



**GOVERNMENT OF MAHARASHTRA  
WATER RESOURCES DEPARTMENT**

**HYDROLOGY PROJECT (SW)  
Executive Engineer, Hydrology Project Division, Nagpur**



**WATER QUALITY LAB LEVEL-II, NAGPUR**

**ANNUAL REPORT YEAR 2011-2012**

**Executive Engineer  
Hydrology Project Division, Nagpur**

## PREFACE

Water is a precious national asset. It is a major constituent of all living beings. Water is available in two basic forms i.e. Surface water and Ground Water.

This report includes water quality data in Godavari Basin & Tapi Basin for the period of June 2011 to May 2012 by the agency M/s. Ashwamedh Engineers & Consultants Co. Op. So. Ltd. as awarded a contract towards Operation and Maintenance of Water Quality Lab Level-II, Nagpur for the said period. The data has been interpreted to know the affected locations.

It is an event of great pleasure to hand over this precise report on analysis of water samples in WQ Laboratory Level . II at Nagpur which is established in Jal Vidnyan Bhavan. It is also a matter of pride to state that this Laboratory is the first in Hydrology Project (SW) to be accredited with ISO 9001:2008 for implementation of Quality Management System (QMS).

This booklet attempts to briefly describe an over view and general conclusion based on the basis of water quality data of water samples collected from selected locations for defined frequencies for the reported period.

It is expected that this booklet will provide an idea in brief about Water Quality Lab. Level -II at Nagpur. Our efforts can always be updated through valuable suggestions.

**(S.S.Chopade)**  
Executive Engineer  
Hydrology Project Division  
Nagpur. ( Maharashtra)

# Annual Report

ing through Water Quality Lab Level-  
**II Nagpur for the Year 2011- 2012**

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# CHAPTER – I

## EXECUTIVE SUMMARY

## CHAPTER-1

### EXECUTIVE SUMMARY

#### **Annual Report On Water Quality Monitoring through Water Quality Lab Level-II, Nagpur for the Year 2011-2012**

##### **1.1 Preamble:**

The water quality monitoring in the area of surface water is performed in order to determine the quality of water. Various parameters are analyzed in the laboratory and 6 parameters are tested at field level. All these tasks recorded are utilized for preparing the Annual Report by performing some specific exercise. This data is considered in order to specify the quality of water at each location. This also helps to determine the pollution level or concentration in each source of water at each station.

##### **1.2 Water Quality Monitoring - Objectives**

Observations of analysis of physical & chemical parameters as per Uniform Protocol for Water Quality Monitoring 2005+ for each location followed by Operation and Maintenance of Water Quality Laboratory Level-II, Nagpur as per Standard Guidelines and mandates including collection, transportation and analysis of samples , data entry in SWDES Software and preparation of the said Annual Report as per specific guidelines issued by Superintending Engineer, Hydrology Project Circle( Collection), Nashik,

##### **1.3 Water Quality Monitoring - Scope**

The Annual Report is prepared for the year 2011-2012. The Table below shows the number of sample analyzed during the reported period. In order to study water quality status station wise, all locations covered under this lab during the year 2011-2012 are considered.

## SAMPLES ANALYSED DURING THE REPORTING PERIOD

Sr. No.	Year	Ground Sample		Baseline Sample		Dam (Reservoir) Sample		Total
		First Round	Second Round	First Round	Second Round	First Round	Second Round	
1	2011-2012	8	95	13	39	4	52	211
Total Samples analyzed during reporting period <b>211</b>								

Seasonal averages of all analyzed parameters are calculated for study of seasonal water quality trend at each location.

### **1.4 Methodology:**

Analysis of Physical and Chemical parameters is done in the laboratory on the basis of Standard Analytical Methods, Instrument Operating Instructions, HIS Manuals, and APHA, 21st Edition 2005.

Data analyzed further validated with prescribed method as per Water Quality Manuals to verify various Ratios manually and is entered in SWDES Software for Water Quality Data Entry. Further the data is sent to State Data Center for further dissemination to user end.

Furthermore to get an idea of about data generated for the period it is decided and instructed to analyze the generated data for the said period in the form of Annual report with the help of various tools in SWDES Software to find out critical parameters and critical locations in the jurisdiction of this Lab.

## Results and Observations

### River Kanhan

The River water quality of River Kanhan is Monitored at two Locations vize, Temburdoh & Mathani. The water quality data reveals that the quality of the water of the River is deteriorating at station Mathani. The colliform bacteria in the water are found in high concentration compared to the specified limits at all stations. In respect to the organic load, the water quality is found to be poor, which can be seen from the higher values of BOD. pH of the water is within the limits of the BIS and CPCB.

### River Wardha

The water quality of River Wardha is Monitored at Four Locations vize, Drugwada, WarudBagaji, SoitDindora & Dhaba. The water quality of River Wardha does not meet the required quality criteria. The Water quality trend shows a high organic pollution at station Dhaba. BOD of Dhaba is found to be more than 2 mg/L during all seasons and is quit high with respect the limit for class-A waterbody 2 mg/L.

The DO of Dhaba found slightly Lower than Normal Limit in all seasons. The BOD at other stations except Drugwada is also found more than 2 mg/L. An increasing trend is found in the BOD at Dhaba when annual average values for last three years are compared. The insufficient DO in the Water body can result in anoxic conditions in the waterbody and can harm the flora and fauna in the region seriously. The alkalinity of The Water is slightly above a BIS (IS 10500: 1993) drinking water standard (desirable) of 200 mg/L at all stations except Drugwada. Also the concentration of colliform bacteria is high at all stations during all seasons and very high during rainy season at stations Dindora and Dhaba.

### River Purna

The water quality of the River Purna is Monitored at three Locations vize, Vishroli, and Manasgaon. The Water quality trend shows river is moderately polluted. BOD in the riverbody has a value more than 2 mg/L at all stations monitored and in all the seasons. DO in the waterbody is found Low during summer season but is within the limits during rest of year. The Bacterial pollution in the water is found to be high enough to cross specified limit by CPCB. The water quality does not fulfill the criteria for safe



### **River Mun**

The water quality of River Mun is Monitored at two Locations Kawatha & Taklikhetri.

The water in the riverbody is also saline in nature. High organic pollution is observed at station Taklikhetri which is indicated by high values of BOD and COD. The bacterial pollution at all stations is high enough to make unsafe for drinking purpose without any conventional treatment.

### **River Penganga**

The Water Quality of the River Penganga is Monitored at Four Locations vize, Kolgaon & Saiphal. The Water of River Penganga shows moderate pollution. The BOD is found more than 2 mg/L at all stations during all seasons. Colliform bacterial density at all stations is higher than the specified standard during all seasons. Alkalinity of the Water is found more than a limit of 200 mg/l specified by BIS The above factors prevents the use of water for drinking without any conventional treatment.

drinking water.

### **River Chandrabhaga**

The water quality of river chandrabhaga was monitored at station Daryapur. The river

Chandrabhaga at Daryapur is grossly polluted. High BOD and COD values are observed during all seasons and particularly during peak summers. This is an indicator of high organic pollution in the riverbody. The high organic contents in the water has resulted in the depletion of DO level below a alarming concentration of 4 ppm; and in some instances during peak summers the values had reached upto 1 ppm. The very low DO during in the water is insufficient for the survival of the aquatic life. The conditions are tending to become anaerobic. The high concentration of colliform bacteria of both faecal and non faecal origin was found very high. This is a strong indicator of urban pollution and discharge of city sewage in the waterbody



## River Wainganga

The water Quality of river Wainganga is monitored at four locations viz. Deori, Kardha, wadsa and Wagholibuti, The Data reveals that, the water Quality of the River does not meet the criteria for class-A waterbody. The BOD at station wadsa and also WagholiBulti are found more than 3 mg/L during most of the year. It shows A higher degree of organic pollution is observed at station Wadsa and WagholiBulti with respect to other Locations and is evidenced by the indicated values of BOD. at station wadsa and WagholiBulti of the year 10-11. Concentration of Colliform bacteria is high in all seasons at three Locations, Deori, Kardha and Wadsa and it makes the water unsafe for drinking purpose. The DO Values at all stations lies above 6 mg/L. The Alkalinity of Location Kardha shows slightly higher than 200 mg/L as compared to other Locations.

## WATER QUALITY OF RESERVOIRS

The Water Quality of Four reservoirs (Dams) namely Pench, Upperwardha, Katepurna and Chapdoh which are used as a source of drinking water is monitored by the water quality Lab Level-II, Nagpur. The BOD of all reservoirs is slightly above the specified limit of 2 mg/L, and at chapdoh it is found slightly higher than at others. Higher values are obtained during summer and may be due to the increase in floral activities during summer. Colliform bacteria are found to be crossing the limit of IS 10500 for drinking water at all stations but it is within the CPCB limits at many instances.

## 1.6 Conclusion

It is observed that, these rivers are polluted to varying extent.

The increasing urbanization and industrialization in the area is affecting the quality of the water to a great extent. The physicochemical as well as bacteriological water quality of these river systems is not satisfactory and this can further deteriorate in the nearby future.

The BOD and COD loading in the waterbody is an evidence of the anthropogenic activities in the catchment of the rivers, which is adversely influencing the water quality.

Biological parameters in all locations contain higher bacterial count is due to the discharge of sewage, drainage waste in to the water sources. The habit of open defecation is a common site on the bank of rivers that consequently floods into the river causing deterioration of the quality of the water. Even increase in human activities discharge bacteria of various type in to the water, which increase the number of count in the water.

## 1.7 Recommendations/Remedial Measures:

- Domestic effluents may be treated and disinfected before discharging.
- Effluents from the non-point sources may be identified. These are required to be collected and treated.
- Use of water of such polluted locations may be useful for tolerant crops and is recommended based on special study.
- Use of direct source water is to be avoided.
- Bathing at such location should be restricted.

## 1.8 Suggestions:

- Create mass awareness in general public regarding surface and ground water quality aspects.
- Educating people about the importance of conservation and restoration of existing sources of water.
- Water quality Annual Report shall be publicly published every year.



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## CHAPTER – II

# INTRODUCTION

## CHAPTER-2

### INTRODUCTION

**1.0** Water is an essential for human life and the presence of reliable source of water is vital factor for the establishment of a community. Apart from its life supporting ability, water also has a potential for spreading ill health and diseases. Thus availability and importance of safe drinking water was realised and practiced thousands of years ago by man. Hence, water quality monitoring becomes a fundamental tool for river basin planning and management. The effective monitoring and management of water quality to safeguard the precious natural riverine system is a challenge for the scientific and engineering communities alike.

#### **2.0 Water Quality Network Layout**

The water quality monitoring of River Godavari and its tributaries and River Tapi and its tributaries flowing through Vidarbha is being carried out by Water Resources Division Nagpur under Hydrology Project since 2001.

In Godavari Basin Water Quality is monitored by Water Resources Division Nagpur at 17 stations and in Tapi Basin at 8 Stations on various rivers flowing through Vidarbha. Also the water quality of 4 reservoirs, which are used as a source of drinking water, is also being monitored by this Division. The stations are classified as baseline, trend and flux stations based on the frequency of sampling and location of stations. Details of Basin and Sub basins in the region are given in **Table 1**.

**Of 17 Water Quality stations on tributaries of Godavari, 12 are base line stations and 5 are trend stations.**

**Where as in Tapi Basin 1 is baseline station and 6 are trend stations.**

**Fig 1** shows Network of Water Quality Monitoring stations of various types in the jurisdiction of Water quality lab level-II under Hydrology Project Division, Nagpur.

#### **3.0 Network Design of river basin**

The network design comprises of monitoring stations which are classified as Baseline, Trend, & Flux Stations. Brief description of each type of stations is given below.

picture of Natural background Condition of a particular  
Baseline stations are positioned in unpolluted areas  
significant. Frequency of Sampling is generally one Sample in  
three months.

**Trend Station:** Trend stations are located on Main River and tributaries where the flow increases by 20%. In case of confluence, Trend Stations are located both on Tributary and main stream of the river before and after confluence. Frequency of sampling is generally 12 times in a year if the area is less than 1 lakh Sq. Km or 24 times in a year if the area is more than 1 lakh Sq. Km.

**Flux Station:** The flux stations are located on immediately upstream of Major River when it is about to cross the state border. These are meant to monitor the total flux of pollutants carried away by the stream.

In the present network there are **13 Baseline and 11 Trend stations**. List is given in

**Table 2.**

**Table 1: Details of the Basin**

Sr. No.	Major Basin	Independent River	Tributary	Sub-Tributary
1.	Godavari	Godavari	Wainganga	Pench Kanhana
			Wardha	
			Penganga	Pus
			Indravati	Bandiya
			Pranhita	
2.	Tapi	Tapi	Purna	Mun Wan Chandrabhaga

**Table 2:**  
**Under Jurisdiction of Water Quality Lab level-II, Nagpur**

Sr. No.	NAME OF STATION	DISTRICT	TAHASIL	NAME OF RIVER
<b>Baseline Stations</b>				
1	Deori	Gondia	Gondia	Wainganga
2.	KamthiKhairi	Nagpur	Parshioni	Pench
3.	Tembhurdoh	Nagpur	Saoner	Kanhan
4.	Wadsachinch	Chandrapur	Wadsa	Wainganga
5.	Wagholibuti	Gadchiroli	Gadchiroli	Wainganga
6.	Petta	Gadchiroli	Ettapalli	Bandia
7.	Damrencha	Gadchiroli	Aheri	Indravati
8.	Mathani	Nagpur	Mouda	Kanhan
9	Kardha	Bhandara	Bhandara	Wainganga
10	Drugwada	Wardha	Ashti	Wardha
11	Saiphall	Yeotmal	Ghatanji	Penganga
12	Khariya	Amravati	Dharni	Tapi
13	Mahagaon	Gadchiroli	Ettapalli	Pranhita
<b>Trend Stations</b>				
14.	Vishroli	Amravati	Chandurbazar	Purna
15.	Dhaba	Chandrapur	Gondpipri	Wardha
16.	WarudBagaji	Amravati	Tiwasa	Wardha
17.	Anantwadi	Yeotmal	Mahagaon	Pus
18.	Kolgaon	Yeotmal	Wuni	Penganga
19.	Soitdindora	Chandrapur	Warora	Wardha
20.	Warkhed	Akola	Telhara	Wan
21.	Daryapur	Amravati	Daryapur	Chandrabhaga
22	Manasgaon	Buldhana	Shegaon	Purna
23.	Kawatha	Akola	Balapur	Mun
24.	TakliKhetri	Akola	Patur	Mun
<b>Reservoirs</b>				
25.	Katepurna	Akola	Barshitakli	Katepurna
26.	Upper Wardha	Amravati	Morshi	Wardha
27.	Pench	Nagpur	Parshioni	Pench
28	Chapdoh	Yeotmal	Arni	Waghadi

## Annual Report of Water Quality Lab Level-II, Nagpur in Analytical Quality Control Exercises

### **1) Within Lab AQC:**

Within Lab AQC conducted in December – 2011.

Samples (Sample A and Sample B) are analysed during the period 02-12-2011 to 24-12-2011.

The overall performance of the Lab stands **100%**.

### **2) Inter Lab AQC:**

i) 27<sup>th</sup> Proficiency Testing (AQC / Water Exercise) conducted by CPCB in September-2011.

Samples received on dated 06-09-2011. Samples analysed during the period 06-09-2011 to 15-09-2011. And the Performance Report received in January-2012. The overall performance of the Lab stands **90 %**.

ii) 28<sup>th</sup> Proficiency Testing (AQC / Water Exercise) conducted by CPCB in February-2012.

Samples received on dated 01-02-2012. Samples analysed during the period 06-02-2012 to 20-02-2012. And the Performance Report received in May-2012. The overall performance of the Lab stands **100 %**.

### **3) Intra Lab AQC:**

Not conducted in this period



## Annual Report for the Period of 2011-2012

### Water Quality Laboratory Level II at Nagpur

#### **Salient Features :-**

##### **1. General Structure of Laboratory:**

1) Sampling Locations as per Water Quality Network covered in this Lab:-28

2) Monthly sample collection: - 32 samples / 19 Samples.

3) Frequency of sampling: - **Trend: .** Monthly  
**Baseline Samples :** Once in Three Months  
**Dam samples:.** Monthly

4) Govt. staff related to Laboratory: -

1. Mr.S.S.Chopade., Executive Engineer
2. Mr.A.K.Hinge, AE-II.
3. Mr. M.M.Dange (AE-II. & Govt. Analyst)
4. Mr. N.L. Kature (C.E.A)

5) Lab operating Agency: - Ashwamedh Engineers & Consultants C.S.L.

- a) Indoor Work .
- 1.Mr. Tanveer A. Ansari. (Chief Analyst)
  2. Mr. Pranali R.Deshmukh. (Senior Analyst)
  - 3.Miss. Rubina R. Khan (Analyst)
  4. Mr. Sanjay Dhobale (Lab. Assistant)

- b) Outdoor Work .
1. Mr. V. H. Hande (Field Chemist)
  2. Mr. J.S.Tale (Field Chemist)

## **2. Scope of Work: Operation and Maintenance of water Quality Laboratory Level-II, Nagpur**

**Outdoor Work** - Surface water sampling and transporting the sample from selected Water Quality network sampling points as per schedule of sampling during the said period.

### **The Surface Water sampling includes:**

- a) Field determination as per standard guideline.
- b) Field parameters to be tested on site & entry to be taken on ID form.
- c) Sample to be transported to laboratory within prescribed time limit.

### **2.1 Indoor Work:**

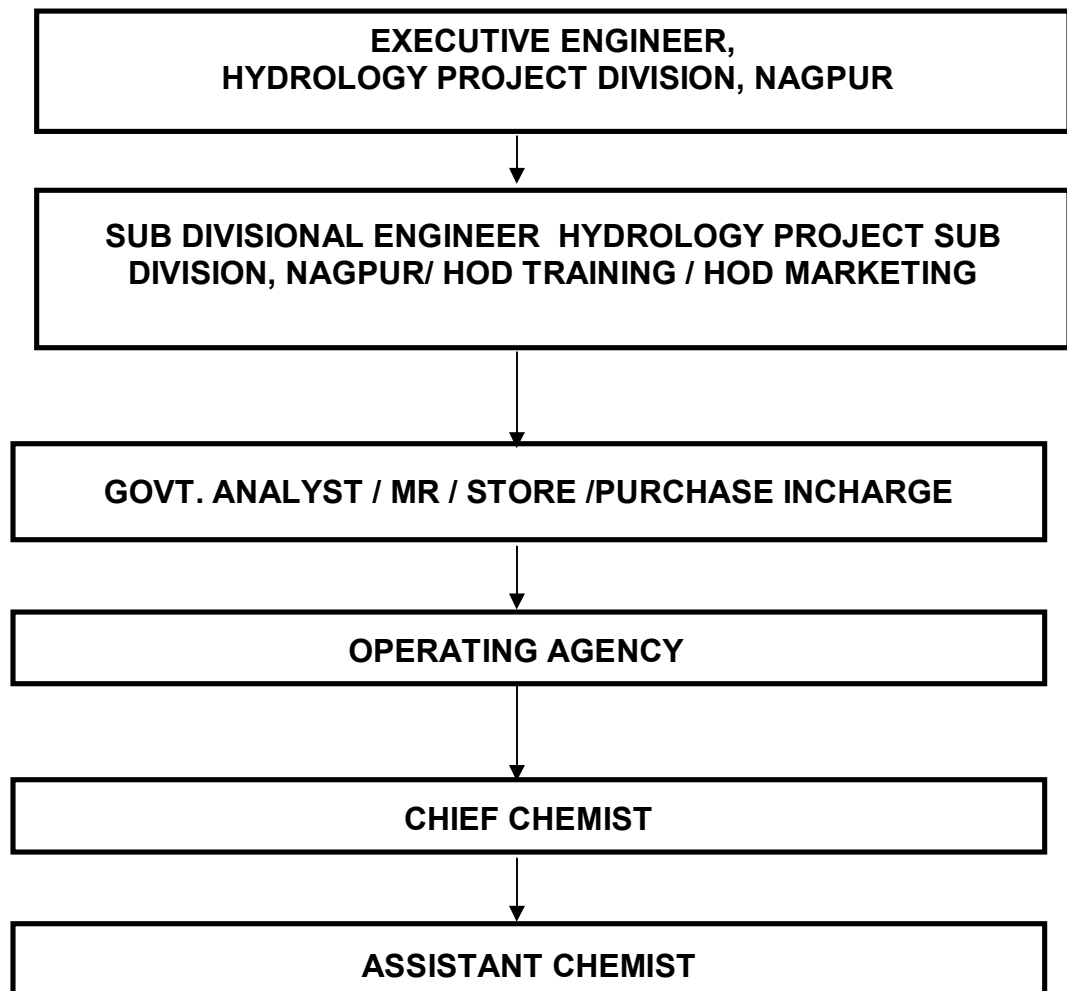
- Day to Day Operation and Maintenance of Water Quality Laboratory Level II.
- The work includes analysis of water samples as per the test procedures.
- Operating the instruments as per specified instruction manual.
- Entry of data in SWDES Software.
- Participating in Analytical Quality Control Exercise (AQC) round.
- i) Within Laboratory AQC ii) Intra Laboratory AQC iii) AQC by CPCB
- The Laboratory staff employed;
  - 1) Chief Chemist: 1 No.
  - 2) Sr. Research Officers: 2 Nos.
  - 3) Research Assistant: 1 No.
  - 4) Lab. Assistant: 1 No.
- The Indoor work also includes keeping data record.
- Log book of Lab equipment
- Preparation of monthly sampling Schedule.
- Keeping sampling record, instruments operation, Laboratory Management, demonstration
- Training to Departmental staff as and when required.

Information to visitors & Customer Satisfaction. Work is carried out as per flow chart.

## PROJECT DIVISION, NAGPUR

### WATER QUALITY LAB, LEVEL – II NAGPUR

#### ORGANISATION CHART



Location covered under the jurisdiction of  
Quality Lab Level-II, Nagpur

Sr. No.	Name of Station	Name of River	Frequency of sampling	No. Of Samples in 2011-2012
Baseline Samples				
1	Deori	Wainganga	Once in three months	4
2.	KamthiKhairi	Pench	Once in three months	4
3.	Tembhurdoh	Kanhan	Once in three months	4
4.	Wadsachinch	Wainganga	Once in three months	4
5.	Wagholibuti	Wainganga	Once in three months	4
6.	Petta	Bandia	Once in three months	4
7.	Damrencha	Indravati	Once in three months	4
8.	Mathani	Kanhan	Once in three months	4
9	Kardha	Wainganga	Once in three months	4
10	Drugwada	Wardha	Once in three months	4
11	Saiphall	Penganga	Once in three months	4
12	Khariya	Tapi	Once in three months	4
13	Mahagaon	Pranhita	Once in three months	4

		of River	Frequency of sampling	No. Of Samples in 2011-2012
<b>Trend Samples</b>				
14.	Vishroli	Purna	Monthly	2
15.	Dhaba	Wardha	Monthly	12
16.	WarudBagaji	Wardha	Monthly	12
17.	Anantwadi	Pus	Monthly	11
18.	Kolgaon	Penganga	Monthly	12
19.	Soitdindora	Wardha	Monthly	12
20.	Warkhed	Wan	Monthly	8
21.	Daryapur	Chandrabhaga	Monthly	9
22.	Manasgaon	Purna	Monthly	3
23.	Kawatha	Mun	Monthly	10
24.	TakliKhetri	Mun	Monthly	12
<b>Reservoir Samples</b>				
25.	Katepurna	Katepurna	twice in a Month	14
26.	Upper Wardha	Wardha	twice in a Month	14
27.	Pench	Pench	twice in a Month	14
28	Chapdoh	Waghadi	twice in a Month	14

**Total No. of Samples collected and analyzed during Reported Period**  
**(June-2011 to May-2012) – 211 Nos.**

## Following Water Quality Parameter at W.Q. Lab Level-II Nagpur

### Trend Samples

Sr. No.	First Round (Once in a year)	Second Round (Rest of the year)
	Parameters	Parameters
1	Colour	Colour
2	Odour	Odour
3	Temperature	Temperature
4	pH	pH
5	Electrical Conductivity	Electrical Conductivity
6	Dissolved Oxygen	Dissolved Oxygen
7	Turbidity	Turbidity
8	Total Dissolved Solids	Total Solids
9	Total Solids	Total Dissolved Solids
10	Suspended Solids	Suspended Solids
11	NH <sub>3</sub> -N	NH <sub>3</sub> -N
12	NO <sub>2</sub>	NO <sub>2</sub>
13	NO <sub>3</sub>	NO <sub>3</sub>
14	Total Phosphorus	Total Phosphorus
15	Biochemical Oxygen Demand (BOD)	Biochemical Oxygen Demand (BOD)
16	Chemical Oxygen Demand (COD)	Chemical Oxygen Demand (COD)
17	Alkalinity	Alkalinity
18	Potassium	Potassium
19	Sodium	Sodium
20	Total Hardness	Total Hardness
21	Calcium	Calcium
22	Magnesium	Magnesium
23	Chlorides	Chlorides
24 & 25	CO <sub>3</sub> , HCO <sub>3</sub>	CO <sub>3</sub> , HCO <sub>3</sub>
26	Total Colliforms	Total coliforms
27	Fecal coliforms	Feacal Colliforms
28	Fluoride	
29	Boron	

## Showing Water Quality Parameter at W.Q. Lab Level-II Nagpur

### Baseline Samples

Sr. No.	First Round ( Once in a year )	Second Round ( Rest of the year )
	Parameters	Parameters
1	Colour	Colour
2	Odour	Odour
3	Temperature	Temperature
4	pH	pH
5	Electrical Conductivity	Electrical Conductivity
6	Dissolved Oxygen	Dissolved Oxygen
7	Turbidity	Total Solids
8	Total Dissolved Solids	Total Dissolved Solids
9	Total Solids	Suspended Solids
10	Suspended Solids	NO <sub>2</sub>
11	NH <sub>3</sub> -N	NO <sub>3</sub>
12	NO <sub>2</sub>	Total Phosphorus
13	NO <sub>3</sub>	Biochemical Oxygen Demand (BOD)
14	Total Phosphorus	Chemical Oxygen Demand (COD)
15	Biochemical Oxygen Demand (BOD)	Alkalinity
16	Chemical Oxygen Demand (COD)	Potassium
17	Alkalinity	Sodium
18	Potassium	Total Hardness
19	Sodium	Calcium
20	Total Hardness	Magnesium
21	Calcium	Chlorides
22	Magnesium	Total coliforms
23	Chlorides	Faecal Colliforms
24 & 25	CO <sub>3</sub> , HCO <sub>3</sub>	CO <sub>3</sub> , HCO <sub>3</sub>
26	Total Colliforms	
27	Fecal coliforms	
28	Fluoride	
29	Boron	



## Showing Water Quality Parameter at W.Q. Lab Level-II Nagpur

### Dam Samples

Sr. No.	First Round ( Once in a year )	Second Round ( Rest of the year )
	Parameters	Parameters
1	Colour	Colour
2	Odour	Odour
3	Temperature	Temperature
4	pH	pH
5	Electrical Conductivity	Electrical Conductivity
6	Dissolved Oxygen	Dissolved Oxygen
7	Turbidity	Total Solids
8	Total Dissolved Solids	Total Dissolved Solids
9	Total Solids	Suspended Solids
10	Suspended Solids	NO <sub>2</sub>
11	NH <sub>3</sub> -N	NO <sub>3</sub>
12	NO <sub>2</sub>	Total Phosphorus
13	NO <sub>3</sub>	Biochemical Oxygen Demand (BOD)
14	Total Phosphorus	Chemical Oxygen Demand (COD)
15	Biochemical Oxygen Demand (BOD)	Alkalinity
16	Chemical Oxygen Demand (COD)	Potassium
17	Alkalinity	Sodium
18	Potassium	Total Hardness
19	Sodium	Calcium
20	Total Hardness	Magnesium
21	Calcium	Chlorides
22	Magnesium	Total coliforms
23	Chlorides	Faecal Colliforms
24 & 25	CO <sub>3</sub> , HCO <sub>3</sub>	CO <sub>3</sub> , HCO <sub>3</sub>
26	Total Colliforms	Total Kjeldahl nitrogen
27	Fecal coliforms	Chlorophyll – A
28	Fluoride	
29	Boron	
30	Total Kjeldahl nitrogen	
31	Chlorophyll – A	



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## CHAPTER – III METHODOLOGY

This laboratory covers Surface Water component which covers Godavari & Tapi Basins and some selected reservoirs.

#### 3.1 Rivers

Water is life and rivers are lifelines. Fortunately almost the entire country is criss-crossed by rivers. Geographical area of the state is divided in five river basins viz. Godavari, Tapi, Narmada, Krishna and west flowing rivers in Konkan region.

#### 3.2 Water Quality Monitoring - Objectives

Observations of analysis of physical & chemical parameters as per Uniform Protocol for Water Quality Monitoring Order 2005+ for each location followed by Operation and Maintenance of Water Quality Laboratory Level-II, Nagpur as per Standard Guidelines and mandates including collection, transportation and analysis of samples, data entry in SWDES Software and preparation of the said Annual Report as per specific guidelines issued by Superintending Engineer, Hydrology Project Circle( Collection), Nashik.

#### 3.3 Methodology:

Analysis of Physical and Chemical parameters is done in the laboratory on the basis of Standard Analytical Methods, Instrument Operating Instructions, HIS Manuals, and APHA, 21st Ed., 2005.

Data analyzed further validated with prescribed method as per Water Quality Manuals to verify various Ratios manually and is entered in SWDES Software for Water Quality Data Entry. Further the data is sent to State Data Center for further dissemination to user end.

Furthermore to get an idea of about data generated for the period it is decided and instructed to analyzed the generated data for the said period in the form of Annual report with the help of various tools in SWDES Software to find out critical parameters and critical locations in the jurisdiction of this Lab.

#### 3.4 Flow Chart

The work of analysis of sample is being monitored on the basis of flow chart generated in the lab as per standard guidelines and analysis of sample is performed as per guidelines of world bank with HIS manuals and APHA, 21 st Ed, 2005 as a standard procedures for analysis of samples.

## ANALYSIS OF HP (REGULAR) WATER SAMPLES



Sampling Source with the help of Depth Sampler

**Treatment:** D.O. Fixing, Preservation of MPN Sample, Colour, Odour Temp, pH, Ec, tested on field, and fill up ID form.

**At Laboratory:** Inward the Sample, Giving the Sr. No. to the sample noted into sample entry register

ID form entry taken into SWEDS Software

Tests are carried out in lab as per Standard Procedures. These tests are : Microbiological test, Chlorophyll-a, Temp, pH, D.O., B.O.D, Ammonia, Nitrate, Nitrite TDS, TSS, C.O.D., Turbidity, Alkalinity, Carbonate & Bicarbonate, Chloride, Fluoride, Boron, Iron, Sodium, Potassium, Total Hardness, Phosphorous, Calcium etc.

Observations & calculations of all Analyzed Parameters are entered in the Data Sheet

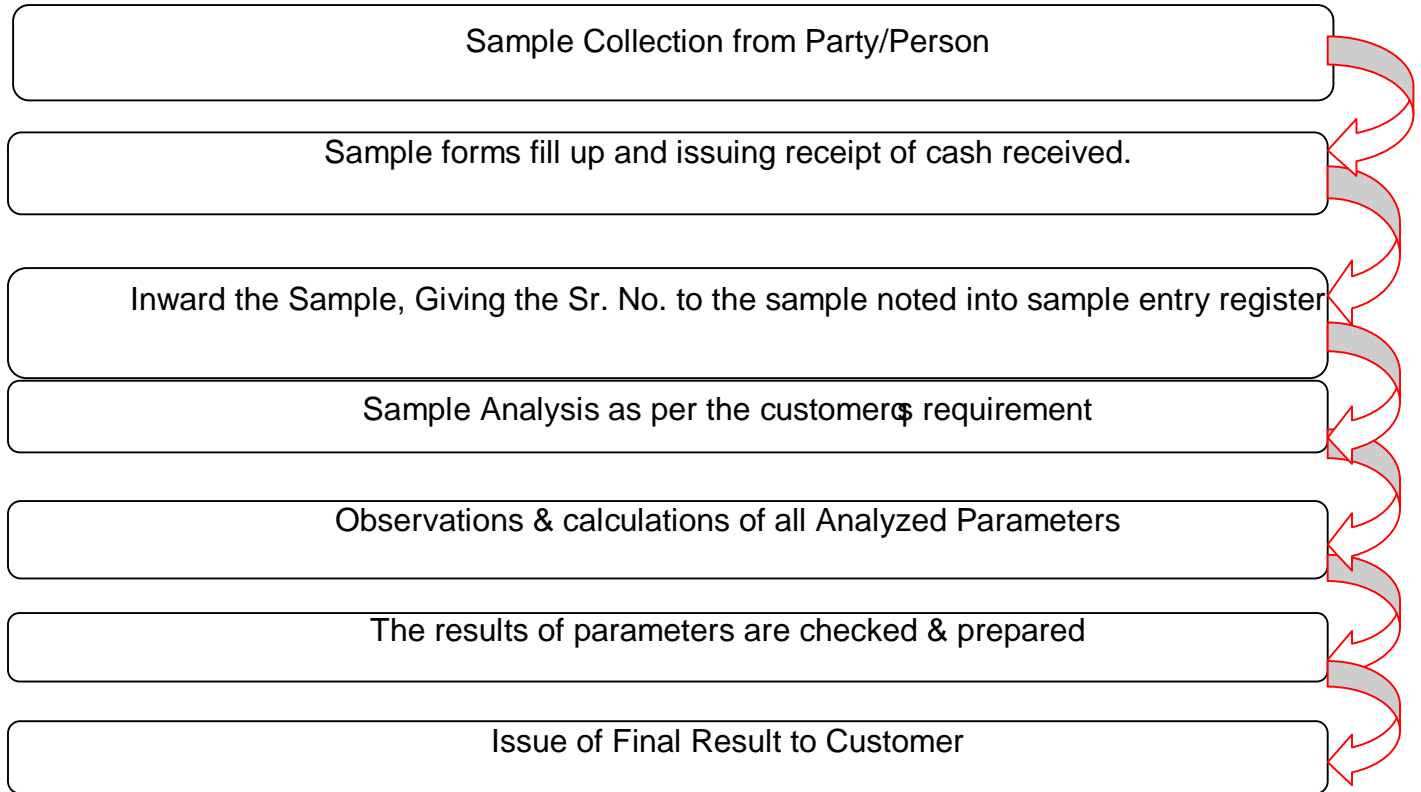
The results of parameters are checked & validated

After Validation Check, all the data is entered in to Data Record and Validation Register

This data is finally entered in to SWEDS Software

Data sent to Executive Engineer, HDP Division, Nashik for further action

## OF ANALYSIS OF PRIVATE (regular) WATER SAMPLE



**of Water Quality samples the following parameters  
zed during the Period 2011-2012**

**ers and the methodology used for the analysis.**

<b>Sr. No.</b>	<b>Parameters</b>	<b>Methodology</b>
1	Determination of Alkalinity Phenolphthalein	Standard. Methods, APHA 21 <sup>st</sup> Edition.
2	Determination of Alkalinity Total	Standard. Methods, APHA 21 <sup>st</sup> Edition.
3	Determination of Aluminium	Standard. Methods, APHA 21 <sup>st</sup> Edition
4	Determination of Bicarbonates	Standard. Methods, APHA 21 <sup>st</sup> Edition
5	Determination of Biochemical Oxygen Demand	Standard. Methods, APHA 21 <sup>st</sup> Edition
6	Determination of Boron	Standard. Methods, APHA 21 <sup>st</sup> Edition
7	Determination of Calcium	Standard. Methods, APHA 21 <sup>st</sup> Edition
8	Determination of Carbonates	Standard. Methods, APHA 21 <sup>st</sup> Edition
9	Determination of Chemical Oxygen Demand	Standard. Methods, APHA 21 <sup>st</sup> Edition
10	Determination of Chlorides	Standard. Methods, APHA 21 <sup>st</sup> Edition
11	Determination of Chlorophyll . A	Standard. Methods, APHA 21 <sup>st</sup> Edition
12	Determination of Faecal Coliforms (MPN)	Standard. Methods, APHA 21 <sup>st</sup> Edition
13	Determination of Total Coliforms ( MPN )	Standard. Methods, APHA 21 <sup>st</sup> Edition
14	Determination of Colour	Standard. Methods, APHA 21 <sup>st</sup> Edition
15	Determination of Dissolved Oxygen	Standard. Methods, APHA 21 <sup>st</sup> Edition
16	Determination of Conductivity	Standard. Methods, APHA 21 <sup>st</sup> Edition
17	Determination of Fluorides	Standard. Methods, APHA 21 <sup>st</sup> Edition
18	Determination of Hardness	Standard. Methods, APHA 21 <sup>st</sup> Edition
19	Determination of Iron	Standard. Methods, APHA 21 <sup>st</sup> Edition
20	Determination of Magnesium	Standard. Methods, APHA 21 <sup>st</sup> Edition
21	Determination of Manganese	Standard. Methods, APHA 21 <sup>st</sup> Edition
22	Determination of Ammonia Nitrogen	Standard. Methods, APHA 21 <sup>st</sup> Edition
23	Determination of Nitrates	Standard. Methods, APHA 21 <sup>st</sup> Edition
24	Determination of Nitrite	Standard. Methods, APHA 21 <sup>st</sup> Edition



	Parameters	Methodology
25	Determination of Organic Nitrogen	Standard. Methods, APHA 21 <sup>st</sup> Edition
26	Determination of Total Oxidised Nitrogen	Standard. Methods, APHA 21 <sup>st</sup> Edition
27	Determination of Odour	Standard. Methods, APHA 21 <sup>st</sup> Edition
28	Determination of pH	Standard. Methods, APHA 21 <sup>st</sup> Edition
29	Determination of Ortho Phosphates	Standard. Methods, APHA 21 <sup>st</sup> Edition
30	Determination of Total Phosphates	Standard. Methods, APHA 21 <sup>st</sup> Edition
31	Determination of Potassium	Standard. Methods, APHA 21 <sup>st</sup> Edition
32	Determination of Silica	Standard. Methods, APHA 21 <sup>st</sup> Edition
33	Determination of Sodium	Standard. Methods, APHA 21 <sup>st</sup> Edition
34	Determination of Suspended Solids- TSS	Standard. Methods, APHA 21 <sup>st</sup> Edition
35	Determination of Total Solids- TS	Standard. Methods, APHA 21 <sup>st</sup> Edition
36	Determination of Dissolved Solids- TDS	Standard. Methods, APHA 21 <sup>st</sup> Edition
37	Determination of Sulphates	Standard. Methods, APHA 21 <sup>st</sup> Edition
38	Determination of Temperature	Standard. Methods, APHA 21 <sup>st</sup> Edition
39	Determination of Turbidity	Standard. Methods, APHA 21 <sup>st</sup> Edition
42	Determination of Free Carbon dioxide	Standard. Methods, APHA 21 <sup>st</sup> Edition
41	Determination of Phenols	Standard. Methods, APHA 21 <sup>st</sup> Edition
42	Determination of Chlorine , Residual	Standard. Methods, APHA 21 <sup>st</sup> Edition
43	Determination of Permanganate Value/ Oxygen Absorbed/ Tidy's Test	Standard. Methods, APHA 21 <sup>st</sup> Edition
44	Determination of Oil & Grease	Standard. Methods, APHA 21 <sup>st</sup> Edition
45	Determination of Acidity	Standard. Methods, APHA 21 <sup>st</sup> Edition
46	Analysis Results (Expression)	Standard. Methods, APHA 21 <sup>st</sup> Edition
47	Data Record and Validation	Standard. Methods, APHA 21 <sup>st</sup> Edition
48	Waste Disposal	HP Approved





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# CHAPTER – IV

## RESULT & OBSERVATIONS

#### 4.1 RESULTS AND OBSERVATIONS

The water quality monitoring in the area of surface water is performed in order to determine the quality of water. Various parameters are analyzed in the laboratory and 6 parameters are tested at field level. All these tasks recorded are utilized for preparing the Annual Report by performing some specific exercise. This data is considered in order to specify the quality of water at each location. This also helps to determine the pollution level or concentration in each source of water at each station.

#### 4.2 Water Quality status- Station wise Exercise

In order to study water quality status station wise, all locations covered under this lab during the year 2010-2011 are considered. Seasonal averages of all analyzed parameters are calculated for study of seasonal water quality trend at each location.

#### 4.3 Objectives

Observations of all physical & chemical parameters are analysed for each location individually & interpretation of data is done to identify seasonal trend. Also critical parameters are identified at every location, including finding out the probable causes behind it at every location and every parameter.

## Summary & Graphs (2011-2012)

DATA ABSTRACT FOR RIVER WAINGANGA FOR 2011-2012					
Station: Deori					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.2	8.3	8.4
2	EC	µmhos/cm	371.0	318.0	576.0
3	DO	mg/L	6.2	6.8	7.0
4	BOD	mg/L	3.4	3.3	2.8
5	COD	mg/L	13.0	12.0	9.0
6	TDS	mg/L	230.0	197.0	340.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	192.0	182.0	248.0
8	Chloride	mg/L	26.0	14.5	52.0
9	Calcium (as Ca)	mg/L	33.6	34.4	48.0
10	Magnesium (as Mg)	mg/L	8.8	10.0	11.7
11	Total coliforms	MPN/100 ml	33.0	240.5	46.0
12	Faecal coliforms	MPN/100 ml	11.0	109.0	17.0
Station: Kardha					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.3	8.3
2	EC	µmhos/cm	359.5	514.0	346.0
3	DO	mg/L	6.3	7.1	6.9
4	BOD	mg/L	3.5	2.8	3.0
5	COD	mg/L	14.0	8.0	11.0
6	TDS	mg/L	219.0	318.0	214.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	188.0	264.0	196.0
8	Chloride	mg/L	19.0	30.0	13.0
9	Calcium (as Ca)	mg/L	37.6	60.8	38.4
10	Magnesium (as Mg)	mg/L	7.8	21.4	13.6
11	Total coliforms	MPN/100 ml	373.0	12.0	110.0
12	Faecal coliforms	MPN/100 ml	173.5	0.0	33.0



Station: WadsaChinch					
Unit	Season			Mean	Mean
	Monsoon	Winter	Summer		
	Mean	Mean	Mean		
1	pH	-	8.3	8.4	8.2
2	EC	µmhos/cm	320.0	325.0	345.0
3	DO	mg/L	6.5	6.8	6.6
4	BOD	mg/L	3.4	2.8	3.0
5	COD	mg/L	13.0	10.0	9.0
6	TDS	mg/L	199.0	202.0	202.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	172.0	184.0	176.0
8	Chloride	mg/L	17.0	17.0	21.0
9	Calcium (as Ca)	mg/L	33.2	32.0	28.8
10	Magnesium (as Mg)	mg/L	10.9	12.6	15.1
11	Total coliforms	MPN/100 ml	189.5	21.0	150.0
12	Faecal coliforms	MPN/100 ml	92.0	5.0	63.0
Station: WagholiButti					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.3
2	EC	µmhos/cm	321.0	304.0	269.0
3	DO	mg/L	6.3	7.0	6.5
4	BOD	mg/L	3.7	3.2	3.1
5	COD	mg/L	13.5	12.0	10.0
6	TDS	mg/L	198.0	190.0	160.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	176.0	176.0	140.0
8	Chloride	mg/L	19.0	15.0	15.0
9	Calcium (as Ca)	mg/L	34.4	28.8	25.6
10	Magnesium (as Mg)	mg/L	9.2	11.7	11.7
11	Total coliforms	MPN/100 ml	269.5	7.0	47.0
12	Faecal coliforms	MPN/100 ml	116.5	0.0	17.0
DATA ABSTRACT FOR RIVER KANHAN FOR 2011-2012					
Station: Temburdoh					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.3	8.3
2	EC	µmhos/cm	364.5	345.0	617.0
3	DO	mg/L	6.4	7.2	6.9
4	BOD	mg/L	3.4	2.9	2.9
5	COD	mg/L	12.5	10.0	8.0
6	TDS	mg/L	225.0	210.0	382.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	196.0	192.0	356.0
8	Chloride	mg/L	19.0	17.0	26.0
9	Calcium (as Ca)	mg/L	35.2	37.6	64.8
10	Magnesium (as Mg)	mg/L	11.4	18.0	15.1
11	Total coliforms	MPN/100 ml	318.5	17.0	26.0



			MPN/100 ml	111.0	0.0	11.0
			<b>Station: Mathani</b>			
<b>No.</b>		<b>Unit</b>	<b>Season</b>			
			<b>Monsoon</b>	<b>Winter</b>	<b>Summer</b>	
			<b>Mean</b>	<b>Mean</b>	<b>Mean</b>	
1	<b>pH</b>	-	8.4	8.4	8.2	
2	<b>EC</b>	µmhos/cm	400.5	489.0	478.0	
3	<b>DO</b>	mg/L	6.2	6.9	6.8	
4	<b>BOD</b>	mg/L	4.0	3.2	2.9	
5	<b>COD</b>	mg/L	16.0	10.0	9.0	
6	<b>TDS</b>	mg/L	239.0	296.0	290.0	
7	<b>Alkalinity</b>	mg/L as CaCO <sub>3</sub>	210.0	236.0	252.0	
8	<b>Chloride</b>	mg/L	18.0	28.0	30.0	
9	<b>Calcium (as Ca)</b>	mg/L	48.0	52.8	40.0	
10	<b>Magnesium (as Mg)</b>	mg/L	10.7	18.5	17.5	
11	<b>Total coliforms</b>	MPN/100 ml	325.5	24.0	70.0	
12	<b>Faecal coliforms</b>	MPN/100 ml	133.5	11.0	26.0	
<b>DATA ABSTRACT FOR RIVER PENCH FOR 2011-2012</b>						
<b>Station: Kamptikhairi</b>						
<b>Sr. No.</b>	<b>Parameter</b>	<b>Unit</b>	<b>Season</b>			
			<b>Monsoon</b>	<b>Winter</b>	<b>Summer</b>	
			<b>Mean</b>	<b>Mean</b>	<b>Mean</b>	
1	<b>pH</b>	-	8.4	8.4	8.4	
2	<b>EC</b>	µmhos/cm	347.5	458.0	426.0	
3	<b>DO</b>	mg/L	6.4	7.0	7.1	
4	<b>BOD</b>	mg/L	3.1	3.0	3.1	
5	<b>COD</b>	mg/L	12.0	11.0	10.0	
6	<b>TDS</b>	mg/L	212.0	284.0	268.0	
7	<b>Alkalinity</b>	mg/L as CaCO <sub>3</sub>	178.0	268.0	236.0	
8	<b>Chloride</b>	mg/L	19.0	28.0	22.0	
9	<b>Calcium (as Ca)</b>	mg/L	38.0	64.8	44.8	
10	<b>Magnesium (as Mg)</b>	mg/L	12.9	15.1	14.6	
11	<b>Total coliforms</b>	MPN/100 ml	610.0	26.0	40.0	
12	<b>Faecal coliforms</b>	MPN/100 ml	235.5	5.0	17.0	



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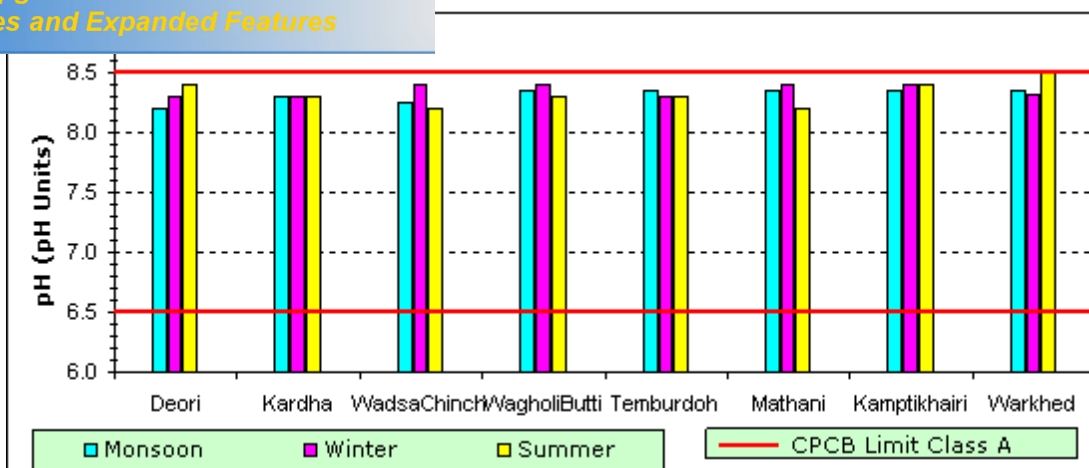
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## WATER QUALITY DATA FOR RIVER WAN FOR 2011-2012

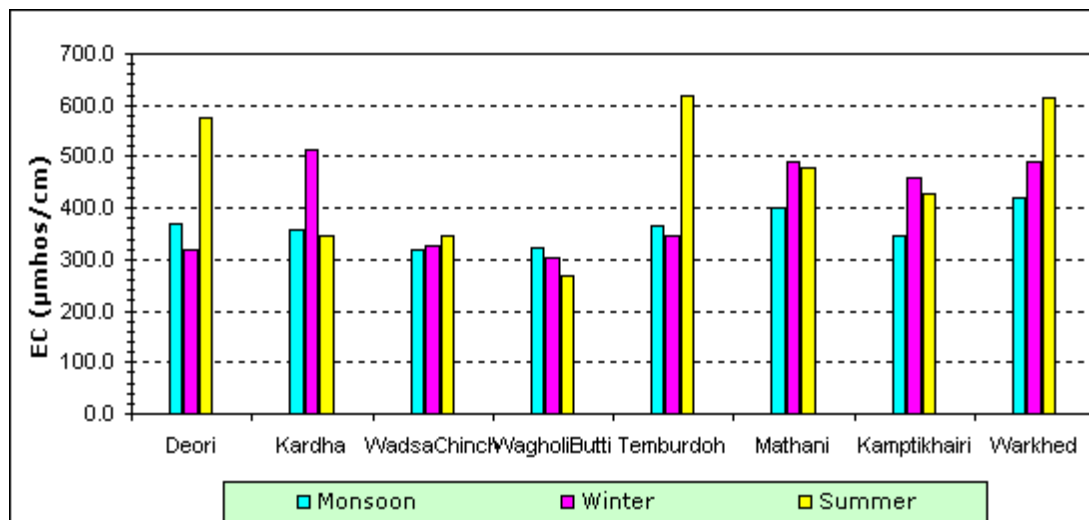
Station: Warkhed

		Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.3	8.5
2	EC	µmhos/cm	418.5	490.6	613.0
3	DO	mg/L	6.2	7.1	6.4
4	BOD	mg/L	3.9	3.0	3.6
5	COD	mg/L	15.5	10.4	17.0
6	TDS	mg/L	250.0	295.2	376.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	216.0	242.0	292.0
8	Chloride	mg/L	22.0	27.8	44.0
9	Calcium (as Ca)	mg/L	40.4	57.8	55.2
10	Magnesium (as Mg)	mg/L	13.1	13.3	19.9
11	Total coliforms	MPN/100 ml	1360.0	98.4	240.0
12	Faecal coliforms	MPN/100 ml	480.0	32.4	79.0

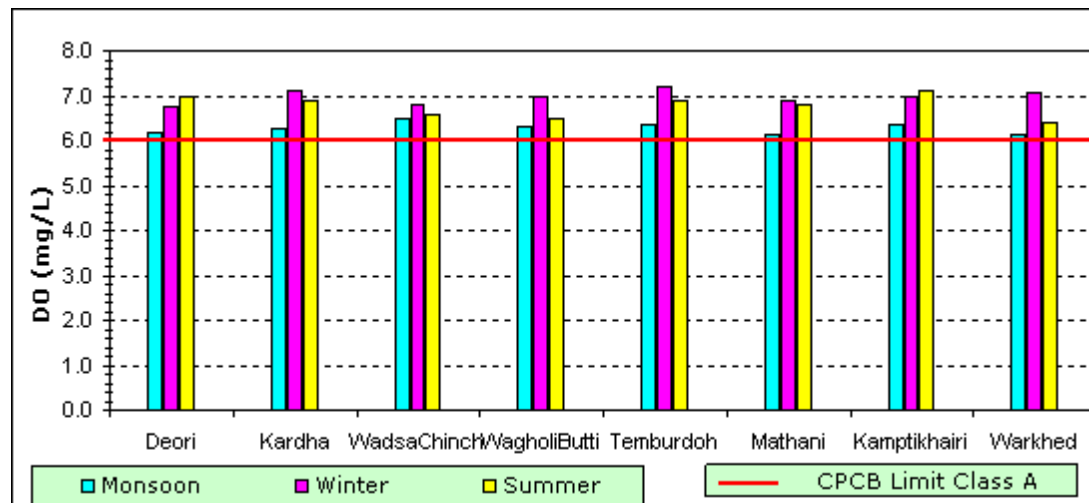
### Variation in pH for the year 2011-2012



### Graph Showing Variation in EC for the year 2011-2012



### Graph Showing Variation in Dissolved Oxygen for the year 2011-2012





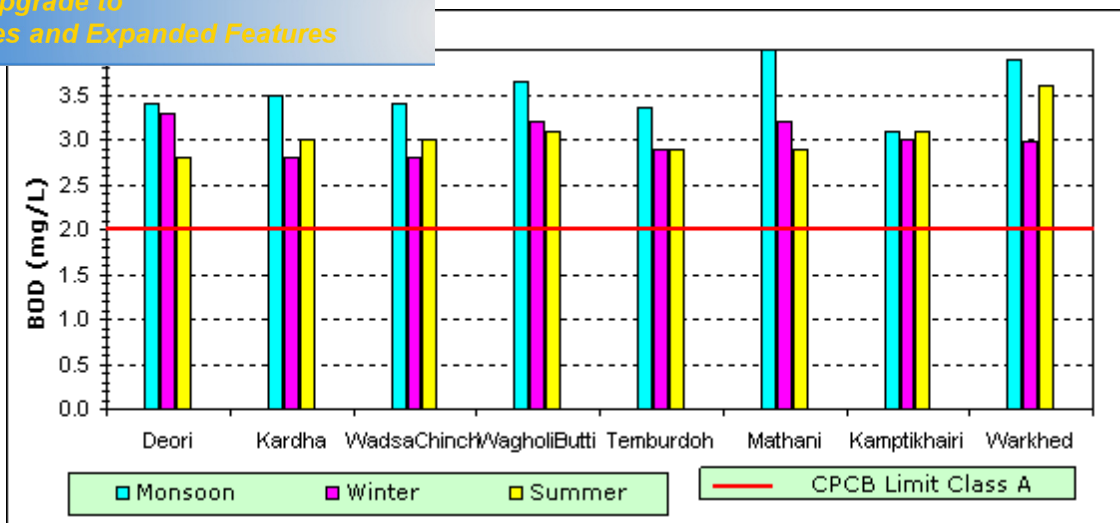


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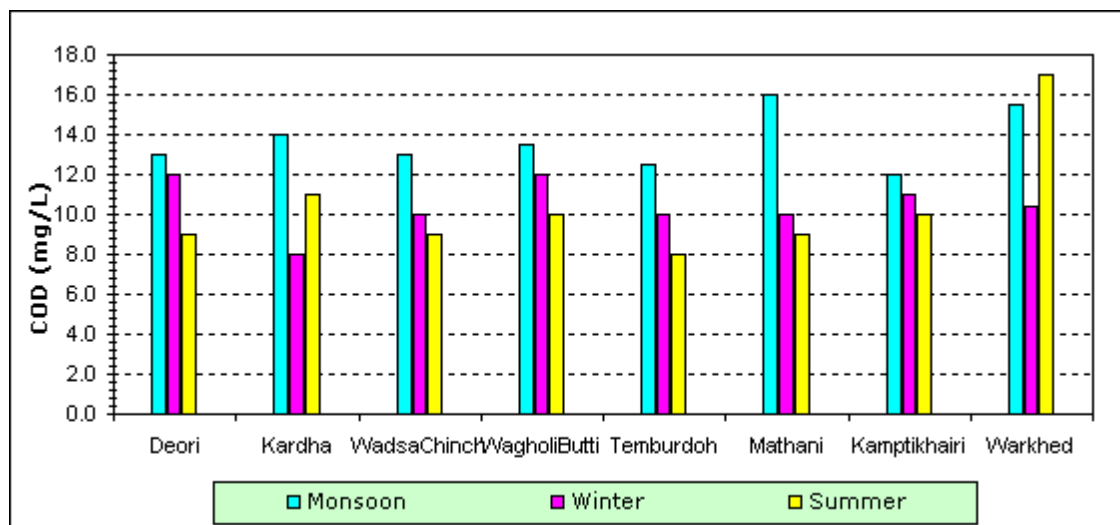
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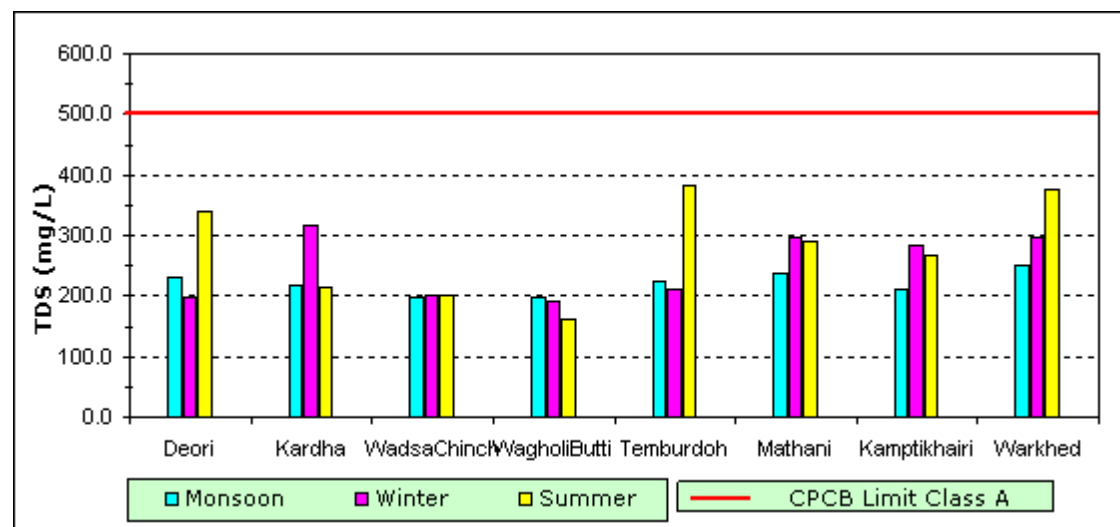
**Variation in BOD for the year 2011-2012**



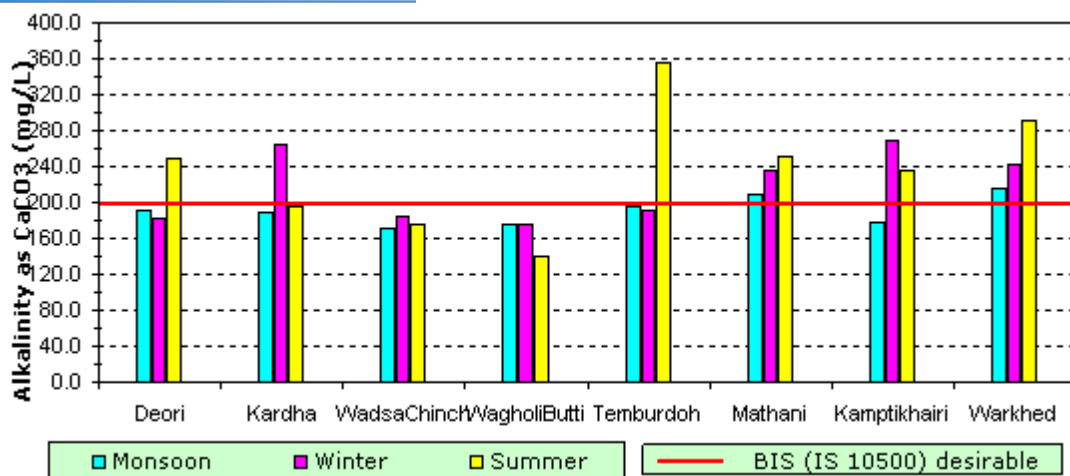
**Graph Showing Variation in COD for the year 2011-2012**



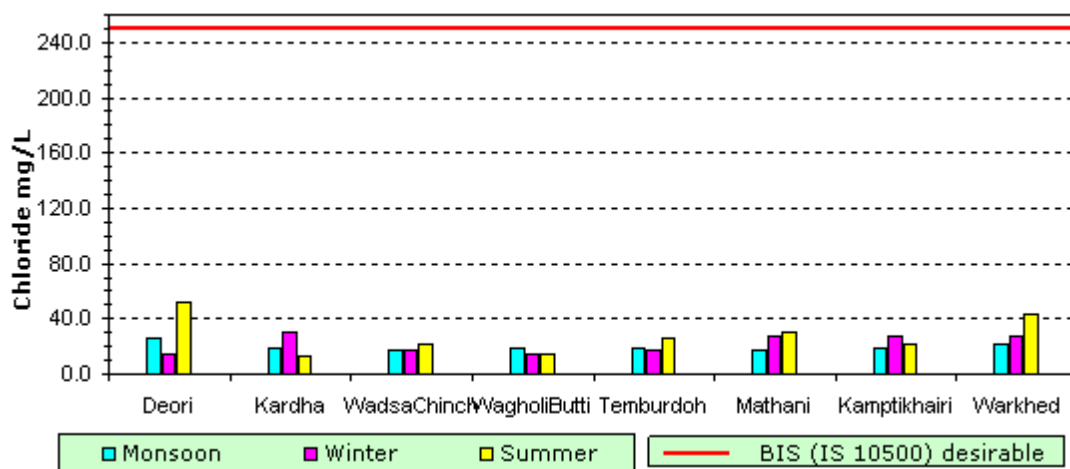
**Graph Showing Variation in TDS for the year 2011-2012**



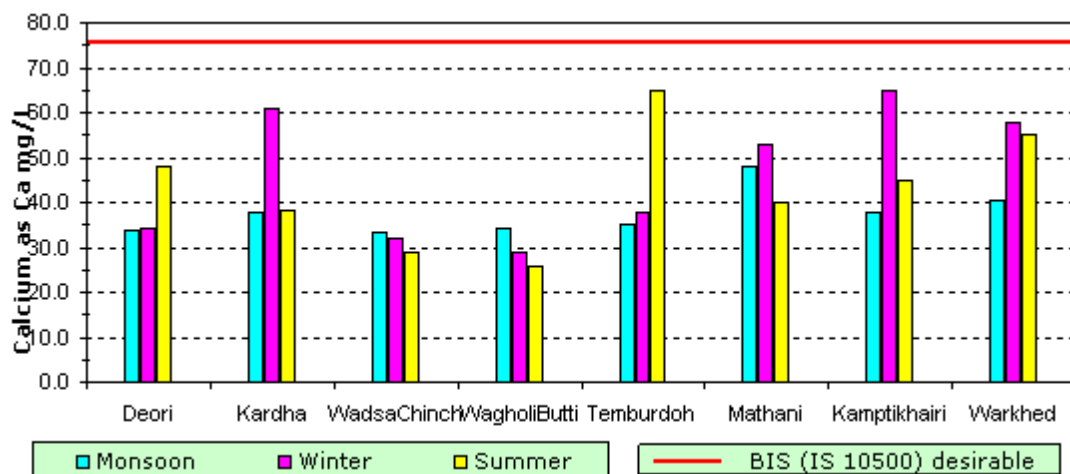
**Graph Showing Variation in Alkalinity for the year 2011-2012**



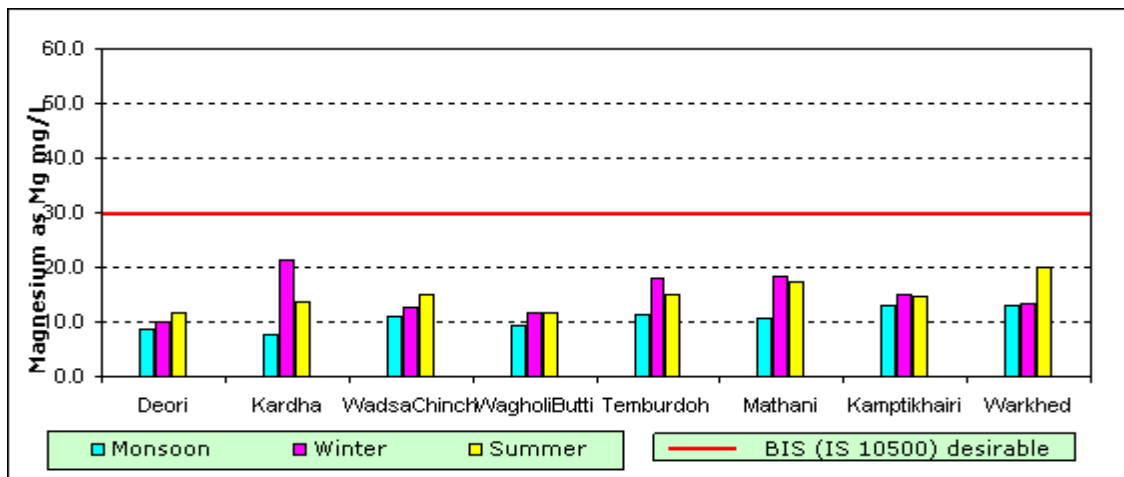
**Graph Showing Variation in Chloride for the year 2011-2012**



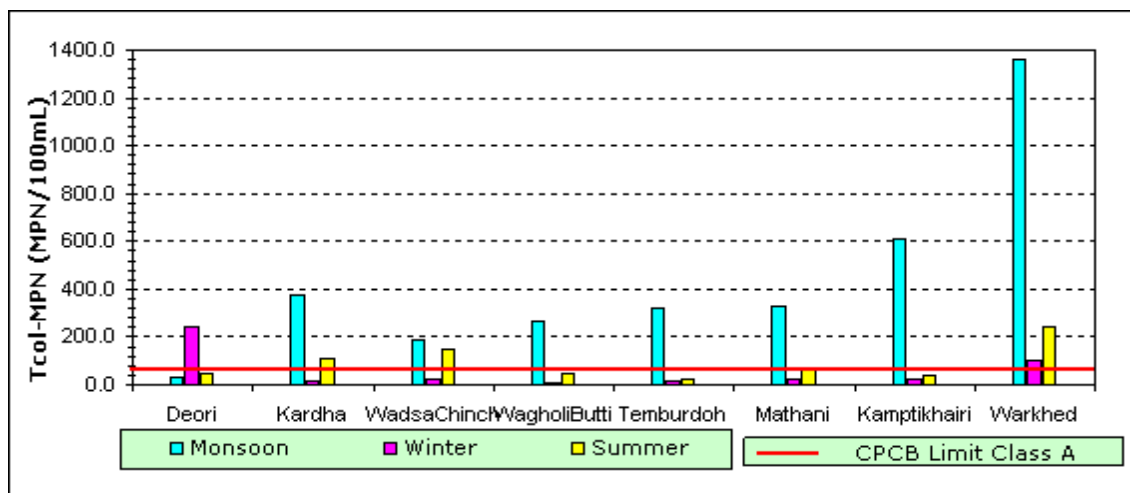
**Graph Showing Variation in Calcium as Ca for the year 2011-2012**



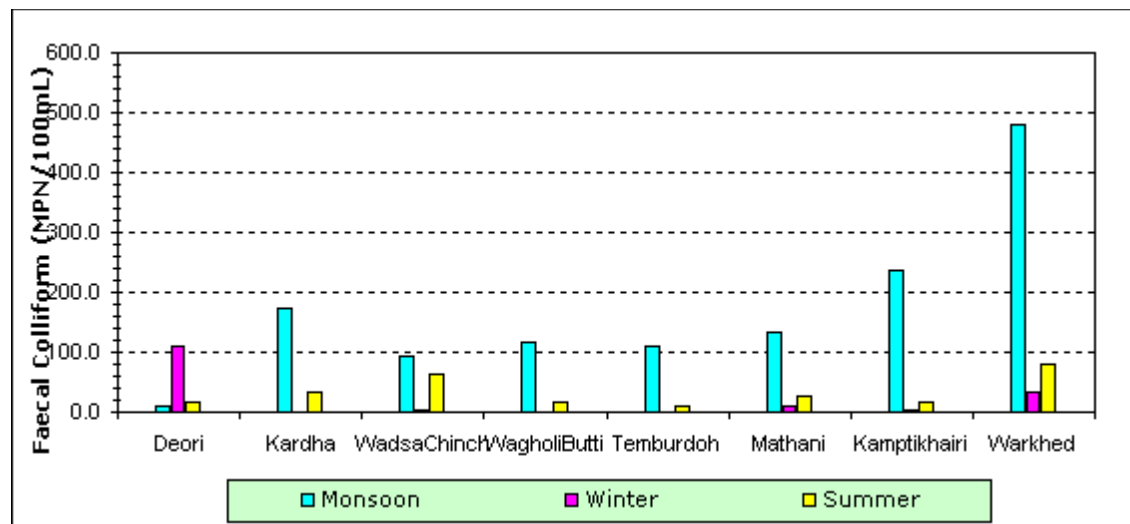
**in Magnesium as Mg for the year 2011-2012**



**Graph Showing Variation in Total Colliforms for the year 2011-2012**



**Graph Showing Variation in Faecal Colliforms for the year 2011-2012**



# CT FOR RIVER PURNA FOR 2011-2012

## Station: Manasgaon

		Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4		
2	EC	µmhos/cm	514.7		
3	DO	mg/L	6.4		
4	BOD	mg/L	3.9		
5	COD	mg/L	13.7		
6	TDS	mg/L	318.7		
7	Alkalinity	mg/L as CaCO <sub>3</sub>	258.7		
8	Chloride	mg/L	40.0		
9	Calcium (as Ca)	mg/L	47.5		
10	Magnesium (as Mg)	mg/L	18.5		
11	Total coliforms	MPN/100 ml	870.0		
12	Faecal coliforms	MPN/100 ml	344.0		

## Station: Vishroli

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3		
2	EC	µmhos/cm	296.0		
3	DO	mg/L	6.5		
4	BOD	mg/L	3.4		
5	COD	mg/L	12.5		
6	TDS	mg/L	183.0		
7	Alkalinity	mg/L as CaCO <sub>3</sub>	166.0		
8	Chloride	mg/L	16.0		
9	Calcium (as Ca)	mg/L	30.8		
10	Magnesium (as Mg)	mg/L	10.0		
11	Total coliforms	MPN/100 ml	450.0		
12	Faecal coliforms	MPN/100 ml	180.0		

# DATA ABSTRACT FOR RIVER MUN FOR 2011-2012

## Station: Kawatha

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.3	8.4
2	EC	µmhos/cm	375.3	350.4	361.0
3	DO	mg/L	6.4	7.0	7.0
4	BOD	mg/L	3.3	3.0	3.2
5	COD	mg/L	12.3	11.8	13.0
6	TDS	mg/L	233.0	212.0	220.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	203.0	184.8	188.0
8	Chloride	mg/L	24.5	16.6	18.0
9	Calcium (as Ca)	mg/L	36.8	40.2	38.4
10	Magnesium (as Mg)	mg/L	10.9	13.8	10.7
11	Total coliforms	MPN/100 ml	312.5	44.4	84.0
12	Faecal coliforms	MPN/100 ml	160.8	14.8	26.0

Station: Taklikhetri					
Unit			Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.3	8.4
2	EC	µmhos/cm	379.0	378.6	534.7
3	DO	mg/L	6.3	7.1	6.4
4	BOD	mg/L	4.0	3.0	3.4
5	COD	mg/L	14.5	10.8	14.0
6	TDS	mg/L	230.5	228.4	326.7
7	Alkalinity	mg/L as CaCO <sub>3</sub>	195.0	189.6	256.0
8	Chloride	mg/L	26.5	21.0	43.3
9	Calcium (as Ca)	mg/L	32.6	44.3	48.0
10	Magnesium (as Mg)	mg/L	13.0	8.2	18.8
11	Total coliforms	MPN/100 ml	637.5	144.8	131.0
12	Faecal coliforms	MPN/100 ml	279.8	41.8	43.7

#### DATA ABSTRACT FOR RIVER CHANDRABHAGA FOR 2011-2012

Station: Daryapur					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.4
2	EC	µmhos/cm	461.7	431.0	573.0
3	DO	mg/L	6.1	6.6	6.6
4	BOD	mg/L	4.1	3.5	3.4
5	COD	mg/L	14.7	12.8	15.0
6	TDS	mg/L	279.3	265.2	354.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	228.0	224.8	268.0
8	Chloride	mg/L	38.0	22.2	48.0
9	Calcium (as Ca)	mg/L	39.7	53.0	57.6
10	Magnesium (as Mg)	mg/L	19.9	13.1	16.5
11	Total coliforms	MPN/100 ml	1996.7	105.0	280.0
12	Faecal coliforms	MPN/100 ml	706.7	39.8	79.0

#### DATA ABSTRACT FOR RIVER TAPI FOR 2011-2012

Station: Kharia					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.5	8.4
2	EC	µmhos/cm	477.5	773.0	430.0
3	DO	mg/L	6.4	6.6	7.0
4	BOD	mg/L	3.6	4.0	3.1
5	COD	mg/L	13.5	18.0	10.0
6	TDS	mg/L	287.0	448.0	252.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	240.0	292.0	232.0
8	Chloride	mg/L	27.5	80.0	23.0
9	Calcium (as Ca)	mg/L	48.8	56.0	30.4
10	Magnesium (as Mg)	mg/L	14.1	21.4	22.4
11	Total coliforms	MPN/100 ml	490.0	8.0	210.0
12	Faecal coliforms	MPN/100 ml	172.0	0.0	63.0



# **FOR RIVER PENGANGA FOR 2011-2012**

## **Station: KolgaonGod**

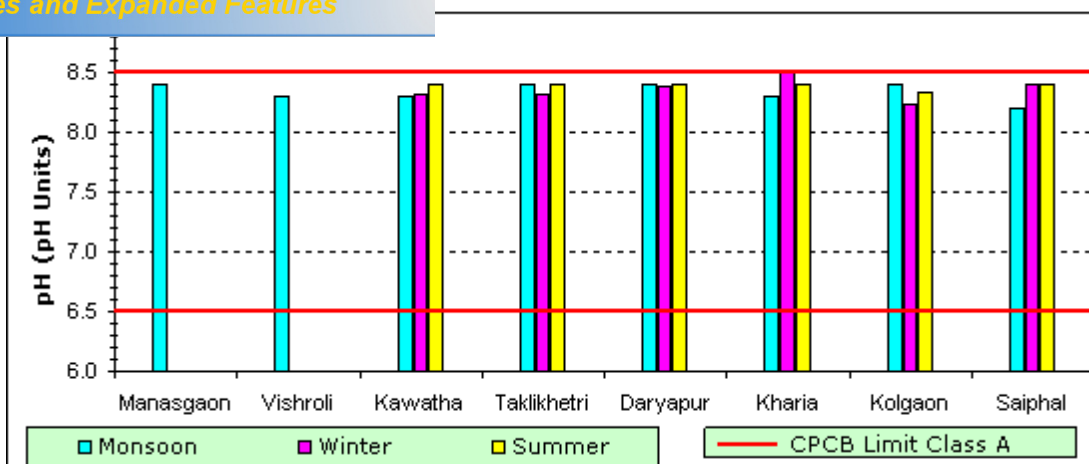
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.2	8.3
2	EC	µmhos/cm	398.5	465.2	525.3
3	DO	mg/L	6.2	6.7	6.7
4	BOD	mg/L	3.7	3.2	3.2
5	COD	mg/L	12.5	13.0	12.0
6	TDS	mg/L	243.0	282.0	320.7
7	Alkalinity	mg/L as CaCO <sub>3</sub>	219.0	243.2	265.3
8	Chloride	mg/L	24.3	21.6	42.7
9	Calcium (as Ca)	mg/L	37.4	53.1	38.4
10	Magnesium (as Mg)	mg/L	16.3	17.7	19.4
11	Total coliforms	MPN/100 ml	1100.8	95.6	62.0
12	Faecal coliforms	MPN/100 ml	442.8	36.6	23.3

## **Station: Saiphal**

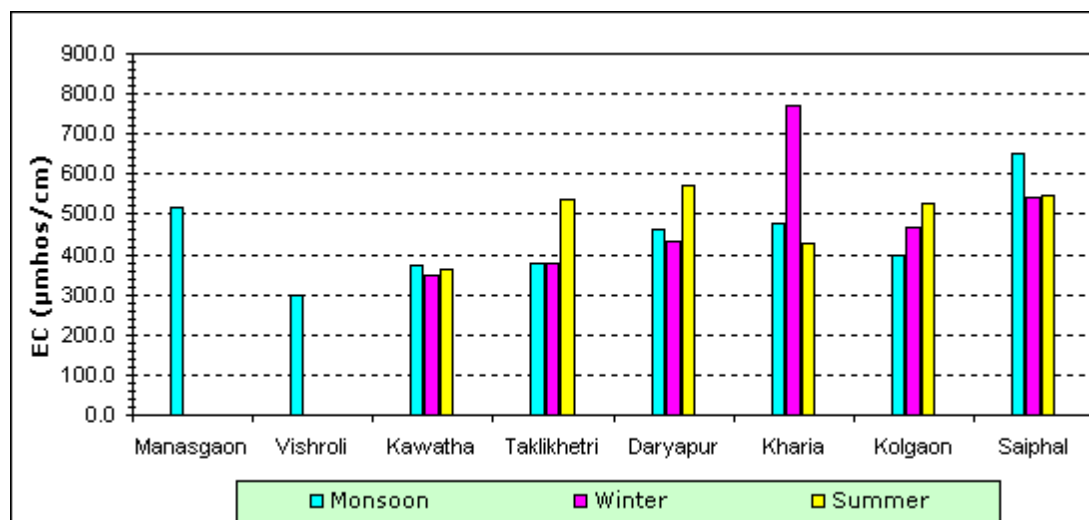
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.2	8.4	8.4
2	EC	µmhos/cm	649.5	541.0	547.0
3	DO	mg/L	6.2	6.8	6.8
4	BOD	mg/L	3.7	3.8	3.4
5	COD	mg/L	13.0	15.0	12.0
6	TDS	mg/L	392.0	330.0	340.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	296.0	272.0	304.0
8	Chloride	mg/L	58.5	34.0	38.0
9	Calcium (as Ca)	mg/L	55.2	60.8	40.0
10	Magnesium (as Mg)	mg/L	21.6	20.4	15.6
11	Total coliforms	MPN/100 ml	432.0	26.0	79.0
12	Faecal coliforms	MPN/100 ml	135.5	7.0	22.0



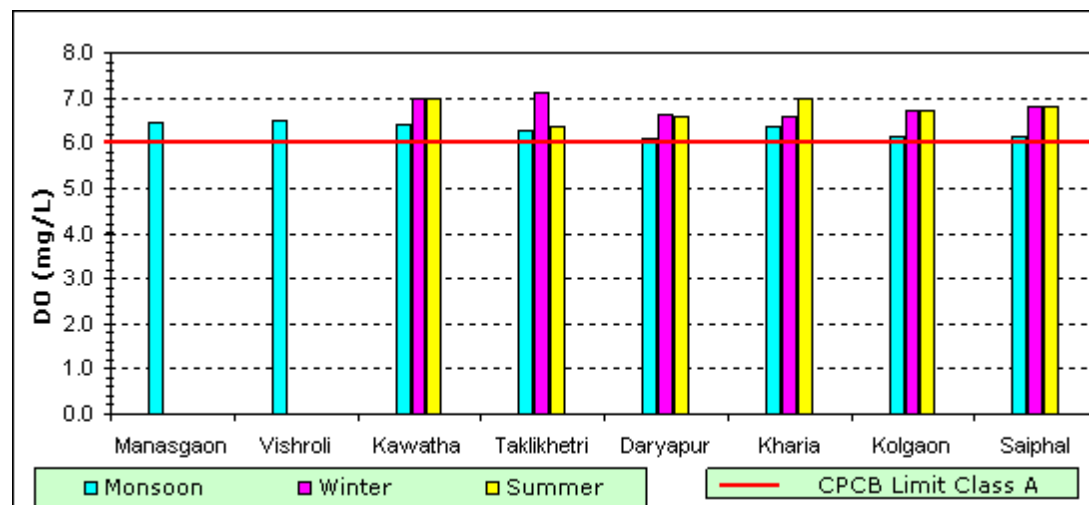
Variation in pH for the year 2011-2012



Graph Showing Variation in EC for the year 2011-2012

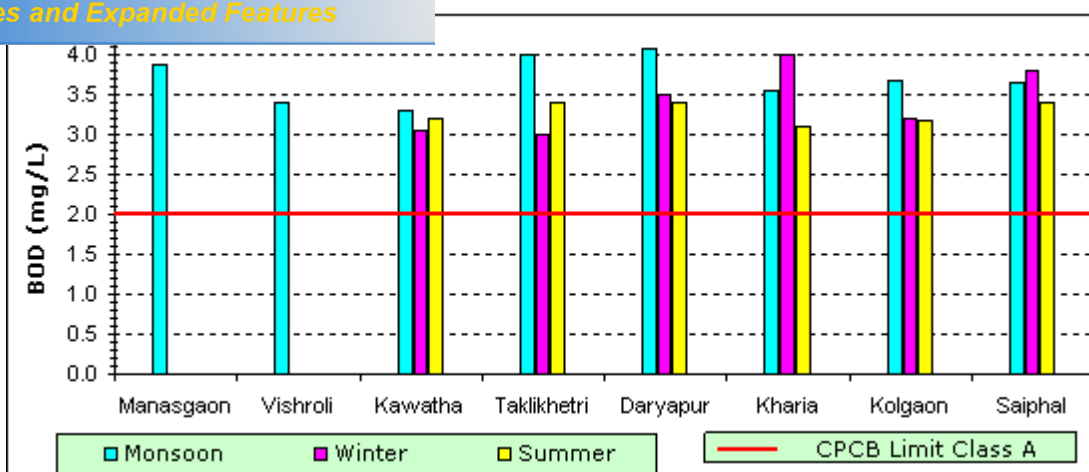


Graph Showing Variation in Dissolved Oxygen for the year 2011-2012

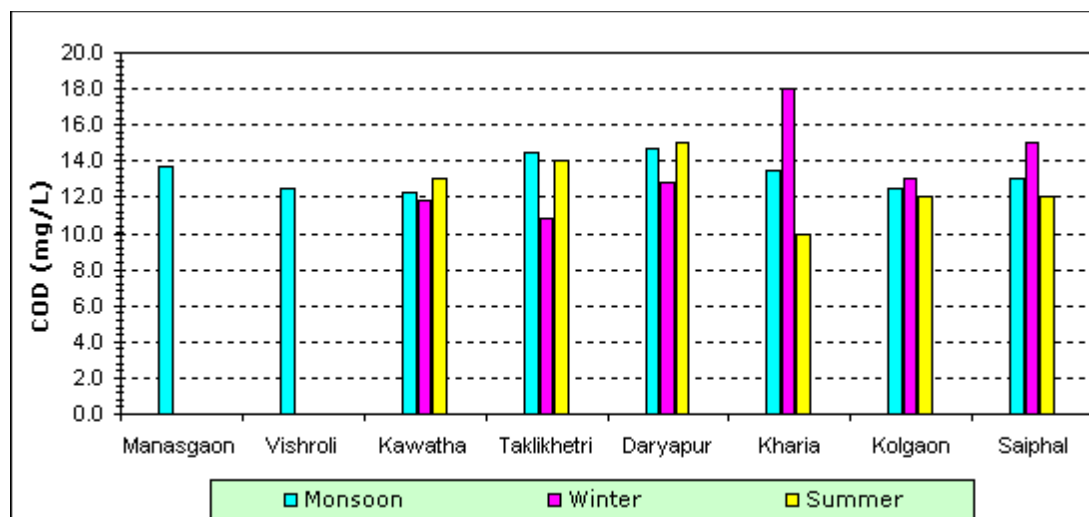




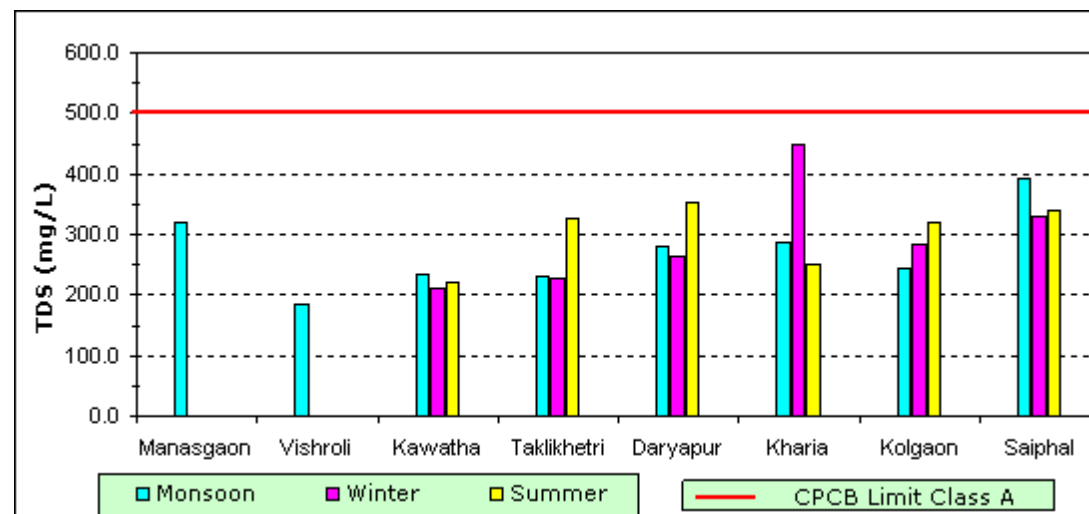
**Variation in BOD for the year 2011-2012**



**Graph Showing Variation in COD for the year 2011-2012**



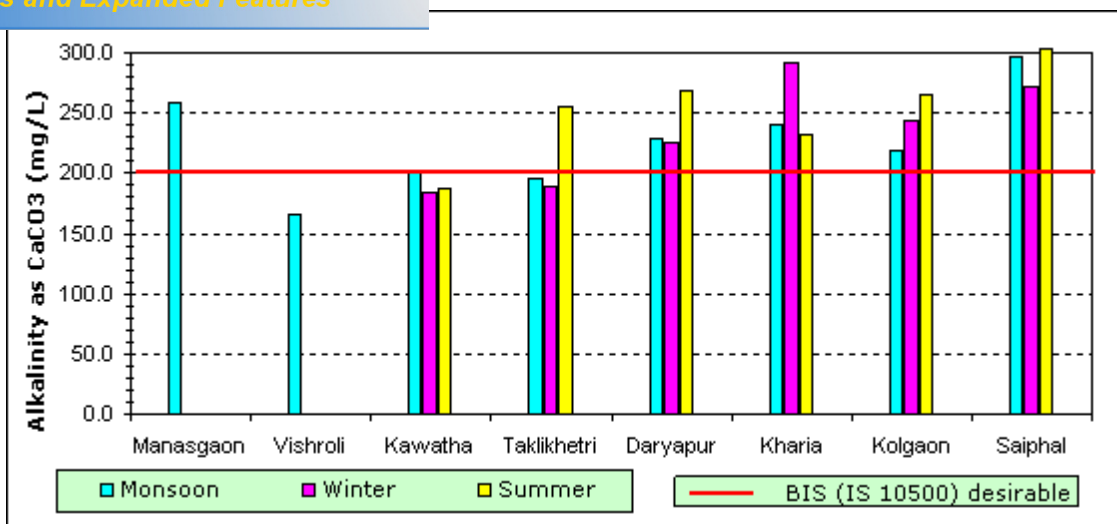
**Graph Showing Variation in TDS for the year 2011-2012**



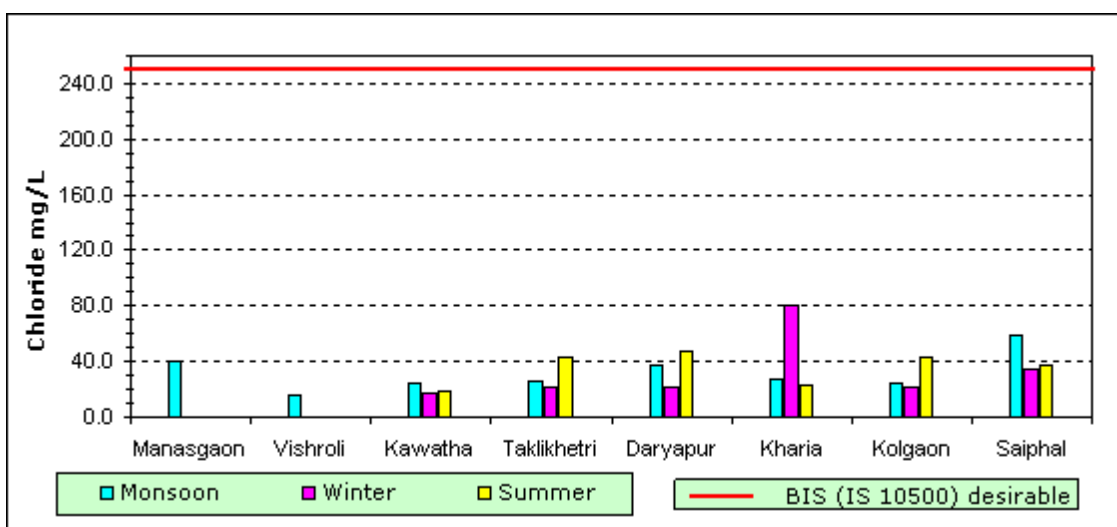




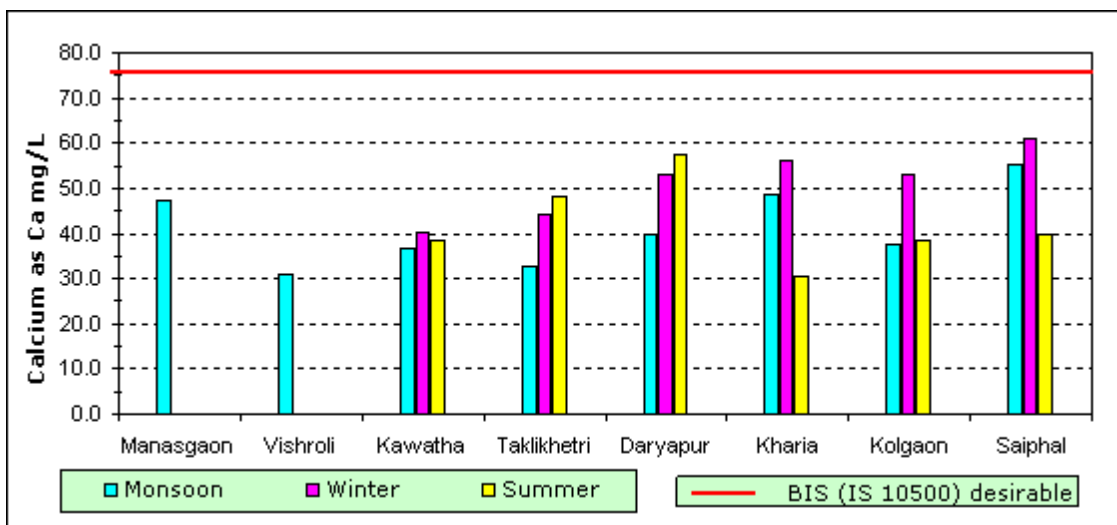
ation in Alkalinity for the year 2011-2012



Graph Showing Variation in Chloride for the year 2011-2012

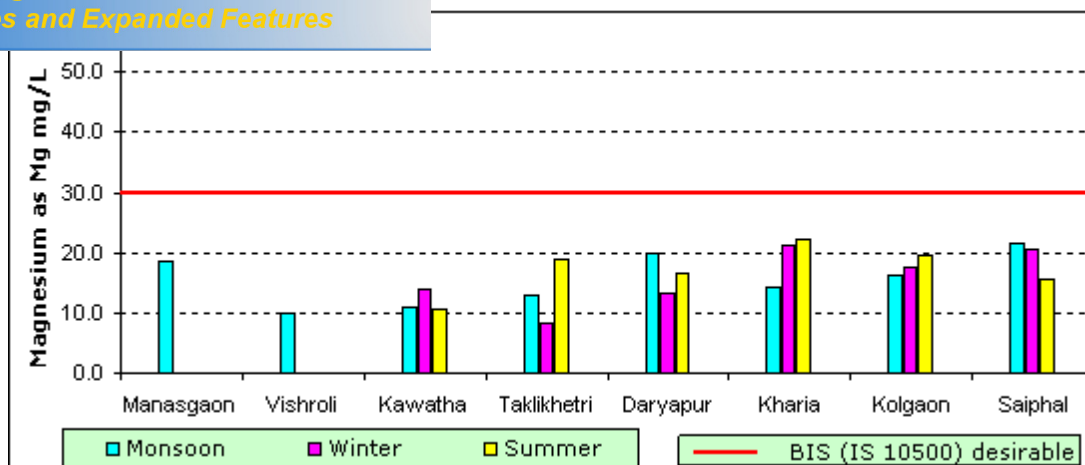


Graph Showing Variation in Calcium as Ca for the year 2011-2012

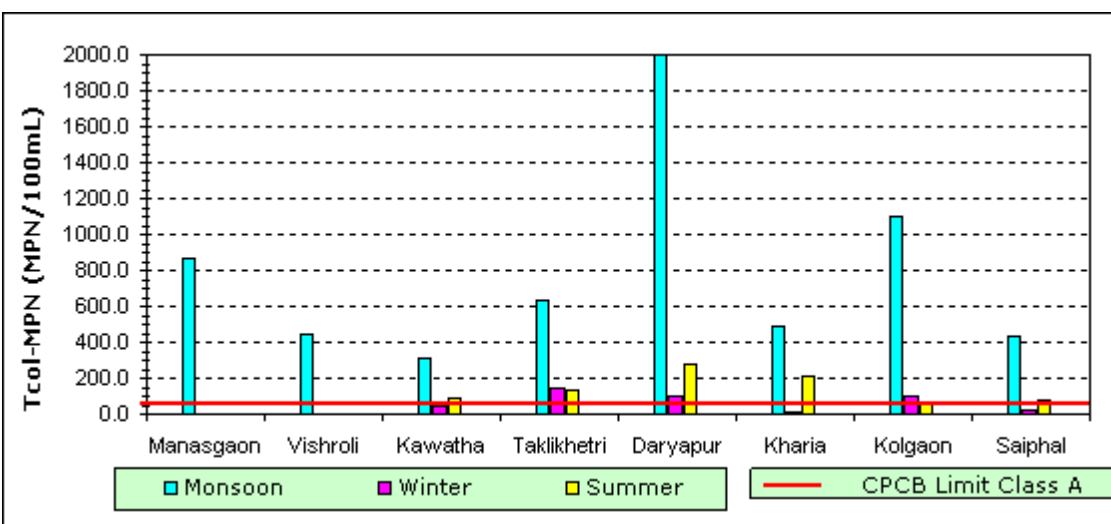




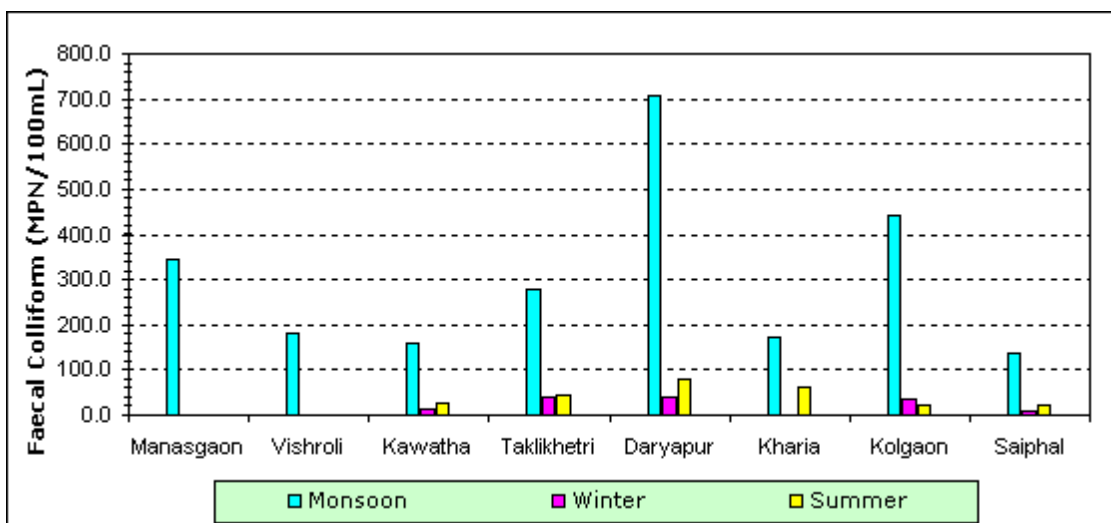
**Graph Showing Variation in Magnesium as Mg for the year 2011-2012**



**Graph Showing Variation in Total Colliforms for the year 2011-2012**



**Graph Showing Variation in Faecal Colliforms for the year 2011-2012**





# **REPORT FOR RIVER WARDHA FOR 2011-2012**

## **Station: Drugwada**

No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.3	8.3
2	EC	µmhos/cm	287.5	422.0	390.0
3	DO	mg/L	6.2	6.8	7.2
4	BOD	mg/L	3.3	2.8	2.9
5	COD	mg/L	13.0	9.0	10.0
6	TDS	mg/L	179.0	262.0	226.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	150.0	232.0	204.0
8	Chloride	mg/L	18.0	22.0	16.0
9	Calcium (as Ca)	mg/L	29.2	47.2	40.0
10	Magnesium (as Mg)	mg/L	12.2	21.9	14.6
11	Total coliforms	MPN/100 ml	856.0	40.0	210.0
12	Faecal coliforms	MPN/100 ml	247.5	11.0	49.0

## **Station: WarudBagaji**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.3	8.4
2	EC	µmhos/cm	413.0	362.2	484.3
3	DO	mg/L	6.5	7.0	6.3
4	BOD	mg/L	3.3	3.0	3.6
5	COD	mg/L	11.0	10.4	14.7
6	TDS	mg/L	252.0	222.0	294.7
7	Alkalinity	mg/L as CaCO <sub>3</sub>	200.0	195.2	234.7
8	Chloride	mg/L	28.8	18.8	37.3
9	Calcium (as Ca)	mg/L	39.6	38.9	40.3
10	Magnesium (as Mg)	mg/L	11.4	13.7	19.9
11	Total coliforms	MPN/100 ml	691.8	65.6	60.0
12	Faecal coliforms	MPN/100 ml	234.8	24.2	23.3

## **Station: SoitDindora**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.3
2	EC	µmhos/cm	425.5	439.8	461.7
3	DO	mg/L	6.2	7.0	6.6
4	BOD	mg/L	4.1	3.0	3.2
5	COD	mg/L	15.5	12.0	12.0
6	TDS	mg/L	253.5	265.2	281.3
7	Alkalinity	mg/L as CaCO <sub>3</sub>	212.0	229.6	228.0
8	Chloride	mg/L	26.8	22.2	35.3
9	Calcium (as Ca)	mg/L	43.6	50.6	36.8
10	Magnesium (as Mg)	mg/L	13.6	14.3	18.3
11	Total coliforms	MPN/100 ml	1089.8	106.8	110.0
12	Faecal coliforms	MPN/100 ml	444.3	51.2	31.7

Station: Dhaba					
Unit	Season				
	Monsoon	Winter	Summer		
	Mean	Mean	Mean		
1	pH	-	8.4	8.4	8.4
2	EC	µmhos/cm	447.8	530.0	648.7
3	DO	mg/L	5.8	6.5	6.3
4	BOD	mg/L	4.3	3.3	4.2
5	COD	mg/L	16.8	12.2	17.3
6	TDS	mg/L	278.5	316.4	398.7
7	Alkalinity	mg/L as CaCO <sub>3</sub>	229.0	257.6	280.0
8	Chloride	mg/L	32.0	34.4	71.3
9	Calcium (as Ca)	mg/L	41.6	52.2	49.1
10	Magnesium (as Mg)	mg/L	18.8	17.3	21.9
11	Total coliforms	MPN/100 ml	1119.3	201.6	230.0
12	Faecal coliforms	MPN/100 ml	366.0	64.0	72.3

#### DATA ABSTRACT FOR RIVER PUS FOR 2011-2012

Station: Anantwadi					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.3	8.4
2	EC	µmhos/cm	643.0	523.2	565.0
3	DO	mg/L	6.3	7.0	6.7
4	BOD	mg/L	3.6	2.9	3.4
5	COD	mg/L	14.0	9.8	13.5
6	TDS	mg/L	384.5	319.2	339.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	265.0	272.8	272.0
8	Chloride	mg/L	58.5	31.6	40.0
9	Calcium (as Ca)	mg/L	62.4	59.5	47.2
10	Magnesium (as Mg)	mg/L	17.5	16.0	26.0
11	Total coliforms	MPN/100 ml	759.3	131.2	24.5
12	Faecal coliforms	MPN/100 ml	319.0	44.6	9.5

#### DATA ABSTRACT FOR RIVER PRANHITA FOR 2011-2012

Station: Mahagaon					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.6	8.4	8.4
2	EC	µmhos/cm	469.0	373.0	473.0
3	DO	mg/L	6.3	6.8	6.8
4	BOD	mg/L	3.7	3.2	3.0
5	COD	mg/L	15.0	11.0	11.0
6	TDS	mg/L	279.0	226.0	294.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	206.0	196.0	244.0
8	Chloride	mg/L	37.5	16.0	39.0
9	Calcium (as Ca)	mg/L	42.4	40.0	27.2
10	Magnesium (as Mg)	mg/L	13.6	7.3	20.4
11	Total coliforms	MPN/100 ml	411.0	70.0	120.0
12	Faecal coliforms	MPN/100 ml	140.5	22.0	33.0



# **FOR RIVER INDRAVATI FOR 2011-2012**

## **Station: Damrencha**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.2	8.3
2	EC	µmhos/cm	115.0	119.5	158.0
3	DO	mg/L	6.3	7.2	6.8
4	BOD	mg/L	3.2	2.8	3.0
5	COD	mg/L	11.0	9.0	11.0
6	TDS	mg/L	70.0	73.0	94.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	56.0	64.0	84.0
8	Chloride	mg/L	9.0	8.5	6.0
9	Calcium (as Ca)	mg/L	12.8	12.8	17.6
10	Magnesium (as Mg)	mg/L	4.4	3.6	4.4
11	Total coliforms	MPN/100 ml	34.0	354.0	79.0
12	Faecal coliforms	MPN/100 ml	17.0	110.0	22.0

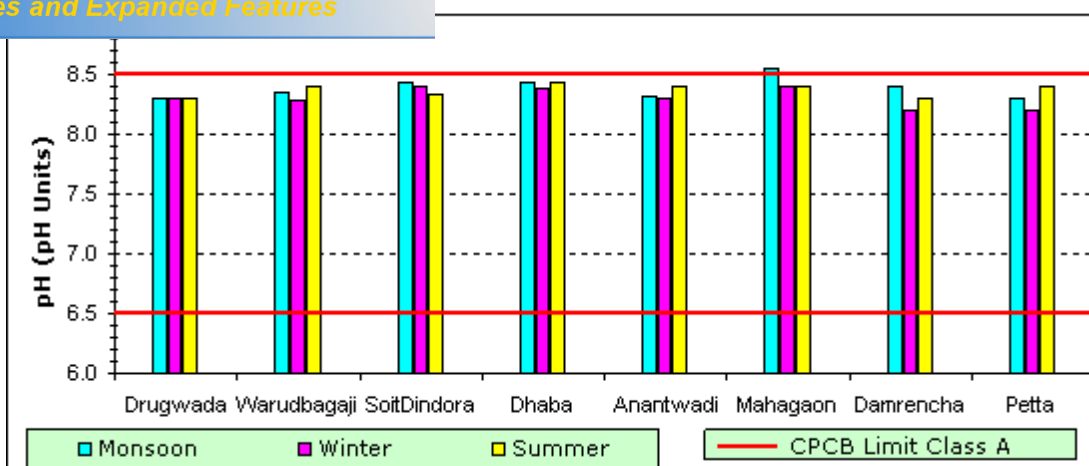
# **DATA ABSTRACT FOR RIVER BANDIA FOR 2011-2012**

## **Station: Petta**

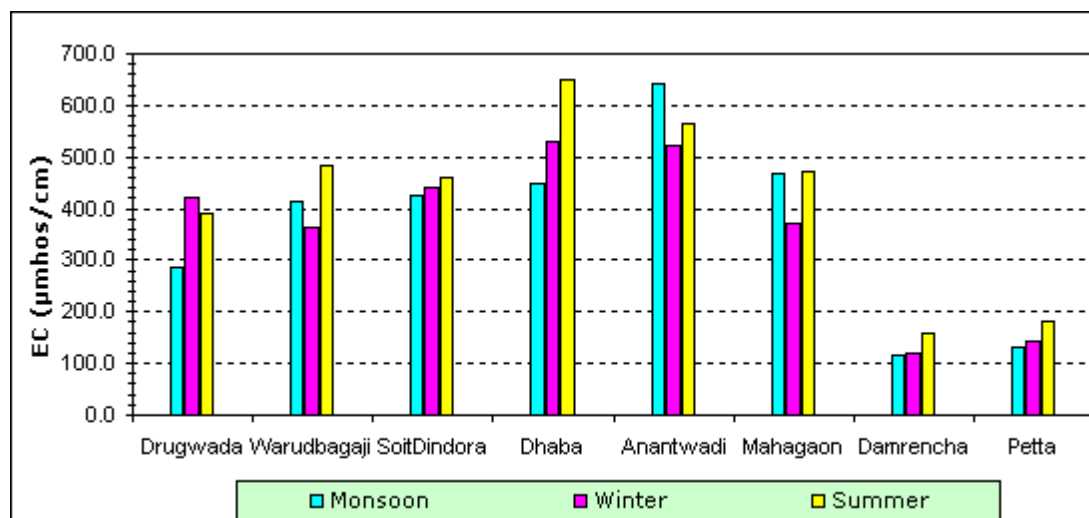
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.3	8.2	8.4
2	EC	µmhos/cm	132.5	143.0	180.0
3	DO	mg/L	6.6	7.0	6.7
4	BOD	mg/L	3.1	2.6	3.3
5	COD	mg/L	10.0	8.0	13.0
6	TDS	mg/L	81.0	88.0	108.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	64.0	76.0	96.0
8	Chloride	mg/L	9.5	9.0	8.0
9	Calcium (as Ca)	mg/L	14.4	16.0	20.0
10	Magnesium (as Mg)	mg/L	3.9	4.9	4.9
11	Total coliforms	MPN/100 ml	611.0	0.0	94.0
12	Faecal coliforms	MPN/100 ml	320.5	0.0	33.0



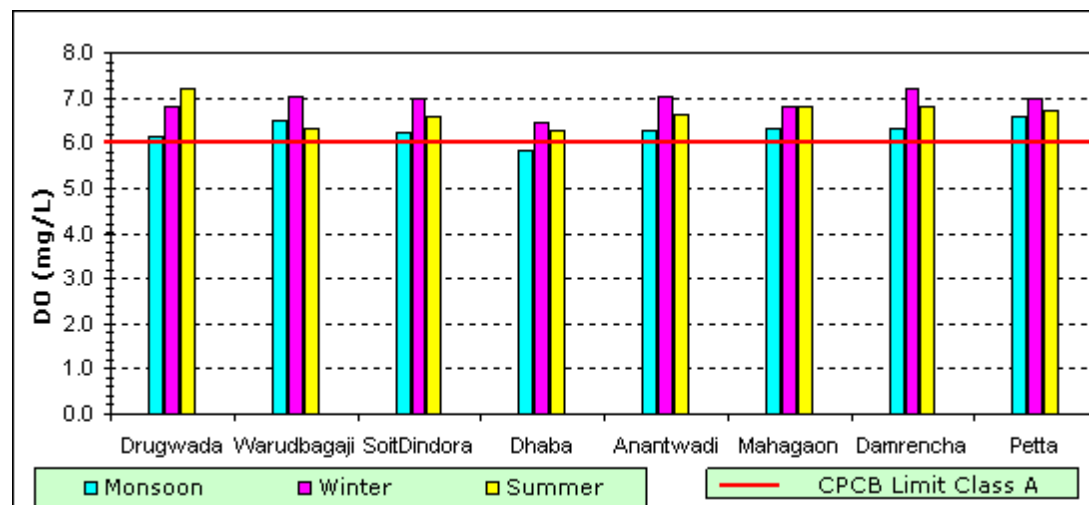
**Graph Showing Variation in pH for the year 2011-2012**



**Graph Showing Variation in EC for the year 2011-2012**

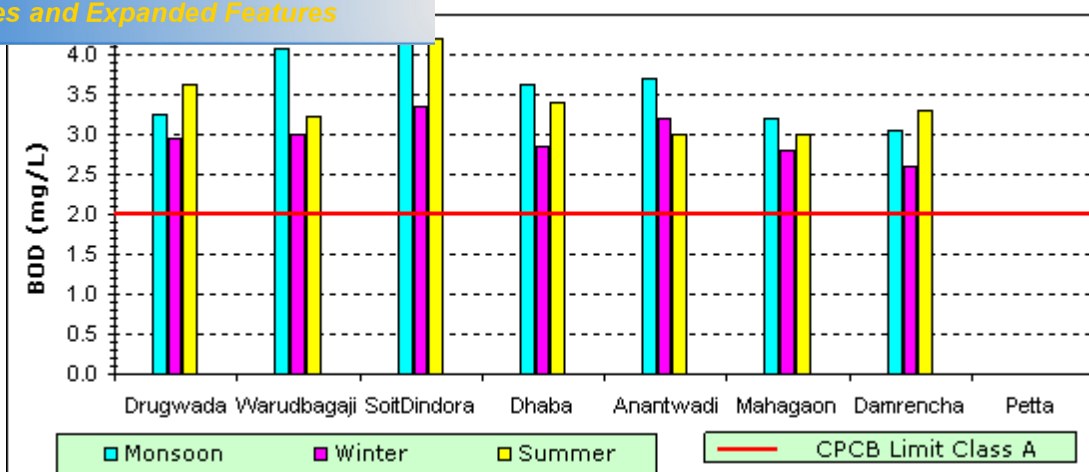


**Graph Showing Variation in Dissolved Oxygen for the year 2011-2012**

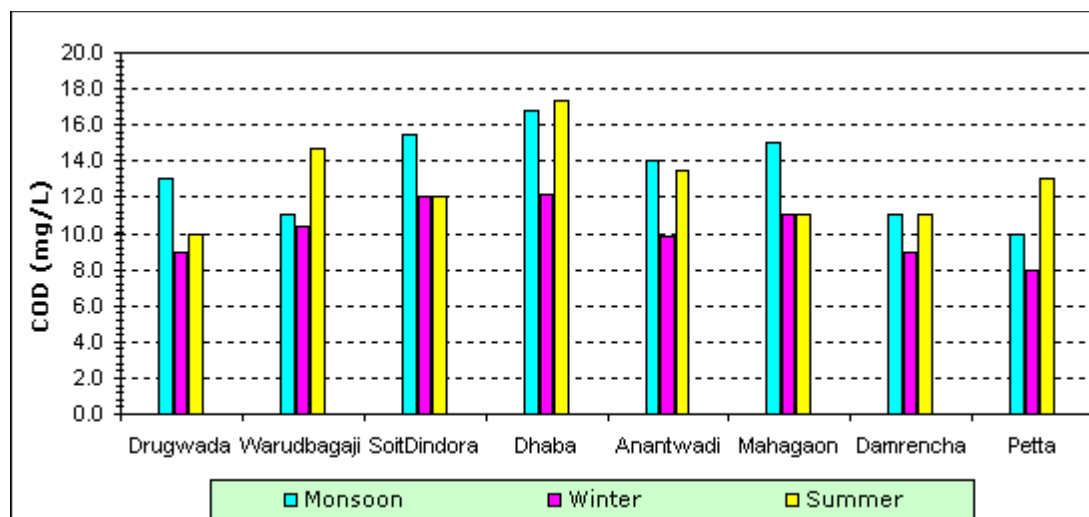




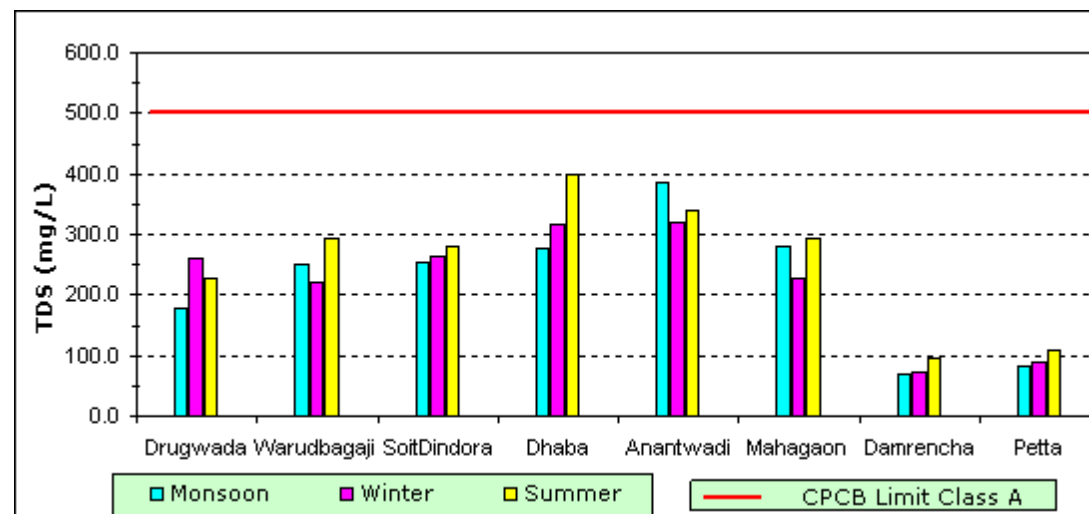
**Variation in BOD for the year 2011-2012**



**Graph Showing Variation in COD for the year 2011-2012**

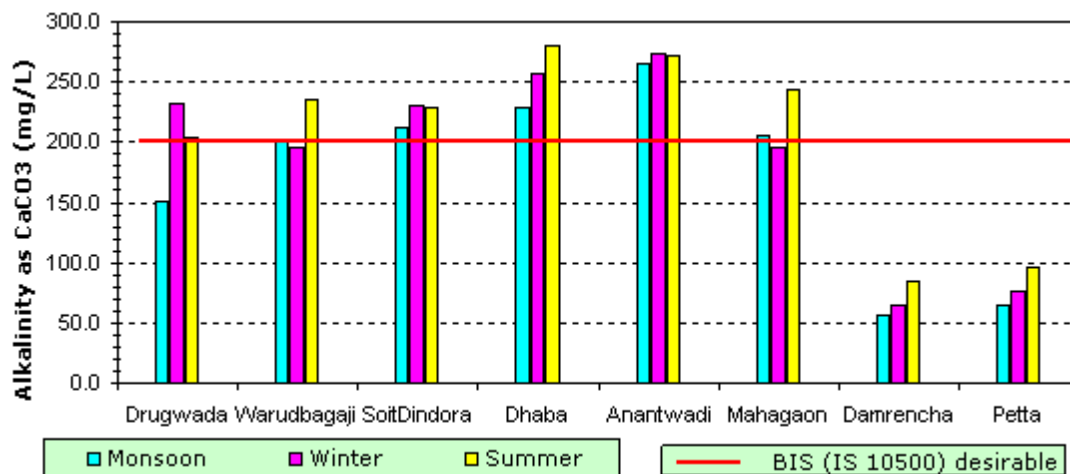


**Graph Showing Variation in TDS for the year 2011-2012**

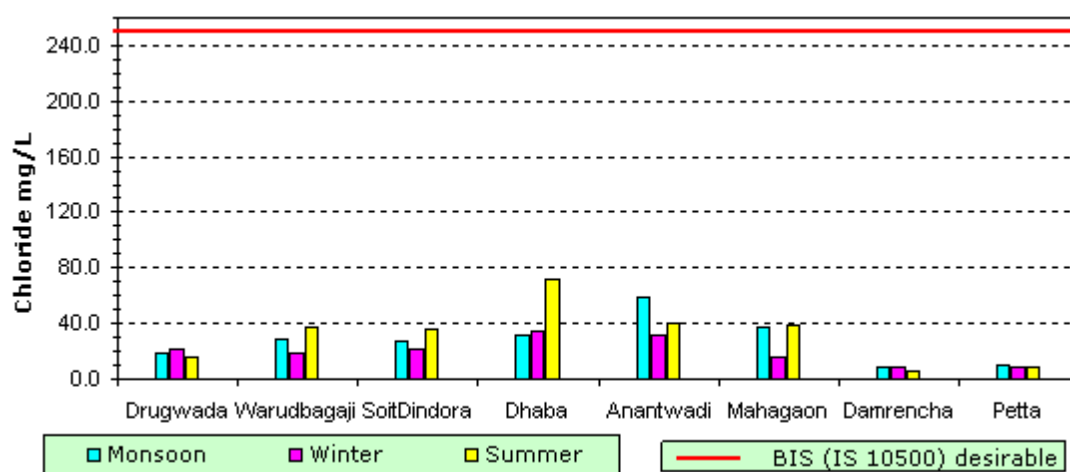




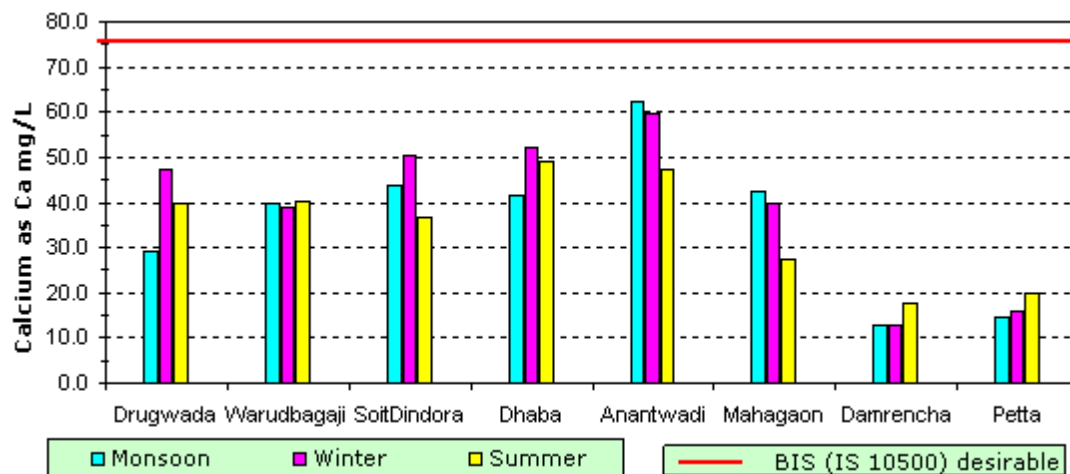
**tion in Alkalinity for the year 2011-2012**



**Graph Showing Variation in Chloride for the year 2011-2012**



**Graph Showing Variation in Calcium as Ca for the year 2011-2012**





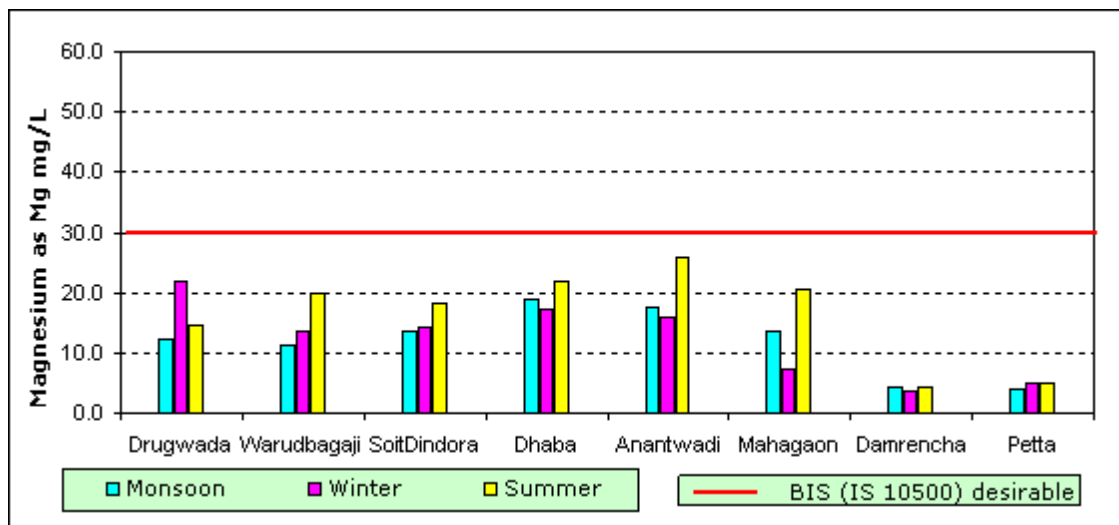


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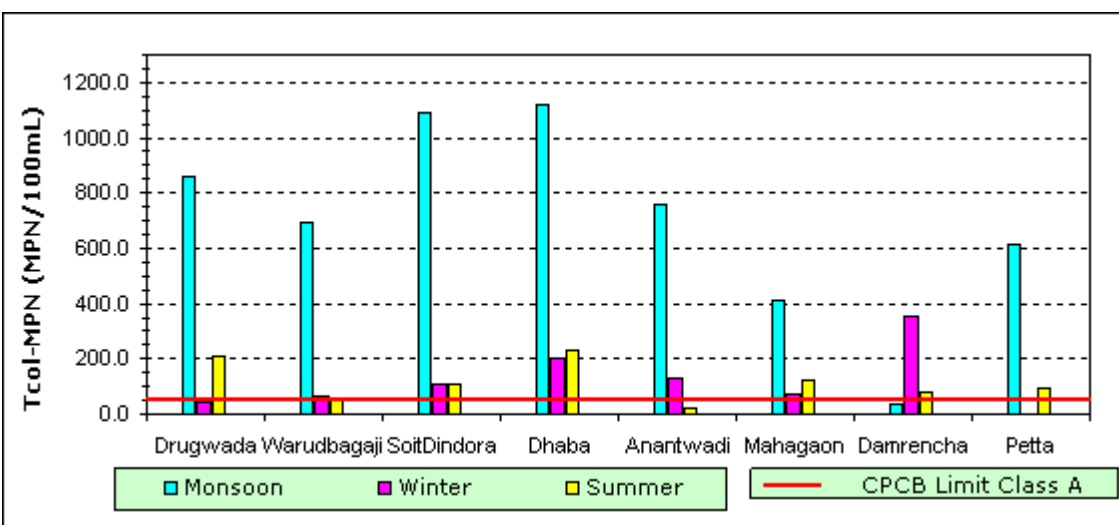
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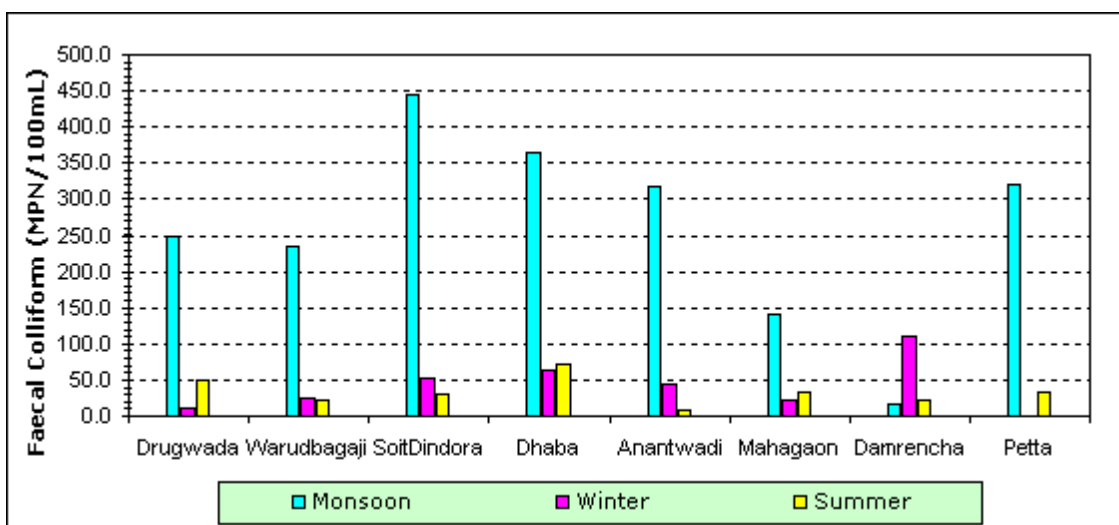
#### in Magnesium as Mg for the year 2011-2012



Graph Showing Variation in Total Colliforms for the year 2011-2012



Graph Showing Variation in Faecal Colliforms for the year 2011-2012





# **ACT FOR RESERVOIR FOR 2011-2012**

## **Station: Chapdoh**

Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.3	8.4
2	EC	µmhos/cm	497.5	440.2	455.3
3	DO	mg/L	6.0	6.8	6.5
4	BOD	mg/L	3.9	3.2	3.6
5	COD	mg/L	16.0	10.4	15.7
6	TDS	mg/L	303.7	264.8	278.7
7	Alkalinity	mg/L as CaCO <sub>3</sub>	219.3	225.6	232.0
8	Chloride	mg/L	43.2	26.4	32.0
9	Calcium (as Ca)	mg/L	45.3	48.6	40.0
10	Magnesium (as Mg)	mg/L	12.9	14.8	14.4
11	Total coliforms	MPN/100 ml	533.8	31.4	73.3
12	Faecal coliforms	MPN/100 ml	258.5	11.8	19.3

## **Station: Katepurna**

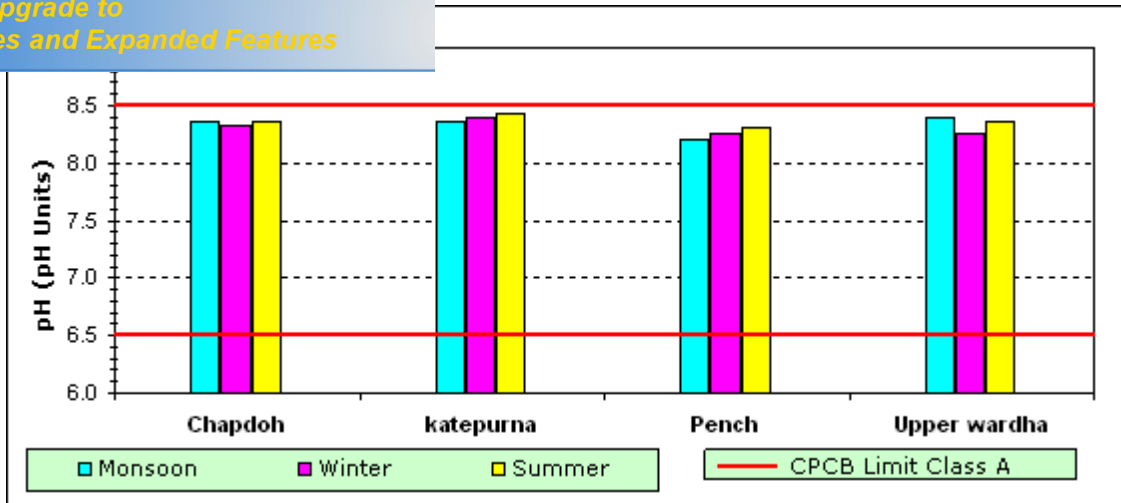
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.4	8.4
2	EC	µmhos/cm	408.8	521.4	625.3
3	DO	mg/L	5.8	6.5	6.7
4	BOD	mg/L	4.0	3.3	3.5
5	COD	mg/L	15.7	12.0	14.7
6	TDS	mg/L	246.7	320.4	376.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	197.3	252.8	297.3
8	Chloride	mg/L	29.2	38.8	46.3
9	Calcium (as Ca)	mg/L	39.2	52.6	57.1
10	Magnesium (as Mg)	mg/L	13.8	17.1	21.0
11	Total coliforms	MPN/100 ml	563.3	94.2	56.3
12	Faecal coliforms	MPN/100 ml	221.0	36.2	23.3



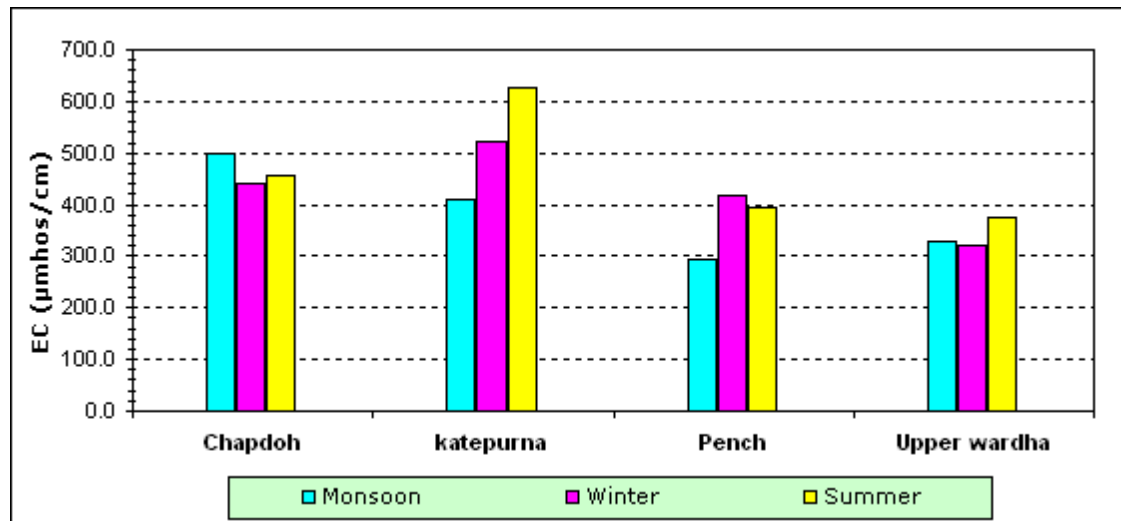
Station: Pench					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.2	8.3	8.3
2	EC	µmhos/cm	293.8	419.0	396.0
3	DO	mg/L	6.3	7.0	6.9
4	BOD	mg/L	3.3	2.9	3.3
5	COD	mg/L	13.0	9.2	13.3
6	TDS	mg/L	178.3	260.0	242.0
7	Alkalinity	mg/L as CaCO <sub>3</sub>	154.0	221.6	210.7
8	Chloride	mg/L	14.8	20.6	18.7
9	Calcium (as Ca)	mg/L	33.7	47.8	44.0
10	Magnesium (as Mg)	mg/L	7.8	14.5	15.1
11	Total coliforms	MPN/100 ml	259.5	39.4	37.7
12	Faecal coliforms	MPN/100 ml	110.8	15.8	8.3
Station: Upperwardha					
Sr. No.	Parameter	Unit	Season		
			Monsoon	Winter	Summer
			Mean	Mean	Mean
1	pH	-	8.4	8.3	8.4
2	EC	µmhos/cm	329.0	320.4	375.7
3	DO	mg/L	6.1	6.8	6.7
4	BOD	mg/L	3.7	3.1	3.5
5	COD	mg/L	13.5	10.6	15.0
6	TDS	mg/L	200.0	195.6	228.7
7	Alkalinity	mg/L as CaCO <sub>3</sub>	167.3	166.4	181.3
8	Chloride	mg/L	20.3	18.4	27.0
9	Calcium (as Ca)	mg/L	33.2	32.6	35.2
10	Magnesium (as Mg)	mg/L	9.2	9.3	15.6
11	Total coliforms	MPN/100 ml	498.5	61.0	39.7
12	Faecal coliforms	MPN/100 ml	200.2	21.2	13.0



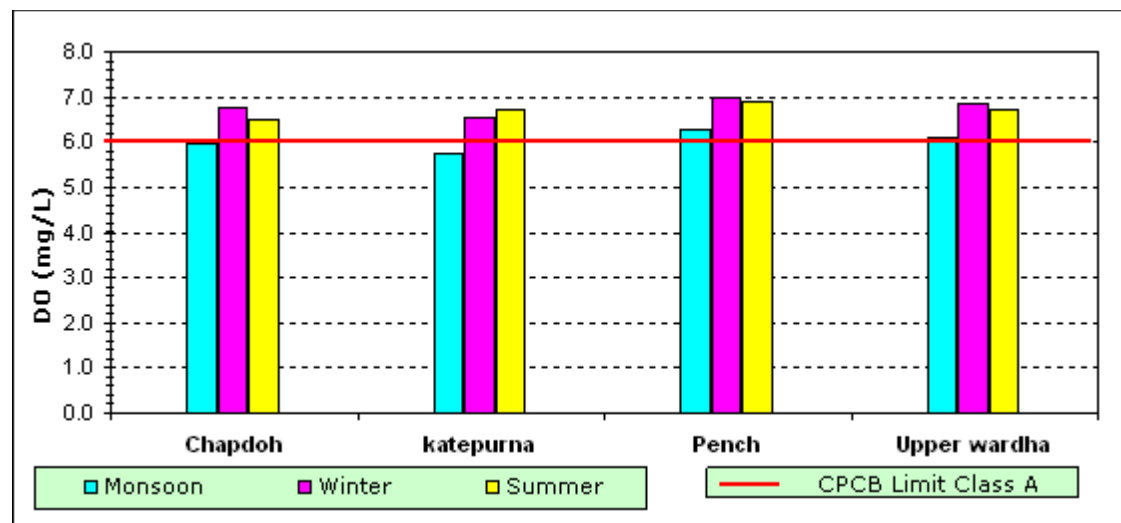
**Variation in pH for the year 2011-2012**



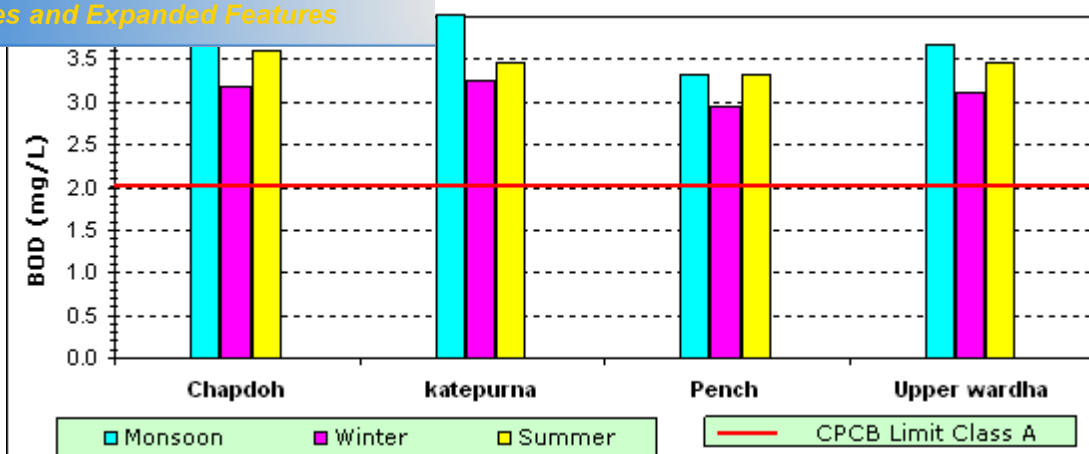
**Graph Showing Variation in EC for the year 2011-2012**



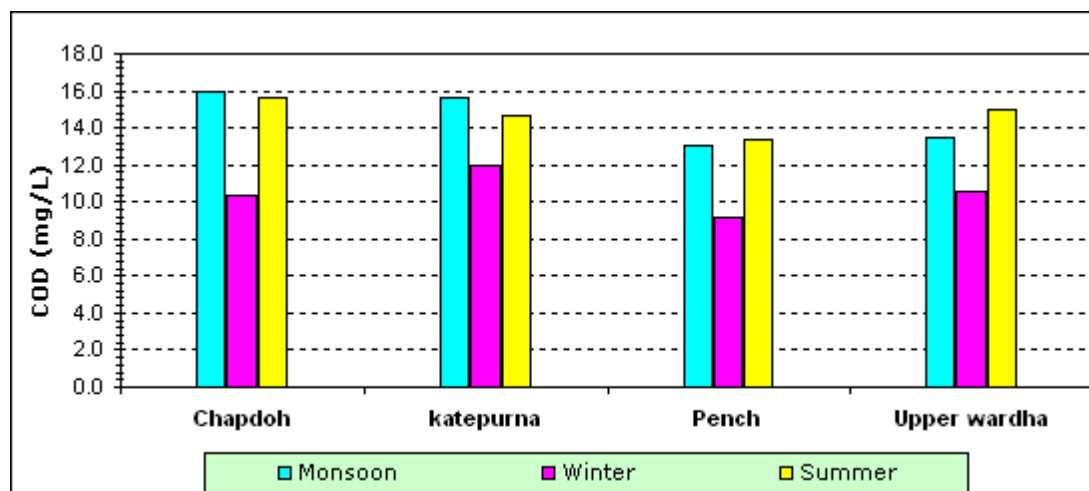
**Graph Showing Variation in Dissolved Oxygen for the year 2011-2012**



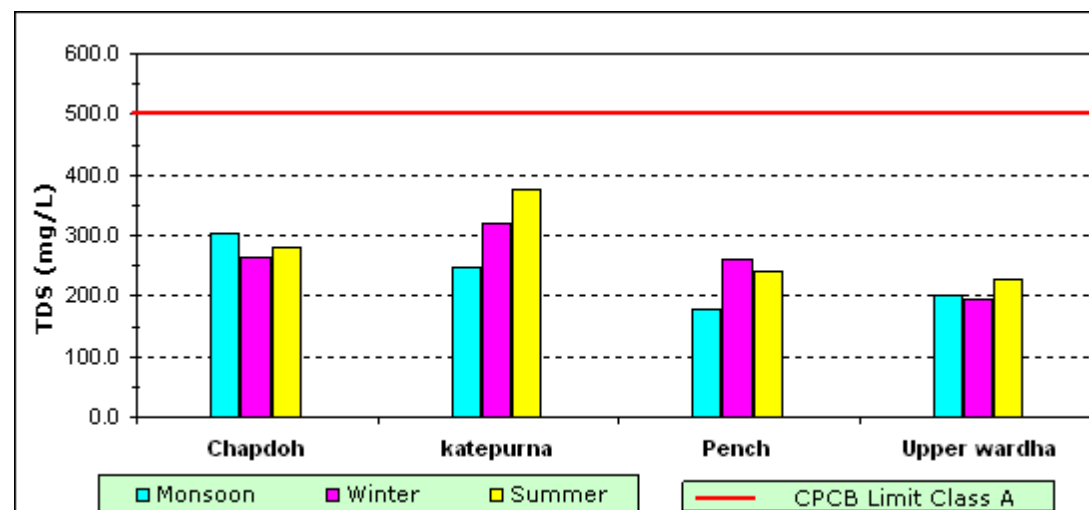
**Graph Showing Variation in BOD for the year 2011-2012**



**Graph Showing Variation in COD for the year 2011-2012**

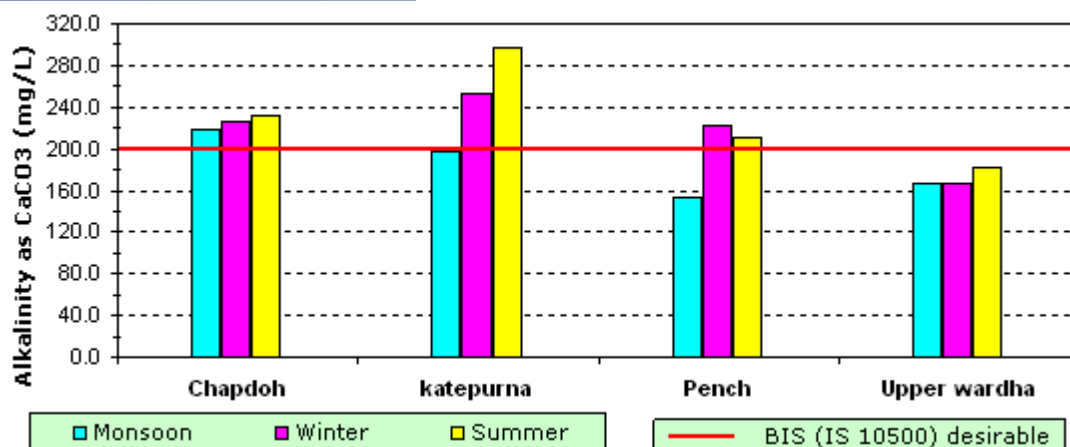


**Graph Showing Variation in TDS for the year 2011-2012**

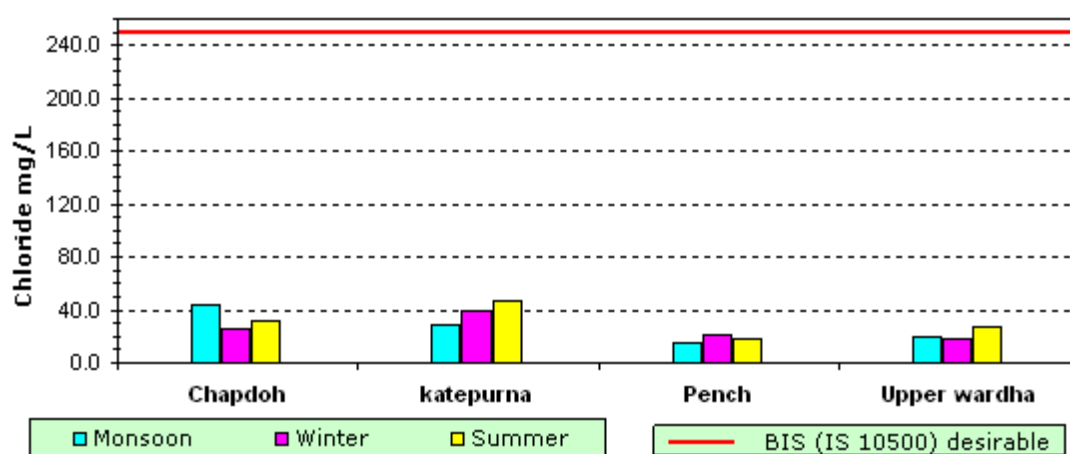




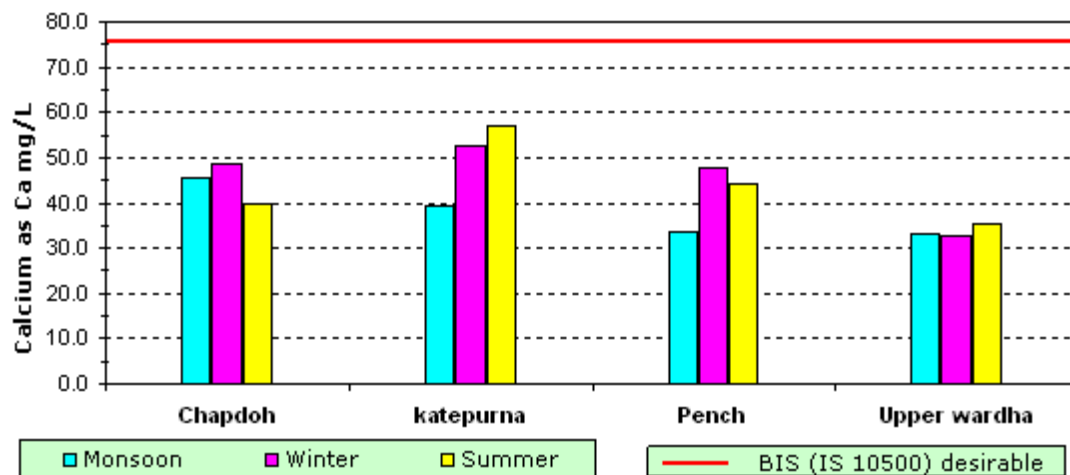
**Graph Showing Variation in Alkalinity for the year 2011-2012**



**Graph Showing Variation in Chloride for the year 2011-2012**

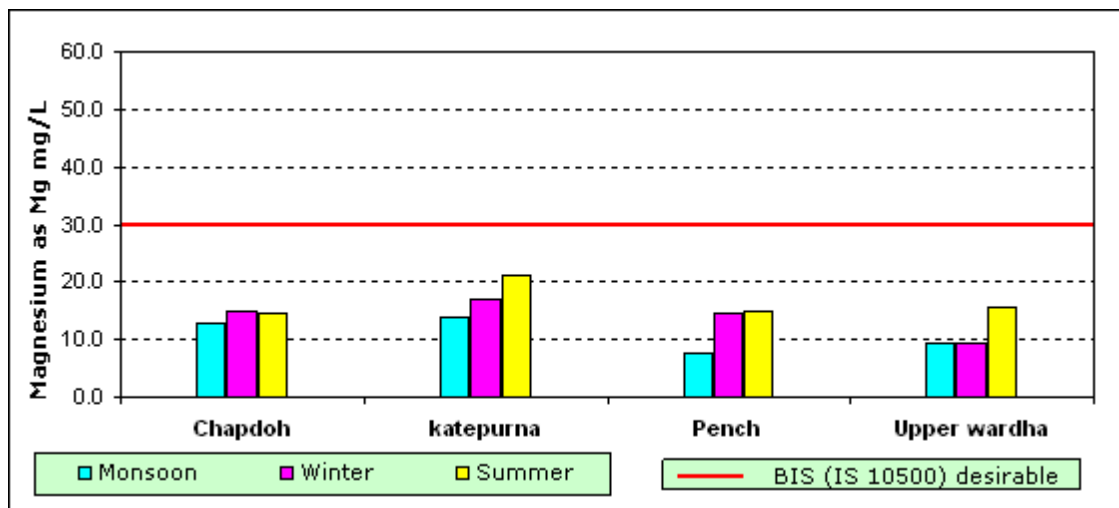


**Graph Showing Variation in Calcium as Ca for the year 2011-2012**

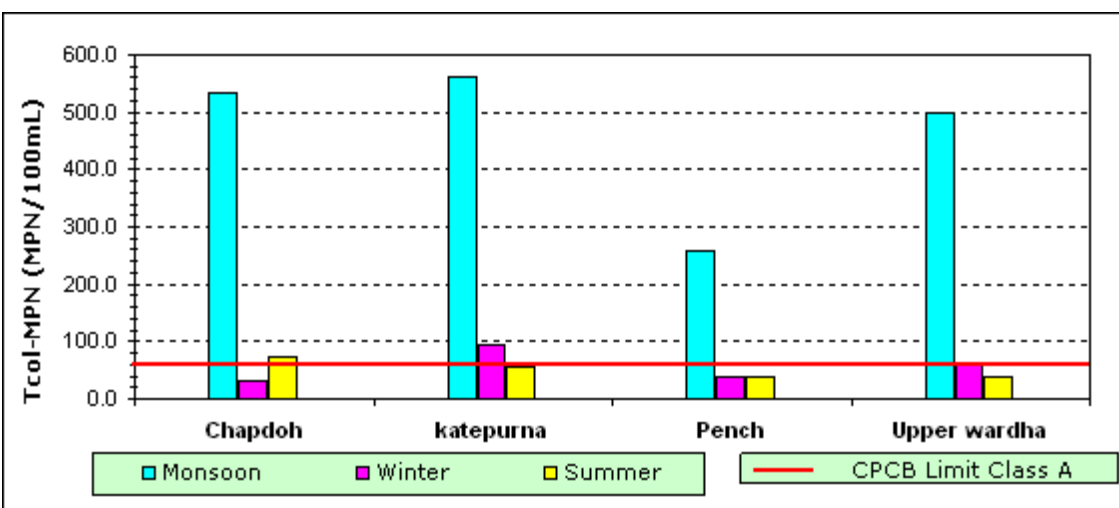




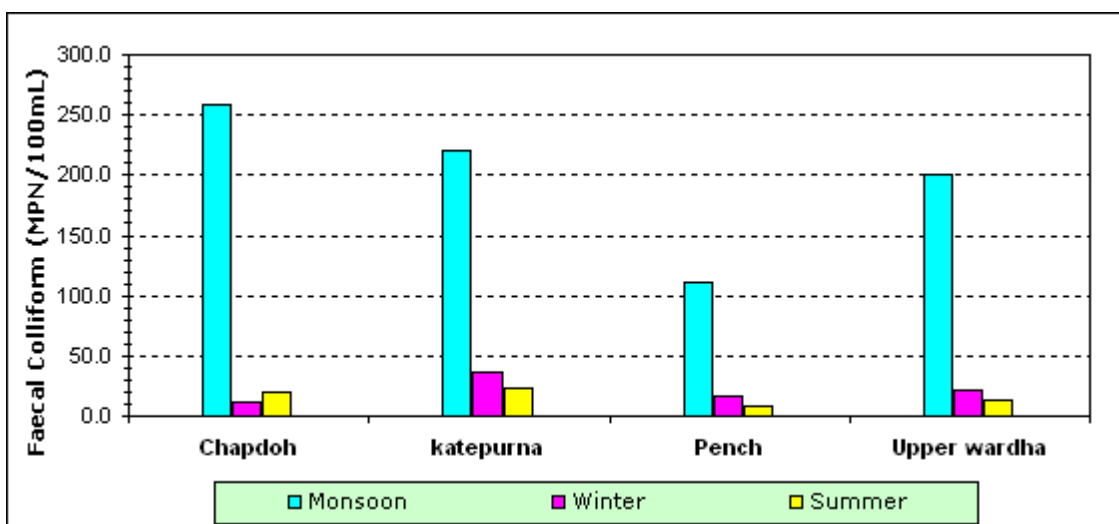
**in Magnesium as Mg for the year 2011-2012**



**Graph Showing Variation in Total Colliforms for the year 2011-2012**



**Graph Showing Variation in Faecal Colliforms for the year 2011-2012**





## Result on the basis of Graph (2011 - 2012)

No.	Parameters	Limit	Name of Critical Location Identified			Remark
1	Biological Oxygen Demand (3 days at 27°C)	2 mg/L	Sr. No.	Locations	Results	
			1	Anantwadi	4.2	
			2	Damrencha	3.2	
			3	Daryapur	4.8	
			4	Deori	3.6	
			5	Dhaba	5.2	
			6	Drugwada	3.4	
			7	Kamthikhairi	3.2	
			8	Kardha	3.8	
			9	Kawatha	3.4	
			10	Khariya	4.1	
			11	KolgaonGod	4.6	
			12	Mahagaon	4.0	
			13	Manasgaon	4.4	
			14	Mathani	4.2	
			15	Petta	3.3	
			16	Saiphal	3.8	
			17	SoitDindora	4.8	
			18	Takli Khetri	5.0	
			19	Tembhurdoh	3.6	
			20	Vishroli	4.0	
			21	WadsaChinch	3.6	
			22	WagholiButi	3.8	
			23	Warkhed	4.0	
			24	WarudBagaji	3.8	
			25	Chapdoh	4.4	
			26	Katepurna	4.4	
			27	Pench	3.8	
			28	Upper wardha	4.2	



			Concentration	Name of Critical Location Identified			Remark
				Sr. No.	Locations	Results	
2	Alkalinity	200 mg/L		1	Anantwadi	324.0	
				2	Daryapur	268.0	
				3	Deori	248.0	
				4	Dhaba	296.0	
				5	Drugwada	232.0	
				6	Kamthikhairi	268.0	
				7	Kardha	264.0	
				8	Kawatha	244.0	
				9	Khariya	292.0	
				10	KolgaonGod	292.0	
				11	Mahagaon	260.0	
				12	Manasgaon	264.0	
				13	Mathani	252.0	
				14	Saiphall	368.0	
				15	SoitDindora	256.0	
				16	Takli Khetri	264.0	
				17	Tembhurdoh	356.0	
				18	WagholiButi	216.0	
				19	Warkhed	292.0	
				20	WarudBagaji	252.0	
				21	Chapdoh	272.0	
				22	Katepurna	332.0	
				23	Pench	260.0	
				24	Upper wardha	208.0	
3	Magnesium (as Mg)	30 mg/L		Sr. No.	Locations	Results	
				1	Anantwadi	33.1	



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			Concentration	Name of Critical Location Identified			Remark
				Sr. No.	Locations	Results	
4	Total Colliforms	50 MPN/100 ml		1	Anantwadi	1700	
				2	Damrencha	700	
				3	Daryapur	2800	
				4	Deori	460	
				5	Dhaba	2800	
				6	Drugwada	1700	
				7	Kamthikhairi	1200	
				8	Kardha	700	
				9	Kawatha	470	
				10	Khariya	940	
				11	KolgaonGod	3500	
				12	Mahagaon	790	
				13	Manasgaon	1700	
				14	Mathani	630	
				15	Petta	1200	
				16	Saiphall	840	
				17	SoitDindora	2200	
				18	Takli Khetri	1700	
				19	Tembhurdoh	630	
				20	Vishroli	630	
				21	WadsaChinch	330	
				22	WagholiButi	460	
				23	Warkhed	2400	
				24	WarudBagaji	1700	
				25	Chapdoh	1200	
				26	Katepurna	1400	
				27	Pench	630	
				28	Upper wardha	1100	



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			Pre- test	Name of Critical Location Identified			Remark
				Sr. No.	Locations	Results	
5	Faecal Colliforms	Absent		1	Anantwadi	700	
				2	Damrencha	220	
				3	Daryapur	1100	
				4	Deori	210	
				5	Dhaba	790	
				6	Drugwada	490	
				7	Kamthikhairi	460	
				8	Kardha	330	
				9	Kawatha	270	
				10	Khariya	330	
				11	KolgaonGod	1300	
				12	Mahagaon	270	
				13	Manasgaon	700	
				14	Mathani	260	
				15	Petta	630	
				16	Saiphall	260	
				17	SoitDindora	790	
				18	Takli Khetri	700	
				19	Tembhurdoh	220	
				20	Vishroli	230	
				21	WadsaChinch	170	
				22	WagholiButi	210	
				23	Warkhed	790	
				24	WarudBagaji	490	
				25	Chapdoh	700	
				26	Katepurna	490	
				27	Pench	260	
				28	Upper wardha	460	



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# CHAPTER – V

## CONCLUSION

## CONCLUSION

2011-2012

Observing all the factors it can be concluded that, analysis result from all the locations shows increase in value of Biological Oxygen Demand, Total Coliforms & Faecal Coliforms. And some other parameters like Alkalinity & Magnesium also crossing its Tolerance limit. The value of Biological Oxygen Demand is very high, even exceeding beyond desired limit is due to the presence of organic matter, which also reduces oxygen content in the water. Water having excess Biological Oxygen Demand is not fit for human activities or consumption.

Biological parameter in all locations contain higher bacterial count is due to the discharge of sewage, drainage waste in to the water sources. Even increase in human activities discharge bacteria of various type in to the water, which increase the number of count in the water.

### 5.2 REMEDIAL MESAURES:

- Use of such water for salt tolerance crop is recommended based on special study.
- Before letting out to the down stream reservoir such source of water to be taken into consideration for the specific use.
- Classification of source may be as per use of water for irrigation based on Sodium Absorption Ratio, Percent Sodium, and Residual Sodium Carbonate.
- Effluent from non point sources to be treated before discharging into the river.
- Use of direct source of water to be avoided.
- Bathing at such location should be restricted.



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# CHAPTER – VI

## OTHER ACTIVITIES

## OTHER ACTIVITIES OF Water Quality Lab. level – II, Nagpur

### to Government of:

Apart from monitoring of water quality network for Water Quality lab level II at Nagpur, the infrastructure facility and services of the lab are made available to the users from various Government, Non Government, Private sector as well as individuals.

The facility is availed by many users with testing of sample towards drinking purpose, irrigation purpose & study purpose.

### **6.2 Participation in other activities:**

Executive Engineer, Hydrology Project Division.

Government Analyst, Water Quality Lab Level-II, Nagpur and Chief Chemist, one Senior Chemist of Water Quality Lab Level-II, Nagpur. participated in two days workshop in Nashik organized by Superintending Engineer, Nashik, in which discussions were done among the employees of all Water Quality Labs Level-II, of HP Maharashtra related to the problems and their solutions during working in Laboratory.

# Annual Report

## Water Quality Monitoring through Water Quality Lab Level-II Nagpur for the Year 2011-2012

### ANNEXURES

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3	Quality Objectives towards ISO 9001:2008	76
4	Lay Out of Water Quality Lab level- II, Nagpur	77





## of Clients 2011 – 2012

No.	Name of Client	Purpose of Analysis
1	Miss. Kiran Ramrao Borkar, Ph.D. Student, N.H.College, Brahmapuri, Dist:Chandrapur.	General
2	Miss. Sarika N. Mankar, M.tech. Student, G.H. Rasoni College, Nagpur.	General
3	Section Engineer (W), BPQ, Balharshah	General
4	Mr. Umesh D. Barde, Student of M.Sc (Final) Geology, R.T.M.Nagpur University	General
5	Mr. Shekhar R. Amdare, Student of M.Sc (Final) Geology, R.T.M.Nagpur University	General
6	Miss. Maduri M. Ingewar, Student of M.Sc (Final) Geology, R.T.M.Nagpur University	General
7	Miss. Mrunalini P. Dhargawe, Student of M.Sc (Final) Geology, R.T.M.Nagpur University	General
8	Senior Section Engineer (Works), Central Railway .Warora	General
9	Chief officer, Municipal Council, Umrer.	General
10	Mr. Anurag Pandey, Wardhaman Nagar, Nagpur	General
11	Mr. Naveen Shrivastaba "The Royal kitchen" at Gokul goving, Nagpur.	General
12	M/S Amitasha Enterprises, 36 villgae, Nildoh, Hingna Road, Nagpur	General
13	M/S Anshika Fasteners Pvt Ltd, 216/217, Wanadongri, Hingana Road, Nagpur.	General
14	Mr. Akash Mote, V-36, Narendra Nagar, Nagpur.	General
15	Mr. Shailesh Pokale, Baraipura, Itwari, Nagpur-02	General
16	Nirmala Apartment, Tilak Nagar, Amravati Road, Nagpur	General
17	M/S Tapan Construction company, Nagpur.	General



## f Clients 2011 – 2012

	Name of Client	Purpose of Analysis
18	Larsen & Tourbo limited, 12, Shivaji Nagar, North Ambazari Road, Nagpur-10	General
19	Mr. R.M.Gopalani, Dharampeth, Behind traffic children park, Nagpur	General
20	Nirmala Apartment, Tilak Nagar, Amravati Road, Nagpur	General
21	S.P.Bhalme, G.H.Raisoni College, Nagpur.	General
22	R.S.Mane, K.D.K.Girls hostel, Nandanwan, Nagpur,	General
23	Bhagwat D. Punde, G.H.Raisoni College of Engineering, Nagpur,	General
24	V.P.Kesalkar, G.H.Raisoni College, Nagpur.	General
25	M/s, S.K.Banerjee, Builders, Engineers & Contractors, 6th Floor "LANDMARK" Ramdaspath, Wardha Road, Nagpur-10	General
26	Sr. Section Engineer ( W ), Central Railway, Warora.	General
27	Silver Oak Apartment, Owners Association, Rajnagar . Katol Road Nagpur.	General
28	Mr. P. N. Patil, G.H.Raisoni College of Engineering, Nagpur.	General
29	Mr. S. B. Kaore, 36-C, Dubey Layout, Jaitala Road, Nagpur.	General
30	Mr. R. M. Gopalani, Dharampeth, Behind traffic children park, Nagpur.	General
31	Dr. P.R.Bajaj Principal of G.H.Raisoni College of Engineering CRPF Gate No:3 Hingna Road, Digdoh, Nagpur	General
32	Miss. Snehal G. Juare Ph.D Student, R.T.M Nagpur University	General
33	Mr. Akash Mute, Nagpur.	General
34	Mr. G. N. Budhlani, Associate Professor, Adarsh Mahavidyalaya, Dhamangaon Railway.	General



## f Clients 2011 – 2012

	Name of Client	Purpose of Analysis
35	Assistant Garrison EngineerI (IAF), 44 Wing Air Force Station, Sonegaon, Nagpur.	General
36	Mr. G. N. Budhlani, Associate Professor, Adarsh Mahavidyalaya, Dhamangaon Railway.	General
37	Miss. Mrunalini V. Khund, Ph.D. Student, R.T.M. Nagpur University	General
38	Executive Engineer, Minor Irrigation Division, Nagpur.	General
39	K.D.K. College of Engineering, Nagpur.	General
40	ADEN, WRR, Sr.Section Engineer (W), Central Raiway, Warora.	General
41	Mr. Ingole, Nagpur	General
42	Assistant Engineer, Gr-I, Gosikhurd rehabilitation, Sub Division, Veltur.	General
43	Miss. Kiran Ramrao Borkar, Ph.D. Student, N.H.College, Brahmapuri, Dist:Chandrapur.	General
44	ADEN, WRR, Sr.Section Engineer (W), Central Raiway, Warora.	General
45	Environmental Consulting & Technology Inc. and Monarch Surveyors & Engineering Consultants Pvt. Ltd. Nagpur	General
46	K.D.K. College of Engineering, Nagpur.	General
47	Mr. M. G. Bhangdiya, 526, Bhangdiya House, Near Getwell Hospital, Dhantoli, Nagpur.	General
48	Principal, G.H.Raisoni, Polytechnic, B-39 Hariganga, Hingna-Wadi Road, MIDC, Nagpur.	General
49	Principal, G.H.Raisoni, Institute of Information Technologt, B-39 Hariganga, Hingna-Wadi Road, MIDC, Nagpur.	General
50	Principal, G.H.Raisoni academy of Engineering & Technology 37-39/1, Shraddha Park, Hingna Wadi Road, Nagpur	General
51	Mr. R.M.Gopalani, Dharampeth, Behind traffic children park, Nagpur	General
52	Harshal M. Warade, Plot No. 62/A, Old Kailas Nagar, Nagpur.	General
53	Manager, Parampujya Parmatma Ek sevak mandal, Itwara, Nagpur-8	General
54	Mr. S.B. Kaore, 36-C, Dubey Laout, Nagpur	General



## **WATER QUALITY LAB, LEVEL – II, NAGPUR**

### **HYDROLOGY PROJECT DIVISION, NAGPUR**

## **QUALITY POLICY**

Water Quality Lab, Level . II, Hydrology Project Division, Nagpur, has laid down the following Quality Policy:

- It is committed to monitor effectiveness of QMS time to time & will also work for continual improvement of the same.
- It is also committed to work for continual improvement in its technology, processes and to increase competency levels of its personnel.
- It is committed to delight the customer by fulfilling customer's requirement, statutory / regulatory requirements and requirement which is not stated by customer but which is required for application of its services.

**Sd/-**

Executive Engineer  
Hydrology Project Division  
Nagpur

## **TY LAB, LEVEL – II, NAGPUR**

### **PROJECT DIVISION, NAGPUR**

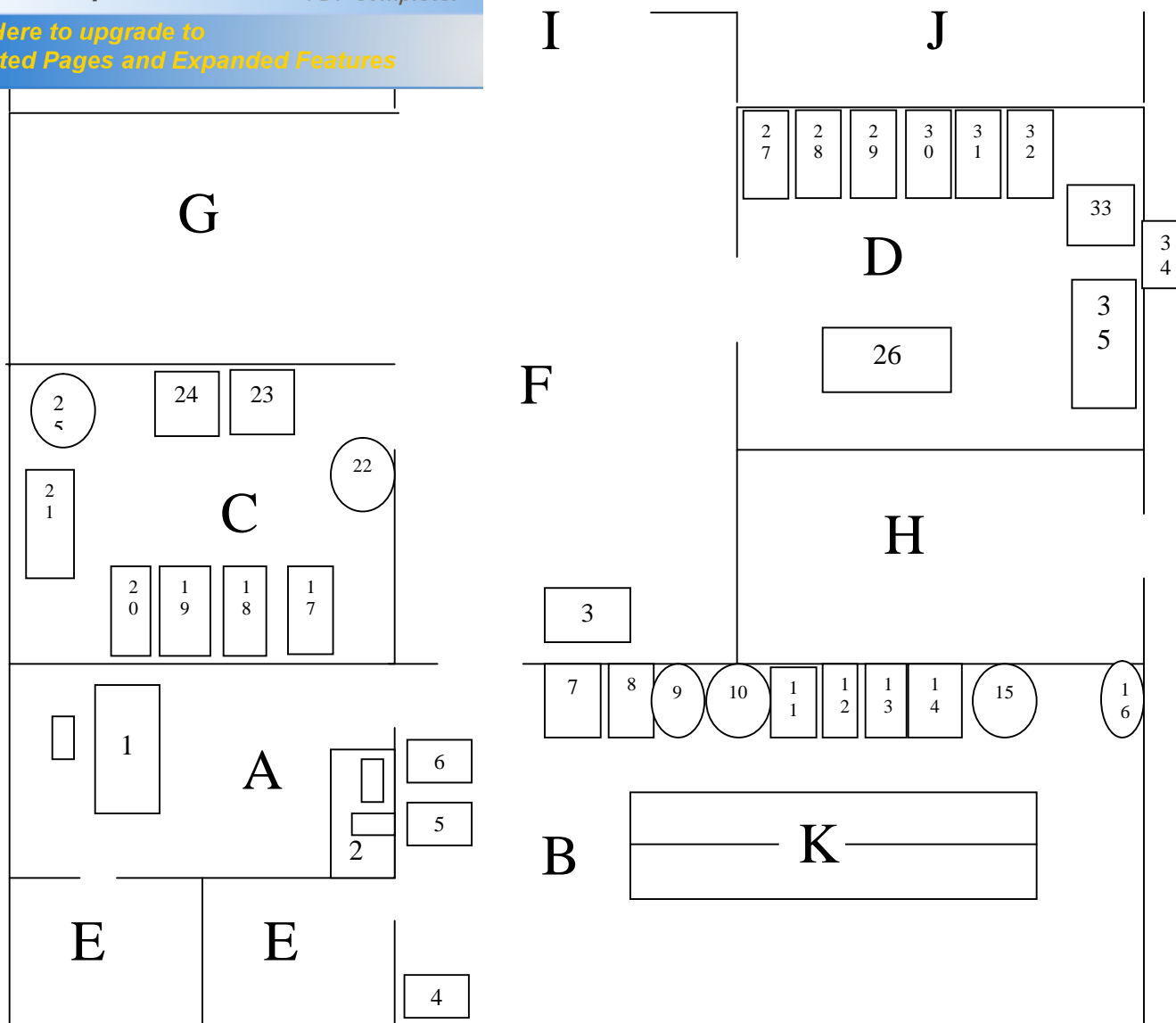
## **QUALITY OBJECTIVES**

Quality objectives are established at relevant functions and levels within the organisation. These include :

- The parameters of testing for which the analytical capability of the laboratory has not been established will be recorded for making efforts for improvement and widening the scope of services.
- Efforts will be made to enhance competence level of all employees at each level.
- Efforts will be made to increase the number of jobs.

**Reference: - Statement of Goals (QF/MR/12)**

**Sd/-**  
Executive Engineer.  
Hydrology Project Division  
Nagpur



## LEGENDS

1	Table of Lab Incharge
2	Computer Table
3	Display Board
4	Fume Cupboard
5	BOB Incubator (BTI)
6	Deep Freezer
7	Refrigerator
8	Hot Air Oven
9	Desiccator
10	Desiccator
11	Hot Plate
12	Muffle Furnace
13	Rotary Shaker
14	Water Bath General Purpose
15	Bi distillation Unit
16	Single distillation Unit
17	Tissue Grinder
18	Centrifuge
19	Water Bath Bacteriological
20	Vacuum Pimp
21	Table Bacteriological Medias
22	Gas Cylinder
23	Bacteriological Incubator
24	BOD Incubator (Labin)
25	Autoclave
26	Table for Chemist
27	Balance Mechanical
28	Balance Electronics
29	pH meter
30	EC meter
31	Turbidity meter
32	Flame photometer
33	ION meter
34	AC
35	Spectrophotometer
A	Office of Lab Incharge
B	Wet Lab
C	Bacteriological Lab
D	Instrument Lab
E	Toilet
F	Hall
G	Staircase & Cooling water machine
H	Electric Room
I	Main Entrance Gate
J	Parking of Four whhler
K	Analysis Table

**LAYOUT OF WATER QUALITY LABORATORY LEVEL - II , NAGPUR**