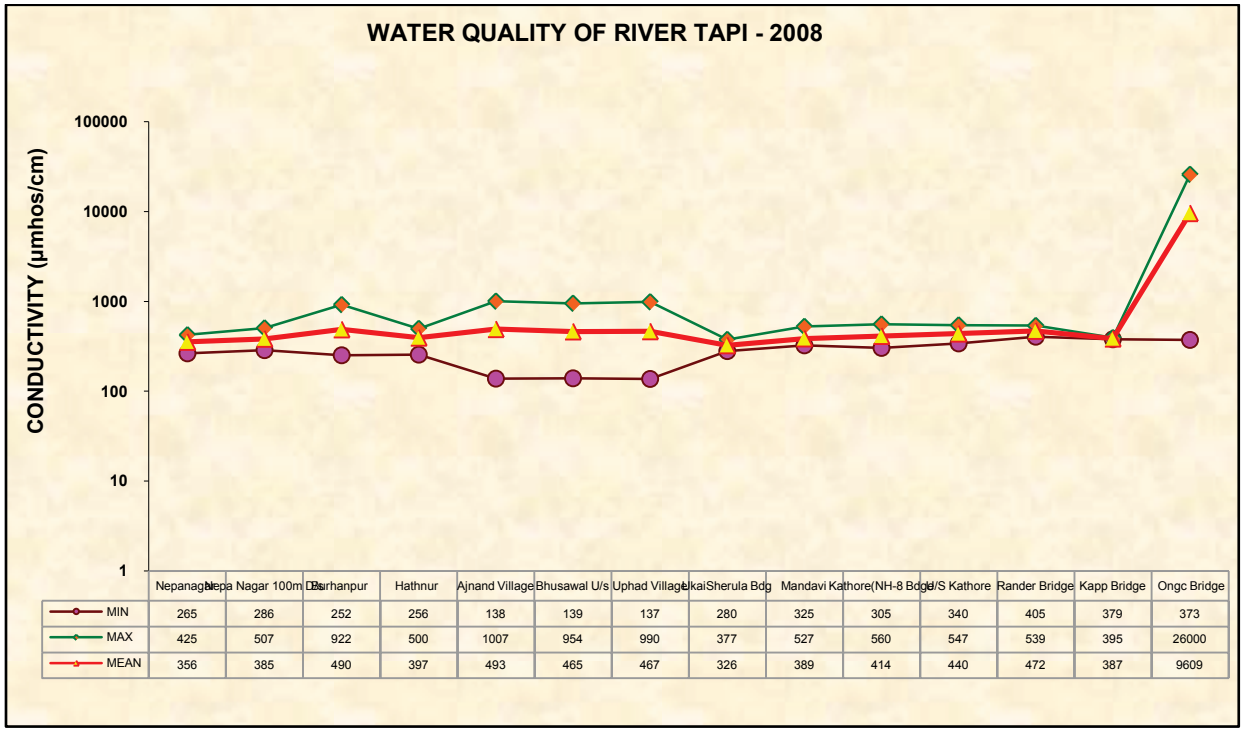
	Nepa Nagar	Nepanagar 100M D/S	Burhan Pur	Hathnaur	Ajnand Village	Bhusawal U/S	Uphad Village	Ukai Sherula Bdg	Mandavi	Kathore NH 8 Bdg	U/S Kathore	Rander Bridge	Kapp Bridge	ONGC Bridge
MIN	7.5	6.5	7.4	7.2	3.8	4.2	5.4	5.5	4.9	4.8	4.4	3.3	4.5	2.1
MAX	8.8	7.8	7.9	8.1	7.9	8.7	8.3	8.5	8.8	8	8.4	8.3	5.3	8.5
MEAN	8.0	7.5	7.6	7.6	6.2	6.4	6.6	6.7	7.4	7.0	6.6	5.8	4.9	4.9



	Nepa Nagar	Nepanagar 100M D/S	Burhan Pur	Hathnaur	Ajnand Village	Bhusawal U/S	Uphad Village	Ukai Sherula Bdg	Mandavi	Kathore NH 8 Bdg	U/S Kathore	Rander Bridge	Kapp Bridge	ONGC Bridge
MIN	50	80	9	90	7	9	10	20	460	75	75	4300	7500	2300
MAX	110	300	350	280	45	30	50	46000	460000	460000	240000	9300	24000	46000
MEAN	75	154	178	163	25	19	21	15105	106721	103453	45431	6800	15750	21343



	Nepa Nagar	Nepanagar 100M D/S	Burhan Pur	Hathnaur	Ajnand Village	Bhusawal U/S	Uphad Village	Ukai Sherula Bdg	Mandavi	Kathore NH 8 Bdg	U/S Kathore	Rander Bridge	Kapp Bridge	ONGC Bridge
MIN	0	0	0	0	3	4	2	15	240	43	43	2300	2000	900
MAX	0	2	2	0	18	17	26	24000	240000	240000	93000	4300	4300	24000
MEAN	0	1	1	0	11	8	11	7837	45687	52914	19286	3300	3150	12357

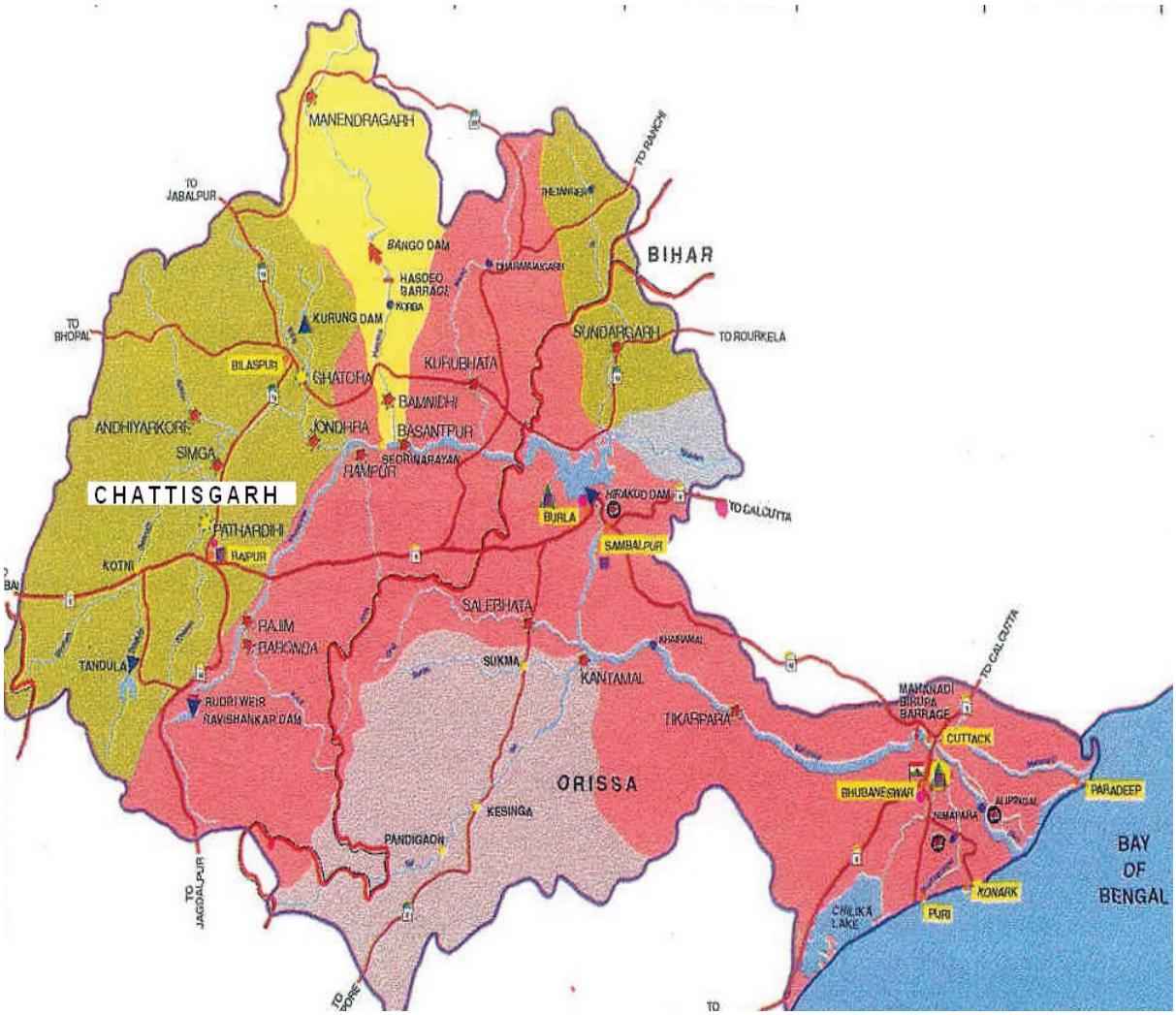


	Nepanagar	Nepa Nagar 100m D/s	Burhanpur	Hathnur	Ajnand Village	Bhusawal U/s	Uphad Village	Lkai Sherula Bdg	Mandavi Kathore(NH-8 Bdge)	d/S Kathore	Rander Bridge	Kapp Bridge	Ongc Bridge
MIN	265	286	252	256	138	139	137	280	325	305	340	405	379	373
MAX	425	507	922	500	1007	954	990	377	527	560	547	539	395	26000
MEAN	356	385	490	397	493	465	467	326	389	414	440	472	387	9609

CHAPTER XII

Water Quality of Rivers in Mahanadi Basin

12.1 Mahanadi River System



The Mahanadi basin extends over an area of 141 thousands sq km. lying in the north east of the Deccan plateau, the basin covers large areas in the States of Chattisgarh and Orissa, and only small areas in Bihar and Maharashtra. The upper basin is a saucer-shaped depression known as the Chhatisgarh. The Mahanadi rises in a pool, 6 km from Pharsiya village near Nagri town in Raipur district of Chattisgarh, and falls into the Bay of Bengal, near False point about 16 km below the confluence of the Chitarala and the Mahanadi.The total length of the river from the head to its outfall into the sea is 851 km of which 357 km are in

Chattisgarh and the balance of 494 km are in Orissa. The Seonath, the Jonk, the Hasdeo, the Mand, the Ib, the Ong and the Tel are the principal tributaries of the Mahanadi river.

The water quality study reveals that the water of Mahanadi is comparatively less polluted compared to the other similar rivers in the country. However, certain stretches like the D/s portion of river Ib at Brajrajnagar, D/s of Sambalpur and Cuttack have comparatively higher degree of pollution. The pollution of Ib river is easily attributable to the discharges from a large paper industry situated in Brajrajnagar. In the majority of the other locations the BOD and the total coliform are the two parameters that are mainly responsible for lowering the water quality. While at places like Tikarapara this could be due to run-off from the areas adjoining the riverbanks that are generally used by the village people for defection. At the urban centres, the high BOD and coliform levels are obviously due to the discharges into the river from domestic sources either directly or indirectly. None of the towns small or large, on the banks of Mahanadi have any regular sewerage system or sewage treatment plants and the domestic wastes find their way mostly through small nullah or storm water drains which join the D/s of the Ib river at Brajrajnagar causing serious depletion of oxygen level along the whole stretch which cause serious threat to the aquatic lives.

Korba has been identified as a critically polluted area in this river basin. The industrial as well as domestic wastewaters are being discharged into the River Hasdeo directly as well as through river Ahiran and Dengur Nala. The major source of pollution in the river is due to Thermal Power Plants, Bharat Aluminium Company, Captive power plant of BALCO, IBP (explosive unit) and coal mining operations. The action plan formulated suggests that the capacity of ash ponds of thermal ponds of BALCO have to be augmented.

The river has often been referred to as the 'Sorrow of Orissa'. The inhabited inner basin Chattisgarh plain suffered frequent droughts whereas the fertile deltaic area has been wrecked by repeated floods.

The basin area of the Mahanadi has a large number of industrial complexes in the Orissa portion of the basin the major industries are paper. textiles and thermal power plants at Choudwar, fertiliser and breweries at Paradeep, Sugar industries of Nayagarh, Badamba, Cement industry at Bargarh, paper industry of Brajrajnagar, coal mining areas of Rampur and lb valley, and an aluminium smelter at Hirakud.

Most of these industries are located on the banks of the river Mahanadi or its tributaries and distributaries, which are used to carry the industrial effluents and wastewater from these industries. From the point of view of significant environmental impacts, the important medium scale industries are the chemical, textile, paper, cement, and leather tanning which consume large quantities of water.

Iron and steel industry at Bhilai, cement industries at Durg and Raipur, textile industry of Rajnandagaon, aluminium and thermal power plants at Korba are the major polluting industries in the State of M.P that falls in the river basin. All these major units are located on the riverbanks of Seonath, Kharoon and Hasdeo. The medium scale industries include chemical and distilleries of Durg, cement industries of Raipur, Iron and steel of Urla, paper industries of Bilaspur and many other agro based industries.

All the industries are discharging their wastewater either directly or indirectly to river Mahanadi as well as its tributaries. The vast mineral and human resources of the basin besides power generation infrastructure has resulted in a growth of a large variety of industries. The industries using the river bodies as the ultimate sink need to establish effluent treatment plants so that the designated best use of the river is sustained.

The basin area of Mahanadi is covering the States of Chhattisgarh, Madhya Pradesh, Orissa and Jharkhand. The important urban centres in these States are Rajnandgaon, Korba, Bilaspur, Durg, Raipur, Dhamtari, Raigarh, Rajharajharandalli in Madhya Pradesh & Chhattisgarh. And Cuttack, Puri, Sambalpur, Jatani, Balangir, Bargarh, Bhawanipatna, Brajarajnagar and Jharsuguda in Orissa.

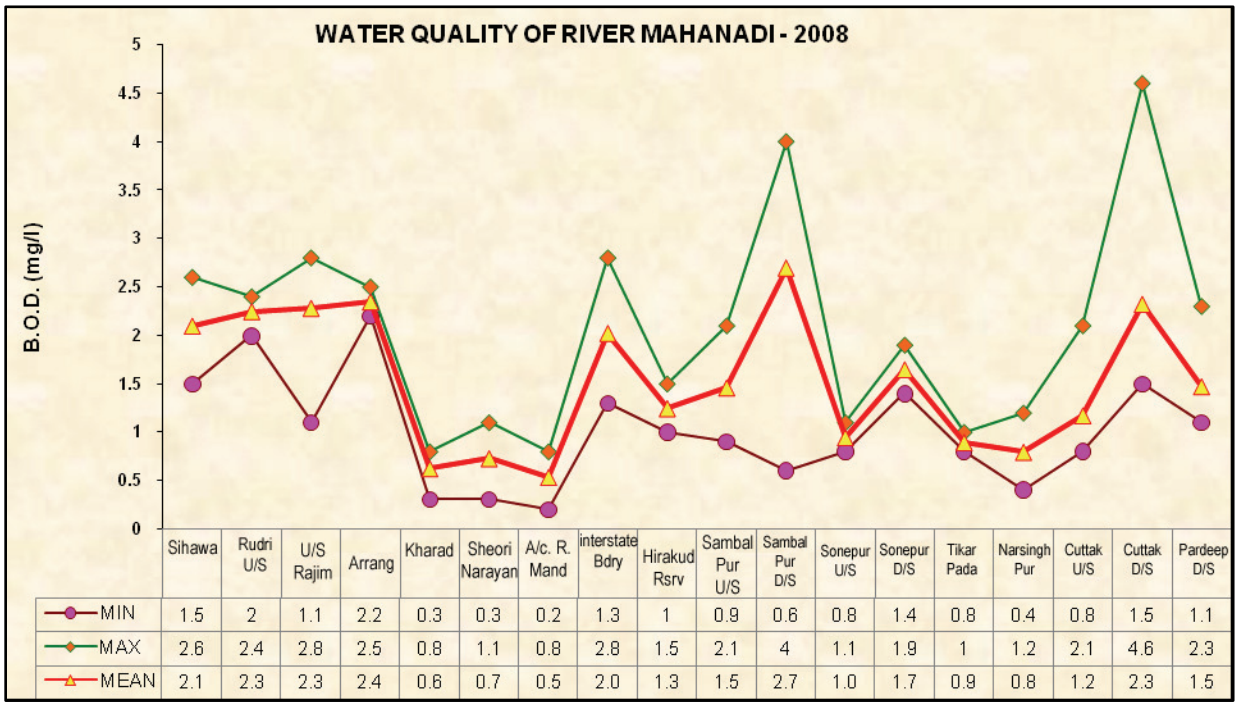
12.2 Water Quality Monitoring in Mahanadi Basin

The State Pollution Control Boards of Chhatissgarh and Orissa at 51 locations are doing the water quality monitoring of the River Mahanadi and its several tributaries in the basin. The ranges of water quality observed in River Mahanadi and Tributary streams Seonath, Kharoon, Hasdeo, Ib, Kuakhai, Kathajodi, Birupa, Arpa, Bheden, Daya, Tel, Serua, Taladanda Canal and Kelo with respect to pH, Conductivity, DO, BOD, COD, Total Coliform and Faecal Coliform are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

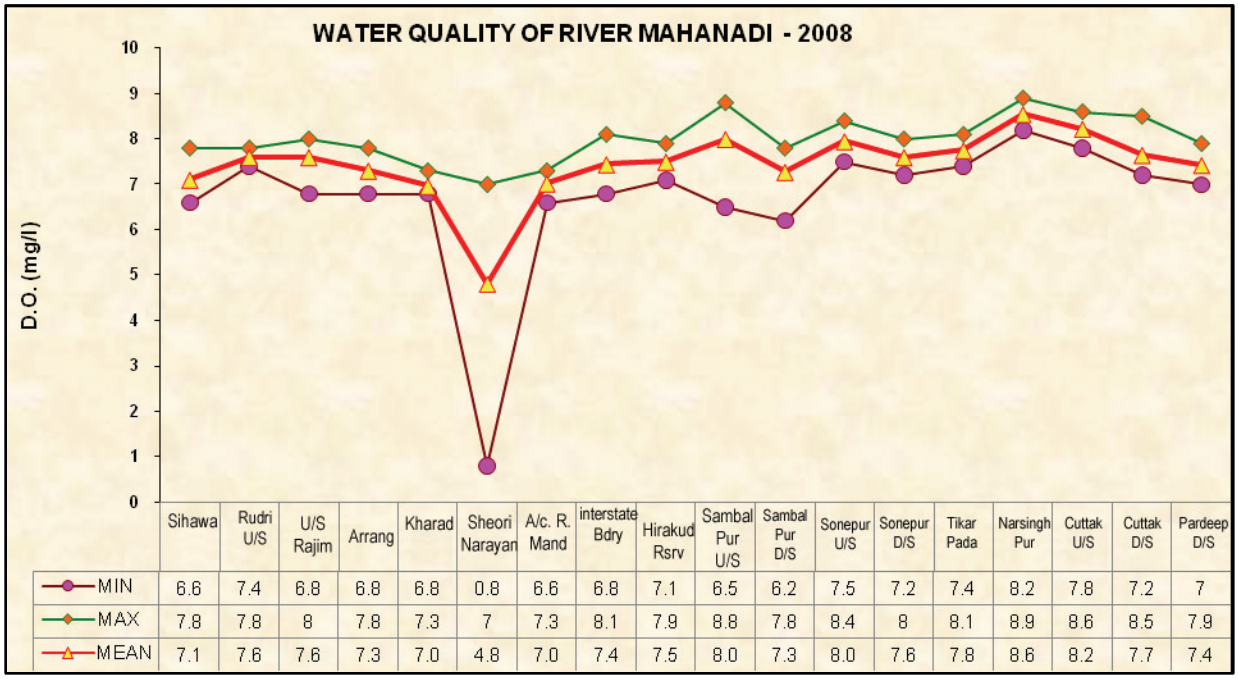
12.2.1 Water Quality of River Mahanadi

The water quality of mainstream of Mahanadi with respect to pH is observed in the range of 6.7–8.8. The value of conductivity ranges from 109 µmhos/cm to 29400 µmhos/cm. The DO value varies from 0.8 -8.9 mg/l. The BOD ranges from 0.2-4.6 mg/l and the higher values are observed at Cuttack D/s (4.6 mg/l) and Sambalpur D/s (4.0 mg/l) in Orissa. The higher value of Faecal Coliform count (54,000 MPN/100 ml) is observed at Sambalpur D/s and (17,000 MPN/100 ml) Cuttack D/s whereas the maximum Total Coliform count is observed at Sambalpur D/s(1,60,000 MPN/100 ml) & Cuttack D/s (28000 MPN/100ml). The concentration of Nitrate (NO_3^-) ranges from Nil-4.4 mg/l while the highest concentration of nitrate is recorded at Arrang, Raipur in Chattisgarh. The water quality status observed in River Mahanadi with respect to pH, Conductivity, DO, BOD, COD, Faecal Coliform count and Total Coliform count is given in Annexure-I Table 12.1.The water quality status of River Mahanadi with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in figure 12.1.

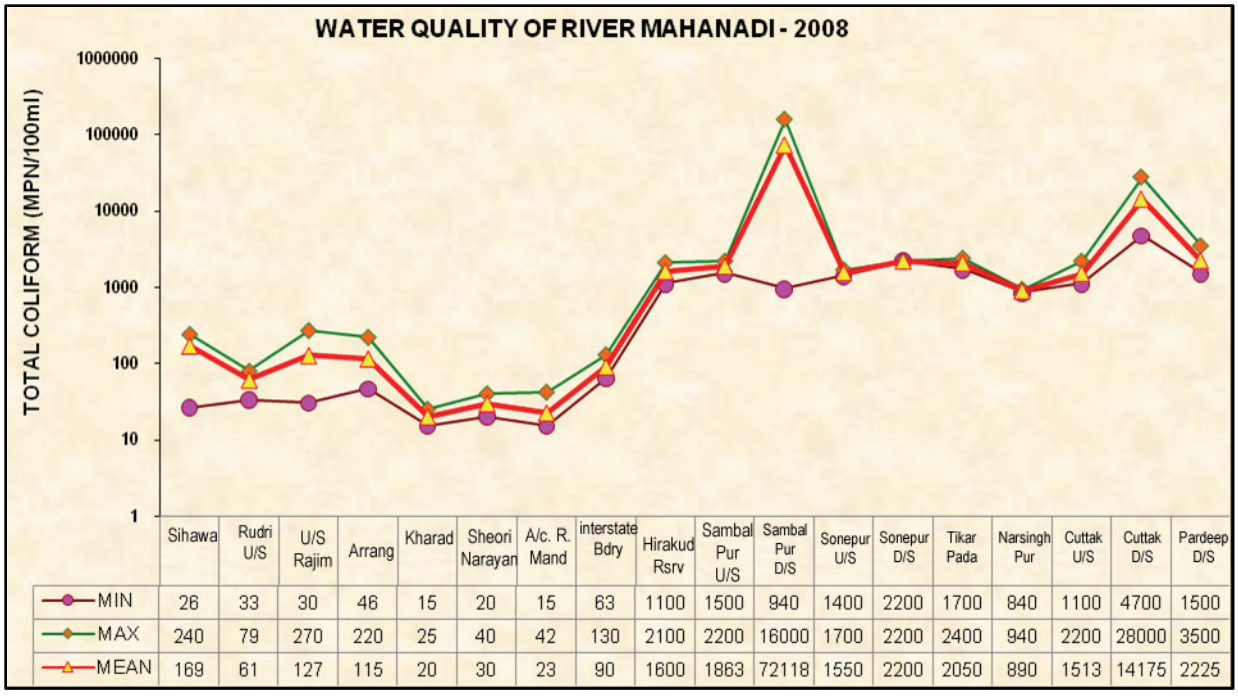
Figure 12.1: Water Quality of River Mahanadi



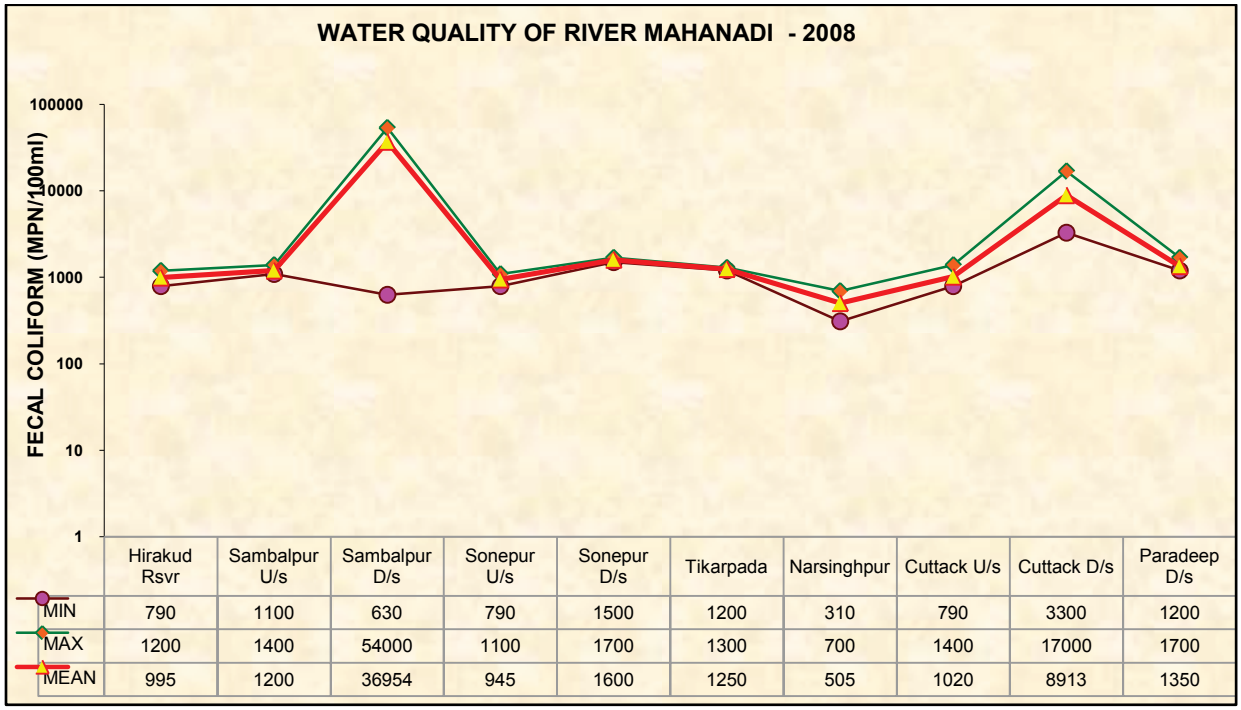
	Sihawa	Rudri U/S	U/S Rajim	Arrang	Kharad	Sheori Narayan	A/c. R. Mand	interstate Bdry	Hirakud Rsrv	Sambal Pur U/S	Sambal Pur D/S	Sonepur U/S	Sonepur D/S	Tikar Pada	Narsingh Pur	Cuttak U/S	Cuttak D/S	Pardeep D/S
MIN	1.5	2	1.1	2.2	0.3	0.3	0.2	1.3	1	0.9	0.6	0.8	1.4	0.8	0.4	0.8	1.5	1.1
MAX	2.6	2.4	2.8	2.5	0.8	1.1	0.8	2.8	1.5	2.1	4	1.1	1.9	1	1.2	2.1	4.6	2.3
MEAN	2.1	2.3	2.3	2.4	0.6	0.7	0.5	2.0	1.3	1.5	2.7	1.0	1.7	0.9	0.8	1.2	2.3	1.5



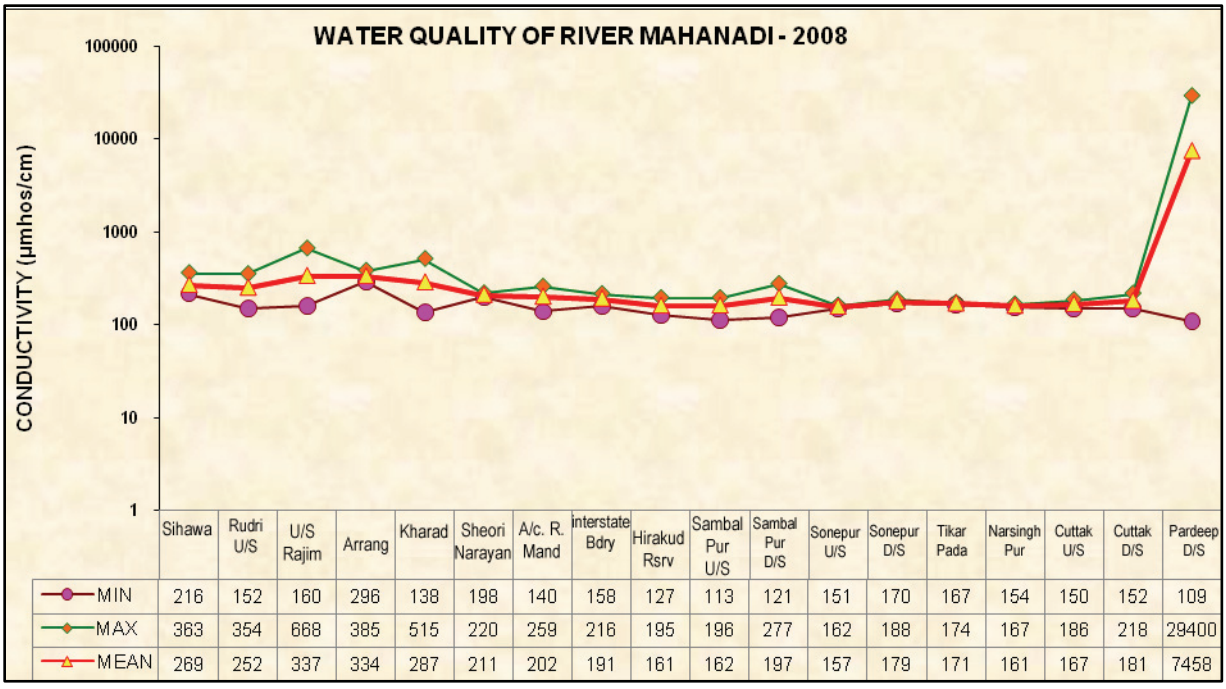
	Sihawa	Rudri U/S	U/S Rajim	Arrang	Kharad	Sheori Narayan	A/c. R. Mand	interstate Bdry	Hirakud Rsrv	Sambal Pur U/S	Sambal Pur D/S	Sonepur U/S	Sonepur D/S	Tikar Pada	Narsingh Pur	Cuttak U/S	Cuttak D/S	Pardeep D/S
MIN	6.6	7.4	6.8	6.8	6.8	0.8	6.6	6.8	7.1	6.5	6.2	7.5	7.2	7.4	8.2	7.8	7.2	7
MAX	7.8	7.8	8	7.8	7.3	7	7.3	8.1	7.9	8.8	7.8	8.4	8	8.1	8.9	8.6	8.5	7.9
MEAN	7.1	7.6	7.6	7.3	7.0	4.8	7.0	7.4	7.5	8.0	7.3	8.0	7.6	7.8	8.6	8.2	7.7	7.4



	Sihawa	Rudri U/S	U/S Rajim	Arrang	Kharad	Sheori Narayan	A/c. R. Mand	interstate Bdry	Hirakud Rsrv	Sambal Pur U/S	Sambal Pur D/S	Sonepur U/S	Sonepur D/S	Tikar Pada	Narsingh Pur	Cuttak U/S	Cuttak D/S	Pardeep D/S
MIN	26	33	30	46	15	20	15	63	1100	1500	940	1400	2200	1700	840	1100	4700	1500
MAX	240	79	270	220	25	40	42	130	2100	2200	16000	1700	2200	2400	940	2200	28000	3500
MEAN	169	61	127	115	20	30	23	90	1600	1863	72118	1550	2200	2050	890	1513	14175	2225



	Hirakud Rsvr	Sambalpur U/s	Sambalpur D/s	Sonepur U/s	Sonepur D/s	Tikarpada	Narsinghpur	Cuttack U/s	Cuttack D/s	Paradeep D/s
MIN	790	1100	630	790	1500	1200	310	790	3300	1200
MAX	1200	1400	54000	1100	1700	1300	700	1400	17000	1700
MEAN	995	1200	36954	945	1600	1250	505	1020	8913	1350



	Sihawa	Rudri U/S	U/S Rajim	Arrang	Kharad	Sheori Narayan	A/c. R. Mand	Interstate Bdry	Hirakud Rsrv	Sambal Pur U/S	Sambal Pur D/S	Sonepur U/S	Sonepur D/S	Tikar Pada	Narsingh Pur	Cuttak U/S	Cuttak D/S	Pardeep D/S
MIN	216	152	160	296	138	198	140	158	127	113	121	151	170	167	154	150	152	109
MAX	363	354	668	385	515	220	259	216	195	196	277	162	188	174	167	186	218	29400
MEAN	269	252	337	334	287	211	202	191	161	162	197	157	179	171	161	167	181	7458

12.2.2 Water Quality of tributaries - Seonath, Kharoon, Hasdeo, Arpa, Kelo, Ib, Kuakhai, Kathajodi and Birupa

The Water Quality of tributary stream Seonath with respect to DO varies from 7.2 - 8.5 mg/l and Conductivity ranges from 284-675 µmhos/cm. The Total Coliform count is observed in the range of 49-1100 MPN/100ml. The BOD is observed in the range of 0.9-3.3 mg/l. In River Kharoon, a tributary of Seonath BOD is observed in the range of 0.9-3.4 mg/l with highest BOD at Bundri, Raipur in Chattisgarh and Total Coliform count in the range of 33-460 MPN/100 ml.

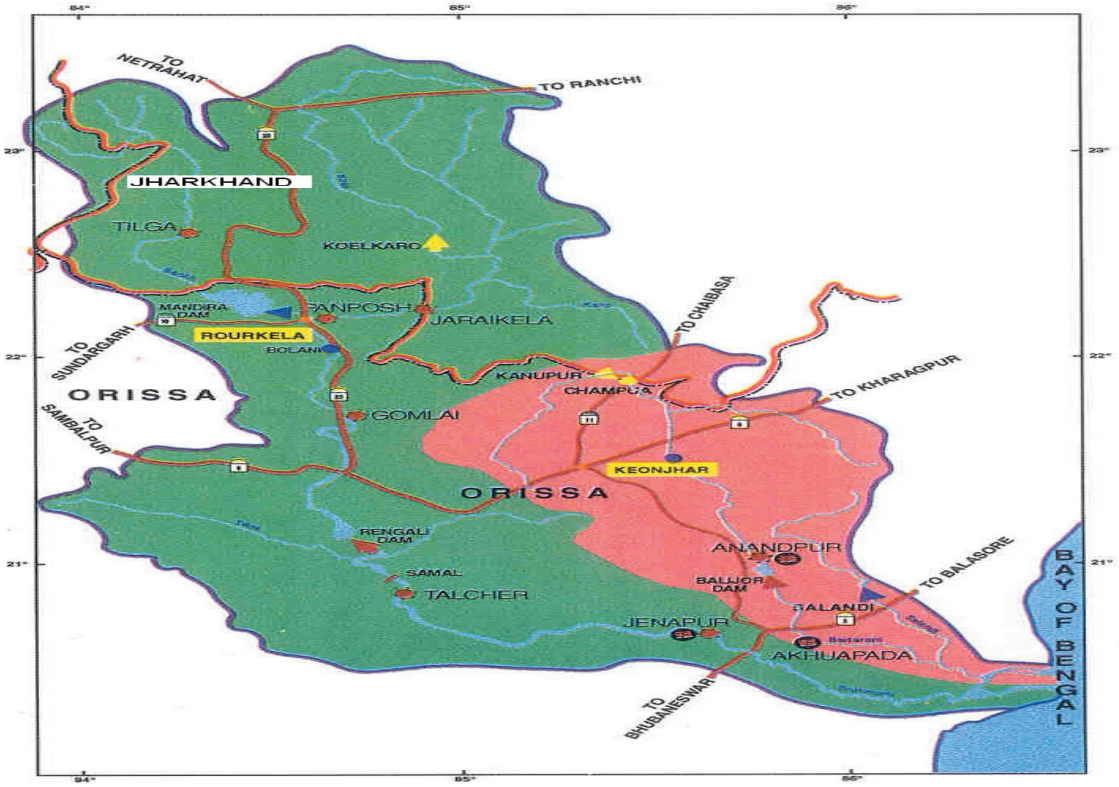
The tributary stream Hasdeo is flowing along Korba and Champa townships. Total Coliform number does not exceed 280 MPN/100 ml indicates that due to enough dilution in river, impact of wastewater discharged from Korba does not affect its quality. Another tributary stream Ib is meeting the desired water quality criteria in respect of all parameters and maintains adequate level of DO in the range of 6.8-8.8 mg/l where as BOD is observed in the range of 0.4-2.3 mg/l. The Total Coliform and Faecal Coliform count are varying from 1100-3500 MPN/100ml and 700-2300 MPN/100ml respectively.

The five tributaries of Mahanadi i.e Kuakhai, Kathjodi, Birupa, Arpa and Kelo are meeting the water quality criteria with respect to pH, conductivity and Dissolved Oxygen (D.O) except having high conductivity values in Birupa at Choudwar (29400 µmhos/cm) and Kuakhai at Bhubaneshwar D/s (3120 µmhos/cm) in Orissa. The BOD is observed higher than the desired criteria in Kathajodi at Cuttak D/s (6.4 mg/l) and Kuakhai at Bhubaneshwar D/s (4.6 mg/l) in Orissa. The Total Coliform and Faecal Coliform are varying from 46-1600000 MPN/100ml and 790- 160000 MPN/100ml respectively in these tributaries. The highest value of Total Coliform and Faecal Coliform is observed in Kathajodi at Cuttak D/s in Orissa. The water quality status observed in rivers Seonath, Kharoon, Hasdeo, IB, Kuakhai, Kathajodi, Arpa, Kelo and Birupa with respect to pH, Conductivity, DO, BOD, COD, Faecal coliform count and Total Coliform count is given in Annexure-I Table 12.2.

CHAPTER XIII

Water Quality of Rivers in Brahmani & Baitarni Basin

13.1 Brahmani and Baitarni River System



The Brahmani-Baitarani basin extends over an area of 51,822 sq km. Lying in the northeast of the Deccan Plateau, the basin covers large areas in the States of Orissa and Jharkhand and a small area in Chattisgarh. The Chhotanagpur Plateau on the west and south bound the basin on the north by the ridge separating it from the Mahanadi basin, and on the east by the Bay of Bengal. The Brahmani sub-basin covers an area of 39,033 sq km while the Baitarani sub-basin covers an area of 12,789 sq km. The Brahmani known as the South Koel, in the upper reaches, rises near Nagri village in the Ranchi district of Jharkhand State. The total length of the river from the head to its outfall into the Bay of Bengal is 799 km of which 258 km is in Jharkhand and 541 km is in Orissa. The Baitarni river rises in the hill ranges of Keonjhar district of Orissa at an elevation of about 900 meters and has a length of about 355 km. Both the rivers outfall in the Bay of Bengal, forming a common delta. The important tributaries of Brahmani are, the Karo, the Sankh and the Tirka and those of Baitarni are the Salandi and the Matai.

The industrial complex of Angul Talcher has been identified as a critically polluted area in the Brahmani basin. The wasteweaters generated form the industries Viz, NALCO, TTPS etc. and mining operations are primarily responsible for deterioration of water quality of Nandira River which is a tributary stream of Brahmani river. Detailed survey of this stretch has been carried out and the action plans have been formulated to improve the water quality of this stretch.

The basin area of Brahmani and Baitarni is covering the States of Jharkhand, and Orissa.The important urban centres in these States are Rourkela in Orissa; and Gumia in Jharkhand

13.2 Water Quality Monitoring in Brahmani and Baitarni Basin

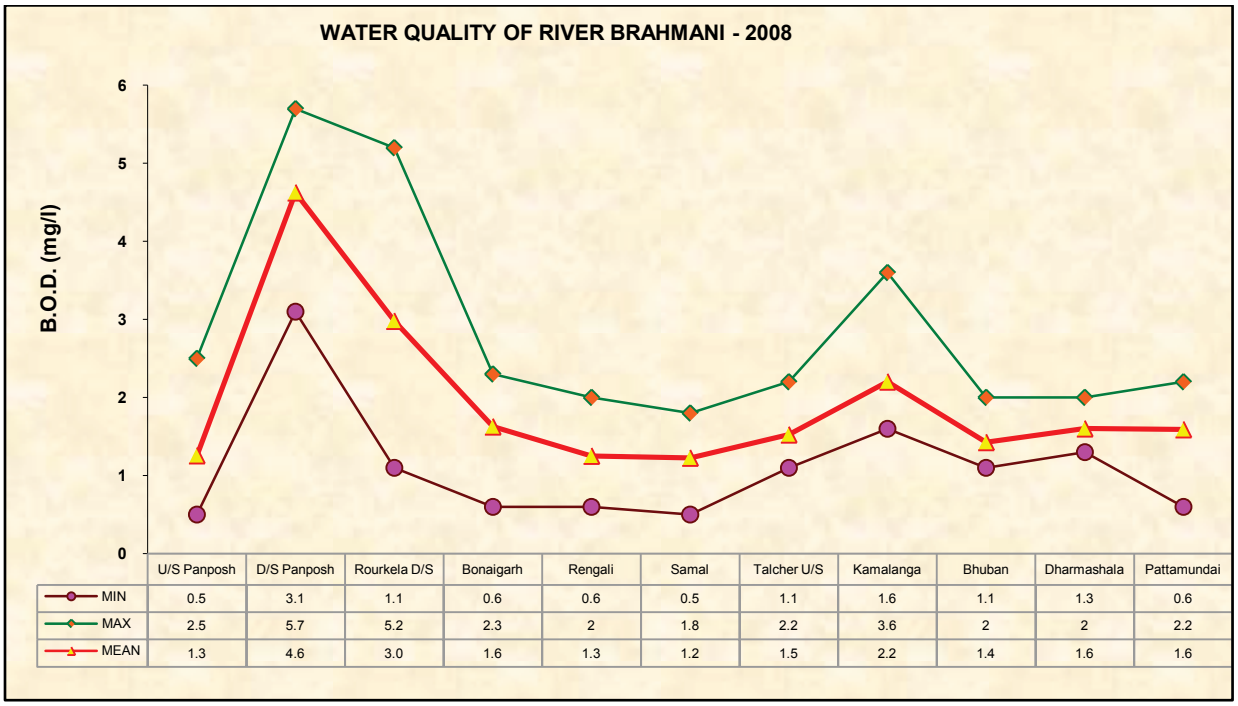
The water quality monitoring of the River Brahmani and Baitarni & its tributaries is being done by the State Pollution Control Boards of Jharkhand and Orissa at 31 locations. There are sixteen (16) monitoring locations on the main stream of River Brahmani, five on Baitarni, one each on tributaries Karo, Kusei & Sankh, two on Kharasrota and five on Koel. The ranges of water quality observed in River Brahmani and its tributaries with respect to pH, Conductivity, DO, BOD, COD, Total Coliform and Faecal Coliform are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

13.3 Water Quality of River Brahmani and tributary streams Koel, Karo, Sankh and Kharasrota

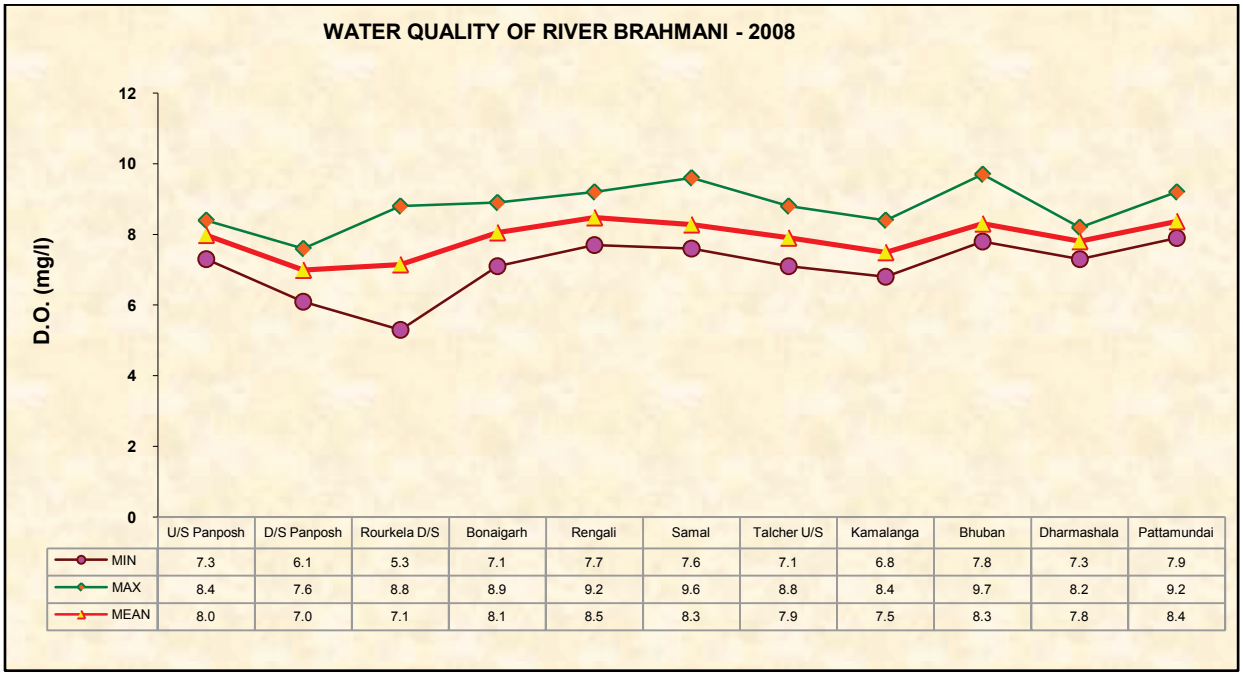
The water quality of mainstream of Brahmani is meeting the desired criteria with respect to pH, DO and conductivity. The BOD varies from 0.5 to 5.7 mg/l and higher values of BOD are observed at Panposh D/s (5.7 mg/l), Rourkela D/s (5.2 mg/l) and Kamalanga (3.6 mg/l) in Orissa. The Faecal Coliform (FC) count ranges from 460 - 14000 MPN/100ml whereas the Total Coliform (TC) count ranges from 940- 21,000 MPN/100ml.The higher values of TC & FC is observed at D/s Panposh, D/s Rourkela and Kamalanga in Orissa.

The water quality of tributary streams Koel, Karo, Sankh and Kharasrota is meeting the desired criteria in respect of all parameters except BOD which is exceeding the criteria limit at Sankh- Bolba (6.2 mg/l), Koel at Basia Dam U/s (5.9 mg/l) and Karo at Lohojimi U/s (5 mg/l) in Jharkhand.The Faecal Coliform (FC) count ranges from 110-280 MPN/100ml whereas the Total Coliform (TC) count ranges from 750- 1500 MPN/100ml. The water quality of mainstream of Brahmani & its tributaries is given in Annexure-I Table 13.1. The water quality status of River Brahmani with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in figure 13.1.

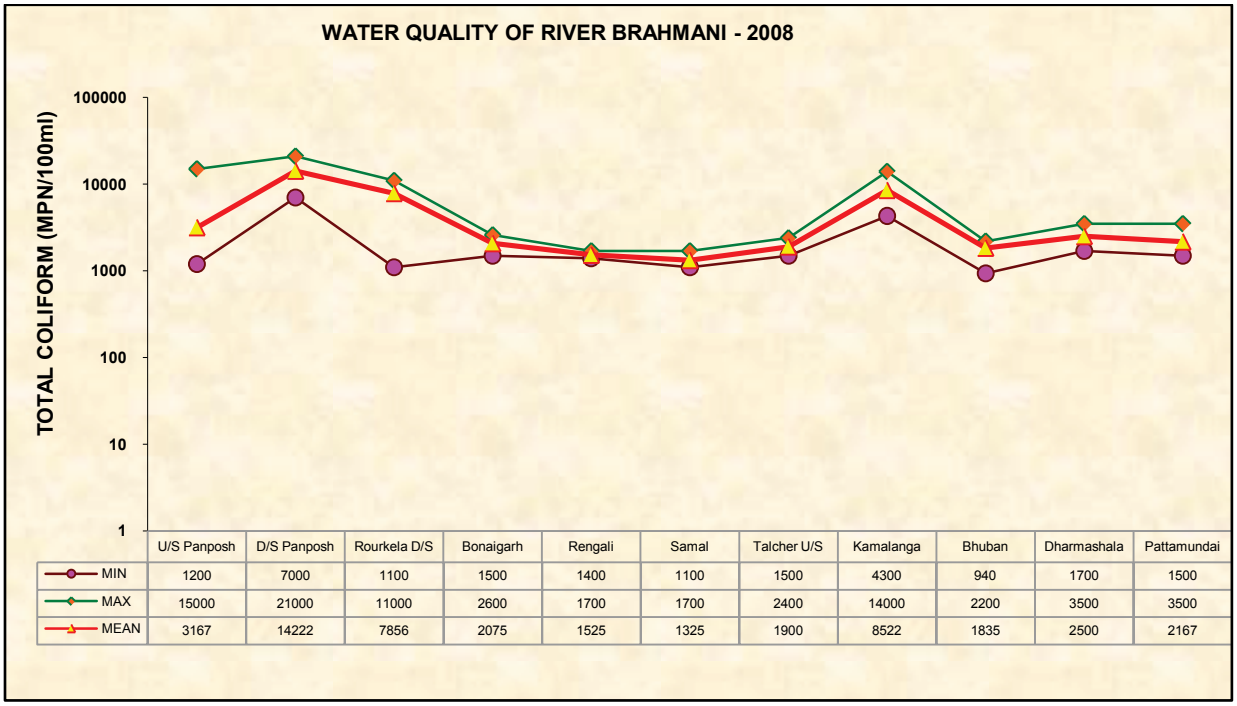
Figure 13.1: Water Quality of River Brahmani



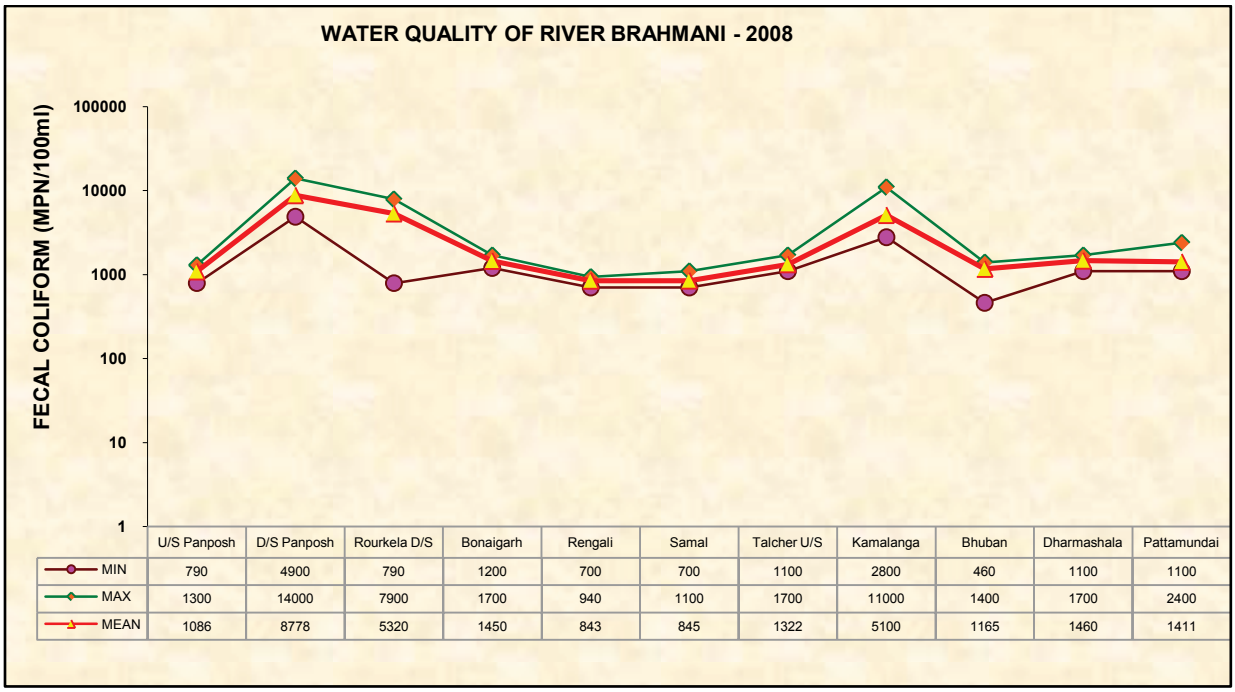
	U/S Panposh	D/S Panposh	Rourkela D/S	Bonaigarh	Rengali	Samal	Talcher U/S	Kamalanga	Bhuban	Dharmashala	Pattamundai
MIN	0.5	3.1	1.1	0.6	0.6	0.5	1.1	1.6	1.1	1.3	0.6
MAX	2.5	5.7	5.2	2.3	2	1.8	2.2	3.6	2	2	2.2
MEAN	1.3	4.6	3.0	1.6	1.3	1.2	1.5	2.2	1.4	1.6	1.6



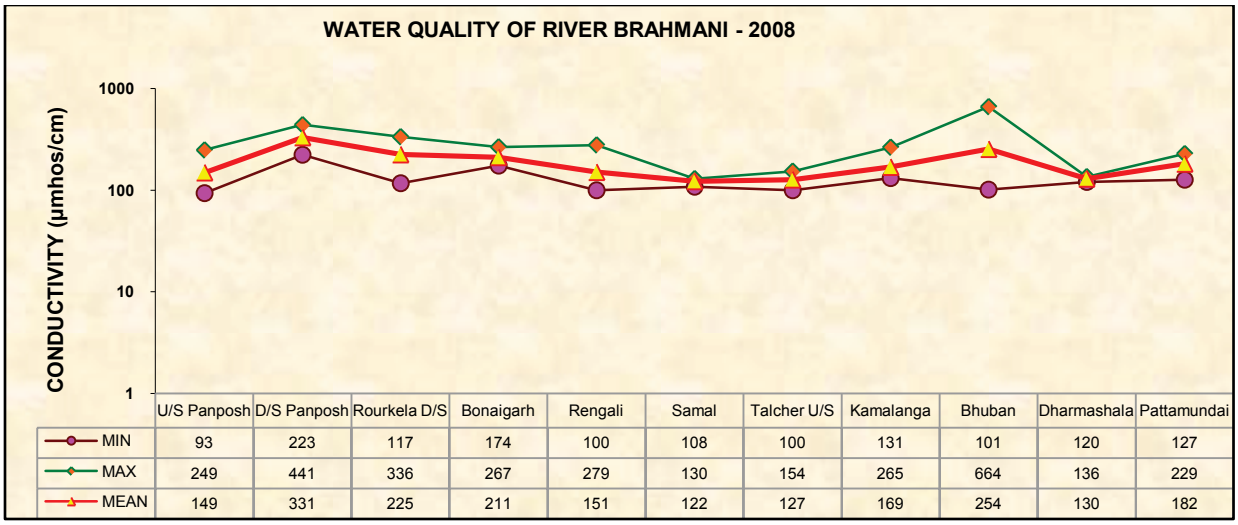
	U/S Panposh	D/S Panposh	Rourkela D/S	Bonaigarh	Rengali	Samal	Talcher U/S	Kamalanga	Bhuban	Dharmashala	Pattamundai
MIN	7.3	6.1	5.3	7.1	7.7	7.6	7.1	6.8	7.8	7.3	7.9
MAX	8.4	7.6	8.8	8.9	9.2	9.6	8.8	8.4	9.7	8.2	9.2
MEAN	8.0	7.0	7.1	8.1	8.5	8.3	7.9	7.5	8.3	7.8	8.4



	U/S Panposh	D/S Panposh	Rourkela D/S	Bonaigarh	Rengali	Samal	Talcher U/S	Kamalanga	Bhuban	Dharmashala	Pattamundai
MIN	1200	7000	1100	1500	1400	1100	1500	4300	940	1700	1500
MAX	15000	21000	11000	2600	1700	1700	2400	14000	2200	3500	3500
MEAN	3167	14222	7856	2075	1525	1325	1900	8522	1835	2500	2167



	U/S Panposh	D/S Panposh	Rourkela D/S	Bonaigarh	Rengali	Samal	Talcher U/S	Kamalanga	Bhuban	Dharmashala	Pattamundai
MIN	790	4900	790	1200	700	700	1100	2800	460	1100	1100
MAX	1300	14000	7900	1700	940	1100	1700	11000	1400	1700	2400
MEAN	1086	8778	5320	1450	843	845	1322	5100	1165	1460	1411

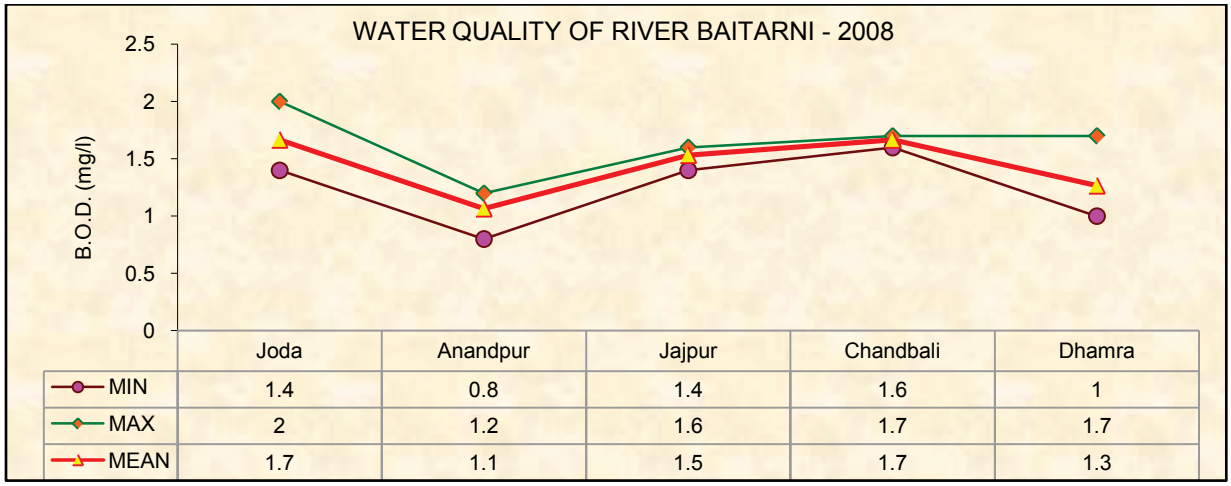


	U/S Panposh	D/S Panposh	Rourkela D/S	Bonaigarh	Rengali	Samal	Talcher U/S	Kamalanga	Bhuban	Dharmashala	Pattamundai
MIN	93	223	117	174	100	108	100	131	101	120	127
MAX	249	441	336	267	279	130	154	265	664	136	229
MEAN	149	331	225	211	151	122	127	169	254	130	182

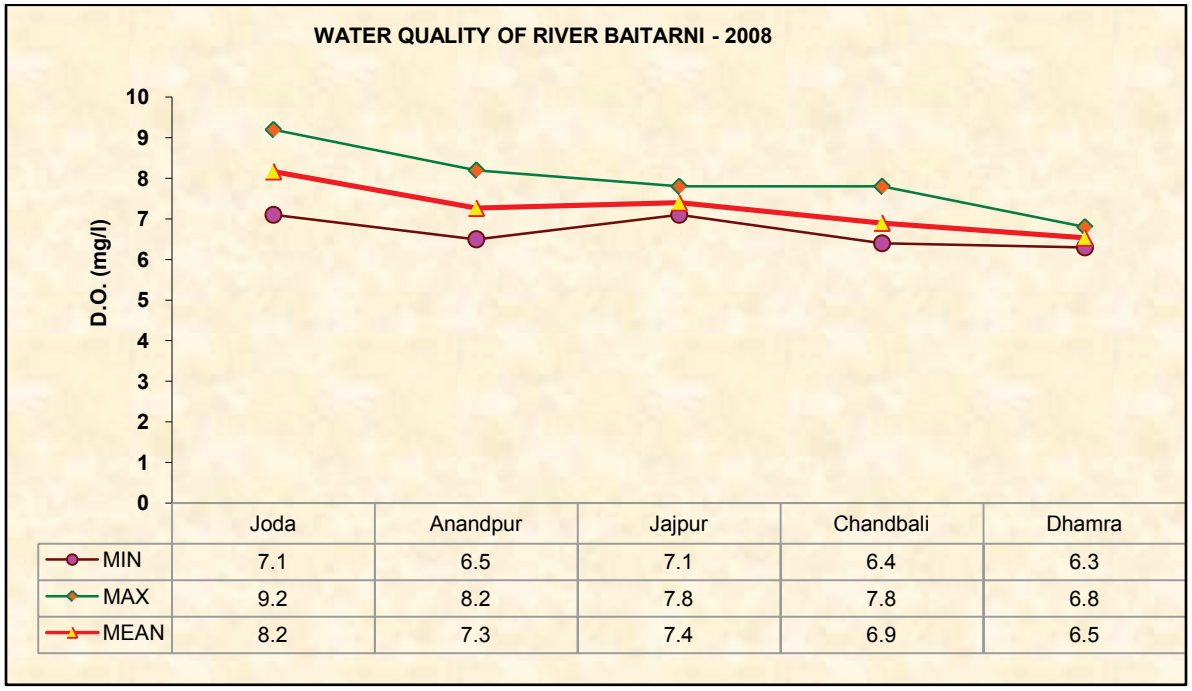
13.4 Water Quality of River Baitarni

The water quality of River Baitarni is observed at 5 locations and meeting the water quality criteria with respect to pH, DO, Conductivity, BOD, TC and FC however the higher values of conductivity are observed at Dhamra (48,400 µmhos/cm) and Chandbali (12320 µmhos/cm) due to estuarine region of the river. BOD values are observed in the range of 0.8-2.0 mg/l. The Faecal Coliform (FC) count ranges from 700 to 3500 MPN/100ml whereas the Total Coliform (TC) count ranges from 940 to 5400 MPN/100ml. The highest value of TC & FC is observed at Jajpur. Nitrate (NO_3^-) values ranges from 0.1-3.5 mg/l. The water quality of River Baitarni is given in Annexure-I Table 13.2. The water quality status of River Baitarni with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in figure 13.2.

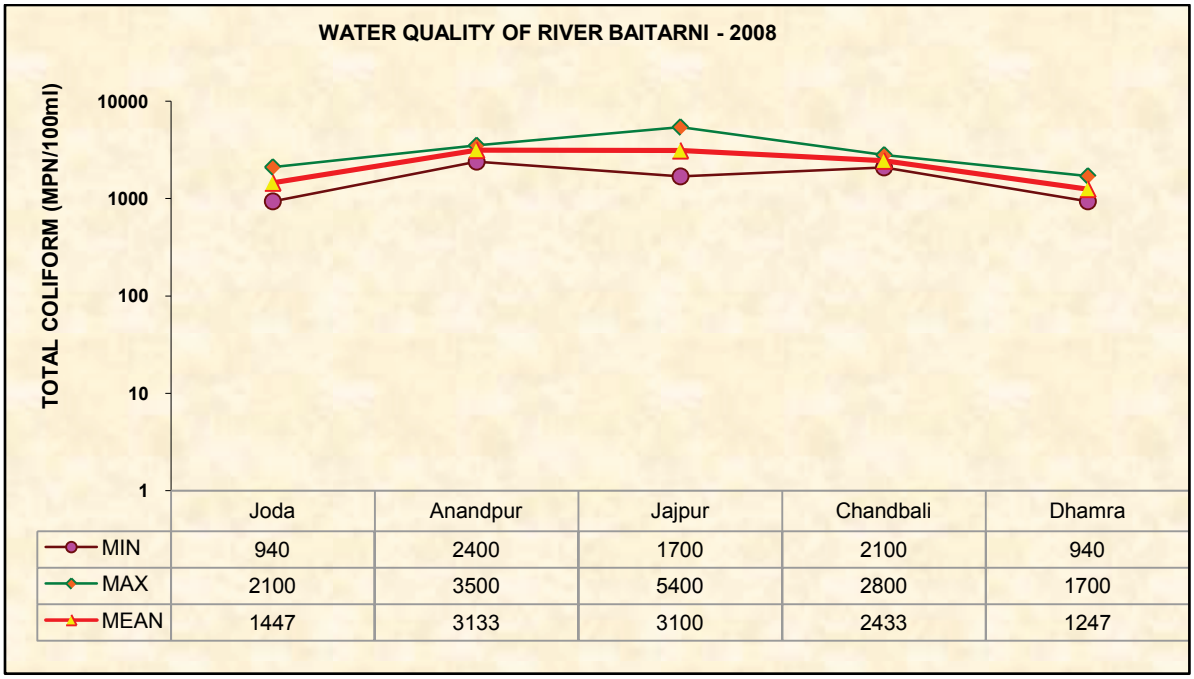
Figure 13.2: Water Quality of River Baitarni



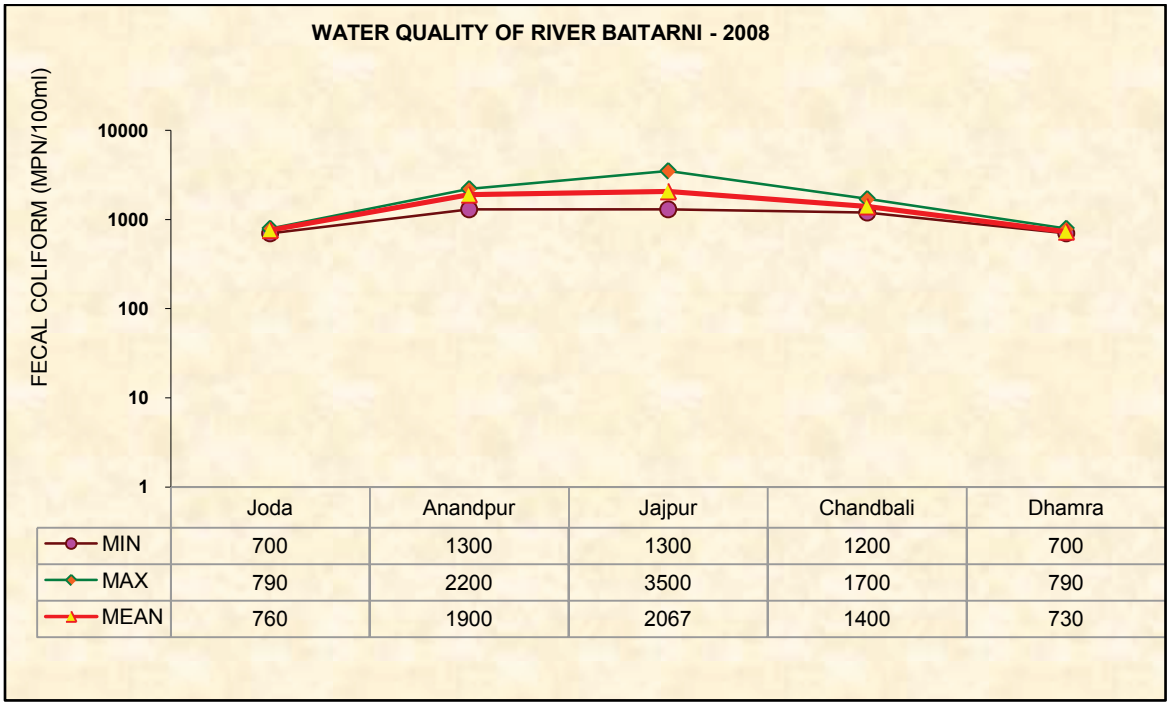
	Joda	Anandpur	Jajpur	Chandbali	Dhamra
MIN	1.4	0.8	1.4	1.6	1
MAX	2	1.2	1.6	1.7	1.7
MEAN	1.7	1.1	1.5	1.7	1.3



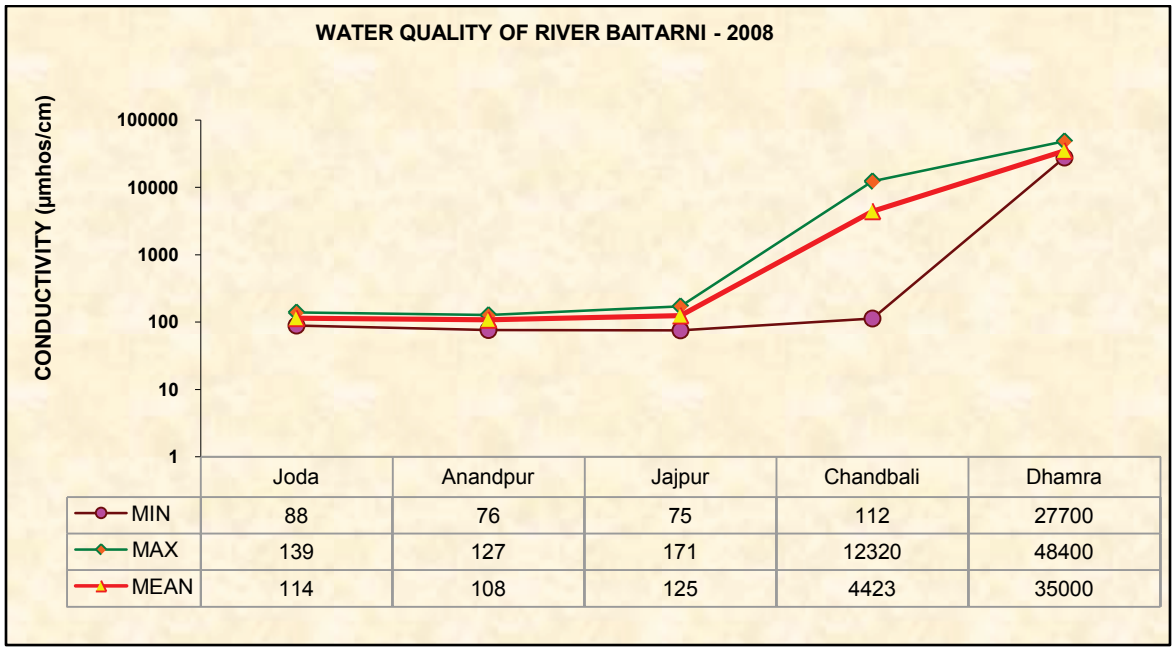
	Joda	Anandpur	Jajpur	Chandbali	Dhamra
MIN	7.1	6.5	7.1	6.4	6.3
MAX	9.2	8.2	7.8	7.8	6.8
MEAN	8.2	7.3	7.4	6.9	6.5



	Joda	Anandpur	Jajpur	Chandbali	Dhamra
MIN	940	2400	1700	2100	940
MAX	2100	3500	5400	2800	1700
MEAN	1447	3133	3100	2433	1247



	Joda	Anandpur	Jajpur	Chandbali	Dhamra
MIN	700	1300	1300	1200	700
MAX	790	2200	3500	1700	790
MEAN	760	1900	2067	1400	730



	Joda	Anandpur	Jajpur	Chandbali	Dhamra
MIN	88	76	75	112	27700
MAX	139	127	171	12320	48400
MEAN	114	108	125	4423	35000

CHAPTER XIV

Water Quality of Rivers in Subarnarekha Basin

14.1 Subarnarekha River System

The Subarnarekha rises near Nagri village in the Ranchi district. Of its total length 269 km are in Jharkhand and 64 km in West Bengal and 62 in Orissa. The river drains a total area of 19,296 sq km. The Subarnarekha is the smallest of the basins and is falling short only marginally to be called a 'major basin'. It has virtually no significant tributary; the tiny Kharkai has gained a name only because of its support to the Jamshedpur steel city. The river Subarnarekha passes through an important industrial belt of Jharkhand.

The river is basically a rainfed peninsular river with the wet months being June to September. The river in its upper and middle reaches remains more or less as a stagnant pool, often highly charged with pollutants, particularly during dry periods. The largest concentration of population is located in the Singbhum and Ranchi districts of Jharkhand. The river and its tributaries are the main sources of urban water supply with the ground water resources still under utilized. Nearly 60 percent of the water supplies eventually find their way to surface water systems. Some of the important towns are also significant industrial centres. None of the towns except partly for Jamshedpur and Tatanagar railway colony have wastewater treatment facility worth mentioning.

The Subarnarekha being a mineral rich area, it is natural that mining activity would always be an important element in the pollution control programme. The possibility of contamination of surface and ground water derived from the ore dumps and radioactive waste materials in the uranium mines at Jaduguda is very great

The basin area of Subarnerekha is covering the States of Jharkhand and Orissa. The important urban centres in these states are Jamshedpur, Chaibasa and Ranchi in Jharkhand; and Bhadrak in Orissa.

14.2 Water Quality Monitoring in Subarnarekha Basin

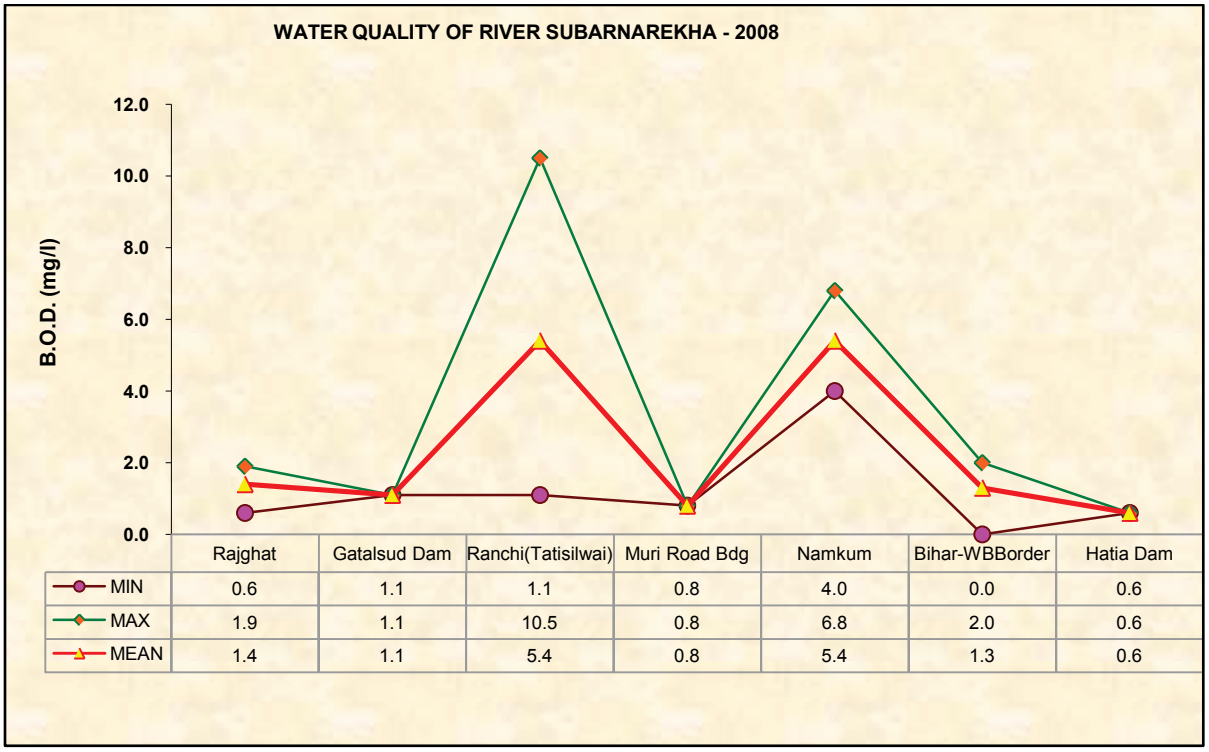
The water quality monitoring of the River Subarnarekha and its tributary is being done in the basin by the State Pollution Control Boards of Jharkhand, Orissa and

West Bengal at 13 locations. The ranges of water quality observed in River Subarnarekha with respect to pH, Conductivity, DO, BOD, COD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

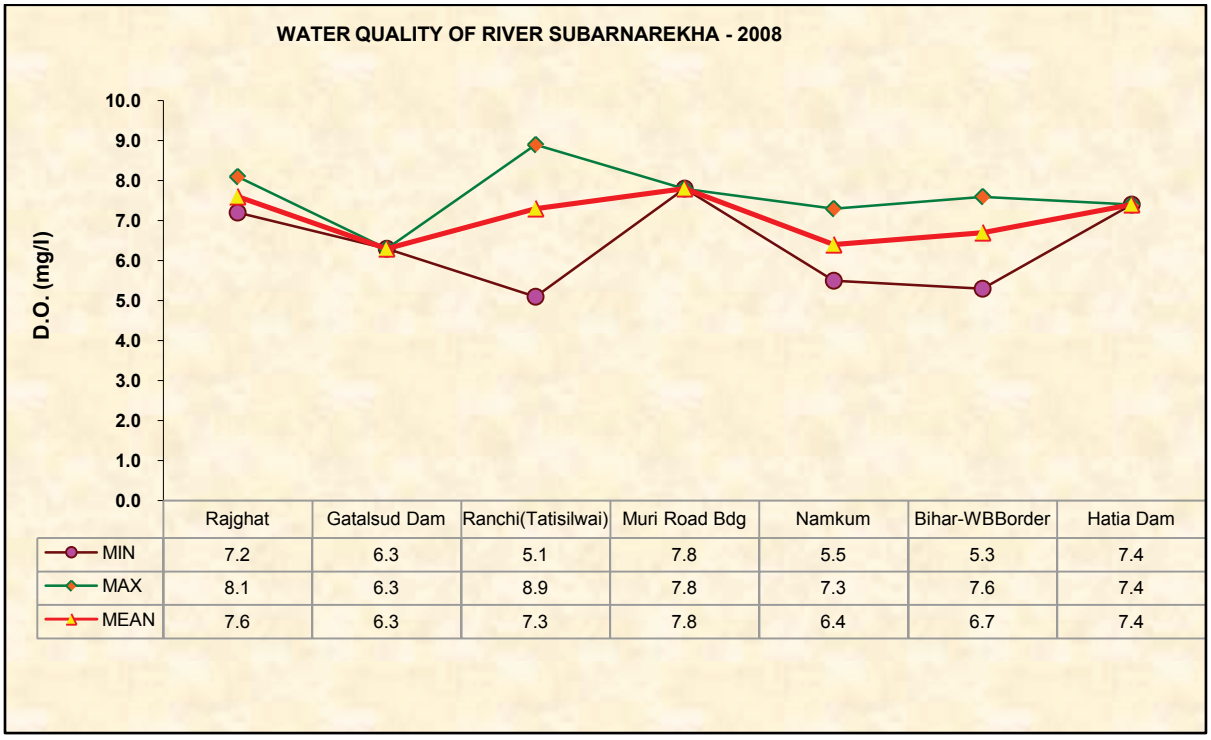
14.3 Water Quality Status of River Subarnarekha

The water quality of Subarnarekha with respect to pH, DO, Total Coliform and Conductivity during the year indicates that it is meeting the desired water quality criteria at all the locations With respect to Faecal Coliform the river is complying with the permissible limit of water quality criteria for bathing. DO is observed in the range of 5.1-8.9 mg/l. The higher values of BOD are observed at Ranchi Tatisilwai (10.5 mg/l) in Jharkhand and Namkum Road Bridge (6.8 mg/l) in West Bengal. The water quality of the River Subarnarekha during the period is given in Annexure-I Table 14.1. The water quality status of River Subarnarekha with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in figure 14.1.

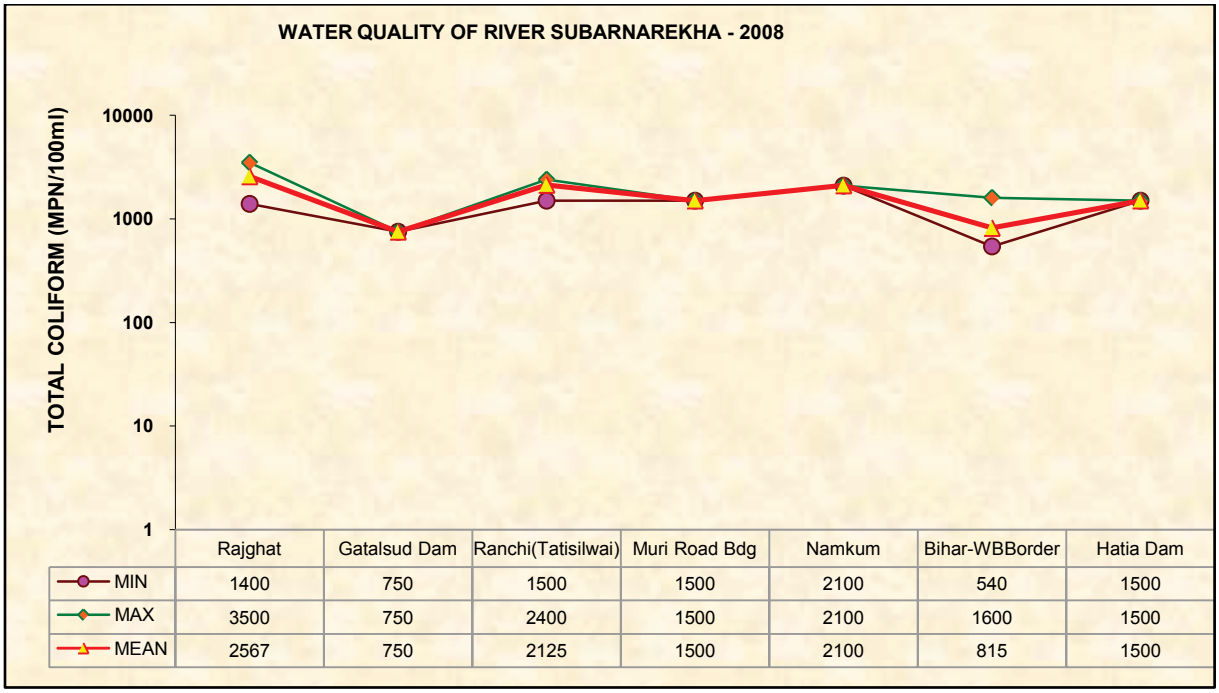
Figure 14.1: Water Quality of River Subarnarekha



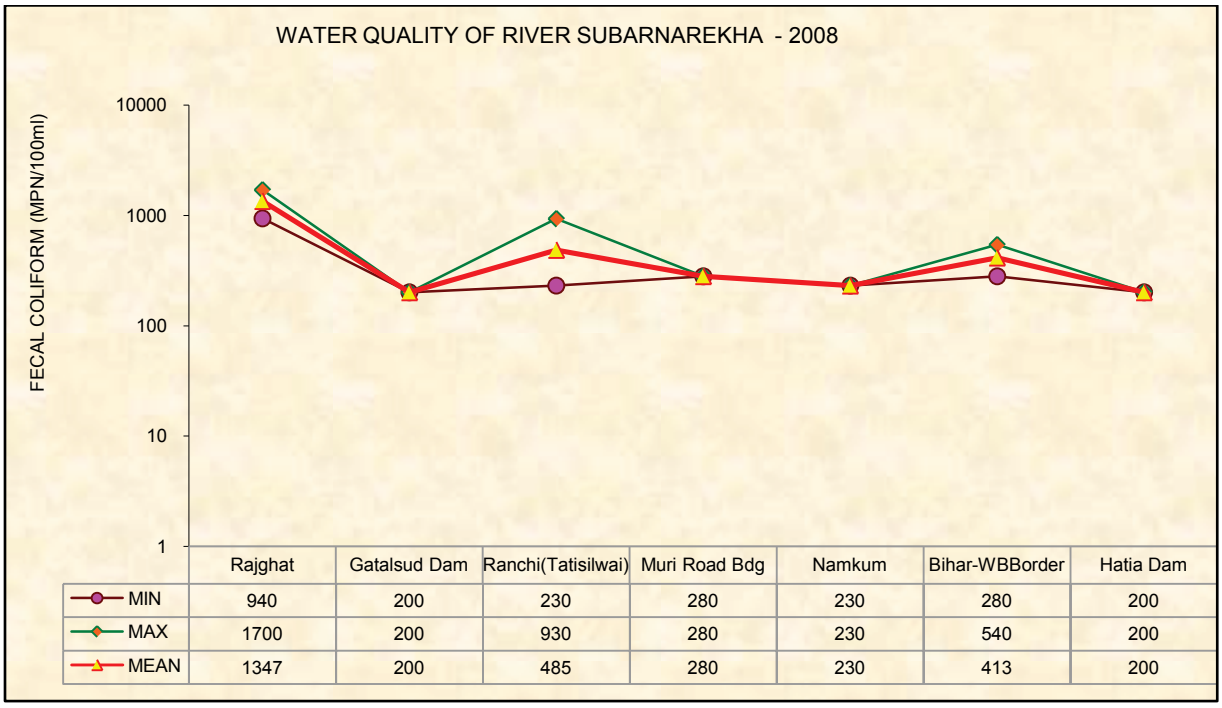
	Rajghat	Gatalsud Dam	Ranchi(Tatisilwai)	Muri Road Bdg	Namkum	Bihar-WBBorder	Hatia Dam
MIN	0.6	1.1	1.1	0.8	4.0	0.0	0.6
MAX	1.9	1.1	10.5	0.8	6.8	2.0	0.6
MEAN	1.4	1.1	5.4	0.8	5.4	1.3	0.6



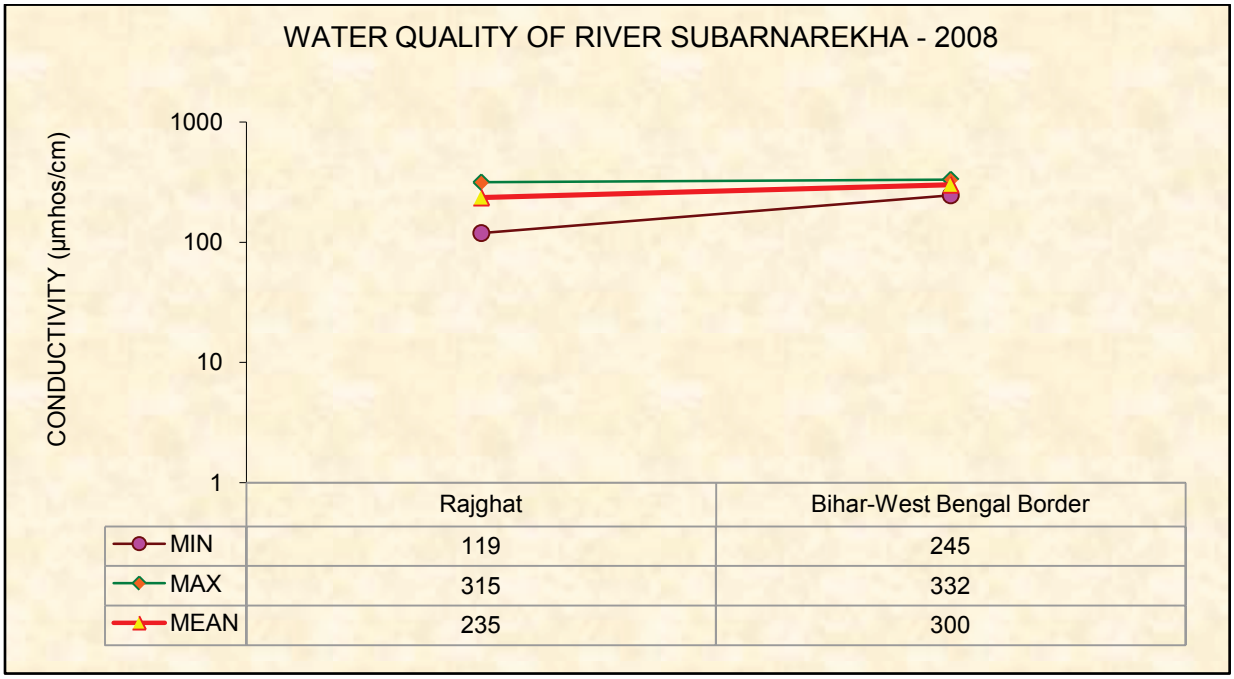
	Rajghat	Gatalsud Dam	Ranchi(Tatisilwai)	Muri Road Bdg	Namkum	Bihar-WBBorder	Hatia Dam
MIN	7.2	6.3	5.1	7.8	5.5	5.3	7.4
MAX	8.1	6.3	8.9	7.8	7.3	7.6	7.4
MEAN	7.6	6.3	7.3	7.8	6.4	6.7	7.4



	Rajghat	Gatalsud Dam	Ranchi(Tatisilwai)	Muri Road Bdg	Namkum	Bihar-WBBorder	Hatia Dam
MIN	1400	750	1500	1500	2100	540	1500
MAX	3500	750	2400	1500	2100	1600	1500
MEAN	2567	750	2125	1500	2100	815	1500



	Rajghat	Gatalsud Dam	Ranchi(Tatisilwai)	Muri Road Bdg	Namkum	Bihar-WBBorder	Hatia Dam
MIN	940	200	230	280	230	280	200
MAX	1700	200	930	280	230	540	200
MEAN	1347	200	485	280	230	413	200



	Rajghat	Bihar-West Bengal Border
MIN	119	245
MAX	315	332
MEAN	235	300

CHAPTER XV

Water Quality of Rivers in Godavari Basin

15.1 Godavari River System

The Godavari basin extends over an area of 3, 12,812 sq km which is nearly 10 percent of the total geographical area of the country. The basin lies in the Deccan plateau, and covers large areas in the States of Andhra Pradesh, Madhya Pradesh, Chattisgarh and Maharashtra, in addition to smaller areas in Karnataka and Orissa.

The Satmala Hills, the Ajanta Range and the Mahadeo Hills, on the south and east by the Eastern Ghats and on the west by the Western Ghats, bound the Godavari basin on the north. The Godavari is the largest river of the Peninsular India, inspite of its massive catchment area; the discharge is not very impressive because of moderate annual average rainfall in the basin. Its four important tributaries are the Manjira, the Pranhita, the Indravati and the Sabari. The wastewater generation from domestic (both rural and urban) and the industrial sector are the main sources of pollution in the river basin. Amongst the five states Orissa State is least industrialized followed by Chhitisgarh and Karnataka, with Maharashtra having the high urban industrial pockets. Most of the industrial activities are centred mainly at Aurangabad & Nasik in Maharashtra, East & West Godavari Distt. in

Andhra Pradesh. Sugar and distillery units are large in number in Maharashtra followed by pharmaceuticals, leather, pulp and paper and pesticide units.In Andhra Pradesh sugar and distillery units are large in number followed by Pulp & Paper and fertilizer industries. The above-mentioned industries are massive water consuming by nature and the deterioration in water quality in the river cannot be ruled out particularly from Nashik to Nanded in Maharashtra and at Baster, in Chattisgarh and Burganpad in Andhra Pradesh.

The important urban centers in this basin are Nagpur, Ambejogai, Ballarpur, Bhandara, Buldhana, Chalisgaon, Hinganghat, Hingoli, Manmad Nandurbar Osmandabad Parli Pusad Shrirampur Udgir Latur Kamptee Ahmadnagar Parbhani Aurangabad Wardha Bid Nashik Chandrapur Jalna Nanded Yavatmal, Amalner and Gondiya in Maharashtra; Jagdalpur in Chhatisgarh, Chiklikalan Parasia ,Chindwara Seoni Balaghat in Madhya Pradesh, Rajahmundry Nizamabad Ramagundam Eluru Warangal Khammam Kothagudem Karimnagar Bhimavaram Kakinada Adilabad , Bellampalle Bodhan Jagtial Kagaznagar Mancherial Mandamarri Narsapur Nirmal Palacole Palwancha Sangareddy Siddipet Siricilla Tadepalligudem and Tanuku in Andhra Pradesh; Bidar in Karnataka; and Jeypur in Orissa

15.2 Water Quality Monitoring in Godavari Basin

The water quality monitoring of the River Godavari are being done in the basin by the State Pollution Control Boards of Maharashtra, Andhra Pradesh, Madhya Pradesh and Orissa at 65 locations. The monitoring locations are on main stream of Godavari (35) and on tributaries are Manjara (Manjira) (5), Maner (2), Nira (1), Wainganga (8), Wardha (3), Kolar (1), Kanhan (3), Purna (2), Indravati (2), Sankhani (1), Nakkavagu (1) and Vamsadhara (1). The ranges of water quality observed in Godavari basin with respect to pH, Conductivity, DO, BOD, COD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

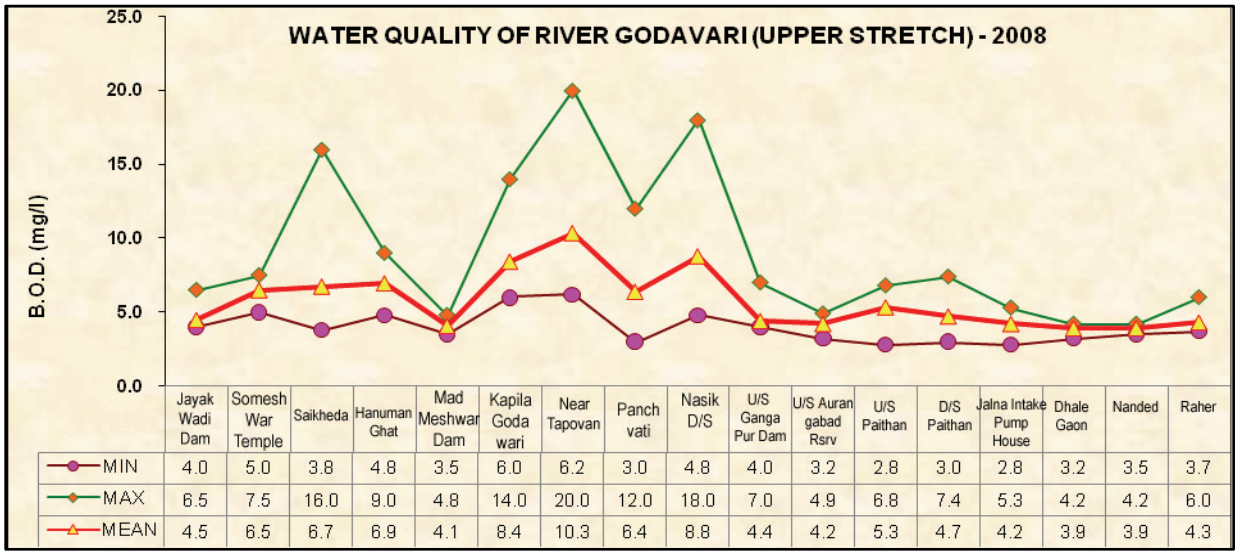
15.2.1 Water Quality of River Godavari

The water quality of River Godavari indicates that the DO value ranges from 1.2-11.3 mg/l. The minimum value of DO (1.2 mg/l) is observed at Bhadrachalam D/s Bathing Ghat, Khammam in Andhra Pradesh. The BOD values ranges from 0.2-20 mg/l and the higher values are observed at Tapovan (20.0 mg/l), Nasik D/s (18 mg/l), Saikheda (10.0 mg/l), Kapila-Godavari confluence point at Tapovan (14.0

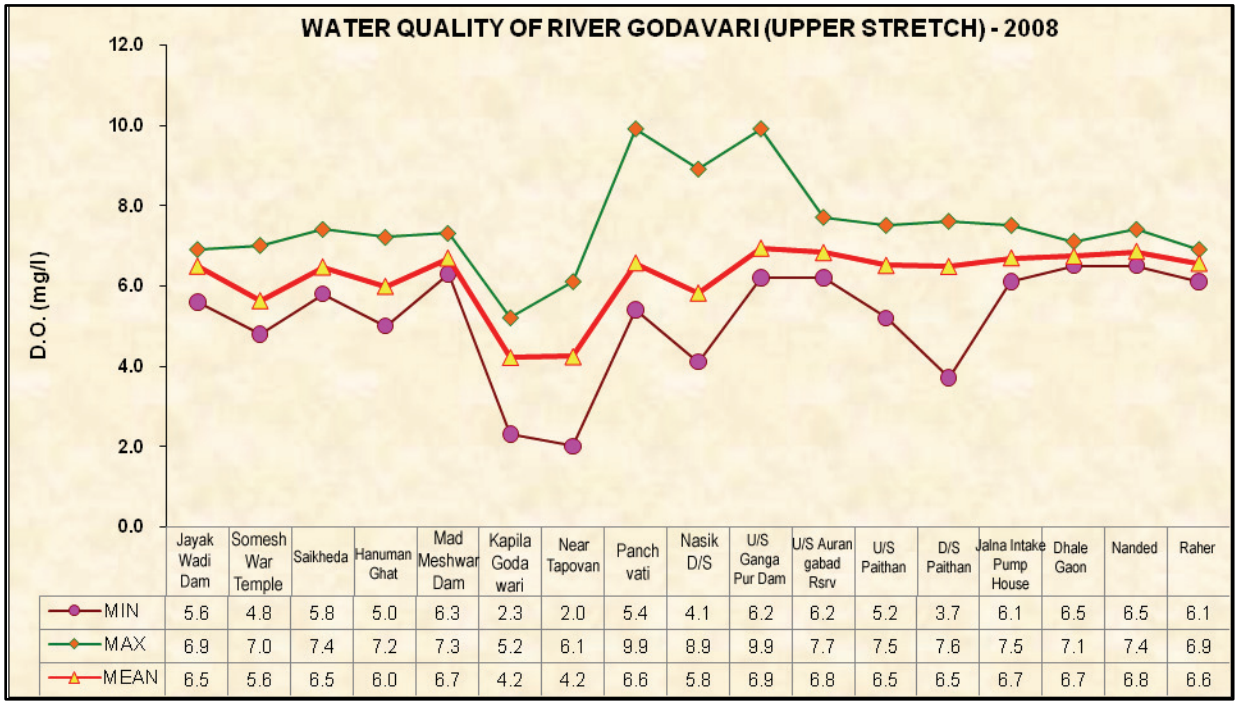
mg/l), Panchavati at Ramkund (12 mg/l), Hanumanghat at Nashik (9.0 mg/l), Near Someshwar Temple (7.5 mg/l), D/s of Paithan (7.4 mg/l), U/s of Gangapur Dam at Nasik (7.0 mg/l), U/s of Paithan (6.8 mg/l) and Jayakwadi Dam at Aurangabad (6.5 mg/l) in Maharashtra & Rajahmundry D/s (6.0 mg/l) and Godavarikhani (5.7 mg/l) in Andhra Pradesh. The Faecal Coliform ranges from Nil-800 MPN/100ml whereas the Total Coliform ranges from 3-28,000 MPN/100 ml. The maximum number of Total Coliform is observed at Rajahmundry D/s in Andhra Pradesh which can be attributed to the proximity of large city.

The River Godavari at most of locations in Maharashtra and Bhadrachalam U/s, near Rly Bdg B/c of Rallavagu at Mancherial, Rajahmundry D/s, Godavarikhani, Ramgundam U/s & D/s and Burgampahad in A.P. is exceeding desired water quality criteria. The sources of pollution is from domestic and industrial wastewater generated from the large cities in Maharashtra and Mancherial, Ramgundam, Rajahmundry, Godavarikhani, Burgampahad and Bhadrachalam cities in Andhra Pradesh. Depletion of dissolved oxygen has been reported due to addition of sewage into the river besides bacteriological pollution.To maintain the desired water quality uses of the River Godavari in these stretches, the municipalities need to treat their wastewater and the industries to install effluent treatment plants (ETP) before discharging into the rivers for sustaining the desired level of water quality.Water quality of River Godavari is presented in Annexure-I Table 15.1. The water quality status of River Godavari with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is presented in Figure 15.1 & 15.2.

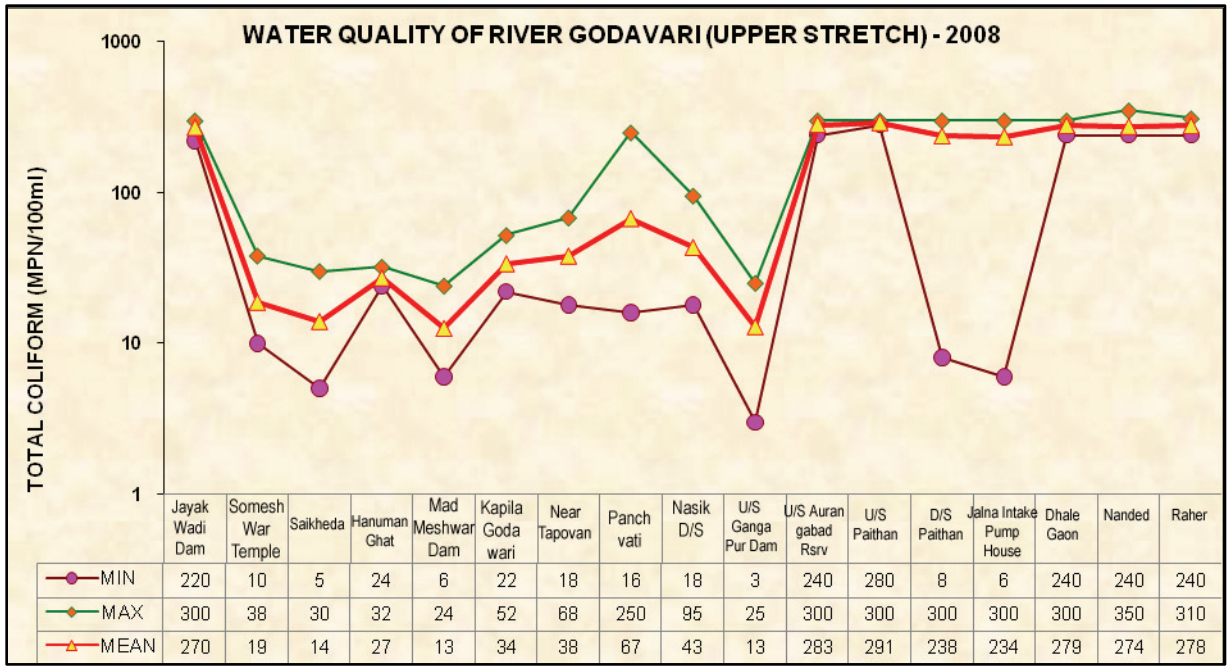
Figure 15.1: Water Quality of River Godavari (Upper Stretch)



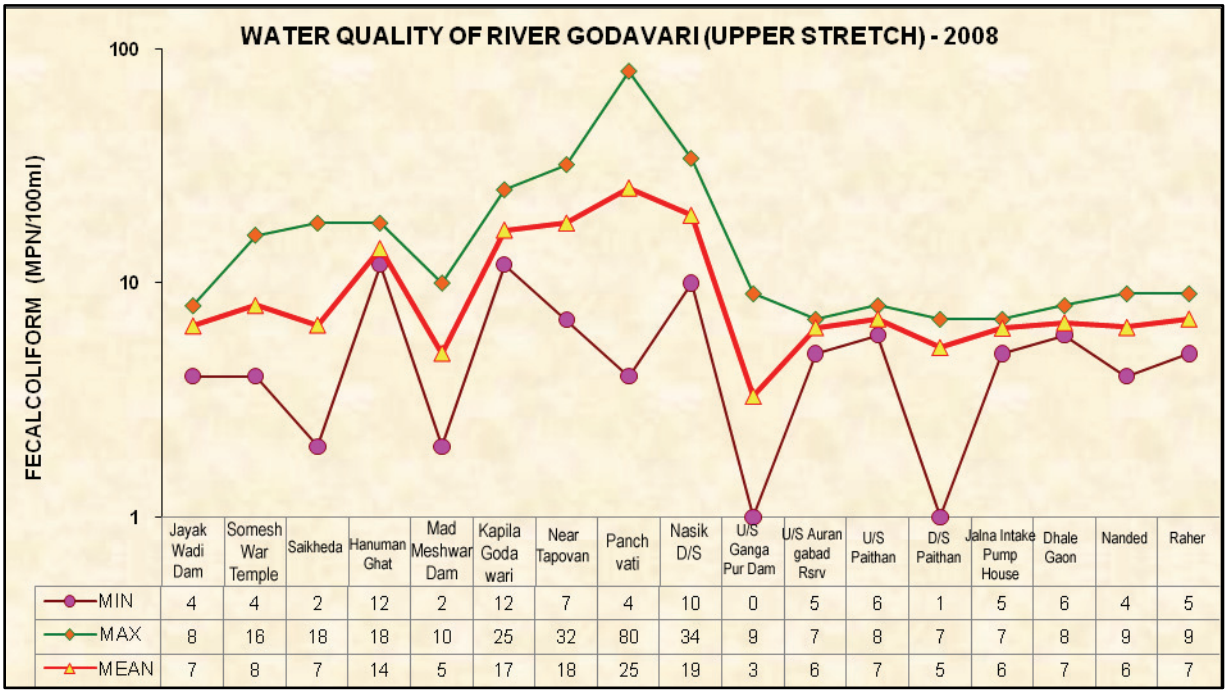
	Jayak Wadi Dam	Somesh War Temple	Saikheda	Hanuman Ghat	Mad Meshwar Dam	Kapila Goda wari	Near Tapovan	Panch vati	Nasik D/S	U/S Ganga Pur Dam	U/S Auran gabad Rsrv	U/S Paithan	D/S Paithan	Jalna Intake Pump House	Dhale Gaon	Nanded	Raher
MIN	4.0	5.0	3.8	4.8	3.5	6.0	6.2	3.0	4.8	4.0	3.2	2.8	3.0	2.8	3.2	3.5	3.7
MAX	6.5	7.5	16.0	9.0	4.8	14.0	20.0	12.0	18.0	7.0	4.9	6.8	7.4	5.3	4.2	4.2	6.0
MEAN	4.5	6.5	6.7	6.9	4.1	8.4	10.3	6.4	8.8	4.4	4.2	5.3	4.7	4.2	3.9	3.9	4.3



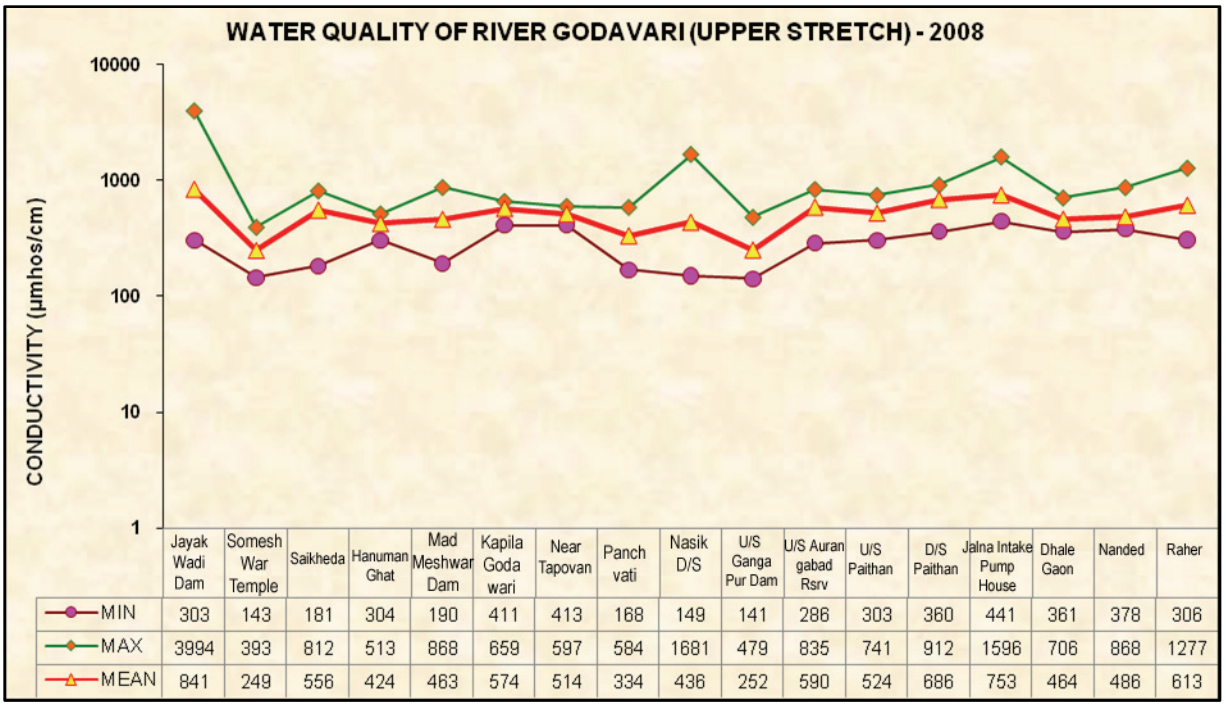
	Jayak Wadi Dam	Somesh War Temple	Saikheda	Hanuman Ghat	Mad Meshwar Dam	Kapila Goda wari	Near Tapovan	Panch vati	Nasik D/S	U/S Ganga Pur Dam	U/S Auran gabad Rsrv	U/S Paithan	D/S Paithan	Jalna Intake Pump House	Dhale Gaon	Nanded	Raher
MIN	5.6	4.8	5.8	5.0	6.3	2.3	2.0	5.4	4.1	6.2	6.2	5.2	3.7	6.1	6.5	6.5	6.1
MAX	6.9	7.0	7.4	7.2	7.3	5.2	6.1	9.9	8.9	9.9	7.7	7.5	7.6	7.5	7.1	7.4	6.9
MEAN	6.5	5.6	6.5	6.0	6.7	4.2	4.2	6.6	5.8	6.9	6.8	6.5	6.5	6.7	6.7	6.8	6.6



	Jayak Wadi Dam	Somesh War Temple	Saikheda	Hanuman Ghat	Mad Meshwar Dam	Kapila Goda wari	Near Tapovan	Panch vati	Nasik D/S	U/S Ganga Pur Dam	U/S Auran gabad Rsrv	U/S Paithan	D/S Paithan	Jalna Intake Pump House	Dhale Gaon	Nanded	Raher
MIN	220	10	5	24	6	22	18	16	18	3	240	280	8	6	240	240	240
MAX	300	38	30	32	24	52	68	250	95	25	300	300	300	300	300	350	310
MEAN	270	19	14	27	13	34	38	67	43	13	283	291	238	234	279	274	278

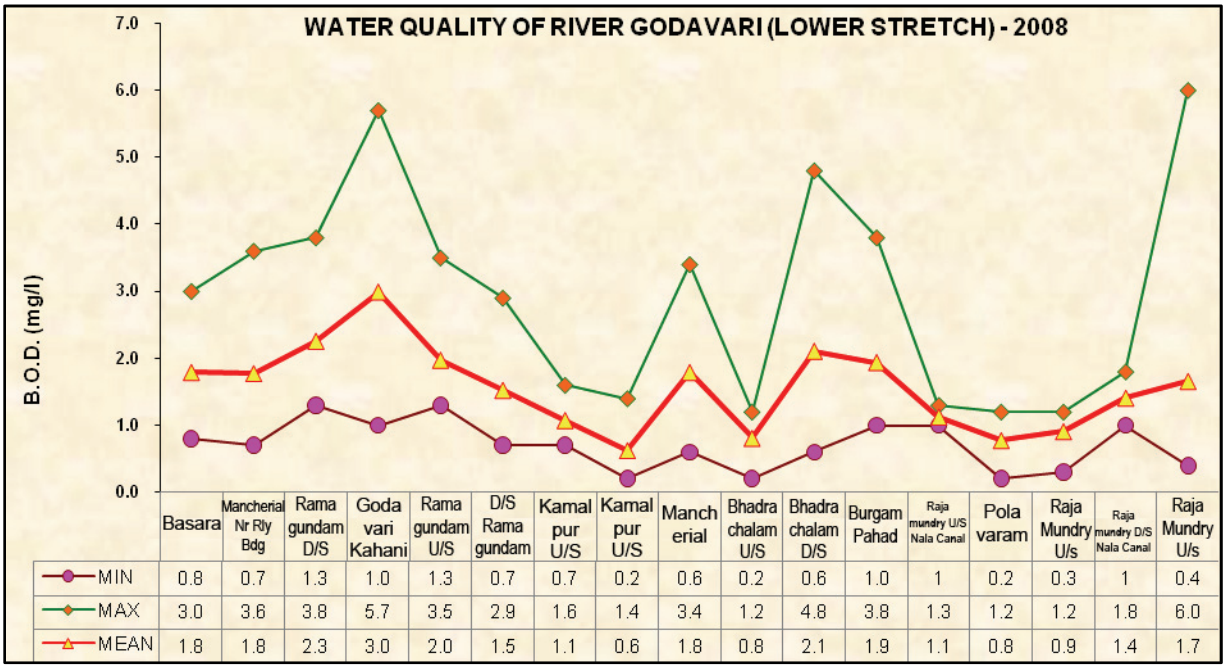


	Jayak Wadi Dam	Somesh War Temple	Saikheda	Hanuman Ghat	Mad Meshwar Dam	Kapila Goda wari	Near Tapovan	Panch vati	Nasik D/S	U/S Ganga Pur Dam	U/S Auran gabad Rsrv	U/S Paithan	D/S Paithan	Jalna Intake Pump House	Dhale Gaon	Nanded	Raher
MIN	4	4	2	12	2	12	7	4	10	0	5	6	1	5	6	4	5
MAX	8	16	18	18	10	25	32	80	34	9	7	8	7	7	8	9	9
MEAN	7	8	7	14	5	17	18	25	19	3	6	7	5	6	7	6	7

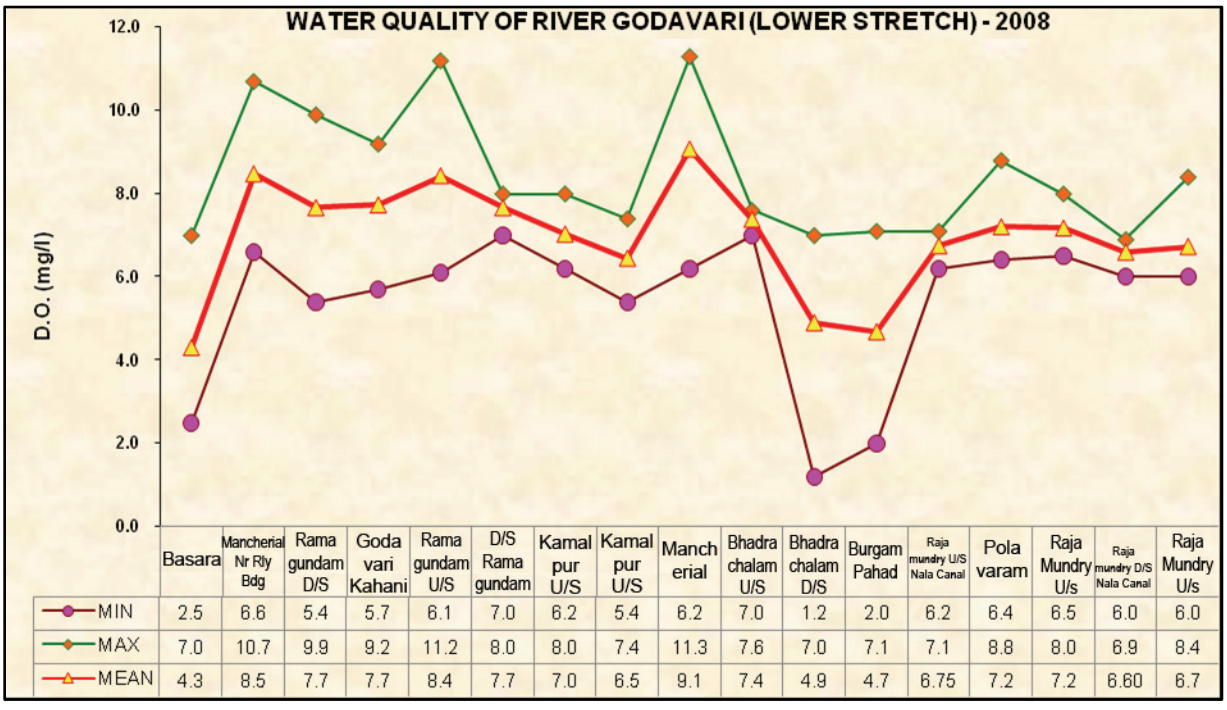


	Jayak Wadi Dam	Somesh War Temple	Saikheda	Hanuman Ghat	Mad Meshwar Dam	Kapila Goda wari	Near Tapovan	Panch vati	Nasik D/S	U/S Ganga Pur Dam	U/S Auran gabad Rsrv	U/S Paithan	D/S Paithan	Jalna Intake Pump House	Dhale Gaon	Nanded	Raher
MIN	303	143	181	304	190	411	413	168	149	141	286	303	360	441	361	378	306
MAX	3994	393	812	513	868	659	597	584	1681	479	835	741	912	1596	706	868	1277
MEAN	841	249	556	424	463	574	514	334	436	252	590	524	686	753	464	486	613

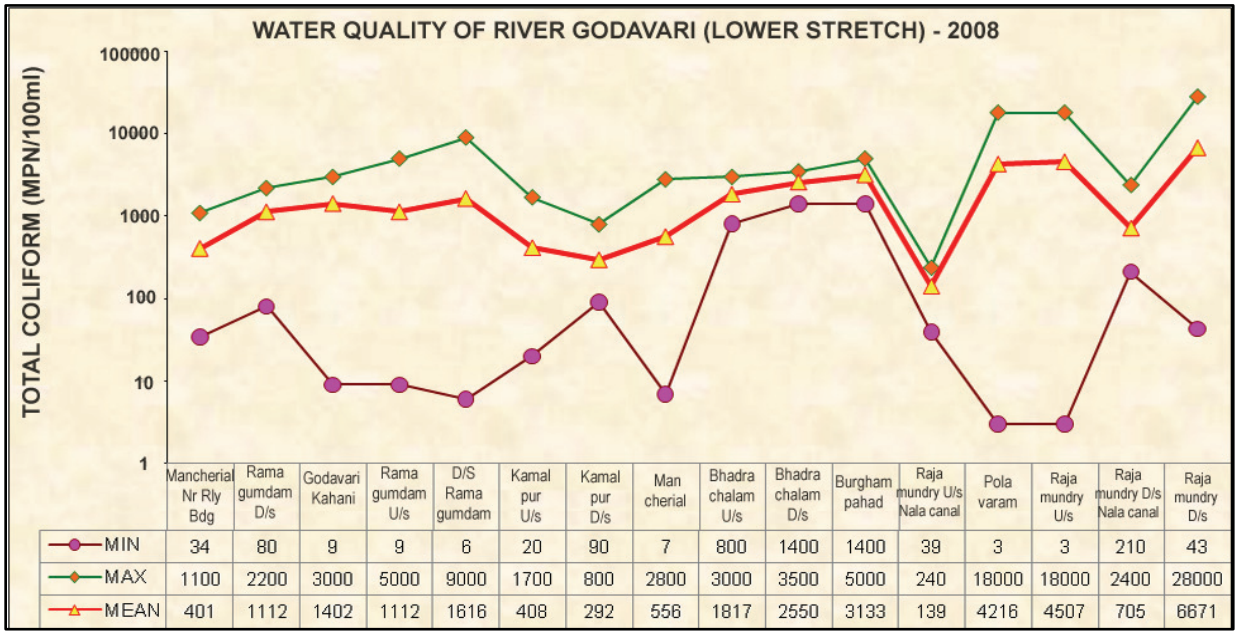
Figure 15.2: Water Quality of River Godavari (Lower Stretch)



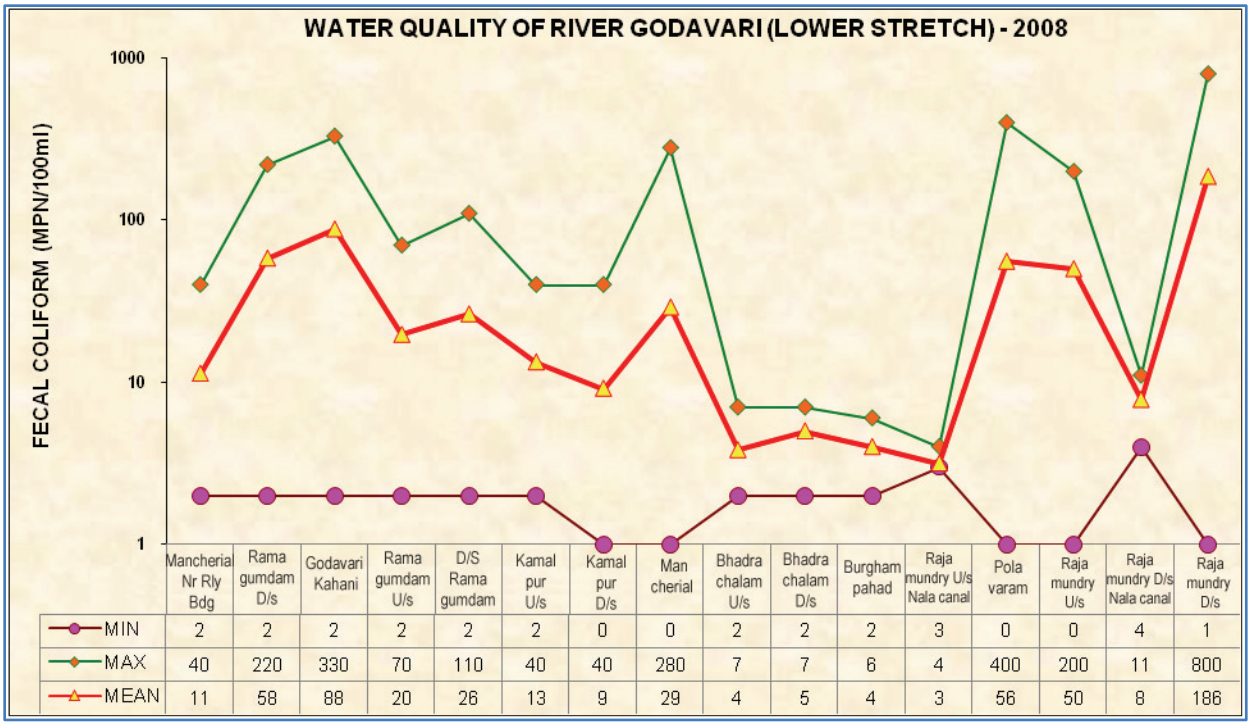
	Basara	Mancherial Nr Rly Bdg	Rama gundam D/S	Goda vari Kahani	Rama gundam U/S	D/S Rama gundam	Kamal pur U/S	Kamal pur U/S	Manch erial	Bhadra chalam U/S	Bhadra chalam D/S	Burgam Pahad	Raja mundry U/S Nala Canal	Pola varam	Raja Mundry U/s	Raja mundry D/S Nala Canal	Raja Mundry U/s
MIN	0.8	0.7	1.3	1.0	1.3	0.7	0.7	0.2	0.6	0.2	0.6	1.0	1	0.2	0.3	1	0.4
MAX	3.0	3.6	3.8	5.7	3.5	2.9	1.6	1.4	3.4	1.2	4.8	3.8	1.3	1.2	1.2	1.8	6.0
MEAN	1.8	1.8	2.3	3.0	2.0	1.5	1.1	0.6	1.8	0.8	2.1	1.9	1.1	0.8	0.9	1.4	1.7



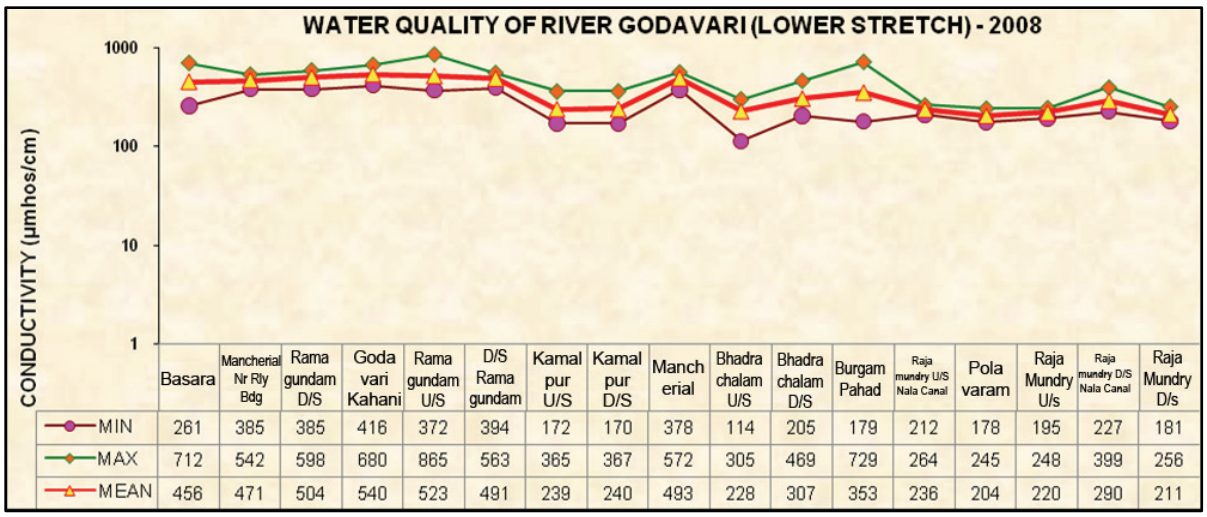
	Basara	Mancherial Nr Rly Bdg	Rama gundam D/S	Goda vari Kahani	Rama gundam U/S	D/S Rama gundam	Kamal pur U/S	Kamal pur U/S	Manch erial	Bhadra chalam U/S	Bhadra chalam D/S	Burgam Pahad	Raja mundry U/S Nala Canal	Pola varam	Raja Mundry U/s	Raja mundry D/S Nala Canal	Raja Mundry U/s
MIN	2.5	6.6	5.4	5.7	6.1	7.0	6.2	5.4	6.2	7.0	1.2	2.0	6.2	6.4	6.5	6.0	6.0
MAX	7.0	10.7	9.9	9.2	11.2	8.0	8.0	7.4	11.3	7.6	7.0	7.1	7.1	8.8	8.0	6.9	8.4
MEAN	4.3	8.5	7.7	7.7	8.4	7.7	7.0	6.5	9.1	7.4	4.9	4.7	6.75	7.2	7.2	6.60	6.7



	Mancherial Nr Rly Bdg	Rama gumdam D/s	Godavari Kahani	Rama gumdam U/s	D/S Rama gumdam	Kamal pur U/s	Kamal pur D/s	Man cherial	Bhadra chalam U/s	Bhadra chalam D/s	Burgham pahad	Raja mundry U/s Nala canal	Pola varam	Raja mundry U/s	Raja mundry D/s Nala canal	Raja mundry D/s
MIN	34	80	9	9	6	20	90	7	800	1400	1400	39	3	3	210	43
MAX	1100	2200	3000	5000	9000	1700	800	2800	3000	3500	5000	240	18000	18000	2400	28000
MEAN	401	1112	1402	1112	1616	408	292	556	1817	2550	3133	139	4216	4507	705	6671



	Mancherial Nr Rly Bdg	Rama gumdam D/s	Godavari Kahani	Rama gumdam U/s	D/S Rama gumdam	Kamal pur U/s	Kamal pur D/s	Man cherial	Bhadra chalam U/s	Bhadra chalam D/s	Burgham pahad	Raja mundry U/s Nala canal	Pola varam	Raja mundry U/s	Raja mundry D/s Nala canal	Raja mundry D/s
MIN	2	2	2	2	2	2	0	0	2	2	2	3	0	0	4	1
MAX	40	220	330	70	110	40	40	280	7	7	6	4	400	200	11	800
MEAN	11	58	88	20	26	13	9	29	4	5	4	3	56	50	8	186



	Basara	Mancherial Nr Rly Bdg	Rama gundam D/S	Goda vari Kahani	Rama gundam U/S	D/S Rama gundam	Kamal pur U/S	Kamal pur D/S	Manch erial	Bhadra chalam U/S	Bhadra chalam D/S	Burgam Pahad	Raja mundry U/S Nala Canal	Pola varam	Raja Mundry U/s	Raja mundry D/S Nala Canal	Raja Mundry D/s
MIN	261	385	385	416	372	394	172	170	378	114	205	179	212	178	195	227	181
MAX	712	542	598	680	865	563	365	367	572	305	469	729	264	245	248	399	256
MEAN	456	471	504	540	523	491	239	240	493	228	307	353	236	204	220	290	211

15.2.2 Water Quality of tributary streams Indravati, Shankini, Manjeera, Maner, Wardha, Wainganga, Kolar, Kanhan, Purna, Nira & Sabari

The Water Quality of tributary streams Indravati, Shankini, Manjeera, Maner, Wardha, Wainganga, Kolar, Kanhan, Purna, Nira & Sabari indicates that BOD and DO are exceeding the criteria limit at certain locations whereas other parameters like pH, Conductivity and Faecal Coliform are meeting the desired water quality criteria. The DO ranges from 0.4-11.7 mg/l and the lower values of DO are found in River Manjeera at Gowdicharla B/c (3.8 mg/l) & A/c Nakkavagu (0.4 mg/l) and Near Ganapathi Sugars at Medak (3.5 mg/l) in Andhra Pradesh.

BOD ranges from 0.1-16 mg/l. The higher values of BOD are observed in River Manjira at Gowdicharla A/c Nakkavagu (16.0 mg/l), Wardha at D/s of ACC Ghuggus (13.0 mg/l), Nira at Pulgaon Cotton Mills, Wardha (11.8 mg/l), Wardha at Rajura Bridge (11.0 mg/l), Wainganga at Asthi (10.5 mg/l), Kanhan at Sinora D/s of M/s Vidharbha Paper Mills (9.8 mg/l) and Wainganga D/s of Ellora Paper Mills (9.4 mg/l), A/c Kanhan & U/s of Gaurav Paper Mills near Jackwell (9.0 mg/l), Purna at Dhupeshwar & Kanhan D/s of Nagpur (8.8 mg/l), Wainganga U/s of Ellora Paper Mills (8.6 mg/l), Wardha at confl. Point of Penganga and Wardha at Juad (8.5 mg/l), Kanhan at Sinora U/s of M/S Vidharbha Paper Mills (8.2 mg/l), Wainganga D/s of Gaurav Paper Mills near Jackwell (7.8 mg/l) and Maner at Warangal U/s (6.1 mg/l).

The Total Coliform ranges from 4-9000 MPN/100ml whereas the Faecal Coliform is observed in the range of Nil-2400 MPN/100ml. The water quality status of tributary streams Indravati, Shankini, Manjeera, Maner, Wardha, Wainganga, Kolar, Kanhan, Purna, Nira & Sabari is given in Annexure-I Table 15.2.

CHAPTER XVI

Water Quality of Rivers in Krishna Basin

16.1 Krishna River System

The Krishna basin extends over an area of 2, 58,948 sq km which is nearly 8% of the total geographical area of the country. Lying in the Deccan plateau, it covers large areas in the States of Maharashtra, Karnataka and Andhra Pradesh. All the major tributaries draining the base of the triangle fall into the river in the upper two-thirds of its length. The Krishna rises in the Western Ghats at an altitude of 1,337 meter just north of Mahabaleshwar, about 64 km from the Arabian Sea and flows from west to east through the States of Maharashtra, Karnataka and Andhra Pradesh to join the Bay of Bengal. The total length of the river from the source to its outfall into the sea is about 1,400 km. Together with its tributaries, the river drains about 708 km of the Western Ghats which is its chief source of supply. The Krishna is the third longest river within India, yet it has a rather poor water wealth

because of fairly low rainfall in the basin. The river has two large tributaries - the Bhima and the Tungabhadra and four smaller tributaries - the Ghataprabha, the Malprabha the Musi and the Muneru. The river basin survey report communicates that the most populous cities in the basin are Hyderabad Aggomeration in A.P. Pune aggomeration in Maharashtra and Bhadravati complex in Karnataka. Bhadravati in Karnataka and Patancheru- Bolaram in Andhra Pradesh are the critically polluted areas identified in the basin area of Krishna. For Bhadravati the major source of water pollution is the wastewater generated from industries besides the untreated sewage of the town, which is being discharged into Bhadra. It is suggested that sewage treatment plant may be provided for the sewage of the town and ETPs of the existing industries need modifications to comply with prescribed standards for restoration of water quality of the Bhadra river.In the Patancheru - Bolaram area in Andhra Pradesh the effluent generated by industries is the main sources of water pollution in the rivers Manpera and Nakkvagu. Industries are polluting ground water in the region.

The basin area of Krishna is covering the States of Maharashtra, Andhra Pradesh, and Karnataka. The important urban centres in Andhra Pradesh are Guntakal, Guntur, Hyderabad, Kurnool, Gudivada, Tenali, Machilipatnam, Vijayawada, Adoni, Mahaboob-Nagar, Bapatla, Chilakaluripet, Gudur, Kavali, Miryalguda, Nalgonda, Suryapet, Yemmiganur, Chikmagalur, Gangawati, Gokak, Harihar, Nipani, Rabkavi-Banhatti, Ranibennur, Shahabad; in Karnataka are Gadag-betagiri, Raichur, Hubli-Dharwad, Shimoga, Bijapur, Bellary, Gulbarga, Bhadravati, Hosepet, Davangere, Belgaum, Chitradurga, Bagalkot; and in Maharashtra are Karad, Pandharpur, Panvel, Satara, Kolhapur, Solapur, Pune, Ichalkaranji, Sangli and Barshi.

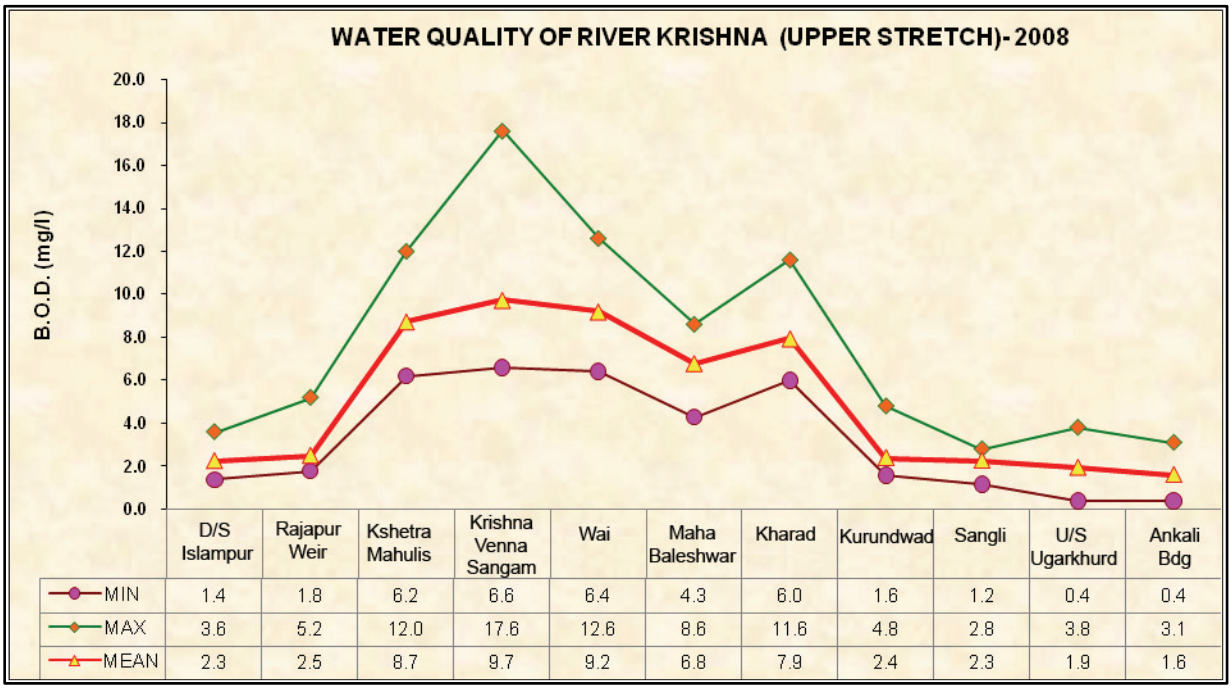
16.2 Water Quality Monitoring in Krishna Basin

The water quality monitoring of the River Krishna are being done in the basin by the State Pollution Control Boards of Maharashtra, Karnataka and Andhra Pradesh at 73 locations. The monitoring locations are on mainstream of River Krishna (22) and tributaries- Bhadra (3), Bhima (10), Ghataprabha (2), Malprabha (3), Muneru (1), Musi (3), Nira (2), Paleru (1), Tunga (1), Tungabhadra (6), Panchganga (4), Chandrabhaga (2), Kagina(1), Koyna(1), Mula(2), Mutha(1), Mula-Mutha(1), Venna(1), Pawana(1), Indrayani(1), Hundri (1), Kundu (1), Kinnersani (1) and Sabari (1). The ranges of water quality observed in River Krishna and its tributaries with respect to pH, Conductivity, DO, BOD, COD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

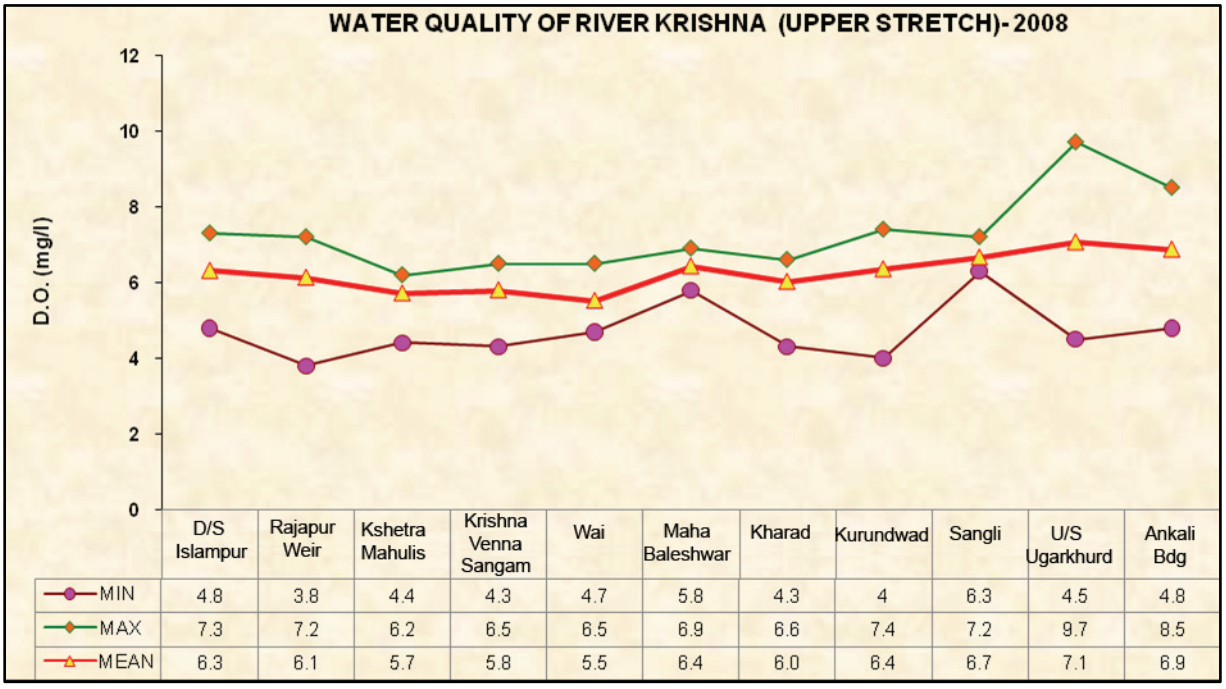
16.2.1 Water Quality of River Krishna

The water quality of River Krishna with respect to pH, Conductivity and DO are largely meeting the water quality criteria at all the locations except DO at Gadwal Bridge (1.1 mg/l) & Wadapalli A/c with Musi (3.1 mg/l) in Andhra Pradesh and Rajapur Weir (3.8 mg/l) in Maharashtra. The BOD ranges from 0.2 to 17.6 mg/l. The maximum value of BOD (17.6 mg/l) is observed at Krishna-Venna Sangam at Mahuli in Maharashtra. Other locations having high BOD are Wai (12.6 mg/l), Kshetra Mahuli (12.0 mg/l), Krishna Bridge at Karad (11.6 mg/l), Mahabaleshwar Dhom Dam near Koyna Dam (8.6 mg/l), Rajapur Weir (5.2 mg/l) and Kurunwad, Kolhapur (4.8 mg/l) in Maharashtra and Wadapally A/c with Musi (8.0 mg/l) & Thanagadi, Mahaboobnagar (5.0 mg/l) in Andhra Pradesh. The Faecal Coliform ranges from 0–3000 MPN/100ml whereas the Total Coliform ranges from 8–16,000 MPN/100ml. The maximum count of TC & FC is observed at D/s of Devsagar Bridge in Karnataka. The water quality status of River Krishna is given in Annexure-I Table 16.1. The water quality status of mainstream of River Krishna with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in Figure 16.1 & 16.2.

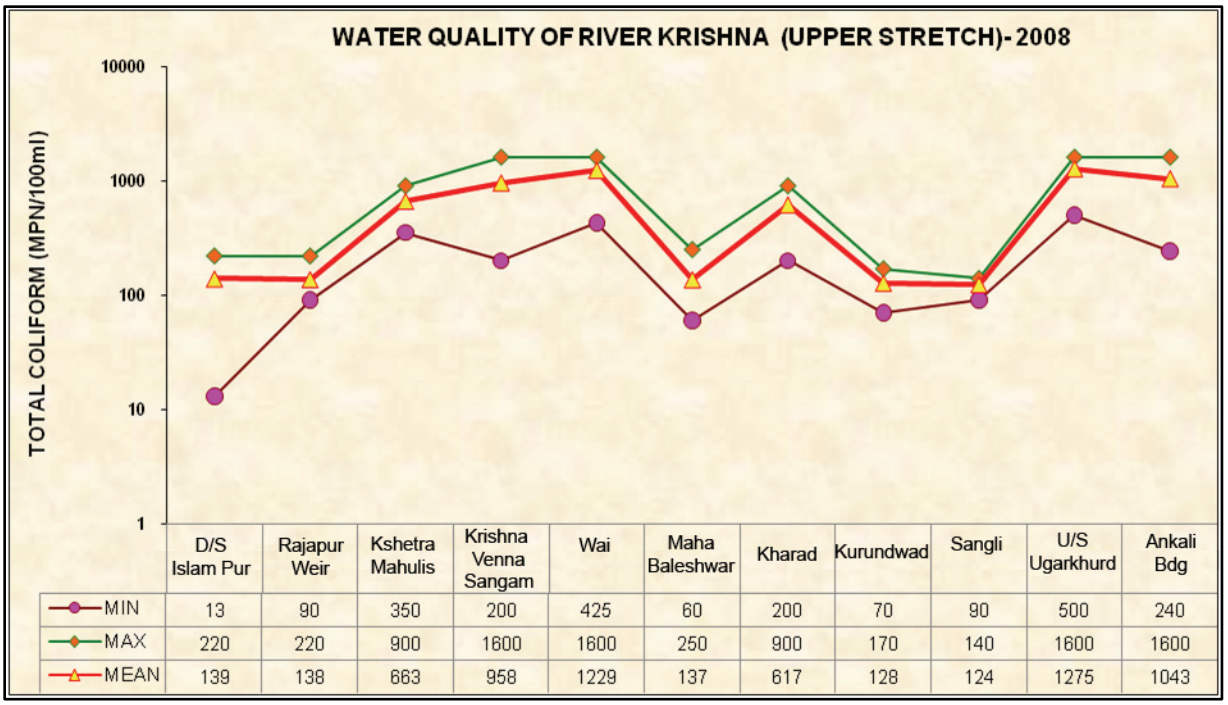
Figure 16.1: Water Quality of River Krishna (Upper Stretch)



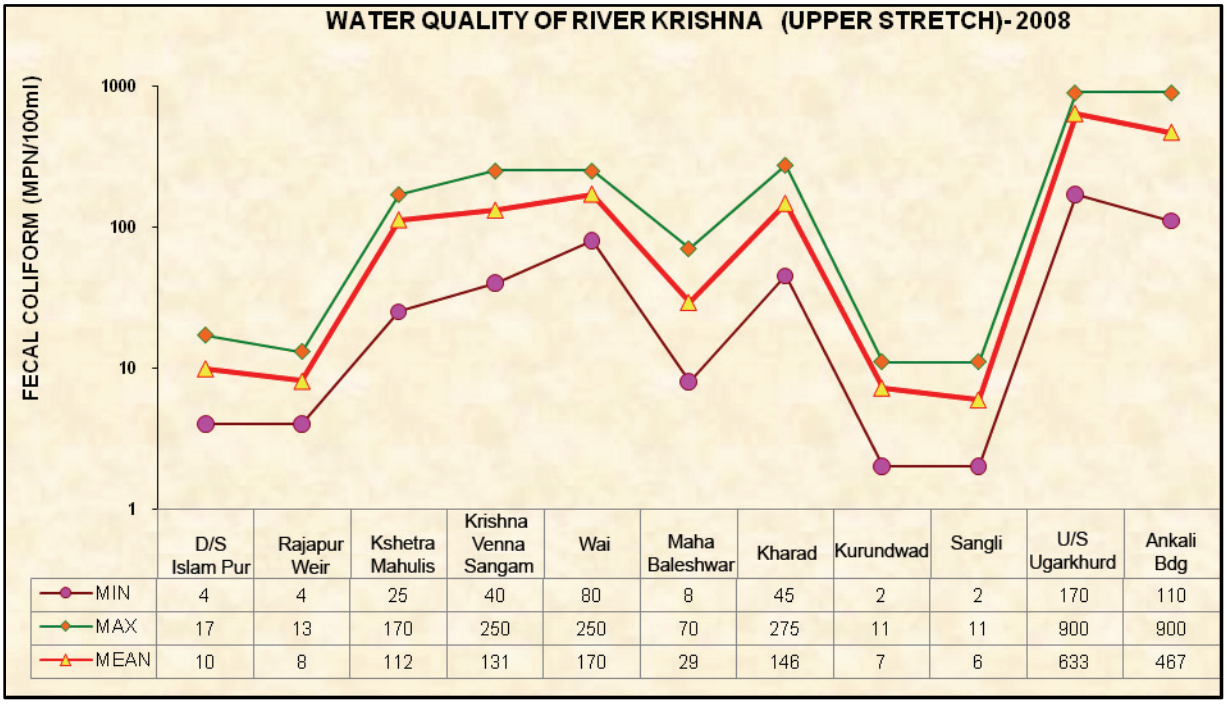
	D/S Islampur	Rajapur Weir	Kshetra Mahulis	Krishna Venna Sangam	Wai	Maha Baleshwar	Kharad	Kurundwad	Sangli	U/S Ugarkhurd	Ankali Bdg
MIN	1.4	1.8	6.2	6.6	6.4	4.3	6.0	1.6	1.2	0.4	0.4
MAX	3.6	5.2	12.0	17.6	12.6	8.6	11.6	4.8	2.8	3.8	3.1
MEAN	2.3	2.5	8.7	9.7	9.2	6.8	7.9	2.4	2.3	1.9	1.6



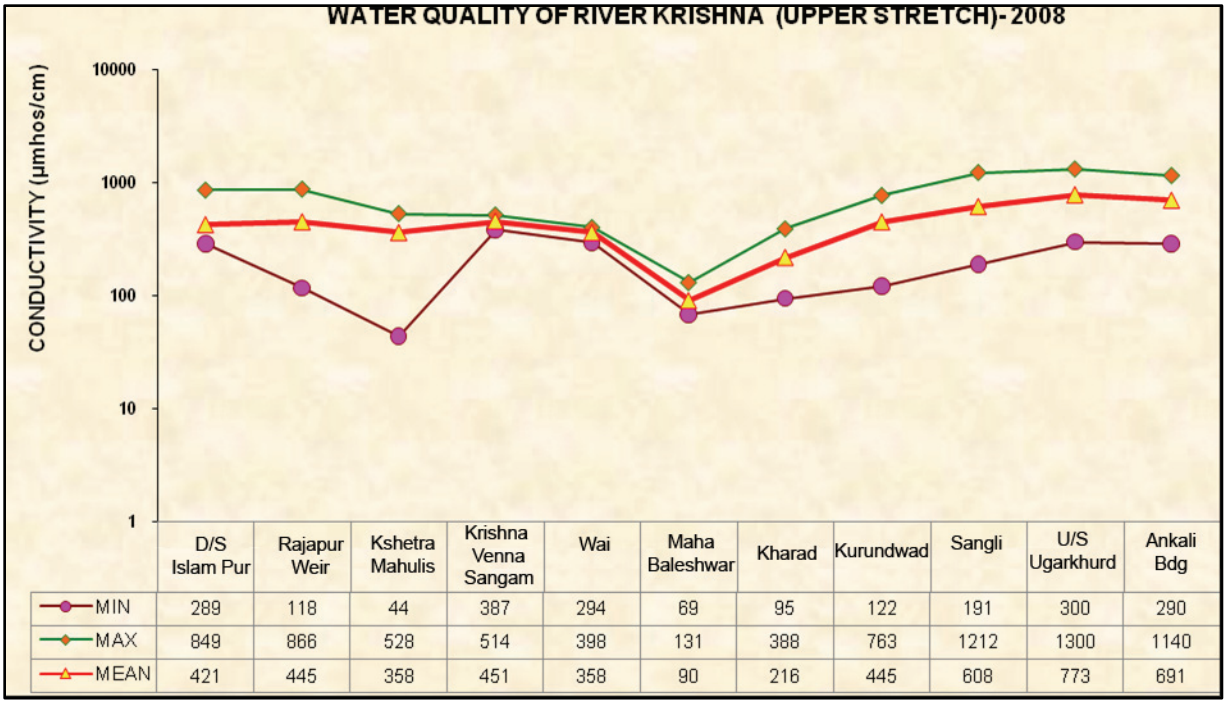
	D/S Islampur	Rajapur Weir	Kshetra Mahulis	Krishna Venna Sangam	Wai	Maha Baleshwar	Kharad	Kurundwad	Sangli	U/S Ugarkhurd	Ankali Bdg
MIN	4.8	3.8	4.4	4.3	4.7	5.8	4.3	4	6.3	4.5	4.8
MAX	7.3	7.2	6.2	6.5	6.5	6.9	6.6	7.4	7.2	9.7	8.5
MEAN	6.3	6.1	5.7	5.8	5.5	6.4	6.0	6.4	6.7	7.1	6.9



	D/S Islam Pur	Rajapur Weir	Kshetra Mahulis	Krishna Venna Sangam	Wai	Maha Baleshwar	Kharad	Kurundwad	Sangli	U/S Ugarkhurd	Ankali Bdg
MIN	13	90	350	200	425	60	200	70	90	500	240
MAX	220	220	900	1600	1600	250	900	170	140	1600	1600
MEAN	139	138	663	958	1229	137	617	128	124	1275	1043

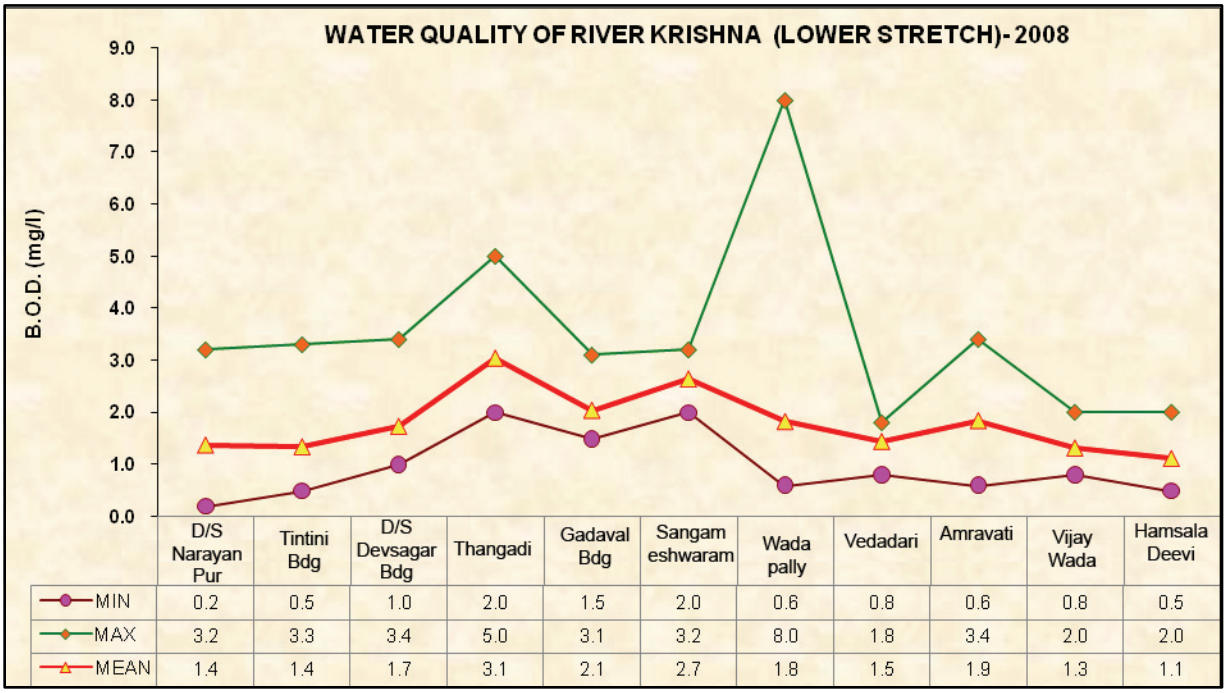


	D/S Islam Pur	Rajapur Weir	Kshetra Mahulis	Krishna Venna Sangam	Wai	Maha Baleshwar	Kharad	Kurundwad	Sangli	U/S Ugarkhurd	Ankali Bdg
MIN	4	4	25	40	80	8	45	2	2	170	110
MAX	17	13	170	250	250	70	275	11	11	900	900
MEAN	10	8	112	131	170	29	146	7	6	633	467

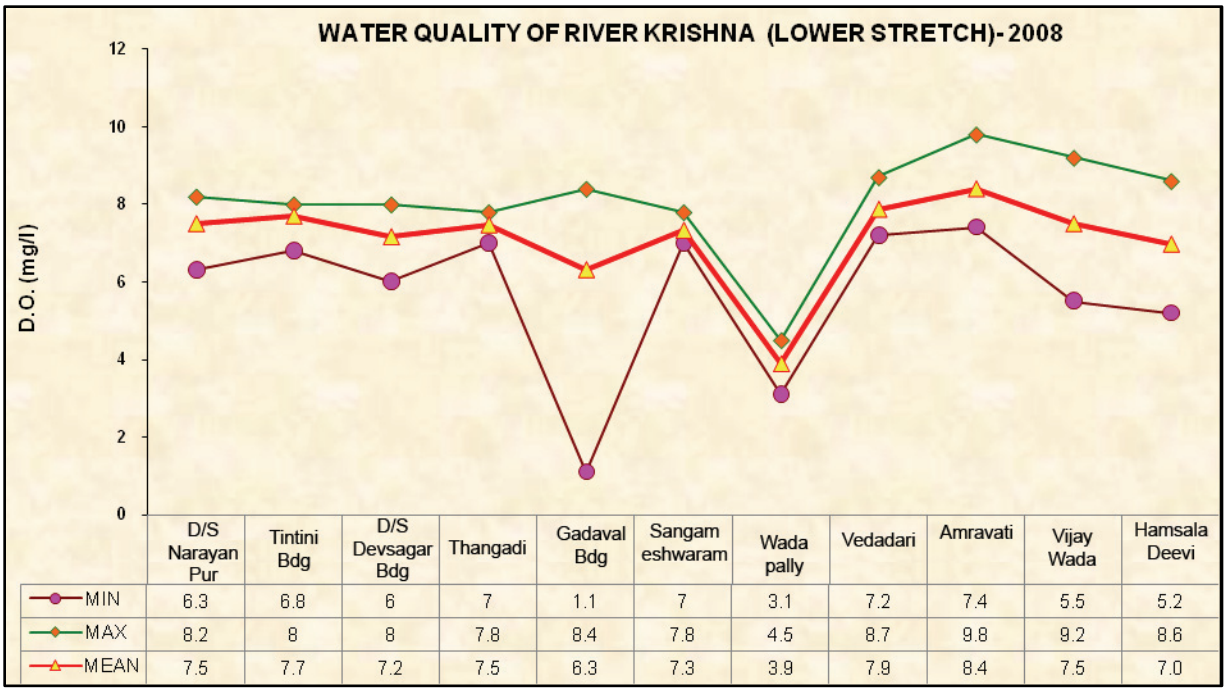


	D/S Islam Pur	Rajapur Weir	Kshetra Mahulis	Krishna Venna Sangam	Wai	Maha Baleshwar	Kharad	Kurundwad	Sangli	U/S Ugarkhurd	Ankali Bdg
MIN	289	118	44	387	294	69	95	122	191	300	290
MAX	849	866	528	514	398	131	388	763	1212	1300	1140
MEAN	421	445	358	451	358	90	216	445	608	773	691

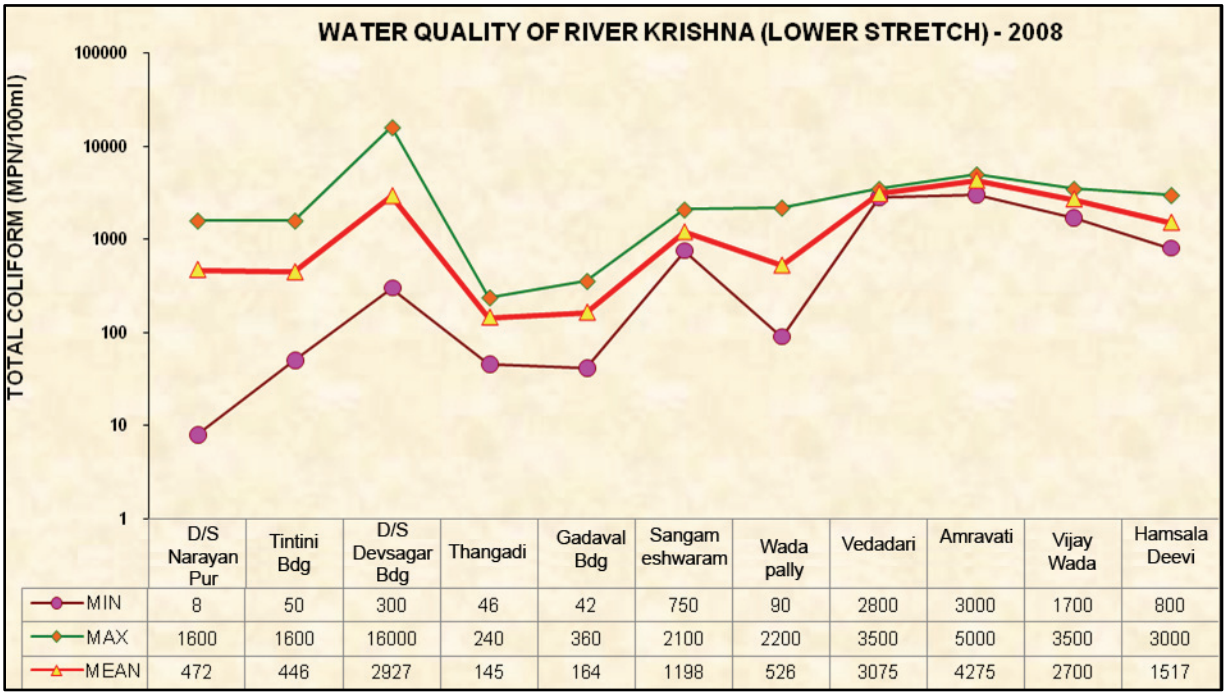
Figure 16.2: Water Quality of River Krishna (Lower Stretch)



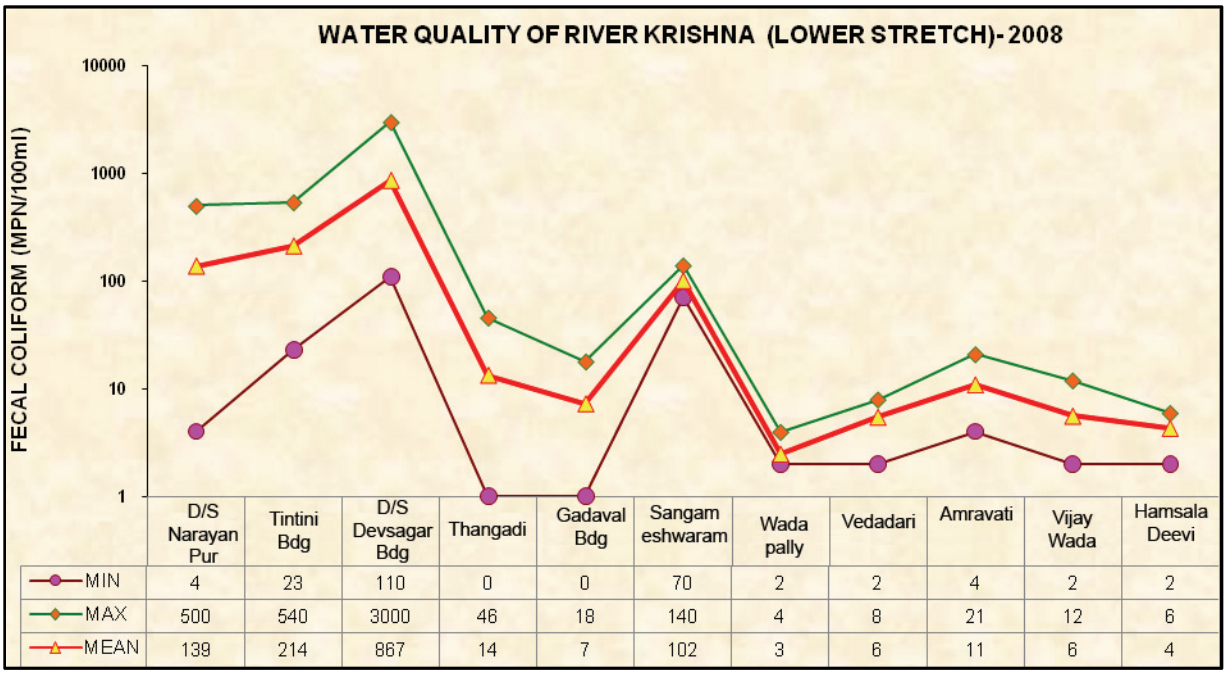
	D/S Narayan Pur	Tintini Bdg	D/S Devsagar Bdg	Thangadi	Gadaval Bdg	Sangam eshwaram	Wada pally	Vedadari	Amravati	Vijay Wada	Hamsala Deevi
MIN	0.2	0.5	1.0	2.0	1.5	2.0	0.6	0.8	0.6	0.8	0.5
MAX	3.2	3.3	3.4	5.0	3.1	3.2	8.0	1.8	3.4	2.0	2.0
MEAN	1.4	1.4	1.7	3.1	2.1	2.7	1.8	1.5	1.9	1.3	1.1



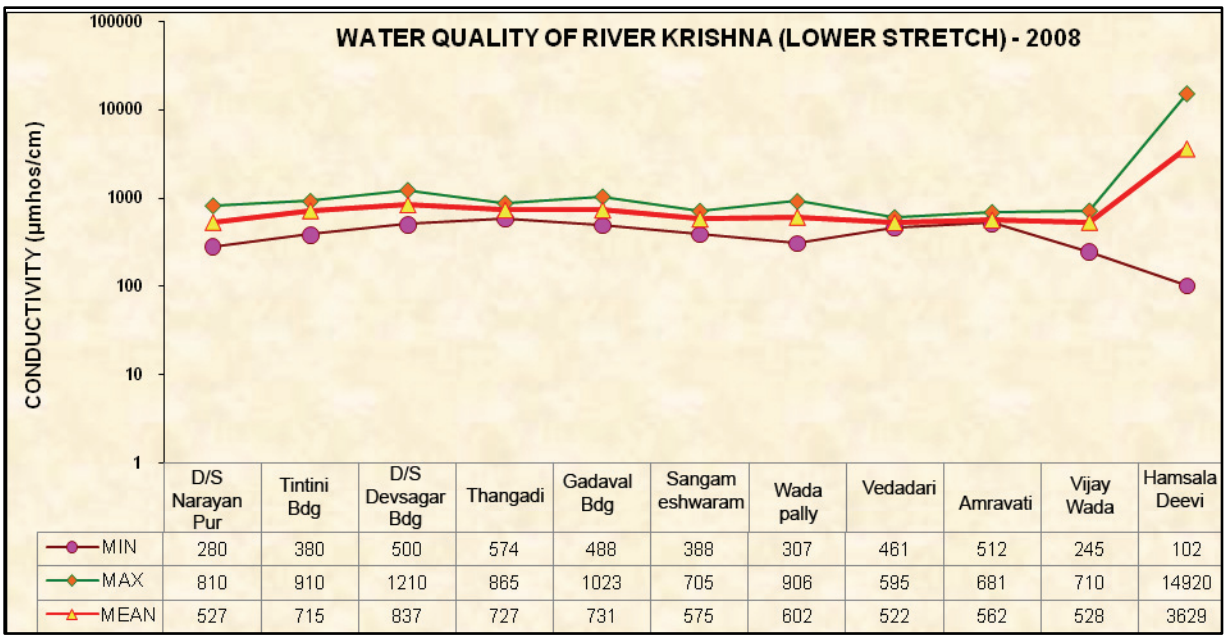
	D/S Narayan Pur	Tintini Bdg	D/S Devsagar Bdg	Thangadi	Gadaval Bdg	Sangam eshwaram	Wada pally	Vedadari	Amravati	Vijay Wada	Hamsala Deevi
MIN	6.3	6.8	6	7	1.1	7	3.1	7.2	7.4	5.5	5.2
MAX	8.2	8	8	7.8	8.4	7.8	4.5	8.7	9.8	9.2	8.6
MEAN	7.5	7.7	7.2	7.5	6.3	7.3	3.9	7.9	8.4	7.5	7.0



	D/S Narayan Pur	Tintini Bdg	D/S Devsagar Bdg	Thangadi	Gadaval Bdg	Sangam eshwaram	Wada pally	Vedadari	Amravati	Vijay Wada	Hamsala Deevi
MIN	8	50	300	46	42	750	90	2800	3000	1700	800
MAX	1600	1600	16000	240	360	2100	2200	3500	5000	3500	3000
MEAN	472	446	2927	145	164	1198	526	3075	4275	2700	1517



	D/S Narayan Pur	Tintini Bdg	D/S Devsagar Bdg	Thangadi	Gadaval Bdg	Sangam eshwaram	Wada pally	Vedadari	Amravati	Vijay Wada	Hamsala Deevi
MIN	4	23	110	0	0	70	2	2	4	2	2
MAX	500	540	3000	46	18	140	4	8	21	12	6
MEAN	139	214	867	14	7	102	3	6	11	6	4



	D/S Narayan Pur	Tintini Bdg	D/S Devsagar Bdg	Thangadi	Gadaval Bdg	Sangam eshwaram	Wada pally	Vedadari	Amravati	Vijay Wada	Hamsala Deevi
MIN	280	380	500	574	488	388	307	461	512	245	102
MAX	810	910	1210	865	1023	705	906	595	681	710	14920
MEAN	527	715	837	727	731	575	602	522	562	528	3629

16.2.2 Water quality of tributary streams Panchganga and Bhima

The water quality of tributary streams Panchganga and Bhima indicates that pH ranges from 6.4-8.8. The conductivity ranges from 86 to 3870 µmhos/cm. The higher value of conductivity is observed in River Panchganga at U/s of Kolhapur Town (3870 µmhos/cm) in Maharashtra. DO varies from 0.6 to 7.6 mg/l. The minimum value of DO is observed in River Bhima (0.6 mg/l) at Pune U/s Vithalwadi in Maharashtra. The BOD ranges from 1.0 to 40.0 mg/l. The maximum value of BOD (40.0 mg/l) is observed in River Bhima at Pune D/s, Bundgarden in Maharashtra. The locations viz. Bhima at Pune U/s Vithalwadi (28.2 mg/l), Takli (19.4 mg/l), A/c with Daunt (18.4 mg/l), Narsinghpur D/s after confluence with river Nira (16.2 mg/l) & Pargaon A/c with Mula- Mutha (16.0 mg/l) and Panchganga at Kolhapur Town (5.0 mg/l) & Shirol (3.8 mg/l) in Maharashtra are potentially polluted having higher BOD levels. The Faecal Coliform ranges from 2–90,000 MPN/100ml whereas the Total Coliform ranges from 2-1,60,000 MPN/100ml. The maximum number of Total Coliform (1,60,000 MPN/100ml) and Faecal Coliform (90,000 MPN/100ml) is observed in River Bhima at Ferozabad D/s followed by Bhima at D/s of Road Bridge at Gangapur Village, Confluence of Jewargi Town Sewage Disposal Point (90,000 & 30,000 MPN/100ml) and D/s of Bdg. near Yadgir (24,000 & 5000 MPN/100ml) in Karnataka. The water quality of tributary streams Panchganga and Bhima during the year is given in Annexure-I Table.16.2.

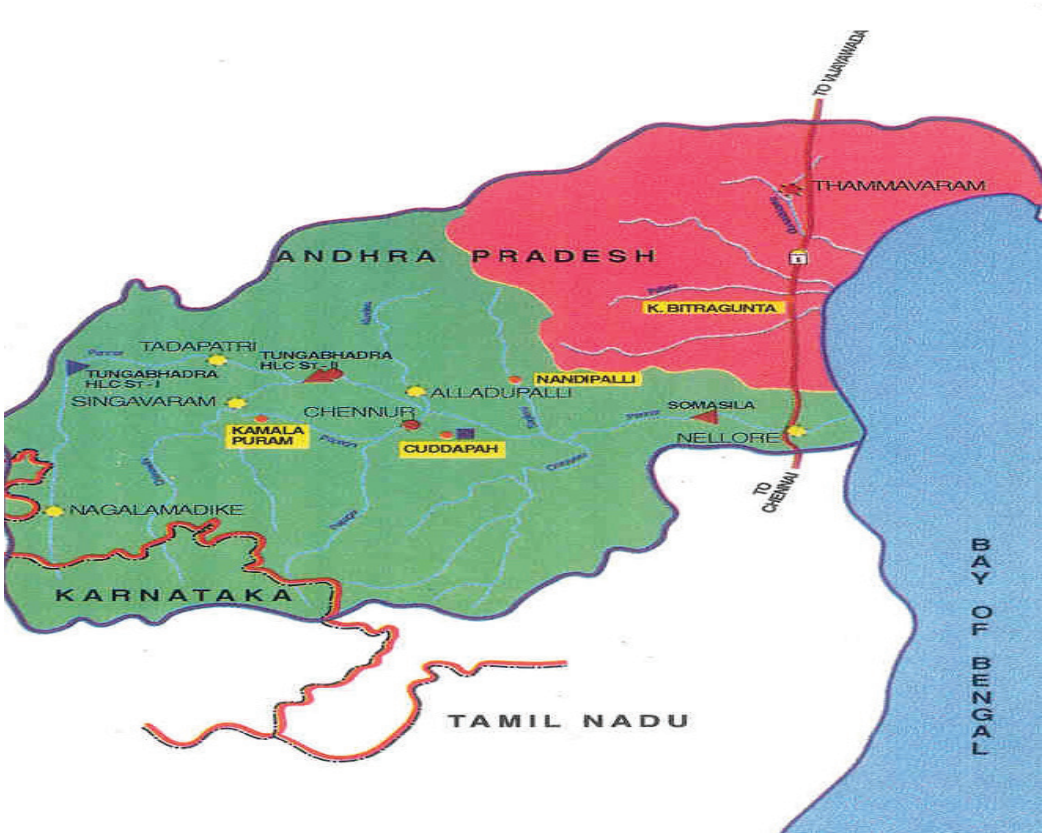
16.2.3 Water Quality of tributary streams Ghatprabha, Malprabha, Nira, Tunghabhadra, Tungha, Bhadra, Musi, Palleru, Muneru, Chandrabhaga, Kagina, Venna, Koyna, Mula, Mutha, Mula-Mutha, Pawana, Indrayani, Nakkavagu, Kundu, Kinnersani & Hundri

The water quality of tributary streams Ghatprabha, Malprabha, Nira, Tunghabhadra, Tungha, Bhadra, Musi, Palleru, Muneru, Chandrabhaga, Kagina, Venna, Koyna, Mula, Mutha, Mula-Mutha, Pawana, Indrayani, Nakkavagu, Kundu, Kinnersani & Hundri indicates that pH ranges from 6.0- 8.8. The conductivity ranges from 60 to 5390 µmhos/cm. The highest value of conductivity is observed in River Nakkavagu at Bachugudem, Medak (5390 µmhos/cm) in Andhra Pradesh. DO varies from Nil- 11.0 mg/l. The minimum value of DO (Nil) is observed in River Musi D/s at Hyderabad, River Mutha at Sangam Bridge near Ganapathy Ghat, River Mula-Mutha at Mundhawa Bridge, River Mula at Aundh Bridge, Aundgaon and Indrayani River at D/s of Alandigaon, Pune in Maharashtra. The BOD ranges from 0.1 to 50 mg/l in these tributaries.The maximum value of BOD (50 mg/l) is observed in River Mula at Aundh Bridge, Aundgaon in Maharashtra and River Nakkavagu at Bachugudem, Medak in Andhra Pradesh. The other locations where BOD is exceeding the criteria are River Indrayani at D/s of Alandigaon, Pune; River Mula-Mutha at Mundhawa Bridge & River Pawana at Sangavigaon, Pune (36.0 mg/l); River Koyna at Karad (35.5 mg/l); River Mutha at Sangam Bridge near Ganapathy Ghat & River Mula at Harrison Bridge (32.0 mg/l); River Nira at D/s of Jubliant Organosis, Pune (21.2 mg/l) & Sarole bridge on Pune-Bangalore Highway (11.5 mg/l) and River Venna at Varye, Satara (12.0 mg/l) in Maharashtra; River Musi at Nagole, Rangareddy (34.0 mg/l) & D/s Hyderabad (23.0 mg/l); River Chandrabhaga D/s of Pandharpur Town (12.0 mg/l), U/s of Pandharpur Town (10.5 mg/l) & U/s Hyderabad (4.2 mg/l); River Kinnersani A/c of KTPS Ash Pond Effluents, Khmmam (5.0 mg/l); River Kagina at D/s of Sewage Disposal Point (4.0 mg/l); River Hundri at Joharpur(V) near Temple, Kurnool (3.8 mg/l); River Tungabhadra at Kurnool U/s, Bavapuram (3.3 mg/l) and River Kundu at Nandyal near Over Bridge, Kurnool (3.2 mg/l) in Andhra Pradesh and River Tungabhadra at Ullanur (5.2 mg/l); River Bhadra at Bhadravathi D/s (4.4 mg/l) & D/s of KIOCL Road Bridge, Near Holehunnur (3.1 mg/l) and River Malprabha at Water Abstr. Point to Hubli, Dharwar (4.1 mg/l) in Karnataka. The Faecal Coliform ranges from 0–54,000 MPN/100ml whereas the Total Coliform ranges from 4-92,000 MPN/100ml. The maximum number of Total Coliform (92,000 MPN/100ml) and Faecal Coliform (54,000 MPN/100ml) is observed in River Tunghabhadra at Ullanur in Karnataka. The water quality of tributary streams of River Krishna during the year is given in Annexure-I Table.16.3.

CHAPTER XVII

Water Quality of Rivers in Penneru Basin

17.1 Penneru River System



The Penneru basin extends over an area of 55,213 sq km. Located in Peninsular India, it covers areas in the States of Karnataka and Andhra Pradesh. The total length of the river from the head to its outfall into the sea is 597 km of which about 61 km are in Karnataka and the balance of 536 km is in Andhra Pradesh.

The principal tributaries of the river are the Jayamangali, the Kunderu and the Sagilery from the left and the Chitravati, the Papagni and the Cheyyeru from the right.

The Penneru river has the lowest average flow, due to low annual average rainfall. The meagre water wealth of the basin has been utilized only for limited irrigational use, and additional support had to be obtained from the adjoining R.Krishna through the Kurnool-Cuddapah (K.C.) and Tungabhadra canals. The Penneru and

its tributaries do not have enough flow to support direct abstraction for larger towns so; infiltration-wells are used for most of the riverside towns. Only Nandyal town abstracts from the K.C. canal.

Major industries situated on the banks of the Penneru river are Paper Mills, Straw Board and Sugar industry. The pollution abatement measures like sewage treatment plants for treating municipal wastewater and effluent treatment plants for industries should be established so that indiscriminate discharge of raw effluent directly into the river body shall not interfere with the designated best uses of the river Penneru.

The basin area of Penneru is covering the States of Karnataka and Andhra Pradesh. The important urban centres in Andhra Pradesh are Proddatur, Hindupur, Anantapur, Cuddapah, Nellore, Nandyal, Dharmavarm, Kadiri, Madanapalle, Rayachoti and Tadipatri.

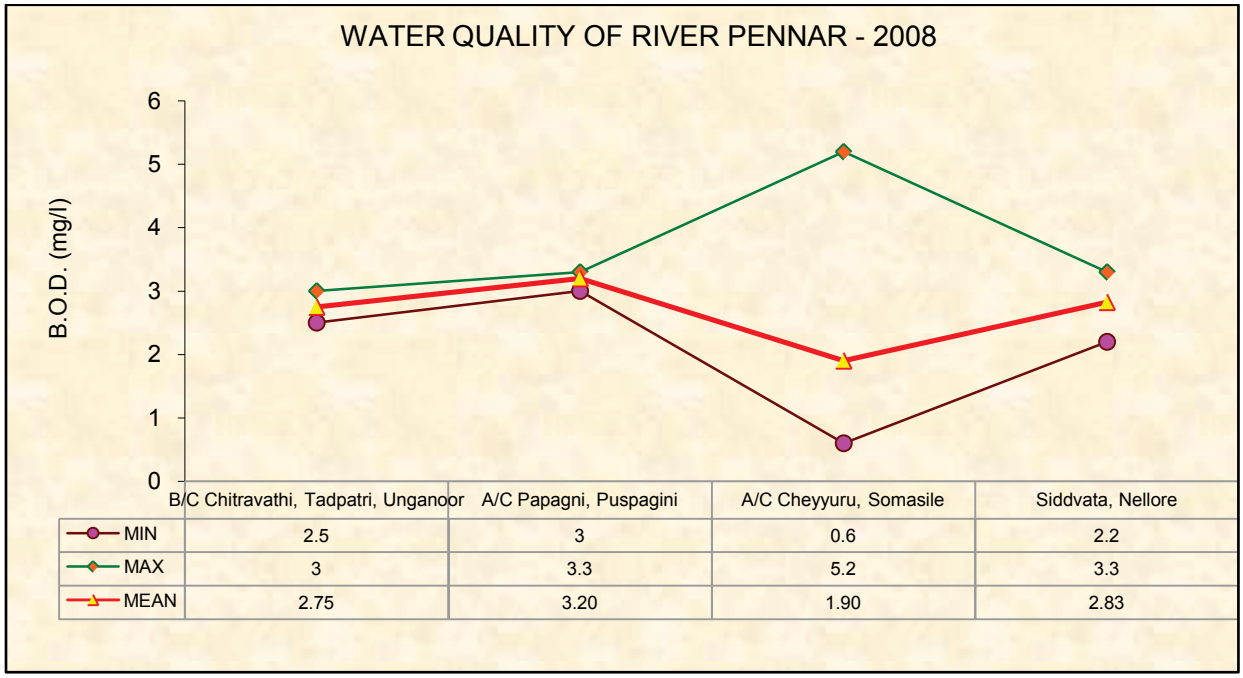
17.2 Water Quality Monitoring in Penneru Basin

The water quality monitoring of the River Penneru are being done in the basin by the State Pollution Control Board of Andhra Pradesh at 5 locations. The monitoring locations are on mainstream of River Penneru (5). The ranges of water quality observed in Penneru Basin with respect to pH, Conductivity, DO, BOD, COD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

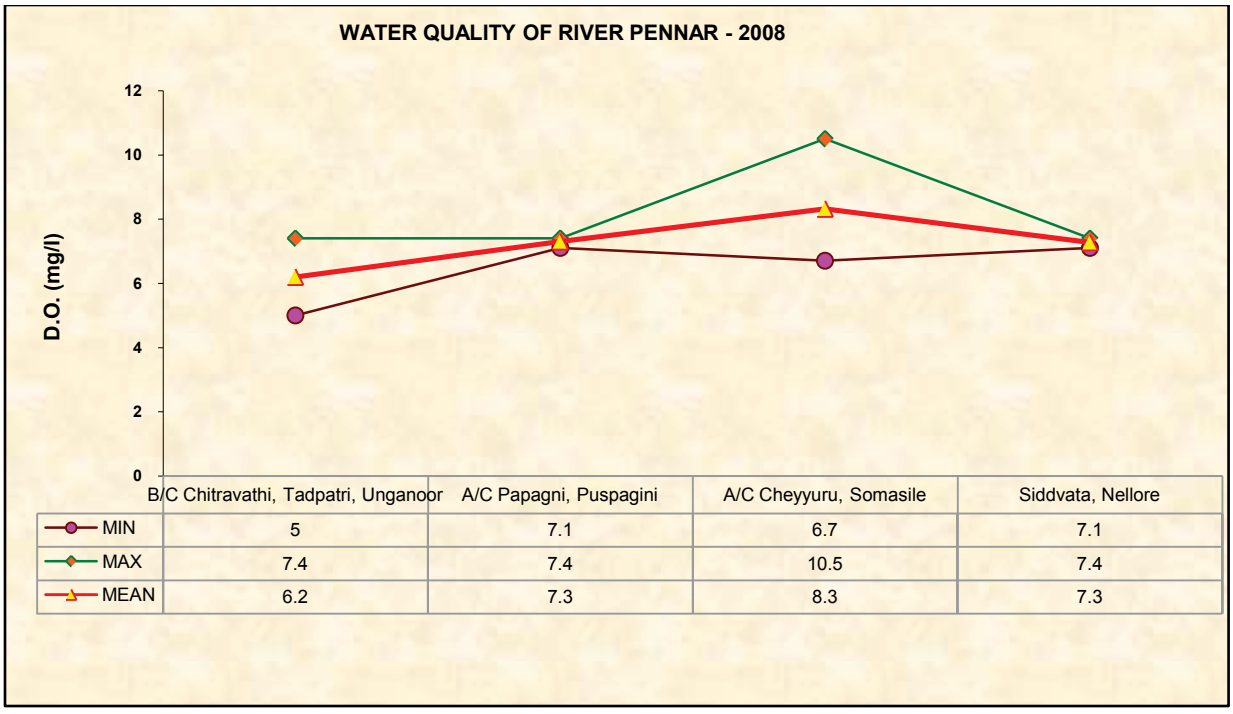
17.2.1 Water Quality of River Penneru

The water quality observed at four locations on Penneru River indicates that pH, Conductivity and BOD are meeting the desired water quality criteria at all locations. DO is observed in the range of 5.0-10.5 mg/l, whereas the BOD varies from 0.6-5.2 mg/l. The higher values of BOD are observed at A/c Cheyyuru, Somasile (5.2 mg/l), A/c Papagni, Puspagini and at Siddvata, Nellore (3.3 mg/l). The Total Coliform varies from 22-3500 MPN/100ml. The conductivity ranges from 226-1173 µmhos/cm. The water quality status of the River Penneru is given in Annexure-I Table 17.1. The water quality status of mainstream of River Penneru with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in Figure 17.1.

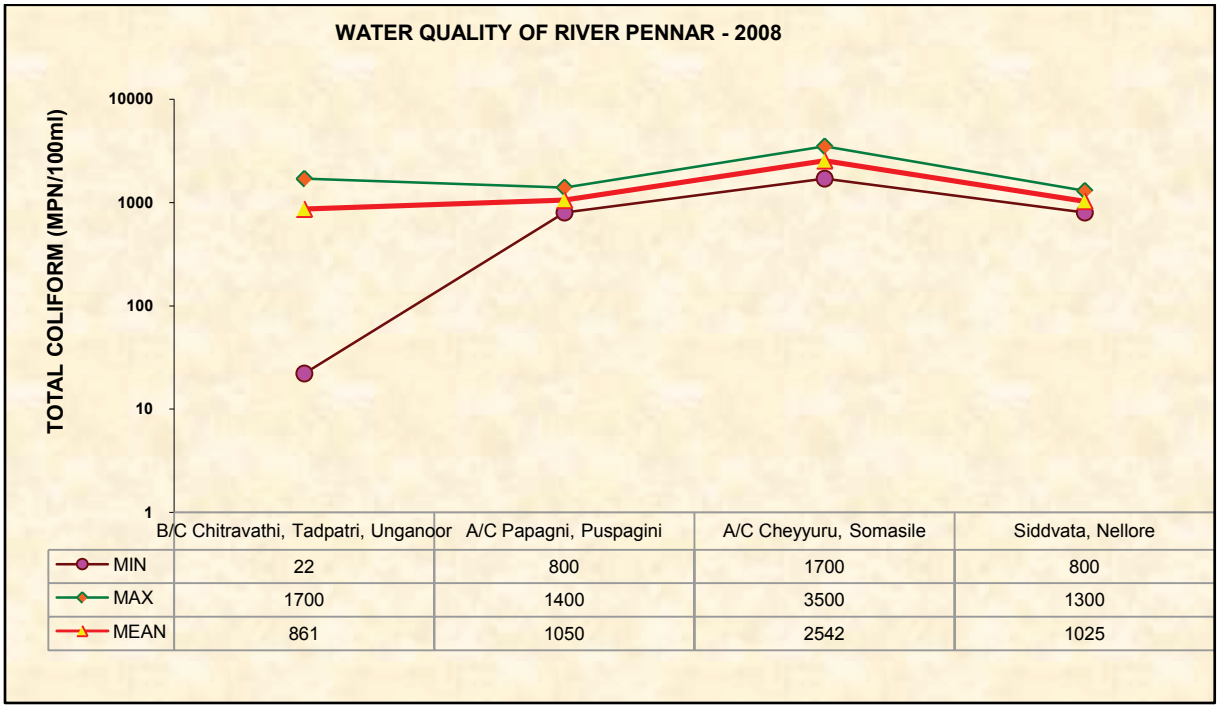
Figure 17.1: Water Quality of River Pennar



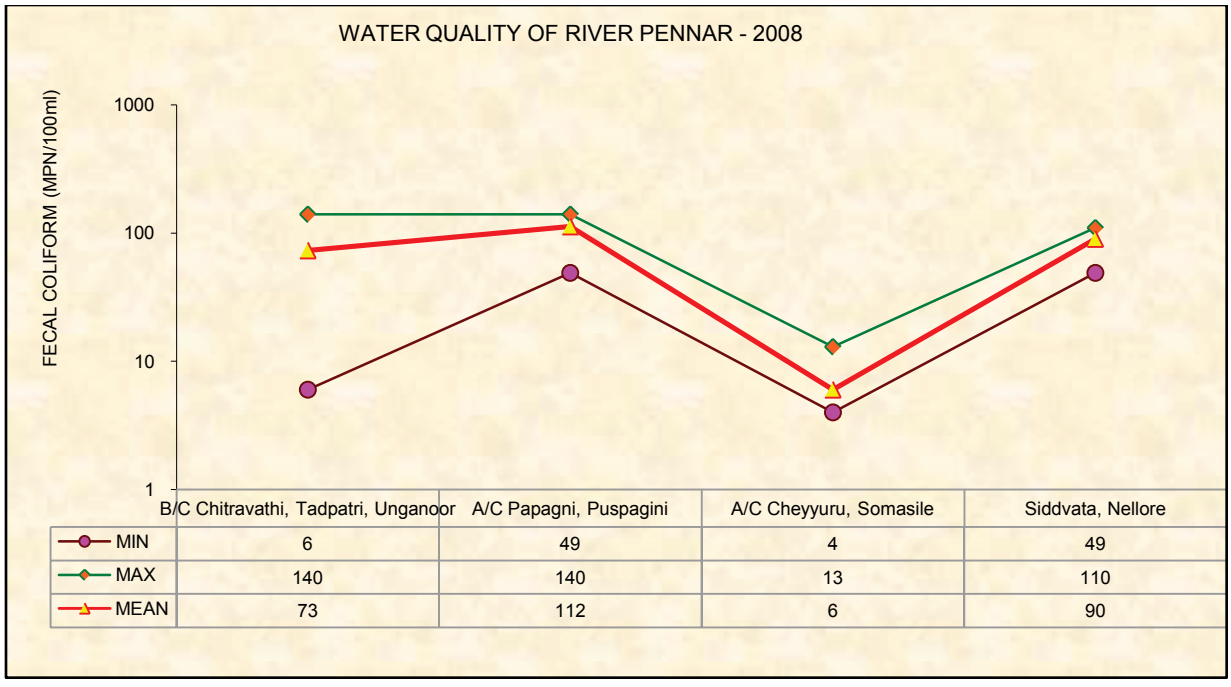
	B/C Chitravathi, Tadpatri, Unganoor	A/C Papagni, Puspagini	A/C Cheyyuru, Somasile	Siddvata, Nellore
MIN	2.5	3	0.6	2.2
MAX	3	3.3	5.2	3.3
MEAN	2.75	3.20	1.90	2.83



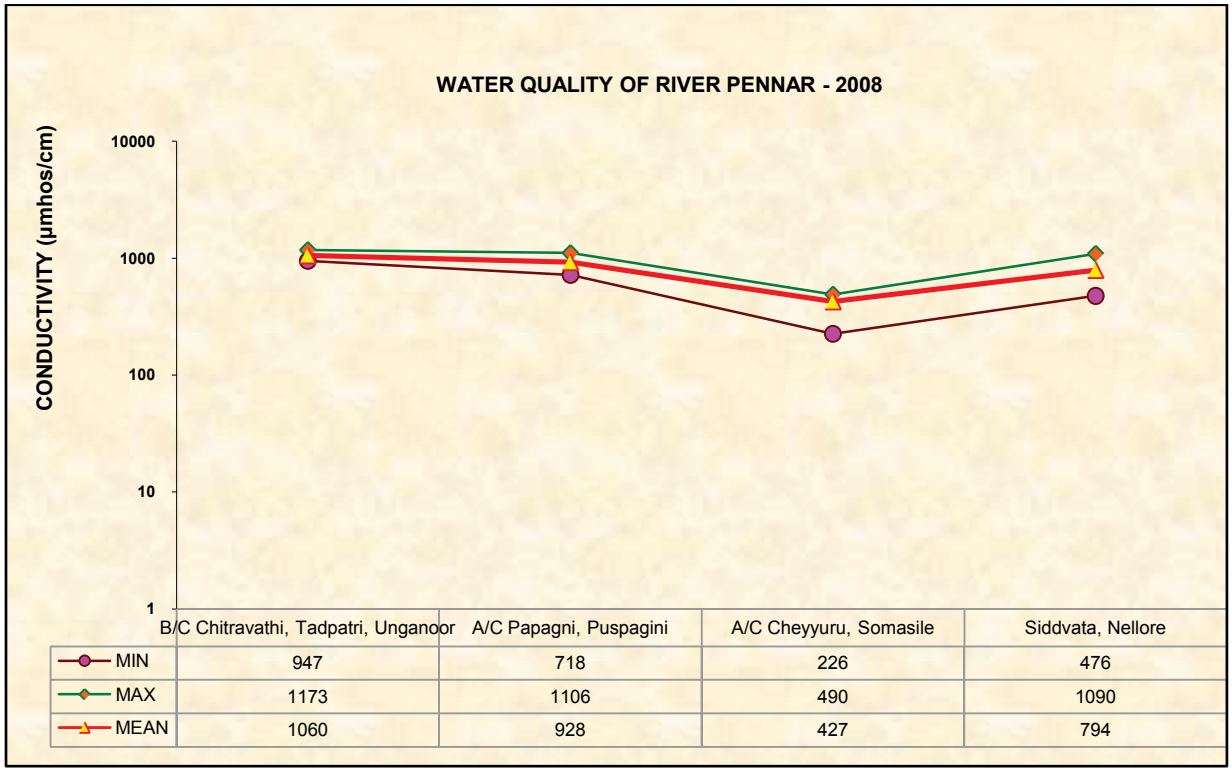
	B/C Chitravathi, Tadpatri, Unganoor	A/C Papagni, Puspagini	A/C Cheyyuru, Somasile	Siddvata, Nellore
MIN	5	7.1	6.7	7.1
MAX	7.4	7.4	10.5	7.4
MEAN	6.2	7.3	8.3	7.3



	B/C Chitravathi, Tadpatri, Unganoor	A/C Papagni, Puspagini	A/C Cheyyuru, Somasile	Siddvata, Nellore
MIN	22	800	1700	800
MAX	1700	1400	3500	1300
MEAN	861	1050	2542	1025



	B/C Chitravathi, Tadpatri, Unganoor	A/C Papagni, Puspagini	A/C Cheyyuru, Somasile	Siddvata, Nellore
MIN	6	49	4	49
MAX	140	140	13	110
MEAN	73	112	6	90



	B/C Chitravathi, Tadpatri, Unganoor	A/C Papagni, Puspagini	A/C Cheyyuru, Somasile	Siddvata, Nellore
MIN	947	718	226	476
MAX	1173	1106	490	1090
MEAN	1060	928	427	794

CHAPTER XVIII

Water Quality of Rivers in Cauvery Basin

18.1 Cauvery River System

The Cauvery Basin extends over an area of 87,900 sq km in the States of Kerala, Karnataka and Tamil Nadu. The total length of the river from the head to its outfall into the sea is 800 km of which about 320 km are in Karnataka 416 km in Tamil Nadu and the remaining length of 64 km forms the common boundary between the States of Karnataka and Tamil Nadu.

The important tributaries, which join the Cauvery within the Karnataka State, are the Harangi, the Hemavati, the Shimsha and the Arkavati on the north (left bank) and the Lakshmantirtha, the Kabani or Kapila and the Suvarnavati on the south (right bank). In the south (right bank), they are the Bhavani, the Noyil and the Amaravati. The delta of Kaveri is so matured that the main river Kaveri has virtually lost its link with the sea, while Coleroon, the main distributaries, bears the brunt of the burden of flow. Like other rivers of South India, the Kaveri too has a rather limited water wealth because of moderate to low rainfall in the basin.

The basin area of Cauvery is covering the States of Karnataka and Tamil Nadu,

The important urban centres in these states are Tumkur, Mandya, Mangalore, Mysore, Hassan, Bangalore, Channapatna, Dod, Ballapur, Ramanagaram, in Karnataka; Karaikal in Pondichery; Valparai, Tamilnadu, Pollachi, Coimbatore, Erode, Thanjavur, Karur, Tiruchirappalli, Salem, Kumbakonam, Bhavani, Chidambaram,Coonoor, Devershola, Mannargudi, Mayiladuthurai, Mettuppalaiyam Nagappattinam, Pattukkottai, Pudukkottai, Tiruchengodu, Udhagamandalam, Udumalaippettai, Villupum in Tamil Nadu. Industrial activity is also high in this basin, particularly in the Bangalore area (Karnataka) and the towns Mettur and Coimbatore in the Tamil Nadu State, followed by the districts of Mysore and Mandya in Karnataka and Periyar and Salem in Tamil Nadu.

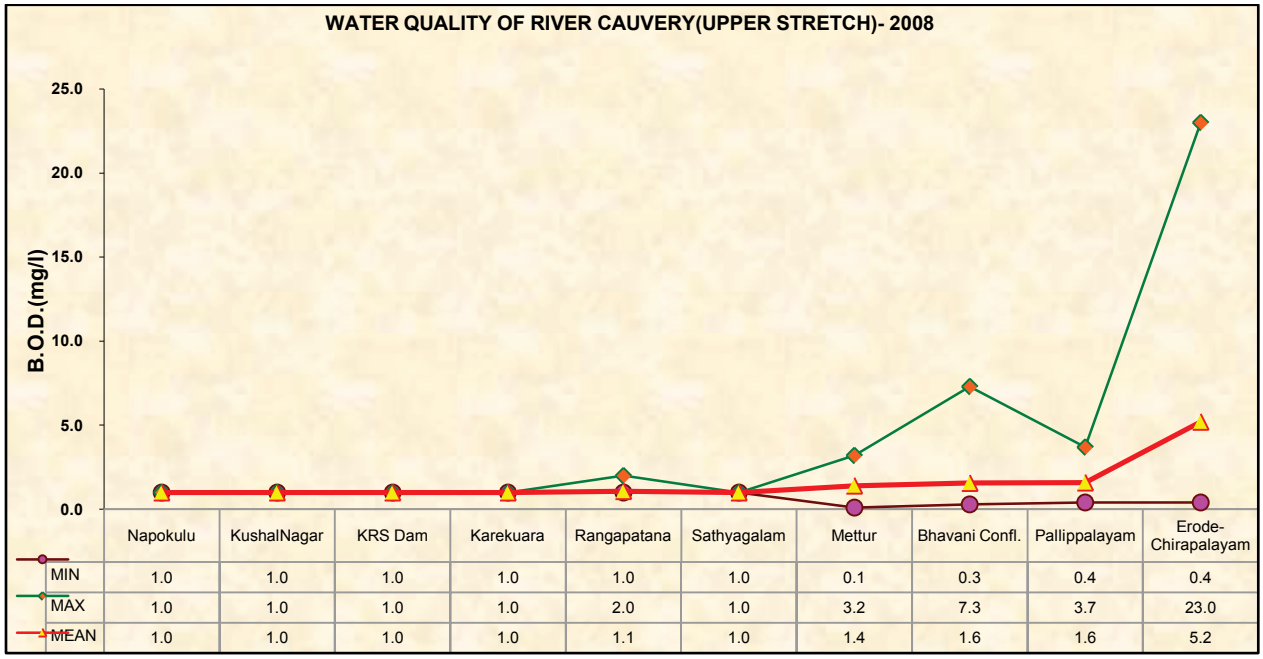
18.2 Water Quality Monitoring in Cauvery Basin

The water quality monitoring of the River Cauvery is being done in the basin by the State Pollution Control Board Karnataka, Tamil Nadu and Kerala at 36 locations. The monitoring locations are on mainstream of River Cauvery (20) and on tributaries are- Arkavati (1), Amravati (1), Bhawani (5), Kabbani (4), Laxmantirtha (1), Shimsa (2), Hemavati (1) and Yagachi (1). The ranges of water quality observed in Cauvery basin with respect to pH, Conductivity, DO, BOD, COD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

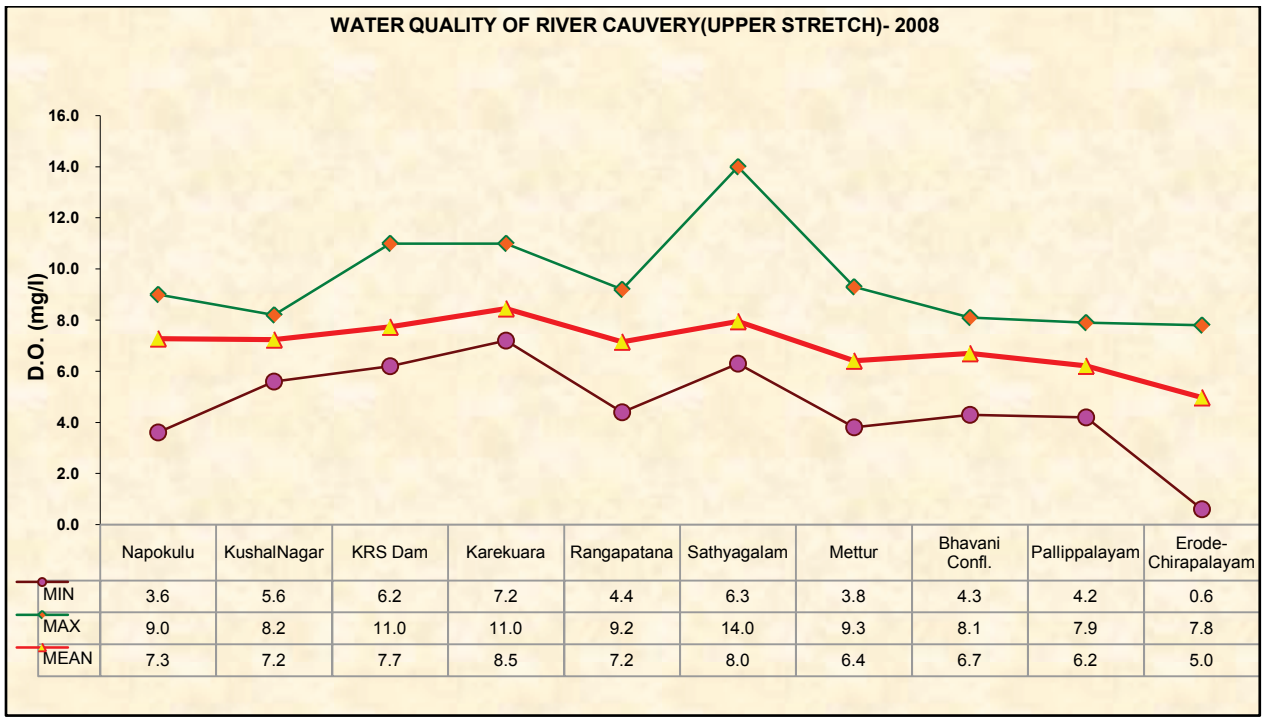
18.2.1 Water Quality of River Cauvery

The Water Quality of River Cauvery at twenty locations indicates that DO is in the range of 0.6-14.0 mg/l and the minimum value is observed at Erode near Chirapalayam in Tamil Nadu. The water quality is meeting the desired water quality criteria at all locations in respect of Conductivity, pH and Total Coliform except Pitchavaram in Tamil Nadu. The BOD varies from 0.1-23 mg/l and the maximum value of BOD (23.0 mg/l) observed at Erode near Chirapalayam. Other locations having higher BOD are Trichy, Grand Anaicut (7.8 mg/l), 1Km D/s of Bhavani River Confluence (7.3 mg/l), Pallipalayam (3.7 mg/l) and Mettur & Pitchavaram (3.2 mg/l). Conductivity in the river varies from 27-28,700 µmhos/cm. The high value of Conductivity is observed at Pitchavaram (28, 700 µmhos/cm). The water quality of River Cauvery is presented in Annexure-I Table 18.1. The water quality status of River Cauvery with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in Figure 18.1 & 18.2.

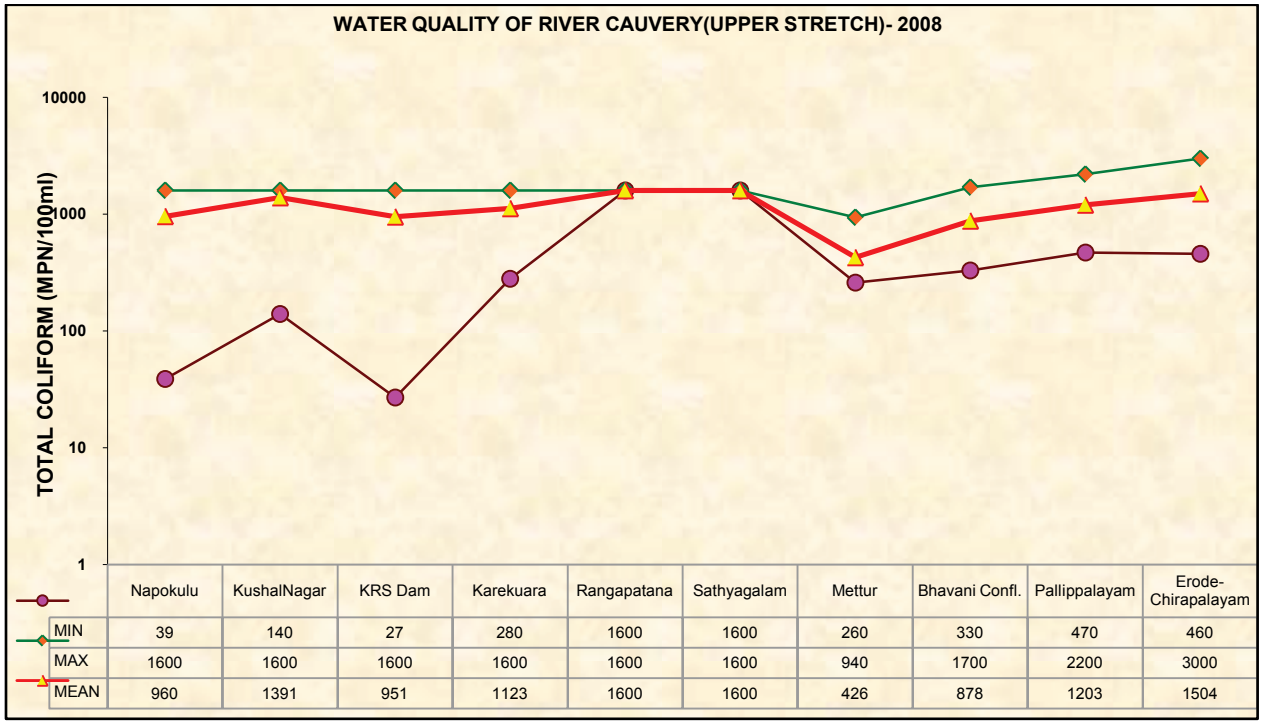
Figure 18.1: Water Quality of River Cauvery (Upper Stretch)



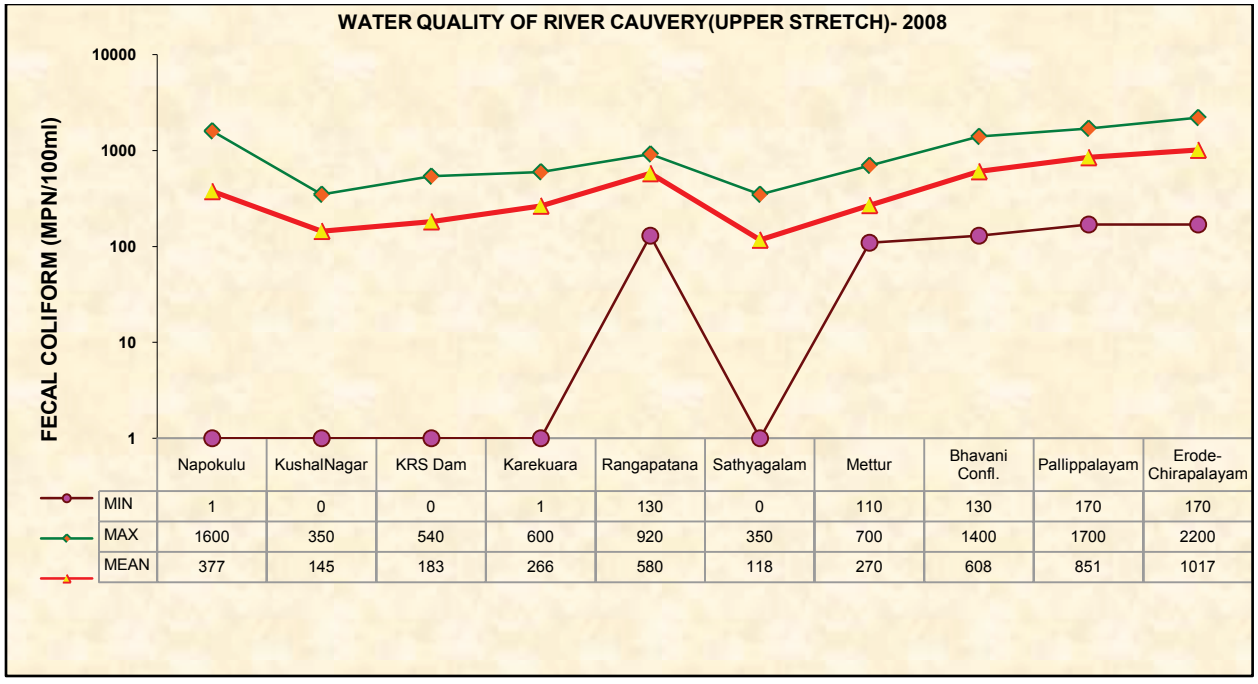
	Napokulu	KushalNagar	KRS Dam	Karekuara	Rangapatana	Sathyagalam	Mettur	Bhavani Confl.	Pallippalayam	Erode-Chirapalayam
MIN	1.0	1.0	1.0	1.0	1.0	1.0	0.1	0.3	0.4	0.4
MAX	1.0	1.0	1.0	1.0	2.0	1.0	3.2	7.3	3.7	23.0
MEAN	1.0	1.0	1.0	1.0	1.1	1.0	1.4	1.6	1.6	5.2



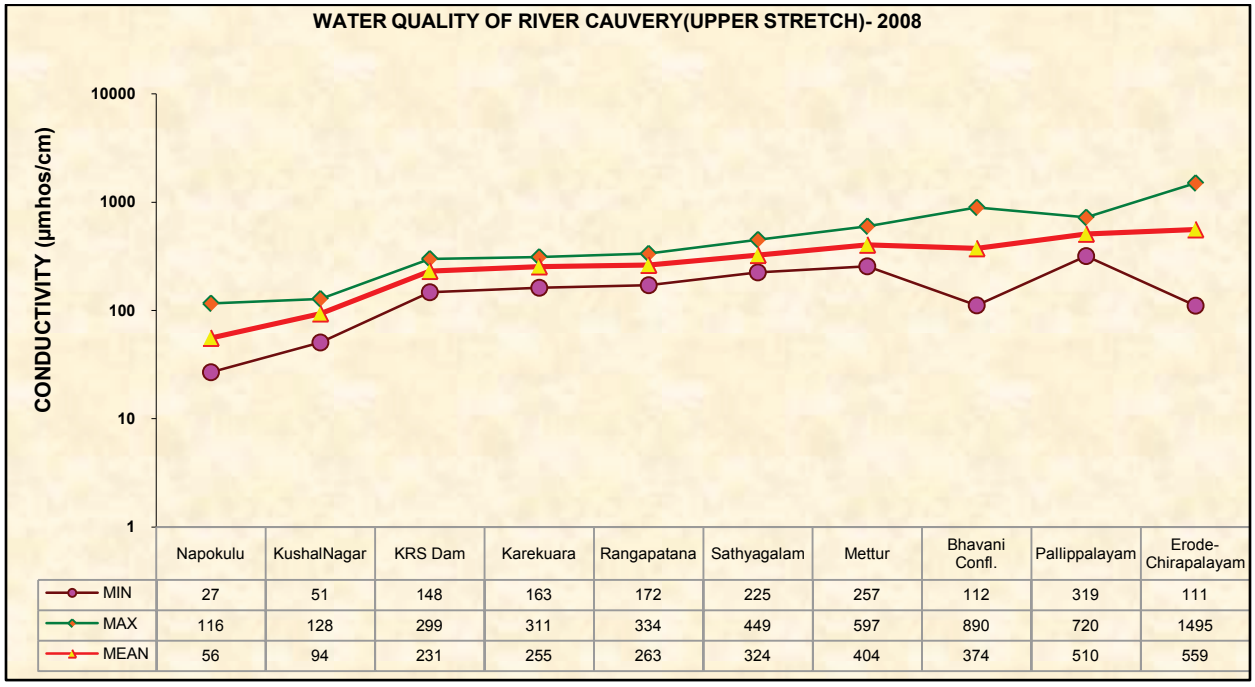
	Napokulu	KushalNagar	KRS Dam	Karekuara	Rangapatana	Sathyagalam	Mettur	Bhavani Confl.	Pallippalayam	Erode-Chirapalayam
MIN	3.6	5.6	6.2	7.2	4.4	6.3	3.8	4.3	4.2	0.6
MAX	9.0	8.2	11.0	11.0	9.2	14.0	9.3	8.1	7.9	7.8
MEAN	7.3	7.2	7.7	8.5	7.2	8.0	6.4	6.7	6.2	5.0



	Napokulu	KushalNagar	KRS Dam	Karekuara	Rangapatana	Sathyagalam	Mettur	Bhavani Confl.	Pallippalayam	Erode-Chirapalayam
MIN	39	140	27	280	1600	1600	260	330	470	460
MAX	1600	1600	1600	1600	1600	1600	940	1700	2200	3000
MEAN	960	1391	951	1123	1600	1600	426	878	1203	1504

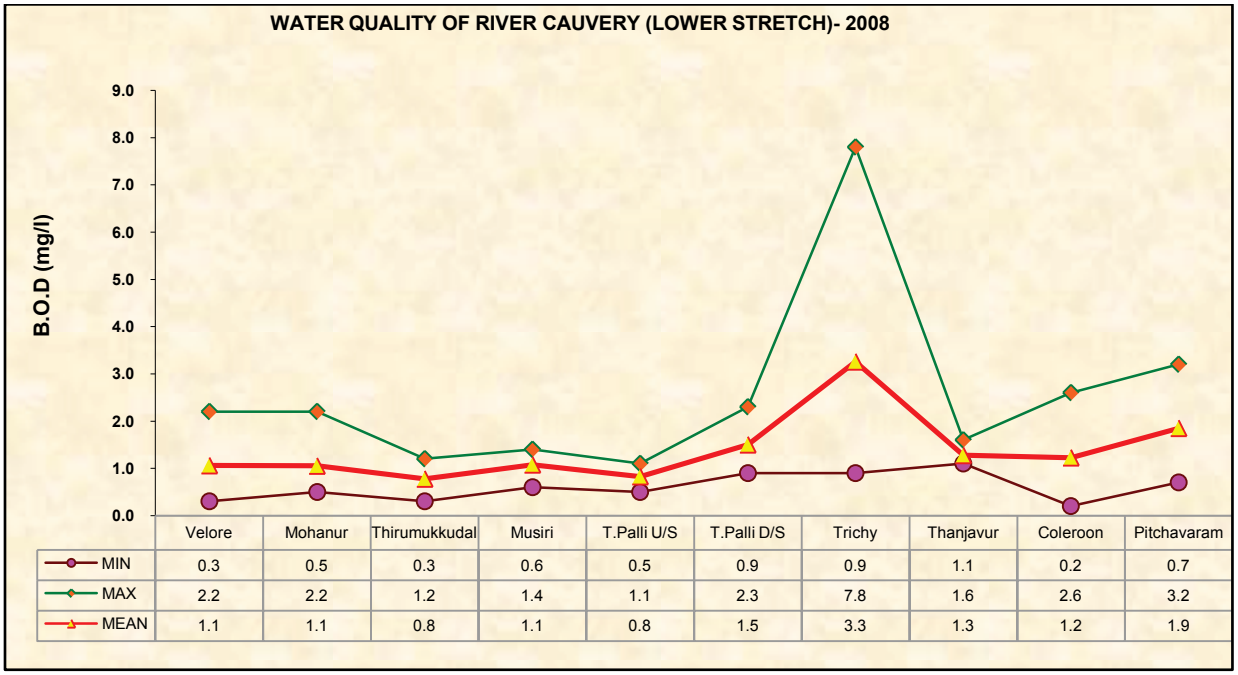


	Napokulu	KushalNagar	KRS Dam	Karekuara	Rangapatana	Sathyagalam	Mettur	Bhavani Confl.	Pallippalayam	Erode-Chirapalayam
MIN	1	0	0	1	130	0	110	130	170	170
MAX	1600	350	540	600	920	350	700	1400	1700	2200
MEAN	377	145	183	266	580	118	270	608	851	1017

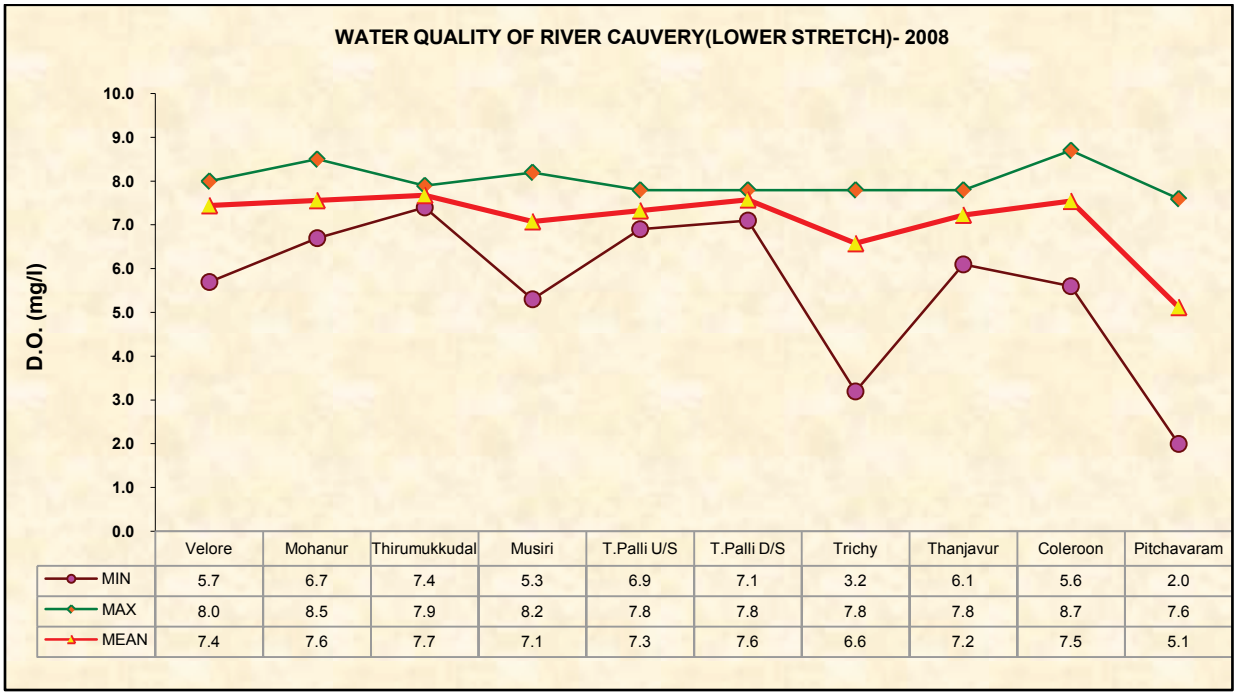


	Napokulu	KushalNagar	KRS Dam	Karekuara	Rangapatana	Sathyagalam	Mettur	Bhavani Confl.	Pallippalayam	Erode-Chirapalayam
MIN	27	51	148	163	172	225	257	112	319	111
MAX	116	128	299	311	334	449	597	890	720	1495
MEAN	56	94	231	255	263	324	404	374	510	559

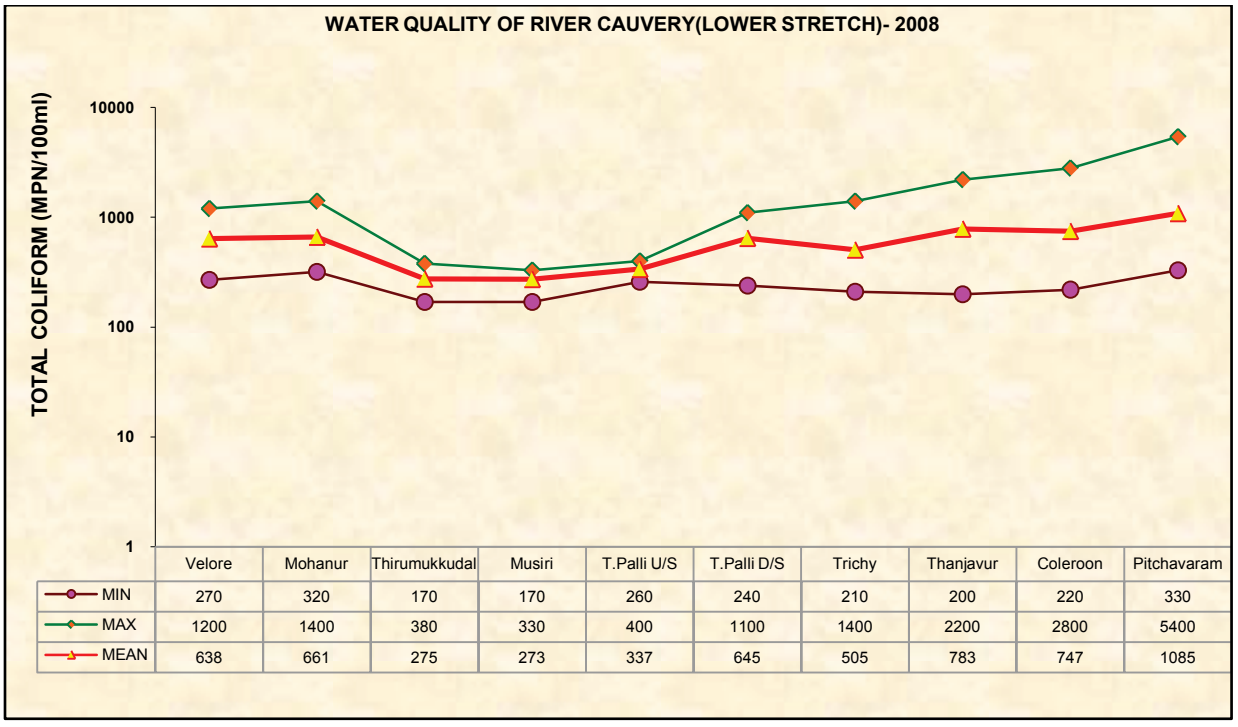
Figure 18.2: Water Quality of River Cauvery (Lower Stretch)



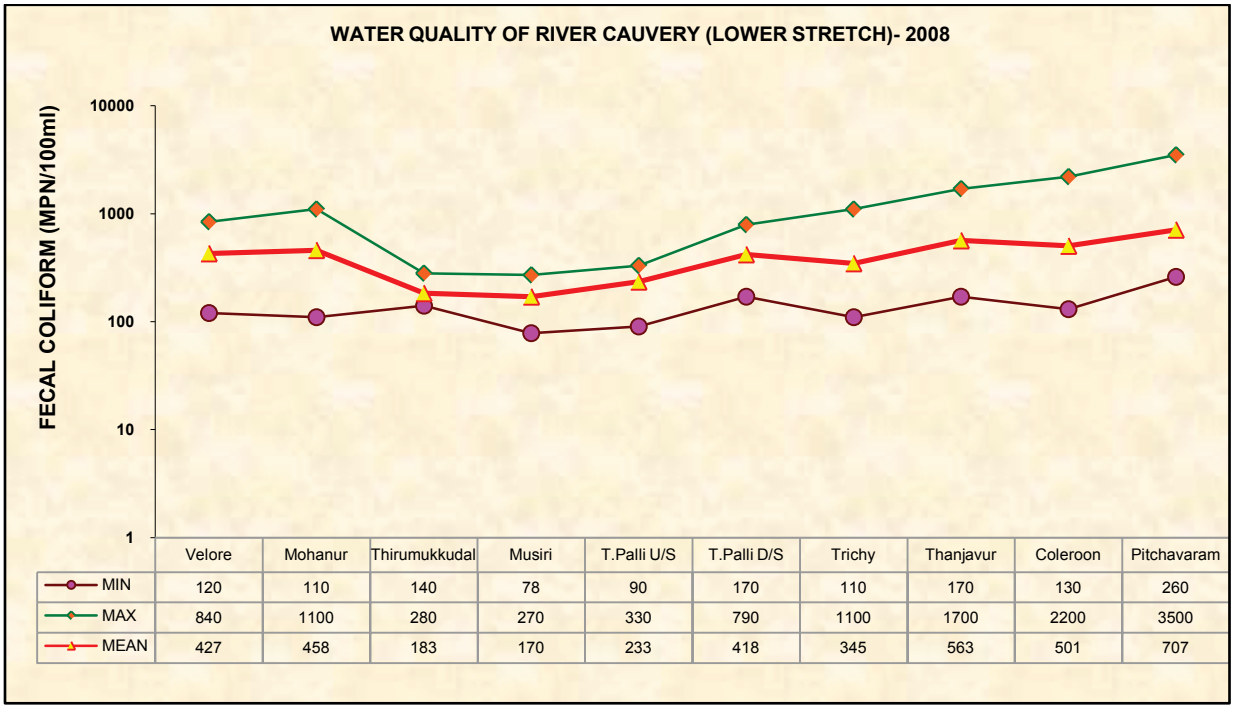
	Velore	Mohanur	Thirumukkudal	Musiri	T.Palli U/S	T.Palli D/S	Trichy	Thanjavur	Coleroon	Pitchavaram
MIN	0.3	0.5	0.3	0.6	0.5	0.9	0.9	1.1	0.2	0.7
MAX	2.2	2.2	1.2	1.4	1.1	2.3	7.8	1.6	2.6	3.2
MEAN	1.1	1.1	0.8	1.1	0.8	1.5	3.3	1.3	1.2	1.9



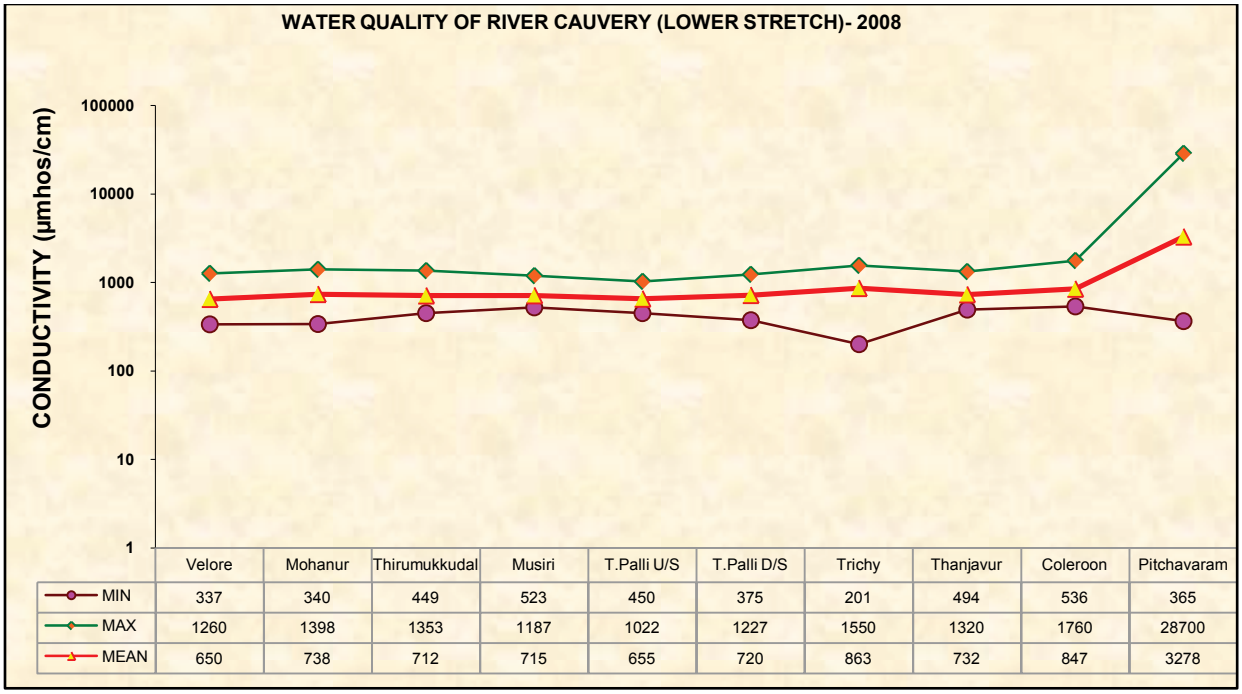
	Velore	Mohanur	Thirumukkudal	Musiri	T.Palli U/S	T.Palli D/S	Trichy	Thanjavur	Coleroon	Pitchavaram
MIN	5.7	6.7	7.4	5.3	6.9	7.1	3.2	6.1	5.6	2.0
MAX	8.0	8.5	7.9	8.2	7.8	7.8	7.8	7.8	8.7	7.6
MEAN	7.4	7.6	7.7	7.1	7.3	7.6	6.6	7.2	7.5	5.1



	Velore	Mohanur	Thirumukkudal	Musiri	T.Palli U/S	T.Palli D/S	Trichy	Thanjavur	Coleroon	Pitchavaram
MIN	270	320	170	170	260	240	210	200	220	330
MAX	1200	1400	380	330	400	1100	1400	2200	2800	5400
MEAN	638	661	275	273	337	645	505	783	747	1085



	Velore	Mohanur	Thirumukkudal	Musiri	T.Palli U/S	T.Palli D/S	Trichy	Thanjavur	Coleroon	Pitchavaram
MIN	120	110	140	78	90	170	110	170	130	260
MAX	840	1100	280	270	330	790	1100	1700	2200	3500
MEAN	427	458	183	170	233	418	345	563	501	707



	Velore	Mohanur	Thirumukkudal	Musiri	T.Palli U/S	T.Palli D/S	Trichy	Thanjavur	Coleroon	Pitchavaram
MIN	337	340	449	523	450	375	201	494	536	365
MAX	1260	1398	1353	1187	1022	1227	1550	1320	1760	28700
MEAN	650	738	712	715	655	720	863	732	847	3278

18.2.2 Water Quality of tributary streams Yagachi, Hemavati, Shimsa, Akravati, Lakshmantirtha, Kabbani, Bhavani and Amravati

The water quality of tributary streams Yagachi, Hemavati, Shimsa, Akravati, Lakshmantirtha, Kabbani, Bhavani and Amravati indicates that pH, Conductivity and DO is meeting the water quality criteria at all the locations except Lakshmantirtha at D/s of Hunsur Town (0.7 mg/l) and Kabbani at Water Intake of KIADB, Nanjangud (1.8 mg/l) in Karnataka. The BOD values ranges from 0.2-7.6 mg/l and the higher values are observed in River Bhavani at Bhavani Sagar (7.6 mg/l) & Bhavani (6.8 mg/l) in Tamil Nadu and Lakshmantirtha at D/s of Hunsur Town (5.1 mg/l) in Karnataka. The Faecal Coliform ranges from 0-1600 MPN/100ml whereas the Total Coliform ranges from 140-1800 MPN/100ml. The water quality of tributaries of River Cauvery is given in Annexure-I Table 18.2

CHAPTER XIX

Water Quality of Medium and Minor Rivers, Canals and Creeks

19.1 Medium and Minor River System

The rivers and streams having catchment area less than 20,000 km^2 are categorized as medium and minor rivers. The medium and minor rivers are mainly confined to the coastal tract of India and are flowing in the States of Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Orissa, Andhra Pradesh, Haryana, Himachal Pradesh, Punjab, Rajasthan, Manipur, Meghalaya, Mizoram and Tripura; and Union Territory of Daman and Diu and Pondicherry.

19.2 Water Quality of Medium and Minor Rivers in Gujarat & Daman

The water quality monitoring of River Damanganga, Baleshwar Khadi, Purna, Kaveri, Dhadar, Ambika, Kolak, Amlakhadi, Mindhola, Bhadar, Bhogavo and Triveni Sangam in Gujarat & Daman is carried out by the respective State Pollution Control Boards. In River Damanganga DO varies from 1.2 mg/l to 7.6 mg/l and BOD is observed in the range of 0.1 mg/l to 30 mg/l. The BOD is observed 46 mg/l in River Amlakhadi A/c of wastewater from Ankleshwar. The higher values of BOD are observed in River Bhogavo (max. 50 mg/l), River Kolak (max. 12 mg/l), River Mindhola (max. 12 mg/l), River Dhadar (9.0 mg/l), Baleshwar Khadi (max. 4.5 mg/l), River Purna (max. 4.3 mg/l), River Ambika (max. 4.2 mg/l) and Triveni Sangam (max. 3.5 mg/l). The Conductivity is found very high in Triveni Sangam near Somnath Temple, Veraval in Junagarh (55,300 µmhos/cm), River Damanganga at Kanchigaon D/s (33,600 µmhos/cm), River Kolak at railway bridge in Vapi (31,500 µmhos/cm), River Kaveri on bridge at Billimora-Valsad road (24,990 µmhos/cm), River Ambika at Billimora (14,555 µmhos/cm), River Bhogavo at Surendranagar D/s (11,500 µmhos/cm), Amlakhadi A/c of wastewater from Ankleshwar (3080 µmhos/cm) and River Kolak at Patiala Bridge (2585 µmhos/cm). The Feacal & Total Coliform are observed higher than the desired criteria in River Mindhola at state Highway Bridge, Sachin (11,00,000 & 4,60,000 MPN/100ml), Baleshwar Khadi at N.H.No. 8 (4,60,000 & 2,10,000 MPN/100ml), River Purna on bridge at Surat-Navsari Highway (2,40,000 & 93,000 MPN/100ml), River Ambika at Bilimora (2,10,000 & 1,50,000 MPN/100ml), River Kaveri at Bilimora-Valsad road (46,000 & 24,000 MPN/100ml) and River Amlakhadi A/c of wastewater from Ankleshwar (9000 & 3000 MPN/100ml). The water quality status of rivers in Gujarat is presented in Annexure-I Table 19.1.

19.3 Water Quality of Medium and Minor Rivers in Goa and Maharashtra

The State Pollution Control Board of Goa carries out the water quality monitoring of River Zuari, Mandovi, Kalna, Valvant, Madai, Khandepar, Talpona, Bicholim, Chapora, Mapusa, Sal, Kushawati and Assonora. The water quality of all the mentioned rivers in Goa is meeting the desired water quality criteria in respect of DO, Conductivity and pH at all the locations however Total Coliform and BOD is meeting the desired water quality criteria most of the locations except River Mandovi at Tonca, Marcela (BOD-4.4 mg/l) and River Bicholim at Varzan Nagar, Bicholim (BOD-3.2 mg/l & TC-5400 MPN/100ml).

The water quality monitoring of River Ulhas, Bhatsa, Kalu, Patalganga, Savitri, Mithi, Vashisti and Kundalika is carried out by the State Pollution Control Board of Maharashtra. All the rivers are meeting the desired water quality criteria with respect to pH, Conductivity and Total Coliform except conductivity in River Mithi (55,830 µmhos/cm) and River Savitri at Ovale Village (20,350 µmhos/cm). DO varies from Nil- 7.5 mg/l. The minimum value of DO (Nil) is observed in River Ulhas at NRC Bund, Mohane, U/s of Badlapur & Jhambul Water Works; River Bhatsa at D/s of Pise Dam and River Mithi. BOD is observed in the range of 1.6-50 mg/l and the higher values are observed in River Kundalika at Arekhurd (max. 50mg/l) & Roha city (max. 6.5 mg/l); River Mithi (max. 50 mg/l); River Patalganga near intake of MIDC Water works (9.0 mg/l) & Shilphata (6.0 mg/l); Kalu at Atale Village (max. 7.5 mg/l); River Ulhas at Jhambul water Works (max. 7.5 mg/l), NRC Bund at Mohane (5.5 mg/l) & U/s of Badlapur (5.0 mg/l) and River Bhatsa at D/s of Pise Dam (max. 4.0 mg/l). The Total Coliform is meeting the criteria limit at all the locations. The water quality status of rivers in Goa and Maharashtra is presented in Annexure-I Table 19.2.

19.4 Water Quality of Medium and Minor Rivers in Kerala

The water quality monitoring of River Periyar, Chaliyar, Kallada, Muvattapuzha, Chalakudy, Karmana, Pamba, Meenachil, Manimala, Achenkoil, Vamanapuram, Amaravila, Ayur, Thirurangady, Kuttiyady, Valayum, Kuppam, Hosdurg, Kakkadavu, Padiyathadka, Neyyar, Mamom, Ayroor, Ithikkara, Pallickal, Karuvannur, Puzhackal, Keecheri, Thirur, Kadalundi, , Kallai, Corapuzha, Thallassery, Ancharakandy, Ramapuram, Peruvamba, Kavvai, Neeleswaram, Pullur, Mogral, Shriya, Uppala, Manjeswar, Korayar, Bharatapuzha, Kadambyar & Irupanam in Kerala is carried out by the State Pollution Control Board of Kerala. The DO does not meet the criteria in River Karmana at Moonnattumukku (0.0 mg/l), Kadambyar at Brahmapuram (0.4 mg/l) & Manckakadavu (1.4 mg/l), Irupanamn (1.9 mg/l), Ayroor at Ayroor Bridge (1.9 mg/l), Korayar at Kanjhikode

(2.3 mg/l) and Pamba Down (3.4 mg/l). The value of BOD varies from 0.1 mg/l to 11.0 mg/l. All the monitoring locations in Kerala on Medium and Minor River are having 3 mg/l BOD or less except Karmana at Moonnattumukku (11.0 mg/l); Puzhackal at Puzhackal Bridge (4.0 mg/l); Kadambyar at Brahmapuram (4.0 mg/l) & Manckakadavu (3.2 mg/l) and Periyar at Pathalam (3.1 mg/l) that indicates about the relatively low concentration of organic matter in water bodies. The Total and Faecal Coliform is observed in the range of 0-56,000 MPN/100ml and Nil-44,000 MPN/100ml with maximum in Karmana at Moonnattumukku. The conductivity observed high in River Hosdurg (44,000 µmhos/cm), Kallai at Kallai Bridge (35,300 µmhos/cm), Chaliyar at Chungapally (19,790 µmhos/cm), Kuppam at Thaliparamba (18,000 µmhos/cm), Periyar at Alwaye (8730 µmhos/cm), Corapuzha at Kanyankode (4500 µmhos/cm) and Karmana at Moonnattumukku (3900 µmhos/cm) due to estuarine zone of these rivers on these locations. The water quality status of rivers in Kerala is presented in Annexure-I Table 19.3.

19.5 Water Quality of Medium and Minor Rivers in Andhra Pradesh, Orissa, Pondicherry, Tamilnadu and Karnataka

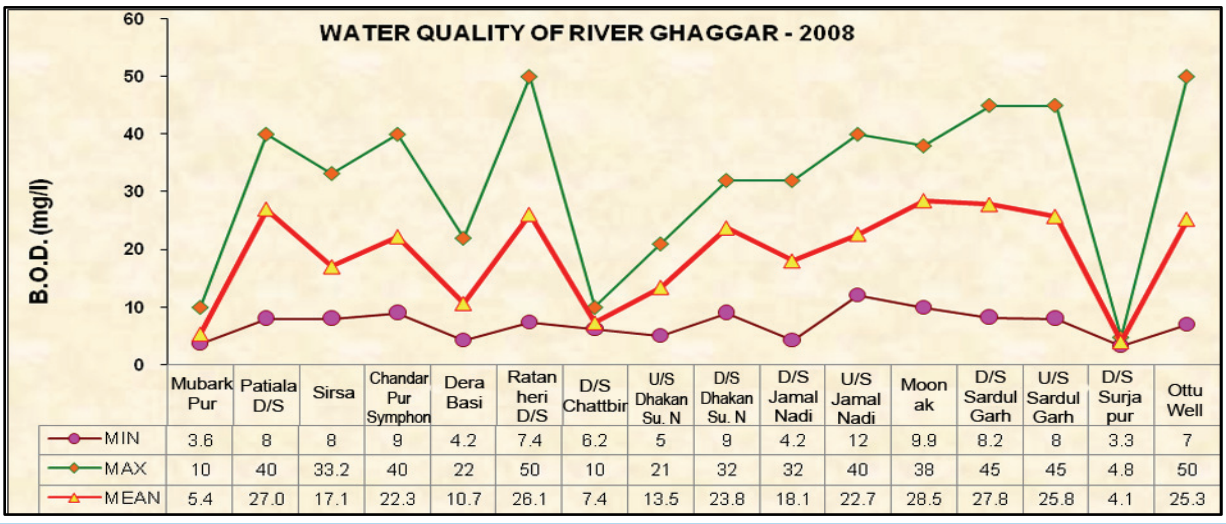
The water quality monitoring of River Nagavalli, Rushikulya, Arasalar, Tambiraparani, Palar, Nethravati, Kumardhara, Vamshadhara and Kali in Andhra Pradesh, Orissa, Pondicherry, Tamilnadu and Karnataka respectively is carried out by the respective State Pollution Control Boards. The pH, Conductivity and DO is meeting the criteria all locations except in River Rushikulya at Ganjam D/s (Conductivity-33,600 µmhos/cm & DO- 3.4 mg/l) in Orissa. BOD varies from 0.0-7.0 mg/l. BOD is observed more than criteria limit in Kali at D/s of West Coast Paper Mill (7.0 mg/l) in Karnataka; Tambiraparani at Murappanadu (4.9 mg/l), Arumuganeri (4.3 mg/l) & Tirunelveli Collectorate (3.3 mg/l) and Palar at Vaniyambadi Water Supply Headworks (4.0 mg/l) in Tamilnadu and Nagavalli at Jaykaypur D/s (3.9 mg/l) in Orissa. The Total and Faecal Coliform are observed in the range of 3-24,000 MPN/100ml and Nil-3400 MPN/100 ml respectively. The critical locations with respect to Coliform levels are River Nagavalli at Thotapalli Regulator (TC-24,000 MPN/100ml) in Andhra Pradesh; Nagavalli at Jaykaypur D/s (TC-5800 & FC-3400 MPN/100ml) in Orissa and Palar at Vaniyambadi Water Supply Headworks (FC-3000 MPN/100ml) in Tamil Nadu. The water quality status of rivers in Andhra Pradesh, Orissa, Pondicherry, Tamilnadu and Karnataka is presented in Annexure-I Table 19.4.

19.6 Water Quality of Medium and Minor Rivers in Himachal Pradesh, Punjab, Haryana and Rajasthan

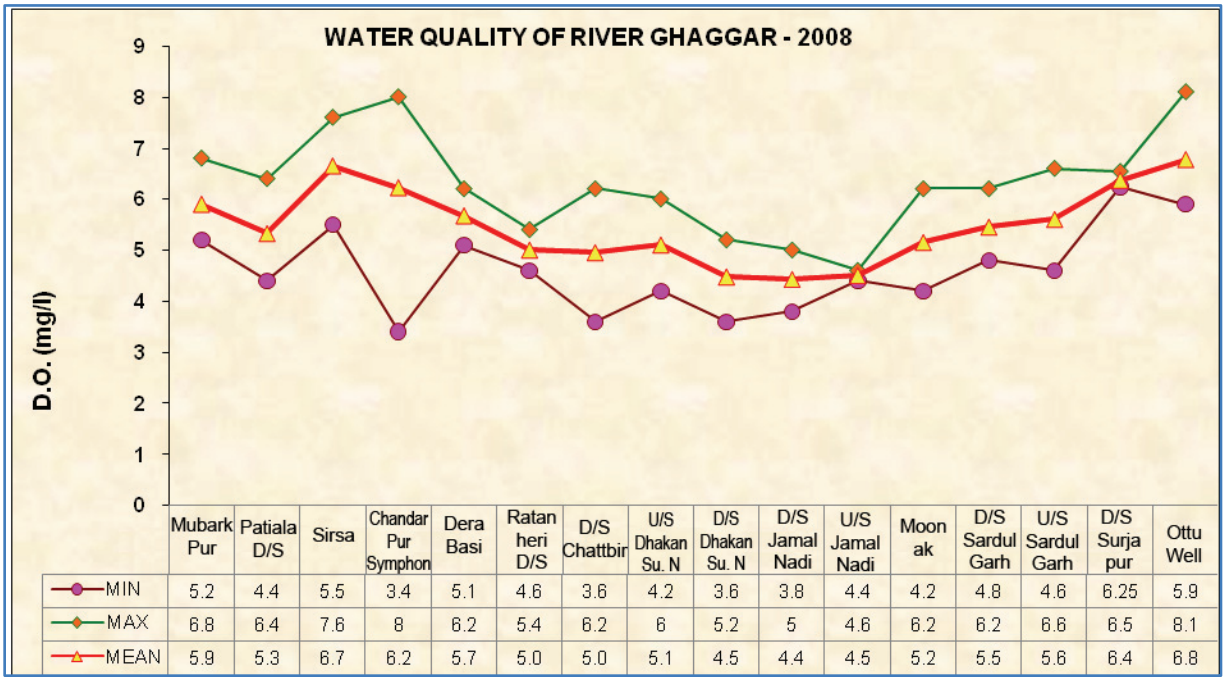
The water quality monitoring of River Ghaggar, Markanda, Sukhana and Kodra Dam in Punjab, Haryana, Himachal Pradesh and Rajasthan is carried out by the

respective State Pollution Control Boards. In River Ghaggar DO varies from 3.4-8.1 mg/l. The low values of DO are observed at Chandrapur Syphon (3.4 mg/l) in Haryana and D/s of Chhatbir, D/s of Dhakanshu Nallah (3.6 mg/l) and D/s of Jharmal Nadi (3.8 mg/l) in Punjab. BOD observed in the range of 3.3-50 mg/l. All the locations in River Ghaggar are grossly polluted. Locations having very high BOD in River Ghaggar are Ottu weir (50.0 mg/l), GH-2 at Chandrapur Syphon (40 mg/l), Road Brdg. Sirsa, Debwali road (33.2 mg/l) and D/s of Surajpur (4.8 mg/l) in Haryana and Ratanheri D/s of Patiala Nadi after confluence (50 mg/l), U/s & D/s Sardulgarh (45 mg/l), U/s of Jharmal nadi & 100m D/s after confluence with river Saraswati, Patiala (40mg/l), Moonak (38 mg/l), D/s of Jharmal nadi & D/s Dhakansu Nallah (32 mg/l), near Bankarpur, Dera Bassi (22 mg/l), U/s of Dhakanshu Nallah (21 mg/l), Mubarakpur Rest House (Patiala) (10 mg/l) and D/s of Chhatbir (4.8 mg/l) in Punjab. The number of Total and Faecal Coliform were in the range of 7000-25, 00,000 MPN/100ml and 700-5, 00,000 MPN/100ml respectively. The river is grossly polluted at majority of monitoring locations due to the discharge of municipal and industrial wastewater. The water quality of tributary stream Markanda at D/s of Kala Amb indicates that the river is grossly polluted due to effluent discharge from Ruchira Paper Mills. The BOD in River Markanda ranges from 0.4 to 590 mg/l and conductivity from 411 to 3640 µmhos/cm. River Sukhana does not meet the criteria limit as the BOD is in the range of 2.8-4.2 mg/l. The water quality of River Kodra is meeting water quality criteria in respect of all parameters except BOD. The water quality status of medium and minor rivers in Punjab, Haryana, Himachal Pradesh and Rajasthan is presented in Annexure-I Table 19.5. The water quality status of River Ghaggar with respect to BOD, DO, Total Coliform, Faecal Coliform and Conductivity is given in Figure 19.1.

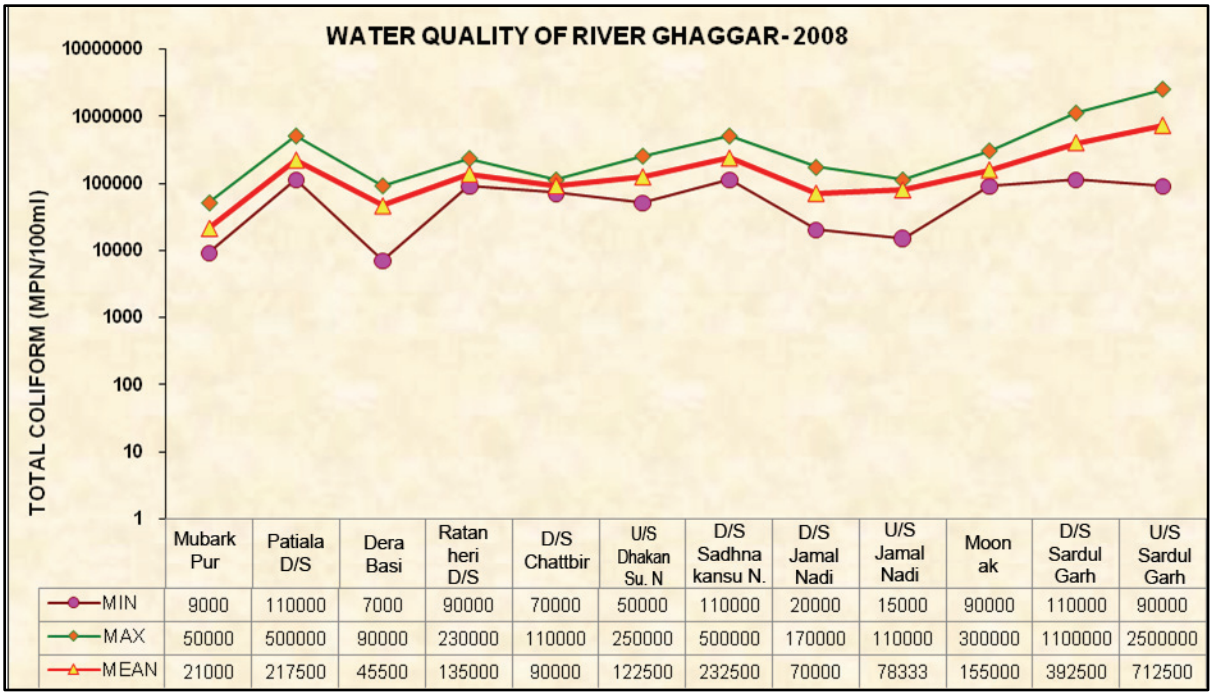
Figure 19.1: Water Quality of River Ghaggar



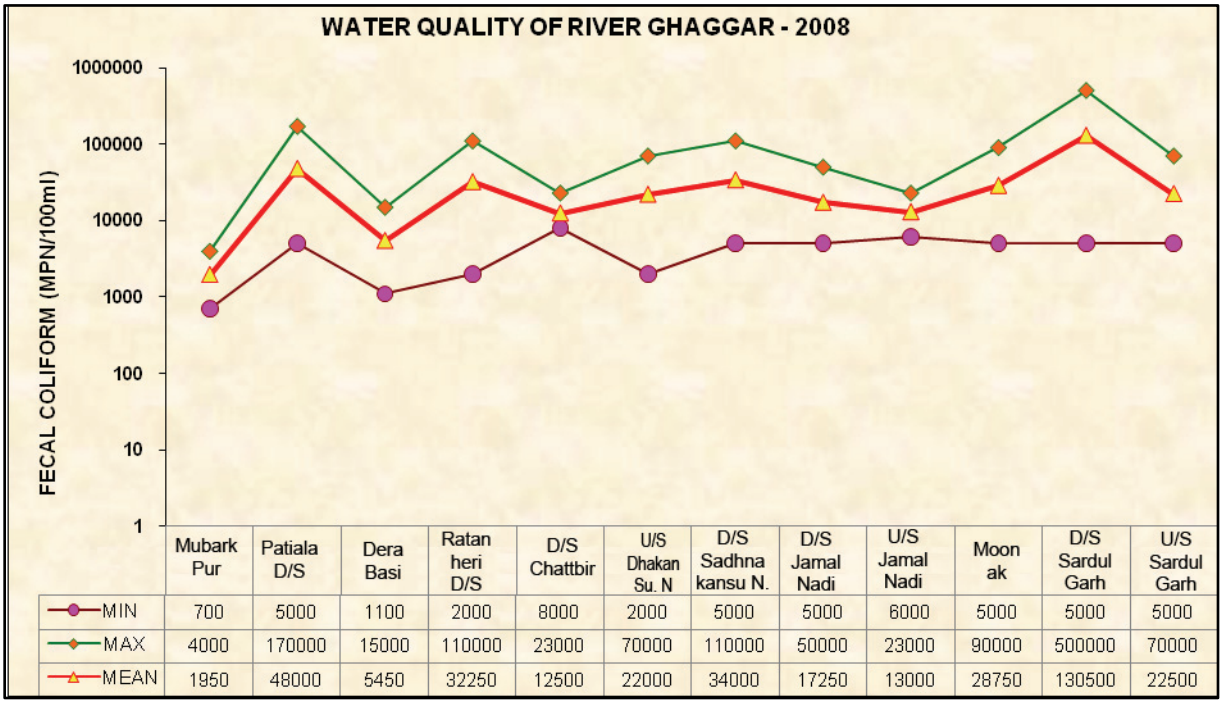
	Mubark Pur	Patiala D/S	Sirsa	Chandar Pur Symphon	Dera Basi	Ratan heri D/S	D/S Chattbir	U/S Dhakan Su. N	D/S Dhakan Su. N	D/S Jamal Nadi	U/S Jamal Nadi	Moon ak	D/S Sardul Garh	U/S Sardul Garh	D/S Surja pur	Ottu Well
MIN	3.6	8	8	9	4.2	7.4	6.2	5	9	4.2	12	9.9	8.2	8	3.3	7
MAX	10	40	33.2	40	22	50	10	21	32	32	40	38	45	45	4.8	50
MEAN	5.4	27.0	17.1	22.3	10.7	26.1	7.4	13.5	23.8	18.1	22.7	28.5	27.8	25.8	4.1	25.3



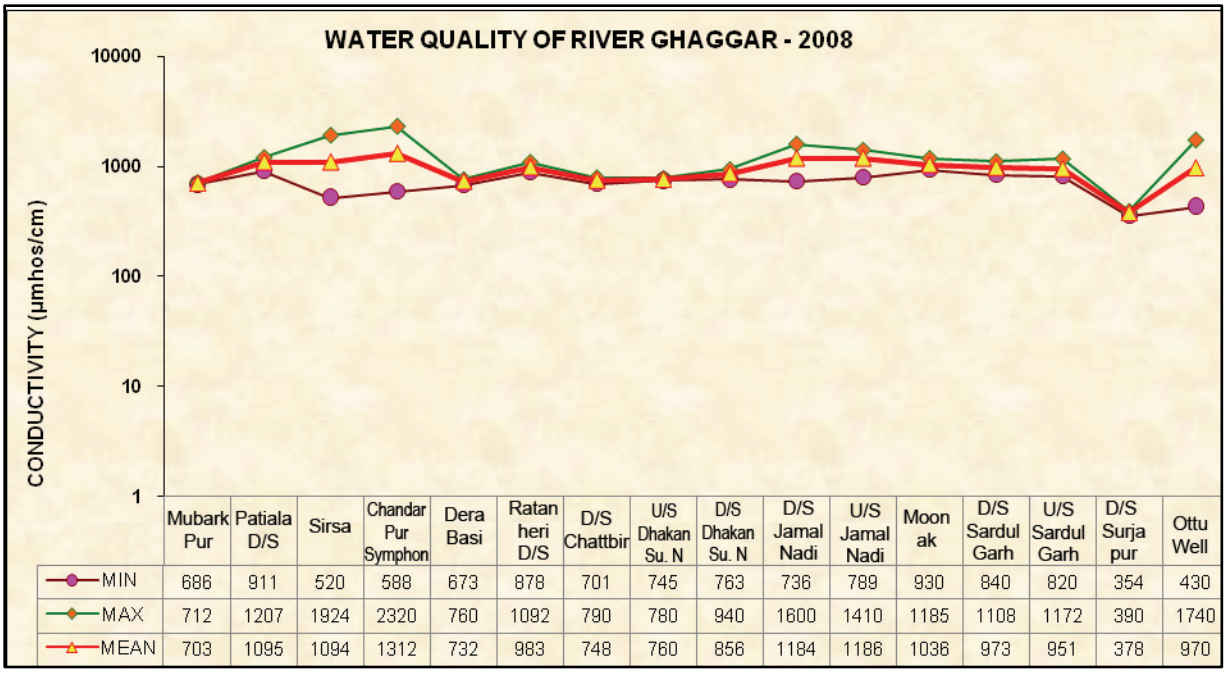
	Mubark Pur	Patiala D/S	Sirsa	Chandar Pur Symphon	Dera Basi	Ratan heri D/S	D/S Chattbir	U/S Dhakan Su. N	D/S Dhakan Su. N	D/S Jamal Nadi	U/S Jamal Nadi	Moon ak	D/S Sardul Garh	U/S Sardul Garh	D/S Surja pur	Ottu Well
MIN	5.2	4.4	5.5	3.4	5.1	4.6	3.6	4.2	3.6	3.8	4.4	4.2	4.8	4.6	6.25	5.9
MAX	6.8	6.4	7.6	8	6.2	5.4	6.2	6	5.2	5	4.6	6.2	6.2	6.6	6.5	8.1
MEAN	5.9	5.3	6.7	6.2	5.7	5.0	5.0	5.1	4.5	4.4	4.5	5.2	5.5	5.6	6.4	6.8



	Mubark Pur	Patiala D/S	Dera Basi	Ratan heri D/S	D/S Chattbir	U/S Dhakan Su. N	D/S Sadhna kansu N.	D/S Jamal Nadi	U/S Jamal Nadi	Moon ak	D/S Sardul Garh	U/S Sardul Garh
MIN	9000	110000	7000	90000	70000	50000	110000	20000	15000	90000	110000	90000
MAX	50000	500000	90000	230000	110000	250000	500000	170000	110000	300000	1100000	2500000
MEAN	21000	217500	45500	135000	90000	122500	232500	70000	78333	155000	392500	712500



	Mubark Pur	Patiala D/S	Dera Basi	Ratan heri D/S	D/S Chattbir	U/S Dhakan Su. N	D/S Sadhna kansu N.	D/S Jamal Nadi	U/S Jamal Nadi	Moon ak	D/S Sardul Garh	U/S Sardul Garh
MIN	700	5000	1100	2000	8000	2000	5000	5000	6000	5000	5000	5000
MAX	4000	170000	15000	110000	23000	70000	110000	50000	23000	90000	500000	70000
MEAN	1950	48000	5450	32250	12500	22000	34000	17250	13000	28750	130500	22500



	Mubark Pur	Patiala D/S	Sirsa	Chandar Pur Symphon	Dera Basi	Ratan heri D/S	D/S Chattbir	U/S Dhakan Su. N	D/S Dhakan Su. N	D/S Jamal Nadi	U/S Jamal Nadi	Moon ak	D/S Sardul Garh	U/S Sardul Garh	D/S Surja pur	Ottu Well
MIN	686	911	520	588	673	878	701	745	763	736	789	930	840	820	354	430
MAX	712	1207	1924	2320	760	1092	790	780	940	1600	1410	1185	1108	1172	390	1740
MEAN	703	1095	1094	1312	732	983	748	760	856	1184	1186	1036	973	951	378	970

19.7 Water Quality of Medium and Minor Rivers in Manipur, Meghalaya, Mizoram and Tripura

The water quality monitoring of River Imphal, Kiyamgio, Minuthong, Iril, Lilong, Tlawing, Tuirial, Umtrew, Kharkhla, Myntdu, Ganol, Khuga, Khujairok, Simsang, Gumti, Nambul and Haora in the states Manipur, Meghalaya, Mizoram and Tripura is carried out by the respective State Pollution Control Boards. The DO meets the criteria at all the locations except in River Nambul at Hump Bridge (2.5 mg/l) and Heirangoithong (3.6 mg/l) in Manipur. The pH is meeting the desired criteria at all the locations. BOD varies from 0.3 to 26 mg/l. The locations having high BOD are River Nambul at Hump Bridge (26 mg/l) and Heirangoithong (24 mg/l) in Manipur; River Kharkhla near Sutnga Khlieriat, Jainti Hills, Meghalaya (7.0 mg/l) and River Gumti at D/s South Tripura (4.0 mg/l) and River Haora Chandrapur, Agartala D/s (3.5 mg/l) in Tripura. River Imphal, Kiyamgio, Minuthong, Iril, Lilong, Tlawing, Tuirial, Umtrew, Myntdu, Ganol, Khuga and Khujairok are meeting the water quality criteria in respect of pH, DO and BOD at all monitoring locations. The Total and Faecal Coliform are meeting the criteria at all the locations on the rivers monitored in North Eastern States. The water quality of Medium and Minor Rivers in Manipur, Meghalaya, Mizoram and Tripura is presented in Annexure-I Table 19.6.

19.8 Water Quality of Creeks, Sea water and Canals

The monitoring locations on creeks in Gujarat, Goa and Maharashtra are one each on Marmugao, Masma Khadi, Amlakhadi, Thane, Mahim and Bassein, two locations on Vashi creeks. The sea water is monitored on four locations in the vicinity of Mumbai in Maharashtra. Gurgaon Canal, Western Yamuna Canal, Cumbarjua Canal, Narmada Main Canal, Tapi Canal at Village Umarwada, Samarla Kota Canal, Tulje Bagh Canal and Katakhal Canal (Agartala Canal) are monitored in Haryana, Goa, Gujarat, Andhra Pradesh and Tripura.

19.8.1 Water Quality of Creeks and Sea water

The water quality of the creeks and sea water with respect to pH, Conductivity, DO, BOD, Total Coliform (TC), Faecal Coliform (FC), Nitrite, Nitrate and Ammonical Nitrogen are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year. DO varies from 0.0 to 7.5 mg/l. BOD observed in the range of 1.2 mg/l to 206 mg/l and most of the values are not meeting the desired criteria except Creek at Dando Mollo,Velsao,

Marmugao. Conductivity is observed very high due to marine water insurgence and it ranges from 574-68,880 µmhos/cm.The Nitrate (NO_3^-) concentrations are in the range of 0.1-5.0 mg/l. The Ammonical Nitrogen concentrations are in the range of 0.0-92 mg/l. The highest concentration of Ammonical nitrogen (92 mg/l) is observed in Amlakhadi Creek at Pungam. The Total and Faecal Coliform count is meeting the criteria limit due to proximity of monitoring locations to sea. The water quality status of the creeks and sea water is presented in Annexure-I Table 19.7.

19.8.2 Water Quality of Canals

The water quality of Gurgaon Canal, Western Yamuna Canal, Cumbarjua Canal, Narmada Main Canal, Tapi Canal at Village Umarwada, Samarla Kota Canal, Tulje Bagh Canal and Katakhal Canal with respect to pH, Conductivity, DO, BOD, Total Coliform (TC), Faecal Coliform (FC), Nitrite, Nitrate and Ammonical Nitrogen are presented as minimum, maximum and mean value to assess the extent of water quality variation of the canals throughout the year. In Western Yamuna Canal DO vary from 0.0 mg/l to 8.7 mg/l and BOD observed in the range of 0.8 mg/l to 247 mg/l with maximum at 100m D/s after receiving Industrial & Municipal Sewage Haryana (Yamuna Nagar). The Total and Faecal Coliform does not meet the criteria at Tajewala and Haiderpur Water Works.

The water quality of Cumbarjua Canal in Goa, Tapi Canal at Village Umarwada in Gujarat, Samarla Kota Canal and Tulje Bagh Canal in Andhra Pradesh meets the water quality criteria with respect to pH, Conductivity, DO, BOD, Total Coliform (TC), Faecal Coliform (FC) and Ammonical Nitrogen.

The water quality of Gurgaon Canal, Narmada Main Canal and Katakhal Canal is meeting the desired water quality criteria with respect to pH, conductivity, Total Coliform (TC), Faecal Coliform (FC) and Ammonical Nitrogen. The DO is observed low with respect to criteria limit in Gurgaon Canal (2.2 mg/l) in Haryana and Katakhal Canal (0.3 mg/l) in Tripura while maximum value of BOD is observed high with respect to criteria limit in Katakhal Canal (14.6 mg/l) in Tripura and Narmada canal (12.0 mg/l) in Gujarat. The water quality status of canals is presented in Annexure-I Table 19.7.

CHAPTER XX

Water Quality of Lakes, Tanks and Ponds

20.1 Lantic Water Bodies

Lakes in India spread over an area of about 7.2 Lakh hectares. There are very few lakes in India, and among them most are quite shallow and none of any considerable size. In the hilly regions, there is abundance of lakes. Lakes are an integral part of a drainage basin and landlocked body of water with a horizontal surface water level.

The Lakes being monitored are Hussainsagar (1), Saroornagar (1), Himayatsagar (1), Pulicate (1), Salaulim (1), Kankoria (1), Chandola (1), Ajwah (1), Sursagar (1), Brahamsarovar (1), Sukhna (2), Govindsagar (1), Pongdam (1), Renuka (1), Wuller (1), Dal (1), Ulsoor (1), HebbalaValley (1), Oruvathikotta (1), Sasthamcotta (1), Ashthamudi (1), Paravur (1), Vembanad (1), Periyar (1), Kodumgallor (1), Kayamkula (1), Punnamadakayal (1), Pookotekayal (1), UpperLake (4), LowerLake (1), Multai (1), Loktak (4), Umiam (1), Ward (1), Thadlaskena (1), Osteri (1), Bahour (1), Harike (2), Pichola (1), Udaisagar (1), Ramgarh Jaipur (1), Pushkar (1), Fatehsagar (1), Kalyana (1), Nakki (1), Udhagamadalam (1), Kodaikanal (1), Yercaud (1), Lakshminarayan Baridigh (1), Rudrasagar (1), Ramgarh-UttarPradesh (1), Naini (1), Rabindrasarovar (1), Nalsarovar (1), Bindusaraovar (1), Sahastrling Sarovar (1), Lakhota Talav (1), Narsimehta Talav (1), Nadiad city Lake (1), Ranjitnagar Talav (1), Ankleshwar reservoir r(1), Dharoi dam (1), Kuwadava (1), Moticher lake (1), Mayem lake (1), Janunia talav(1), Yashwant sagar (1), Sirpur talav (1), Kali sindh reservoir (1), Periat tank (1), Shahpura (1), Madhav lake (1), Nagchun (1), Karwa dam (1), Khandari reservoir (1), Daloni Beel (1), Mer Beel (1), Govindgarh tank (1), Bilawali talav (1), Bhoothathankettu reservoir (1), Dimna (1), Edamalayar reservoir (1), Hazaribagh Meethajheel (1), Kondacharala- aava (1), Laxminarayan Chevuru (1), Malampuzha reservoir (1), Miralam (1), Noor Md. Kunta (1), Pazhassi reservoir (1), Ranchi lake (1), Topchachi lake (1), Vembanadu lake (1), Chilka lake (1) and Anshupa lake (1).

The tanks and ponds being monitoring are Dharamsagar (1), Bibinagar (1), Kistrapetrareddy (1), Goysagar (1), Thol (1), Gandigudem(1), Kajipally Tank(1), Mallapur Tank(1), Premajipet Tank(1), Elangabeel System (1), Lakshadweep (1), Olpad village pond (1), Bishnu Pushkar pukhuri(1), Bor Beel(1), Bor pukhuri(1), Botodriva pond(1), Chand dubi Beel(1), Deepar Beel(1), Dighali pukhuri(1), Dhudia talav(1), Baskandi pond(1), Galabeel(1), Ganga pukhuri(1), Gaurisagar(1), Gopur

tank(1), Padum pukhuri(1), Hordai pukhuri(1), Jaipal pukhuri(1), Mahamaya mandir pukhuri(1), Rajadinia pukhuri(1), Raja pukhuri(1), Rajmaw pukhuri(1), Saranbeel(1), Sivasagar tank(1), Subhagya kund(1),Sai Chevuru(1), Asani Kunta(1), Durgam Chevuru(1), Pedda Chevuru(1), Nalla Chevuru(1), Bhadrakali Chevuru(1), Shiv Ganga Pond(1), Padmanabha Swamy Temple Pond(1), Bindusagar(1), Narendra pokhari(1), Markanda pokhari(1), Indradyumna (1), Swetaganga(1), Parvatisagar(1). The number of monitoring locations on each lake is given in parenthesis.

20.2 Lakes, Tanks and Ponds in Andhra Pradesh, Karnataka, Kerala, Tamilnadu, Pondicherry and Goa.

The respective State Pollution Control Boards and PWD in Lakshadweep carry out the water quality monitoring of Lakes, Tanks and Pond in Andhra Pradesh, Karnataka, Kerala, Tamilnadu and union territory of Pondicherry and Lakshadweep. The ranges of water quality observed in these water bodies with respect to pH, Conductivity, DO, BOD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year. DO varies from 0.0 mg/l to 10.9 mg/l. Lakes and Tanks having very low DO and not meeting the water quality criteria limits are Hussain Sagar lake, Gandigudem Tank, Saroornagar, Laxminarayana Chevuru, Miralam Lake, Noor Md. Kunta, Nalla Chevuru, Sai Chevuru, Asani Kunta, Durgam Chevuru, Pedda Chevuru, Bibinagar Tank, Kistareddypet Tank, Premajipet Tank, Kajipally Tank and Mallapur Tank in A.P.; Heballa Valley Lake in Karnataka; Oruvathilkotta Lake and Kayamkulam in Kerala.

Lakes and Tanks with high conductivity and is not meeting the water quality criteria are Hussain Sagar lake, Gandigudem Tank, Saroornagar, Pulicate lake, Laxminarayana Chevuru, Miralam Lake, Noor Md. Kunta, Sai Chevuru, Asani Kunta, Pedda Chevuru, Kistareddypet Tank (Medak Dist.), Premajipet Tank and Kajipally Tank,in AP; Ashthamudi Lake at Quilon, Paravur Lake, and Kochi (Oil Tanker Jetty) in Kerala.

BOD is observed in the range of 0.0 mg/l to 50 mg/l. Lakes and Tanks with high concentration of organic matter and not complying to the standard limits for BOD are Hussain Sagar lake (50 mg/l), Sai Chevuru (50 mg/l), Asani Kunta (50 mg/l), Saroornagar lake (50 mg/l), Noor Md. Kunta (50 mg/l), Premajipet Tank (50 mg/l), Kajipally Tank (50 mg/l) Pedda Chevuru (44 mg/l), Kistareddypet Tank (Medak Dist.) (33 mg/l), Nalla Chevuru (21 mg/l), Mallapur Tank (19 mg/l), Gandigudem Tank (15 mg/l), Miralam Lake (9 mg/l), Pulicate lake (8.5 mg/l), Laxminarayana

Chevuru (8 mg/l), Durgam Chevuru (5 mg/l), Bibinagar Tank (4.8 mg/l) and Himayat Sagar Lake (4.3 mg/l) in AP; Ulsoor Lake (7 mg/l) and Heballa Valley (6 mg/l) in Karnataka; Udhagamandalam lake (6.2 mg/l) in Tamil Nadu; Oruvathilkotta Lake (6.6 mg/l), Kayamkulam (3.6 mg/l), Alappuzha lake (3.4 mg/l) and Pond at (Padmanabha) Sree Padmanabha Swamy Temple (TVPM) (3.4 mg/l) in Kerala.

The water quality of Lakes and tanks in respective states is meeting the water quality criteria with respect to Total Coliform except in Pulicate Lake and Sai Chevuru in AP; Oruva Thilkotta Lake in Kerala and Udhagamandalam Lake in Tamil Nadu where TC is observed higher than the desired criteria. The Faecal Coliform is also meeting the water quality criteria in most of the lakes except Oruva Thilkotta Lake in Kerala and Udhagamandalam Lake in Tamil Nadu. The concentration of Nitrate (NO_3^-) varies from 0.1 to 150.0 mg/l whereas the highest value is observed in Kajipally Tank at Madak. The Ammonical Nitrogen (NH_4-N) is observed in the range of 0.0-15.0 mg/l. The water quality status of Lakes and tanks in Andhra Pradesh, Karnataka, Kerala, Tamilnadu, Goa and union Territory of Pondicherry is presented in Annexure-I Table 20.1.

20.3 Lakes in Gujarat, Madhya Pradesh and Rajasthan

The water quality monitoring of Lakes, Tanks and Pond in Gujarat, Madhya Pradesh and Rajasthan is carried out by the respective State Pollution Control Boards. The ranges of water quality observed in these Lakes with respect to pH, Conductivity, DO, BOD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year. DO varies from Nil to 14.0 mg/l with minimum at Pushkar lake(NIL), Udaisagar Lake at Udaipur (2.0 mg/l) and Nakki Lake, Mt. Abu (3.8 mg/l) in Rajasthan; Bindusarovar Siddhpur (1.9 mg/l), Narsimehta Talav-Junagadh (3.1 mg/l), Olpad Village Pond, Surat (3.2 mg/l), Moticher Lake Dist. Surat (3.3 mg/l) and Nalsarovar Lake (3.4 mg/l) in Gujarat; Conductivity is observed higher than the water quality criteria at Nalsarovar Lake (Sanand), Dist.Ahmedabad (10800 µmhos/cm) in Gujarat.

BOD is observed in the range of 0.1 mg/l to 49 mg/l with maximum at Thol Tank (Kalol) (Dist. Mehasana) (49 mg/l). Other Lakes and Tanks having high BOD and not meeting the standard of BOD are Nalsarovar Lake (47 mg/l), Lakhota Talav, Kankoria lake (16 mg/l), Chandola Lake (13 mg/l), Ajwah Lake (13 mg/l), Bindusarovar, Siddhpur (Dist.Patan) (15 mg/l), Sursagar Lake (5.2 mg/l), Jamnagar (5 mg/l), Narsimehta Talav- Junagadh (8.0 mg/l),City Lake of Nadiad

(26.4 mg/l), Dharoi Dam Dist-Mehsana (11 mg/l), Moticher Lake Dist. Surat (4.5 mg/l), Kuwadava Lake Dist. Rajkot (3.9 mg/l), Olpad Village Pond (9.6 mg/l) and Dhudhia Talav at Navsari (3.1 mg/l) in Gujarat; Udaisagar lake (11.8 mg/l), Pushkar Lake (20 mg/l) and Nakki lake at Mt.Abu (3.2 mg/l) in Rajasthan; Upper Lake (7.0 mg/l), Lower lake (7.1 mg/l) and Shahpura Lake (6.6 mg/l) of Bhopal, Bilawali Talab at Indore (7.5 mg/l) and Janunia Talab Near W/S (3.3 mg/l) in Madhya Pradesh.

The water quality of Lakes and tanks in respective states is meeting the water quality criteria with respect to Total Coliform and Faecal Coliform at most of the locations except in Olpad village Pond, Moticher Lake Dist. Surat and Dhudhia Talav at Navsari in Gujarat. The concentration of Nitrate (NO_3^-) varies from 0.1 to 11.3 mg/l. The Ammonical Nitrogen (NH_4-N) is observed in the range of 0.0-7.2 mg/l. The water quality status of Lakes in Gujarat, Madhya Pradesh and Rajasthan is presented in Annexure-I Table 20.2.

20.4 Lakes in Haryana, Himachal Pradesh, Punjab, Chandigarh and West Bengal

The water quality monitoring of Lakes, Tanks and Pond in Haryana, Chandigarh, Himachal Pradesh, Punjab and West Bengal is carried out by the respective State Pollution Control Boards. The ranges of water quality observed in these water bodies with respect to pH, Conductivity, DO, BOD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year. All the lakes monitored are meeting the required level of water quality criteria in respect of DO, pH, TC and conductivity at most of the locations. DO varies from 5.2 mg/l to 12 mg/l. BOD is observed in the range of 0.1 mg/l to 4.2 mg/l. Lakes and Tanks having BOD higher than criteria limit are Rabindra Sarovar Lake-Kolkata (4.2 mg/l) and Sukhna Lake-Chandigarh (3.9 mg/l). The Total Coliform and Faecal Coliform varies from 17 to 33,000 MPN/100ml and 4 to 22,000 MPN/100ml respectively. Lake having TC and FC more than the desired criteria is Rabindra Sarobar Lake, Kolkata. The water quality status of Lakes and tanks in Haryana, Himachal Pradesh, Punjab, Chandigarh and West Bengal is presented in Annexure-I Table 20.3.

20.5 Lakes, Tanks and Ponds in Assam, Manipur and Tripura

The water quality monitoring of Lakes, Tanks and Pond in Assam, Manipur and Tripura is carried out by the respective State Pollution Control Boards. The ranges

of water quality observed in these lakes with respect to pH, Conductivity, DO, BOD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year. DO varies from 0.0 mg/l to 18.0 mg/l. The high values of DO in Dighali Pukhuri and Subhagya Kunda Pond Kamakhya Temple in Guwahati indicate that these lakes or ponds are septic or eutrophicated. DO is observed lower than the desired criteria in Mer Beel at Madhabpur, Elangabeel system pond, Jaipal Pukhuri at Sipajhar, Saran Beel and Deepar Beel at Boragaon near IASST in Assam and Rudrasagar in Tripura whereas all other locations monitored are meeting the required level of DO. Conductivity is observed higher than the water quality criteria at Elangabeel system pond in Assam (4390 µmhos/cm).

BOD is observed in the range of 0.6 mg/l to 50 mg/l. Lakes and Tanks having BOD more than criteria are Elangabeel System Pond (50 mg/l), Botodriva Satra Pond, Nagaon (24.5 mg/l), Deepar Beel at Boragaon near IASST (18.0 mg/l), Rajadinia Pukhuri at Abhayapuri (14.8 mg/l), Rajapukhuri at Gauripur (10.8 mg/l), Mahamaya Mandir Pukhuri (13.2 mg/l), Bishnu Puskar Pukhuri of Hayagrib Madhab Temple at Hajo (10.2 mg/l), Padumpukhuri at Tezpur (9.6 mg/l), Subhagya Kunda Pond Kamakhya Temple in Guwahati (9.4 mg/l), Gophur Tank at Gophur (9 mg/l), Jaipal Pukhuri (8.8 mg/l), Dighali Pukhuri at Guwahati (6.2 mg/l), Ganga Pukhuri, Nalbari (Gordon School) (7.6 mg/l), Bor Beel at Jakai (6 mg/l), Mer Beel at Madhabpur (5.4 mg/l), Goysagar Tank at Sibsagar (4.9 mg/l), Gaurisagar Tank (4.3 mg/l), Sivasagar Tank (Borpukhuri) Near Sivadol (4.2 mg/l), Rajmaw Pukhuri at Jorhat (4 mg/l), Baskandi Pond inside the Baskandi Madrasa (3.7 mg/l) and Gala Beel at Dergaon (3.6 mg/l) in Assam and Rudrasagar, Sonumura (3.2 mg/l) in Tripura. The water quality of Lakes, Tanks and Ponds in respective states is meeting the water quality criteria with respect to Total Coliform and Faecal Coliform. The water quality status of Lakes, Tanks and Ponds in Assam, Manipur and Tripura is presented in Annexure-I Table 20.4.

CHAPTER XXI

Assessment of Groundwater Quality

21.1 Ground Water Quality Monitoring

The groundwater occurrence and availability is largely governed by the state of cementation and compaction of the formation, which control the pore volume. The geological formations encountered in the country may be broadly divided into three categories-the unconsolidated, the semi-consolidated and the consolidated. In India a sizable proportion of population is dependant on ground water for drinking and other household utilities besides its use in irrigation at large. Due to limited cost effective treatment options for polluted ground water, the affected resource is generally lost for drinking and other utilities.

21.2 State wise Groundwater Quality Monitoring

To assess the problem of groundwater quality deterioration, network of groundwater quality monitoring is extended to 411 locations. The Statewise number of groundwater monitoring locations is given below.

Table 21.1: State wise Distribution of Groundwater Monitoring Stations

State/water body	No. of wells
ANDHRA PRADESH	24
ASSAM	32
BIHAR	20
CHANDIGARH	7
CHHATISSGARH	4
DAMAN & Diu(ZOV)	13
GOA	6
GUJARAT	42
HIMACHAL PRADESH	20
KERALA	30
LAKSHDWEEP	15
MADHYA PRADESH	18
MAHARASHTRA	30
MANIPUR	5
MEGHALAYA	5
MIZORAM	2
ORISSA	15

State/water body	No. of wells
PONDICHERRY	15
PUNJAB	6
RAJASTHAN	37
TAMIL NADU	2
TRIPURA	7
UTTAR PRADESH	25
UTTRANCHAL	1
WEST BENGAL	30
Total	**411**

The ranges of water quality observed in groundwater with respect to pH, Conductivity, BOD, Total Coliform (TC) and Faecal Coliform (FC) are presented as minimum, maximum and mean value to assess the extent of water quality variation throughout the year.

21.3 Status of Ground Water Quality in Andhra Pradesh

The water quality monitoring of ground water in Andhra Pradesh is carried out by Andhra Pradesh Pollution Control Board. pH of groundwater is observed in the range of 6.7-8.3. Conductivity varies from 164-4700 µmhos/cm and is meeting the criteria limit for drinking as well as irrigation purposes except few locations viz. Rama Temple,Visakhapatnam (4700 µmhos/cm), Nandayal-Kurnool(3840 µmhos/cm), Bore well near Ckm College, Enumamula.V-Warangal (3750 µmhos/cm), Navlok Gardens-Nellore(2840 µmhos/cm), Open well near Pratap Nagar bridge –Kakinada (2640µmhos/cm), Nagiri-Chittoor (2440µmhos/cm), Nagaram –Khammam(2360 µmhos/cm). The quality of ground water in Andhra Pradesh is presented in Annexure-I Table 21.1.

21.4 Status of Ground Water Quality in Assam, Meghalaya, Mizoram and Tripura

The water quality monitoring of ground water in Assam, Meghalaya and Tripura is carried out by respective State Pollution Control Boards. pH of groundwater is observed in the range of 5.2-8.2 and observed below 6.0 at Sibsagar, Silchar and near BPRL, Dhaligaon in Assam; Ramhulm (Northern part) in Mizoram and Kunjban, Agartala in Tripura. Conductivity varies from 20-3940 µmhos/cm and is meeting the criteria limit for drinking as well as irrigation purposes except at few locations viz. Raipur region (3560 µmhos/cm); Jagiroad near HPC Effluent discharge point & near MSW dumping site at Garchuk- Guwahati (2810 µmhos/cm) and Panchgram market near Cachar Paper mill(3940 µmhos/cm).

BOD is not meeting the desired criteria at Panchgram market near Cachar Paper mill (6.6 mg/l), Sibsagar (5.6 & 4.8 mg/l), Silchar (4.9 mg/l), Silapathar (4.6 mg/l), Guwahati (3.7 mg/l) and Karbi Anglong distt. (3.5 mg/l) in Assam. Total Coliform is meeting the desired criteria at all monitoring locations. The concentration of Nitrate (NO_3^-) is observed in the range of 0 - 11.8 mg/l. The quality of ground water in Assam, Meghalaya and Tripura is presented in Annexure-I Table 21.2.

21.5 Status of Ground Water Quality in Chattisgarh and Madhya Pradesh

The water quality monitoring of groundwater in Chattisgarh and Madhya Pradesh is carried out by respective State Pollution Control Boards. pH of groundwater is observed in the range of 6.9-8.4 and meet the water quality criteria. Conductivity varies from 82-4772 µmhos/cm. BOD and Total Coliform are meeting the desired criteria at all the locations except high value of BOD at Raipur Region in Chhatissgarh. The quality of ground water in Chattisgarh and Madhya Pradesh is presented in Annexure-I Table 21.3.

21.6 Status of Ground Water Quality in Himachal Pradesh, Chandigarh and Punjab

The water quality monitoring of ground water in Himachal Pradesh, Chandigarh and Punjab is carried out by respective State Pollution Control Boards and Pollution Control Committees. pH of groundwater is observed in the range of 5.8-9.1.The Lowest value of pH is observed at Dharamshala Kangra D/s of MSW Dumping Site in Himachal Pradesh. Conductivity varies from 180-1750 µmhos/cm. BOD is found in the range of 0.1-11.2 mg/l and meeting the water quality criteria except at Shimla D/s of MSW Dumping Site. Total Coliform is meeting the desired criteria at all the locations. The quality of ground water in Himachal Pradesh, Chandigarh and Punjab is presented in Annexure-I Table 21.4.

21.7 Status of Ground Water Quality in Kerala

The water quality monitoring of ground water in Kerala is carried out by respective State Pollution Control Boards. pH of groundwater is observed in the range of 4.1-8.0 and does not meet the water quality criteria at few locations such as Nedumangad in Thiruvananthapuram (6.1 mg/l);Vaikom & Brahmapuram MSW Dumpark in Ernakulam (6.0 mg/l), Laloor in Thrissur & Karoor-Pala (5.8 mg/l); Chungapally, Punkunnam Trissur Distt., Fathimapuram (Changanassery) & Malapuram (5.7 mg/l), Pappanamkode, Payyannur, Manjeri & Edayar in Ernakulam (5.6 mg/l); Mavoor Kozhikkode Distt., Eloor (5.3 mg/l), Kalamassery in Ernakulam (4.9 mg/l); Vadavathoor- Kottayam & Ollur in Thrissur(4.8 mg/l),

Kundra in Kollam (4.4 mg/l); Kannur (4.4 mg/l); Chellora Trenching ground, Kannur(4.1 mg/l).Conductivity varies from 52-952 µmhos/cm. BOD and Total Coliform is meeting the desired criteria at all the locations. The quality of ground water in Kerala is presented in Annexure-I Table 21.5.

21.8 Status of Ground Water Quality in Pondicherry and Tamil Nadu

The State Pollution Control Board/ Pollution Control Committee carry out the water quality monitoring of ground water in Pondicherry and Tamilnadu. pH of groundwater is observed in the range of 6.2-9.0. Conductivity varies from 159-2240µmhos/cm. BOD is observed higher than the desired criteria at Chunmbar River (5.0 mg/l) in Pondicherry. Nitrate is observed in the range of 0.1-12.9 mg/l. The quality of ground water in Pondicherry and Tamilnadu is presented in Annexure-I Table 21.6.

21.9 Status of Ground Water Quality in Daman, Maharashtra and Gujarat

The water quality monitoring of ground water in Daman, Maharashtra and Gujarat is carried out by respective State Pollution Control Board of Maharashtra and Gujarat and CPCB Zonal Office, Varodara. pH of groundwater is observed in the range of 6.1-8.6 and meeting the water quality criteria at all monitoring locations except at Rasulwadi- Sambarwadi in Sangli (6.2) and Sangera, Gondia & Savali in Sangli (6.1).Conductivity varies from 331-11490 µmhos/cm and is meeting the desired criteria at all locations except at Pandesara, Industrial (11490 µmhos/cm); Sachin GIDC (11300 µmhos/cm); Olpad (7740µmhos/cm); Mira-Bhayander (7234 µmhos/cm); Palghar (4966 µmhos/cm); SNR. Vinayak Jal Suddhikaran Sahakari Mandali Ltd., Bavla (3660 µmhos/cm); Pirana Terminal pumping station, V.N. Bridge (3500 µmhos/cm); Siddhpur, Patan (3250 µmhos/cm); Bore well of Santej village (3130 µmhos/cm); STP Madhapur, Rajkot(2640 µmhos/cm); Palanpur(2390 µmhos/cm) and Surendra Nagar (2380 µmhos/cm) in Gujarat; Sangera in Gondia & Savali in Sangli (8687 µmhos/cm); Rajkot (4810 µmhos/cm); Parvati Industrial estate, Shirol (3429 µmhos/cm); Raipur, Nagpur(2650 µmhos/cm) and Rasulwadi-Sambarwadi (2631 µmhos/cm) in Maharashtra. BOD is observed high at Somnath Industrial Estate (38.5 mg/l) in Daman; Bore well at Katpur near ZP School (26.8 mg/l); Vadodara Industrial-Nandesar(14 mg/l); Koradi and Pirana Terminal Pumping Station, Pirana Nr. V.N. Bridge (13mg/l); Khaperkheda & Bore well of Palsana village (11 mg/l); Bhahmni(10.7 mg/l); Surendra Nagar and Palanpur (10 mg/l); BMW site at Burudgaon (9 mg/l); Akot(8 mg/l); Hand Pump near Zilla Parishad Primary School(7.8 mg/l); Pimpri- Chinchwad (7.6 mg/l); Nadiad (7.1 mg/l); Mira- Bhayander & Sukali(7 mg/l); Sawargaon, Mehsana, Vasai, Raipur & Bhandewari (6 mg/l); Phandarpur-Gangapur(5.8 mg/l); Someshwar Rice mill Nr. Bavla Eco Project, Bavla (5.1 mg/l); Dug

well at Ranjangaon(5 mg/l); MSW site at Pathardi(4.1 mg/l); Palghar(4 mg/l) and Dahanu(3.4 mg/l). The concentration of Nitrate is observed in the range of 0.1- 82.6 mg/l. The quality of ground water in Daman, Maharashtra and Gujarat is presented in Annexure-I Table 21.7.

21.10 Status of Ground Water Quality in Rajasthan

The water quality monitoring of ground water in Rajasthan is carried out by State Pollution Control Board. pH of groundwater is observed in the range of 6.9-8.9 and meet the water quality criteria. The conductivity varies from 560-31,000 µmhos/cm and is not meeting the desired criteria at well of Loomji Chaudhary, near Nayagaon, Pali and well of Bhopal Singh, 24 km. from Pali Town (31000 µmhos/cm); well U/s 1 km from Jodhpur Town (12100 µmhos/cm); Village Vinayakia, Jodhpur (Hukum Singh Rathore) (9000 µmhos/cm); Well Kothi in village Bagar Rajput, Alwar (5400 µmhos/cm); Near Khanpura Talab, Ajmer (5200 µmhos/cm); Pabupura Road near Civil Airport, Jodhpur (4200 µmhos/cm); Village Vinayakia, Jodhpur (Hiralal Kumhar) (3900 µmhos/cm); Village Vinayakia, Jodhpur (Badri Kumhar) (3800 µmhos/cm); Inside Shiv Temple Near Air Force Station, Ajmer (3600 µmhos/cm); Handpump of Vidhani village, Goner road, Jaipur (3300 µmhos/cm); Well at Village Santhla near Bhiwadi Industrial Area, Bhiwadi and near Shree Kalyaneshwar Mahadev Temple, Jaisinghpura Khurd, Jaipur (3200 µmhos/cm); Hotel Orient Place, Subhas Nagar, Udaipur (3100 µmhos/cm); Near Rana Pratap Nagar, Railway Station, Udaipur(3000 µmhos/cm); Hand pump near Secondary School about 300 metre from Kansua Nallah, Kota (2900 µmhos/cm); Opp. Pvt. Bus Stand, Ajmer (2700 µmhos/cm). BOD is observed in the range of 0.1-21.2 mg/l and the locations having BOD more than the criteria are well of Loomji Chaudhary, near Nayagaon, Pali (21.2 mg/l); Bhopal Singh, 24 km. from Pali Town (11.5 mg/l), U/s 1 km from Jodhpur Town (6.5 mg/l), Village Gattal near Bhiwadi Industrial Area, Bhiwadi (3.2 mg/l) and Pabupura Road near Civil Airport, Jodhpur(3.1 mg/l). Total Coliforms are meeting the desired criteria at all the locations. The quality of ground water in Rajasthan is presented in Annexure-I Table 21.8.

21.11 Status of Ground Water Quality in Uttar Pradesh and Uttarakhand

The ground water quality monitoring in Uttar Pradesh and Uttarakhand is carried out by respective State Pollution Control Boards. pH of groundwater is observed in the range of 6.3-7.8 and meeting the water quality criteria except at M/s Kanoria Chemical, Sonbhadra, U.P. (6.3). Conductivity varies from 152-6550 µmhos/cm. Conductivity is observed high at IFFCO-Phoolpur, Allahabad (6550 µmhos/cm), Sahibabad industrial area Ghaziabad (4161 µmhos/cm), Pilkhua Industrial Area Ghaziabad (2792 µmhos/cm) and well at Roadways Bus Station Unnao (2782 µmhos/cm) in Uttar Pradesh. BOD observed high at Captain Ganj (4.4 mg/l) in Uttar

Pradesh. Total Coliform is meeting the desired criteria. The quality of ground water in Uttar Pradesh and Uttarakhand is presented in Annexure-I Table 21.9.

21.12 Status of Ground Water Quality in Orissa

State Pollution Control Board carries out the water quality monitoring of ground water in Orissa. pH of groundwater is observed in the range of 6.5-8.4 and meet the water quality criteria. Conductivity varies from 91-1147 µmhos/cm and meeting the desired criteria. The quality of ground water in Orissa is presented in Annexure-I Table 21.10.

21.13 Status of Ground Water Quality in Bihar

State Pollution Control Board carries out the water quality monitoring of ground water in Bihar.pH of groundwater is observed in the range of 7.2 – 8.4 and meet the water quality criteria. Conductivity varies from 352-954 µmhos/cm and is meeting the desired criteria. The concentration of Nitrate (NO_3^-) is observed in the range of 0.1- 2.1 mg/l.The quality of ground water in Bihar is presented in Annexure-I Table 21.11.

21.14 Status of Ground Water Quality in West Bengal

State Pollution Control Board carries out the water quality monitoring of ground water in West Bengal. pH of groundwater is observed in the range of 6.8-8.5 and meets the water quality criteria. Conductivity varies from 133-2470 µmhos/cm and meeting the criteria for beneficial uses. BOD is observed in the range of Nil-3.0 mg/l. Total Coliform varies from Nil-1600 MPN/100 ml and meeting the desired criteria at all the locations. The quality of ground water in West Bengal is presented in Annexure-I Table 21.12.

ANNEXURE-I

WATER QUALITY DATA-2008

- **RIVER BASINS - INDUS, GANGA, BRAHMAPUTRA, MAHI, SABARMATI, NARMADA, TAPI, MAHANADI, BRAHMANI AND BAITRANI, SUBARNAREKHA, GODAVARI, KRISHNA, PENNERU & CAUVERY.**

- **MEDIUM & MINOR RIVERS, CANALS, CREEKS/SEA WATER AND DRAINS**

- **STATEWISE - LAKES, TANKS AND PONDS**

- **STATEWISE - GROUNDWATER**

TABLE 5.1 WATER QUALITY OF RIVER BEAS - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1001	BEAS AT U/S MANALI, H.P.	3.0	8.0	6.2	7.4	9.1	8.6	7.2	8.0	7.7	83	170	110	0.1	0.9	0.3	-	-	-	0.2	0.2	0.2	2	23	10	26	2400	641
1002	BEAS AT D/S KULU, H.P.	1.5	20.0	11.1	7.5	10.4	9.2	7.0	7.5	7.4	83	143	107	0.4	2.4	1.0	-	-	-				70	920	495	280	2400	1200
1003	BEAS AT D/S AUT, H.P.	2.5	14.0	9.2	8.4	11.5	9.8	7.5	7.8	7.7	53	237	123	0.1	1.0	0.5	-	-	-	0.2	0.2	0.2	17	130	60	170	1600	897
1004	BEAS AT U/S PANDON DAM, H.P.	2.0	15.0	10.0	8.4	11.6	9.5	7.3	7.9	7.7	55	351	161	0.2	0.4	0.3	-	-	-	0.2	0.2	0.2	7	23	13	23	350	141
1005	BEAS AT EXIT OF TUNNEL DEHAL POWER HOUSE, H.P.	9.0	16.0	13.3	9.3	12.5	10.5	7.5	8.1	7.9	83	294	172	0.1	0.5	0.3	-	-	-	0.3	0.3	0.3	13	280	101	240	1600	778
1550	U/S MANDI, H.P	4.0	18.0	13.0	7.8	11.5	9.1	7.5	8.1	7.9	86	305	175	0.1	0.4	0.2	-	-	-	-	-	-	5	33	24	33	920	498
1006	BEAS AT D/S MANDI, H.P.	6.0	18.0	13.7	7.4	10.7	8.9	7.1	8.0	7.7	95	432	234	0.4	7.6	2.8	-	-	-	0.3	0.3	0.3	130	1600	670	1600	2400	2000
1007	BEAS AT D/S ALAMPUR, H.P.	6.0	21.0	15.0	8.5	10.3	9.3	7.2	8.4	8.0	149	312	252	0.1	0.6	0.2	-	-	-	0.3	0.3	0.3	4	17	10	7	240	120
1008	BEAS AT D/S DEHRAGOPIPUR, H.P.	8.0	22.0	16.7	8.4	9.5	9.1	7.4	8.4	7.8	173	303	232	0.1	0.4	0.2	-	-	-				2	14	9	21	240	153
1009	BEAS AT D/S PONG DAM, H.P.	7.0	22.0	15.0	3.8	9.9	5.7	7.4	8.0	7.6	153	272	195	0.1	0.3	0.2	-	-	-	0.3	0.3	0.3	4	14	9	21	280	159
1693	BEAS AT TALWARA H/W, PUNJAB	16.0	18.0	17.0	7.2	8.4	7.9	7.3	7.4	7.4	188	284	221	0.2	0.4	0.3	1	1.4	1.2	0.6	0.6	0.6	0	0	0	35	50	45
1694	U/S PATHANKOT, PUNJAB	18.0	19.0	18.3	7.1	8.2	7.8	7.5	7.7	7.6	192	272	228	0.4	1.0	0.6	1.4	1.4	1.4	0.6	0.8	0.7	11	35	27	100	110	107
1695	D/S PATHANKOT,PUNJAB	18.0	19.0	18.3	6.9	8.0	7.6	7.4	7.7	7.5	196	292	232	0.4	1.2	0.7	1.2	1.6	1.4	0.8	0.8	0.8	50	50	50	350	350	350
1010	BEAS AT MIRTHAL BRIDGE, GURDASPUR, PUNJAB	17.0	19.0	18.0	7.0	8.0	7.6	7.2	7.6	7.4	204	290	235	0.6	1.2	0.8	1.2	1.8	1.5	0.8	1.0	0.9	50	110	70	500	500	500
1294	BEAS AT 1KM.D/S OF EFFL. DISH. POINT AT MUKERIAN , PUNJAB	17.0	19.0	18.0	6.9	7.6	7.4	7.3	7.6	7.4	208	302	262	0.8	1.3	1.0	1.8	2.8	2.1	1.0	1.2	1.1	50	110	70	500	700	567
1011	BEAS AT G.T.ROAD UNDER BDG. NEAR KAPURTHALA, PUNJAB	17.0	19.0	18.0	6.7	7.6	7.3	7.4	7.5	7.5	212	256	229	0.8	0.9	0.8	1.6	2.4	1.9	1	1.4	1.2	50	110	77	500	500	500
1696	U/S GOINDWAL, PUNJAB	17.0	19.0	18.0	6.8	7.2	7.0	7.5	7.6	7.6	226	302	271	0.8	1.0	0.9	1.4	2.4	1.9	0.8	1.2	1.1	50	50	50	350	500	450
1012	BEAS AT 100M D/S INDUST. DISCH. GOINDWAL PUNJAB	17.0	19.0	18.0	6.7	7.0	6.9	7.4	7.6	7.5	298	316	304	0.8	1.0	0.9	1.4	2.7	2.0	0.8	1.9	1.4	35	110	82	350	700	517
1697	BEAS AT HARIKE, PUNJAB	17.0	19.0	18.0	7.0	7.0	7.0	7.5	7.5	7.5	246	362	289	0.8	1.0	0.9	1.2	2	1.6	0.6	1.4	0.9	35	50	45	350	350	350

TABLE 5.2 :- WATER QUALITY OF RIVER SATLUJ - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	WATER QUALITY CRITERIA				> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1867	B/C WITH RIVER SPITI AT KHAB, DISTT.KINNAUR, H.P.	8.9	14.7	11.8	7.2	9.3	8.3	7.5	8.0	7.7	235	364	316	0.1	0.9	0.4	-	-	-	-	-	-	0	2	1	2	27	11
1389	SATLUJ AT NEPTHA ZAKHAI, H.P	4.5	15.2	10.2	8.3	9.8	8.9	7.2	8.1	7.8	199	380	312	0.1	0.7	0.3	-	-	-	-	-	-	2	8	5	12	70	32
1086	SATLUJ AT U/S RAMPUR, H.P.	4.5	13.0	7.9	8.7	11.4	9.9	7.6	8.3	8.0	203	313	275	0.1	0.6	0.3	-	-	-	0.37	0.37	0.37	6	20	13	20	110	67
1087	SATLUJ AT D/S RAMPUR, H.P.	6.5	13.2	8.9	7.9	10.2	9.3	7.6	8.5	8.0	202	314	261	0.2	0.7	0.4	-	-	-	0.31	0.31	0.31	17	52	31	90	170	134
1013	SATLUJ AT U/S TATAPANI, H.P.	7.5	14.4	10.1	7.9	9.9	9.0	7.6	7.9	7.7	249	352	301	0.3	0.6	0.4	-	-	-	0.62	0.62	0.62	12	46	24	80	350	154
1014	SATLUJ AT U/S SLAPPER, H.P.	10.0	17.5	14.2	7.7	12.4	9.7	7.8	8.2	8.0	181	484	315	0.2	0.6	0.3	-	-	-	0.46	0.46	0.46	17	79	38	170	540	293
1015	SATLUJ AT D/S SLAPPER, H.P.	10.0	17.5	14.2	7.8	12.3	9.8	7.8	8.2	8.0	177	514	300	0.3	0.5	0.4	-	-	-	0.45	0.45	0.45	34	110	63	540	920	667
1016	SATLUJ AT D/S BHAKHRA, H.P.	14.0	20.0	17.0	8.1	10.8	9.2	7.7	8.2	7.9	183	276	218	0.1	0.4	0.2	-	-	-	0.14	0.14	0.14	4	12	8	20	79	42
1017	AT 100M U/S OF HEADWORKS, NANGAL, PUNJAB	16.0	18.0	17.3	8.8	8.9	8.8	7.6	7.8	7.7	259	270	265	0.0	0.0	0.0	0.60	1.40	1.00	0.20	0.60	0.35	0	0	0	35	35	35
1018	SATLUJ AT 100M D/S ,NANGAL	17.0	20.0	18.5	8.0	8.8	8.4	7.8	7.8	7.8	282	298	289	0.4	0.8	0.6	1.80	2.80	2.35	0.80	1.80	1.30	9	11	10	110	300	205
1293	SATLUJ AT 1 KM. D/S OF ZENITH, PUNJAB	18.0	20.0	18.7	7.0	8.6	7.6	7.5	7.9	7.7	298	598	431	1.0	2.2	1.6	2.60	3.00	2.80	0.80	1.80	1.33	110	500	305	500	3000	1533
1019	SATLUJ AT U/S HEAD WORKS ROPAR, PUNJAB	17.0	20.0	18.5	7.4	8.6	7.8	7.3	7.8	7.5	280	298	290	0.8	1.0	0.9	1.40	2.80	2.20	0.80	1.60	1.15	50	110	83	230	700	483
1380	SATLUJ AT D/S NFL, PUNJAB	18.0	20.0	18.8	8.2	8.7	8.4	7.8	7.9	7.9	276	290	284	0.4	0.8	0.6	2.00	2.40	2.30	0.80	1.60	1.20	50	50	50	110	500	403
1690	U/S BUDHA NALLAH (UPPER), PUNJAB	17.0	22.0	19.0	5.2	6.6	5.9	7.4	7.4	7.4	384	396	388	1.0	4.5	2.9	1.40	2.40	1.73	0.50	1.80	0.97	90	500	297	900	9000	3633
1020	AT 100M D/S BUDHA NALA CONFL., LUDHIANA,PUNJAB	18.0	23.0	20.0	1.2	5.2	3.5	7.0	7.7	7.3	612	843	728	12.0	48.0	28.7	2.10	5.20	3.17	1.00	4.80	2.43	1100	10000	4533	50000	110000	71667
1021	AT BOAT BDG. DHARMKOTNAKODAR ROAD, JALANDHAR	17.0	23.0	19.7	1.6	5.4	4.1	7.2	7.6	7.4	402	527	452	5.0	18.0	10.3	2.00	4.00	2.73	0.70	3.20	1.63	700	5000	2233	11000	30000	18000
1381	AT D/S EAST BEIN, PUNJAB	17.0	18.0	17.7	5.0	5.6	5.4	7.2	7.4	7.3	496	750	591	3.0	6.2	4.1	2.40	3.60	2.80	1.20	2.20	1.60	900	3000	1667	11000	20000	17000
1691	U/S HUSSANIWALA - H/W FEROZEPUR, PUNJAB	16.0	22.0	18.7	6.0	7.0	6.5	7.5	7.7	7.6	162	492	280	1.0	2.4	1.7	1.00	1.40	1.20	0.50	1.00	0.77	20	100	73	350	500	450
1692	D/S HUSSANIWALA- H/W FEROZEPUR, PUNJAB	16.0	22.0	18.7	4.2	7.0	5.8	7.4	7.7	7.6	184	499	291	1.2	2.2	1.6	1.20	1.80	1.47	0.80	1.20	0.93	30	110	83	250	700	483
1022	SATLUJ AT BRIDGE HARIKE, AMRITSAR, PUNJAB	17.0	19.0	18.0	5.0	6.2	5.4	7.2	7.8	7.4	388	510	461	2.4	2.6	2.5	2.00	2.80	2.33	1.20	1.80	1.47	50	110	90	500	700	567

TABLE 5.3 :- WATER QUALITY OF RIVER RAVI, PARVATI, LARGI, SIRSA & SWAN – 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1089	RAVI AT U/S CHAMBA, H.P.	8.0	18.0	12.3	8.7	9.9	9.4	7.0	8.3	7.7	81	180	132	0.1	0.3	0.2	-	-	-	-	-	-	2	11	5	9	140	61
1088	RAVI AT U/S MADHOPUR, H.P.	8.0	21.0	16.3	7.0	9.8	8.3	7.4	8.3	7.7	127	338	195	0.1	0.3	0.2	-	-	-	0.22	0.22	0.22	7	33	15	26	350	182
1097	RAVI AT U/S OF MADHOPUR HEADWORKS,GURDASPUR	16.0	16.0	16.0	7.2	7.2	7.2	7.6	7.6	7.6	268	268	268	0.4	0.4	0.4	1.20	1.20	1.20	0.60	0.60	0.60	-	-	-	35	35	35
1290	PARVATI BEFORE CONF. TO RIVER BEAS, H.P.	2.0	15.0	9.5	8.2	9.8	9.1	7.2	8.1	7.6	55	168	103	0.4	1.2	0.6	-	-	-	-	-	-	22	920	267	117	2400	852
1090	LARGI AT D/S, H.P.	1.0	16.0	10.8	8.2	12.0	9.6	7.0	8.0	7.5	64	215	115	0.2	0.6	0.3	-	-	-	-	-	-	21	46	31	180	1600	578
1551	RIVER SIRSA , U/S SITOMAJRI NALLAHGARH, H.P	15.0	30.0	23.1	7.4	9.8	9.0	7.7	8.2	8.0	270	427	378	0.3	0.6	0.5	-	-	-	-	-	-	11	20	15	30	130	87
1552	RIVER SIRSA , D/S NALAGARH BRIDGE, H.P	8.3	29.0	21.0	8.2	12.0	9.4	7.4	8.3	8.0	432	1090	756	0.6	2.6	1.5	-	-	-	-	-	-	11	79	39	80	920	334
1868	RIVER SIRSA AT D/S NALAGARH DISTT. SOLAN, H.P.	18.0	33.5	27.1	8.3	11.6	9.4	7.5	8.7	8.2	421	1130	771	1.0	2.6	1.7	-	-	-	-	-	-	20	49	31	100	920	320
1869	RIVER SWAN AT D/S NANGAL DISTT. UNA, H.P.	10.0	28.0	21.0	6.2	9.4	7.4	7.4	8.3	7.9	318	633	455	1.3	2.2	1.9	-	-	-	-	-	-	21	64	43	150	220	188

TABLE 6.1 :- WATER QUALITY OF RIVER GANGA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 5 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 500 MPN/100ml		
1491	BHAGIRATHI AT GANGOTRI,	2.5	12.0	7.3	9.0	10.1	9.6	7.1	7.8	7.4	130	130	130	2.0	2.0	2.0	0.13	0.13	0.13	-	-	-	26	26	26	3900	3900	3900
1484	ALKANANDA B/C MANDAKINI AT RUDRA PRAYAG	8.0	18.0	14.1	7.6	10.4	9.4	6.9	8.3	7.5	125	166	148	0.9	2.3	1.4	0.19	0.25	0.23	-	-	-	110	65000	17083	0	10100000	2182120
1485	MANDAKINI B/C ALKALNADA AT RUDRAPRAYAG	8.0	18.0	13.6	7.7	10.1	9.2	6.9	7.5	7.2	80	172	109	1.0	2.5	1.3	0.20	0.35	0.30	-	-	-	50	48000	12638	0	5100000	1032820
1486	ALKANANDA A/C MANDAKINI AT RUDRAPRAYAG	8.0	17.0	14.1	7.6	10.8	9.3	6.9	7.8	7.3	93	164	137	0.9	2.3	1.3	0.20	0.24	0.22	-	-	-	150	48000	13738	0	650000	262840
1487	ALKANANDA B/C TO BHAGIRATHI AT DEVPRAYAG	8.0	19.0	14.6	6.9	10.3	9.2	7.1	8.6	7.5	140	164	155	0.9	5.4	1.8	0.22	0.29	0.26	-	-	-	750	79000	20598	0	560000	217440
1488	BHAGIRATHI B/C WITH ALAKNANDA AT DEVPRAYAG	9.0	19.0	14.8	7.5	9.8	8.9	7.1	8.6	7.5	100	165	130	0.9	6.0	2.0	0.18	0.19	0.19	0.04	0.04	0.04	170	2800	1143	0	470000	130560
1489	ALKANANDA A/C WITH BHAGIRATHI AT DEVPRAYAG	11.0	18.0	13.9	7.7	10.3	9.3	7.1	8.4	7.5	130	160	141	0.9	5.2	1.7	0.22	0.24	0.23	-	-	-	90	68000	18510	0	720000	170960
1060	GANGA AT RISHIKESH U/S, UT	10.0	20.0	16.9	6.1	9.6	8.7	7.1	8.4	7.4	170	170	170	1.2	3.2	2.0	-	-	-	-	-	-	1	1	1	0	23	9
1061	GANGA AT HARIDWAR D/S, UT	12.0	26.0	19.4	5.2	6.6	6.0	6.1	7.2	6.6	-	-	-	4.2	7.6	5.4	-	-	-	-	-	-	3	4	4	24	1600	551
1062	GANGA AT GARHMUKTESHWAR, U.P	10.0	25.0	19.9	7.0	10.0	8.5	7.2	7.7	7.5	162	337	203	2.0	3.2	2.6	0.40	1.00	0.73	0.50	0.70	0.60	900	2600	1608	2100	7500	3361
1145	GANGA AT NARORA, U.P	-	-	-	7.6	8.9	8.4	7	8.4	8	118	260	154	2	3.6	2.6	-	-	-	-	-	-	490	1800	1159	2200	9200	5025
1063	GANGA AT KANNAUJ U/S (RAJGHAT)	15.0	34.0	26.2	5.6	10.4	7.4	7.2	8.8	8.0	42	740	374	2.8	4.6	3.6	0.30	2.40	1.14	2.80	2.80	2.80	0	23000	3567	1500	75000	17358
1066	GANGA AT KANNAUJ D/S, U.P	17.0	34.0	27.4	5.3	9.8	7.1	7.3	8.9	7.9	250	850	425	3.0	5.2	4.1	0.30	1.90	1.16	0.10	0.60	0.35	900	15000	3080	3900	75000	14782
1146	GANGA AT BITHOOR (KANPUR), U.P.	15.0	33.0	26.2	5.5	9.7	7.4	7.3	8.7	8.1	39	570	307	2.4	5.6	3.5	0.20	2.60	1.31	0.10	1.20	0.65	400	23000	3125	2100	93000	13692
1067	GANGA AT KANPUR U/S (RANIGHAT), U.P	15.0	34.0	26.8	6.1	11.6	7.6	7.0	8.8	8.1	39	560	357	2.4	5.2	3.4	0.20	2.80	1.52	-	-	-	400	23000	3190	2100	93000	13555
1068	GANGA AT KANPUR D/S (JAJMAU PUMPING STATION), U.P	15.0	34.0	26.8	1.6	9.9	5.6	7.4	8.8	8.0	67	860	479	3.8	21.0	8.3	0.30	3.80	2.24	0.10	1.80	1.13	1500	46000	16818	15000	240000	94250
1147	GANGA AT DALMAU (RAI BAREILLY), U.P.	15.0	30.0	25.6	7.2	9.8	8.7	7.7	8.1	7.8	260	355	314	3.1	3.9	3.4	0.60	0.80	0.67	0.40	0.50	0.43	4300	5200	4744	6100	7500	6778
1046	GANGA AT ALLAHABAD (RASOOLABAD), U.P.	15.0	31.5	24.5	7.2	10.2	8.4	8.1	8.3	8.3	266	634	423	2.7	4.1	3.4	2.90	3.80	3.32	0.10	0.10	0.10	1100	6000	2400	2800	9000	4275
1049	GANGA AT ALLAHABAD D/S (SANGAM), U.P.	16.0	31.0	25.0	6.5	9.7	8.0	8.1	8.4	8.3	270	758	469	3.3	5.4	4.0	2.60	3.20	2.90	0.10	0.10	0.10	1700	11000	5167	3500	17000	8875
1070	GANGA AT VARANASI U/S (ASSIGHAT), U.P	25	30	27.2	8.3	8.7	8.5	7	7.7	8	230	363	318	3.2	3.8	3.4	0.2	0.3	0.25	-	-	-	11000	13000	11667	14000	23000	15500
1071	GANGA AT VARANASI D/S (MALVIYA BRIDGE), U.P	26	30	27.4	6.5	7.9	7.3	8	8.9	9	264	397	353	9.2	12.4	10.5	0.3	0.4	0.36	0.15	0.2	0.18	18000	110000	74500	94000	220000	144833

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 5 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 500 MPN/100ml**		
1073	GANGA AT TRIGHAT (GHAZIPUR), U.P	26	29	27.2	7.8	8.4	8.1	8	8.9	8	274	378	339	3.6	4.8	4.3	0.3	0.3	0.30	-	-	-	17000	27000	22250	26000	43000	32333
1074	GANGA AT BUXAR,BIHAR	19.0	30.0	23.3	7.6	9.0	8.7	8.1	8.3	8.2	242	370	336	2.2	2.7	2.4	-	-	-	-	-	-	2200	13000	4000	3000	24000	8083
1077	GANGA AT KHURJI, PATNA U/S, BIHAR	18.0	31.0	24.0	7.8	9.3	8.4	7.6	8.4	8.0	262	465	360	2.1	2.7	2.4	-	-	-	-	-	-	1300	17000	4992	2200	30000	9550
1079	GANGA AT PATNA D/S (GANGA BRIDGE),BIHAR	18.0	30.0	23.8	2.6	9.0	7.4	7.5	8.5	8.0	271	467	377	2.3	2.9	2.6	-	-	-	-	-	-	5000	50000	14545	16000	90000	34545
1817	GANGA AT MOKAMA (U/S)	17.0	31.0	23.8	7.8	9.1	8.5	7.5	8.6	8.1	308	378	345	2.0	2.6	2.4	-	-	-	-	-	-	1700	17000	5245	3000	50000	12091
1815	GANGA AT MOKAMA (D/S)	16.2	30.0	23.6	7.5	8.8	8.2	7.4	8.6	8.1	316	416	370	2.4	2.9	2.6	-	-	-	-	-	-	5000	30000	13917	16000	90000	38500
1818	GANGA AT MUNGER	19.0	26.0	22.5	8.6	9.2	8.8	8.1	8.3	8.2	342	381	355	2.0	2.5	2.3	-	-	-	-	-	-	1300	11000	4225	3000	22000	8750
1819	GANGA AT BHAGALPUR	20.0	24.0	22.0	8.6	9.0	8.8	8.2	8.2	8.2	353	386	370	2.2	2.6	2.4	-	-	-	-	-	-	2200	13000	5800	5000	28000	12750
1816	GANGA AT KAHALGAON	19.0	25.0	22.5	8.2	9.4	8.8	8.1	8.3	8.2	342	381	369	2.1	2.8	2.4	-	-	-	-	-	-	2400	22000	6100	5000	50000	16417
1080	GANGA AT BAHARAMPORE	19.5	35.5	27.8	5.9	9.1	7.4	7.3	8.6	8.0	183	358	280	0.6	3.0	1.7	0.10	0.70	0.23	-	-	-	17000	70000	29000	22000	110000	55667
1472	GANGA AT SERAMPORE	20.0	32.0	27.8	5.5	8.3	6.7	7.7	8.2	7.9	174	375	292	1.4	2.2	1.8	0.10	0.60	0.35	-	-	-	22000	110000	63000	80000	170000	105000
1053	GANGA AT DAKSHINESHWAR	18.0	31.5	27.4	4.1	8.2	6.1	7.4	8.2	7.8	201	378	316	1.4	6.0	4.2	0.10	0.80	0.33	-	-	-	35000	850000	283333	55000	1400000	605417
1471	GANGA AT HOWRAH-SHIVPUR	22.0	32.0	28.0	4.5	8.1	6.0	7.8	8.2	8.0	195	375	307	1.6	2.3	1.9	0.20	0.40	0.28	-	-	-	70000	135000	100000	150000	400000	221250
1470	GANGA AT GARDEN REACH	24.0	30.0	27.9	4.7	8.4	6.4	7.8	8.0	7.9	185	378	308	1.3	2.8	2.3	0.20	0.30	0.28	-	-	-	55000	400000	176250	85000	1100000	733750
1052	GANGA AT ULUBERIA	17.0	31.5	26.7	4.4	8.1	6.0	7.6	8.4	7.9	213	441	319	1.0	5.4	2.8	0.10	0.50	0.30	-	-	-	4000	170000	37000	8000	500000	103750
1054	GANGA AT PALTA WEST BENGAL	18.0	31.5	26.9	4.9	8.8	6.6	7.0	8.6	8.1	192	367	296	0.6	1.8	1.3	0.10	0.50	0.29	-	-	-	30000	110000	67500	70000	220000	133333
	ESTUARINE ZONE																											
1469	GANGA AT DIAMOND HARBOUR	21.0	31.0	27.5	5.3	7.4	6.1	7.8	7.8	7.8	219	6320	1943	0.5	2.5	1.6	0.20	0.40	0.33	-	-	-	4000	22000	11250	8000	130000	43250

TABLE 6.2 :- WATER QUALITY OF RIVER YAMUNA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1492	YAMUNA AT YAMUNOTRI, UTTAR PRADESH	7.5	10.0	8.8	7.8	10.3	9.1	7.1	7.2	7.2	40	105	73	0.9	1.1	1.0	0.23	0.23	0.23	-	-	-	1300	1300	1300	66000	66000	66000
1493	SHYAMA CHATTI, UTTARANCHAL	10.0	13.0	11.5	8.2	10.1	9.2	7.4	7.8	7.6	90	107	99	0.9	11.0	6.0	0.33	4.00	2.17	-	-	-	23000	23000	23000	87000	87000	87000
1494	YAMUNA AT U/S OF LAKHWAR DAM, U.P	12.0	21.5	15.9	8.1	9.6	8.7	7.2	8.3	7.6	130	398	240	0.9	2.3	1.2	0.26	0.36	0.31	0.01	0.01	0.01	240	170000	50910	0	1350000	366600
1490	YAMUNA AT U/S DAK PATTHAR, UTTAR PRADESH	13.0	23.5	16.9	6.5	9.5	8.3	6.8	8.3	7.3	140	268	211	0.9	3.6	1.8	0.31	0.40	0.36	0.01	0.01	0.01	800	380000	109200	2	3700000	723670
1553	RIVER YAMUNA , U/S PAONTA SAHIB, H.P	11.0	30.0	22.3	6.1	13.3	8.5	7.4	8.5	7.9	170	600	421	0.4	3.0	1.2	-	-	-	-	-	-	11	131000	29088	26	4400000	984586
1554	RIVER YAMUNA , D/S PAONTA SAHIB, H.P	27.0	31.5	29.7	7.8	8.0	7.9	8.1	8.2	8.2	619	800	718	2.2	2.4	2.3	2.30	2.50	2.40	0.10	0.10	0.10	900	1400	1200	2100	2400	2233
1117	YAMUNA AT HATHNIKUND HARYANA	10.0	26.0	18.9	7.6	10.6	9.6	7.4	8.4	7.9	150	412	255	1.0	3.0	1.4	-	-	-	-	-	-	180	91000	25360	120000	1580000	395545
1496	YAMUNA AT KALANAUR, YAMUNA NAGAR, HARYANA	12.0	27.0	22.7	6.0	8.6	7.6	7.4	8.3	7.8	202	528	323	1.0	4.0	1.9	-	-	-	-	-	-	1440	169000	66476	112000	2200000	873455
1119	YAMUNA AT SONEPAT, HARYANA	6.0	27.0	20.2	4.5	9.1	7.2	7.1	8.4	7.8	230	3340	763	1.0	5.0	2.7	-	-	-	-	-	-	600	760000	152033	155000	6600000	1220000
1120	YAMUNA AT WAZIRABAD, DELHI, CPCB	11.0	29.0	22.3	6.2	10.5	8.1	7.6	8.3	7.9	230	660	460	1.0	3.0	1.5	0.17	2.66	0.95	0.01	0.29	0.09	500	60000	18600	19000	570000	146727
1121	YAMUNA AT NIZAMUDDIN, DELHI	13.0	31.0	24.1	0.0	4.4	0.5	7.3	8.0	7.6	410	1590	1153	2.0	55.0	25.7	0.29	13.9	1.70	0.01	0.06	0.04	170000	1990000	1064545	2300000	17900000	8918182
1375	YAMUNA AT OKHLA BRIDGE (INLET OF AGRA CANAL), DELHI	11.0	30.0	22.6	0.0	1.4	0.2	7.3	8.0	7.7	430	1200	679	2.0	32.0	12.8	0.09	1.66	0.90	0.02	0.09	0.04	189000	2900000	709900	160000	27000000	6512000
1812	RIVER YAMUNA AT OKHLA AFTER	-	-	-	0.0	0.0	0.0	7.1	8.0	7.6	-	-	-	51.0	70.0	61.8	-	-	-	-	-	-	530000	10900000	4788333	12400000	103000000	48683333

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
	MEETING OF SHAHDARA DRAIN, DELHI																											
1497	YAMUNA AT MAZAWALI, U.P	14.0	29.0	23.0	0.0	3.7	1.3	7.5	8.1	7.8	290	1550	1062	4.0	28.0	16.3	0.48	0.88	0.72	0.02	0.23	0.08	28000	1570000	427818	620000	36000000	8772727
1123	YAMUNA AT MATHURA U/S , U.P.	16.0	30.0	24.3	2.6	6.7	4.9	7.7	8.2	7.9	560	1264	941	2.0	17.0	8.9	0.17	1.70	0.65	0.01	2.98	0.53	3700	1150000	178100	129000	14200000	2895091
1124	YAMUNA AT MATHURA D/S , U.P.	14.0	31.0	24.9	2.5	8.4	5.8	7.7	8.2	7.9	460	1350	989	4.0	18.0	10.6	0.16	1.76	0.74	0.02	1.41	0.43	4100	1010000	311109	270000	9800000	2831818
1125	YAMUNA AT AGRA U/S, U.P.	15.0	29.5	23.7	2.2	8.7	5.9	7.6	8.3	7.8	670	1420	995	8.8	17.0	7.7	0.47	3.20	1.31	0.17	0.95	0.47	3200	800000	205718	220000	3800000	1285455
1126	YAMUNA AT D/S OF AGRA, U.P.	16.0	30.0	24.8	2.1	15.2	5.3	7.5	8.3	7.8	730	1440	1033	7.0	24.0	14.0	0.51	5.83	1.49	0.19	1.24	0.56	65000	1170000	459364	590000	22000000	7672727
1498	YAMUNA AT BATESWAR, U.P	12.0	31.5	24.4	2.5	18.4	8.8	7.5	9.2	8.0	320	1595	1019	3.0	26.0	12.2	-	-	-	-	-	-	7700	430000	83727	42000	1980000	694091
1127	YAMUNA AT ETAWAH, U.P.	13.0	32.0	23.2	2.1	17.0	9.6	7.2	9.5	8.0	440	1497	1006	2.0	27.0	11.2	-	-	-	-	-	-	6200	470000	80018	52000	2500000	824455
1499	YAMUNA AT JUHIKA B/C WITH CHANBAL, ETAWAH, U.P	13.0	31.0	23.3	5.3	20.6	10.5	7.7	8.8	8.0	350	970	623	1.0	8.0	4.2	-	-	-	-	-	-	5100	1790000	193909	72000	9000000	1349364
2283	YAMUNA AT HAMIRPUR	18.0	31.0	25.3	4.3	7.9	6.6	7.7	7.9	7.8	320	632	509	1.0	3.0	2.0	-	-	-	-	-	-	2200	101000	49050	120000	1660000	782500
1069	YAMUNA AT ALLAHABAD D/S (BALUA GHAT), U.P	16.5	31.5	25.5	7.0	8.7	7.9	7.7	8.4	8.2	275	800	563	1.8	2.8	2.2	2.00	2.50	2.33	0.10	0.10	0.10	500	8000	2250	1400	13000	3925

TABLE 6.3 :- WATER QUALITY OF RIVER KALINADI, RAMGANGA, GOMTI, SARYU, GHAGARA, HINDON, KALI-HINDON, RIHAND, GANDAK, DAHA AND FARMAR - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1480	KALINADI AT U/S OF GULAOTHI TOWN IN BULANDSAHAR, U.P.	16.0	29.0	23.8	0.0	0.0	0.0	7.5	7.8	7.7	480	2570	1621	21.0	183	106	0.18	5.71	2.56	-	-	-	131000	510000	305250	3600000	140000000	47150000
1065	KALINADI AT KANNAUJ (BEFORE CONF.),U.P	15.0	34.0	26.3	4.8	10.6	7.1	7.0	9.0	8.0	61	930	473	3.1	8.8	5.5	0.20	2.60	1.45	0.10	1.20	0.47	400	15000	2618	1100	93000	14133
1477	KALINADI AT U/S OF MUZAFFAR NAGAR U.P.	14.0	30.0	23.1	5.1	10.3	7.7	7.7	7.9	7.8	340	530	410	3.0	32.0	11.0	1.10	4.25	2.35	0.02	0.40	0.19	900	300000	137975	62000	3900000	1292500
1478	KALINADI AT D/S OF MUZAFFAR NAGAR, U.P.	18.5	31.0	25.9	0.0	0.0	0.0	7.7	8.0	7.8	630	1140	965	1.0	364	147	0.34	5.55	2.72	-	-	-	380000	1580000	1085000	2400000	67000000	34125000
1064	RAMGANGA AT KANNAUJ (BEFORE CONF.),U.P	17.5	34.0	27.6	4.3	7.8	5.6	7.6	8.3	7.9	320	860	576	3.7	16.0	7.1	0.40	2.80	1.66	0.7	0.7	0.7	700	15000	2370	2300	75000	10473
1350	GOMTI AT SITAPUR U/S AT WATER INTAKE, U.P.	15.0	30.0	23.2	5.8	10.0	8.0	7.5	8.5	8.0	230	490	382	1.3	2.6	1.9	0.60	0.80	0.69	0.10	0.10	0.10	70	500	212	330	1300	779
1351	GOMTI AT LUCKNOW U/S AT WATER INTAKE POINT,U.P.	14.0	30.0	24.0	3.9	9.4	6.8	7.4	8.4	7.8	218	504	389	1.9	3.4	2.9	0.70	1.10	0.86	0.10	0.30	0.13	900	3000	1545	2200	4000	2900
1352	GOMTI AT LUCKNOW D/S, U.P.	14.0	29.0	24.3	0.8	4.9	2.6	7.2	7.8	7.4	232	610	442	7.6	14.0	9.8	1.20	1.80	1.35	0.20	0.30	0.23	30000	140000	70818	50000	170000	112727
1072	GOMTI AT VARANASI, U.P	26	30	27.2	8.2	8.5	8.4	8	8.2	7.8	262	348	327	3.2	3.7	3.5	0.2	0.3	0.20				13000	23000	18000	17000	31000	23143
1353	GOMTI AT JAUNPUR D/S, U.P.	26	30	27.4	7.9	8.1	8.0	8	8.3	8.2	278	370	335	3.8	4.4	4.2	0.3	0.4	0.32	0.12	0.12	0.12	17000	27000	22200	21000	34000	27800
1361	SAI AT UNNAO AFTER DRAIN OUTFALL, U.P.	14.0	30.0	23.4	3.5	11.6	7.6	7.3	9.3	8.0	230	569	406	1.0	3.6	2.2	0.60	0.70	0.65	0.10	0.10	0.10	230	1400	632	500	3500	1989
1354	SARYU AT AYODHYA AT MAIN BATHING GHAT, U.P.	16.0	29.0	24.9	8.1	9.7	9.1	7.2	7.8	7.6	195	365	292	2.7	3.3	3.0	0.60	0.70	0.63	0.10	0.50	0.26	3100	4700	3909	3700	7100	4873
1076	GHAGHARA NEAR CHAPRA, BIHAR	18.0	29.0	23.0	7.6	9.2	8.6	7.2	8.4	7.8	219	348	264	2.0	2.5	2.2	-	-	-	-	-	-	500	1100	675	800	2200	1250
1483	HINDON AFTER CONFL. WITH R. KRISHNA & KALI NEAR BINAULI TOWN, MEERUT,U.P.	15.0	29.0	22.8	0.0	1.0	0.3	7.5	7.9	7.7	340	470	398	1.0	36.0	13.0	0.29	0.93	0.62	0.26	0.26	0.26	14100	780000	244025	220000	4400000	2095000
1358	HINDON AT GHAZIABAD D/S, U.P.	12.0	27.0	21.3	0.0	8.5	1.6	7.0	7.6	7.1	675	1195	920	24.0	36.0	29.3	0.70	1.80	1.34	1.20	1.50	1.35	14000	180000	117091	110000	240000	212727
1359	RIHAND AT RENUKUT U/S, U.P.	20.0	31.5	26.3	7.4	8.3	7.9	7.4	8.3	7.9	281	692	354	1.9	3.3	2.5	1.30	2.10	1.77	1.40	1.40	1.40	0	2300	1200	1700	6000	2960
1360	RIHAND AT RENUKUT D/S, U.P.	20.0	31.5	26.6	7.2	8.5	7.9	7.4	8.3	8.0	300	633	379	2.1	3.2	2.6	1.60	2.60	1.88	0.10	0.10	0.10	800	3000	1880	2100	7000	3800
1078	GANDAK AT SONEPUR, PATNA (BEFORE CONFL.),BIHAR	18.0	28.0	22.5	7.8	9.3	8.6	7.1	8.5	7.7	216	265	244	1.7	2.3	2.1	-	-	-	-	-	-	300	800	583	700	1400	983
1821	DAHA AT SIWAM	19.5	30.0	23.9	7.8	8.5	8.3	7.2	8.1	7.8	162	364	280	2.0	2.6	2.3	-	-	-	-	-	-	700	2400	1120	1400	9000	3200
1824	FARMAR AT JOGBANI	20.0	30.0	25.0	8.0	9.2	8.5	7.9	8.2	8.1	324	387	356	2.0	2.3	2.2	-	-	-	-	-	-	800	800	800	1300	1400	1350

TABLE 6.4 :- WATER QUALITY OF RIVER CHAMBAL, KHAN, KSHIPRA, PARVATI, BETWA, SIND, TONS, SONE, , SANKH, MANDAKINI, DOHUS, CHURNI AND GOHAD - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
2119	BETWA AT NAYAPUR D/S MANDIDEEP INDL. AREA NO.1, DIST.RAISEN	26.0	28.0	27.0	2.7	9.0	6.2	7.3	8.6	7.9	298	3700	1016	0.5	6.8	3.7	0.10	13.6	4.97	0.20	18.40	9.30	0	12	3	27	1600	528
2121	BETWA NEAR ROAD BRIDGE, BHOJPUR	26.0	28.0	27.0	4.9	16.0	8.3	7.2	8.6	7.8	210	700	452	1.5	4.5	3.0	0.10	11.5	3.20	0.00	15.20	7.60	0	8	3	33	350	123
2122	BETWA NEAR W/S INTAKE WELL POINT RAISEN	27.0	29.0	27.4	6.8	9.2	7.8	7.0	8.7	7.6	220	500	328	0.5	2.6	1.5	0.10	6.8	3.45	1.10	1.10	1.10	0	0	0	4	250	87
1614	R.BETWA NEAR INTAKE POINT, VIDISHA, M.P	20.0	34.0	26.8	5.3	9.1	7.8	7.0	8.7	7.6	200	540	331	0.2	4.8	1.9	0.10	7.2	1.52	1.80	3.10	2.45	0	4	1	4	940	263
2124	BETWA AT CHARANTIRGHAT, VIDISHA	27.0	29.0	28.0	6.2	8.9	7.6	7.0	8.6	7.5	280	540	369	0.8	5.4	2.4	0.10	1.8	0.78	3.40	7.20	5.30	0	4	1	14	240	100
2125	BETWA D/S AFTER MIXING OF RIVER BAIS AT VIDISHA	26.0	28.0	27.0	6.2	9.1	7.8	7.0	8.8	7.5	260	800	418	1.4	3.8	2.7	0.20	1.3	0.75	0.00	10.40	5.20	0	0	0	2	219	59
1356	BETWA BEFORE CONF. YAMUNA AT HAMIRPUR, U.P.	16.0	28.0	23.0	7.0	10.1	8.0	7.6	8.7	8.3	220	660	411	1.2	2.9	2.0	-	-	-	-	-	-	40	100	71	220	480	355
2120	RIVER KALIASOT NEAR ROAD BRIDGE, MANDIDEEP	27.0	28.0	27.5	6.2	13.6	7.8	7.1	8.6	7.8	306	610	416	1.3	6.0	3.0	0.1	10.6	2.98	0.1	13.1	6.6	0	8	3	26	500	171
1365	CHAMBAL AT NAGDA U/S (WATER INTAKE POINT) M.P.	19.0	29.0	26.3	6.6	7.5	7.0	7.2	8.6	8.2	350	1020	668	2.0	2.0	2.0	0.70	1.9	1.06	0.10	0.10	0.10	-	-	-	220	220	220
1366	CHAMBAL AT NAGDA D/S, M.P.	24.0	30.0	27.6	-	-	-	6.8	8.4	7.7	6290	9340	7605	-	-	-	0.10	2.6	1.23	0.10	0.10	0.10	-	-	-	-	-	-
1418	CHAMBAL GANDHI SAGAR DAM, RAMPURA, MP	26.0	29.0	27.7	7.3	7.9	7.6	7.5	8.3	8.0	348	512	413	2.0	2.0	2.0	0.10	0.90	0.65	-	-	-				280	280	280
1288	CHAMBAL AT KOTA U/S (INTAKE PT. NEAR BARRAGE), RAJASTHAN	20.0	35.5	29.0	5.1	6.7	5.9	7.9	8.4	8.1	250	580	318	0.4	2.6	1.3	0.14	0.42	0.29	-	-	-	3	4	3	4	20	13
1289	CHAMBAL AT KOTA D/S (2 KM. FROM CITY),RAJASTHAN	19.0	33.5	27.1	3.2	7.8	5.9	8.0	8.7	8.3	280	880	506	1.4	6.2	3.3	0.30	0.74	0.50	-	-	-	4	14	6	14	210	91
1609	R. CHAMBAL AT DHOLPUR	15.5	25.0	20.4	7.5	8.4	7.9	7.3	8.1	7.7	380	780	607	1.2	2.5	1.9	0.20	0.80	0.39	-	-	-	-	-	-	-	-	-
1413	CHAMBAL AT RAMESHWARGHAT SAWAIMADHOPUR, RAJASTHAN	18.0	35.0	27.3	4.6	7.1	5.5	7.3	8.6	8.0	290	690	479	0.1	3.9	1.3	0.10	1.02	0.50	-	-	-	3	7	4	4	28	12
1376	CHAMBAL AT ETAWAH BEFORE CONFL. TO R.	13.0	31.0	23.8	3.8	12.4	8.4	7.7	8.7	8.0	270	645	455	1.0	3.0	2.0	-	-	-	-	-	-	800	36000	10620	22000	880000	213000

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
	YAMUNA, U.P.																											
1510	TONS RIVER, H.P	12.8	23.0	16.1	8.4	9.6	8.8	7.2	8.3	7.7	78	621	258	0.4	3.0	1.2	0.18	0.41	0.29	0.02	0.02	0.02	17	430000	76141	46	3900000	707190
1607	GOHAD DAM, GOHAD, M.P	14.8	14.8	14.8	8.1	8.3	8.2	7.5	7.8	7.7	510	510	510	1.4	1.4	1.4	0.1	0.4	0.25	-	-	-	-	-	-	-	-	-
2111	RIVER KHAN AT SANWER	24.0	29.8	27.5	2.1	5.5	3.5	7.5	8.0	7.9	957	2362	1399	43	50	46	6.0	32	24.1	4.8	22.1	13.5	2	40	19	30	1600	1286
2110	RIVER KHAN AT SAKKAR KHADI, INDORE	24.0	31.0	27.8	0.0	8.0	1.8	7.4	8.5	7.9	1300	1935	1589	48	50	50	14.7	40	24.5	1.4	10.4	5.9	12	200	80	1600	1600	1600
1367	KHAN AT KABIT KHEDI (NEAR INDORE) M.P.	19.0	30.2	25.8	0.0	0.0	0.0	7.0	8.5	7.7	1498	1580	1546	50	50	50	7.2	36	22.1	0.1	2.1	1.1	50	280	125	1600	1600	1600
1613	KOLAR DAM WATER SUPPLY INTAKE WELL, D. SEHORE, M.P	20.5	33.0	26.4	7.0	8.4	7.8	7.0	8.1	7.4	104	426	259	0.9	2.8	1.7	0.1	0.9	0.28	0.0	11.2	3.7	0	0	0	0	350	118
1369	KSHIPRA AT RAMGHAT AT UJJAIN, M.P.	22.0	29.0	25.0	4.5	9.6	7.3	7.3	8.7	8.2	425	1210	979	7.0	7.0	7.0	0.1	2.1	1.11	0.1	0.1	0.1	-	-	-	1600	1600	1600
1370	KSHIPRA AT TRIVENISANGAM (1 KM. D/S OF SANGAM), M.P.	22.0	28.5	24.9	3.9	9.6	7.0	7.9	8.6	8.2	480	1200	914	5.0	5.0	5.0	0.8	2.9	1.34	0.1	0.1	0.1	-	-	-	1600	1600	1600
1468	KSHIPRA AT SIDDHAWAT (D/S) OF UJJAIN.,M.P.	22.0	29.0	25.5	2.8	8.4	6.3	8.0	8.6	8.3	551	1280	1057	8.0	8.0	8.0	0.7	2.1	1.23	0.2	0.2	0.2	-	-	-	1600	1600	1600
1615	R.PARVATI NEAR INTAKE POINT PILLUKHEDI DISTT. RAJGARH, M.P	19.0	19.0	19.0	8.1	8.1	8.1	7.4	7.4	7.4	294	294	294	1.7	1.7	1.7	-	-	-	-	-	-	-	-	-	488	488	488
1433	SANKH AT TIGRA RESERVOIR, M.P.	20.0	31.0	24.0	7.4	8.0	7.7	7.3	7.6	7.4	348	960	647	1.3	2.0	1.7	0.10	0.50	0.35	-	-	-	-	-	-	-	-	-
1608	R. SINDH AT DABRA, M.P	24.0	26.0	25.0	7.8	7.8	7.8	8.1	8.1	8.1	600	870	735	1.2	1.2	1.2	0.20	0.40	0.30	-	-	-	-	-	-	-	-	-
1075	SONE AT KOELWAR, BIHAR	17.0	32.0	22.8	7.0	9.0	8.4	7.4	8.4	7.9	205	255	231	2.0	2.4	2.1	-	-	-	-	-	-	500	800	650	800	1700	1167
1763	CHURNI AT GADE BORDER (BANGLADESH - INDIA BORDER), WEST BENGAL	30.5	30.5	30.5	4.1	4.1	4.1	7.8	7.8	7.8	303	303	303	1.2	1.2	1.2	-	-	-	-	-	-	14000	14000	14000	22000	22000	22000
1764	CHURNI D/S OF SANTIPUR TOWN, WEST BENGAL	22.0	31.5	28.0	2.5	5.0	3.7	7.8	8.5	8.0	218	632	473	0.8	2.4	1.6	-	-	-	-	-	-	4000	70000	19500	10000	140000	42083
1823	DHOUS AT MADHUBANI	17.0	28.0	24.3	6.8	8.5	7.9	7.8	8.2	8.1	315	416	374	2.1	2.4	2.2	-	-	-	-	-	-	700	800	750	1100	2200	1575
1735	GOVIND SAGAR, U.P	15.0	26.0	20.3	7.3	8.9	7.9	8.0	8.3	8.2	147	290	216	1.1	1.9	1.5	-	-	-	-	-	-	20	50	34	160	280	213

TABLE 6.5 :- WATER QUALITY OF RIVER DAMODAR, RUPNARAYAN, BARAKAR, KONAR, JUMAR, BOKARO AND MAHANANDA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
2382	DAMODAR AT PHUSRO ROAD BRIDGE	23.0	24.0	23.5	6.5	6.6	6.6	6.0	6.5	6.3	-	-	-	2.3	2.4	2.4	-	-	-	-	-	-	-	-	-	-	-	-
2383	DAMODAR U/S JAMADOVA	18.0	27.0	21.7	7.0	7.3	7.2	6.7	7.5	7.2	-	-	-	2.1	2.2	2.2	-	-	-	-	-	-	-	-	-	-	-	-
2384	DAMODAR D/S SINDRI	17.0	27.8	22.6	6.8	7.3	7.1	6.8	7.5	7.3	-	-	-	1.9	2.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-
2391	DAMODAR AT PANCHET DAM	18.0	24.0	21.3	7.2	8.0	7.7	6.7	7.5	7.2	-	-	-	1.5	1.8	1.6	-	-	-	-	-	-	-	-	-	-	-	-
1331	DAMODAR AT DISHERGARH VILL.(NR.BIHAR-WEST BENGAL BORDER) WEST BENGAL	22.0	35.0	29.1	6.2	9.5	7.9	7.1	8.4	7.8	116	243	178	0.5	3.1	1.6	0.4	0.7	0.57	-	-	-	700	50000	9833	1700	90000	19867
1332	DAMODAR AT D/S OF IISCO AFTER 3RD OUTFALL AT DHENNA VILLAGE, WEST BENGAL	22.0	34.5	29.0	6.4	10.1	8.2	7.1	8.3	7.9	124	262	208	0.8	4.5	1.9	0.1	0.6	0.33	-	-	-	400	90000	10408	1300	160000	20192
1333	DAMODAR AT NARAINPUR AFTER CONFL. OF NUNIA NALLAH, WEST BENGAL	22.0	35.0	29.6	6.1	9.5	7.7	7.3	8.5	8.0	206	282	246	1.0	6.8	2.9	0.3	0.7	0.53	-	-	-	800	28000	7318	2600	90000	21718
1334	DAMODAR NEAR MUJHER MANA VILLAGE AFTER CONF. OF TAMLA NALLAH, WEST BENGAL	21.0	34.5	29.5	4.2	9.0	6.8	7.4	8.7	8.1	196	544	404	1.9	6.8	3.9	0.8	1.9	1.01	-	-	-	8000	90000	29583	13000	160000	87750
1335	DAMODAR AT HALDIA D/S (2 KM AWAY FROM HALDIA TOWN), WEST BENGAL	21.0	34.0	27.6	4.8	7.5	6.1	7.4	8.2	7.9	397	68700	13257	0.4	4.9	2.1	0.1	0.6	0.37	-	-	-	50000	350000	153636	110000	700000	250909
1336	BARAKAR AT ASANSOL (WATER INTAKE POINT), WEST BENGAL	27.0	33.0	30.8	6.4	8.5	7.8	7.7	8.4	8.0	124	199	166	1.3	3.8	2.8	0.2	0.8	0.5	-	-	-	17000	30000	24750	50000	160000	115000
1337	RUPNARAYAN BEFORE CONFL. TO RIVER GANGA NEAR	21.0	31.0	26.8	5.3	7.4	6.3	7.7	8.4	8.0	229	707	406	1.2	2.2	1.6	0.2	0.5	0.4	-	-	-	3300	105000	65825	11000	150000	94000

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
	GEONKHALI, WEST BENGAL																											
1946	MAHANANDA AT SILIGURI	27.0	31.0	29.0	5.5	8.1	6.8	7.2	7.5	7.3	110	164	130	0.9	3.8	2.7	0.1	0.6	0.3	-	-	-	17000	110000	65667	50000	300000	153333
2396	JUMAR AT KANKE DAM	25.0	25.0	25.0	5.6	5.6	5.6	6.0	6.0	6.0	-	-	-	3.2	3.2	3.2	-	-	-	-	-	-	930	930	930	2400	2400	2400
2381	BOKARO AT JARANDI	20.5	25.0	22.2	5.0	6.8	6.2	6.2	6.5	6.3	-	-	-	3.7	4.2	4.0	-	-	-	-	-	-	-	-	-	-	-	-
2390	KONAR AT TENUGHAT DAM	18.5	23.2	20.4	7.0	8.0	7.5	6.5	7.5	6.9	-	-	-	1.4	1.6	1.5	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 7.1 :- WATER QUALITY OF RIVER BRAHMAPUTRA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1260	BRAHAMPUTRA AT KHERGHAT (AFTER CONFL. WITH DIBANG & DIHANG),ASSAM	12	28	21	3.3	8.7	6.5	6.1	7.7	7.0	101	377	193	0.5	2.6	1.26	0.1	0.1	0.10	-	-	-	0	910	131	1	2800	794
1030	BRAHAMPUTRA AT DIBRUGARH, ASSAM	16	28	22	5.1	9.6	7.2	6.5	7.7	7.2	105	460	211	0.6	2.8	1.58	0.1	0.4	0.16	-	-	-	0	360	98	1	1400	425
1262	BRAHAMPUTRA AT NIMATIGHAT, ASSAM	18	26	23	5.0	7.5	6.4	6.8	8.1	7.3	90	245	161	0.4	3.3	1.52	0.1	0.1	0.10	-	-	-	0	910	272	1	1500	754
1526	BRAHMPUTRA RIVER AT DHENUKHAPAHAR, ASSAM	13	29	23	6.5	8.4	7.6	7.1	7.6	7.3	84	210	135	0.5	2.5	1.37	0.1	0.2	0.11	-	-	-	0	2400	523	1	11000	1629
1031	BRAHAMPUTRA AT PANDU, ASSAM	18	27	23	7.0	9.6	8.0	6.1	7.7	7.2	122	254	179	0.6	4.4	1.77	0.1	0.3	0.13	-	-	-	0	24000	3817	360	240000	34447
1299	BRAHAMPUTRA AT JOGIJHOGA NEAR BRIDGE, ASSAM	24	32	27	6.0	8.8	7.1	7.0	8.0	7.4	75	318	207	0.5	5.4	1.45	0.1	0.1	0.10	-	-	-	0	2400	644	1	24000	4266
2069	BRAHMPUTRA RIVER NEAR WATER INTAKE POINT AT KACHARIGHAT, PANBAZAR, GUWAHATI, ASSAM	18	28	25	4.3	9.1	7.3	7.6	8.0	7.9	134	145	140	0.5	1.7	0.93	0.1	0.1	0.10	-	-	-	910	4300	2040	1500	15000	6267
2064	BRAHMAPUTRA RIVER AT CHANDRAPUR, GUWAHATI	19	28	25	6.7	9.2	7.6	6.8	7.7	7.3	110	242	146	0.4	4	1.78	0.1	0.2	0.15	-	-	-	300	360	340	730	2000	1277
2067	BRAHMPUTRA RIVER AT SUALKUCHI, DIST. KAMRUP, ASSAM	26	28	27	8.3	8.7	8.5	7.0	8.0	7.6	142	152	148	0.5	1.5	0.87	0.1	0.1	0.10	-	-	-	300	360	330	730	910	820
2066	BRAHMAPUTRA RIVER AT DHUBRI	24	30	28	6.9	8.5	7.6	6.8	7.3	7.1	140	231	173	1.0	3.1	2.03	0.1	0.2	0.13	-	-	-	0	2000	683	730	2800	1610

TABLE 7.2 :- WATER QUALITY OF RIVER DHANSIRI - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1796	FULL NAGARJAN, NAGALAND	15	29	24	6.0	7.6	7.0	7.3	8.7	8.2	90	239	161	0.4	2	0.9	1.8	7.4	4.48	1.1	1.1	1.1	-	-	-	-	-	-
1799	TOWN BOUNDARY BRIDGE (DIPHU ROAD), NAGALAND	14	28	24	4.8	9.2	6.7	7.4	8.4	7.9	72	176	128	0.4	2.4	1.0	2.4	6.2	4.58	-	-	-	-	-	-	-	-	-
1797	BRIDGE NEAR PURANA BAZAAR, NAGALAND	16	29	25	6.0	8.0	7.2	7.2	8.3	7.9	92	223	130	0.4	1.2	0.8	1.6	6.0	4.10	-	-	-	-	-	-	-	-	-
1800	NUTON BASTI, NAGALAND	14	27	23	2.4	7.6	4.5	7.3	7.7	7.5	113	225	172	0.8	2.8	1.6	1.4	5.3	4.05	-	-	-	-	-	-	-	-	-
1798	NEAR CHECK GATE (DIMAPUR KHUTKHUTI ROAD), NAGALAND	16	29	26	3.2	9.0	6.4	7.1	8.2	7.8	62	231	145	0.4	2.4	1.2	1.7	5.4	3.93	-	-	-	-	-	-	-	-	-
1259	DHANSIRI AT GOLAGHAT, ASSAM	18	27	23	6.8	8.0	7.4	6.9	7.9	7.6	170	229	192	0.5	3.9	1.7	0.1	0.2	0.13	-	-	-	0	360	120	730	1100	913
1928	DHANSIRI AT NAGALAND-ASSAM BORDER, DIMAPUR	16	29	25	4.0	6.4	5.3	6.8	7.8	7.0	119	259	202	0.4	2.4	1.3	1.5	8.2	5.33	-	-	-	-	-	-	-	-	-
1930	DZU D/S KOHIMA TOWN	13	25	20	3.2	8.0	5.8	8.1	8.5	8.3	68	400	249	0.8	1.2	1.0	1.8	5.1	3.90	-	-	-	-	-	-	-	-	-
1929	CHATHE AT MEDZIPHEMA, DIMAPUR	15	28	24	6.0	8.4	7.0	7.7	8.2	8.1	62	118	95	0.4	0.8	0.6	1.9	6.7	4.18	-	-	-	-	-	-	-	-	-

TABLE 7.3 :- WATER QUALITY OF RIVER SUBANSIRI, KHARSANG, BURHIDIHING, PAGLDIA, DIGBOI, JAI BHARALI, KOLONG, MANAS, DISANG, JHANJI, BHOGDOI, MORA BHARALI, BORAK, BHARALU, DEEPAR BILL & KATHAKAL - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1261	SUBANSIRI AT GEREKAMUKH,ASSAM,(BEFORE CONFL. WITH BRAH.),ASSAM	14	24	19	8.5	9.9	9.1	6.7	7.6	7.1	50	147	81	0.5	2.7	1.65	0.1	0.2	0.15	-	-	-	0	0	0	1	360	91
2061	RIVER KHARSANG BEFORE CONFLUENCE WITH BURIDIHING NEAR KHARSANG (ASSAM-ARUNANCHAL BORDER)	19	25	22	6.8	7.4	7.1	6.5	7.3	7.0	120	516	229	0.7	2.1	1.25	0.1	0.4	0.18	-	-	-	0	300	100	1	910	424
1422	BURHIDIHING AT MARGHERITA, ASSAM	20	26	23	5.1	9.0	6.6	6.4	7.4	6.9	301	493	354	0.9	2.2	1.53	0.1	0.6	0.33	-	-	-	0	300	75	1	910	500
2062	BURIDIHING NEAR DULIAJAN AT D/S, TINSUKIA	21	28	25	5.4	8.0	6.9	6.1	7.6	7.1	132	860	403	0.7	3.0	1.75	0.1	0.6	0.25	-	-	-	0	300	75	1	910	500
2230	BURHIDIHING RIVER AT DULIAJAN (INTAKE POINT OF OIL INDIA LTD.)	20	29	26	7.0	7.2	7.1	6.5	7.3	6.9	125	294	235	1.9	7.0	4.07	0.1	0.3	0.2	-	-	-	0	0	0	1	360	181
2065	PAGLDIA RIVER NEAR NALBARI TOWN, DIST. NALBARI, ASSAM	27	35	31	6.6	8.5	7.5	7.6	8.1	7.9	220	260	243	0.4	1.8	0.93	0.1	0.2	0.13	-	-	-	0	360	180	360	4300	2330
1530	DIGBOI RIVER AT LAKHIPATHE, RESERVE FOREST, DIGBOI, ASSAM	13	27	23	3.6	9.2	6.8	6.7	7.0	6.8	140	187	161	0.4	3.7	2.10	0.1	0.1	0.10	-	-	-	0	300	75	300	1500	860
2063	JAI BHARALI RIVER NEAR BISWANATH CHARALI, SONITPUR	12	26	21	7.9	8.6	8.3	7.2	7.4	7.3	76	98	87	0.6	1.4	0.98	0.1	0.1	0.10	-	-	-	0	0	0	300	910	575
2237	KALONG RIVER AT U/S OF ANANDARAM DEKIAL PHUKAN BRIDGE, NAGAON	27	33	29	5.5	8.0	6.7	6.9	7.2	7.1	175	189	181	0.8	3.6	2.33	0.1	0.1	0.1	-	-	-	0	1500	867	910	2200	1703
2059	KOLONG RIVER AT MARIGAON	19	32	27	7.3	8.3	7.8	7.1	7.9	7.6	98	110	104	0.6	3.3	2.28	0.2	0.2	0.20	-	-	-	0	730	438	700	3500	1508
2060	MANAS RIVER AT NH-31 CROSSING, BARPETA, DISTRICT	21	32	28	5.7	8.8	7.4	7.0	7.9	7.6	350	479	437	0.5	0.9	0.63	0.1	0.1	0.10	-	-	-	0	1500	750	360	15000	4630
2058	DISANG RIVER AT DILLIGHAT, DIBRUGARH DIST., ASSAM	14	26	22	5.5	9.0	7.4	6.3	7.3	6.6	122	223	152	0.8	5.5	2.30	0.1	0.3	0.15	-	-	-	0	360	180	1	910	545
1298	DISANG AT GUNDAMGHAT, ASSAM	16	23	21	5.8	7.2	6.5	6.8	7.3	7.0	110	256	161	1.2	5.0	2.67	0.2	0.4	0.30	-	-	-	0	0	0	1	360	220
1258	JHANJI AT N.H. CROSSING JORHAT, ASSAM	18	26	22	5.8	18.0	9.3	6.9	7.7	7.3	130	254	165	0.8	1.6	1.10	0.1	0.1	0.10	-	-	-	300	730	423	700	2100	1110
1527	BHOGDOI RIVER AT JORHAT ,ASSAM	17	25	22	5.4	6.5	5.9	6.8	7.6	7.2	176	221	196	0.8	2.6	1.63	0.1	0.1	0.10	-	-	-	0	360	180	730	1100	913
1531	*MORA BHARALI AT TEZPUR, ASSAM	12	27	22	7.5	9.0	8.1	7.0	7.6	7.3	108	246	202	0.9	4.0	2.15	0.1	0.2	0.13	-	-	-	0	0	0	1	910	638
1423	BORAK AT PANCHAGRAM , ASSAM	13	28	17	6.4	7.9	7.2	7.1	8.1	7.6	145	203	162	0.5	1.3	0.88	0.1	0.1	0.10	-	-	-	0	2000	575	1	2700	940
1528	BHARALU RIVER AT GUWAHATI	22	35	28	-	-	-	7.3	7.7	7.4	750	868	785	2.2	31.5	18.43	0.1	0.1	0.10	-	-	-	1500	24000	9267	2100	110000	40467
1529	DEEPAR BILL, ASSAM*	22	32	28	5.0	10.2	8.1	6.9	7.8	7.3	180	190	186	0.7	8.2	3.15	0.1	0.2	0.13	-	-	-	0	910	547	730	1500	1243
2068	U/S OF KATHAKAL AT MATIJURI, DIST. HAILAKANDI, ASSAM	12	28	16	7.0	8.1	7.5	7.0	8.1	7.7	180	193	187	0.7	2.5	1.35	0.1	0.1	0.10	-	-	-	0	2600	1025	730	2800	1783

TABLE 7.4 :- WATER QUALITY OF RIVER TEESTA, DIKCHU, MANEY KHOLA, RANICHU, KUNDLI, DIKHOW, KOHORA, BOGINADI, RANGA NADI, PANCHNAI, KAPILI, BEKI, SANKOSH, BARAK, SONAI & KUSHIYARA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1801	RIVER TEESTA AFTER CONFIUENCE OF RIVERS LACHENCHU & LACHUNGCHU AT CHUNGTHAANG, SIKKIM	-	-	-	8.5	12.0	10.4	6.0	7.0	6.5	210	270	238	2.0	3.0	2.45	2.0	3.2	2.6	-	-	-	40	170	110	80	280	221
1807	RIVER TEESTA AFTER CONFLUENCE WITH RIVER RANICHU AT SINGTAM	-	-	-	9.0	12.5	11.0	6.4	7.2	6.7	240	280	258	2.2	3.5	3.01	2.3	3.4	2.9	-	-	-	80	220	140	170	350	258
1808	RIVER TEESTA AFTER CONFLUENCE WITH RANGCHU AFTER MEETING THE INDUSTRIAL EFFLUENTS FROM THE TOWN RANICHU	-	-	-	8.0	12.0	10.6	6.2	7.0	6.6	230	280	262	2.5	3.6	3.11	2.4	3.2	3.0	-	-	-	100	170	146	220	350	277
1809	RIVER TEESTA AT MELLI DOWNSTREAM, SIKKIM	-	-	-	9.0	12.0	10.7	6.1	6.9	6.5	250	290	267	2.6	3.8	3.23	2.8	3.5	3.1	-	-	-	110	220	148	280	350	290
1947	TEESTA AT SILIGURI	18	22	20	8.5	15.2	11.3	7.1	7.4	7.3	60	73	66	0.8	2.0	1.40	0.1	0.3	0.2	-	-	-	11000	80000	36000	22000	130000	58000
1802	RIVER DIKCHU BEFORE CONFIUENCE WITH RIVER TEESTA NEAR NHPC HYDROELECTRIC POWER PROJ, SIKKIM	-	-	-	8.0	12.0	10.4	6.3	6.8	6.5	220	280	253	2.0	3.4	2.52	2.2	3.1	2.6	-	-	-	40	170	110	110	280	221
1803	RIVER MANEY KHOLA AT BURTUK NEAR ARMY BASE CAMP, 4 KM U/S OF GANGTOK, SIKKIM	-	-	-	9.0	12.0	10.8	6.0	7.2	6.5	230	270	253	2.0	3.2	2.52	2.2	3.3	2.7	-	-	-	40	140	99	90	280	215
1804	RIVER MANEY KHOLA AFTER CONFLUENCE WITH RAY KHOLA AT ADAMPOOL AFTER MEETINGWAST	-	-	-	9.0	12.0	11.0	6.4	7.0	6.6	240	280	258	2.2	3.2	2.63	2.1	3.3	2.6	-	-	-	50	170	96	130	280	204

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
	E OF STP, GANGTOK D																											
1805	AFTER CONFLUENCE OF RANICHU AND RORACHU AT RANIPOOL, SIKKIM	-	-	-	8.5	12.0	11.1	6.2	6.9	6.5	240	280	258	2.2	3.2	2.77	2.2	3.2	2.6	-	-	-	70	120	95	170	280	224
1806	RANICHU BEFORE CONFLUENCE WITH RIVER TEESTA AT SINGTAMSIKKIM	-	-	-	8.0	12.5	10.9	6.2	6.8	6.4	230	280	251	2.4	3.5	2.90	2.2	3.5	2.8	-	-	-	50	170	118	170	300	237
2229	KUNDLI RIVER AT KUNDLI/ SAPAKHOWA, SADIA.	18	26	22	5.6	8.3	6.5	6.7	7.0	6.8	201	213	205	0.9	3.1	2.20	0.1	0.1	0.1	-	-	-	0	730	243	1	1500	600
2231	DIKHOW RIVER AT DIKHOW BRIDGE SIVASAGAR	22	24	23	5.6	7.0	6.1	6.9	7.4	7.1	170	176	172	0.6	2.3	1.23	0.1	0.1	0.1	-	-	-	0	360	120	300	1100	770
2232	KOHORA RIVER AT N.H. CROSSING, KOHORA	26	30	28	6.8	6.8	6.8	6.4	6.8	6.6	43	45	44	1.5	2.5	2.00	0.1	0.1	0.1	-	-	-	0	0	0	300	360	330
2233	BOGINADI NEAR BRIDGE NH-52, LAKHIMPUR	15	24	21	8.1	8.5	8.2	6.8	7.2	7.0	85	106	96	0.6	2.2	1.53	0.1	0.1	0.1	-	-	-	0	300	100	1	700	467
2234	RANGA NADI D/S OF HYDEL PROJECT	15	24	21	7.8	8.2	8.0	6.9	7.3	7.1	101	114	108	0.5	2.6	1.60	0.1	0.1	0.1	-	-	-	0	0	0	1	300	101
2235	PANCHNAI RIVER AT NH-52 CROSSING, ORANG	19	28	24	7.7	8.6	8.1	7.2	7.6	7.4	130	136	133	0.9	1.4	1.20	0.1	0.1	0.1	-	-	-	0	0	0	300	730	463
2236	KAPILI RIVER AT DHARMTUL BRIDGE, NH-31, NAGAON	27	33	29	6.1	9.0	7.8	6.9	7.3	7.2	105	110	107	0.6	2.0	1.10	0.1	0.1	0.1	-	-	-	0	360	240	1	910	607
2238	BEKI RIVER AT NH-37 CROSSING AT BARPETA ROAD	27	31	29	5.4	7.8	6.9	5.8	7.7	7.1	135	140	137	0.3	0.7	0.50	0.1	0.2	0.1	-	-	-	0	360	120	700	910	840
2239	SANKOSH RIVER, DHUBRI	28	28	28	6.9	6.9	6.9	7.0	7.0	7.0	125	125	125	1.6	1.6	1.60	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
2240	BARAK RIVER AT D/S OF SILCHAR	12	12	12	7.0	8.3	7.5	6.8	7.5	7.1	140	154	148	1.0	2.5	1.83	0.1	0.2	0.1	-	-	-	0	0	0	910	1500	1170
2241	SONAI RIVER AT SONAI	12	12	12	7.4	8.0	7.6	7.0	7.5	7.3	140	160	153	0.7	1.4	1.03	0.1	0.1	0.1	-	-	-	0	0	0	1	1100	487
2242	KUSHIARA RIVER AT KARIMGANJ	12	12	12	7.5	8.4	7.8	6.8	7.3	7.0	152	162	155	0.4	2.4	1.20	0.1	1.2	0.5	-	-	-	0	360	120	360	1400	890

TABLE 8.1 :- WATER QUALITY OF RIVER MAHI & ITS TRIBUTARY - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1233	MAHI AT BADNAWAR, M.P.	20	32	26	7.4	8.5	7.8	8	7.8	7.6	225	1132	508	0.9	1.9	1.4	0.1	1.2	0.5	0.1	1	0.6	0	0	0	0	140	76
1232	MAHI (D/S) CONF WITH R. CHAP (UNDER SAGWARA-SARHI RD. BDG.),RAJASTHAN	20	31	26	4.6	6.6	5.7	8	8.3	8.2	390	630	516	0.2	1.46	0.8	0.2	0.7	0.5	-	-	-	3	4	4	7	28	19
1230	MAHI AFTER CONF. WITH ANAS AT PARDI (BANASWADA),GUJARAT.	22	25	24	7.6	13	9.6	8	8.7	8.3	316	360	338	1.1	3.6	2.4	-	-	-	-	-	-	-	-	-	3	4	3
1229	MAHI NEAR RAJASTHAN BORDER AT KADANA DAM,GUJARAT	22	25	24	8	11	9.4	8	8.4	8.2	318	376	346	0.4	4	2.3	-	-	-	-	-	-	-	-	-	3	3	3
1863	MAHI AT UMETA BRIDGE	22	27	25	8.2	9.9	9.1	8	8.6	8.5	435	435	435	2.8	3.3	3.1	0.3	0.3	0.3				7	7	7	11	11	11
1864	MAHI AT MUJPUR	22	27	25	9.2	10	9.7	8	8.3	8.3	485	692	589	2.1	4.2	3.2	0.3	0.3	0.3	0.1	0.1	0.1	4	4	4	11	11	11
1231	MAHI AT VIRPUR, GUJARAT	24	26	25	8.3	13	11.0	8	8.5	8.4	329	350	337	0.9	4.6	2.5	-	-	-	-	-	-	-	-	-	3	4	4
4	MAHI AT SEVALIA, GUJARAT	23	29	26	6	12	9.2	7	8.8	8.3	264	470	390	0.5	3.2	1.8	0.1	0.3	0.2	-	-	-	3	3	3	3	7	4
5	MAHI AT VASAD, GUJARAT	22	28	26	4.6	12	8.1	7	8.9	8.3	400	1660	546	0.2	6.8	2.8	0.1	0.5	0.3	0.2	0.2	0.2	0	18	7	3	210	28
1227	PANAM AT LUNAWADA,GUJARAT	23	23	23	11	11	10.8	8	8.2	8.2	370	370	370	3.7	3.7	3.7	-	-	-	-	-	-	-	-	-	4	4	4
1228	ANAS AT DAHOD,(KUSHALGARH),DIST. PANCHMAHAL,GUJARAT	25	27	26	5.9	8.6	7.3	8	8.5	8.3	408	510	459	1.3	3.8	2.6	-	-	-	-	-	-	-	-	-	4	4	4
2102	RIVER SHIVNA AT RAMGHAT, MANDSAUR	26	30	28	6.4	7.8	7.2	7	8.9	8.2	254	480	405	-	-	-	0.9	1.7	1.3	-	-	-	-	-	-	-	-	-
2103	RIVER JAMMER AT DHOLOWAD, RATLAM	22	28	25	5	7.8	7.0	7	8.6	8.2	239	629	360	-	-	-	0.8	1.3	1.0	-	-	-	-	-	-	-	-	-
2104	RIVER MALEI AT JAORA	21	29	27	6.2	7.6	7.1	8	8.4	8.3	460	1100	667	-	-	-	0.1	2.1	0.9	-	-	-	-	-	-	-	-	-
2105	RIVER CHILLAR AT SHAJAPUR	23	26	25	7	7.8	7.4	7	8.2	7.8	270	550	423	-	-	-	0.6	1.1	1.0	0.1	0.1	0.1	-	-	-	-	-	-

TABLE 9.1 : - WATER QUALITY OF RIVER SABARMATI & ITS TRIBUTARIES - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	WATER QUALITY CRITERIA				> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1866	RIVER SABARMATI AT HANSAOL BRIDGE, GUJARAT	22	31	27	6.6	9.5	7.9	8	8.5	8.3	191	532	374	2	3	2.5	0.1	1	0.5	-	-	-	15	150	49	23	210	80
1221	SABARMATI AT KHEROJ BRIDGE, GUJARAT	25	30	29	3	11	8.2	7	8.7	8.0	511	778	603	3	12	5.9	0.1	2.6	0.8	0.1	0.1	0.1	9	1500	161	23	2100000	190987
1482	SABARMATI AT MAHUDI JAIN TEMPLE, 150 KM. FORM ORIGIN,GUJARAT	29	30	30	6.5	9	7.8	8	8.4	8.3	666	750	708	3	4	3.5	0.5	0.6	0.6	-	-	-	70	90	80	150	430	290
1	SABARMATI AT DHAROI DAM, GUJARAT	28	28	28	8.2	8.2	8.2	8	8.4	8.4	593	593	593	3	3	3.0	0.3	0.3	0.3	-	-	-	4	4	4	15	15	15
2	SABARMATI AT AHMEDABAD AT V.N. BRIDGE,GUJARAT	24	33	29	0	3.6	1.5	7	8.6	7.5	425	2320	1053	2	31	16.3	0.1	2.5	0.9	0.1	0.1	0.1	9	15000	3442	23	43000	9888
1409	SABARMATI AT RAILWAY BRIDGE AHMEDABAD, GUJARAT	22	32	29	1.1	9	5.1	8	8.7	7.9	205	519	403	1	16	5.6	0.1	1.3	0.4	0.1	0.7	0.3	15	230	68	43	460	200
1408	SABARMATI AT VILL. MIROLI TALUKA ASCROI,AHMEDABAD, GUJARAT	24	33	29	0	0	0.0	7	8.7	7.7	1640	3200	2362	-	-	-	0.3	2.8	1.6	0.2	0.2	0.2	1500	43000	9490	2100	93000	24691
1223	SABARMATI AFTER CONF. WITH MESHWA AT VAUTHA (NEAR DHOKLA),GUJARAT	25	33	29	0	3.8	0.6	8	8.6	7.8	1410	2940	2007	41	48	45.3	0.1	4	1.0	0.5	0.5	0.5	700	9000	2573	1500	23000	6264
1222	SHEDHI AT KHEDA, GUJARAT	27	32	29	3.7	11.8	7.1	8	8.2	7.9	829	1340	1065	0.8	19	8.0	0.1	5.1	1.4	1.3	1.3	1.3	9	15	12	15	43	24
1437	KHARI AT LALI VILLAGE NEAR AHMEDABAD, GUJARAT	32	32	32	0.7	1.2	1.0	8	8.7	8.2	2430	2500	2465	9	9	9.0	0.2	1	0.6	-	-	-	1500	23000	12250	2100	43000	22550

TABLE 10.1 : - WATER QUALITY OF RIVER NARMADA & ITS TRIBUTARIES - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1241	NARMADA AT MANDLA NEAR ROAD BDG. M.P.	22	28	25	-	-	-	7	7.7	7.5	204	455	301	1.2	2.3	1.6	0.1	0.8	0.5	-	-	-	0	23	11	21	460	241
44	NARMADA AT SETHANIGHAT M.P.	21	29	27	6.4	8.2	7.0	7	8.4	7.8	310	570	399	0.3	5.8	3.1	0.2	2	0.9	0.1	5.2	1.1	0	14	6	13	2400	1035
1240	NARMADA AT NARSINGHPUR M.P.	15	30	24	-	-	-	7	7.9	7.6	298	462	369	1.6	2.5	2.0	0.3	2.6	1.1	-	-	-	0	21	5	43	460	161
1234	NARMADA AT HOSHANGABAD U/S M.P.	19	29	26	6.8	9.9	7.8	7	8.6	7.6	258	441	328	0.4	5.9	1.9	0.1	0.9	0.4	0.1	0.7	0.4	4	11	8	4	350	147
2123	NARMADA AT KORIGHAT HOSHANGABAD	27	29	28	6.2	7.6	6.9	7	7.7	7.6	328	429	369	0.9	3.3	2.4	0.9	0.9	0.9	0.8	0.8	0.8	6	17	12	23	940	421
1235	NARMADA AT HOSHANGABAD D/S M.P.	20	29	26	6.2	13	8.0	7	8.4	7.5	306	490	372	0.9	11.4	3.2	0.1	1	0.4	0.9	0.9	0.9	2	12	9	110	1600	411
2106	NARMADA AT NEMAWAR	23	30	26	7.2	7.5	7.3	7	8.4	8.0	220	460	309	-	-	-	0.1	1.3	0.8	-	-	-	-	-	-	-	-	-
2113	NARMADA NEAR PUNASA DAM, PUNASA	25	32	28	7.4	8	7.7	8	8	7.7	197	278	243	0.6	1.2	0.8	0.1	1.3	0.6	0.1	0.1	0.1	0	2	0	22	90	47
1430	NARMADA AT D/S OF OMKARESHWAR M.P.	18	31	27	7	8.8	7.6	8	10	7.9	206	304	255	0.9	1.3	1.1	0.4	1	0.8	0.1	0.6	0.2	0	2	0	2	350	149
2112	NARMADA NEAR MORTAKKA BRIDGE, BADWAH	26	30	28	6.6	8.2	7.5	7	8	7.7	194	364	257	0.6	1.3	0.9	0.4	1.9	0.8	0.1	0.8	0.3	0	2	1	2	140	90
2099	NARMADA LALPUR, JABALPUR	20	31	25	-	-	-	7	7.9	7.6	180	615	329	0.9	1.4	1.2	0.1	1.7	1.0	-	-	-	0	0	0	39	150	77
45	NARMADA AT MANDLESHWAR M.P.	19	30	26	6.4	8.6	7.8	8	8	7.7	196	310	252	0.4	1.6	0.9	0.1	1.4	0.6	0.1	1	0.3	0	2	0	0	140	57
1431	NARMADA AT MAHESHWAR, M. P.	19	30	25	6.8	8.6	7.8	8	8	7.7	224	430	285	0.9	1.4	1.2	0.1	1	0.6	0.1	0.1	0.1	0	0	0	40	170	112
1239	NARMADA AT BADWANI, M.P.	20	29	26	7.7	8.2	8.0	8	8	7.7	212	440	285	0.8	1.4	1.1	0.1	0.4	0.2	0.1	0.1	0.1	0	0	0	50	110	90
7	NARMADA AT GARUDESHWAR, GUJARAT	21	28	26	6.6	13	8.9	7	8.7	8.0	260	312	285	0.2	6	1.9	0.1	0.8	0.5	-	-	-	0	4	1	0	11	4
1245	NARMADA AT CHANDOD, GUJARAT	21	26	25	7.7	11	9.4	7	8.9	8.0	262	376	294	0.8	3.2	2.1	0.5	0.5	0.5	-	-	-	2	2	2	3	40	13
1244	NARMADA AT PANETHA, GUJARAT	23	28	26	6.8	11	8.4	7	8.8	7.9	266	353	305	0.4	2.8	1.3	0.4	0.9	0.7	-	-	-	0	2	0	2	110	16
1243	NARMADA AT BHARUCH,ZADESHVAR, GUJARAT	22	29	27	6.8	11	7.8	7	8.7	8.0	285	367	323	1	3.6	1.9	0.7	12	3.0	0.7	0.7	0.7	0	140	61	3	1100	498
1981	NARMADA AT ZANOR (NTPC), BHARUCH	22	28	25	4.9	7.6	6.3	7	7.1	7.0	336	580	458	0.7	1.2	1.0	0.4	0.5	0.5	-	-	-	2	2	2	70	90	80
1236	CHOTA TAWA BEFORE CONFL. WITH RIVER NARMADA,M.P.	27	28	27	7.8	7.8	7.8	8	7.6	7.6	310	328	319	0.8	1.2	1.0	0.3	0.8	0.6	-	-	-	0	0	0	60	70	65
2114	KUNDA AT KHARGONE	26	32	28	4.9	8	6.8	8	8.5	7.9	570	853	693	1.3	4.2	2.2	0.6	1.8	1.0	0.1	0.2	0.1	0	2	1	220	900	427
2100	GOUR RIVER BHOGA DOOR, JABALPUR	14	30	24	-	-	-	7	7.8	7.5	212	521	433	1.1	2.8	1.6	0.3	2.4	1.1	-	-	-	0	0	0	39	1100	274
2101	KATNI RIVER NEAR NAGAR NIGAM	16	30	25	-	-	-	7	7.8	7.6	218	681	382	1.5	2.2	1.7	0.2	1.9	0.7	-	-	-	0	0	0	9	1100	530

TABLE 11.1 : - WATER QUALITY OF RIVER TAPI & ITS TRIBUTARIES - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
9	TAPI AT NEPANAGAR M.P.	20	28	25	7.5	8.8	8.0	7.0	7.7	7.5	265	425	356	0.6	1.3	1.0	0.1	1	0.5	0.1	0.1	0.1	0	0	0	50	110	75
2115	TAPTI AT NEPA NAGAR 100 METRE D/S AFTER MIXING PANDHAR NALLA	24	30	28	6.5	7.8	7.5	7.0	8.0	7.6	286	507	385	0.8	1.4	1.1	0.1	5	1.2	0.1	0.1	0.1	0	2	1	80	300	154
10	TAPI AT BURHANPUR M.P.	19	29	26	7.4	7.9	7.6	7.4	7.6	7.5	252	922	490	0.8	2.2	1.4	0.1	2.9	1.0	0.1	0.1	0.1	0	2	1	9	350	178
1250	TAPI AT HATHNUR M.P.	20	29	26	7.2	8.1	7.6	7.5	8.0	7.7	256	500	397	0.9	1.7	1.3	0.4	1.8	1.1	0.6	1.1	0.9	0	0	0	90	280	163
1313	TAPI AT AJNAND VILLAGE, MAHARASHTRA	24	41	31	3.8	7.9	6.2	7.7	8.9	8.3	138	1007	493	4	21	8.3	0.2	2.1	0.7	-	-	-	3	18	11	7	45	25
1251	TAPI AT BHUSAWAL U/S MAHARASHTRA	22	33	28	4.2	8.7	6.4	6.6	8.9	8.1	139	954	465	4.2	19	6.9	0.3	4.2	0.8	-	-	-	4	17	8	9	30	19
1314	TAPI AT UPHAD VILLAGE, MAHARASHTRA	26	39	31	5.4	8.3	6.6	7.8	8.7	8.2	137	990	467	4.2	14	6.6	0.1	4.2	0.8	-	-	-	2	26	11	10	50	21
46	TAPI AT UKAI, SHERULA BRIDGE, GUJARAT	22	32	27	5.5	8.5	6.7	7.7	8.4	8.1	280	377	326	0.2	3.6	1.5	0.1	0.9	0.3	0.5	0.5	0.5	15	24000	7837	20	46000	15105
1247	TAPI AT MANDAVI, GUJARAT	25	32	28	4.9	8.8	7.4	7.3	8.4	8.1	325	527	389	0.3	3.3	1.7	0.1	0.6	0.3	0.8	0.8	0.8	240	240000	45687	460	460000	106721
47	TAPI AT KATHORE, (NH-8 BRIDGE), GUJARAT	21	32	27	4.8	8	7.0	7.5	8.4	8.2	305	560	414	0.2	3	1.6	0.2	0.9	0.4	0.5	0.5	0.5	43	240000	52914	75	460000	103453
1248	TAPI AT SURAT U/S KATHORE, GUJARAT	22	32	27	4.4	8.4	6.6	7.5	8.5	8.2	340	547	440	0.6	2.8	1.7	0.3	1	0.5	0.2	0.2	0.2	43	93000	19286	75	240000	45431
1982	TAPI AT RANDER BRIDGE, SURAT	28	30	29	3.3	8.3	5.8	8.2	8.4	8.3	405	539	472	2.1	7.4	4.8	0.1	0.4	0.3	-	-	-	2300	4300	3300	4300	9300	6800
1983	TAPI NEAR BARDOLI (KAPP BRIDGE) BARDOLI	-	-	-	4.5	5.3	4.9	7.9	8.2	8.1	379	395	387	0.8	3.1	2.0	0.1	0.2	0.2	-	-	-	2000	4300	3150	7500	24000	15750
2071	TAPI AT ONGC BRIDGE AT SURAT, DIST. SURAT	25	30	28	2.1	8.5	4.9	7.8	8.1	7.9	373	26000	9609	1.1	6	3.9	0.1	1.6	0.6	-	-	-	900	24000	12357	2300	46000	21343

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1253	GIRNA AT MALEGAON (MANMAD), MAHARASHTRA	23	32	28	5	6.9	6.2	7.4	8.2	7.8	132	486	325	4.5	8.5	6.0	0.3	2.9	1.5	-	-	-	4	17	10	15	40	26
1252	GIRNA AT JALGAON, MAHARASHTRA	29	34	31	5.2	6.6	6.1	7.8	8.7	8.4	216	431	300	4	10	6.3	0.1	1.1	0.5	-	-	-	7	9	8	16	45	26
1907	RANGAVALI D/S OF NAVAPUR	23	32	29	5.6	8.8	6.6	7.8	8.7	8.2	247	1008	507	5	8.4	6.3	0.1	1.1	0.5	-	-	-	12	14	13	17	50	30
2070	KIM AT SAHOL BRIDGE, OLPAD HANSOT ROAD, DIST. SURAT	25	31	29	4.5	6.7	5.8	7.8	8.3	8.0	310	1370	811	0.1	6	2.4	0.1	2.6	0.7	-	-	-	9	24000	10352	43	46000	20807
2127	DENWA NEAR SARNI, ROAD BRIDGE	26	29	27	5.4	8.8	6.9	7.0	8.6	8.0	240	530	382	0.3	4	2.9	-	-	-	-	-	-	0	4	1	0	350	93
2155	PURNA RIVER A/C OF MORNA, NANDURA VILLAGE	20	26	23	4.6	5.1	4.9	7	7.2	7.2	614	1177	896	5.8	10.2	8.0	1.1	1.7	1.4	-	-	-	50	90	70	220	400	310

TABLE 12.1 : - WATER QUALITY OF RIVER MAHANADI - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1851	MAHANADI AT SIHAWA	24	33	28	6.6	7.8	7.1	8	8.5	7.9	216	363	269	1.5	2.6	2.1	0.8	2.0	1.4	0.1	1.5	1.0	-	-	-	26	240	169
1264	MAHANADI AT RUDRI U/S AT DHAMTORI RESERVOIR,CHHATISSGARH	24	34	28	7.4	7.8	7.6	7	8.4	7.7	152	354	252	2	2.4	2.3	0.8	2.5	1.7	0.1	1.4	1.0	-	-	-	33	79	61
1099	MAHANADI AT U/S OF RAJIM, CHHATISSGARH.	23	34	28	6.8	8	7.6	7	8.5	7.9	160	668	337	1.1	2.8	2.3	0.6	3.6	2.2	0.6	2.6	1.3	-	-	-	30	270	127
1852	MAHANADI AT ARRANG, RAIPUR	24	36	28	6.8	7.8	7.3	7	8.5	7.9	296	385	334	2.2	2.5	2.4	0.6	4.4	2.5	0.6	1.4	1.2	-	-	-	46	220	115
1100	MAHANADI AT KHARAD CHHATISSGARH.	24	31	28	6.8	7.3	7.0	7	8.8	8.0	138	515	287	0.3	0.8	0.6	1.1	1.7	1.5	0.2	1.6	1.0	-	-	-	15	25	20
1282	MAHANADI AT SHEORINARAYAN VILLAGE, CHHATISSGARH.	26	30	28	0.8	7	4.8	8	8.3	7.9	198	220	211	0.3	1.1	0.7	1.3	1.9	1.6	1.3	1.3	1.3	-	-	-	20	40	30
1467	MAHANADI AFTER CONFL. WITH RIVER MAND,CHHATISSGARH	24	32	28	6.6	7.3	7.0	7	8.3	7.9	140	259	202	0.2	0.8	0.5	1.0	2.0	1.3	0.9	1.5	1.1	-	-	-	15	42	23
1101	MAHANADI AT INTERSTATE BOUNDRY CHHATISSGARH.	19	28	23	6.8	8.1	7.4	7	8.4	7.6	158	216	191	1.3	2.8	2.0	1.1	1.3	1.2	0.0	0.3	0.1	-	-	-	63	130	90
1281	MAHANADI AT HIRAKUD RESERVOIR, ORISSA	19	31	25	7.1	7.9	7.5	8	8.1	8.0	127	195	161	1	1.5	1.3	0.2	0.3	0.2	-	-	-	790	1200	995	1100	2100	1600
1270	MAHANADI AT SAMBALPUR U/S, ORISSA	18	34	27	6.5	8.8	8.0	7	8.2	7.8	113	196	162	0.9	2.1	1.5	0.0	0.9	0.4	-	-	-	1100	1400	1200	1500	2200	1863
1271	MAHANADI AT SAMBALPUR D/S, ORISSA	19	36	28	6.2	7.8	7.3	8	8	7.8	121	277	197	0.6	4	2.7	0.2	1.8	0.7	-	-	-	630	54000	36954	940	160000	72118
1272	MAHANADI D/S (AFTER CONFL. WITH R. ONG SONEPUR U/S), ORISSA	22	32	27	7.5	8.4	8.0	7	8.2	7.8	151	162	157	0.8	1.1	1.0	0.2	0.8	0.5	-	-	-	790	1100	945	1400	1700	1550
1274	MAHANADI AFTER CONFL. WITH R.TEL (SONEPUR D/S),ORISSA	22	32	27	7.2	8	7.6	7	7.4	7.4	170	188	179	1.4	1.9	1.7	0.1	0.6	0.3	-	-	-	1500	1700	1600	2200	2200	2200
1275	MAHANADI AT TIKARPADA, ORISSA	23	29	26	7.4	8.1	7.8	8	8.4	8.2	167	174	171	0.8	1	0.9	0.2	0.8	0.5	-	-	-	1200	1300	1250	1700	2400	2050
1276	MAHANADI AT NARSINGHPUR, ORISSA	25	30	28	8.2	8.9	8.6	8	7.9	7.9	154	167	161	0.4	1.2	0.8	0.5	0.8	0.6	-	-	-	310	700	505	840	940	890
1277	MAHANADI AT CUTTACK U/S, ORISSA	22	35	29	7.8	8.6	8.2	7	8.3	7.7	150	186	167	0.8	2.1	1.2	0.0	1.8	0.5	-	-	-	790	1400	1020	1100	2200	1513
1278	MAHANADI AT CUTTACK D/S, ORISSA	23	36	28	7.2	8.5	7.7	7	8.2	7.8	152	218	181	1.5	4.6	2.3	0.1	1.4	0.5	-	-	-	3300	17000	8913	4700	28000	14175
	ESTUARINE ZONE																											
1639	MAHANADI AT PARADEEPD/S, ORISSA	22	35	28	7	7.9	7.4	7	8	7.6	109	29400	7458	1.1	2.3	1.5	0.2	0.6	0.5	-	-	-	1200	1700	1350	1500	3500	2225

TABLE 12.2 : - WATER QUALITY OF RIVER SEONATH, KHAROON, HASDEO, ARPA, KELO, IB, KUAKHAI, KATHAJODI AND BIRUPA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1107	SEONATH AT U/S RAJNANDGAON, CHAATISSGARH	23	27	25	7.2	7.9	7.5	7	7.5	7.5	304	326	317	0.9	1.4	1.1	0.4	0.7	0.5	0.4	0.7	0.5	-	-	-	75	1100	280
1845	SEONATH RIVER WATER SUPPLY WELL, DURG.	23	25	24	7.3	7.9	7.6	8	7.5	7.5	322	328	325	0.9	1.2	1.1	0.4	0.5	0.5	0.7	0.7	0.7	-	-	-	93	460	264
1266	SEONATH AT SHIMGA AFTER CONFL. WITH R. KHAROON,CHHATISSGARH	20	32	27	7.2	8.5	7.6	7	8.5	8.0	284	675	463	1.1	3.3	2.5	0.4	3.2	1.8	0.6	1.7	1.2	-	-	-	49	220	160
1265	KHAROON AT RAIPUR U/S, CHHATTISGARH	23	33	28	7.4	8.1	7.8	7	8.4	7.9	234	290	262	1.9	2.7	2.3	0.6	2.8	1.7	0.8	2.8	1.6	-	-	-	46	240	132
1847	KHAROON RIVER B/C KHAPRI DRAIN, DURG, RAIPUR ROAD BRIDGE	24	25	24	7.5	8	7.7	8	7.5	7.5	315	376	337	0.9	1.1	1.0	0.4	0.6	0.5	0.6	0.6	0.6	-	-	-	75	460	248
1846	KHAROON RIVER A/C KHAPRI DRAIN	24	25	24	7.5	7.9	7.7	8	7.5	7.5	336	418	377	1.1	1.5	1.3	0.6	0.7	0.7	0.6	0.6	0.6	-	-	-	93	240	167
1853	KHAROON RIVER BUNDRI, RAIPUR	20	30	25	6.8	7.8	7.4	7	8.3	7.9	268	755	465	1.9	3.4	2.6	0.6	3.6	2.1	0.8	1.3	1.2	-	-	-	33	180	94
1105	HASDEO AT U/S KORBA,CHHATISSGARH	24	33	26	6.3	7.6	6.8	7	7.3	7.2	-	-	-	1.4	2.7	1.9	1.2	1.7	1.5	1.6	1.6	1.6	-	-	-	109	280	207
1106	HASDEO AT U/S OF CHAMPA,CHHATISSGARH	24	35	29	6.7	7.4	7.0	8	8.8	8.2	113	208	166	0.5	1.2	0.7	1.4	1.7	1.5	0.9	1.6	1.3	-	-	-	15	35	27
1848	ARPA RIVER D/S OF BILASPUR	26	28	27	6	7.1	6.6	8	7.8	7.8	143	330	237	0.8	1.8	1.3	1.7	1.7	1.7	1.5	1.5	1.5	-	-	-	240	240	240
1849	KELO RIVER U/S OF RAIGARH	18	28	23	6.9	8	7.3	7	8	7.4	86	198	169	1.6	2.8	1.9	1.0	1.2	1.1	-	-	-	-	-	-	46	110	75
1850	KELO RIVER D/S OF RAIGARH	18	28	23	6.8	8.2	7.4	7	8.2	7.7	103	197	170	1.8	2.8	2.1	1.1	1.3	1.2	-	-	-	-	-	-	68	140	97
1267	IB AT SUNDARGARH, ORISSA	17	32	26	7.1	8.8	8.2	7	8.3	7.7	78	161	134	0.4	2	1.1	0.2	0.5	0.2	-	-	-	790	1100	943	1100	1700	1363
1268	IB AT JHARSUGUDA (INTAKE), ORISSA	18	30	25	7.2	8.7	8.1	7	8.2	7.6	113	165.7	147	0.7	1.8	1.2	0.1	0.6	0.3	-	-	-	1100	2300	1513	1700	3500	2538
1300	IB AT RAJ NAGAR U/S, ORISSA	18	31	25	7.3	8.5	7.8	7	8.1	7.7	129	167	154	0.6	2.2	1.2	0.1	1.1	0.4	-	-	-	700	1100	914	1100	1700	1413
1269	IB AT BRAJRAJNAGAR (INTAKE) D/S, ORISSA	19	31	26	6.8	8.1	7.6	7	8.2	7.8	154	180	166	0.8	2.3	1.4	0.1	4.7	1.3	-	-	-	940	2200	1268	1700	2800	1988
1279	KUAKHAI AT BHUBANESWAR U/S, ORISSA	23	36	29	4.1	9.4	7.8	8	8.1	7.9	156	187	170	0.8	1.9	1.3	0.1	0.6	0.3	-	-	-	790	1100	885	1100	1700	1400
1280	KUAKHAI AT BHUBANESWAR D/S, ORISSA	24	34	28	6.1	7.8	6.9	7	8.2	7.6	100	3120	593	1	4.6	3.2	0.2	4.5	1.8	-	-	-	1100	13000	7088	1400	22000	10963
1301	KATHAJODI AT CUTTACK D/S, ORISSA	24	35	28	6.9	8.2	7.5	8	8.3	8.0	189	373	243	2.7	6.4	4.2	0.3	4.9	1.6	-	-	-	2400	160000	66550	5400	160000	307425
	ESTUARINE ZONE																											
1640	BIRUPA AT CHOUDWAR, ORISSA	26	28	27	7.3	8.2	7.6	7	7.7	7.5	254	29400	14385	0.4	1.6	1.1	0.1	0.6	0.4	-	-	-	1300	3400	2000	2200	4700	3100

TABLE 13.1 : - WATER QUALITY OF RIVER BRAHMANI & ITS TRIBUTARIES - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1037	BRAHMANI AT U/S PANPOSH, ORISSA	23	35	27	7.3	8.4	8.0	7	8.3	7.8	93	249	149	0.5	2.5	1.3	0.2	0.6	0.3	-	-	-	790	1300	1086	1200	15000	3167
1038	BRAHMANI AT D/S PANPOSH, ORISSA	23	36	28	6.1	7.6	7.0	7	8.4	7.7	223	441	331	3.1	5.7	4.6	1.3	8.8	4.3	0.02	0.02	0.02	4900	14000	8778	7000	21000	14222
1302	BRAHMANI AT ROURKELA D/S, ORISSA	21	38	28	5.3	8.8	7.1	7	8.3	7.7	117	336	225	1.1	5.2	3.0	0.2	6.6	1.7	-	-	-	790	7900	5320	1100	11000	7856
1039	BRAHMANI AT BONAIGARH, ORISSA	21	29	25	7.1	8.9	8.1	8	8.2	7.9	174	267	211	0.6	2.3	1.6	0.3	1.3	0.8	-	-	-	1200	1700	1450	1500	2600	2075
1040	BRAHMANI AT RENGALI, ORISSA	21	31	27	7.7	9.2	8.5	7	8	7.7	100	279	151	0.6	2	1.3	0.2	1.2	0.7	-	-	-	700	940	843	1400	1700	1525
1041	BRAHMANI AT SAMAL, ORISSA	22	38	30	7.6	9.6	8.3	7	8.2	7.9	108	130	122	0.5	1.8	1.2	0.1	0.8	0.5	-	-	-	700	1100	845	1100	1700	1325
1303	BRAHMANI AT TALCHER U/S, ORISSA	23	34	30	7.1	8.8	7.9	7	8.4	7.8	100	154	127	1.1	2.2	1.5	0.1	0.6	0.3	-	-	-	1100	1700	1322	1500	2400	1900
1042	BRAHMANI AT KAMALANGA, ORISSA	22	37	30	6.8	8.4	7.5	7	8.4	7.7	131	265	169	1.6	3.6	2.2	0.0	0.8	0.4	-	-	-	2800	11000	5100	4300	14000	8522
1043	BRAHMANI AT BHUBAN, ORISSA	27	34	31	7.8	9.7	8.3	8	8.3	8.2	101	664	254	1.1	2	1.4	0.2	0.6	0.4	4	4	4	460	1400	1165	940	2200	1835
1044	BRAHMANI AT DHARMASHALA, ORISSA	25	34	29	7.3	8.2	7.8	7	8	7.6	120	136	130	1.3	2	1.6	0.1	1.1	0.4	-	-	-	1100	1700	1460	1700	3500	2500
1045	BRAHMANI AT PATTAMUNDAI, ORISSA	25	36	28	7.9	9.2	8.4	7	8.2	7.6	127	229	182	0.6	2.2	1.6	0.1	0.5	0.3	-	-	-	1100	2400	1411	1500	3500	2167
1033	KOEL AT BASIA,DAM U/S,JHARKHAND	18	34	27	6.9	8.3	7.6	7	7.6	7.1	-	-	-	0.4	5.9	2.1	-	-	-	-	-	-	110	280	214	750	1500	1313
2376	NORTH KOEL U/S DALTANGANJ	24	26	25	8	8.1	8.1	7	7.2	7.2	-	-	-	0.5	2	1.3	-	-	-	-	-	-	230	230	230	1200	1200	1200
2377	NORTH KOEL D/S BCCL, REHLA	23	24	24	7.8	8.2	8.0	7	7.1	6.9	-	-	-	0.6	2.5	1.6	-	-	-	-	-	-	230	280	255	1500	1500	1500
1035	KARO AT LOHOJIMI U/S, JHARKAND	20	32	26	6.8	8.6	7.7	6	7.4	6.9	-	-	-	0.5	5	2.1	-	-	-	-	-	-	110	280	228	750	1500	1275
1034	SANKH AT BOLBA, JHARKAND	20	33	26	7	8.6	7.9	7	7.8	7.3	-	-	-	1.1	6.2	2.7	-	-	-	-	-	-	110	280	208	750	1500	1300

TABLE 13.2 : - WATER QUALITY OF RIVER BAITARNI & ITS TRIBUTARIES- 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1081	BAITARNI AT JODA, ORISSA	25	32	28	7.1	9.2	8.2	8	7.9	7.9	88	139	114	1.4	2	1.7	0.1	1.4	0.8	-	-	-	700	790	760	940	2100	1447
1082	BAITARNI AT ANANDPUR, ORISSA	27	32	30	6.5	8.2	7.3	8	8	7.8	76	127	108	0.8	1.2	1.1	0.3	1.2	0.8	-	-	-	1300	2200	1900	2400	3500	3133
1083	BAITARNI AT JAJPUR ORISSA	27	31	29	7.1	7.8	7.4	8	8.2	7.8	75	171	125	1.4	1.6	1.5	0.2	2.3	0.9	-	-	-	1300	3500	2067	1700	5400	3100
1084	BAITARNI AT CHANDBALI, ORISSA	22	34	28	6.4	7.8	6.9	8	7.8	7.8	112	12320	4423	1.6	1.7	1.7	0.2	3.5	1.5	-	-	-	1200	1700	1400	2100	2800	2433
	ESTUARINE ZONE																											
1085	BAITARNI AT DHAMRA ORISSA	24	36	29	6.3	6.8	6.5	8	8.2	7.9	27700	48400	35000	1	1.7	1.3	0.8	1.2	1.0	-	-	-	700	790	730	940	1700	1247

TABLE 14.1 :- WATER QUALITY OF RIVER SUBARNAREKHA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	WATER QUALITY CRITERIA				**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1641	SUBARNAREKHA AT RAJGHAT NEAR BIHAR BORDER, ORISSA	25.0	28.0	26.5	7.2	8.1	7.6	7.4	8.0	7.7	119	315	235	0.6	1.9	1.4	0.50	1.48	0.93	-	-	-	940	1700	1347	1400	3500	2567
2397	SUBARNAREKHA AT GATALSUD DAM	26.0	26.0	26.0	6.3	6.3	6.3	6.7	6.7	6.7	-	-	-	1.1	1.1	1.1	-	-	-	-	-	-	200	200	200	750	750	750
23	SUBARNAREKHA AT RANCHI,(TATISILWAI) JHARKHAND	19.0	31.0	25.9	5.1	8.9	7.3	6.5	7.6	7.1	-	-	-	1.1	10.5	5.4	-	-	-	-	-	-	230	930	485	1500	2400	2125
2386	SUBARNAREKHA AT MURI ROAD BRIDGE	27.0	27.0	27.0	7.8	7.8	7.8	7.0	7.0	7.0	-	-	-	0.8	0.8	0.8	-	-	-	-	-	-	280	280	280	1500	1500	1500
2385	SUBARNAREKHA AT NAMKUM ROAD BRIDGE	24.0	25.0	24.5	5.5	7.3	6.4	6.8	7.0	6.9	-	-	-	4.0	6.8	5.4	-	-	-	-	-	-	230	230	230	2100	2100	2100
1762	SUBARNAREKHA AT BIHAR - WEST BENGAL BORDER, WEST BENGAL	20.5	35.5	29.5	5.3	7.6	6.7	6.8	7.5	7.2	245	332	300	0.0	2.0	1.3	-	-	-	-	-	-	280	540	413	540	1600	815
2395	SUBARNAREKHA AT HATIA DAM	26.0	26.0	26.0	7.4	7.4	7.4	6.7	6.7	6.7	-	-	-	0.6	0.6	0.6	-	-	-	-	-	-	200	200	200	1500	1500	1500

TABLE 15.1 :- WATER QUALITY OF RIVER GODAVARI – 2008

STATION CODE	LOCATIONS	TEMPERATURE ºC			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1312	GODAVARI AT JAYAKWADI DAM, AURNAGABAD,MAHARASHTRA	13	35	29	5.6	6.9	6.5	6.9	8.2	7.6	303	3994	841	4.0	6.5	4.5	0.1	1.8	0.5	-	-	-	4	8	7	220	300	270
2177	GODAVARI RIVER NEAR SOMESHWAR TEMPLE.	24	27	26	4.8	7.0	5.6	7.8	8.1	7.9	143	393	249	5.0	7.5	6.5	0.7	4.1	1.8	-	-	-	4	16	8	10	38	19
2182	GODAVARI RIVER AT SAIKHEDA.	23	27	25	5.8	7.4	6.5	7.6	8.1	7.9	181	812	556	3.8	16.0	6.7	0.7	4.5	2.5	-	-	-	2	18	7	5	30	14
2179	GODAVARI RIVER AT HANUMAN GHAT, NASHIK CITY.	24	27	26	5.0	7.2	6.0	7.1	8.3	7.7	304	513	424	4.8	9.0	6.9	0.2	4.2	1.9	-	-	-	12	18	14	24	32	27
2183	GODAVARI RIVER AT NANDUR- MADMESHWAR DAM.	23	27	25	6.3	7.3	6.7	7.6	8.1	7.9	190	868	463	3.5	4.8	4.1	0.5	4.5	2.3	-	-	-	2	10	5	6	24	13
2181	GODAVARI RIVER AT KAPILA- GODAVARI CONFLUENCE POINT, TAPOVAN.	24	27	26	2.3	5.2	4.2	7.3	8.3	7.9	411	659	574	6.0	14.0	8.4	0.6	4.1	2.2	-	-	-	12	25	17	22	52	34
2180	GODAVARI RIVER NEAR TAPOVAN.	24	27	26	2.0	6.1	4.2	7.1	8.4	7.7	413	597	514	6.2	20.0	10.3	0.3	4.5	2.3	-	-	-	7	32	18	18	68	38
1096	GODAVARI AT PANCHAVATI AT RAMKUND,MAHARASHTRA	17	35	27	5.4	9.9	6.6	7.0	8.4	7.7	168	584	334	3.0	12.0	6.4	0.2	4.2	1.4	-	-	-	4	80	25	16	250	67
1211	GODAVARI AT NASIK D/S, MAHARASHTRA	17	35	27	4.1	8.9	5.8	6.9	8.4	7.7	149	1681	436	4.8	18.0	8.8	0.3	4.3	1.7	-	-	-	10	34	19	18	95	43
1095	GODAVARI AT U/S OF GANGAPUR DAM,NASIK,MAHARASHTRA	17	34	27	6.2	9.9	6.9	6.0	8.4	7.9	141	479	252	4.0	7.0	4.4	0.2	3.0	1.2	0.2	0.2	0.2	0	9	3	3	25	13
2160	GODAVARI RIVER AT U/S OF AURANGABAD RESERVOIR, KAIGAON TOKKA NEAR KAIGAON BRIDGE.	26	32	29	6.2	7.7	6.8	7.1	8.2	7.6	286	835	590	3.2	4.9	4.2	0.1	0.7	0.4	-	-	-	5	7	6	240	300	283
2158	GODAVARI RIVER AT U/S OF PAITHAN AT PAITHAN INTAKE PUMP HOUSE AT JAYAKWADI .	26	32	29	5.2	7.5	6.5	7.0	7.8	7.4	303	741	524	2.8	6.8	5.3	0.1	0.9	0.4	-	-	-	6	8	7	280	300	291
2159	GODAVARI RIVER AT D/S OF PAITHAN AT PATHEGAON BRIDGE.	27	32	29	3.7	7.6	6.5	7.2	8.3	7.6	360	912	686	3.0	7.4	4.7	0.1	3.1	1.2	-	-	-	1	7	5	8	300	238
2161	GODAVARI RIVER AT JALNA INTAKE WATER PUMP HOUSE, SHAHABAD.	20	29	25	6.1	7.5	6.7	7.3	8.0	7.6	441	1596	753	2.8	5.3	4.2	0.1	0.5	0.3	0.2	0.2	0.2	5	7	6	6	300	234
12	GODAVARI AT DHALEGAON,	16	27	26	6.5	7.1	6.7	7.4	8.2	7.9	361	706	464	3.2	4.2	3.9	0.1	1.0	0.5	-	-	-	6	8	7	240	300	279
1210	GODAVARI AT NANDED, MAHARASHTRA	26	27	27	6.5	7.4	6.8	7.6	8.3	8.0	378	868	486	3.5	4.2	3.9	0.2	0.8	0.4	-	-	-	4	9	6	240	350	274

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1209	GODAVARI AT RAHER, MAHARASHTRA	27	30	29	6.1	6.9	6.6	7.0	8.1	7.5	306	1277	613	3.7	6.0	4.3	0.1	0.8	0.5	-	-	-	5	9	7	240	310	278
2360	GODAVARI AT BASARA, ADILABAD	20	28	25	2.5	7.0	4.3	7.2	8.4	7.7	261	712	456	0.8	3.0	1.8	0.4	2.9	1.1				-	-	-	-	-	-
2361	GODAVARI AT MANCHERIAL, NEAR RLY BDG B/C OF RALLAVAGU	21	28	25	6.6	10.7	8.5	7.0	9.5	8.1	385	542	471	0.7	3.6	1.8	0.1	0.3	0.1	0.1	0.1	0.1	2	40	11	34	1100	401
2362	GODAVARI AT RAMAGUNDAM D/S, NEAR FCI INTAKE WELL, KARIMNAGAR	23	28	26	5.4	9.9	7.7	7.4	9.1	8.1	385	598	504	1.3	3.8	2.3	0.1	0.3	0.1	0.1	0.1	0.1	2	220	58	80	2200	1112
2363	GODAVARI AT GODAVARIKHANI, NEAR BATHING GHAT, KARIMNAGAR	23	28	26	5.7	9.2	7.7	7.2	8.6	8.0	416	680	540	1.0	5.7	3.0	0.1	0.9	0.3	0.1	0.1	0.1	2	330	88	9	3000	1402
2364	GODAVARI AT RAMAGUNDAM U/S , KARIMNAGAR	23	28	25	6.1	11.2	8.4	7.4	9.6	8.2	372	865	523	1.3	3.5	2.0	0.1	0.3	0.2	0.1	0.1	0.1	2	70	20	9	5000	1112
2356	GODAVARI, D/S OF RAMANUGUNDAM,	23	28	25	7.0	8.0	7.7	7.3	9.0	8.0	394	563	491	0.7	2.9	1.5	0.1	0.3	0.1	0.1	0.1	0.1	2	110	26	6	9000	1616
2365	GODAVARI AT KAMALPUR U/S M/S AP RAYONS LTD. INTAKE WELL, WARANGAL	21	28	26	6.2	8.0	7.0	7.2	9.3	7.9	172	365	239	0.7	1.6	1.1	0.1	0.4	0.2	0.1	0.1	0.1	2	40	13	20	1700	408
2366	GODAVARI AT KAMALPUR D/S AT M/S. AP RAYONS LTD. DISCHARGE POINT, WARANGAL	21	28	26	5.4	7.4	6.5	7.2	8.5	7.9	170	367	240	0.2	1.4	0.6	0.1	0.4	0.2	0.1	0.1	0.1	0	40	9	90	800	292
13	GODAVARI AT MANCHERIAL, A.P.	20	29	25	6.2	11.3	9.1	7.4	9.5	8.3	378	572	493	0.6	3.4	1.8	0.1	1.0	0.3	0.1	0.1	0.1	0	280	29	7	2800	556
2367	GODAVARI AT BHADRACHALAM U/S BATHING GHAT, KHAMMAM	25	26	25	7.0	7.6	7.4	7.2	8.4	7.8	114	305	228	0.2	1.2	0.8	0.1	1.8	0.5	0.1	0.3	0.2	2	7	4	800	3000	1817
2368	GODAVARI AT BHADRACHALAM D/S BATHING GHAT, KHAMMAM	25	25	25	1.2	7.0	4.9	7.1	8.3	7.9	205	469	307	0.6	4.8	2.1	0.1	1.6	0.5	0.1	0.3	0.2	2	7	5	1400	3500	2550
2369	GODAVARI AT BURGAMPAHAD, KHAMMAM	25	26	25	2.0	7.1	4.7	5.2	8.2	6.9	179	729	353	1.0	3.8	1.9	0.1	1.9	0.9	0.1	0.2	0.1	2	6	4	1400	5000	3133
2370	GODAVARI AT RAJAMUNDRY U/S OF NALLA CHANNEL	21	27	24	6.2	7.1	6.75	7	8.3	7.7	212	264	236	1	1.3	1.1	0.1	2.3	0.8	0.1	0.1	0.1	3	4	3	39	240	139
14	GODAVARI AT POLAVARAM, A.P.	23	31	27	6.4	8.8	7.2	7.4	7.9	7.6	178	245	204	0.2	1.2	0.8	0.1	1.2	0.3	0.1	0.1	0.1	0	400	56	3	18000	4216
1218	GODAVARI AT RAJAHMUNDRY U/S, A.P.	26	32	28	6.5	8.0	7.2	7.4	7.9	7.6	195	248	220	0.3	1.2	0.9	0.1	0.5	0.3	0.1	0.1	0.1	0	200	50	3	18000	4507
2371	GODAVARI AT RAJAMUNDRY D/S OF NALLA CHANNEL	21	27	24	6.0	6.9	6.60	6	8.1	7.4	227	399	290	1	1.8	1.4	0.1	2.5	1.0	0.1	0.1	0.1	4	11	8	210	2400	705
1219	GODAVARI AT RAJAHMUNDRY D/S, A.P.	21	35	27	6.0	8.4	6.7	7.1	8.5	7.8	181	256	211	0.4	6.0	1.7	0.1	1.6	0.4	0.1	0.1	0.1	1	800	186	43	28000	6671

TABLE 15.2 :- WATER QUALITY OF RIVER INDRAVATI, SHANKINI, MANJEERA, MANER, WARDHA, WAINGANGA, KOLAR, KANHAN, PURNA, NIRA & SABARI - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1854	INDRAVATI RIVER A/C DANTEWADA RIVER, NELSONNAR, DANTEWADA.	23	30	27	7.6	8.0	7.8	7	7.7	7.5	-	-	-	1.1	1.8	1.4	-	-	-	-	-	-	-	-	-	6	90	28
1855	INDRAVATI RIVER B/C GODAVARI AT BHOPALPATNAM, DANTEWADA	28	30	29	7.6	7.9	7.8	7	7.7	7.6	-	-	-	1.0	1.7	1.4	-	-	-	-	-	-	-	-	-	4	98	51
1856	SHANKNI RIVER A/C DANKANI RIVER DANTEWADA.	23	30	27	7.5	7.8	7.6	7	7.7	7.4	-	-	-	1.1	1.3	1.2	-	-	-	-	-	-	-	-	-	8	8	8
2374	RIVER MANJEERA AT GOWDICHARLA B/C WITH NAKKAVAGU	20	28	23	3.8	4.6	4.3	7	8.8	8.1	187	295	266	0.6	1.8	1.3	0.3	1.1	0.6	0.7	0.7	0.7	-	-	-	-	-	-
2375	RIVER MANJEERA AT GOWDICHARLA A/C WITH NAKKAVAGU	20	28	22	0.4	4.1	2.8	7	7.8	7.4	303	815	549	0.9	16.0	6.8	1.8	7.4	3.9	0.2	0.2	0.2	-	-	-	-	-	-
1781	MANJEERA RIVER - NEAR GANAPATHI SUGARS , MEDAK DIST., A.P	20	27	23	3.5	7.0	4.5	7	8.9	8.0	179	503	287	0.3	3.3	1.4	0.2	1.1	0.5	0.1	0.1	0.1	2	4	3	30	1200	506
1891	MANJRA AT D/S IN INTAKE POINT TO BIDAR CITY	26	29	28	7.5	8.2	8.0	7	8.5	8.0	390	790	608	0.5	5.0	2.4	0.1	0.8	0.4	-	-	-	23	2400	467	60	9000	1436
1215	MANER AT WARANGAL U/S, A.P.	22	27	25	5.7	7.0	6.3	7	8.2	7.7	147	284	215	1.7	6.1	3.8	0.1	0.5	0.2	0.1	0.1	0.1	0	12	4	4	440	181
1158	MANER AT SOMNAPALLI, A.P.	22	28	25	6.0	11.7	8.0	7	8.6	8.1	348	534	440	0.1	3.4	1.5	0.1	1.0	0.2	0.1	0.1	0.1	0	40	7	4	1600	206
2174	WARDHA RIVER D/S OF ACC GHUGGUS.	22	26	24	4.8	6.3	5.6	7	8.3	7.5	367	480	445	5.7	13.0	8.1	0.5	4.2	2.0	-	-	-	21	110	68	26	350	192
2156	WARDHA RIVER AT CONFLUENCE POINT OF PENGANGA & WARDHA AT JUAD.	22	23	22	5.6	6.6	6.1	7	8.1	7.8	216	593	359	4.6	8.5	6.3	0.2	3.0	1.9	-	-	-	23	130	79	80	280	180
1212	WARDHA AT RAJURA BRIDGE, MAHARASHTRA	26	29	27	4.6	5.8	5.4	7	8	7.6	535	1715	1239	8.5	11.0	9.5	1.1	1.9	1.5	-	-	-	50	220	113	130	900	400
1213	WAINGANGA AT BALAGHAT, M.P.	16	29	23	-	-	-	7	7.9	7.7	215	673	418	1.2	2.8	1.7	0.1	3.2	1.2	-	-	-	0	23	2	11	2100	608

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1214	WAINGANGA AT CHINDWARA, M.P.	16	29	23	-	-	-	7	7.8	7.6	142	805	465	1.4	2.6	1.8	0.5	2.3	1.5	-	-	-	0	39	5	11	1100	305
1910	WAINGANGA AFTER CONLUENCE WITH KANHAN	21	32	27	4.8	6.0	5.4	7	8	7.7	404	486	445	7.2	9.0	8.1	0.4	0.7	0.6	-	-	-	140	300	220	280	500	390
2173	WAINGANGA RIVER U/S OF ELLORA PAPER MILL.	27	32	30	5.3	6.0	5.7	7	8.1	7.8	298	943	517	5.4	8.6	6.9	0.2	2.7	0.9	-	-	-	22	110	47	80	140	107
2172	WAINGANGA RIVER D/S OF ELLORA PAPER MILL.	27	32	29	4.9	5.9	5.4	7	8.1	7.7	294	981	555	6.2	9.4	8.1	0.2	3.6	1.1	-	-	-	27	140	86	110	280	205
2175	WAINGANGA U/S OF GAURAV PAPER MILLS, NEAR JACKWELL.	22	27	24	6.1	6.7	6.4	8	8.4	8.2	273	386	319	4.0	9.0	6.3	0.5	1.1	0.7	-	-	-	23	140	101	90	170	143
2176	WAINGANGA D/S OF GAURAV PAPER MILLS, NEAR JACKWELL.	27	27	27	4.0	4.0	4.0	8	8.3	8.3	437	437	437	7.8	7.8	7.8	0.6	0.6	0.6	-	-	-	240	240	240	500	500	500
11	WAINGANGA AT ASHTI, MAHARASHTRA	21	30	25	4.9	6.8	5.8	7	8.3	7.7	202	625	410	4.2	10.5	6.6	0.2	2.4	0.7	-	-	-	30	220	62	110	550	192
1908	KOLAR BEFORE CONFLUENCE TO KANHAN AT KAMPTEE	21	22	22	5.4	6.2	5.8	7	8.1	7.8	512	1230	775	6.5	7.0	6.8	0.4	0.7	0.5	-	-	-	17	110	69	70	500	227
1909	KANHAN D/S OF NAGPUR	25	33	29	4.9	6.0	5.5	8	7.8	7.7	422	850	636	7.0	8.8	7.9	0.4	0.8	0.6	-	-	-	140	170	155	280	500	390
2170	KANHAN RIVER U/S OF M/S VIDHARBHA PAPER MILL, SINORA.	20	21	21	5.9	6.7	6.2	7	8	7.5	380	506	438	4.2	8.2	6.1	0.5	2.2	1.2	-	-	-	13	80	33	17	300	138
2171	KANHAN RIVER D/S OF M/S VIDHARBHA PAPER MILL, SINORA.	21	22	21	4.1	5.9	5.4	7	7.9	7.5	399	583	466	6.6	9.8	8.2	0.5	1.3	1.0	-	-	-	17	110	62	50	500	212
1913	PURNA AT DHUPESHWAR	28	31	30	4.9	5.5	5.2	7	8.3	7.8	380	1213	797	8.6	8.8	8.7	0.5	1.7	1.1	-	-	-	50	500	275	350	900	625
1315	NIRA AT PULGAON COTTON MILL, WARDHA, MAHARASHTRA	22	32	26	4.1	6.8	5.5	7	8.5	7.8	350	1616	699	5.4	11.8	7.7	0.4	12.3	2.4	-	-	-	17	900	237	50	1600	462
1157	MANJERA AT RAIPALLU, A.P.	20	28	25	3.2	5.2	4.4	7	8.5	7.9	191	324	268	0.8	5.0	1.6	0.2	3.3	0.8	0.1	0.2	0.13	2	3	2	40	412	236
2373	SABARI AT KUNAVARAM, KHAMMAM	25	27	26	6.7	7.5	7.0	7	8.3	7.7	76	98	88	0.6	3.2	1.4	0.1	1.5	0.6	0.1	0.1	0.1	2	7	4	800	2800	1740

TABLE 16.1 :- WATER QUALITY OF RIVER KRISHNA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									<2500 MPN/100ml			< 5000 MPN/100ml		
1906	KRISHNA D/S OF ISLAMPUR	22	37	28	4.8	7.3	6.3	6	7.7	6.7	289	849	421	1.4	3.6	2.25	0.3	5	1.53	-	-	-	4	17	10	13	220	139
1153	KRISHNA AT RAJAPUR WEIR, MAHARASHTRA	20	27	23	3.8	7.2	6.1	6	7.6	7.0	118	866	445	1.8	5.2	2.50	0.3	2.4	1.32	-	-	-	4	13	8	90	220	138
2187	KRISHNA RIVER AT KSHETRA MAHULI.	18	27	21	4.4	6.2	5.7	8	8.5	8.1	44	528	358	6.2	12	8.73	0.1	0.2	0.12	-	-	-	25	170	112	350	900	663
2188	KRISHNA RIVER AT KRISHNA-VENNA SANGAM AT MAHULI.	17	20	19	4.3	6.5	5.8	8	8.8	8.3	387	514	451	6.6	17.6	9.73	0.1	0.2	0.13	-	-	-	40	250	131	200	1600	958
2190	KRISHNA RIVER AT WAI.	18	21	19	4.7	6.5	5.5	8	8.4	8.1	294	398	358	6.4	12.6	9.20	0.1	0.2	0.12	-	-	-	80	250	170	425	1600	1229
1194	KRISHNA AT MAHABALESHWAR DHOM DAM NEAR KOINA DAM,MAHARASHTRA	18	23	20	5.8	6.9	6.4	7	8.6	8.0	69	131	90	4.3	8.6	6.78	0.1	0.4	0.13	-	-	-	8	70	29	60	250	137
36	KRISHNA AT KRISHNA BRIDGE, KARAD, MH	19	28	22	4.3	6.6	6.0	7	8.6	8.1	95	388	216	6	11.6	7.94	0.1	0.3	0.14	-	-	-	45	275	146	200	900	617
1310	KRISHNA AT KURUNDWAD IN KOLHAPUR, MAHRAST	20	27	22	4	7.4	6.4	6	7.5	6.9	122	763	445	1.6	4.8	2.40	0.6	2.4	1.30	-	-	-	2	11	7	70	170	128
37	KRISHNA AT SANGLI, MAHARASHTRA	22	37	28	6.3	7.2	6.7	6	7.6	6.7	191	1212	608	1.2	2.8	2.27	0.2	2.2	1.07	-	-	-	2	11	6	90	140	124
1182	KRISHNA AT U/S OF UGARKHURD BARRAGE,KARNATAKA	24	38	28	4.5	9.7	7.1	8	8.5	8.0	300	1300	773	0.4	3.8	1.94	3.9	15	7.48	-	-	-	170	900	633	500	1600	1275
1889	KRISHNA - ANKALI BRIDGE ALONG CHIKKODI KAGWAD	23	37	28	4.8	8.5	6.9	8	8.3	8.0	290	1140	691	0.4	3.1	1.61	3.7	16	7.48	-	-	-	110	900	467	240	1600	1043
1181	KRISHNA AT D/S OF NARYANPURA DAM,KRTK	26	39	28	6.3	8.2	7.5	7	8.6	8.2	280	810	527	0.2	3.2	1.38	0.1	1	0.42	-	-	-	4	500	139	8	1600	472
1028	KRISHNA AT TINTINI BRIDGE, KARNATAKA	26	29	28	6.8	8	7.7	8	8.8	8.3	380	910	715	0.5	3.3	1.35	0.2	0.5	0.30	0.1	0.1	0.1	23	540	214	50	1600	446
1170	KRISHNA AT D/S OF DEVASAGAR BDG.,KARNATAKA	26	29	27	6	8	7.2	8	8.9	8.4	500	1210	837	1	3.4	1.74	0.1	0.7	0.37	-	-	-	110	3000	867	300	16000	2927
1784	THANGADI , MAHABOBNAGAR D, A.P	30	35	33	7	7.8	7.5	8	8.5	8.1	574	865	727	2	5	3.05	1.1	5.6	2.48	0.1	0.1	0.1	0	46	14	46	240	145
39	KRISHNA AT GADWAL BRIDGE, A.P.	22	35	30	1.1	8.4	6.3	7	8.8	8.1	488	1023	731	1.5	3.1	2.05	0.1	5	2.02	0.1	0.1	0.1	0	18	7	42	360	164
1175	KRISHNA AFTER CONFL. WITH TUNGABHADRA, SANGAMESHWARAM A.P.	24	30	26	7	7.8	7.3	7	8.3	7.9	388	705	575	2	3.2	2.65	0.2	1.4	0.82	0.1	0.1	0.1	70	140	102	750	2100	1198
1465	KRISHNA AT WADAPALLY AFTER CONFL. WITH R. MUSI, A.P.(SHIFTED FROM 1220)	20	32	27	3.1	4.5	3.9	7	8.3	7.9	307	906	602	0.6	8	1.83	0.2	1.9	0.80	0.1	0.1	0.1	2	4	3	90	2200	526
1786	VEDADRI , GUNTUR DIST., A.P	25	30	28	7.2	8.7	7.9	8	8.1	7.9	461	595	522	0.8	1.8	1.45	0.1	3	0.98	0.1	0.1	0.1	2	8	6	2800	3500	3075
1787	AMARAVATI , GUNTUR DIST., A.P	32	32	32	7.4	9.8	8.4	8	8.4	8.1	512	681	562	0.6	3.4	1.85	0.1	4.7	1.50	0.1	0.1	0.1	4	21	11	3000	5000	4275
25	KRISN AT VIJYWADA, A.P	25	31	28	5.5	9.2	7.5	7	8.8	7.9	245	710	528	0.8	2	1.33	0.1	3.5	0.92	0.1	0.2	0.11	2	12	6	1700	3500	2700
	ESTUARINE ZONE																											
1782	HAMSALA DEEVI , GUNTUR DIST, A.P	25	31	29	5.2	8.6	7.0	7	8.4	7.9	102	14920	3629	0.5	2	1.13	0.1	31	3.59	0.1	0.2	0.1	2	6	4	800	3000	1517

TABLE 16.2 :- WATER QUALITY OF RIVER PANCHGANGA AND BHIMA-2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1311	PANCHAGANGA AT ICHALKARANJI, MAHARASHTRA	20	28	24	6.1	6.8	6.4	7	7.8	7.0	135	611	442	2	2.4	2.20	0.7	1.7	1.3	-	-	-	4	13	8	110	300	205
2163	PANCHAGANGA RIVER AT SHIROL NEAR SHIROL INTAKE WELL.	19	26	22	4.4	7.4	6.2	7	7.2	6.9	177	682	311	1.6	3.8	2.46	0.2	3	1.2	-	-	-	2	12	7	90	170	121
1904	PANCHAGANGA U/S OF KOLHAPUR TOWN	19	27	21	5	7.3	6.4	6	7.6	7.1	86	3870	711	1.8	2.8	2.23	0.3	2	1.2	0.2	0.2	0.2	4	12	8	2	220	133
1905	PANCHAGANGA D/S OF KOLHAPUR TOWN	19	27	21	3.9	6.8	5.9	7	7.5	7.0	132	293	186	2	5	2.78	0.5	3.8	1.4	-	-	-	4	21	12	140	280	218
1189	BHIMA AT PUNE U/S VITHALWADI, MAHARASHTRA	20	28	25	0.6	4.4	2.4	7	7.9	7.6	382	572	441	11	28.2	22.2	0.1	0.6	0.3	-	-	-	30	425	209	275	1800	1369
1190	BHIMA AT PUNE, D/S OF BUNDGARDEN, MAHARASHTRA	22	28	24	1	4.1	2.7	7	8	7.6	350	504	442	20	40	31.0	0.1	0.5	0.2	-	-	-	225	350	265	900	1600	1460
1191	BHIMA AT PARGAON (AFTER CONFL.WITH MULE MARTHA) MAHARASHTRA.	23	27	25	3.8	5.8	5.1	7	8.2	7.7	376	737	626	7.1	16	10.1	0.1	0.2	0.2	-	-	-	70	250	129	425	900	606
1192	BHIMA AFTER CONF. WITH DAUNT, MAHARASHTRA	23	27	25	2.5	6.8	5.3	7	8.2	7.7	282	670	444	4.8	18.4	9.6	0.1	0.2	0.2	-	-	-	70	110	92	425	550	508
1188	BHIMA AT NARSINGHPUR,(D/S AF.CONFL.WITH R.NIRA),MAHARASHTRA	25	33	30	4.3	6.8	5.9	8	8.6	8.2	524	1593	833	5.9	16.2	8.4	0.1	0.3	0.2	-	-	-	35	250	154	250	1600	994
28	BHIMA AT TAKLI, MAHARASHTRA	28	32	30	4.5	6.7	5.9	7	8.8	8.1	670	2006	1245	6	19.4	10.0	0.1	0.6	0.2	-	-	-	10	225	133	70	1600	920
1183	BHIMA AT D/S OF ROAD BRIDGE AT GANGAPUR VILLAGE,KARNATAKA	23	33	28	6.6	7.4	6.9	8	8.6	8.0	430	1430	777	1.5	3	2.33	0.1	0.6	0.3	0.1	0.4	0.2	500	30000	7672	500	90000	16450
1184	BHIMA AT FEROZABAD VILLAGE (D/S), KARNATAKA	24	34	29	6.8	7.6	7.2	8	8.7	8.1	490	2000	886	1	3	1.79	0.1	0.6	0.2	0.1	0.2	0.2	50	90000	11402	130	160000	25803
1888	BHIMA RIVER AT CONFLUENCE OF JEWARGI TOWN SEWAGE DISPOSAL POINT	26	33	29	6.5	7.5	7.0	8	8.4	8.0	400	1800	808	1	3	1.75	0.1	0.6	0.3	0.1	0.1	0.1	110	30000	5474	170	90000	18070
1167	BHIMA AT D/S OF BDG. NEAR YADGIR,KARNATAKA	25	33	29	6.7	7.4	7.2	8	8.5	8.0	400	1060	698	1	2.4	1.59	0.1	3.4	0.9	0.1	0.1	0.1	130	5000	1937	240	24000	5924

TABLE 16.3 WATER QUALITY OF RIVER GHATPRABHA, MALPRABHA, NIRA, TUNGHABHADRA, TUNGHA, BHADRA, MUSI, PALLERU, MUNERU, CHANDRABHAGA, KAGINA, VENNA, KOYNA, MULA, MUTHA, MULA-MUTHA, PAWANA, INDRAYANI, NAKKAVAGU, KUNDU, KINNERSANI & HUNDRI - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1185	GHATPRABHA AT D/S OF MUDHOL RD. CROSS BDG., KARNATAKA	26	28	27	5.2	6.5	6.03	8	8.1	7.9	440	1120	697	0.3	1.2	0.60	6.8	25.5	13.3	-	-	-	12	900	471	34	1600	1078
1163	GHATPRABHA AT W.A. POINT TO GOKAK TOWN,KARNATAKA	26	36	29	6.1	8.5	7.15	8	8.5	8.0	300	550	443	0.6	2.7	1.18	5.1	20.3	13.5	-	-	-	80	900	695	220	1600	1255
1187	MALPRABHA AT D/S OF KHANAPUR VILLAGE,KARNATAKA	25	36	29	4.5	7.9	6.40	7	7.8	7.5	180	580	323	0.1	4.1	1.73	3.6	4.7	4.0	-	-	-	280	900	745	1600	9000	3450
1164	MALPRABHA AT WATER ABSTR. PT. TO HUBLI,DHARWAR,KARNATAKA	28	30	29	6.5	7.2	6.78	8	8.4	8.2	260	420	345	0.1	0.6	0.35	2.3	4.5	3.1	-	-	-	8	300	154	22	900	516
1186	MALPRABHA AT D/S OF AIHOLE TOWN, KARNATAKA	26	34	29	5.8	7.6	6.80	8	8.3	8.1	630	2400	1110	0.2	1.7	0.90	4.0	19.9	11.0	-	-	-	280	900	645	1600	1900	1675
2195	NIRA RIVER AT D/S OF JUBILANT ORGANOSIS, PUNE.	25	29	27	2.8	5.8	4.27	7	8.5	8.0	195	1434	964	6.5	21.2	12.8	0.1	0.5	0.2	0.6	0.6	0.6	70	275	181	225	1600	871
1463	NIRA AT SAROLE BDG.ON PUNE-BANGLORE HIGHWAY, MAHARASHTRA	22	32	25	4.9	6.9	6.22	8	8.8	8.1	78	784	348	5.6	11.5	7.93	0.1	0.3	0.1	-	-	-	75	250	143	350	1600	746
2186	VENNA RIVER AT VARYE, SATARA.	17	21	19	5.9	6.8	6.17	8	8.4	8.0	293	406	349	3.5	12	7.17	0.1	0.2	0.1	-	-	-	40	170	104	425	900	704
2189	KOYNA RIVER AT KARAD.	17	21	20	1.7	6.5	5.13	8	8.5	8.1	92	350	193	5.8	35.5	13.4	0.1	0.3	0.1	-	-	-	30	150	79	350	900	579
2194	MULA RIVER AT HARRISON BRIDGE NEAR MULA-PAWANA SANGAM.	24	30	27	1	4.9	3.92	8	8.4	7.8	157	3330	875	15	32	21.7	0.1	0.8	0.4	0.1	0.1	0.1	95	550	288	275	1800	1188
2193	MULA RIVER AT AUNDH BRIDGE, AUNDGAON.	24	30	27	0	5.4	3.38	7	8.4	7.9	233	617	414	11	50	21.8	0.1	0.5	0.2	-	-	-	80	425	284	425	1800	1388
2192	MULA-MUTHA RIVER AT MUNDHAWA BRIDGE.	26	31	28	0	5.1	3.18	7	8.4	7.8	133	497	334	9.8	36	20.6	0.1	0.6	0.3	-	-	-	200	350	250	900	1800	1433
2191	MUTHA RIVER AT SANGAM BRIDGE NEAR GANAPATHY GHAT.	26	32	28	0	3	1.12	7	8.3	7.7	353	495	432	21	32	26.2	0.1	0.4	0.2	-	-	-	110	350	260	1600	1800	1700
2196	PAWANA RIVER AT SANGAVIGAON, PUNE.	23	29	26	0.3	6	2.87	7	8.3	7.8	391	759	537	6.7	36	19.8	0.1	0.3	0.2	0.1	0.1	0.1	200	275	230	275	1800	1413
2197	INDRAYANI RIVER AT D/S OF ALANDIGAON, PUNE	22	26	24	0	6.1	4.15	8	8.4	8.0	186	629	354	7.2	36	15.3	0.1	0.2	0.1	-	-	-	65	350	162	350	1600	808
38	TUNGHABHADRA AT HONNALI BRIDGE, KARNATAKA	25	27	26	7	7.4	7.25	7	8.6	7.9	200	330	252	1.2	2.6	1.88	0.1	0.3	0.2	-	-	-	30	70	53	50	90	71
1029	TUNGHABHADRA AT HARALAHALLI BRIDGE, KARNATAKA	26	28	26	7.4	8.5	7.86	8	8.5	8.1	171	330	264	1.3	2	1.74	0.2	0.3	0.2	-	-	-	50	50	50	60	70	62
29	TUNGHABHADRA AT ULLANUR, KARNATAKA	26	29	27	6.4	8.2	7.60	8	8.8	8.2	400	1040	743	1.3	5.2	3.10	0.1	1.0	0.5	-	-	-	2400	54000	17271	5000	92000	30375
1785	MANTHRALAYAM , KURNOOL DIST., A.P	25	26	25	7	7.4	7.23	7	8.2	8.0	951	1129	1046	2.2	3	2.60	0.8	5.7	2.8	0.1	0.1	0.1	90	170	131	1100	2100	1425

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1174	TUNGHABHADRA AT KURNOOL U/S, BAVAPURAM, A.P.	25	27	26	6	7	6.75	7	7.8	7.6	968	1137	1032	2.4	3.3	2.93	0.2	3.0	1.5	0.1	0.1	0.1	70	260	145	1400	1700	1475
1168	TUNGHA AT D/S OF SHIMOGA TOWN, KARNATAKA	25	27	26	6.1	7	6.63	7	7.7	7.1	140	250	199	1.3	2.4	1.89	0.1	0.2	0.2	0.1	0.1	0.1	70	170	89	90	200	114
1896	CONFLUENCE POINT OF TUNGA AND BHADRA AT KUDLI	24	26	25	5.2	6	5.60	7	7.9	7.6	280	410	345	1.4	2.2	1.80	0.2	0.3	0.3	-	-	-	80	130	105	110	170	140
1091	BHADRA AT MALLESWARAM D/S OF KIOCL KARNATAKA	20	27	22	6	7.1	6.75	6	8.3	7.0	60	230	94	1	2	1.55	0.1	0.4	0.2	-	-	-	150	400	285	300	1800	1177
1387	BHADRA AT D/S OF BHADRAVATHI, KARNATAKA	24	27	25	3.9	6.4	4.86	7	7.6	7.2	300	420	340	2.4	4.4	3.56	0.3	0.3	0.3	-	-	-	300	500	471	500	900	843
1169	BHADRA AT D/S OF KIOCL ROAD BRIDGE, NEAR HOLEHUNNUR,KARNATAKA	24	28	26	4.9	6.6	5.70	7	7.7	7.5	230	390	304	1.9	3.1	2.31	0.2	0.3	0.2	-	-	-	110	280	197	140	350	249
1172	MUSI U/S AT HYDERABAD, A.P.	22	39	28	5.2	11	7.59	7	8.7	8.0	246	1562	485	0.5	4.2	1.68	0.4	39.0	5.3	0.1	0.1	0.1	0	165	24	4	680	163
1173	MUSI D/S AT HYDERABAD, A.P.	20	28	25	0	4	1.24	7	8.1	7.4	1005	1677	1389	5	23	12.9	1.6	16.0	6.8	0.1	15.4	2.01	2	220	98	40	21000	3291
2339	RIVER MUSI AT NAGOLE,RANGAREDDY	22	26	24	0.5	7.5	3.35	7	8.3	7.6	1003	2020	1408	4	34	16.3	0.3	9.8	3.9	0.1	1.8	0.4	15	170	98	70	680	371
1178	PALLERU BEFORE CONFL. WITH KRISHNA, JAGGAYYAPET, A.P.	25	30	28	8	11	8.95	8	8.3	8.1	563	709	630	0.8	2.2	1.50	0.1	1.5	0.9	0.1	0.1	0.1	2	7	5	2200	2800	2550
1177	MUNERU BEFORE CONFL. WITH KRISHNA, NANDIGAMA, A.P.	26	29	28	7.2	9.4	8.65	8	8.4	8.1	592	689	628	1	2.4	1.60	0.1	1.9	0.9	0.1	0.2	0.13	2	6	5	2200	3000	2550
1911	CHANDRABHAGA U/S OF PANDHARPUR TOWN	24	30	27	5.6	6.2	5.90	8	8.3	8.1	553	1414	1121	6.8	10.5	8.57	0.1	0.1	0.1	-	-	-	80	130	102	425	900	625
1912	CHANDRABHAGA D/S OF PANDHARPUR TOWN	29	32	30	5.1	6.5	5.63	8	8.7	8.3	680	1397	1036	6.6	12	8.65	0.1	0.2	0.1	-	-	-	170	225	198	900	1600	1250
1895	KAGINA D/S OF SEWAGE DISPOSAL POINT	26	34	31	6	7	6.65	8	8.6	8.3	520	790	598	1.8	4	2.60	0.2	0.6	0.3	-	-	-	900	9000	4400	1600	30000	15867
2349	RIVER NAKKAVAGU, BACHUGUDEM,MEDAK	29	29	29	7	7	7.00	7	7.7	7.6	2380	5390	3885	50	50	50.0	20.0	65.0	42.5	-	-	-	-	-	-	-	-	-
2350	RIVER HUNDRI, JOHARPUR(V), NEAR TEMPLE, KURNOOL	25	26	25	6.4	8	7.12	7	8.4	7.8	638	1057	839	2	3.8	3.08	0.7	5.0	2.5	0.1	0.1	0.1	49	280	136	800	1700	1266
2351	RIVER KUNDU, NANDYAL, NEAR OVER BDG., KURNOOL	24	25	25	7	7	7	8	8.1	8	556	867	711.5	3	3.2	3.1	2	3	2.5	0.1	0.1	0.1	94	130	112	1100	1400	1250
2372	KINNERASANI A/C OF KTPS ASH POND EFFLUENTS, KHAMMAM	20	25	21	6.9	7.7	7.3	7	8.3	7.8	197	365	326	0.8	5.0	1.9	0.1	0.8	0.3	0.1	0.1	0.1	2	7	4	1100	2600	1800

TABLE 17.1 :- WATER QUALITY OF RIVER PENNAR - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1255	PENNAR B/C CHITRAVATHI, TADPATRI, UNGANOOR, A.P.	24	28	26.0	5	7.4	6.2	7	8	7.7	947	1173	1060	2.5	3	2.75	0.7	4.1	2.40	0.1	0.1	0.1	6	140	73	22	1700	861
1256	PENNAR A/C PAPAGNI, PUSPAGINI, A.P.	22	30	25.5	7.1	7.4	7.3	8	8.3	7.9	718	1106	928	3	3.3	3.20	0.4	4	2.30	0.1	0.1	0.1	49	140	112	800	1400	1050
1257	PENNAR A/C CHEYYURU, SOMASILE, A.P.	27	33	29.9	6.7	11	8.3	7	8.7	7.9	226	490	427	0.6	5.2	1.90	0.1	4.7	0.87	0.1	0.1	0.1	4	13	6	1700	3500	2542
30	PENNAR AT SIDDVATA, NELLORE, A.P.	23	28	24.6	7.1	7.4	7.3	7	8	7.4	476	1090	794	2.2	3.3	2.83	0.5	3	1.33	0.1	0.1	0.1	49	110	90	800	1300	1025

TABLE 18.1 :- WATER QUALITY OF RIVER CAUVERY - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	WATER QUALITY CRITERIA				> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1198	CAUVERY AT NAPOKULU BDG (D/S), KARNATAKA	20	29	24.1	3.6	9.0	7.3	7	8.7	7.5	27	116	56	1.0	1.0	1.0	0.1	0.8	0.33	-	-	-	1	1600	377	39	1600	960
1195	CAUVERY AT KUSHAL NAGAR U/S (NEAR BAICHANAHALLI), KARNATAKA	22	29	26.4	5.6	8.2	7.2	7	8.7	7.7	51	128	94	1.0	1.0	1.0	0.1	1.3	0.57	-	-	-	0	350	145	140	1600	1391
33	CAUVERY AT KRS DAM,BALAMURIKSHETRA, KARNATAKA	24	30	27.3	6.2	11.0	7.7	8	8.7	8.3	148	299	231	1.0	1.0	1.0	0.2	1.7	0.69	-	-	-	0	540	183	27	1600	951
1386	CAUVERY AT D/S OF KAREKUARA VILLAGE, KARNATAKA	25	30	27.5	7.2	11.0	8.5	8	8.8	8.3	163	311	255	1.0	1.0	1.0	0.2	1.1	0.58	-	-	-	1	600	266	280	1600	1123
1171	CAUVERY AT SRI RANGAPATTANNA,D/S OF ROAD BDG.,KARNATAKA	23	31	27.6	4.4	9.2	7.2	8	8.7	8.1	172	334	263	1.0	2.0	1.08	0.2	1.7	0.73	-	-	-	130	920	580	1600	1600	1600
34	CAUVERY AT SATHYAGALAM BRIDGE, KARNATAKA	26	29	28.0	6.3	14.0	8.0	8	8.6	8.3	225	449	324	1.0	1.0	1.00	0.1	1	0.53	-	-	-	0	350	118	1600	1600	1600
50	CAUVERY AT METTUR, TAMIL NADU	22	29	25.2	3.8	9.3	6.4	7	8.8	7.9	257	597	404	0.1	3.2	1.41	0.1	0.4	0.22	0.1	0.3	0.15	110	700	270	260	940	426
1322	CAUVERY AT 1KM. D/S OF BHAVANI RIVER CONFL., TAMILNADU	24	31	26.8	4.3	8.1	6.7	7	8.7	7.6	112	890	374	0.3	7.3	1.57	0.1	0.6	0.27	0.1	0.3	0.15	130	1400	608	330	1700	878
51	CAUVERY AT PALLIPPALAYAM, TAMIL NADU	26	32	27.1	4.2	7.9	6.2	7	8.5	7.8	319	720	510	0.4	3.7	1.59	0.1	0.5	0.24	0.1	0.6	0.18	170	1700	851	470	2200	1203
1320	CAUVERY AT ERODE NEAR CHIRAPALAYAM, TAMILNADU	24	29	26.9	0.6	7.8	5.0	7	8	7.3	111	1495	559	0.4	23.0	5.21	0.1	0.5	0.24	0.1	0.2	0.11	170	2200	1017	460	3000	1504
1323	CAUVERY AT VELORE NEAR KATTIPALAYAM, TAMILNADU	26	31	27.3	5.7	8.0	7.4	7	8.7	7.9	337	1260	650	0.3	2.2	1.06	0.1	0.4	0.23	0.1	0.2	0.11	120	840	427	270	1200	638
1324	CAUVERY AT MOHANUR NEAR PATTAIPALAYAM, TAMILNADU	26	30	27.3	6.7	8.5	7.6	7	8.6	7.8	340	1398	738	0.5	2.2	1.05	0.1	0.3	0.23	0.1	1.0	0.18	110	1100	458	320	1400	661
1451	CAUVERY AT THIRUMUKKUDAL-CONFL. PT.OF R. AMRAVATI,TAMILNADU	23	30	27.8	7.4	7.9	7.7	8	8.4	8.1	449	1353	712	0.3	1.2	0.78	0.1	0.2	0.13	0.1	0.1	0.10	140	280	183	170	380	275
31	CAUVERY AT MUSIRI, TAMIL NADU	23	32	28.8	5.3	8.2	7.1	8	8.1	7.9	523	1187	715	0.6	1.4	1.08	0.1	0.4	0.18	0.1	0.1	0.10	78	270	170	170	330	273
1202	CAUVERY AT TIRUCHIRAPPALLI U/S, TAMILNADU	22	31	28.5	6.9	7.8	7.3	8	8.2	8.0	450	1022	655	0.5	1.1	0.83	0.1	0.2	0.15	0.1	0.1	0.10	90	330	233	260	400	337
1325	CAUVERY AT TIRUCHIRAPPALLI D/S, TAMILNADU	22	31	28.0	7.1	7.8	7.6	8	8.1	7.9	375	1227	720	0.9	2.3	1.50	0.1	0.4	0.23	0.1	0.2	0.13	170	790	418	240	1100	645
1203	CAUVERY AT TRICHY,GRAND ANAICUT, TAMILNADU	21	32	28.4	3.2	7.8	6.6	7	8.4	7.8	201	1550	863	0.9	7.8	3.26	0.1	1.1	0.48	0.1	0.9	0.18	110	1100	345	210	1400	505
1206	CAUVERY AT THANJAVUR, TAMILNADU	26	31	29.0	6.1	7.8	7.2	7	8.4	7.9	494	1320	732	1.1	1.6	1.28	0.1	0.3	0.20	0.1	0.2	0.13	170	1700	563	200	2200	783
1326	CAUVERY AT COLEROON, TAMILNADU	25	34	29.3	5.6	8.7	7.5	7	8.3	7.9	536	1760	847	0.2	2.6	1.23	0.1	0.5	0.23	0.1	0.2	0.11	130	2200	501	220	2800	747
1327	CAUVERY AT PITCHAVARAM, TAMILNADU	25	35	28.9	2.0	7.6	5.1	7	8.1	7.5	365	28700	3278	0.7	3.2	1.85	0.1	0.6	0.21	0.1	0.1	0.10	260	3500	707	330	5400	1085

TABLE 18.2 :- WATER QUALITY OF RIVER YAGACHI, HEMAVATI, SHIMSA, AKRAVATI, LAKSHMANTIRTHA, KABBANI, BHAVANI AND AMRAVATI - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1893	YAGACHI RIVER NEAR PUMPING STATION. HASSAN CITY	23	26	24.5	6.4	7.2	6.9	7.4	7.7	7.6	280	500	383	1.0	2.0	1.50	0.1	6.0	1.63	-	-	-	100	200	138	500	1500	813
1199	HEMAVATI AT D/S OF HOLENARASIPURA TOWN AT RAMADEVALA WEIR	18	24	22.0	6.9	7.2	7.0	7.0	8.2	7.6	350	800	517	1.0	2.0	1.67	0.1	0.6	0.27	-	-	-	300	400	333	1450	1800	1617
1200	SHIMSHA AT D/S OF HIGHWAY BRIDGE, YEDIYAR, KARNATAKA	20	29	25.7	7.1	8.0	7.5	7.0	8.1	7.6	100	600	400	2.0	3.0	2.67	7.5	7.5	7.50	-	-	-	110	110	110	1600	1600	1600
1166	SHIMSHA AT D/S OF BRIDGE, HALAGUR, KARNATAKA	26	27	26.8	5.2	7.8	6.5	7.9	8.3	8.1	322	562	412	1.0	1.0	1.00	0.6	1.4	1.00	-	-	-	170	210	190	1600	1600	1600
1165	ARKAVATHI AT D/S OF KANAKAPURA TOWN, KARNATAKA	26	28	27.0	5.6	6.8	6.1	7.7	7.8	7.8	190	1100	763	1.0	3.0	2.00	3.2	15.0	9.10	7.6	7.6	7.60	17	140	79	1600	1600	1600
1196	LAKSHMANTIRTHA AT D/S OF HUNSUR TOWN, KARNATAKA	26	30	28.0	0.7	3.0	1.6	7.3	8.1	7.8	278	672	480	2.0	5.1	3.03	0.2	1.4	0.85	1.3	1.3	1.30	1	1600	801	1600	1600	1600
1207	KABBANI AT MUTHANKARA, KERALA	24	29	26.5	5.9	7.0	6.6	6.7	7.0	6.9	62	108	88	0.6	0.8	0.68	0.2	7.2	2.60	0.1	0.4	0.23	0	400	100	240	1200	500
1197	KABBANI AT SARAGUR VILLAGE D/S, KARNATAKA	26	30	27.8	6.5	10.5	7.9	7.5	8.1	7.9	104	209	155	1.0	1.0	1.00	0.2	0.9	0.50	-	-	-	1	600	317	1600	1600	1600
41	KABBANI AT CAUSE WAY SATTUR, KARNATAKA	26	30	28.3	5.3	9.5	6.8	8.0	8.5	8.2	223	560	348	1.0	1.0	1.00	0.2	1.2	0.63	-	-	-	140	140	140	1600	1600	1600
1445	KABBANI AT WATER INTAKE OF KIADB AT NANJANGUD,KARNATAKA	26	32	28.3	1.8	9.8	5.9	7.4	8.6	8.1	207	492	301	1.0	2.0	1.25	0.2	0.5	0.35	-	-	-	1	350	128	1600	1600	1600
1208	BHAVANI AT ELACHIVAZHY, KERALA	26	29	26.9	6.8	7.7	7.1	7.1	7.7	7.4	45	232	143	0.3	0.4	0.38	0.1	5.6	1.97	0.1	0.5	0.30	0	70	33	140	240	213
1201	BHAVANI AT PATHIRAKALIAMMAN KOIL, TAMILNADU	31	33	32.0	6.7	8.4	7.7	6.6	8.2	7.3	82	247	162	0.4	2.0	1.03	0.1	0.6	0.38	0.1	0.2	0.11	100	900	303	150	1200	453
1204	BHAVANI AT SIRUMUGAI,TAMILNADU	31	32	31.9	6.4	7.9	7.4	6.7	7.7	7.1	66	246	145	0.5	2.0	1.09	0.1	0.6	0.33	0.1	0.3	0.13	100	460	251	170	700	377
1321	BHAVANI AT BHAVANI SAGAR, TAMILNADU	25	30	27.3	4.7	8.5	6.9	6.9	8.1	7.4	122	296	176	0.5	7.6	1.53	0.1	0.6	0.27	0.1	0.4	0.13	120	460	278	220	940	468
1319	AMRAVATI AT 1KM D/S FROM EFF.DIS. PT. AT MADHUTHUKKULAM,TAMILNADU	25	34	29.6	6.1	8.0	7.6	6.7	8.2	7.7	86	490	270	0.3	1.7	1.07	0.1	1.0	0.34	0.1	0.3	0.13	110	400	190	210	480	309
1205	BHAVANI AT BHAVANI, TAMILNADU	25	31	27.2	4.0	7.9	6.5	6.8	8.1	7.5	120	730	421	0.2	6.8	1.58	0.1	0.7	0.28	0.1	0.3	0.13	130	1200	397	330	1500	620

TABLE 19.1 :- WATER QUALITY OF MEDIUM & MINOR RIVERS IN GUJARAT & DAMAN - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1393	DAMANGANGA AT D/S OF MADHUBAN, DAMAN	-	-	-	-	-	-	7	8.1	7.6	202	348	281	-	-	-	0.2	6.9	2.13	-	-	-	-	-	-	-	-	-
1150	DAMANGANGA AT KACHIGAON U\S AT GIDC WIER,GUJ	22	26	25	6.8	7.6	7.2	7	8.3	7.8	138	326	262	0.1	0.4	0.28	0.1	0.3	0.15	0.1	0.1	0.10	0	30	19	21	120	50
1246	DAMANGANGA AT KACHIGAON D\S (DAMAN),GUJARAT	24	26	25	1.2	7.1	4.9	7	7.8	7.4	143	33600	10362	2.1	30	9.70	0.1	3.7	0.64	1.1	1.1	1.10	7	27	14	21	50	29
1860	BALEHWAR KHADI AT N.H. NO. 8	23	29	27	4.6	6.4	5.1	8	8	7.8	315	752	530	1.8	4.5	2.73	0.1	1	0.60	0.9	0.9	0.90	7500	210000	64125	21000	460000	137000
1861	RIVER PURNA ON BRIDGE AT SURAT-NAVSARI HIGHWAY	25	30	28	4.7	6.6	6.0	8	8.3	8.2	401	1011	612	0.5	4.3	2.28	0.3	0.5	0.40	0.7	0.7	0.70	2300	93000	28650	4300	240000	68650
1862	RIVER KAVERI ON BRIDGE AT BILLIMORA-VALSAD	28	31	30	5.6	6.6	6.1	8	8.2	8.1	476	24990	8782	0.6	3	1.90	0.2	0.8	0.43	-	-	-	9300	24000	16100	24000	46000	38667
1865	RIVER DHADAR AT KOTHADA	25	27	27	0	1.8	1.1	7	8.4	7.8	617	1380	1076	6	9	7.67	0.2	1	0.63	0.7	1.1	0.90	28	28	28	3	150	77
1148	AMBIKA AT BILIMORA,GUJT	24	32	29	5.5	8	6.8	8	8.3	8.0	508	14555	3431	1.6	4.2	2.80	0.1	0.6	0.30	0.1	0.5	0.30	2	150000	32120	6	210000	49061
1149	KOLAK AT PATALIA BDG., GUJARAT	22	27	25	3.4	5.9	4.5	7	8	7.6	610	2585	1161	3.9	12	7.43	0.1	0.9	0.53	0.3	0.3	0.30	14	220	99	34	500	259
1435	KOLAK AT RAILWAY BRIDGE NO. 313 VAPI,VALSAD, GUJARAT	22	28	25	5	6.8	6.0	7	8	7.3	403	31500	8838	3.5	8	5.58	0.6	0.8	0.70	0.2	0.2	0.20	8	17	14	22	40	31
1434	AMLAKHADI AFTER CONFL. OF W. WATER FROM ANKLESH,GUJARAT	30	30	30	0	0	0	7	7.1	7.1	3080	3080	3080	46	46	46.0	4.8	4.8	4.80	-	-	-	3000	3000	3000	9000	9000	9000
1438	MINDHOLA AT STATE HIGHWAY BRIDGE SACHIN, GUJARAT	25	30	28	1	4.2	2.8	8	8.1	7.9	510	852	663	3.7	12	5.93	0.5	1.9	0.97	0.6	0.6	0.60	24000	460000	150250	46000	1100000	358000
1436	BHADAR D/S JETPUR VILL. AFTER CONF. OF W.WATER FROM JETPUR CITY,GUJARAT	28	30	29	4.7	6	5.6	8	8.2	8.0	752	1960	1265	2	2.3	2.13	0.1	0.1	0.10	-	-	-	110	1100	503	170	5000	1693
2072	RIVER BHOGAVO D/S OF SURENDRANAGAR.	26	31	28	3.1	5.4	4.1	7	8.2	7.9	1020	11500	4491	5	50	16.50	0.1	0.1	0.10	-	-	-	20	110	58	27	210	116
2082	TRIVENI SANGAM, NR. SOMNATH TEMPLE, VERAVAL, DIST. JUNAGADH.	28	31	29	5.1	6.8	6.3	7	8.2	7.9	25900	55300	43983	0.8	3.5	1.83	0.1	6.8	1.22	-	-	-	80	130	105	130	260	188

TABLE 19.2 :- WATER QUALITY OF MEDIUM & MINOR RIVERS IN GOA & MAHARASHTRA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1399	ZUARI AT D/S OF PT. WHERE KUMBARJRIA CANAL JOINS, GOA	29	30	30	6.5	6.7	6.6	8	8	7.8	36	38	37	1.6	2.9	2.25	0	0	0.01	-	-	-	2	17	10	4	22	13
1475	ZUARI AT PANCHAWADI	27	29	28	6.5	7	6.8	7	7.1	7.1	8	14	11	0.9	2.4	1.65	0	0.1	0.07	-	-	-	11	33	22	17	49	33
1476	MANDOVI AT TONCA, MARCELA, GOA	26	27	27	6.5	6.5	6.5	7	7.5	7.5	26	30	28	4.4	4.7	4.55	0	0.1	0.05	-	-	-	7	33	20	9	79	44
1400	MANDOVI AT NEGHBOURHOOD OF PANAJI, GOA	27	29	28	7	7.2	7.1	8	8	8.0	48	50	49	1	1.5	1.25	0	0	0.02	-	-	-	2	4	3	7	7	7
1543	RIVER KALNA AT CHANDEL-PERNEM, GOA	26	26	26	7	8.1	7.6	7	7.6	7.3	88	97	93	0.7	1.2	0.95	0	0	0.03	-	-	-	240	240	240	350	350	350
1544	RIVER VALVANT AT SANKLI - BICHOLIM, GOA	26	26	26	7.2	7.5	7.4	7	7	7.0	63	71	67	2.3	2.6	2.45	0.1	0.2	0.13	-	-	-	14	920	467	17	1600	809
1545	RIVER MADAI AT DABOS - VALPOI, GOA	26	27	27	6.5	7.5	7.0	7	7.4	7.3	79	98	89	1.3	1.7	1.50	0	0	0.02	-	-	-	27	33	30	34	49	42
2270	RIVER KHANDEPAR AT CODLI NEAR BRIDGE ,U/S OPA WATERWORKS,SANGUEM	29	29	29	5.4	5.4	5.4	7	7.3	7.3	75	75	75	1.8	1.8	1.80	0.1	0.1	0.06	-	-	-	350	350	350	2400	2400	2400
1546	RIVER KHANDEPAR AT OPA - PONDA, GOA	27	29	28	6.5	6.8	6.7	7	7.2	7.2	93	96	95	0.9	1.9	1.40	0.1	0.1	0.10	-	-	-	8	27	18	11	33	22
1547	RIVER TALPONA AT CANACONA, GOA	27	29	28	6.8	6.8	6.8	7	7.1	6.9	56	60	58	1.8	2	1.90	0	0	0.03	-	-	-	17	33	25	27	79	53
1548	RIVER ASSONORA AT ASSONORA, GOA	24	25	25	4.7	6.5	5.6	7	6.8	6.8	61	73	67	1	2.8	1.90	0.1	0.1	0.06	-	-	-	33	130	82	34	240	137
2271	RIVER SAL PAZORKHONI,CUNCOLIM(NEAR CULVERT MARGAO-CANACONA NATIONAL HIGHWAY)	25	30	28	4.6	5.7	5.2	7	7.8	7.2	13	45	29	1.1	2.2	1.65	0	0.1	0.04	-	-	-	4	70	37	7	280	144
2272	RIVER KUSHAWATI NEAR BUND AT KEVONA,RIVON,SANGUEM	26	26	26	6.2	6.2	6.2	7	7.1	7.1	146	146	146	2.1	2.1	2.10	0.1	0.1	0.09	-	-	-	920	920	920	2400	2400	2400
2274	RIVER MAPUSA ON CULVERT ON HIGHWAY MAPUSA-PANAJI	31	31	31	3.6	3.6	3.6	7	7	7.0	29	29	29	2	2	2.00	0.1	0.1	0.09	-	-	-	33	33	33	170	170	170
2275	RIVER CHAPORA NEAR ALORNA FORT ,PERNEM	30	30	30	6.8	6.8	6.8	7	7.2	7.2	1370	1370	1370	2.6	2.6	2.60	0.1	0.1	0.08	-	-	-	33	33	33	110	110	110
2276	RIVER BICHOLIM VARAZAN NAGAR , BICHOLIM	28	28	28	8.1	8.1	8.1	7	7.1	7.1	335	335	335	3.2	3.2	3.20	0.2	0.2	0.21	-	-	-	1300	1300	1300	5400	5400	5400
1093	ULHAS AT U/S OF NRC BUND AT MOHANE, MAHARASHTRA	18	30	26	0	7.4	6.3	7	8.2	7.6	90	150	119	3	5.5	3.67	0.1	1.1	0.37	0.7	0.7	0.70	2	900	157	50	1800	781

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1094	ULHAS AT U/S OF BADLAPUR, MAHARASHTRA	19	30	27	0	7.5	6.4	7	8.4	7.6	74	149	109	3	5	3.40	0.1	1.2	0.42	-	-	-	7	350	95	11	1600	316
2162	ULHAS RIVER ATJAMBHUL WATER WORKS.	24	29	27	0	7.5	5.9	7	7.9	7.2	93	158	119	3	7.5	4.04	0.1	1.4	0.65	0.7	0.7	0.70	0	600	133	0	900	223
1461	BHATSA AT D/S OF PISE DAM NEAR PISE VILLAGE (ULHAS), MAHARASHTRA	21	29	25	0	7.5	5.3	7	7.8	7.7	86	143	109	3	4	3.25	0.1	0.9	0.38	-	-	-	2	600	165	9	900	296
1092	KALU AT ATALE VILLAGE, MAHARASHTRA	22	30	26	5.5	6.5	6.0	7	8.2	7.8	157	697	301	4	7.5	5.43	0.1	0.6	0.30	-	-	-	80	275	166	250	1800	1050
1462	PATALGANGA NEAR INTAKE OF MIDC W/W, MAHARASHTRA	14	28	22	5.6	7.4	6.6	7	7.8	7.2	68	276	131	3.2	9	4.50	0.1	3.2	0.83	-	-	-	25	900	285	70	1800	737
1151	PATALGANGA AT SHILPHATA, MAHARASHTRA	13	28	22	6.5	7.2	6.8	7	7.9	7.2	72	192	110	3	6	3.90	0.1	1.6	0.49	-	-	-	50	1600	480	80	1800	1036
1152	KUNDALIKA AT ROHA CITY, MAHARASHTRA	26	29	27	5.8	7.1	6.7	7	8.4	7.6	75	130	109	3.2	6.5	4.13	0.1	0.5	0.28	-	-	-	25	900	260	170	1800	624
2198	KUNDALIKA RIVER AT ARE KHURD (SALINE ZONE)	29	29	29	3.5	6.7	5.2	7	7.5	7.0	156	829	478	3.4	50	16.3	0.1	0.8	0.35	-	-	-	80	1600	500	225	1800	1008
2164	VASHISTI RIVER AT U/S OF THREE M PAPER MILLS NEAR M/S MULTIFILMS PLASTIC PVT. LTD. AT KHERDI.	20	22	21	6.6	7.4	6.9	6	6.8	6.6	171	597	291	1.6	2.4	1.96	0.2	2.2	1.40	-	-	-	2	8	4	90	120	104
2168	MITHI RIVER	31	34	32	0	4.1	0.7	7	7.5	7.3	267	55830	12697	28	50	45.6	0.6	1.9	1.32	-	-	-	2	1600	642	4	1800	1259
2199	SAVITRI RIVER AT OVALE VILLAGE.	21	27	23	6.6	7.3	6.8	6	7	6.6	142	20350	6232	1.6	2.6	2.13	0.6	6	2.72	0.6	0.6	0.60	4	8	6	4	140	106

TABLE 19.3 :- WATER QUALITY OF MEDIUM & MINOR RIVERS IN KERALA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
17	PERIYAR NEAR ALWAYE-ELOOR, KERALA	27	31	29	4	7.6	6.2	6	7.1	6.5	59	8730	1638	0.5	2.6	1.5	0.1	6.8	0.80	0.1	0.4	0.17	0	870	349	40	1820	816
18	PERIYAR AT KALADY, KERALA	25	30	28	6.3	7.6	7.3	6	7.1	6.6	24	76	36	0.2	1.3	0.6	0.1	3.2	0.41	0.1	0.2	0.13	0	1320	304	330	2270	1056
1338	PERIYAR AT SEWAGE DISCHARGE POINT, KERALA	26	31	28	5.5	7	6.4	6	8	6.7	30	53	41	0.4	1.9	1.0	0.1	6.4	0.75	0.1	0.2	0.13	0	1300	443	250	2640	1179
2335	R PERIYAR AT KALAMASSERY	27	31	28	4.6	5.7	5.1	6	7.5	6.8	41	61	52	0.7	2.8	1.6	0.1	0.4	0.22	-	-	-	210	1350	555	280	3920	1680
2334	RIVER PERIYAR AT PATHALAM	27	30	28	6.3	7.4	6.8	6	7.4	6.7	34	810	183	0.6	3.1	1.3	0.1	0.5	0.28	-	-	-	150	1100	358	590	5240	1748
2333	RIVER PERIYAR AT MUPPATHADAM	27	28	27	5.6	7	6.3	6	6.4	6.3	30	199	115	0.7	1	0.9	0.2	0.8	0.50	-	-	-	240	670	455	1070	4660	2865
2336	R PERIYAR AT PURAPPALLIKAVU	26	30	28	5.5	7.8	7.2	6	7	6.7	39	1900	455	0.6	2.2	1.1	0.1	0.4	0.28	-	-	-	0	560	245	40	1650	753
20	CHALIYAR AT KOOLIMADU, KERALA	26	29	27	6	7.2	6.8	7	7.3	6.9	41	129	80	0.3	0.8	0.4	0.1	4	0.52	0.1	0.3	0.13	0	600	207	140	1050	508
21	CHALIYAR AT CHUNGAPALLY, KERALA	26	29	27	6.4	7.2	6.8	7	7.5	7.0	56	19790	4515	0.2	0.5	0.4	0.1	15	1.53	0.1	0.2	0.13	0	500	184	110	900	427
42	KALLADA AT PERUMTHOTTAMKADAVU, PUNALOOR, KERALA	28	31	29	7.3	8	7.7	7	7.6	7.2	33	79	47	0.7	1.3	1.0	0.1	12	2.00	0.1	0.3	0.14	0	740	253	80	1200	452
43	MUVATTAPUZHA AT VETTIKKATTUMUKKU, KERALA	27	31	29	4.7	8	7.1	6	8.2	6.8	41	85	57	0.8	2.8	1.5	0.1	9.2	1.12	0.1	0.4	0.18	0	720	230	80	1950	681
1154	CHALAKUDY AT PULICKALKA-DAVU	26	32	29	4.7	8	6.6	6	6.9	6.3	44	393	148	0.2	2.9	1.2	0.1	6.8	0.93	0.1	0.2	0.12	0.1	680	190	210	2040	935
1155	KARAMANA AT MOONNATTUMUKKU	25	28	26	0	6.8	1.8	6	7.1	6.8	840	3900	2012	0.5	11	5.5	0.1	4.9	1.80	0.1	1.3	0.33	0.1	44000	20458	6000	56000	31167
1156	PAMBA AT CHENGANNUR, KERALA	25	27	26	6.2	7.2	6.7	6	6.5	6.2	34	50	40	0.5	0.8	0.6	0.3	2.4	1.00	0.1	0.4	0.23	0	1000	425	800	1400	1100
1341	PAMBA AT THAKAZHY, KERALA	25	26	26	4.5	6.6	5.8	6	6.9	6.3	47	110	65	0.5	2.6	1.1	0.4	8	2.97	0.1	0.4	0.30	0	1400	525	700	1800	1200
1565	PAMBA DOWN, KERALA	26	27	26	3.4	5.8	5.1	6	6.7	6.3	34	65	50	0.7	1.3	1.0	0.6	8	3.10	0.1	0.4	0.27	0	1800	700	900	2600	1600
1339	MEENACHIL AT KIDANGOOR, KERALA	25	28	26	5.6	7.4	6.6	6	6.6	6.2	31	63	42	0.5	0.7	0.6	0.4	3.6	1.97	0.1	0.3	0.20	0	1400	475	600	1600	925
1340	MANIMALA AT KALLOOPARA, KERALA	25	29	27	6	7	6.6	6	7.1	6.4	35	54	43	0.4	1	0.7	0.5	8	3.13	0.1	0.8	0.40	0	1200	400	700	1400	975
1384	MANIMALA AT THONDRA, KERALA	26	29	27	6.5	7	6.7	6	7.1	6.4	38	70	50	0.4	0.6	0.5	0.7	8.8	3.60	0.1	0.8	0.40	0	1600	500	700	2200	1175
1342	ACHENKOIL AT THUMPAMON, KERALA	25	29	26	6.1	7.2	6.6	5	7.1	6.3	36	57	46	0.4	1	0.6	0.2	5.6	1.07	0.1	0.6	0.21	0	1600	624	80	2200	1010
1443	ACHENKOIL AT CHENNITHULA, KERALA	26	28	27	5.6	6.4	5.9	6	7.5	6.4	47	58	54	0.6	0.9	0.7	0.5	8.8	3.53	0.1	0.4	0.27	0	1400	375	140	1800	985
1442	VAMANAPURAM, KERALA	26	27	27	7.2	7.8	7.6	6	6.9	6.7	47	72	55	0.3	1.5	0.7	0.1	12	4.17	0.1	0.1	0.10	0	700	295	500	3200	1575
1563	AMARAVILA, KERALA	25	28	27	5.9	7	6.5	6	7.2	6.7	54	84	72	0.1	1.4	0.8	0.2	8	2.83	0.1	0.2	0.15	0	90	30	400	1200	775
1564	AYUR, KERALA	28	31	29	7.1	7.5	7.3	7	7.7	7.4	60	88	71	0.6	0.9	0.7	0.3	10	4.10	0.1	1	0.40	0	1100	490	80	1800	940
1566	THIRURANGADY, KERALA	26	28	27	5	7	6.3	6	7.1	6.7	69	89	79	0.6	0.7	0.7	0.1	5.6	2.03	0.1	0.5	0.33	0	400	190	240	1166	702
1567	KUTTIYADY ESTATE, KERALA	24	27	26	6.8	7	6.9	7	6.6	6.6	30	40	33	0.2	0.4	0.4	0.1	4	1.40	0	0.1	0.07	0	0	0	0	60	28
1568	VALAYAM, KERALA	26	28	27	6.4	7.2	6.8	7	6.8	6.7	41	51	46	0.2	0.6	0.4	0.2	4	1.47	0	0.1	0.07	0	80	30	0	240	150
1569	THALIPARAMBA, KERALA	27	30	29	4.8	7	5.9	6	7.8	7.1	63	18000	6666	0.4	1.1	0.7	0.1	12	4.13	0	0.4	0.17	0	400	118	50	900	393
1570	HOSDURG, KERALA	27	30	28	5.8	7.2	6.4	7	7.6	7.1	65	44000	17771	0.4	1.6	1.0	0.3	15	5.20	0	0.2	0.10	0	1840	760	60	3600	1865
1571	KAKKADAVU, KERALA	27	29	28	6.3	7.8	7.3	6	7.2	6.7	26	140	62	0.3	1.8	0.9	0.1	8	2.80	0	0.2	0.10	0	650	293	60	1900	920
1572	PADIYATHADKA, KERALA	27	31	28	7.2	7.9	7.6	7	6.9	6.6	50	76	61	0.1	1.5	0.5	0.1	10	3.40	0	0.1	0.07	0	300	85	110	1400	503

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1573	IRUMPANAM, KERALA	29	32	30	1.9	2.7	2.4	6	7.1	6.7	129	342	221	1.3	3	2.1	1	9.6	3.97	0.2	1.6	0.90	0	840	220	140	1320	660
2284	R NEYYAR AT ARUVIPURAM	26	27	27	6.9	7.2	7.1	6	7.3	6.8	68	110	89	0.4	2	1.2	0.2	0.6	0.40	-	-	-	40	1200	620	300	2900	1600
2285	R MAMOM AT MAMOM BRIDGE	26	27	27	6.2	6.6	6.4	6	6.9	6.7	107	112	110	0.4	0.5	0.5	0.2	0.2	0.20	0.1	0.1	0.10	400	2400	1400	2400	4000	3200
2286	R AYROOR AT AYROOR BRIDGE	27	27	27	1.9	5	3.5	7	7	6.9	98	111	105	0.3	1.1	0.7	0.1	0.2	0.15	-	-	-	30	500	265	400	1200	800
2287	R ITHIKKARA AT ITHIKKARA	27	28	28	6.8	8	7.4	7	7.3	7.3	121	189	155	0.8	0.8	0.8	1.1	1.3	1.20	-	-	-	280	860	570	440	1400	920
2288	R PALLICKAL NELIMUKAL	27	29	28	6.1	7.5	6.8	7	7.1	6.9	74	80	77	0.8	0.9	0.9	1.3	2.3	1.80	-	-	-	80	350	215	120	820	470
2289	R KARUVANNURR AT KARUVANNUR BDG.	27	27	27	5.5	5.5	5.5	7	6.5	6.5	75	75	75	1.9	1.9	1.9	0.1	0.1	0.10	-	-	-	1300	1300	1300	2100	2100	2100
2290	R PUZHACKAL AT PUZHACKAL BRIDGE	31	31	31	5.4	5.4	5.4	7	6.5	6.5	102	102	102	4	4	4.0	0.1	0.1	0.10	-	-	-	320	320	320	680	680	680
2291	R KEECHERI AT VADAKANCHRY BRIDGE	30	30	30	4.8	4.8	4.8	7	6.8	6.8	90	90	90	1.1	1.1	1.1	0.1	0.1	0.10	-	-	-	730	730	730	1090	1090	1090
2292	R THIRUR AT THALAKKADATHUR BRIDGE	28	28	28	5.2	6.4	5.8	6	6.3	6.3	73	101	87	0.4	1	0.7	0.1	0.1	0.10	0.1	0.1	0.10	600	666	633	1400	1600	1500
2293	R KADALUNDI AT HAJIRAPPALLY	27	28	27	7.1	7.4	7.3	7	6.6	6.6	56	57	57	0.4	0.4	0.4	0.1	0.4	0.25	-	-	-	260	333	297	700	1066	883
2294	R KALLAI AT KALLAI BRIDGE	28	28	28	5.4	6.2	5.8	7	7.8	7.5	1281	35300	18291	0.7	0.9	0.8	0.2	0.3	0.25	-	-	-	170	700	435	300	1700	1000
2295	R CORAPUZHA AT KANAYANKODE	28	29	28	6.1	6.2	6.2	7	6.8	6.7	494	4500	2497	0.3	0.6	0.5	0.1	0.2	0.15	-	-	-	120	900	510	500	1700	1100
2296	R THALLASSERY AT PATHIPPALAM	27	27	27	6.9	7.7	7.3	6	6.2	6.1	42	48	45	0.2	1.2	0.7	0.2	0.2	0.20	-	-	-	140	160	150	1000	1100	1050
2297	R ANCHARAKANDY AT MERUVAMBA	25	28	27	7.4	7.8	7.6	6	6.7	6.3	36	43	39	0.1	0.7	0.5	0.1	0.4	0.20	-	-	-	960	1160	1040	2250	2800	2588
2298	R KUPPAM AT RAYAROM	25	26	25	7.6	7.8	7.7	6	6.7	6.6	27	35	31	0.3	0.3	0.3	0.1	0.2	0.15	-	-	-	480	500	490	1100	1500	1300
2299	R RAMAPURAM AT RAMAPURAM BRIDGE	27	30	28	4.8	6	5.4	6	6.1	5.9	118	1072	595	0.5	1	0.8	0.1	0.1	0.10	-	-	-	560	580	570	1250	1500	1375
2300	R PERUVAMBA AT CHANDAPPURA	27	28	28	7.3	7.5	7.4	6	6.2	6.1	28	31	30	0.7	1.1	0.9	0.2	0.4	0.30	-	-	-	640	740	690	1000	1100	1050
2301	R KAVVAI AT KUTTIYOL PALAM	27	29	28	6.3	6.8	6.6	6	5.9	5.9	32	42	37	0.5	0.8	0.7	0.1	0.1	0.10	-	-	-	540	540	540	1450	2000	1725
2302	R NEELASWARAM AT NAMBIARKAL DAM	27	29	28	6.1	6.9	6.5	6	6.7	6.5	40	2230	1135	0.5	0.8	0.7	0.2	0.3	0.25	-	-	-	700	1000	850	1600	2100	1850
2303	R PULLUR AT PULLUR BR.	27	27	27	6.9	7.4	7.2	6	5.9	5.9	34	43	39	0.6	0.9	0.8	0.3	0.8	0.55	-	-	-	300	580	440	1400	1600	1500
2304	R MOGRAL MOGRAL BR.	28	30	29	6.1	6.4	6.3	6	6.8	6.5	195	1655	925	0.9	1.2	1.1	0.1	0.5	0.30	-	-	-	700	960	830	1300	1800	1550
2305	R SHRIYA AT ANGADIMOGARU	27	27	27	7.5	7.6	7.6	7	6.7	6.6	48	52	50	0.1	1.1	0.6	0.2	0.3	0.25	-	-	-	1520	1800	1660	2500	3500	3000
2306	R UPALA AT UPALA BR.	27	27	27	7.1	7.5	7.3	6	6.6	6.5	55	72	64	0.9	1.9	1.4	0.2	0.8	0.50	-	-	-	1120	1440	1280	2800	2900	2850
2307	R MANJESWAR AT BAJRAKKARA BR.	26	27	27	7.4	7.5	7.5	7	7.3	7.0	69	79	74	0.2	1.3	0.8	0.1	0.1	0.10	-	-	-	1200	1600	1400	2400	3200	2800
2326	R KORAYAR AT KANJIKODE	25	28	26	2.3	6.5	4.4	7	7.7	7.3	55	801	428	0.3	0.5	0.4	0.1	0.2	0.15	-	-	-	210	360	285	580	1600	1090
2331	R BHARATHAPUZHA AT KUTTIPPURAM	24	29	27	6.5	7	6.8	7	7.6	7.0	62	276	169	0.3	0.6	0.4	0.2	0.4	0.25	-	-	-	120	400	255	380	700	560
2337	R KADAMBAYAR AT BRAHMAPURAM	28	30	29	0.4	6.2	1.7	6	6.8	6.2	60	390	181	1.8	4	3.0	0.1	1.2	0.45	-	-	-	40	2080	672	980	5200	2208
2338	R KADAMBAYAR AT MANCKAKADAVU	28	30	29	1.4	6.8	3.0	6	6.5	6.1	61	120	80	1.3	3.2	2.0	0.1	0.3	0.13	-	-	-	170	480	268	830	1920	1240

TABLE 19.4 :- WATER QUALITY OF MEDIUM & MINOR RIVERS IN ANDHRA PRADESH, ORISSA, PONDICHERRY, TAMILNADU & KARNATAKA - 2008

STATION CODE	LOCATIONS	TEMPERATURE ºC			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1448	NAGAVALLI AT THOTAPALLI REGULATOR, A.P.	25	32	28	6.3	7.6	6.9	7	8.3	7.8	245	721	469	0.2	1.3	0.89	0.1	2.6	0.86	0.1	0.1	0.10	0	600	152	3	24000	5874
1455	RUSHIKULYA AT GANJAM U/S, ORISSA	30	33	32	7.1	8.4	7.7	8	8.1	8.1	134	350	266	0.8	2.5	1.83	0.5	1.3	1.01	0.01	0.01	0.01	1700	2200	1950	2100	4300	3175
1456	RUSHIKULYA AT GANJAM D/S, ORISSA	30	34	32	3.4	8.4	6.8	7	8.4	7.8	5200	33600	16468	0.9	2.2	1.65	0.5	3.3	2.00	0.02	0.02	0.02	230	580	440	630	840	775
1642	NAGAVALLI AT JAYKAYPUR D/S, ORISSA	21	34	28	6.8	8.2	7.5	8	8.5	8.2	207	243	233	2	3.6	2.50	0.2	2.3	0.89	0.01	0.01	0.01	1700	3400	2600	3300	5800	4300
1643	NAGAVALLI AT RAYAGADA D/S, ORISSA	24	29	26	7	8.1	7.6	8	8.5	8.1	201	264	233	0.6	2	1.35	0.4	2.8	1.43	0.04	0.04	0.04	1300	2700	2025	2100	4700	3200
1685	ARASALAR RIVER KARAIKAL REGION, PONDICHERRY	19	30	26	6.6	7.6	7.0	7	8.4	7.6	398	715	593	0	1	0.25	0.1	3.8	1.95	-	-	-	-	-	-	-	-	-
1159	TAMBIRAPARANI AT BDG.NR. MADURA COATS LTD.PAPAVINASAM,TAMILNADU	22	26	25	6.5	8.5	7.6	6	6.8	6.6	69	182	118	0.5	2.1	1.15	0.1	0.2	0.15	0.1	0.1	0.10	50	90	70	130	280	180
1160	TAMBIRAPARANI AT CHERANMADEVI,CAUSE WAY,TAMILNADU	23	30	27	6	7.7	6.8	6	6.9	6.6	86	285	179	1	2.7	1.88	0.1	0.4	0.20	0.1	0.2	0.13	110	140	118	220	350	253
1161	TAMBIRAPARANI AT TIRUNELVELI,COLLECTORATE,TAMILNADU.	24	31	28	5.9	8.4	6.8	6	7.8	6.7	60	415	172	0.7	3.9	2.14	0.1	0.4	0.19	0.1	0.1	0.10	170	350	263	220	500	402
1162	TAMBIRAPARANI AT MURAPPANADU, TAMILNADU	27	32	28	6	8.1	6.9	6	8.2	7.1	130	458	260	0.6	4.9	1.78	0.1	0.3	0.13	0.1	0.1	0.10	30	240	110	90	300	200
1328	TAMBIRAPARANI AT PAPPANKULAM,TAMILNADU	23	28	27	5.9	7.9	7.3	6	7.6	6.6	42	232	94	0.5	2.2	1.27	0.1	0.6	0.17	0.1	0.1	0.10	30	130	73	110	170	150
1329	TAMBIRAPARANI AT RAIL BDG. NR. AMBASAMUDAM, TAMILNADU	22	27	26	6.8	8.5	7.4	6	7.4	6.7	42	197	88	0.4	2.7	1.03	0.1	0.3	0.15	0.1	0.1	0.10	30	170	89	80	280	173
1330	TAMBIRAPARANI AT ARUMUGANERI, TAMILNADU	27	30	28	5.6	7.9	7.2	7	8.4	7.2	154	586	439	1.1	4.3	2.28	0.1	0.4	0.14	0.1	0.2	0.11	80	500	236	170	900	415
1450	PALAR AT VANIYAMBADI WATER SUPPLY HEAD WORK, TAMILNADU	22	28	27	6.3	7.2	6.8	7	8.2	7.6	560	1343	749	0.5	4	2.25	0.1	0.9	0.36	0.1	0.1	0.10	13	3000	424	21	5000	699
1444	KALI AT D/S WEST COAST PAPER MILL, KARNATAKA	25	28	26	6.4	7.3	6.9	7	7.8	7.3	139	319	252	3	7	4.33	0.4	1.9	1.00	0.1	0.1	0.10	130	560	322	225	1800	858
1894	KUMARADHARA - U/S OF UPPINAGADY TOWN BEFORE CONFLUENCE WITH RIVER NETHRAVATHI	28	32	29	6.9	7.2	7.0	7	7.7	7.3	30	58	46	1	1	1.00	-	-	-	-	-	-	20	92	49	220	1600	707
1892	NETRAVATHI U/S OF DHARMASTALA AT WATER SUPPLY INTAKE POINT	30	35	31	6.9	7	7.0	7	7.8	7.3	20	51	40	1	1	1.0	-	-	-	-	-	-	4	22	12	52	100	81
2352	RIVER VAMSHADHARA, KALINGAPATNAM,VIZIANAGARAM	28	31	30	7.1	8.2	7.7	8	8.1	8.1	158	231	195	1	1.2	1.10	0.1	1.3	0.70	0.1	0.1	0.10	0	0	0	9	11	10

TABLE 19.5 :- WATER QUALITY OF MEDIUM & MINOR RIVERS IN HIMACHAL PRADESH, PUNJAB, HARYANA, CHANDIGARH & RAJASTHAN - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1871	RIVER MARKANDA AT PAONTA, DISTT. SIRMOUR, H.P.	17	28	23	7.2	8.8	8.0	8	8.5	8.2	411	815	572	0.4	0.8	0.5	-	-	-	-	-	-	7	18	12	21	28	26
1884	KALA AMB D/S MARKANDA RIVER	18	32	24	0.4	6.2	3.8	7	8.5	7.8	380	3640	1424	4.3	590	155.6	0.62	0.70	0.66	-	-	-	-	-	-	-	-	-
1870	RIVER SUKHANA AT PARWANOO, DISTT. SOLAN, H.P.	21	24	23	2.2	7.1	4.9	7	8.2	7.8	257	1210	704	2.8	4.2	3.5	-	-	-	-	-	-	34	80	57	210	540	375
1023	GHAGGAR AT MUBARAKPUR REST HOUSE (PATIALA), PUNJAB	18	22	20	5.2	6.8	5.9	7	7.4	7.2	686	712	703	3.6	10	5.4	1.2	3.8	2.05	0.8	1	0.85	700	4000	1950	9000	50000	21000
1024	GHAGGAR AT 100M D/S CONF. WITH R. SARASWATI (PATIALA),PUNJAB	18	25	21	4.4	6.4	5.3	7	7.8	7.4	911	1207	1095	8	40	27.0	2.4	5.6	3.35	1.2	2.8	1.60	5000	170000	48000	110000	500000	217500
1025	GHAGGAR GH-1 AT ROAD BRDG. SIRSA,DEBWALI ROAD,HARYANA	19	41	30	5.5	7.6	6.7	5	7.9	6.9	520	1924	1094	8	33.2	17.1	11	38	19.4	-	-	-	-	-	-	-	-	-
1026	GHAGGAR GH-2 AT CHANDARPUR SYPHON,	18	41	30	3.4	8	6.2	5	7.6	7.0	588	2320	1312	9	40	22.3	12	21	17.7	-	-	-	-	-	-	-	-	-
1295	GHAGGAR NEAR BANKARPUR,DERA BASSI,PUNJAB	18	23	21	5.1	6.2	5.7	7	7.5	7.3	673	760	732	4.2	22	10.7	1.8	4.2	2.40	0.6	1.4	1.10	1100	15000	5450	7000	90000	45500
1473	GHAGGAR AT RATANHERI, D/S OF PATIALA NADI (AFTER CONFL.), PUNJAB	18	24	21	4.6	5.4	5.0	7	7.5	7.2	878	1092	983	7.4	50	26.1	2	4.4	3.05	0.4	2.4	1.25	2000	110000	32250	90000	230000	135000
1698	D/S CHHATBIR, PUNJAB	15	24	20	3.6	6.2	5.0	7	7.6	7.3	701	790	748	6.2	10	7.4	2	4	2.65	0.8	1.4	1.15	8000	23000	12500	70000	110000	90000
1699	U/S DHAKANSU NALLAH, PUNJAB	16	25	20	4.2	6	5.1	7	7.8	7.2	745	780	760	5	21	13.5	2.2	3	2.55	0.8	1.6	1.25	2000	70000	22000	50000	250000	122500
1700	D/S DHAKANSU NALLAH, PUNJAB	17	25	21	3.6	5.2	4.5	7	7.7	7.2	763	940	856	9	32	23.8	2.4	5.8	3.45	1.2	1.8	1.45	5000	110000	34000	110000	500000	232500
1701	D/S JHARMAL NADI, PUNJAB	16	25	21	3.8	5	4.4	7	7.4	7.2	736	1600	1184	4.2	32	18.1	2.2	8	3.75	1	2	1.45	5000	50000	17250	20000	170000	70000
1702	U/S JHARMAL NADI, PUNJAB	17	23	20	4.4	4.6	4.5	7	7.7	7.4	789	1410	1186	12	40	22.7	2	5	3.07	0.8	1.4	1.13	6000	23000	13000	15000	110000	78333
1703	GHAGGER AT MOONAK, PUNJAB	19	25	21	4.2	6.2	5.2	7	7.8	7.5	930	1185	1036	9.9	38	28.5	2.4	5.2	3.55	1.2	3	2.05	5000	90000	28750	90000	300000	155000
1704	D/S SARDULGARH, PUNJAB	19	25	21	4.8	6.2	5.5	7	7.7	7.6	840	1108	973	8.2	45	27.8	2.4	6	3.33	1.2	3	1.90	5000	500000	130500	110000	1100000	392500
1705	U/S SARDULGARH, PUNJAB	19	24	21	4.6	6.6	5.6	7	7.8	7.6	820	1172	951	8	45	25.8	2.2	6	3.23	1.1	3	1.83	5000	70000	22500	90000	250000	712500
1885	RIVER GHAGGAR AT D/S OF SURAJPUR	10	36	25	6.3	6.5	6.4	7	8.7	7.9	354	390	378	3.3	4.8	4.1	0.44	1.5	0.94	-	-	-	-	-	-	-	-	-
1887	GHAGGAR BEFORE OTTU WEIR (BEFORE MIXING OF SATLUJ CANAL WATER) (HARYANA)	19	41	31	5.9	8.1	6.8	5	8	7.0	430	1740	970	7	50	25.3	10	41	20.2	-	-	-	-	-	-	-	-	-
1717	KODRA DAM, MOUNT ABU, RAJASTHAN	14	27	21	4.1	6.7	5.4	7	8.3	8	250	510	438	0.1	3.3	1.70	0.2	0.6	0.4	-	-	-	3	3	3	4	9	6

TABLE 19.6 :- WATER QUALITY OF MEDIUM & MINOR RIVERS IN MANIPUR, MIZORAM, MEGHALAYA & TRIPURA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1424	IMPHAL AT MAHABALI, MANIPUR	26	27	27	7.4	8.3	7.9	7	6.9	6.7	97	142	120	1.2	1.2	1.2										10	260	135
1457	IMPHAL AT KOIRENGEI, MANIPUR	22	29	26	5.6	6.7	6.2	7	7.5	7.3	127	143	135	1.8	1.8	1.8										10	215	113
1627	KIYAMGI, MANIPUR	25	28	27	8.1	8.2	8.2	7	7.8	7.6	120	231	176	1.9	1.9	1.9										10	260	135
1628	MINUTHONG(IMPHAL RIVER, MANIPUR	28	28	28	5.6	7.6	6.6	7	7.5	7.4	82	141	112	1.2	1.2	1.2										30	152	91
1458	IRIL AT PORAMPET, MANIPUR	24	28	26	7.3	8.4	7.9	8	7.9	7.8	140	251	196	0.8	0.8	0.8										5	140	73
1624	LILONG, MANIPUR	28	29	29	8.4	9.5	9.0	8	8.1	8.0	140	397	269	1.8	1.8	1.8										40	270	155
1925	KHUGA RIVER (CHURACHANDPUR DIST.)	28	28	28				8	8	8.0	698	698	698															
1926	KHUJAIROK RIVER, MOREH (CHANDEL DIST.)	30	30	30	9.6	9.6	9.6	8	7.6	7.6	633	633	633													30	30	30
1625	HUMP BRIDGE, MANIPUR	26	29	27	2.5	3.8	3.2	7	6.9	6.8	43	735	389	26	26	26										375	890	633
1626	HEIRANGOITHONG, MANIPUR	27	29	28	3.6	7.3	5.5	7	7.8	7.5	32	717	375	24	24	24										350	415	383
1428	KYRHUKHLA NEAR SUTNGA KHLIERIAT,JAINTIA HILLS DT.,MEGHALAYA	19	19	19	5	5	5.0	3	3.2	3.2	630	630	630	7	7	7	2.5	2.5	2.5				27	27	27	33	33	33
2050	TLAWNG UPSTREAM AIZAWL	20	31	26	6.4	7.8	7.0	8	8.1	7.8	70	145	122	0.3	0.9	0.65				0.1	0.1	0.10				3	3	3
2051	TLAWNG DOWNSTREAM AIZAWL	21	31	26	5.7	8.7	7.2	8	8	7.8	82	149	130	0.5	1.2	0.93	0.1	0.1	0.1	0.1	0.2	0.13				3	3	3
2052	TUIRIAL UPPER CATCHMENT	20	31	25	4.3	7.6	6.6	8	8.3	8.0	88	182	151	0.4	1.6	0.98				0.1	0.1	0.10				3	7	6
2053	TUIRIAL LOWER CATCHMENT	20	31	25	5.4	7.4	6.7	8	8.1	7.9	165	220	188	0.6	1.7	1.03				0.1	0.2	0.13				3	15	8
1403	GUMTI AT U/S SOUTH TRIPURA,TRIPURA	26	30	28	6	6.3	6.1	7	8.1	7.7	110	130	120	0.5	2.45	1.36							110	440	264	180	530	350
1404	GUMTI AT D/S SOUTH TRIPURA, TRIPURA	26	31	29	4.2	6.9	5.4	7	7.7	7.3	130	153	141	0.8	4.0	2.67	0.01	0.1	0.08				17	550	285	260	620	510
1726	CHANDRAPUR, AGARTALA D/S OF HAORA RIVER, TRIPURA	27	30	28	5.2	6.4	5.8	8	8.0	7.8	125	180	161	2.5	3.5	2.93	0.01	0.1	0.10				420	560	518	560	610	588

TABLE 19.7 :- WATER QUALITY OF CREEK & CANAL - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
CREEKS AND SEA WATER																												
2267	CREEK AT DANDO MOLLO,VELSAO, MARMUGAO	30	30	30	7.5	7.5	7.5	8.8	8.8	8.8	-	-	-	1.3	1.3	1.3	5.0	5.0	5.0	-	-	-	23	23	23	240	240	240
2080	MASMA KHADI-OLPAD- SARAS ROAD	25	31	29	2.9	5.1	4.5	6.4	8.3	7.7	574	4650	1838	1.2	8.0	3.4	0.1	0.9	0.5	-	-	-	4300	24000	12314	9300	75000	31657
2081	AMLAKHADI CREEK AT PUNGAM.	21	31	27	0.0	0.0	0.0	6.7	7.4	7.2	3070	6830	4576	28	206	81.2	1.3	1.4	1.4	1.2	2	1.6	900	3300	1700	1100	12000	6040
1316	BASSEIN CREEK AT BASSIN IN THANE DT.	26	30	28	0.0	5.2	3.8	7.7	8.3	8.0	12980	62430	37099	6.0	9.0	7.8	0.5	1.5	1.0	-	-	-	2	900	391	11	1800	1040
1317	THANE CREEK AT ELEPHANTA ISLAND,	30	32	31	0.0	5.1	3.6	7.4	7.9	7.6	8476	68880	47587	9.0	12.0	9.8	1.1	2.1	1.4	-	-	-	2	80	51	14	550	261
1318	MAHIM CREEK AT MAHIM BAY, MAHARASHTRA	30	32	31	0.0	4.7	2.7	7.3	7.7	7.5	11180	68730	49533	10.0	35.0	21.8	0.1	1.9	1.2	-	-	-	2	900	249	17	1600	648
2184	VASHI CREEK AT AIROLI BRIDGE.	23	28	26	3.5	6.7	5.4	7.0	9.2	7.8	1194	51820	21643	4.0	12.0	7.2	0.5	4.1	1.7	-	-	-	170	1700	670	225	1800	1054
2185	VASHI CREEK AT VASHII BRIDGE.	23	32	26	4.1	5.6	5.0	6.8	7.7	7.5	10180	56740	36564	6.0	12.0	9.2	1.2	2	1.7	0.9	0.9	0.9	130	550	289	350	1600	770
2165	SEA WATER AT GATEWAY OF INDIA.	31	34	32	0.0	7.0	4.1	6.9	8.1	7.6	11310	62270	45189	7.0	11.0	8.3	0.8	1.6	1.2				4	1600	633	20	1800	1067
2166	SEA WATER AT CHARNI ROAD CHOUPATHY.	31	34	32	0.0	7.3	3.5	7.0	8.2	7.6	11400	62500	45190	7.0	11.0	9.3	0.7	1.9	1.2	1.6	1.6	1.6	12	550	342	150	1800	871
2167	SEA WATER AT WORLI SEA FACE.	31	34	32	0.0	7.2	3.8	7.0	8.1	7.6	12370	62720	45591	7.0	11.0	9.2	0.8	1.8	1.2	-	-	-	2	900	382	4	1800	781
2169	SEA WATER AT VERSOVA.	29	34	31	0.0	7.3	4.5	7.0	8.1	7.7	18770	61770	51133	6.0	16.0	9.6	0.6	1.7	1.0	-	-	-	8	1600	333	25	1800	457
	CANAL																											
1886	WESTERN YAMUNA CANAL AT TAJEWALA	20	30	23	6.6	6.9	6.8	7.3	8.8	8.0	213	608	259	0.9	1.2	1.0	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-
2056	WESTERN YAMUNA CANAL AT DAMLA D/S OF YAMUNA NAGAR	10	31	23	0.0	7.9	1.6	7.2	8.4	7.7	220	1810	1017	2.0	188	69.8				-	-	-	14300	10100000	2639209	210000	72000000	23914545
1109	W.YAM. CANAL WC-1(Y.NAGAR)100M D/S AFTER RECEIVING IND.&SEW.EFFL	23	40	32	1.5	6.0	3.6	7.5	8.0	7.7	273	1949	1277	4.5	247.0	166	1.5	1.5	1.5	-	-	-	-	-	-	-	-	-
1110	W.YAM. CANAL WC-2 (NEAR KARNA LAKE)G.T.ROAD KARNAL,HARYANA	32	32	32	6.3	6.3	6.3	8.1	8.1	8.1	324	324	324	2.2	2.2	2.2	0.4	0.4	0.4	-	-	-	-	-	-	-	-	-
1111	W.YAM. CANAL C-3 DELHI BRANCH AT R.D.245250, HARYANA	14	26	20	6.4	6.6	6.5	8.0	8.3	8.1	199	282	236	1.2	1.9	1.5	0.2	0.3	0.3	-	-	-	-	-	-	-	-	-

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1112	W.YAM. CANAL C-4 BEFORE ENTER INTO DELHI BRANCH,R.D.28262 8 HARYANA	14	26	20	6.3	6.7	6.5	8.0	8.3	8.2	197	279	234	0.8	1.8	1.1	0.1	0.4	0.2	-	-	-	-	-	-	-	-	-
1114	W.YAM. CANAL WC-6 SIRSA BRANCH AT RD.BRIDGE JIND KAITHAL ROAD HARYANA	14	26	19	6.2	6.6	6.4	7.5	8.1	7.8	178	252	211	1.9	2.2	2.1	0.2	0.4	0.3	-	-	-	-	-	-	-	-	-
1115	W.YAM. CANAL C-7 DELHI PARALLEL BRANCH AT KHUBRU FALL RD-145250	14	26	20	6.3	6.6	6.5	8.0	8.3	8.1	200	270	234	1.4	2.9	1.9	0.2	0.3	0.3	-	-	-	-	-	-	-	-	-
1116	W.YAM. CANAL WC-4 DELHI PARALLEL BRANCH AT PANIPAT HARYANA	17	21	19	6.3	6.5	6.4	8.0	8.1	8.1	323	668	446	0.9	2.4	1.8	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-
1479	WESTERN YAMUNA CANAL AT HAIDERPUR WATER WORKS, DELHI	18	28	23	7.7	8.7	8.4	7.7	8.1	7.8	230	255	245	1.0	1.0	1.0	0.3	1.1	0.7	0.01	0.02	0.02	5900	135000	651000	54000	14900000	4189750
2268	CUMBARJUA CANAL CORLIM(DISCHARGE POINT OF SYNGENTA LIMITED)	30	30	30	6.4	6.4	6.4	7.3	7.3	7.3	-	-	-	2.9	2.9	2.9	0.1	0.1	0.1	-	-	-	540	540	540	2400	2400	2400
2073	NARMADA MAIN CANAL, NR. VILLAGE. LIMBADIA, DIST. GANDHINAGAR.	20	31	28	6.7	8.6	7.6	7.7	8.4	8.1	282	768	403	2.0	12.0	5.3	0.1	1.2	0.4	-	-	-	4	90	18	7	150	33
2074	TAPI CANAL AT VILLAGE UMARWADA, NEAR GIDC ESTATE OF PANOLI.	26	31	28	7.4	7.8	7.7	7.2	8.0	7.7	291	376	332	0.3	3.0	1.2	0.4	1.4	0.7	-	-	-	40	110	78	900	1400	1200
1419	GURGAON CANAL, GC-1,(NEAR BADARPUR BORDER), HARYANA	22	26	24	2.2	2.8	2.5	7.2	7.5	7.3	940	1230	1077	18	24	22	4	4.2	4.1	-	-	-	-	-	-	-	-	-
1729	NEAR PRAGATI VIDYABHAWAN, AGARTALA, TRIPURA	26	31	29	0.3	1.5	1.0	7.5	7.7	7.6	270	320	300	8.5	14.6	11.1	0.5	0.6	0.5	-	-	-	580	670	627	720	810	763
2354	SAMARLA KOTA CANAL,Kakinada,East Godavari	20	27	23	6.1	6.8	6.6	7.1	7.9	7.7	209	267	251	1.2	1.8	1.5	0.1	1.9	0.7	0.1	0.1	0.1	3	4	4	39	460	178
2355	TULJE BAGH CANAL, TEKRI DRAIN,Kakinada, East Godavari,	22	26	25	4.5	6.9	5.9	7.3	7.9	7.6	509	1652	947	1.8	2.5	2.2	0.2	2.3	1.2	0.1	0.1	0.1	3	15	5	120	1100	323
	DRAINS																											
2047	N-CHOE (ATTAWA CHOE)	18	28	23	0.3	1.7	1.2	7.1	8.0	7.3	642	642	642	39.0	50.0	47.8	0.3	1.3	0.7	-	-	-	-	-	-	-	-	-
2048	PATIALA KI RAO	18	28	24	0.3	2.0	1.2	7.0	7.9	7.4	1014	1014	1014	50.0	50.0	50.0	0.2	1.7	1.0	-	-	-	-	-	-	-	-	-
2049	SUKHNA CHOE	15	28	23	1.4	1.8	1.7	7.1	7.4	7.3	960	960	960	33.0	50.0	46.6	0.3	2.1	1.0	-	-	-	-	-	-	-	-	-
2178	CHIKHALI NALLAH MEETS GODAVARI	24	25	25	0.8	7.0	3.6	3.6	8.1	6.8	833	1049	986	12.0	50.0	28.6	1.6	5.1	3.6	-	-	-	15	32	22	36	50	42

TABLE 20.1 :- WATER QUALITY OF LAKE, POND & TANK IN ANDHRA PRADESH, KARNATAKA, KERALA, TAMILNADU, LAKSHADWEEP, PONDICHERRY & GOA- 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1549	SALAULIM LAKE AT SALAULIM - SANGUEM	28.0	28.0	28.0	7.1	7.1	7.1	7.2	7.2	7.2	42	42	42	0.5	0.5	0.5	-	-	-	-	-	-	2	2	2	2	2	2
2269	MAYEM LAKE, BICHOLIM	30.0	30.0	30.0	7.3	7.3	7.3	6.8	6.8	6.8	45	45	45	1.7	1.7	1.7	-	-	-	-	-	-	790	790	790	3500	3500	3500
1391	HUSSAIN SAGAR LAKE, BUDAMERU,A.P.	22.0	29.0	25.9	0.3	9.7	5.9	7.0	8.1	7.5	872	2090	1454	2.0	29.0	13.0	0.5	59	11	0.1	6.8	0.9	5	110	53	150	1034	345
1780	GANDIGUDEM ,MEDAK DISTRICT, A.P	24.0	26.5	25.3	2.0	4.2	2.7	7.0	8.0	7.3	2140	5610	4120	0.8	50.0	31.7	7.8	15	11	0.1	0.1	0.1	3	3	3	100	120	110
1788	SAROONAGAR , RANGA REDDY DIST. A.P	20.0	28.0	24.8	0.6	7.5	3.8	7.1	8.9	7.6	1179	2650	1658	2.0	50.0	15.4	2.7	32	13	0.1	1.2	0.2	2	105	39	90	476	261
1789	HIMAYAT SAGAR LAKE , R.R.DIST., A.P	20.0	28.0	24.4	6.5	8.2	7.2	7.7	8.6	8.0	244	500	344	0.5	4.3	1.8	0.5	2	1.2	0.1	0.1	0.1	0	7	2	35	260	118
1790	PULICATE LAKE , NELLORE DIST., A.P	29.0	36.0	31.7	4.2	7.2	5.7	5.8	8.5	7.5	26700	100000	55945	1.9	8.5	3.9	0.1	30	6.3	0.1	1.4	0.3	2	9	4	1400	9000	3127
2340	LAXMINARAYANA CHEVURU at Edulabad,Rangareddy	22.0	26.5	24.3	3.1	4.5	3.8	7.6	8.9	8.3	779	2320	1550	2.4	8.0	5.2	4.1	4.1	4.1	0.1	0.1	0.1	7	7	7	85	85	85
2341	MIRALAM LAKE NEAR ZOO PARK, RANGAREDDY	23.0	26.5	24.7	2.0	10.9	4.9	7.1	9.2	8.3	40	2780	1623	3.0	9.0	5.9	4	8.6	5.8	0.1	0.1	0.1	28	28	28	575	575	575
2342	NOOR MD. KUNTA, Kattedan, Rangareddy	23.0	28.0	24.8	0.5	1.5	1.0	7.4	8.8	8.0	1996	5460	3064	12.0	50.0	32.7	0.8	21	9.7	0.1	2.9	0.8	210	275	243	510	625	568
2353	KONDACHARLA-AAVA LAKE,Parawada Pharma city,Vishakhapatnam	24.5	28.5	26.4	6.8	8.2	7.4	7.5	8.1	7.7	460	686	556	0.8	1.3	1.1	0.2	5.4	1.5	0.1	0.1	0.1	0	3	1	23	150	59
2344	NALLA CHEVURU,Rangareddy	26.0	29.0	27.5	0.6	1.5	1.1	7.6	8.2	7.9	1591	1928	1760	10.0	21.0	15.5	2	3.4	2.7	0.1	6.2	3.2	21	51	36	175	305	240
2345	SAI CHEVURU, NEAR TANNERY INDUSTRIES, DESAIPET, WARANGAL	21.0	28.0	23.8	0.0	5.5	3.3	6.6	8.8	7.7	1540	19400	9847	7.0	50.0	31.6	0.1	0.1	0.1	0.1	0.1	0.1	2	90	32	70	16000	3053
2346	BHADRAKALI CHEVURU, BHADRAKALI TEMPLE, WARANGAL	21.0	26.0	23.5	6.0	6.2	6.1	7.3	8.3	7.8	334	420	377	1.6	2.0	1.8	0.1	0.1	0.1	0.1	0.1	0.1	2	2	2	20	50	35
2347	ASANI KUNTA,Kajipally,Medak	18.0	26.0	23.0	0.0	0.0	0.0	6.9	7.9	7.4	4020	14530	10642	50.0	50.0	50.0	15	77	41	0.2	0.2	0.2	-	-	-	-	-	-
2357	DURGAM CHEVURU	23.0	26.0	24.8	3.5	4.8	4.1	7.5	8.2	8.0	820	1037	911	3.0	5.0	3.5	3.2	10	5	0.1	0.2	0.1	-	-	-	-	-	-
2359	PEDDA CHEVURU	22.0	25.0	24.0	0.6	7.0	3.3	7.1	8.6	7.9	907	2930	1936	1.0	44.0	13.7	2	10	7.5	0.1	0.1	0.1	75	82	79	310	520	415
1447	DHARMASAGAR TANK NEAR WARANGAL.	22.0	28.0	26.0	4.4	10.2	7.0	7.3	8.9	8.2	252	436	347	0.3	2.6	1.4	0.1	0.7	0.3	0.1	0.1	0.1	0	4	2	23	146	82
1464	BIBINAGAR TANK, A.P.	25.0	30.0	27.3	3.1	4.4	4.0	7.7	9.3	8.3	285	617	453	0.8	4.0	1.7	0.9	1.8	1.3	0.1	0.3	0.2	2	3	3	10	100	55
1783	KISTAREDDYPET TANK,MEDAK DIST A.P	25.5	26.5	26.0	3.2	4.2	3.7	7.5	8.0	7.7	2350	19720	11035	1.1	33.0	17.1	5	94	46	0.2	0.2	0.2	3	3	3	100	100	100
2343	PREMAJIPET TANK, Kattedan, Rangareddy	22.0	25.0	23.5	0.0	0.0	0.0	8.0	8.8	8.4	3010	5450	4230	20.0	50.0	35.0	6.8	14	10	0.1	0.1	0.1	180	180	180	375	375	375
2348	KAJIPALLY TANK,Kajipally,Medak	19.0	26.0	22.3	0.0	0.0	0.0	6.8	7.8	7.3	2990	22600	12553	50.0	50.0	50.0	22	150	95	0.1	0.1	0.1	-	-	-	-	-	-

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
2358	MALLAPUR TANK	23.0	26.0	24.2	0.0	4.0	2.2	7.2	8.0	7.6	1290	1982	1776	4.0	19.0	12.1	4	9	5.9	0.1	0.1	0.1	12	65	34	225	285	255
1388	ULSOOR LAKE TRAINING CENTRE OF FISH BREEDING,KARNATAKA	28.0	30.0	29.0	8.5	10.0	9.3	7.8	10.5	9.4	300	800	500	4.0	7.0	5.3	0.4	5.7	3.1	1.8	1.8	1.8	2	26	14	8	1600	804
1446	HEBALLA VALLEY LAKE AT D/S ROAD BRIDGE NR. MANDYA, KARNATAKA	26.0	28.0	27.0	1.2	7.5	4.0	7.4	8.3	7.7	361	466	425	2.0	6.0	3.5	0.5	2.1	1.1	-	-	-	1	430	216	1600	1600	1600
1383	ORUVATHILKOTTA LAKE, KERALA	25.0	26.0	25.8	0.0	6.8	1.8	6.3	6.7	6.4	320	1050	630	2.4	6.6	4.2	0.1	20	7.4	0.2	0.7	0.5	0	2800	1325	80	12500	6845
1385	SASTHAMCOTTA LAKE, KERALA	28.0	30.0	28.9	6.9	7.9	7.3	7.1	7.4	7.3	51	93	74	0.7	1.0	0.9	0.3	8	3.7	0	0.1	0.1	0	90	43	30	200	103
1441	ASHTHAMUDI LAKE AT QUILON, KERALA	27.5	30.0	28.8	5.9	8.0	6.8	7.6	8.0	7.9	30000	46700	38300	0.8	2.6	1.3	0.5	42	15	0	0.7	0.3	0	280	90	40	600	213
1574	PARAVUR, KERALA	28.0	30.0	28.6	5.4	6.5	6.2	7.5	8.0	7.7	15500	31400	23235	0.8	1.8	1.2	0.2	36	13	0	0.3	0.1	0	240	68	60	400	158
1575	KOCHI (OIL TANKER JETTY), KERALA	29.0	32.0	30.3	4.4	6.7	5.8	7.0	7.6	7.2	1940	36900	15100	0.9	3.0	1.8	0.1	16	5.4	0.1	0.1	0.1	0	1550	493	200	4840	2533
1576	THEKKADY, KERALA	25.0	26.0	25.5	6.2	7.8	6.9	5.7	6.7	6.3	31	38	35	0.3	0.5	0.4	0.1	9.6	3.3	0.1	0.2	0.1	0	700	325	700	1100	975
1577	KODUNGALLOOR, KERALA	28.0	31.0	29.8	6.3	7.3	6.7	6.9	7.7	7.2	2210	31400	17255	1.3	2.9	1.8	0.1	20	6.8	0.0	0.1	0.1	0	590	195	150	2300	973
1578	KAYAMKULAM, KERALA	29.0	32.0	30.4	1.3	7.2	5.0	6.6	7.6	7.2	12000	44000	26750	2.8	3.6	3.3	0.1	20	7.1	0.0	0.1	0.1	0	860	240	80	2660	805
1579	ALAPPUZHA, KERALA	28.0	31.0	29.6	5.0	6.6	5.9	6.3	7.2	6.9	160	434	259	0.5	3.4	2.3	0.5	8	3.1	0.1	0.2	0.2	0	410	203	240	760	450
1580	POOKOTE, KERALA	24.0	29.0	26.3	6.2	7.2	6.6	6.0	6.5	6.3	28	31	29	0.2	0.4	0.3	0.1	2.4	0.9	0.0	0.1	0.1	0	0.1	0	0	100	45
2312	Lake VEMBANADU AT PATHIRAMANAL	28.0	28.0	28.0	6.8	6.8	6.8	7.4	7.4	7.4	115	115	115	0.8	0.8	0.8	0.3	0.3	0.3	-	-	-	30	30	30	100	100	100
2318	PAZHASSI RESERVOIR (KANNUR)	26.5	29.5	28.0	7.1	7.3	7.2	6.4	6.5	6.5	28	52	40	0.2	0.9	0.6	0.1	0.3	0.2	-	-	-	200	900	550	800	1250	1025
2328	RSVR AT MALAMPUZHA	25.0	27.5	26.3	7.2	7.4	7.3	6.9	7.4	7.2	66	100	83	0.3	0.5	0.4	0.1	0.2	0.2	-	-	-	10	40	25	100	280	190
2329	RSVR AT BHOOTHATHANKETU	25.0	26.0	25.5	7.5	7.8	7.7	6.1	6.2	6.2	21	23	22	0.4	0.8	0.6	0.1	0.2	0.2	-	-	-	170	500	335	660	810	735
2330	RSVR AT EDAMALAYAR	28.0	30.0	29.0	7.4	7.8	7.6	6.4	6.5	6.5	20	22	21	0.4	0.7	0.6	0.1	0.1	0.1	-	-	-	30	460	245	890	2050	1470
2325	POND AT (PADMANABHA) SREE PADMANABHA SWAMY TEMPLE (TVPM)	25.0	27.0	26.0	6.6	8.4	7.7	6.8	7.8	7.2	210	260	228	1.2	3.4	2.4	0.1	0.3	0.1	0.1	0.1	0.1	20	800	333	160	4000	1777
1401	POND NEAR JUMA MASJID, LAKSHAWDIP	28.0	31.0	29.5	5.8	5.9	5.9	8.5	9.2	8.9	478	511	495	0.6	0.7	0.7	-	-	-	-	-	-	1100	1100	1100	1100	1100	1100
1396	OSTERI LAKE, PONDICHERRY	28.0	31.6	30.2	8.0	13.6	10.1	7.2	10.1	8.9	264	321	285	0.0	2.7	1.2	0.1	0.8	0.5	-	-	-	-	-	-	-	-	-
1686	BAHOUR LAKE, PONDICHERRY	26.0	31.8	28.9	5.1	6.5	5.8	7.1	8.0	7.4	387	462	416	0.0	2.2	1.4	0.1	2.5	1.3	-	-	-	-	-	-	-	-	-
1420	KODAI KANAL LAKE, TAMILNADU	10.0	22.0	15.7	6.8	7.0	6.9	6.3	7.8	7.0	66	98	83	2.1	3.1	2.6	0.1	0.1	0.1	0.1	0.1	0.1	7	9	8	17	33	23
1421	UDHAGAMADALEM LAKE (OOTY), TN	15.0	18.0	16.3	5.1	7.9	6.3	6.9	7.4	7.2	289	446	361	0.8	6.2	4.0	0.3	4.1	1.7	0.1	0.5	0.3	140	70000	18710	470	94000	25368
1452	YERCAUD LAKE, SALEM, TAMILNADU	15.0	22.0	19.3	6.3	7.8	7.3	7.0	7.8	7.3	242	272	261	1.2	2.7	1.9	0.2	3.9	1.6	0.1	3.1	1.2	170	390	287	470	700	557

TABLE 20.2 :- WATER QUALITY OF LAKE, POND & TANK IN GUJARAT, MADHYA PRADESH & RAJASTHAN - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1343	KANKORIA LAKE AT AHMEDABAD, NR. BALVATIKA, GUJARAT	25.0	30.0	27.0	6.4	9.2	7.7	7.1	8.9	8.0	1020	1430	1283	1.0	16.0	10.7	0.2	0.6	0.4	-	-	-	90	900	308	150	1500	558
1344	CHANDOLA LAKE AT AHMEDABAD	30.0	30.0	30.0	5.1	5.1	5.1	7.3	7.3	7.3	585	585	585	13.0	13.0	13.0	0.2	0.2	0.2	-	-	-	2300	2300	2300	4300	4300	4300
1345	AJWAH LAKE AT SRI SAYAJI SABVAR,BARODA,GUJARAT	27.0	28.0	27.3	4.4	9.9	7.5	7.9	8.2	8.1	285	328	314	2.4	5.2	3.4	0.3	0.3	0.3	-	-	-	4	4	4	3	7	5
1346	SURSAGAR LAKE AT BARODA, GUJARAT	24.0	28.0	26.8	5.4	7.4	6.1	7.1	7.5	7.4	1766	2020	1892	3.2	7.0	4.6	0.4	0.4	0.4	-	-	-	3	15	8	4	28	17
1972	NALSAROVAR LAKE (SANAND), DIST.AHMEDABAD	25.0	30.0	27.5	3.4	9.2	6.3	7.5	9.1	8.3	636	10800	4512	2.0	47.0	18.3	0.2	2.6	1	-	-	-	15	93	42	43	240	105
1973	BINDUSAROVAR, SIDDHPUR (DIST.PATAN)	27.0	30.0	28.5	1.9	7.8	4.9	8.2	8.2	8.2	256	685	471	3.0	15.0	9.0	0.1	0.8	0.5	-	-	-	15	15	15	21	43	32
1975	LAKHOTA TALAV, JAMNAGAR	29.0	29.0	29.0	7.2	7.2	7.2	8.2	8.2	8.2	310	310	310	5.0	5.0	5.0	0.5	0.5	0.5	-	-	-	15	15	15	43	43	43
1976	NARSIMEHTA TALAV-JUNAGADH	25.0	28.0	26.5	3.1	6.2	4.7	7.8	8.1	8.0	768	1080	924	3.1	8.0	5.6	0.1	0.1	0.1	-	-	-	17	17	17	40	50	45
1977	CITY LAKE OF NADIAD	24.0	30.0	27.0	7.2	7.2	7.2	7.8	9.1	8.5	1468	1480	1474	13.0	26.4	19.7				-	-	-	93	93	93	7	100	54
2075	DHAROI DAM, DIST. MEHSANA.	27.0	31.0	28.9	5.7	8.2	7.1	7.7	8.2	8.0	396	725	548	2.0	11.0	4.5	0.1	2	0.5	-	-	-	4	43	12	9	93	24
2076	ANKLESHWAR RESERVOIR AT GIDC ANKLESHWAR AT VALIA ROAD.	25.0	30.0	26.6	7.1	7.7	7.3	7.2	8.0	7.5	300	347	331	0.6	2.0	1.2	0.4	0.5	0.5	-	-	-	12	40	25	300	900	580
2077	MOTICHER LAKE NEAR KAKARPAR ATOMIC POWER STATION, DIST. SURAT.	25.0	29.0	27.9	3.3	7.1	5.9	7.8	8.4	8.1	343	447	379	0.6	4.5	2.2	0.1	0.5	0.4	-	-	-	93	7500	2017	240	21000	5930
2078	KUWADAVA LAKE, VILL. KUWADAVA, DIST. RAJKOT.	25.0	30.0	27.6	3.9	7.1	5.9	7.4	8.2	7.9	527	1880	1047	1.8	3.9	2.3	0.1	0.1	0.1	-	-	-	13	17	15	26	50	31
1979	OLPAD, VILLAGE POND:OLPAD, SURAT	31.0	32.0	31.5	3.2	6.8	5.0	7.9	8.1	8.0	530	753	642	4.4	9.6	7.0	0.2	0.2	0.2	-	-	-	46000	46000	46000	110000	110000	110000
2079	DHUDHIA TALAV AT NAVSARI, DIST. NAVSARI.	27.0	31.0	29.4	6.2	8.2	7.1	7.7	8.4	8.2	283	364	331	1.0	3.1	2.0	0.1	0.9	0.2	-	-	-	2	43000	7249	2	93000	13451
1971	THOL TANK (KALOL) (DIST. MEHASANA)	28.0	30.0	29.0	5.7	10.7	8.6	7.5	8.6	8.0	548	632	591	2.2	49.0	25.8	0.1	1.3	0.6	-	-	-	90	900	510	150	1500	895
1373	UPPER LAKE AT BHOPAL (INTAKE POINT), M.P.	24.0	30.0	27.3	6.4	8.2	7.2	7.5	8.4	8.0	260	334	289	1.5	4.9	3.0	0.1	0.2	0.2	0.2	0.2	0.2	4	4	4	160	1600	643
2137	UPPER LAKE AT YATCH CLUB	26.0	26.0	26.0	6.2	7.0	6.6	7.5	7.7	7.6	230	600	415	1.3	7.0	4.2	1.8	1.8	1.8	3.0	3.0	3	2	2	2	130	280	205
2138	UPPER LAKE AT KARBALA CLUB	26.0	29.0	27.5	6.9	7.4	7.2	7.5	7.8	7.7	320	500	410	0.9	2.0	1.5							0	4	2	200	220	210
2139	UPPER LAKE AT BAIRAGARH CLUB	27.0	28.0	27.5	6.5	7.2	6.9	7.0	7.2	7.1	290	330	310	0.6	1.3	1.0	6.8	6.8	6.8	1.0	1.0	1	4	4	4	8	170	89
1374	LOWER LAKE AT BHOPAL OUTLET M.P.	20.0	28.0	25.8	8.1	14.0	11.2	7.6	8.3	8.0	388	538	457	3.7	7.1	5.1	0.3	11	4.2	0.4	0.4	0.4	14	14	14	2400	2400	2400

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					**> 4 mg/l**			**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1466	MULTAI TANK LAKE AT VILLA. KHARI ON BETUL-AMRAVATI ROAD M.P.	20.0	20.0	20.0	7.7	7.7	7.7	8.4	8.4	8.4	254	254	254	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-	22	22	22
2128	KHANDARI RESERVOIR WATER OFF TAKE POINT	15.0	29.0	23.4	-	-	-	7.2	7.8	7.5	122	630	375	1.1	2.6	1.5	0.3	1.7	0.7	-	-	-	0	0	0	39	460	190
2129	PERIAT TANK JABALPUR	16.0	29.0	22.4	-	-	-	7.2	7.7	7.5	213	564	337	1.1	1.4	1.2	0.5	1.8	1.1	-	-	-	0	20	3	28	460	144
2131	YASHWANT SAGAR AT INDORE	25.0	29.0	26.8	6.6	7.4	6.9	7.5	9.0	7.9	432	551	493	1.0	1.8	1.5	0.1	2.9	1.5	0.1	0.1	0.1	0	2	1	70	210	133
2132	BILAWALI TALAB AT INDORE	25.0	30.0	27.8	6.8	7.5	7.1	7.2	7.5	7.4	215	445	310	1.0	7.5	2.8	0.1	5.9	3.2	0.1	0.1	0.1	0	0	0	60	220	158
2134	NAGCHUN TALAB AT KHANDWA	25.0	29.0	27.4	7.4	7.8	7.6	7.5	8.0	7.7	240	336	292	1.2	2.1	1.5	0.8	1.2	1	0.1	0.1	0.1	0	0	0	60	220	135
2136	SHAHPURA LAKE AT WEIR NEAR AYUSHMAN HOSPITAL, BHOPAL	26.0	29.0	27.5	5.8	12.0	8.9	7.5	7.6	7.6	450	454	452	5.8	6.6	6.2	3.5	3.5	3.5				8	8	8	940	940	940
2140	KERWA DAM NEAR REST HOUSE, BPL	26.0	28.0	27.0	6.5	7.1	6.8	7.0	8.0	7.5	202	230	216	1.9	3.1	2.5	1.7	1.7	1.7	0.2	0.2	0.2	2	2	2	90	170	130
2141	JANUNIA TALAB NEAR W/S	27.0	28.0	27.5	6.3	8.2	7.3	7.3	7.3	7.3	430	530	480	1.6	3.3	2.5	6.8	6.8	6.8	0.8	0.8	0.8	12	12	12	26	350	188
1285	PICHOLA LAKE AT UDAIPUR (WATER INTAKE POINT), RAJASTHAN	21.0	31.0	28.3	5.0	6.4	5.7	8.1	9.7	8.6	500	770	623	0.9	2.4	1.6	0.3	0.9	0.5	-	-	-	4	11	7	20	150	87
1286	UDAISAGAR LAKE AT UDAIPUR (INTAKE PT.) RAJASTHAN	21.0	31.0	27.8	2.0	4.7	3.2	8.2	8.8	8.5	1540	2200	2010	4.2	11.8	7.5	0.2	0.7	0.5	-	-	-	7	14	12	75	1100	355
1414	PUSHKAR LAKE, RAJASTHAN	19.0	27.0	24.0	0.0	3.3	1.5	7.4	8.5	7.9	330	590	428	5.6	20.0	11.0	0.2	0.5	0.3	-	-	-	4	20	9	9	1100	289
1481	FATEH SAGAR LAKE AT UDAIPUR INTAKE POINT OF PHED,RAJASTHAN	20.0	31.0	27.5	4.5	7.5	5.8	8.3	9.0	8.7	490	630	570	0.9	1.9	1.3	0.2	0.5	0.3	-	-	-	4	7	5	14	150	69
1714	KAYALANA JHEEL JODHPUR, RAJASTHAN	19.2	26.2	23.6	5.0	8.1	6.6	7.5	8.2	7.9	250	370	318	0.5	2.9	1.3	0.3	0.5	0.4	-	-	-	3	4	4	7	14	11
1716	NAKKI LAKE, MT. ABU, RAJASTHAN	14.0	28.0	21.8	3.8	6.2	5.1	7.6	8.2	7.9	270	840	555	0.1	3.2	1.2	0.1	1.1	0.5	-	-	-	3	4	4	4	14	9

TABLE 20.3 :- WATER QUALITY OF LAKE, POND & TANK IN CHANDIGARH, HARYANA, HIMACHAL PRADESH, PUNJAB & WEST BENGAL - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
2046	SUKHNA LAKE	18.0	29.0	24.5	7.5	9.3	8.1	7.9	8.2	8.0	240	261	252	0.7	3.9	2.1	0.1	1.3	0.5	-	-	-	-	-	-	-	-	-
1291	GOBINDSAGAR LAKE AT BILASPUR, H.P.	12.0	27.0	18.9	7.4	12.0	9.2	7.7	8.3	8.0	191	419	278	0.4	1.0	0.7	-	-	-	-	-	-	110	110	110	540	540	540
1292	PONGDAM LAKE AT PONG VILLAGE,H.P.	6.0	25.0	17.5	7.2	10.2	8.6	7.7	8.4	7.9	116	260	191	0.1	0.8	0.3	-	-	-	-	-	-	4	17	11	17	350	179
1429	RENUKA LAKE , 35 KM FROM PATNA SAHIB NORTH , H.P	14.0	28.0	22.0	6.0	6.9	6.4	7.9	8.0	8.0	578	903	699	0.8	1.9	1.2	-	-	-	-	-	-	13	18	16	24	33	30
1349	BRAHMSAROVAR LAKE AT KURUKSHETRA, HARYANA	19.8	32.0	25.9	6.3	6.6	6.4	7.9	8.8	8.3	224	227	226	1.8	2.6	2.2	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-
1382	HARIKE LAKE D/S FROM CANAL, PUNJAB	17.0	18.0	17.7	5.2	6.2	5.7	7.4	7.8	7.5	388	502	430	1.4	2.4	1.9	2.2	2.6	2.4	1.2	1.4	1.3	50	100	83	500	500	500
1765	RABINDRASAROVAR NATIONAL LAKE, CALCUTTA, WEST BENGAL	22.0	32.0	28.4	7.2	10.6	8.8	7.5	8.6	7.8	288	350	322	3.5	4.2	3.7	0.1	0.1	0.1	-	-	-	4000	22000	12000	8000	33000	20000

TABLE 20.4 :- WATER QUALITY OF LAKE, POND & TANK IN ASSAM, MANIPUR & TRIPURA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
2205	MER BEEL AT MADHABPUR	22.0	26.0	24.0	1.0	4.3	2.8	6.4	7.1	6.8	160	181	172	2.4	5.4	4.2	0.1	0.2	0.1	-	-	-	0	360	120	360	3500	1590
2206	DALONI BEEL NEAR JOGIGHOPA	26.0	30.0	28.0	7.1	7.4	7.3	7.1	8.1	7.6	90	100	95	1.5	3.0	2.3	0.1	0.1	0.1	-	-	-	0	360	180	700	910	805
1263	ELANGABEEL SYSTEM POND (CONNECTED TO R. KOLANG), ASSAM	24.0	34.0	28.9	0.0	1.9	0.6	7.0	7.8	7.5	2560	4390	3168	7.0	50.0	36.0	0.3	0.5	0.5	13.2	13.2	13	0	2100	798	300	3500	1678
2207	BOR BEEL AT JAKAI.	22.0	26.0	24.0	4.9	8.4	6.4	6.0	7.1	6.7	46	58	54	4.8	6.0	5.6	0.1	0.2	0.1	-	-	-	0	360	120	300	3500	1387
2208	BORPUKHURI, NAZIRA	23.0	24.0	23.5	4.6	7.2	5.9	6.4	7.3	6.9	58	62	60	1.8	2.1	2.0	0.1	0.1	0.1	-	-	-	0	0	0	360	700	530
2209	GAURISAGAR TANK, GAURISAGAR	22.0	24.0	23.0	5.1	5.8	5.5	6.9	7.4	7.2	240	251	246	2.5	4.3	3.4	0.1	0.2	0.2	-	-	-	0	0	0	700	730	715
2210	RAJMAW PUKHURI, JORHAT	22.0	24.0	23.0	5.4	6.8	6.3	6.8	7.2	7.0	85	99	93	1.7	4.0	2.6	0.1	1	0.4	-	-	-	300	360	340	730	910	790
2211	PADUMPUKHURI, TEZPUR	23.0	27.0	25.0	7.7	7.8	7.8	7.1	7.4	7.3	112	120	116	4.4	9.6	7.0	0.1	0.2	0.2	-	-	-	0	0	0	910	910	910
2212	GOPHUR TANK, GOPHUR	21.0	26.0	23.7	7.7	8.0	7.8	7.0	7.3	7.2	108	125	117	2.2	9.0	6.1	0.1	0.2	0.1	-	-	-	0	0	0	1	700	467
2213	JAIPAL PUKHURI, SIPAJHAR	23.0	28.0	26.0	0.5	8.2	4.6	6.6	8.5	7.5	46	86	70	2.4	8.8	5.9	0.1	0.1	0.1	-	-	-	0	360	120	730	910	850
2214	BOTODRIVA SATRA POND, NAGAON	25.5	34.0	28.8	4.6	8.0	6.2	6.3	7.3	6.9	58	62	61	2.9	24.5	12.1	0.1	0.1	0.1	-	-	-	0	300	100	300	730	443
2215	SARAN BEEL	28.0	34.5	30.8	3.9	9.9	7.1	6.8	7.6	7.2	87	102	94	0.6	2.3	1.7	0.1	0.2	0.2	-	-	-	0	360	180	360	730	545
2216	DIGHALI PUKHURI, GUWAHATI	27.0	36.0	30.3	7.2	18.0	12.2	9.1	9.7	9.4	210	230	220	4.8	6.2	5.6	0.1	0.3	0.2	-	-	-	0	360	180	360	910	635
2217	SUBHAGYA KUNDA POND KAMAKHYA TEMPLE, GUWAHATI	20.0	34.0	27.3	7.5	17.2	10.9	7.3	8.1	7.7	710	727	716	6.2	9.4	7.9	0.4	0.8	0.6	-	-	-	360	730	545	910	1500	1205
2218	DEEPAR BEEL AT BORAGAON NEAR IASST, GUWAHATI	29.0	32.0	30.7	2.4	8.0	4.6	6.5	7.1	6.8	290	339	318	4.1	18.0	10.7	0.1	0.1	0.1	-	-	-	700	1100	900	1600	2200	1900
2219	BISHNU PUSKAR PUKHURI OF HAYAGRIB MADHAB TEMPLE, HAJO	27.0	36.0	32.0	9.4	13.2	10.9	7.5	9.2	8.6	280	296	289	2.7	10.2	7.4	0.1	0.1	0.1	-	-	-	360	360	360	730	910	820
2220	CHAND DUBI BEEL, CHAND DUBI	26.0	33.0	29.7	7.6	9.3	8.3	6.1	6.9	6.4	41	54	47	1.1	1.8	1.5	0.1	0.1	0.1	-	-	-	0	1100	367	360	2200	1097

STATION CODE	LOCATIONS	TEMPERATURE °C			D.O. (mg/l)			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
WATER QUALITY CRITERIA					> 4 mg/l			6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
2221	GANGA PUKHURI, NALBARI (GORDON SCHOOL)	20.0	35.5	29.8	6.9	8.5	7.5	7.1	7.9	7.5	79	85	81	2.0	7.6	5.0	0.1	0.1	0.1	-	-	-	0	360	180	300	910	605
2222	RAJADINIA PUKHURI AT ABHAYAPURI	26.0	31.0	28.5	7.0	7.6	7.3	6.7	7.9	7.3	29	45	37	3.4	14.8	9.1	0.1	0.1	0.1	-	-	-	0	360	180	900	910	905
2223	MAHAMAYA MANDIR PUKHURI	28.0	30.0	29.0	5.1	7.9	6.8	7.1	7.6	7.3	78	82	81	1.9	13.2	7.3	0.1	0.1	0.1	-	-	-	0	0	0	360	910	727
2224	RAJAPUKHURI AT GAURIPUR	29.0	29.0	29.0	4.6	7.8	6.4	7.5	7.9	7.7	75	85	80	1.2	10.8	5.6	0.3	7.6	2.8	-	-	-	0	0	0	700	730	720
2225	BASKANDI POND INSIDE THE BASKANDI MADRASA, BASKANDI	10.0	11.0	10.5	7.2	7.9	7.6	7.0	7.7	7.3	196	204	200	1.0	3.7	2.8	0.1	0.1	0.1	-	-	-	0	0	0	910	910	910
2226	SIVASAGAR TANK (BORPUKHURI) NEAR SIVADOL	23.0	24.0	23.5	4.8	7.0	5.9	6.3	7.5	6.9	101	118	110	3.9	4.2	4.1	0.1	0.3	0.2	-	-	-	0	0	0	910	1100	1005
2227	HORDAI PUKHURI, CHARAIDEW	22.0	22.0	22.0	4.5	4.5	4.5	6.6	6.6	6.6	132	132	132	2.1	2.1	2.1	0.1	0.1	0.1	-	-	-	0	0	0	1100	1100	1100
2228	GALA BEEL AT DERGAON	28.0	29.0	28.5	7.4	8.2	7.8	6.3	7.5	6.9	180	200	190	2.6	3.6	3.1	0.1	0.1	0.1	-	-	-	0	360	180	730	910	820
1532	*GOYSAGAR TANK, SIBSAGAR, ASSAM	16.0	24.0	20.7	5.6	7.5	6.5	6.3	7.4	6.8	23	250	168	1.4	4.9	2.8	0.1	0.1	0.1	-	-	-	0	0	0	360	700	473
1425	LOKTAK LAKE AT THANA, MANIPUR	29.0	29.0	29.0	4.8	4.8	4.8	6.5	6.5	6.5	185	185	185	-	-	-	20	20	20	-	-	-	-	-	-			
1426	LOKTAK LAKE AT BISHNUPUR, MANIPUR	28.2	28.2	28.2	5.7	5.7	5.7	6.8	6.8	6.8	215	215	215	-	-	-	-	-	-	-	-	-	-	-	-	20	20	20
1629	SENDRA (LOKTAK LAKE),MANIPUR	27.4	27.4	27.4	5.5	5.5	5.5	7.4	7.4	7.4	157	157	157	-	-	-	-	-	-	-	-	-	-	-	-	15	15	15
1630	KARANG ISLAND(LOKTAK LAKE),MANIPUR	27.9	27.9	27.9	5.7	5.7	5.7	7.3	7.3	7.3	313	313	313	-	-	-	-	-	-	-	-	-	-	-	-	10	10	10
1727	LAXMI NARAYAN BARI PALACE COMPOUND, TRIPURA	27.0	30.0	28.3	4.2	6.7	5.6	7.6	8.4	7.9	230	320	257	1.4	3.0	2.2	0	0.65	0.4	-	-	-	230	580	400	380	610	462
1728	RUDRASAGAR, SONUMURA, TRIPURA	26.5	31.0	29.1	3.1	6.6	5.4	7.1	7.7	7.5	96	170	146	1.5	3.2	2.0	0	0.12	0.1	0.1	0.1	0.1	340	460	398	420	520	490

TABLE 21.1 : - WATER QUALITY OF GROUND WATER IN ANDHRA PRADESH - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
15	WELL AT KUYYURA, A.P.	22	28	25	6.9	7.3	7.1	164	191	178	0.5	0.5	0.5	0.1	0.4	0.3	0.1	0.1	0.1	1	2	2	16	260	138
16	WELL AT TADAVAI A.P.	22	26	24	6.7	7.2	7.0	755	1039	897	0.4	1.2	0.8	1.3	7	4.2	0.1	0.1	0.1	1	2	2	8	20	14
26	WELL AT VIJAYWADA, A.P.	30	30	30	7.4	7.4	7.4	1101	1101	1101	0.8	0.8	0.8	1.8	1.8	1.8	0.1	0.1	0.1	2	2	2	1100	1100	1100
27	WELL AT PEDDAVOORA, A.P.	22	22	22	7.9	8	8.0	543	769	656	-	-	-	1.5	1.5	1.5	-	-	-	2	2	2	50	50	50
1791	B/W. - EAST OF SAICHERUVU ,PAIDIPALLY (V),WARANGAL DIST., A.P	20	25	23	7	7.1	7.1	900	1463	1182	0.3	0.3	0.3	9	12	10.5	0.1	0.1	0.1	2	40	21	24	800	412
1792	B/W -NEAR CKM COLLEGE , ENUMAMULA (V) ,WARANGAL DIST., A.P	20	25	23	6.9	7	7.0	1778	3750	2764	0.3	0.5	0.4	8.4	10	9.2	0.1	0.1	0.1	1	2	2	2	78	40
1793	O/W - BHOOMAIAH NEAR ASHPONDS OF NTPC , KUNDANPALLY (V) , RAMAGUNDAM , KARIMNAGAR	20	28	24	7.1	7.4	7.3	1350	1918	1634	0.4	0.5	0.45	2.7	6.1	4.4	0.1	0.1	0.1	2	2	2	60	104	82
1794	B/W - MANAKONDUR (V) , KARIMNAGAR DIST.	20	28	24	7.1	7.4	7.3	778	800	789	0.2	0.5	0.35	8	8	8.0	0.1	0.1	0.1	2	2	2	20	24	22
1525	B/W - IDA , NEAR CHAITANYA CHLORIDES ,PASHAMAYLAM , MEDAK DIST.	22	22	22	7.4	7.7	7.6	645	1791	1218	-	-	-	0.4	2.1	1.3	0.1	0.1	0.1	-	-	-	-	-	-
1811	B/W. - PRIMARY SCHOOL - RUDRAVELLI (V) , BIBINAGAR (M), NALGONDA DIST., A.P	21	21	21	7.6	7.6	7.6	1211	1853	1532	-	-	-	0.6	0.7	0.7	-	-	-	-	-	-	-	-	-
1810	B/W - SRI RAMNAGAR COLONY, SAKKAR NAGAR, BODHAN, NIZAMABAD DIST. , A.P	22	28	25	7.2	8.1	7.6	1108	1352	1197	-	-	-	2.3	4.4	3.3	0.5	0.5	0.5	2	2	2	70	70	70
1513	B W. - KRISHNA MURTHY, D.NO. 48-16-43 AUTONAGAR VIJJAYAWADA, KRISNA DIST., A.P.	30	30	30	7.5	7.5	7.5	1128	1128	1128	1	1	1	1.8	1.8	1.8	0.1	0.1	0.1	2	2	2	1100	1100	1100
1514	B/W. - VIJAY KUMAR AUTONAGAR VIJAYAWADA, KRISHNA DIST., A.P.	30	30	30	7.3	7.4	7.4	1287	1653	1470	0.8	0.8	0.8	1.7	20.7	11.2	0.1	0.1	0.1	2	2	2	1100	1100	1100
1515	B/W. - NAGARAM(V), PALVONCHA, KHAMMAM	25	29	27	7.3	7.8	7.6	1684	2360	1925	1.4	3.6	2.2	0.3	17.3	9.0	0.1	0.1	0.1	2	4	2	800	1100	1040
1516	B W OF NAVLOK GARDENS NELLORE AP	29	32	31	6.7	7.6	7.2	1241	2840	2041	1.8	4.2	3.0	0.6	11.5	6.1	0.1	0.1	0.1	2	2	2	1100	1100	1100
1517	B/W. - TUNGBHADRA RIVER NEAR KURNOOL, A.P.	24	26	25	7.3	7.6	7.4	1492	1895	1650	1.3	2	1.6	2.6	14.5	7.4	0.1	0.1	0.1	2	4	3	4	14	11
1518	B/W. - NANDYAL, KURNOOL DIST., A.P.	24	26	25	7.4	7.9	7.7	1440	3840	2079	1	1.8	1.4	2.9	13.5	5.8	0.1	0.1	0.1	2	6	4	6	21	13
1519	B/W. - NAGIRI, CHITTOOR DIST., A.P	19	26	25	7.3	7.9	7.6	1063	2440	1784	1	2.4	1.6	0.4	25.3	7.9	0.1	0.1	0.1	2	110	16	6	1700	220
1520	B/W. - SWARNAMUKHI RIVER, SRIKALAHASTI, CHITTOOR DIST., A.P.	20	25	23	7.6	8.3	7.8	625	1555	1160	1	3.2	2.1	0.4	13.8	6.4	0.1	0.1	0.1	2	140	38	6	1100	284
1521	O/W. - NEAR RAMA TEMPLE , WARD No.2 , MINDI , VISAKHAPATNAM, A.P	28	29	28	7	7.4	7.2	3900	4700	4300	1	1.1	1.1	37.2	55.5	46.4	0.1	0.1	0.1	3	3	3	460	1100	780
1522	O/W. PEDDANUYYI - VIZIANAGARAM, A.P	28	35	31	7.6	7.9	7.8	217	699	458	1	1	1	2.4	4.4	3.4	0.1	0.1	0.1	0	4	2	240	1100	670
1523	B/W. - NEAR M/S ANDHRA SUGARS LTD. , KOVVUR , W.G.DIST., A.P	27	29	28	7.8	7.8	7.8	212	213	213	1	1	1	0.3	0.6	0.5	-	-	-	0	0	0	3	3	3
1524	O/W. -NEAR PARTAP NAGAR BRIIDGE - KAKINADA , E.G.	26	29	27	7	7.9	7.5	2160	2640	2400	0.8	1	0.9	6.2	17.2	11.7	0.1	0.1	0.1	0	0	0	3	3	3

TABLE 21.2 : - WATER QUALITY OF GROUND WATER IN ASSAM, MIZORAM, MANIPUR & TRIPURA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1533	*DIGBOI, TINSUKIA DISTT., ASSAM	25	29	27	7.0	7.1	7.1	130	148	139	0.3	1	0.7	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
1534	*KARBI ANGLONG DISTT., ASSAM	24	26	25	6.7	6.9	6.8	315	334	325	1.8	3.5	2.7	0.1	0.1	0.1	-	-	-	0	0	0	360	360	360
1535	*SIBSAGAR , ASSAM	22	24	23	5.9	6.6	6.3	220	239	230	1.8	4.8	3.3	0.1	0.1	0.1	-	-	-	0	0	0	1	360	181
1536	*SIBSAGAR, ASSAM	24	24	24	6.2	6.2	6.2	280	280	280	5.6	5.6	5.6	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
1537	*(JORHAT, ASSAM	20	22	21	6.4	6.9	6.7	145	154	150	2	2	2	0.2	0.3	0.25	-	-	-	0	0	0	1	300	151
1538	*SILCHAR, ASSAM	12	13	12	5.2	5.8	5.5	102	114	108	0.8	4.9	2.9	0.1	5.2	2.65	-	-	-	0	0	0	360	910	635
1539	*BARPETA, ASSAM	27	28	27	7.1	7.9	7.5	510	578	544	0.4	2.6	1.5	0.1	0.8	0.45	-	-	-	0	360	180	1	2800	1401
1540	*BONAIGAON, ASSAM	25	28	27	6.1	7.1	6.6	295	304	300	1.2	1.7	1.5	5.1	11.8	8.45	-	-	-	0	0	0	1	360	181
1541	*GUWAHATI, ASSAM	20	27	24	7.2	7.8	7.5	141	758	450	2.1	3.7	2.9	0.2	0.3	0.25	-	-	-	0	0	0	1	1	1
1542	*GUWAHATI, ASSAM	22	27	25	6.8	6.8	6.8	850	1001	926	0.9	3	2.0	0.2	2.9	1.55	-	-	-	0	0	0	360	360	360
2243	GROUND WATER FROM LEDO, MARGERITA	18	26	22	6.0	6.1	6.1	350	351	351	0.8	1	0.9	0.3	1.4	0.85	-	-	-	0	0	0	1	1	1
2244	GROUND WATER FROM NAZIRA	21	24	23	6.5	7.2	6.9	290	310	300	1.6	3	2.3	0.1	0.1	0.1	-	-	-	0	0	0	1	300	151
2245	GROUND WATER FROM NUMALIGARH (NEAR NRL TE LABOR COLONY)	20	20	20	6.6	6.6	6.6	126	126	126	0.6	0.6	0.6	0.4	0.4	0.4	-	-	-	0	0	0	1	1	1
2246	GROUND WATER FROM SEMENCHAPARI	17	23	20	6.9	7.4	7.2	424	467	446	1.1	2.1	1.6	0.2	0.2	0.2	-	-	-	0	0	0	1	1	1
2247	GROUND WATER FROM SILAPATHAR	17	23	20	6.5	6.7	6.6	111	121	116	0.4	4.6	2.5	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
2248	GROUND WATER FROM LAKHIMPUR TOWN	17	23	20	6.9	7.2	7.1	330	369	350	1.5	1.5	1.5	0.1	11.8	5.95	-	-	-	0	0	0	1	1	1
2249	GROUND WATER FROM TEZPUR (MISSION CHARIALI)	23	24	24	6.8	7.5	7.2	120	136	128	0.7	1.3	1	0.1	0.6	0.35	-	-	-	0	0	0	1	1	1
2250	GROUND WATER FROM NAGAON (PANIGAON)	27	28	27	6.5	7.2	6.9	410	503	457	1.8	2.3	2.1	0.1	0.1	0.1	-	-	-	0	0	0	1	360	181
2251	GROUND WATER FROM JAGIROAD NEAR HPC EFFLUENT DISCHARGE POINT	25	28	27	6.7	7.1	6.9	2350	2810	2580	0.8	3	1.9	0.1	1.4	0.75	-	-	-	0	360	180	1	910	456
2252	GROUND WATER NEAR MSW DUMPING SITE AT GARCHUK-GUWAHATI	25	28	26	6.5	7.1	6.8	280	2810	1545	0.7	3	1.9	0.1	1.5	0.8	-	-	-	360	360	360	910	910	910
2253	GROUND WATER FROM NALBARI	20	26	23	7.5	7.7	7.6	240	264	252	2.2	2.9	2.6	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
2254	GROUND WATER FROM BARPETA ROAD(RLY STATION)	25	27	26	7.1	8.2	7.7	435	455	445	0.6	0.6	0.6	0.1	0.3	0.2	-	-	-	0	730	365	1	1500	751
2255	GROUND WATER NEAR BPRL, DHALIGAON	25	29	27	5.8	7.5	6.7	125	133	129	0.6	2.8	1.7	0.4	1.3	0.85	-	-	-	0	0	0	1	300	151
2256	GROUND WATER FROM KOKRAJHAR DISTRICT (HS SCHOOL)	27	29	28	6.1	7.9	7.0	450	482	466	0.9	1.5	1.2	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
2257	GROUND WATER FROM DHUBRI DISTRICT (COLLEGE NAGAR)	28	30	29	6.3	6.7	6.5	410	427	419	0.4	0.8	0.6	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
2258	GROUND WATER FROM GOALPARA DIST. (GOALPARA COLLEGE)	23	25	24	6.3	7.9	7.1	435	452	444	0.7	0.8	0.8	0.3	0.7	0.5	-	-	-	0	0	0	1	360	181
2259	GROUND WATER FROM DIPHU (GOVT. COLLEGE)	22	27	25	6.6	7.4	7.0	1150	1291	1221	1	1.5	1.3	0.1	0.1	0.1	-	-	-	0	0	0	360	910	635
2260	GROUND WATER FROM HAMREN	20	20	20	6.5	6.5	6.5	121	121	121	1	1	1	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
2261	GROUND WATER FROM HAFLONG	10	28	19	7.1	7.3	7.2	170	179	175	1.6	2	1.8	0.1	0.1	0.1	-	-	-	0	0	0	1	1	1
2262	GROUND WATER FROM KARIMGANJ (COLLEGE)	11	11	11	6.8	7.1	7.0	430	470	450	0.3	0.4	0.4	0.1	0.1	0.1	-	-	-	0	0	0	1	1500	751

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
2263	GROUND WATER FROM HIALAKANDI (NEAR ASTC BUS STAND)	12	25	18	6.2	8.0	7.1	320	335	328	1.4	1.7	1.6	0.1	0.1	0.1	-	-	-	0	0	0	1	910	456
2264	GROUND WATER IN PANCHGRAM MARKET NEAR CACHAR PAPER MILL	12	27	19	6.7	8.2	7.5	850	3940	2395	1.2	6.6	3.9	0.1	0.1	0.1	-	-	-	0	0	0	360	730	545
2054	RAMHLUM (NORTHERN PART)	18	23	20	5.7	8.0	6.7	386	464	424	1.2	2.7	1.6	-	-	-	0.1	0.2	0.2	-	-	-	7	15	10
2055	MISSION VENGTHLANG (SOUTHERN PART)	17	22	20	6.1	6.9	6.5	428	720	594	1.4	2.1	1.7	-	-	-	0.1	0.2	0.2	-	-	-	7	19	13
1920	KAKCHING (THOUBAL DIST.)	28	28	28	7.0	7.0	7.0	115	115	115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1921	HEIROK (THOBAL DIST.)	21	21	21	6.7	6.7	6.7	20	20	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1922	LAMKA (CHURACHANDPUR DIST.)	28	28	28	6.5	6.5	6.5	557	557	557	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1924	PALLEL (CHANDEL DIST.)	29	29	29	7.1	7.1	7.1	367	367	367	-	-	-	-	-	-	-	-	-	-	-	-	30	30	30
1405	WELL AT UDAIPUR (TUBEWELL), TRIPURA	25	29	27	6.7	7.6	7.3	460	562	523	-	-	-	0.03	1.05	0.30	-	-	-	0	0	0	0	0	0
1406	WELL AROUND UDAIPUR (TUBEWELL), TRIPURA	25	28	27	6.5	7.9	7.5	265	380	302	-	-	-	0	0.12	0.05	-	-	-	0	0	0	0	0	0
1730	KUNJBAN, AGARTALA, TRIPURA	26	28	27	5.9	6.2	6.1	160	165	162	-	-	-	0	0.04	0.02	-	-	-	0	0	0	0	0	0
1731	LANKAMURA, TRIPURA	27	28	27	6.9	7.3	7.0	55	62	58	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0
1732	A.D.NAGAR, AGARTALA, TRIPURA	26	27	27	6.4	6.7	6.5	85	95	90	-	-	-	0	0.02	0.01	-	-	-	0	0	0	0	0	0
1733	SHIBNAGAR, AGARTALA, TRIPURA	27	28	27	6.5	6.6	6.5	140	151	147	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0
1734	GANDHIGRAM, AGARTALA, TRIPURA	26	28	27	6.9	7.1	7.0	145	152	148	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0

TABLE 21.3 : - WATER QUALITY OF GROUND WATER IN CHATTISGARH & MADHYA PRADESH - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1620	AT RAIPUR REGION, CHHATISSGARH	23	28	26	7.2	7.9	7.5	390	1243	891	0.4	0.8	0.7	2.6	33	17.8	0.1	2	1.45	-	-	-	5	5	5
1621	AT RAIPUR REGION,CHHATISSGARH	20	32	27	7.4	8.1	7.9	298	3560	2336	0.9	3.6	2.3	0.3	20	10.2	0.6	3	1.85	-	-	-	4	50	22
1622	AT BILASPUR REGION, CHHATISSGARH	27	30	29	7.9	8.3	8.1	1835	1976	1906	0.1	0.1	0.1	50	50	50	2.5	3.5	3.0	-	-	-	-	-	-
1623	AT BILASPUR REGION, CHHATISSGARH	28	30	29	7.7	8.4	8.1	1872	2215	2044	0.1	0.1	0.1	50	50	50	2.1	3	2.55	-	-	-	-	-	-
1616	OPEN WELL/TUBE WELL INDUSTRIAL AREA, GOVINDPURA, BHOPAL, M.P	28	28	28	7.5	7.5	7.5	450	450	450	2.1	2.1	2.1	-	-	-	-	-	-	-	-	-	16	16	16
1617	OPEN WELL/TUBE WELL INDUSTRIAL AREA MANDIDEEP, DISTT. RAISEN, M.P	27	27	27	7.2	7.2	7.2	380	380	380	1.5	1.5	1.5	-	-	-	-	-	-	-	-	-	17	17	17
1618	GROUND WATER SAMPLING AT TWO POINTS IN INDUSTRIAL AREA MALANPUR	18	18	18	6.9	7.4	7.2	620	1310	965	2.2	2.2	2.2	0.3	1.4	0.85	-	-	-	-	-	-	-	-	-
1619	GROUND WATER SAMPLING AT TWO POINTS IN INDUSTRIAL AREA MALANPUR	22	38	30	7.4	7.6	7.5	1328	1650	1489	1	1	1	0.8	0.9	0.85	-	-	-	-	-	-	-	-	-
1897	TUBE WELL AT JAINABAD, NEAR TAPTI RIVER BRIDGE, PUMPING STN. BURHANPUR	27	30	28	7	8	7.5	898	1071	972	0.6	1	0.8	0.1	30	15.7	0.1	0.1	0.10	-	-	-	2	10	7
2143	KATHODA, JABALPUR	24	24	24	7.8	7.8	7.8	924	924	924	1.1	1.1	1.1	5.3	5.3	5.3	-	-	-	-	-	-	11	11	11
2144	MADAI GRAM, JABALPUR	24	24	24	7.7	7.7	7.7	1024	1024	1024	1	1	1	8.2	8.2	8.2	-	-	-	-	-	-	11	11	11
2145	MEHATWAS, NAGDA	-	-	-	7.6	7.6	7.6	2650	2650	2650	-	-	-	2.9	2.9	2.9	-	-	-	-	-	-	-	-	-
2146	BHAGATPURI VILLAGE, NAGDA	-	-	-	7.6	7.6	7.6	1250	1250	1250	-	-	-	2.7	2.7	2.7	-	-	-	-	-	-	-	-	-
2147	PRATAL NAGAR, DEWAS	-	-	-	8	8	8.0	2490	2490	2490	-	-	-	1.2	1.2	1.2	-	-	-	-	-	-	-	-	-
2149	CULVERT ON A.B. ROAD, MAKSI	-	-	-	7.3	7.3	7.3	948	948	948	-	-	-	4.3	4.3	4.3	-	-	-	-	-	-	-	-	-
2150	TRENCHING GROUND, NEAR GARDEN, DEV GURADIYA ROAD, INDORE	26	30	28	7	8	7.6	986	2084	1370	0.4	1.6	0.9	0.1	27.1	6.5	0.1	2.2	0.97	-	-	-	4	8	5
2151	TRENCHING GROUND IN THE PREMISES OF M/S RISHABH MASALA UDYOG, INDORE	26	30	28	7	8	7.6	82	3746	2295	1	2.8	1.4	0.1	4.9	2.9	0.1	2.4	0.87	-	-	-	3	60	12
2152	TRENCHING GROUND IN THE PREMISES OF M/S LAKHANI FOOT WEAR, INDORE	26	30	28	6.9	7.8	7.2	730	4772	2491	0.8	1.2	1.0	0.1	40	6.6	40	40	40	-	-	-	2	9	5

TABLE 21.4 : - WATER QUALITY OF GROUND WATER IN HIMACHAL PRADESH, CHANDIGARH & PUNJAB - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1555	AT KALA AMB, H.P	26	27	27	7.4	8.3	7.9	682	1750	1216	-	-	-	-	-	-	-	-	-	9	9	9	11	11	11
1556	AT PAONTA SAHIB, H.P	23	25	24	7.1	7.5	7.3	180	632	406	-	-	-	-	-	-	-	-	-	7	7	7	10	10	10
1557	AT PARWANOO, H.P	22	24	23	7.4	8.4	7.9	480	789	635	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1558	AT BADDI, H.P	26	27	26	7.6	8.2	7.9	407	1620	1014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1559	AT BAROTIWALA, H.P	26	27	26	7.3	8.8	8.1	414	532	473	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1560	AT NALAGARH, H.P	26	27	26	7.8	9.1	8.5	1196	1620	1408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1561	AT DAMTAL, H.P	24	24	24	6.7	6.7	6.7	950	950	950	0.2	0.2	0.2	-	-	-	-	-	-	9	9	9	110	110	110
1562	AT UNA, H.P	27	30	29	7	7.3	7.2	937	1290	1114	-	-	-	-	-	-	-	-	-						
1872	SHIMLA D/S OF MSW DUMPING SIOT	12	15	13	7	8.5	7.8	404	609	507	8	11.2	9.6	-	-	-	-	-	-	90	90	90	350	350	350
1873	DHARAMSHALA KANGRA D/S OF MSW DUMPING SIOT	16	20	18	5.8	6	5.9	240	262	251	0.1	0.1	0.1	-	-	-	-	-	-	4	6	5	94	420	257
1875	MANDI-D/S OF MSW DUMPING SIOT	13	19	16	7.8	7.8	7.8	266	319	293	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1876	PARWANOO INDUSTRIAL AREA	20	21	21	7.4	8.1	7.8	472	635	554	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1877	BADDI INDUSTRIAL AREA	25	25	25	7.3	7.3	7.3	507	507	507	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1878	BAROTIWALA INDUSTRIAL AREA	26	27	26	7.2	7.6	7.4	318	625	472	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1879	NALAGARH INDUSTRIAL AREA	26	28	27	7.1	7.5	7.3	1277	1670	1474	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1880	KALA AMB INDUSTRIAL AREA	25	27	26	7.3	7.5	7.4	520	674	597	-	-	-	-	-	-	-	-	-	8	8	8	10	10	10
1881	PAONTA SAHIB INDUSTRIAL AREA	23	25	24	7.1	7.2	7.2	548	735	642	-	-	-	-	-	-	-	-	-	7	7	7	12	12	12
1882	MEHATPUR INDUSTRIAL AREA	26	26	26	7.8	7.9	7.9	611	828	720	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1883	UNA INDUSTRIAL AREA	26	26	26	7.6	8.2	7.9	504	776	640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2039	SECTOR 15	24	25	25	6.9	7.6	7.3	844	1011	928	0.1	0.1	0.1	7.8	8.2	8	-	-	-	-	-	-	-	-	-
2040	SECTOR 22	24	25	25	6.9	7.4	7.2	871	973	922	0.6	0.7	0.7	7	9.1	8.05	-	-	-	-	-	-	-	-	-
2041	SECTOR 34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2042	SECTOR 47	24	24	24	7.3	7.9	7.6	630	752	691	0.1	0.4	0.3	6.3	7.8	7.05	-	-	-	-	-	-	-	-	-
2043	PALSORA VILLAGE	24	25	25	6.9	7.5	7.2	833	940	887	0.2	0.3	0.3	6.4	7.3	6.85	-	-	-	-	-	-	-	-	-
2044	DHANAS VILLAGE	24	25	24	6.9	7.2	7.1	966	1104	1058	0.4	0.4	0.4	8.9	9.3	9.17	-	-	-	-	-	-	-	-	-
2045	DADU MAJRA	24	25	25	7	7.4	7.2	1037	1056	1047	0.1	0.2	0.2	5.3	9.5	7.4	-	-	-	-	-	-	-	-	-
1898	PETROL PUMP OPP. HERO CYCLE, LUDHIANA	28	28	28	7.1	7.2	7.2	1140	1460	1300	-	-	-	1.6	1.8	1.7	0.8	0.8	0.8	-	-	-	-	-	-
1899	BHAGWAN SINGH, H.NO.907, DASMESH NAGAR, GALI NO. 6, LUDHIANA	-	-	-	7.1	7.1	7.1	1385	1385	1385	-	-	-	19	19	19	-	-	-	-	-	-	-	-	-
1900	GURCHAARAN SINGH HAIBOWAL DAIRY COMPLEX, LUDHIANA	-	-	-	7.2	7.2	7.2	550	550	550	-	-	-	2.1	2.1	2.1	-	-	-	-	-	-	-	-	-
1901	DUSSHERA GROUND INDUSTRIAL ESTATE, LUDHIANA	-	-	-	7.2	7.2	7.2	455	455	455	-	-	-	1.9	1.9	1.9	-	-	-	-	-	-	-	-	-
1902	SHUKLA TEA STAL POINT, LUDHIANA	-	-	-	7.3	7.3	7.3	516	516	516	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-
1903	PUNJAB AGRICULTUREAL UNIVERSITY, LUDHIANA	-	-	-	7.2	7.2	7.2	575	575	575	-	-	-	2.2	2.2	2.2	-	-	-	-	-	-	-	-	-

TABLE 21.5 : - WATER QUALITY OF GROUND WATER IN KERALA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
19	WELL AT ELOOR, KERALA	27	29	28	5.3	7.1	6.0	130	294	206	0.3	2.0	0.8	1.5	12.6	5.5	0.1	2.8	0.87	0	560	131	10	1320	432
22	WELL AT CHUNGAPALLY, KERALA	27	28	28	5.7	5.7	5.7	110	126	118	0.4	0.8	0.6	0.6	4	2.3	1.8	1.8	1.8	-	-	-	20	60	40
35	WELL AT PUNALUR, KERALA	28	29	28	6.7	7.5	7.1	305	329	317	0.7	0.9	0.8	8.5	16	12.3	10.6	10.6	10.6	0	480	240	620	740	680
1581	PAPPANAMKODE,THIRUVANANTHAPURAM, KERALA	26	26	26	5.6	5.8	5.7	190	340	265	0.3	0.6	0.45	1.6	8	4.8	0.2	0.2	0.2	-	-	-	0	180	90
1582	NEDUMANGAD,THIRUVANANTHAPURAM, KERALA	26	26	26	6.1	6.4	6.3	420	560	490	0.4	0.5	0.45	1.7	8	4.9	0.4	0.4	0.4	-	-	-	0	50	25
1583	KUNDARA,KOLLAM DISTT. , KERALA	27	29	28	4.4	4.9	4.7	171	210	191	0.6	0.8	0.7	8.5	16	12.3	6.3	6.3	6.3	0	100	50	60	160	110
1584	CHERTHALA,ALLEPPY, KERALA	28	29	29	7.4	7.5	7.5	170	180	175	0.2	1.2	0.7	0.1	3.8	2.0	0.1	0.1	0.1	0	250	125	80	750	415
1585	VYTTILA,ERNAKULAM DISTT. , KERALA	28	29	28	7.8	8	7.9	383	430	407	0.5	0.5	0.5	0.5	3.2	1.9	3.6	3.6	3.6	-	-	-	100	140	120
1586	EDAYAR ERNAKULAM DISTT., KERALA	28	28	28	5.6	6.7	6.2	155	183	169	0.5	0.6	0.6	3	3.2	3.1	3.1	3.1	3.1	0	50	25	0	270	135
1587	KALAMASSERY ERNAKULAM DISTT. , KERALA	28	28	28	4.9	5.4	5.2	139	162	151	0.3	0.5	0.4	1.6	9	5.3	6	6	6	0	10	5	0	140	70
1588	PUNKUNNAM TRISSUR DISTT. , KERALA	26	28	27	5.7	6.9	6.3	106	128	117	0.5	2	1.3	1.6	3.2	2.4	3.9	3.9	3.9	0	120	60	40	380	210
1589	MALAPURAM , KERALA	26	28	27	5.7	6	5.9	280	370	325	1	1.6	1.3	1.7	4.8	3.3	3.4	3.4	3.4	0	800	400	40	1233	637
1590	MAVOOR, KOZHIKKODE DISTT. , KERALA	26	29	28	5.8	6.6	6.2	109	153	131	0.2	0.6	0.4	1.2	7.2	4.2	3.2	3.2	3.2	0	60	30	40	190	115
1591	KANNUR (MUNICIPALITY) KANNUR DISTTM , KERALA	30	30	30	4.4	4.7	4.6	83	104	94	0.6	1.2	0.9	4.6	12	8.3	3.1	3.1	3.1	0	100	50	80	400	240
1592	PAYYANNUR, KANNUR DISTT. , KERALA	29	29	29	5.6	5.7	5.7	140	178	159	0.1	1.6	0.9	4	8	6	2.8	2.8	2.8	0	480	240	440	850	645
2308	FATHIMAPURAM (CHANGANASSERY)	28	28	28	5.7	5.7	5.7	197	197	197	0.4	0.4	0.4	2.9	2.9	2.9	-	-	-	11	11	11	24	24	24
2309	KAROOR (PALA)	27	27	27	5.8	5.8	5.8	82	82	82	0.5	0.5	0.5	4.7	4.7	4.7	-	-	-	110	110	110	170	170	170
2310	VAIKOM	28	28	28	6	6	6.0	95	95	95	0.9	0.9	0.9	4.2	4.2	4.2	-	-	-	8	8	8	17	17	17
2311	VADAVATHOOR (KOTTAYAM)	28	28	28	4.8	4.8	4.8	159	159	159	0.7	0.7	0.7	0.1	0.1	0.1	-	-	-	14	14	14	22	22	22
2313	SARVODAPURAM, ALAPPUZHA	28	28	28	7.3	7.3	7.3	183	183	183	0.5	0.5	0.5	0.1	0.1	0.1	-	-	-	300	300	300	600	600	600
2314	KUREEPUZHA (KOLLAM)	27	27	27	7.3	7.3	7.3	306	306	306	0.7	0.7	0.7	7.5	7.5	7.5	-	-	-	200	200	200	300	300	300
2315	K.M.M.L. (KOLLAM)	28	28	28	7.6	7.6	7.6	464	464	464	0.6	0.6	0.6	9.6	9.6	9.6	-	-	-	60	60	60	100	100	100
2316	CHELLORA TRENCHING GROUND (KANNUR)	28	28	28	4.1	4.1	4.1	52	52	52	0.9	0.9	0.9	2.5	2.5	2.5	-	-	-	0	0	0	50	50	50
2317	PUNNALPETTIPPALAM (TELLICHERRY MUNICIPALITY	28	28	28	6.5	6.5	6.5	373	373	373	1.5	1.5	1.5	2.5	2.5	2.5	-	-	-	140	140	140	1300	1300	1300
2320	MANJERI	26	26	26	5.6	5.6	5.6	164	164	164	0.6	0.6	0.6	1.7	1.7	1.7	-	-	-	333	333	333	866	866	866
2321	LALOOR (THRISSUR)	28	28	28	5.8	5.8	5.8	530	530	530	1	1	1	8.5	8.5	8.5	-	-	-	120	120	120	370	370	370
2322	OLLUR (THRISSUR)	25	25	25	4.8	4.8	4.8	240	240	240	0.9	0.9	0.9	6.1	6.1	6.1	-	-	-	580	580	580	1240	1240	1240
2323	BRAHMAPURAM M.S.W. DUMPARK (ERNAKULAM)	27	27	27	6	6	6.0	200	200	200	0.2	0.2	0.2	1	1	1	-	-	-	240	240	240	650	650	650
2324	HAZARDOUS WASTE DUMP (AMBALAMUGHAL)	28	28	28	7.2	7.2	7.2	270	270	270	1.5	1.5	1.5	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
2327	KARUKAMANI	27	27	27	7.2	7.2	7.2	952	952	952	0.7	0.7	0.7	1.4	1.4	1.4	-	-	-	12	12	12	300	300	300

TABLE 21.6 : - WATER QUALITY OF GROUND WATER IN TAMILNADU & PONDICHERRY - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
32	WELL AT MUSIRI, TAMIL NADU	30	31	30	6.9	7.3	7.1	1800	1919	1850	0.2	0.6	0.3	0.3	1.5	0.83	0.1	0.1	0.1	78	270	166	140	400	260
1449	COLLECTOR WELL AT THIRUPUVANAM FOR MADURAI WAT. SUPPLY SCHEME, TAMILNADU	30	30	30	7.3	7.3	7.3	780	780	780	1.9	1.9	1.9	0.1	0.1	0.1	0.1	0.1	0.1	2	2	2	7	7	7
1397	WELL AT MUTHIALPET AREA(I), PONDICHERRY	27	27	27	6.9	6.9	6.9	1958	1958	1958	-	-	-	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-
1398	WELL AT THENGAITHITTU AREA,(II) PONDICHERRY	28	32	30	6.8	7.4	7.1	1087	1100	1094	-	-	-	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-
1453	WELL AT MUTHARAPLATYAM (PWD), PONDICHERRY	29	30	30	6.5	6.9	6.7	496	602	549	-	-	-	2.7	2.7	2.7	-	-	-	-	-	-	-	-	-
1454	KALAPET,PONDI. UNIVER. ADMN. BLOCK	28	30	29	6.2	6.7	6.5	159	185	172	-	-	-	0.7	0.7	0.7	-	-	-	-	-	-	-	-	-
1687	NEHRU STATUE, PONDICHERRY	30	30	30	7.1	7.1	7.1	2240	2240	2240	-	-	-				-	-	-	-	-	-	-	-	-
1688	KATTERIKUPPAM, PODICHERRY	30	34	32	7.1	7.3	7.2	628	712	670	-	-	-	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-
1689	CHUNMBAR RIVER, PONDICHERRY	29	32	30	8.1	9	8.6	521	860	700	3	5	4.3	0.1	12.9	6.5	-	-	-	-	-	-	-	-	-
2009	KURUMBAPET	28	30	29	6.2	6.9	6.6	382	383	383	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-
2010	METTUPALAYAM	30	30	30	6.3	6.6	6.5	460	506	483	-	-	-	3.9	3.9	3.9	-	-	-	-	-	-	-	-	-
2011	URUVAIYAR	32	35	33	6.8	7.6	7.2	1380	1385	1383	-	-	-	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-
2012	KARUVADIKUPPAM	37	37	37	6.9	6.9	6.9	251	251	251	-	-	-	2.8	2.8	2.8	-	-	-	-	-	-	-	-	-
2013	T.R.PATTINAM, KARAIKAL	28	30	29	8.3	8.3	8.3	1636	1838	1737	-	-	-	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-
2014	VADAMATTAM, KARAIKAL	26	31	28	7.9	8.1	8.0	1461	1603	1532	-	-	-	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-

TABLE 21.7 : - WATER QUALITY OF GROUNDWATER IN DAMAN, MAHARASHTRA & GUJARAT - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1440	WELL AT SOMNATH INDL. ESTATE, DAMAN	-	-	-	7	8.1	7.5	960	1886	1603	39	38.5	38.5	8.1	82.6	46.55	-	-	-	-	-	-	-	-	-
1984	INDL. ESTATE TARAPUR	30	30	30	8.5	8.5	8.5	457	457	457	3	3	3	0.1	0.1	0.1	-	-	-	25	25	25	225	225	225
1985	MIRA-BHAYANDER	30	30	30	8.5	8.5	8.5	7234	7234	7234	7	7	7	2.6	2.6	2.6	-	-	-	70	70	70	550	550	550
1986	DAHANU	27	27	27	7.5	7.5	7.5	1086	1086	1086	3.4	3.4	3.4	0.1	0.1	0.1	-	-	-	13	13	13	170	170	170
1987	VASAI	28	28	28	8.1	8.1	8.1	1019	1019	1019	6	6	6	0.7	0.7	0.7	-	-	-	25	25	25	350	350	350
1988	PALGHAR	27	28	28	7.6	7.7	7.7	1700	4966	3333	2	4	3	3.7	8.4	6.05	-	-	-	2	30	16	5	350	178
1990	BMW SITE, BURUDGAON, AHMEDNAGAR	29	29	29	7.3	7.3	7.3	1874	1874	1874	9	9	9	5.1	5.1	5.1	-	-	-	26	26	26	58	58	58
1991	MSW SITE, PATHARDI, NASIK	25	25	25	7.1	7.2	7.2	396	396	396	4.1	4.1	4.1	1.8	8	4.9	1.8	1.8	1.8	0.1	14	7.05	14	35	24.5
1992	MSW SITE, PIMPRI-CHINCHWAD, PUNE	32	33	33	8	8	8.0	975	1345	1160	5.8	7.6	6.7	0.1	0.1	0.1	-	-	-	25	225	125	225	900	563
1993	PHANDARPUR, GANGAPUR, AURANGABAD	31	31	31	7.8	7.8	7.8	1667	1667	1667	5.8	5.8	5.8	4.6	4.6	4.6	-	-	-	9	9	9	350	350	350
1995	KHAPERKHEDA, NAGPUR	21	21	21	7.7	7.7	7.7	1045	1045	1045	11	11	11	5.3	5.3	5.3	-	-	-	11	11	11	27	27	27
1996	KORADI, NAGPUR	22	22	22	7.7	7.7	7.7	1467	1467	1467	13	13	13	12	12	12	-	-	-	4	4	4	21	21	21
1997	RAIPUR, NAGPUR	30	30	30	8	8	8.0	2650	2650	2650	6	6	6	0.8	0.8	0.8	-	-	-	33	33	33	170	170	170
1998	BHAHMNI, KALMESHWAR, NAGPUR	22	22	22	7.6	7.6	7.6	1300	1300	1300	11	10.7	10.7	5	5	5	-	-	-	11	11	11	27	27	27
1999	SANGERA GONDIA	24	24	24	6.1	6.1	6.1	8687	8687	8687	1.6	1.6	1.6	5	5	5	-	-	-	2	2	2	6	6	6
2000	BHANDEWARI, NAGPUR	21	21	21	8	8	8.0	1526	1526	1526	6	6	6	10.2	10.2	10.2	-	-	-	22	22	22	70	70	70
2001	SUKALI, AMRAVATI	32	32	32	7.8	7.8	7.8	704	704	704	7	7	7	13.1	13.1	13.1	-	-	-	2	2	2	4	4	4
2002	AKOT, AKOLA	32	32	32	8.3	8.3	8.3	621	621	621	8	8	8	3.3	3.3	3.3	-	-	-	110	110	110	280	280	280
2003	SAWARGAON, YAVATMAL	23	23	23	7.8	7.8	7.8	761	761	761	6	6	6	0.7	0.7	0.7	-	-	-	2	2	2	4	4	4
2004	PARVATI INDL. ESTATE, YADRAV, SHIROL	27	27	27	7.9	7.9	7.9	3429	3429	3429	2	2	2	4.7	4.7	4.7	-	-	-	-	-	-	-	-	-
2006	MIDC, SHINOLI, CHENDGAD	21	21	21	8	8	8.0	766	766	766	1.8	1.8	1.8	4.7	4.7	4.7	-	-	-	-	-	-	-	-	-
2007	SAVALI, SANGLI	24	24	24	6.1	6.1	6.1	8687	8687	8687	1.6	1.6	1.6	5	5	5	-	-	-	2	2	2	6	6	6
2008	RASULWADI-SAMBARWADI, SANGLI	24	24	24	6.2	6.2	6.2	2631	2631	2631	1.8	1.8	1.8	5.1	5.1	5.1	-	-	-	9	9	9	140	140	140
2200	BORE WELL AT KATPUR, NEAR Z.P SCHOOL.	29	29	29	7.9	7.9	7.9	1830	1830	1830	27	26.8	26.8	0.7	0.7	0.7	-	-	-	9	9	9	350	350	350
2201	DUG WELL AT RANJANGAON.	28	28	28	7.4	7.4	7.4	2100	2100	2100	5	5	5	0.7	0.7	0.7	-	-	-	9	9	9	350	350	350
2203	HAND PUMP IN THE PREMISES OF ZILLA PARISHAD PRIMARY SCHOOL	33	33	33	7.7	7.7	7.7	1268	1268	1268	7.8	7.8	7.8	2	2	2	-	-	-	27	27	27	180	180	180
3	WELL AT AHMEDABAD, GUJARAT	27	29	28	7.3	7.5	7.4	1550	1650	1600	2	3	2.5	2.2	2.2	2.2	3.6	3.6	3.6	2	2	2	5	5	5
1226	WELL AT NAROL, AHMEDABAD, GUJARAT	29	32	31	7.3	7.4	7.4	1420	1490	1455	0.8	3	1.9	0.3	0.6	0.45	-	-	-	2	2	2	5	5	5
1950	JUNAGADH	26	26	26	7.2	7.2	7.2	1486	1486	1486	0.9	0.9	0.9	0.1	0.1	0.1	-	-	-						
1951	RAJKOT	28	28	28	7.5	7.5	7.5	1578	4810	3194	0.7	0.9	0.8	0.1	0.1	0.1	-	-	-	3	3	3	5	5	5
1952	SURENDRANAGAR	28	28	28	7.6	7.8	7.7	1520	2380	1950	0.7	10	5.35	0.1	0.1	0.1	-	-	-	4	4	4	7	7	7
1955	PALANPUR	28	28	28	7.2	7.2	7.2	2390	2390	2390	10	10	10	6.2	6.2	6.2	-	-	-	2	2	2	5	5	5
1956	MEHASANA	23	28	26	7.5	7.5	7.5	1190	1450	1320	2.2	6	4.1	7.9	8.4	8.15	-	-	-	2	2	2	5	5	5
1957	SIDDHPUR (DIST.PATAN)	27	28	28	7.3	7.7	7.5	1530	3250	2390	1.8	2	1.9	5	5.6	5.3	-	-	-	2	2	2	5	5	5
1958	HIMATNAGAR	29	29	29	7.2	7.3	7.3	1470	1560	1515	2	2.1	2.05	7.7	9.2	8.45	-	-	-	2	2	2	5	5	5
1959	NADIAD	24	24	24	7.6	7.6	7.6	2200	2200	2200	7.1	7.1	7.1	-	-	-	-	-	-	-	-	-			
1960	DAHOD	27	27	27	7.9	7.9	7.9	1893	1893	1893	0.4	0.4	0.4	-	-	-	-	-	-	-	-	-	3	3	3

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1961	GODHARA	26	27	27	7.7	7.7	7.7	1107	1107	1107	0.7	0.8	0.75	-	-	-	-	-	-	-	-	-	4	4	4
1962	VADODARA (INDUSTRIAL-NANDESARI)	24	24	24	7.4	7.4	7.4	1900	1900	1900	14	14	14	-	-	-	-	-	-	-	-	-			
1963	ANKLESHWAR (INDUSTRIAL AREA)	30	30	30	7.2	7.2	7.2	507	507	507	0.8	0.8	0.8	2	2	2	-	-	-	0	0	0	70	70	70
1964	PANDESARA (INDSTRIAL) SURAT	29	29	29	7.8	7.8	7.8	11490	11490	11490	0.3	0.3	0.3	0.5	0.5	0.5	-	-	-	28	28	28	210	210	210
1965	MORA-HAJIRA (INDUSTRIAL), HAJIRA	29	29	29	8.5	8.5	8.5	1480	1480	1480	0.8	0.8	0.8	0.4	0.4	0.4	-	-	-	4	4	4	15	15	15
1966	GABHENI VILLAGE, SURAT (INDUSTRIAL)	29	29	29	8.6	8.6	8.6	960	960	960	0.5	0.5	0.5	1.7	1.7	1.7	-	-	-	4300	4300	4300	9300	9300	9300
2083	BORE WELL OF CHHATRAL GIDC.	29	29	29	7.5	7.5	7.5	1790	1790	1790	1.7	1.7	1.7	2.8	2.8	2.8	-	-	-	2	2	2	5	5	5
2084	BORE WELL OF PALSANA VILLAGE.	28	29	29	7.6	8.2	7.9	1340	1950	1645	0.4	11	5.7	0.4	1.7	1.05	-	-	-	2	9	5.5	5	21	13
2085	BORE WELL OF SANTEJ VILLAGE.	29	29	29	7.6	7.6	7.6	3130	3130	3130	2.3	2.3	2.3	2.2	2.2	2.2	-	-	-	2	2	2	5	5	5
2087	B/W- HAZARDOUS W. DISPOSAL SITE (GUJ. ENVIRO P.& I. LTD.)	29	29	29	8.3	8.3	8.3	1140	1140	1140	1.2	1.2	1.2	0.6	0.6	0.6	-	-	-	23	23	23	150	150	150
2088	BORE WELL OF SACHIN GIDC.	29	29	29	7.8	7.8	7.8	11300	11300	11300	1	1	1	0.8	0.8	0.8	-	-	-	9	9	9	23	23	23
2090	WELL AT OLPAD.	30	30	30	7.9	7.9	7.9	7740	7740	7740	2.3	2.3	2.3	0.5	0.5	0.5	-	-	-	9	9	9	23	23	23
2091	FROM BORE WELL OF NAVSARI GIDC INDUSTRIES ASSOCIATION OFFICE.	28	28	28	8.4	8.4	8.4	2040	2040	2040	1.2	1.2	1.2	0.5	0.5	0.5	-	-	-	3	3	3	20	20	20
2092	FROM WATER WORKS OF NAVSARI NEAR DHUDIA TALAV.	29	29	29	8.5	8.5	8.5	508	508	508	0.8	0.8	0.8	0.2	0.2	0.2	-	-	-	2	2	2	3	3	3
2093	BORE WELL OF BARDOLI AT REST HOUSE.	28	28	28	8.1	8.1	8.1	2110	2110	2110	1.6	1.6	1.6	0.3	0.3	0.3	-	-	-	3	3	3	20	20	20
2094	WELL AT ANKLESHWAR INDUSTRIAL AREA (BORE WELL OF M/S INDUSTRIAL CARBON AT ANKLESHWAR- RAJPIPLA ROAD.	30	30	30	8.1	8.1	8.1	331	331	331	0.7	0.7	0.7	3.4	3.4	3.4	-	-	-	0	0	0	40	40	40
2095	BORE WELL AT STP MADHAPAR, DIST. RAJKOT.	25	30	28	7.2	7.7	7.45	1600	2640	2120	2	2	2	0.1	0.1	0.1	-	-	-	4	4	4	7	7	7
2096	B/W, SNR. VINAYAK JAL SUDDHIKARAN SAHAKARI MANDALI LTD.(CETP), BAVLA, AHMEDABAD.	29	29	29	7.3	7.3	7.3	3660	3660	3660	2.3	2.3	2.3	2.5	2.5	2.5	-	-	-	2	2	2	5	5	5
2097	B/W OF SOMESHWAR RICE MILL, NR. BAVLA ECO PROJECT, (CETP), BAVLA, AHMEDABAD.	30	30	30	7.7	7.7	7.7	2130	2130	2130	5.1	5.1	5.1	2.8	2.8	2.8	-	-	-	2	2	2	5	5	5
2098	BORE WELL OF PIRANA TERMINAL PUMPING STN., PIRANA, NR. V. N. BDG, AHMEDABAD.	30	30	30	7.1	7.1	7.1	3500	3500	3500	13	13	13	1.3	1.3	1.3	-	-	-	2	2	2	5	5	5

TABLE 21.8 : - WATER QUALITY OF GROUND WATER IN RAJASTHAN - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1415	WELL OF LOOMJI, CHAUDHARY, NEAR NAYAGAON, PALI, (U/S 1 KM. FROM PALI TOWN), RAJASTHAN	20	25	23	7.1	8.7	7.9	5500	31000	18250	5.7	21.2	13.4	0.2	0.9	0.5	-	-	-	7	14	11	150	210	180
1416	WELL OF BHOPAL SINGH, 24 Km. FROM PALI TOWN	21	26	24	7.9	8.04	8.0	8600	31000	19800	1.6	11.5	6.6	0.1	11.8	6.0	-	-	-	3	3	3	20	28	24
1417	WELL (U/S 1 KM FROM JODHPUR TOWN)	25	27	26	7	7.36	7.2	3200	12100	7650	4.1	6.5	5.3	0.1	0.5	0.3	-	-	-	4	7	6	150	1100	625
1706	RIICO PUMP HOUSE NEAR MONTO MOTORS, MIA, ALWAR, RAJASTHAN	28	32	30	7.3	8.41	7.8	820	1800	1310	0.4	0.8	0.6	0.5	0.6	0.5	-	-	-	3	3	3	4	9	7
1707	BORE WELL IN MODI ALKALIS & CHEMICALS, MIA, ALWAR, RAJASTHAN	29	32	30	7.6	8.07	7.8	890	1000	945	1.3	1.5	1.4	0.2	3.4	1.8	-	-	-	3	3	3	4	7	6
1708	WELL KOTHI IN VILLAGE BAGAR RAJPUT, ALWAR	24	25	25	7.5	8.38	7.9	2500	5400	3950	1.1	1.2	1.1	0.4	3.4	1.9	-	-	-	3	3	3	4	7	6
1709	WELL AT VILLAGE SANTHLA VERY NEAR BHIWADI INDUSTRIAL AREA, BHIWADI	28	28	28	8.1	8.36	8.2	680	3200	1940	0.2	1.6	0.9	0.4	3.4	1.9	-	-	-	3	3	3	7	9	8
1710	WELL AT VILLAGE ALUPUR, VERY NEAR BHIWADI INDUSTRIAL AREA, BHIWADI	28	29	29	8	8.42	8.2	680	1000	840	0.3	0.8	0.6	0.6	3.2	1.9	-	-	-	3	3	3	7	7	7
1711	WELL AT VILLAGE HARCHANDPUR, VERY NEAR, BHIWADI TO BHIWADI INDUSTRIAL AREA, BHIWADI	28	28	28	8	8.68	8.4	690	1400	1045	0.1	0.8	0.5	0.4	3.4	1.9	-	-	-	3	3	3	4	4	4
1712	WELL AT VILLAGE BHIWADI , VERY NEAR, BHIWADI TO BHIWADI INDUSTRIAL AREA, BHIWADI	28	29	29	8.1	8.45	8.3	680	1100	890	0.4	2.8	1.6	0.1	3.2	1.6	-	-	-	3	4	4	4	14	9
1713	WELL AT VILLAGE GATTAL, NEAR, BHIWADI TO BHIWADI INDUSTRIAL AREA, BHIWADI	28	28	28	8.2	8.81	8.5	560	1260	910	0.3	3.2	1.7	0.4	2.6	1.5	-	-	-	3	4	4	4	14	9
1715	HAND PUMP NEAR SECONDARY SCHOOL ABOUT 300mt. FROM KANSUA NALLAH KOTA	28	30	29	8.1	8.64	8.4	880	2900	1890	0.1	1.6	0.9	21.7	21.7	21.7	-	-	-	3	3	3	4	4	4
1720	CHAUDHARY KA WELL VILLAGE PANIALA, KOTAPUTALI NEAR ASSOCIATED ALCOHOL BREVERIES LTD JAIPUR, RAJASTH	24	29	27	7.3	8.46	7.9	1260	1800	1530	0.5	1.4	0.9	0.4	0.4	0.4	-	-	-	3	4	4	7	20	14
1721	PHED WELL NEAR RAILWAY LINE JHOTAWARA, JAIPUR, RAJASTHAN	29	29	29	7.7	8.67	8.2	690	1900	1295	0.4	0.5	0.5	0.2	0.4	0.3	-	-	-	3	3	3	4	2400	1202
1722	PHED WELL NEAR NEI, KHATIPURA, RAJASTHAN	26	26	26	7.3	8.44	7.9	770	1000	885	0.2	0.3	0.2	0.3	0.3	0.3	-	-	-	3	7	5	4	20	12
1723	HAND PUMP OF VIDHANI VILLAGE GONER ROAD JAIPUR, RAJASTHAN	27	28	28	7.5	8.85	8.2	3100	3300	3200	0.2	0.4	0.3	0.2	0.6	0.4	-	-	-	3	4	4	4	75	40
1724	WELL OF GOOJARON KI TALAI, MOHANA ROAD SANGANER JAIPUR, RAJASTHAN	28	29	29	8	8.75	8.4	1160	2100	1630	0.5	0.7	0.6	0.4	0.5	0.4	-	-	-	3	4	4	4	2400	1202
1725	PUBLIC HAND PUMP BEFORE SANGANER PULIA, RAJASTHAN	26	28	27	7.5	8.4	8.0	1380	2200	1790	0.4	0.7	0.6	0.3	0.5	0.4	-	-	-	3	3	3	4	150	77
2015	PABUPURA ROAD NEAR CIVIL AIR PORT, JODHPUR (MANGILAL RATHOR)	26	27	27	7.2	7.43	7.3	3800	4200	4000	1.3	3.1	2.2	0.5	0.7	0.6	-	-	-	4	20	12	210	240	225
2016	VILLAGE VINAYAKIA, JODHPUR (HIRALAL KUMHAR)	26	27	26	7	7.54	7.3	2900	3900	3400	0.5	1.0	0.8	0.2	0.3	0.3	-	-	-	7	7	7	28	2400	1214

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
2017	VILLAGE VINAYAKIA, JODHPUR (BADRI KUMHAR)	25	28	26	7.4	7.36	7.4	2900	3800	3350	0.4	0.6	0.5	0.2	0.5	0.3	-	-	-	11	14	13	150	2400	1275
2018	VILL VINAYAKIA, JODHPUR (HUKUM SINGH RATHORE)	26	27	27	7.6	7.71	7.7	6500	9000	7750	1.6	2.9	2.2	0.5	8.3	4.4	-	-	-	7	7	7	150	460	305
2019	NEAR UIT BRIDGE, UDAIPUR	25	28	27	7.2	8.6	7.9	1140	1400	1270	1.2	1.9	1.5	0.4	1.0	0.7	-	-	-	4	4	4	14	20	17
2020	NEW FATEHPURA, 200 FT.FROM PANCHWATI NALLAH, UDAIPUR	26	29	28	7.1	8.56	7.8	1510	1520	1515	0.2	1.3	0.8	0.5	10.3	5.4	-	-	-	3	3	3	4	7	6
2021	NEAR ARVIND GENERAL STORE, ALOO FACTORY, KACCHI BASTI, SARDARPURA, UDAIPUR	25	28	27	7.3	8.7	8.0	990	1900	1445	0.6	1.2	0.9	0.4	5.1	2.7	-	-	-	3	3	3	4	7	6
2022	NR RANA PRATAP NAGAR, RAILWAY STN, UDAIPUR	26	29	28	7.1	8.3	7.7	1790	3000	2395	0.2	0.5	0.3	0.5	10.0	5.2	-	-	-	3	3	3	4	4	4
2023	HOTEL ORIENT PLACE, SUBHAS NAGAR, UDAIPUR	24	29	27	7.4	7.69	7.5	1900	3100	2500	1.5	1.7	1.6	0.2	6.0	3.1	-	-	-	4	4	4	7	14	11
2024	IN SIDE SHIV TEMPLE NEAR AIR FORCE STATION AJMER ROAD, JAIPUR	27	28	28	7	8.29	7.7	2600	3600	3100	0.2	0.4	0.3	0.1	0.4	0.3	-	-	-	4	4	4	14	14	14
2025	NEAR SHREE KALYANESHWAR MAHADEV TEMPLE, JAI SINGH PURA KHURD, JAIPUR.	25	26	26	6.9	8.51	7.7	2000	3200	2600	0.2	0.5	0.4	0.2	0.3	0.3	-	-	-	3	3	3	4	28	16
2026	NR FOJI NAGAR, KACCHI BASTI, AMBABARI, JAIPUR.	26	28	27	7.7	8.56	8.1	640	760	700	0.1	0.4	0.3	0.1	0.3	0.2	-	-	-	3	3	3	4	20	12
2027	NR ABN CENTRAL ACADEMY, SUSILPURA, SODALA, JAIPUR.	27	27	27	7.9	8.82	8.3	590	700	645	0.1	2.0	1.0	0.3	0.4	0.3	-	-	-	4	4	4	14	14	14
2028	NEAR SAMSHAN VISHWAKARMA NAGAR, MAHARANIFARM, JAIPUR	27	30	29	7.8	8.58	8.2	630	850	740	0.5	1.6	1.0	0.3	0.5	0.4	-	-	-	3	4	4	4	14	9
2029	NEAR GANDHI BHWAN, AJMER	24	26	25	7.7	7.85	7.8	920	1320	1120	0.1	0.8	0.5	1.1	14.0	7.6	-	-	-	3	7	5	9	1100	555
2030	OPPOSITE PRIVATE BUS STAND, AJMER	26	27	27	7.3	7.5	7.4	1800	2700	2250	0.1	0.2	0.1	0.5	1.0	0.8	-	-	-	3	4	4	4	28	16
2031	NEAR 9 NO. PETROL PUMP, NEAR ADARSH NAGAR GATE, AJMER	26	26	26	7.8	7.86	7.8	910	1110	1010	0.2	0.2	0.2	1.8	14.0	7.9	-	-	-	3	4	4	20	75	48
2032	NEAR KHANPURA TALAB, AJMER	26	27	27	7.1	7.94	7.5	5100	5200	5150	0.2	0.6	0.4	0.5	0.6	0.5	-	-	-	3	4	4	9	20	15
2033	OUTSIDE JLN HOSPITAL, AJMER	25	26	26	7.2	7.37	7.3	2100	2200	2150	0.2	0.4	0.3	0.4	0.7	0.6	-	-	-	4	7	6	9	1100	555

TABLE 21.9 : - WATER QUALITY OF GROUND WATER IN UTTAR PRADESH & UTTARANCHAL - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1736	G WATER QUALITY STATION SARDARNAGAR, U.P	24	24	24	6.8	6.8	6.8	1216	1216	1216	1.8	1.8	1.8	3.2	3.2	3.2	1	1	1	40	40	40	120	120	120
1737	GROUND WATER QUALITY STATION CAPTANGANJ	26	26	26	6.8	6.8	6.8	916	916	916	4.4	4.4	4.4	-	-	-	1.2	1.2	1.2	20	20	20	60	60	60
1738	SITE 1, INDUSTRIAL AREA NEAR M/S WOODWARM CHEMICAL LTD., UNNAO, U.P	-	-	-	7.3	7.3	7.3	778	778	778	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1739	SITE 2, INDUSTRIAL AREA NEAR M/S AMIN SONS, UNNAO,U.P	-	-	-	6.7	6.7	6.7	1834	1834	1834	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1740	AT ROADWAYS BUS STATION, UNNAO, U.P	-	-	-	7.1	7.1	7.1	2782	2782	2782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1741	MAGAWARA INDUSTRIAL AREA NEAR M/S JAMJAM TANNERS, UNNAO, U.P	-	-	-	6.9	6.9	6.9	774	774	774	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1742	CHINHAT INDUSTRIAL AREA IN LUCKNOW NEAR M/S INDIA PESTICIDES LUCKNOW, U.P	22	22	22	7.1	7.2	7.2	561	712	637	-	-	-	7.6	7.6	7.6	0.1	0.1	0.1	-	-	-	-	-	-
1743	AISHBAGH INDUSTRIAL AREA AT LUCKNOW NEAR M/S EVEREADY INDUSTRIES LTD. LUCKNOW, U.P	22	28	25	6.9	7.2	7.1	1012	1024	1018	-	-	-	11.4	11.4	11.4	0.1	0.1	0.1	-	-	-	-	-	-
1744	JAJMAU INDUSTRIAL AREA No. 6 KANPUR, U.P	-	-	-	7.2	7.5	7.4	152	170	161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1745	PANKI INDUSTRIAL AREA NEAR INDUSTRY OF AMMONIA FERTIZER KANPUR, U.P	-	-	-	6.8	7.1	7.0	194	195	195	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1746	NAGAR PALIKA TUBE WELL, SULTANPUR, U.P	30	30	30	7.5	7.5	7.5	1150	1150	1150	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0
1747	INDIA MARKA HAND PUMP IN SAROWNI BLOCK AT RAIBAREILLY, U.P	30	30	30	7.5	7.5	7.5	740	740	740	-	-	-	-	-	-	0.1	0.1	0.1	0	0	0	0	0	0
1749	TUBE WELL AT MEERUT CITY, U.P	22	30	26	7.8	7.8	7.8	750	756	753	0.4	0.4	0.4	-	-	-	-	-	-	0	0	0	11	16	13.5
1750	TUBE WELL AT BAGPAT CITY, U.P	22	29	26	7.7	7.8	7.8	870	876	873	0.6	0.8	0.7	-	-	-	-	-	-	0	0	0	14	18	16
1751	TUBE WELL IN INDUSTRIAL AREA AT GAJRAULA,MORADABAD, U.P	29	29	29	7.5	7.5	7.5	238	238	238	0.8	0.8	0.8	-	-	-	-	-	-	0	0	0	20	20	20
1752	SAHIBABAD INDUSTRIAL AREA, GHAZIABAD	-	-	-	7	7.4	7.2	3610	4191	3901	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1753	MEERUT ROAD INDUSTRIAL AREA GHAZIABAD	-	-	-	7.3	7.5	7.4	980	1305	1143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1754	HAPUR ROAD INDUSTRIAL AREA GHAZIABAD	-	-	-	7	7.6	7.3	721	1065	893	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1755	PILKHUA INDUSTRIAL AREA GHAZIABAD, U.P	-	-	-	7	7.5	7.3	1282	2792	2037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1756	GOPIGANJ INDUSTRIAL AREA BHADOHI, VARANASI	-	-	-	7.5	7.5	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1757	MIRZAPUR INDUSTRIAL AREA, U.P	25	25	25	6.7	6.7	6.7	1745	1745	1745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1758	GROUND AROUND STP DINAPUR,VARANASI, U.P	-	-	-	7.4	7.4	7.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1759	IFFCO, PHOOLPUR,ALLAHABAD, U.P	26	27	27	6.9	6.9	6.9	1254	6550	3902	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1760	M/S KANORIA CHEMICAL SONBHADRA, U.P	26	26	26	6.3	6.3	6.3	1153	1153	1153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1761	TUBE WELL IN SINGRAULI INDUSTRIAL AREA, U.P	25	25	25	6.8	6.8	6.8	788	788	788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 21.10 WATER QUALITY OF GROUND WATER IN ORISSA - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1644	JAGATPUR INDUSTRIAL AREA, CUTTACK	24	24	24	8.4	8.4	8.4	550	550	550	0.9	0.9	0.9	6.1	6.1	6.1	0.03	0.03	0.03	2	2	2	2	2	2
1645	MADHUPATNA- KALYAN NAGAR AREA, CUTTACK	24	24	24	8.2	8.2	8.2	326	326	326	0.8	0.8	0.8	4.6	4.6	4.6	0.02	0.02	0.02	2	2	2	2	2	2
1646	BIDANASHI - TULASIPUR AREA, CUTTACK	25	25	25	8	8	8	91	91	91	0.1	0.1	0.1	1.4	1.4	1.4	0.05	0.05	0.05	2	2	2	2	2	2
1647	BADAMBARI AREA, CUTTACK, ORISSA	24	24	24	7.7	7.7	7.7	301	301	301	0.9	0.9	0.9	0.2	0.2	0.2	0.00	0.00	0.00	2	2	2	2	2	2
1648	RANIHAT- MANGALABAGH AREA, CUTTACK	24	24	24	8.4	8.4	8.4	197	197	197	0.5	0.5	0.5	0.2	0.2	0.2	0.00	0.00	0.00	2	2	2	2	2	2
1649	KHANDAGIRI AREA, BHUBANESWAR, ORISSA	25	25	25	6.7	6.7	6.7	234	234	234	1.6	1.6	1.6	10.1	10.1	10.1	0.14	0.14	0.14	2	2	2	2	2	2
1650	CAPITAL HOSPITAL AREA, BHUBANESWAR	24	24	24	7.6	7.6	7.6	546	546	546	1.3	1.3	1.3	9.3	9.3	9.3	0.04	0.04	0.04	2	2	2	2	2	2
1651	OLD TOWN- SAMANTARAAIPUR AREA, BHUBANESWAR,ORISSA	25	25	25	6.5	6.5	6.5	210	210	210	0.6	0.6	0.6	9.6	9.6	9.6	0.04	0.04	0.04	2	2	2	2	2	2
1652	KALPNA - LAXMINAGAR AREA, BHUBANESWAR	25	25	25	6.7	6.7	6.7	296	296	296	0.5	0.5	0.5	9.8	9.8	9.8	0.08	0.08	0.08	2	2	2	2	2	2
1653	MANCHESWAR INDUSTRIAL AREA, BHUBANESWAR	25	25	25	6.7	6.7	6.7	1147	1147	1147	0.7	0.7	0.7	35.1	35.1	35.1	0.43	0.43	0.43	2	2	2	2	2	2
1654	SECRETARIAT- GOVERNOR HOUSE-OLDBUS STAND AREA, BHUBANESWAR, ORISSA	24	24	24	8	8	8	160	160	160	0.7	0.7	0.7	7.1	7.1	7.1	0.06	0.06	0.06	2	2	2	2	2	2
1655	NEAR SEA BEACH, PURI, ORISSA	24	24	24	7.6	7.6	7.6	383	383	383	0.7	0.7	0.7	35.2	35.2	35.2	0.21	0.21	0.21	2	2	2	2	2	2
1656	NEAR JAGANNATH TEMPLE, PURI, ORISSA	25	25	25	7.9	7.9	7.9	1020	1020	1020	0.2	0.2	0.2	14.8	14.8	14.8	0.12	0.12	0.12	2	2	2	2	2	2
1657	HOSPITAL BUSSTAND-MAUSHIMA TEMPLE AREA, PURI	25	25	25	7.6	7.6	7.6	896	896	896	0.4	0.4	0.4	12.6	12.6	12.6	0.12	0.12	0.12	2	2	2	2	2	2
1658	NEAR RIVER KUSHABHADRA, PURI, ORISSA	24	24	24	7.8	7.8	7.8	-	-	-	-	-	-	1.8	1.8	1.8	0.00	0.00	0.00	2	2	2	2	2	2

TABLE 21.11 WATER QUALITY OF GROUND WATER IN BIHAR - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				6.5-8.5			< 2250 µmhos/cm			< 3 mg/l									< 2500 MPN/100ml			< 5000 MPN/100ml		
1825	PATNA	23	26	25	7.2	7.7	7.5	582	665	624	-	-	-	-	-	-	-	-	-	8	8	8	13	17	15
1826	PATNA	24	24	24	7.6	7.6	7.6	352	352	352	-	-	-	-	-	-	-	-	-	8	8	8	14	14	14
1827	PATNA	21	28	25	7.2	7.7	7.5	525	716	621	-	-	-	-	-	-	-	-	-	1	2	2	2	4	3
1828	PATNA	23	24	24	7.4	7.8	7.6	521	784	653	-	-	-	-	-	-	-	-	-	1	2	2	2	4	3
1829	PATNA	20	26	23	7.4	7.7	7.6	581	945	763	-	-	-	0.5	0.5	0.5	-	-	-	2	4	3	4	7	6
1830	MUZAFFARPUR	24	27	26	7.9	8	8.0	846	954	900	-	-	-	0.9	0.9	0.9	-	-	-	2	7	5	4	11	8
1831	MUZAFFARPUR	24	27	26	8	8.1	8.1	850	915	883	-	-	-	1	1	1	-	-	-	1	4	3	2	7	5
1832	BEGUSARAI	22	24	23	8.2	8.2	8.2	568	568	568	-	-	-	0.1	0.1	0.1	-	-	-	4	7	6	11	17	14
1833	BEGUSARAI	22	23	23	8.4	8.4	8.4	452	468	460	-	-	-	0.9	0.9	0.9	-	-	-	8	8	8	14	14	14
1834	PURNEA	21	29	25	7.8	7.8	7.8	362	371	367	-	-	-	1.2	1.2	1.2	-	-	-	8	8	8	14	22	18
1835	PURNEA	22	28	25	7.8	7.9	7.9	362	376	369	-	-	-	1.8	1.8	1.8	-	-	-	13	13	13	17	23	20
1836	BEGUSARAI	22	24	23	7.5	7.8	7.7	472	489	481	-	-	-	2	2	2	-	-	-	4	8	6	13	13	13
1837	BEGUSARAI	23	25	24	7.9	8.1	8.0	424	432	428	-	-	-	0.8	0.8	0.8	-	-	-	11	11	11	21	21	21
1838	MUNGER	21	26	24	7.6	7.6	7.6	458	466	462	-	-	-	1.8	1.8	1.8	-	-	-	8	8	8	13	14	14
1839	MUNGER	22	25	24	8	8.4	8.4	438	442	440	-	-	-	1.6	1.6	1.6	-	-	-	2	4	3	4	7	6
1840	MOTIHARI	25	25	25	8	8	8.0	486	486	486	-	-	-	-	-	-	-	-	-	2	2	2	4	4	4
1841	GAYA	23	26	25	8	8	8.0	756	868	812	-	-	-	1.9	1.9	1.9	-	-	-	11	11	11	22	26	24
1842	GAYA-	24	27	26	8.1	8.1	8.1	504	536	520	-	-	-	1.8	1.8	1.8	-	-	-	1	2	2	2	7	5
1843	RAJGIR	25	28	27	8.1	8.2	8.2	548	552	550	-	-	-	2.1	2.1	2.1	-	-	-	8	9	9	17	21	19
1844	CHAPRA	26	26	26	7.2	8.2	7.7	378	416	397	-	-	-	1.8	1.8	1.8	-	-	-	1	2	2	2	4	3

TABLE 21.12 WATER QUALITY OF GROUND WATER IN WEST BENGAL - 2008

STATION CODE	LOCATIONS	TEMPERATURE °C			pH			CONDUCTIVITY (µmhos/cm)			B.O.D. (mg/l)			NITRATE- N (mg/l)			NITRITE- N (mg/l)			FECAL COLIFORM (MPN/100ml)			TOTAL COLIFORM (MPN/100ml)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
	Water quality criteria				**6.5-8.5**			**< 2250 µmhos/cm**			**< 3 mg/l**									**< 2500 MPN/100ml**			**< 5000 MPN/100ml**		
1766	MINE PIT WATER ASSANSOL, WEST BENGAL	32	32	32	8.1	8.4	8.3	747	775	761	1.1	3	2.1	0.4	0.4	0.4	-	-	-	4	900	452	8	1600	804
1767	DURGAPUR TOWN,NEAR IISCO, BURDWAN	33	33	33	7.4	7.7	7.6	984	988	986	0.2	1	0.6	0.3	0.5	0.4	-	-	-	9	14	12	33	34	34
1768	DURGAPUR TOWN, BURDWAN, WEST BENGAL	28	33	31	6.8	7.7	7.3	512	976	744	0	0.2	0.1	0.7	11.1	5.9	-	-	-	0	8	4	0	13	7
1769	INSIDE HINDUSTAN LIVER FACTORY, HALDIA	30	34	32	7.3	7.4	7.4	2160	2180	2170	0	1.3	0.7	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1770	NEAR IOC REFINERY HALDIA, WEST BENGAL	33	34	33	7.3	7.6	7.5	1646	1838	1742	0.2	0.9	0.6	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1771	KALYANI INDUSTRIAL AREA, NADIA, WEST BENGAL	28	29	28	7.7	7.9	7.8	584	650	617	0.7	0.8	0.8	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1772	BARSAT MUNICIPALITY NORTH 24-P, WEST BENGAL	28	29	28	7.4	7.6	7.5	753	1069	911	0.4	0.8	0.6	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1773	TANGRA, CALCUTTA ,WEST BENGAL	28	32	30	7.5	7.9	7.7	1933	2130	2032	1	1.1	1.1	0.1	0.1	0.1	-	-	-	0	2	1	0	4	2
1774	TOPSIA CALCUTTA, WEST BENGAL	27	28	28	7.7	8.1	7.9	1690	1801	1746	0.4	1	0.7	0.1	0.1	0.1	-	-	-	0	8	4	0	13	7
1775	DHAPA CALCUTTA, WEST BENGAL	28	30	29	7.3	8.2	7.8	1725	1760	1743	0.9	1.6	1.3	0.1	0.1	0.1	-	-	-	2	2	2	4	4	4
1776	GARIA CALCUTTA, WEST BENGAL	27	29	28	7.4	8.5	8.0	977	1020	999	0.4	1.2	0.8	0.1	0.1	0.1	-	-	-	0	4	2	0	8	4
1777	BEHALA CALCUTTA, WEST BENGAL	29	30	30	7.8	8.4	8.1	988	1002	995	1	1.2	1.1	0.1	0.1	0.1	-	-	-	2	2	2	4	8	6
1778	DOMJUR HOWRAH, WEST BENGAL	27	29	28	7.3	7.8	7.6	997	1120	1059	0.8	1	0.9	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1779	DANKUNI (NEAR COAL COMPLEX), WEST BENGAL	28	29	29	7.1	7.7	7.4	990	993	992	0.4	0.9	0.7	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1931	COSSIPORE - NORTH KOLKATA	28	30	29	7.9	8.1	8.0	2380	2420	2400	0.8	2.2	1.5	0.1	0.1	0.1	-	-	-	14	220	117	17	280	149
1932	CENTRAL KOLKATA	28	28	28	7.9	8	8.0	898	1944	1421	0.7	2.3	1.5	0.1	0.1	0.1	-	-	-	0	4	2	2	13	8
1933	NEAR GALVANISATION UNIT, HOWRAH	27	28	28	7.7	7.9	7.8	1194	1303	1249	0.2	2.3	1.3	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1934	CENTRAL HOWRAH-RESIDENTAIL AREA	27	28	28	7.8	7.9	7.9	2370	2470	2420	0.8	1.9	1.4	0.1	0.1	0.1	-	-	-	0	2	1	0	4	2
1935	INSIDE KOLKATA LEATHER COMPLEX	29	30	29	7.8	8.1	8.0	1373	1534	1454	0.4	1.1	0.8	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1936	RESIDENTIAL AREA - SONARPUR	23	27	25	7.7	8.3	8.0	1325	1921	1623	0.4	2	1.2	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1937	RAJARHAT - NEW TOWNSHIP	27	29	28	7.7	7.7	7.7	2070	2250	2160	0.8	1.7	1.3	0.1	0.1	0.1	-	-	-	0	2	1	0	4	2
1938	BSIRHAT MUNICIPALITY	28	32	30	8.5	8.5	8.5	2070	2100	2085	0.4	0.6	0.5	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1939	BARRAKPORE MUNICIPALITY	28	28	28	7.8	8	7.9	386	456	421	0.1	0.2	0.2	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1940	NEAR THE PHOSPHATE COMPANY-RISHRA	29	30	30	7.2	7.9	7.6	757	771	764	0.6	0.9	0.8	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1941	NEAR FLY ASH DUMPING SITE-KUNTIGHAT, BANDEL	28	28	28	7.4	7.7	7.6	461	469	465	0.6	0.9	0.8	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1942	NEAR EXIDE INDUSTRIES-HALDIA	31	33	32	7.3	7.4	7.4	1648	1675	1662	0.2	1.1	0.7	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1943	INSIDE TATA METALIKS, KHARAGPUR	30	31	31	7.8	7.8	7.8	635	637	636	1.4	1.4	1.4	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1944	KHARAGPUR INDUSTRIAL AREA	29	30	30	7.3	7.6	7.5	133	141	137	0.5	1.3	0.9	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0
1945	ENGLISH BAZAR- MALDAH	29	29	29	7.9	8	8.0	490	606	548	0.2	1.5	0.9	0.1	0.1	0.1	-	-	-	0	0	0	0	0	0