



**GOVERNMENT OF MAHARASHTRA
WATER RESOURCES DEPARTMENT**

HYDROLOGY PROJECT (SW)



WATER QUALITY LAB LEVEL-II, KALWA (THANE)

ANNUAL REPORT

YEAR 2010-2011

**Executive Engineer
Hydrology Project Division, Kalwa (Thane)**

PREFACE

“**Water**” is a prime natural resource and is considered as 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 Surface Water quality data in West Flowing Rivers South of Tapi Basin for the period of June 2010 to May 2011. The Independent rivers Damanganga, Vaitarna, Ulhas & Patalganga are included in this report. This report has been prepared by the agency M/s. Ashwamedh Engineers & Consultants Soc Ltd., Nashik as the agency was awarded the contract for Operation and Maintenance of Water Quality Lab Level-II, Kalwa (Thane) for the said period. The data has been interpreted to know the affected locations.

Therefore it is a great pleasure to handing over this precise report on analysis of water samples carried out at WQ Laboratory Level – II at Kalwa (Thane).

The report attempts to briefly describe an over view and general conclusion based on the basis of water quality data of water samples collected from sampling locations as per approved network and as per defined frequencies for the reported period.

It is expected that this report will provide an idea in brief about Water Quality Laboratory Level-II at Kalwa(Thane). Our efforts can always be updated through valuable suggestions.

(A.P. BADE)

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Water Quality Laboratory Level-II
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Annual Report
of
Water Quality Monitoring through
Water Quality Lab Level-II Kalwa (Thane)
for the year 2010-11

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CHAPTER - 1
EXECUTIVE SUMMARY

CHAPTER-1**EXECUTIVE SUMMERY**

**Annual Report on Water Quality Monitoring through
Water Quality Lab Level-II, Kalwa (Thane) for the Year 2010-2011
(Jun 10 to May 11)**

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 location.

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, Kalwa (Thane) 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, Data Collection, Planning & Hydrology Circle, Nashik.

1.3 Water Quality Monitoring - Scope

The Annual Report is prepared for the period Jun 2010 to May 2011 of the water year 2010-11. The Table below shows the number of samples analyzed during the reported period. In order to study water quality status location wise, all locations covered under this lab during the year 2010-11 are considered.

TABLE SHOWING SAMPLES ANALYSED DURING THE REPORTING PERIOD

Sr. No.	Year	Trend Samples	Baseline Samples	Dam (Reservoir) Samples	Total
1	2010-11	101	0	69	170
Total Samples analyzed during reporting period					170

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 validation ratios manually and is entered in SWDES Software for Water Quality Data Entry. Further the data is sent to State Data Center for storage and further dissemination to users.

Furthermore to get an idea about the 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.

1.5 Results and Observations:

After observing all this data it is clear that most of the chemical parameters are also within tolerance limits, except following parameters.

- i) Dissolved Oxygen
- ii) Biological Oxygen Demand

Bacteriological parameters like Total Coliforms and Faecal Coliforms are exceeding the desired limits.

From the observations at Mande location, almost all parameters are exceeding the desired limit which indicates that at the upstream of this location there are a considerable source of pollution. i.e. non point source which is to be find out for further desired study.

1.6 Conclusion

From the results, 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 catchments 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 locations should be restricted.

1.8 Suggestions:

- Awareness in community through local bodies, NGO's, Educational institutes.
- Water literacy shall be increased.
- All disciplines can come together for water awareness campaigning.
- Annual Report shall be published regularly.
- Lean flow in river shall be maintained.

CHAPTER - 2

INTRODUCTION

CHAPTER-2

INTRODUCTION

2.1 General:

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 are recorded and are utilized for preparing the Annual Report by performing some specific exercise. These data are 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.

2.2 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, Kalwa (Thane) 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,

2.3 Water Quality Monitoring - Scope

In order to study water quality status station wise, all locations covered under this lab during the year 2009-2010 are considered.

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

2.4 Other activities

Apart from monitoring of water quality network for Water Quality lab level II at Kalwa (Thane), the infrastructure facility is made available to the users from various Government, Non Government, Private sector as well as individuals.

The facility has been availed by users with testing of sample towards drinking purpose, construction purpose.

Since the laboratory has been established recently, the clients that have approached are very few and are mostly individuals. Efforts are being carried out to attract more clients such as Municipal Corporations, Industries, Institutions etc.

During the period January to May 2010, some clients approached to the laboratory.

Total revenue of Rs. 6432 has been generated during this period.

Annual Report for the Period of 2010-2011 (Jun 2010 to May 2011)

Water Quality Laboratory Level II at Kalwa(Thane)

Salient Features :-

1. General Structure of Laboratory:

- 1) Sampling Locations as per Water Quality Network covered in this Lab:-19
 2) Monthly sample collection: - June to Oct. 22 samples Nov.to May. 10 samples

- 3) Frequency of sampling: - **Trend** : – Monthly
Dam samples :- Fortnightly

- 4) Govt. staff related to Laboratory: -

Mr.A.C.Kapre., Executive Engineer
 Mr.V.J. Nemade., Executive Engineer
 Mr.D.K. Tembe, Sub Divisional Officer
 Mr.A.P. Bade, Sub Divisional Engineer (Addl.charge)
 Mr.A.P.Bade (AE-II. & Govt. Analyst)
 Miss R.R.Durgule (C.E.A)

- 5) Lab operating Agency: - Ashwamedh Engineers & Consultants Coop. Soc. Ltd.

Agency staff related to Laboratory: -

a) Indoor Work –

- 1.Mr. Rajendra Phanse (Dy.Branch Manager)
2. Miss Snehal Deoke(Chief Chemist)
3. Miss. Ranjana Kadu (Sr. Research Officer)
- 4.Miss. Shalaka Bhave (Research Assistant)
- 5.Mrs. Vaishali Chunchuwar(Research Assistant)
6. Mr.Rahul (Lab. Assistant)

b) Outdoor Work –

1. Mr. Milind Mohite(Assistant Chemist)
2. Mr. Pathan (Attendent)

2. Scope of Work:

Operation and Maintenance of water Quality Laboratory Level-II, Kalwa(Thane)

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.

Indoor Work:

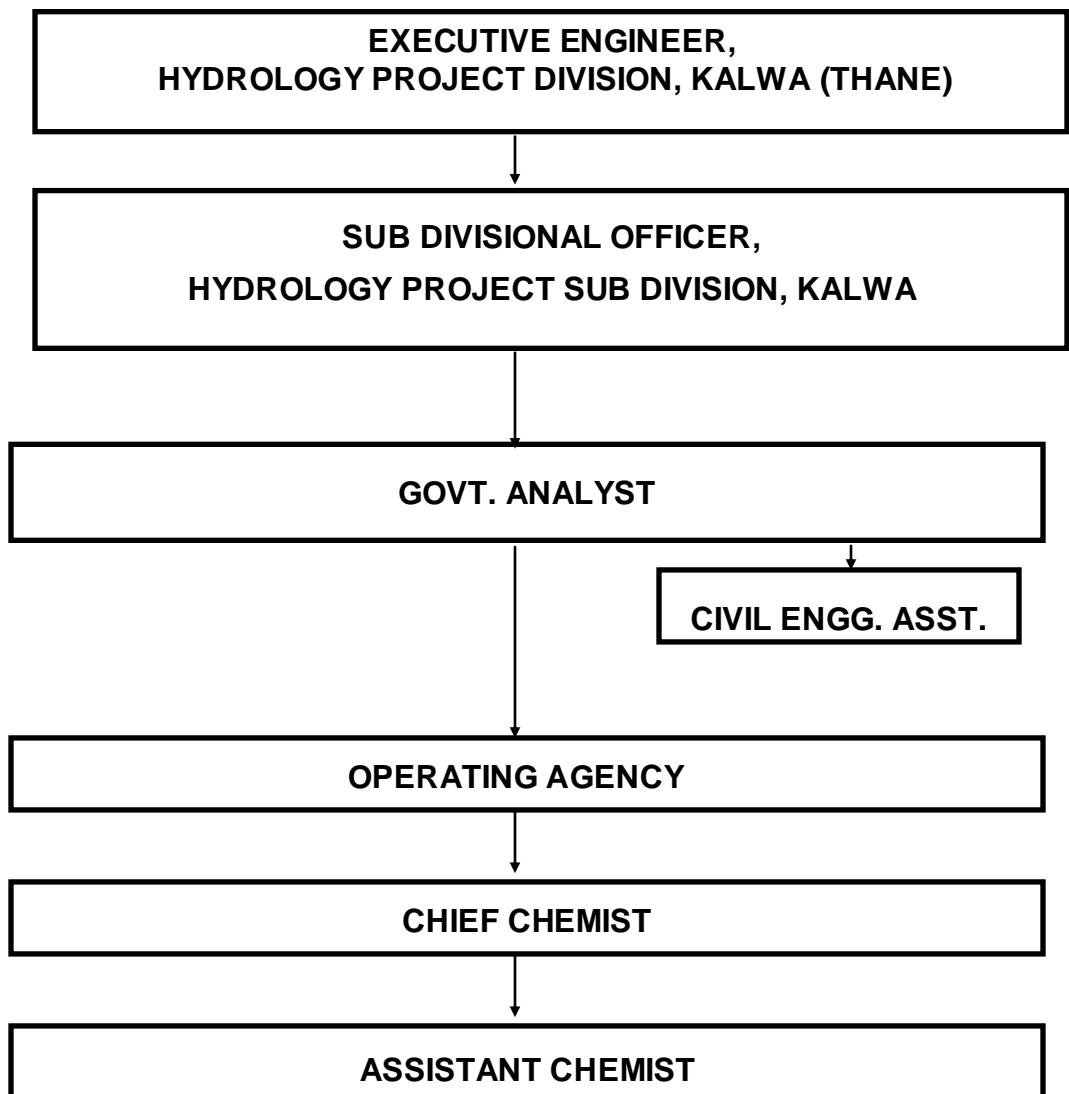
- Day to Day Operation and Maintenance of Water Quality Laboratory Level II.
- The work includes analysis of water samples as per the test procedures.
- Operating the instruments as per specified instruction manual.
- Entry of data in SWDES Software.

The Laboratory staff employed;

- 1) Chief Chemist: 1 No.
 - 2) Sr. Research Officers: 1Nos.
 - 3) Research Assistant: 2 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.

HYDROLOGY PROJECT DIVISION, KALWA (THANE)
WATER QUALITY LAB LEVEL – II, KALWA (THANE)

ORGANISATION CHART



CHAPTER - 3

METHODOLOGY

CHAPTER-3

METHODOLOGY

3.1 General:

This laboratory is for Surface Water analysis and the area covered during the period Jan to May 2010 is Damanganga, Vaitarna, Ulhas & Patalganga Rivers 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, Kalwa (Thane) 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.

The Annual Report is prepared for the period June 2010 to May 2011 of the water year 2010-11. The Table below shows the number of samples analyzed during the reported period. In order to study water quality status location wise, all locations covered under this lab during the year 2009-10 are considered.

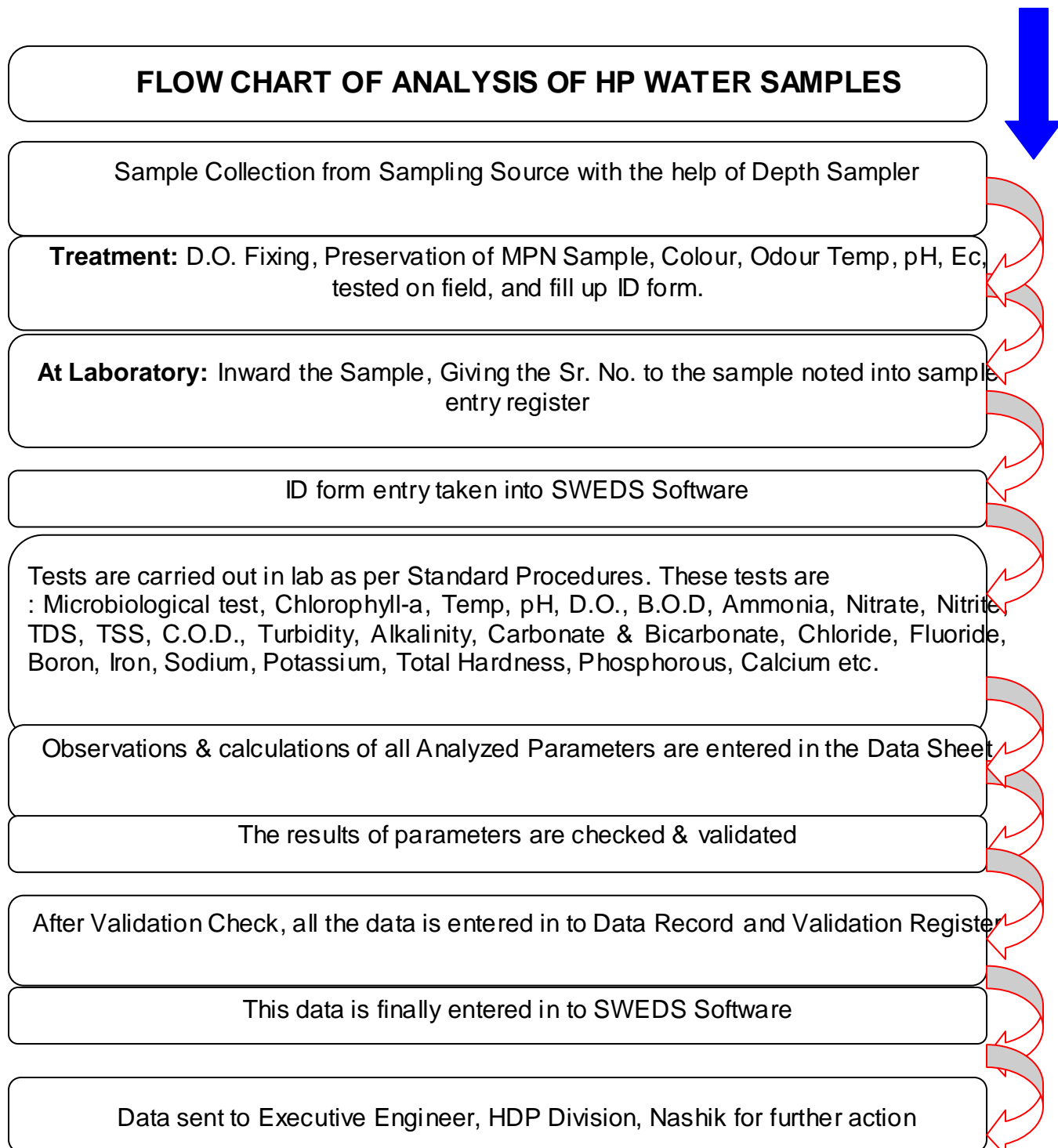
TABLE SHOWING SAMPLES ANALYSED DURING THE REPORTING PERIOD

Sr. No.	Year	Trend Sample	Baseline Sample	Dam (Reservoir) Sample	Total
1	2010-2011	101	0	69	170
Total Samples analyzed during reporting period					170

The details of locationwise samples analysed are as below:

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.



_Methodology For the analysis of Water Quality samples the following parameters were analyzed during the Period 2010-2011

Table showing List of parameters and the methodology used for the analysis.

Sr. No	Parameters	Methodology
1.	Colour	APHA, 21 st Ed., 2005, 2120-B, 2-2
2.	Odour	IS 3025 (Part 5): 1983, Reaffirmed 2006
3.	Temperature	APHA, 21 st Ed., 2005, 2550-B, 2-61
4.	pH	APHA, 21 st Ed., 2005, 4500-H ⁺ - B, 4-90
5.	Electric Conductivity	APHA, 21 st Ed., 2005, 2510- B, 2-47
6.	Dissolved Oxygen	IS 3025 (Part 38): 1989, Reaffirmed 2003
7.	Turbidity	APHA, 21 st Ed., 2005, 2130-B, 2-9
8.	Total Solids	IS 3025 (Part 15): 1984, Reaffirmed 2003, Amds.1
9.	Dissolved Solids	IS 3025 (Part 16): 1984, Reaffirmed 2006, Ed.2.1 (1999-12)
10.	Suspended Solids	IS 3025 (Part 17): 1984, Reaffirmed 2006, Amds.1
11.	NH ₃ -N	APHA, 21 st Ed., 2005, 4500-NH ₃ F, 4-110
12.	NO ₂ ⁻	APHA, 21 st Ed., 2005, 4500-NO ₂ -B, 4-118
13.	NO ₃ ⁻	APHA, 21 st Ed., 2005, 4500-NO ₃ , B -4 -120
14.	Total Phosphorous	APHA, 21 st Ed., 2005, 4500 P, E, 4-153
15.	Biochemical Oxygen Demand	IS 3025 (Part 44): 1993, Reaffirmed 2003, Amds.1
16.	Chemical Oxygen Demand	APHA, 21 st Ed., 2005, 5220-B, 5-15
17.	Potassium K ⁺	IS 3025 (Part 45): 1993, Reaffirmed 2003, Amds.1
18.	Sodium Na ⁺	IS 3025 (Part 45):1993, Reaffirmed 2003, Amds.1
19.	Calcium Ca ⁺⁺	APHA, 21 st Ed., 2005, 3500-B, 3-65
20.	Magnesium Mg ⁺⁺	APHA, 21 st Ed., 2005, 3500-Mg, B, 3-84
21.	Iron (as Fe)	APHA, 21 st Ed., 2005, 3111-B, 3-17
22.	Carbonate CO ₃	APHA, 21 st Ed., 2005, 2320-B, 2-27, 5 -1 & 4500-CO ₂ -D, 4-34
23.	Bi-Carbonate H CO ₃	APHA, 21 st Ed., 2005, 2320-B, 2-27, 5 -3 & 4500-CO ₂ -D, 4-34
24.	Chloride Cl	APHA, 21 st Ed., 2005, 4500-Cl, B, 4-70
25.	Fluoride F	APHA, 21 st Ed., 2005, 4500-F ⁻ , D, 4-85
26.	Boron B	APHA, 21 st Ed., 2005, 4500-B-C, 4-23
27.	Total Coliforms	APHA, 21 st Ed., 2005, 9221-B, 9-49
28.	Faecal Coliforms	APHA, 21 st Ed., 2005, 9221-E, 9-56
29.	Alkalinity	IS 3025 (Part 23): 1986, Reaffirmed 2003, Amds.1

**Table showing No. of Location covered under the jurisdiction of
Water Quality Lab Level-II, Kalwa (Thane)
during the period June 2010 to May 2011**

Sr. No.	Name of Station	Name of River	Frequency of sampling
Trend Samples			
1.	Khadkhad	Domihira	Monthly
2.	Kambe	Ulhas	Monthly
3.	Mande	Kalu	Monthly
4.	Turade	Patalganga	Monthly
5.	Waghivali	Galoba Nala	Monthly
6.	Alman	Vaitrana	Monthly
7.	Kasa	Surya	Monthly
8.	Chinchara	Surya	Monthly
9.	Khapri	Kalu	Monthly
10.	Pali	Amba	Monthly
11.	Varasgoan	Kundalika	Monthly
12.	Bridge at Kal	Kal	Monthly
13.	Kangule	Savitri	Monthly
14.	Birwadi	Kal	Monthly
15.	Khadadi	Lendi	Monthly
16.	Shindyachapada	Dhamni	Monthly
Reservoir Samples			
1.	Bhatsa Dam	Bhatsa	Fortnightly
2.	Surya Dam	Surya	Fortnightly
3.	Hetawane Dam	Bhogeshwari	Fortnightly

CHAPTER - 4

RESULTS AND OBSERVATIONS

4.1 RESULTS AND CONCLUSIONS

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 2010-11 (Jun 10 to May 11) 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.

4.4 Critical parameters Identified

After observing all this data it is clear that most of the physical parameter are within tolerance limit except at few locations.

Most of the chemical parameters are also within tolerance limits, except following parameters.

- i) Dissolved Oxygen
- ii) Biological Oxygen Demand

Bacteriological parameters like Total Coliform and Fecal Coliforms are also exceeding the limits.

**Classification of location on the basis of Wilcox technique
towards use of water for irrigation purpose**

Sr. No.	Name of Location	Classification As per Wilcox Technique	Remarks
WEST FLOWING RIVERS (WFR) KONKAN REGION			
I. Damanganga Sub-Basin			
1	Khadkhad	C1 & S1	A
2	Khadadi	C1 & S1	A
3	Shindyachapada	C1 & S1	A
II. Vaiterna Sub-Basin			
1	Waghivali	C1 & S1	A
2	Alman	C1 & S1	A
3	Chinchara	C1 & S1	A
4	Kasa	C1 & S1	A
5	Surya	C1 & S1	A
III. Ulhas Sub-Basin			
1	Khapri	C1 & S1	A
2	Mande	C4 & S4	C
3	Kambe	C1 & S1	A
4	Bhatsa	C1 & S1	A
IV. Patalganga Sub-Basin			
1	Hetawane	C1 & S1	A
2	Turade	C1 & S1	A
V. Amba Sub-Basin			
1	Pali	C1 & S1	A
VI. Kundalika Sub-Basin			
1	Varasgaon	C1 & S1	A
VII. Savitri Sub-Basin			
1	Goregaon	C1 & S1	A
2	Kangule	C1 & S1	A
3	Birwadi	C1 & S1	A

Note: A: Water is Good for Irrigation Purpose.

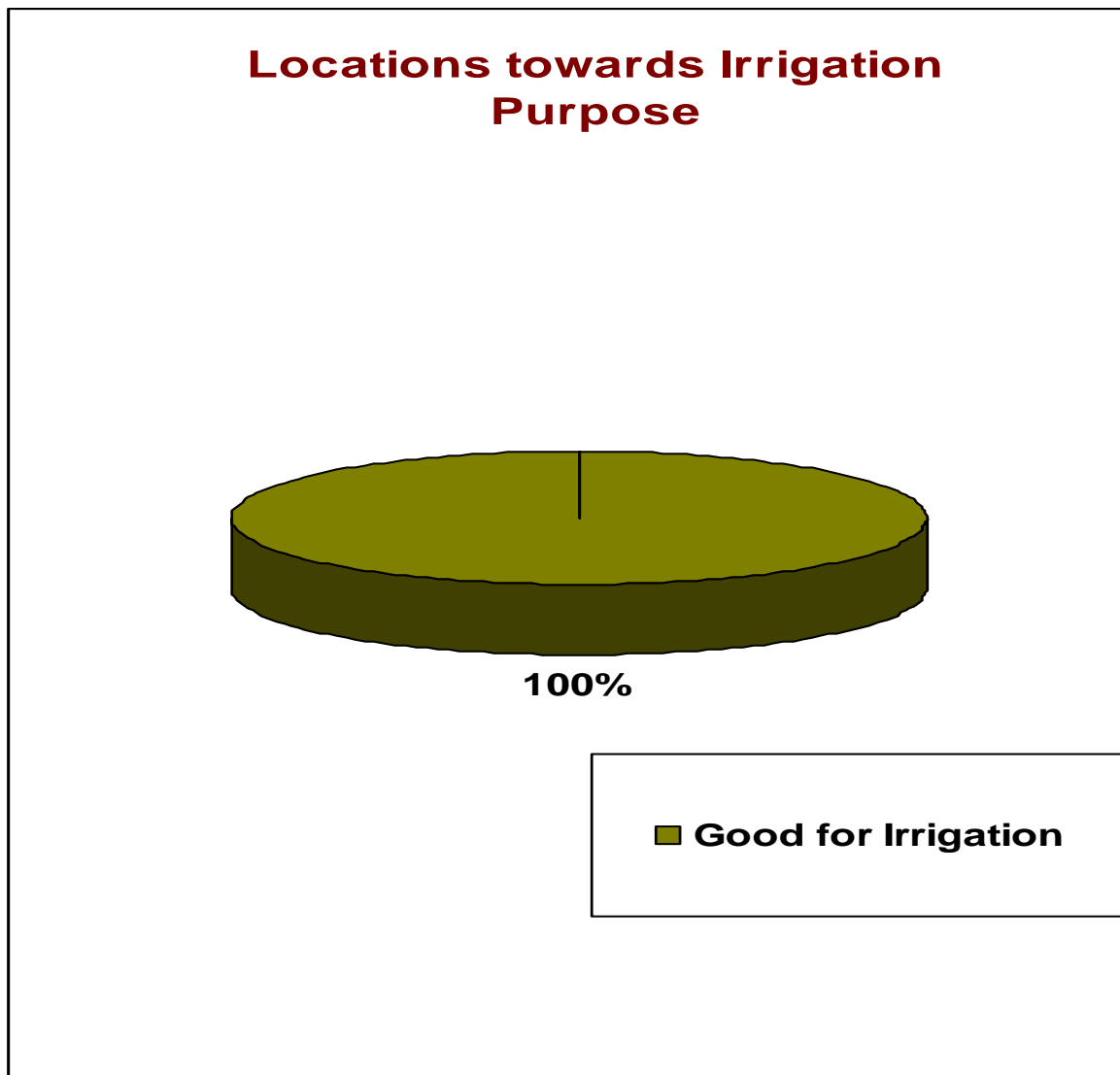
B: Water is Suitable for Irrigation Purpose.

C: Water is suitable for Salt Tolerant Plant.

D: Inadequate data and no flow in the river

Abstract for classification of water towards Irrigation purpose

Sr. No.	Good for Irrigation (A)	Suitable for Irrigation (B)	Suitable for Salt Tolerant Plant (C)	Inadequate Data (D)	Total
1	18	-	1	-	19



4.5 Observation on the basis of various disciplines criteria

Sr. No.	River	Quality class and suitability of water as per....		
		CPCB Guideline	ICAR Standard	IS 10500
1.	Damanganga	Class C	Suitable for irrigation.	Critical parameters: Coliforms
2.	Vaiterna	Class E	Suitable for irrigation.	Critical parameters: Coliforms
3.	Ulhas	Class E except Mande	Suitable for irrigation except Mande	Critical location Mande At other locations Critical parameter: Coliforms
4.	Patalganga	Class E	Suitable for irrigation.	Critical parameters: Coliforms
5.	Amba	Class C	Suitable for irrigation.	Critical parameters: Coliforms
6.	Savitri	Class E	Suitable for irrigation.	Critical parameters: Coliforms
7.	Kundalika	Class C	Suitable for irrigation.	Critical parameters: Coliforms

Findings:

1. Stretch of Godavari & Tapi is suitable for irrigation.
2. Stretch of Panazara is to be studied in details.
3. Stretch of Girna is not suitable for drinking purpose without treatment.
4. Mande is the critical location as per all classification.

CPCB Water Quality Criteria

Designated best use	Quality Class	Primary Water Quality Criteria
Drinking water source without conventional treatment but with chlorination	A	<ul style="list-style-type: none"> ➤ Total coliform organisms (MPN/100 ml) shall be 50 or less ➤ pH between 6.5 and 8.5 ➤ Dissolved Oxygen 6 mg/l or more, and ➤ Biochemical Oxygen Demand 2 mg/l or less
Outdoor bathing (organized)	B	<ul style="list-style-type: none"> ➤ Total coliform organisms(MPN/100 ml) shall be 500 or less ➤ pH between 6.5 and 8.5 ➤ Dissolved Oxygen 5 mg/l or more, and ➤ Biochemical Oxygen Demand 3 mg/l or less
Drinking water source with conventional treatment	C	<ul style="list-style-type: none"> ➤ Total coliform organisms(MPN/100 ml) shall be 5000 or less ➤ pH between 6 and 9 ➤ Dissolved Oxygen 4 mg/l or more, and ➤ Biochemical Oxygen Demand 3 mg/l or less
Propagation of wildlife and fisheries	D	<ul style="list-style-type: none"> ➤ pH between 6.5 and 8.5 ➤ Dissolved Oxygen 4 mg/l or more, and ➤ Free ammonia (as N) 1.2 mg/l or less
Irrigation, industrial cooling, and controlled disposal	E	<ul style="list-style-type: none"> ➤ pH between 6.0 and 8.5 ➤ Electrical conductivity less than 2250 micro mhos/cm, ➤ Sodium Absorption Ratio less than 26, ➤ and Boron less than 2 mg/l.
	Below E	➤ Not Meeting A, B, C, D & E Criteria

Classification as per Wilcox Technique

Sr. No.	Parameter	Class	Range	Remark
1.	Electrical Conductivity	C1	<250	Good For Most Soils & Crops
		C2	250-750	Some Leaching For Sensitive Crop
		C3	750-2250	Tolerant Crops & Leaching
		C4	>2250	Only For Permeable Soils And Tolerant Crops
2.	SAR (Sodium Absorption Ratio)	S1	0-10	Excellent
		S2	10-18	Good
		S3	18-26	Fair
		S4	>26	Poor

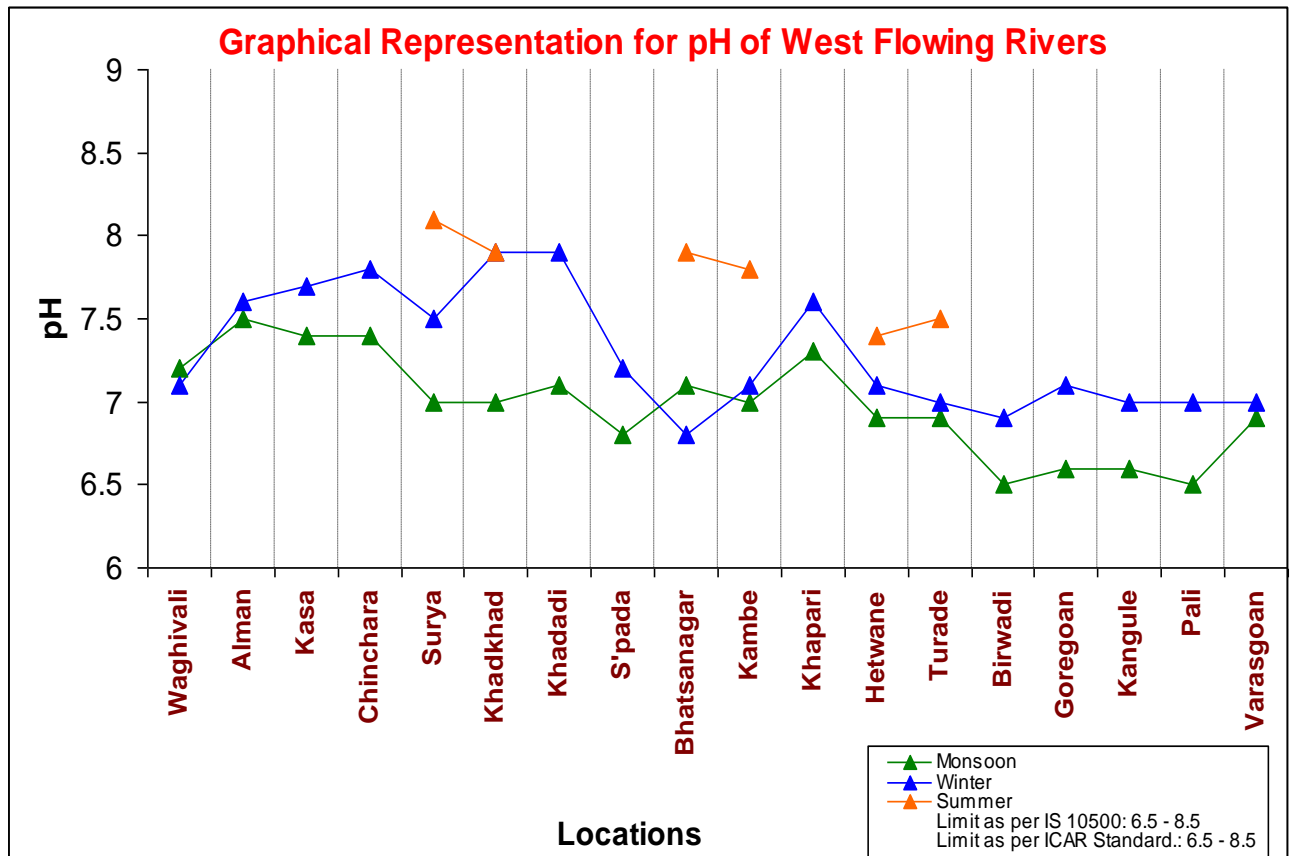
ICAR Standard for Irrigation Water

Sr. No.	Parameter	limit	Unit
1.	pH	6.5-8.5	-
2.	Electrical Conductivity	2250	
3.	Total Dissolved Solids	2100	mg/Lit
4.	Chloride	600	mg/Lit
5.	Sulphate	1000	mg/Lit
6.	Boron	2	mg/Lit
7.	% Sodium	60	%
8.	SAR (Sodium Absorbance Ratio)	26	-

RESULTS OBTAINED DURING 2010-11

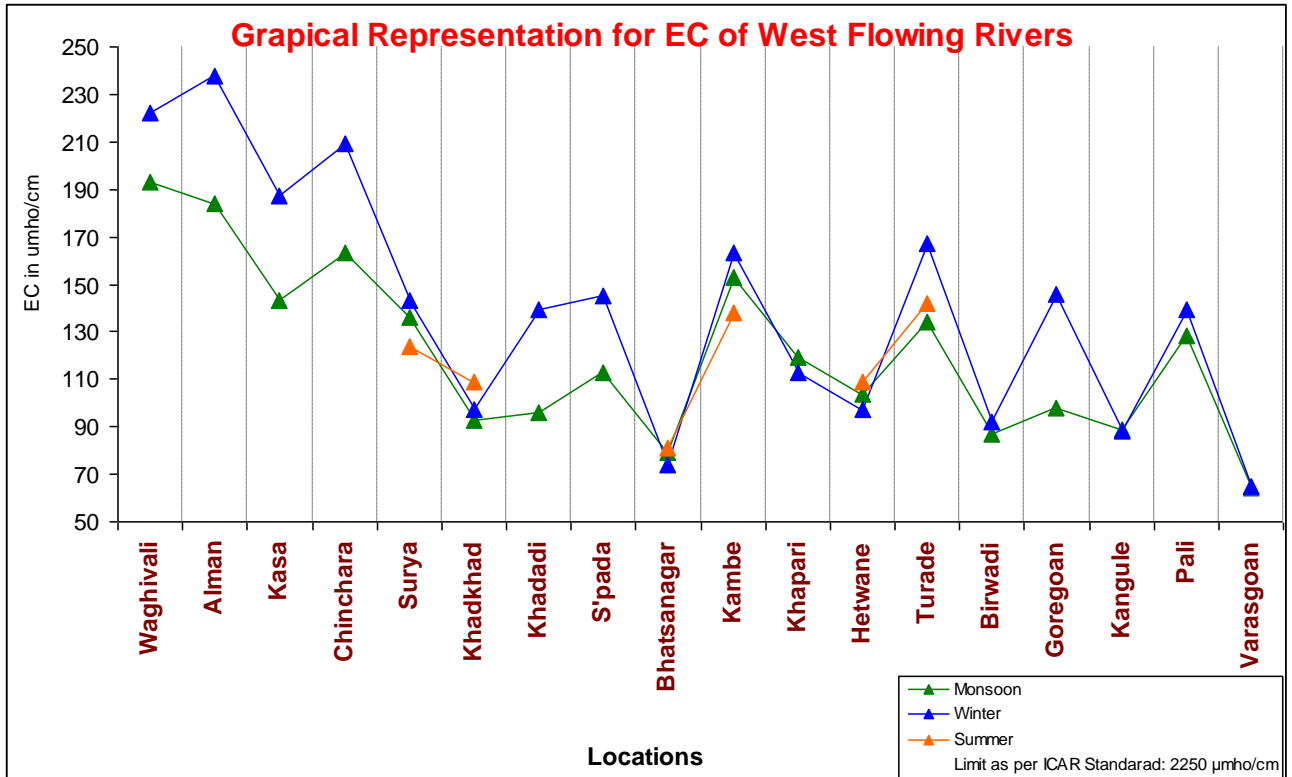
WEST FLOWING RIVERS (Excluding location Mande)

1. pH



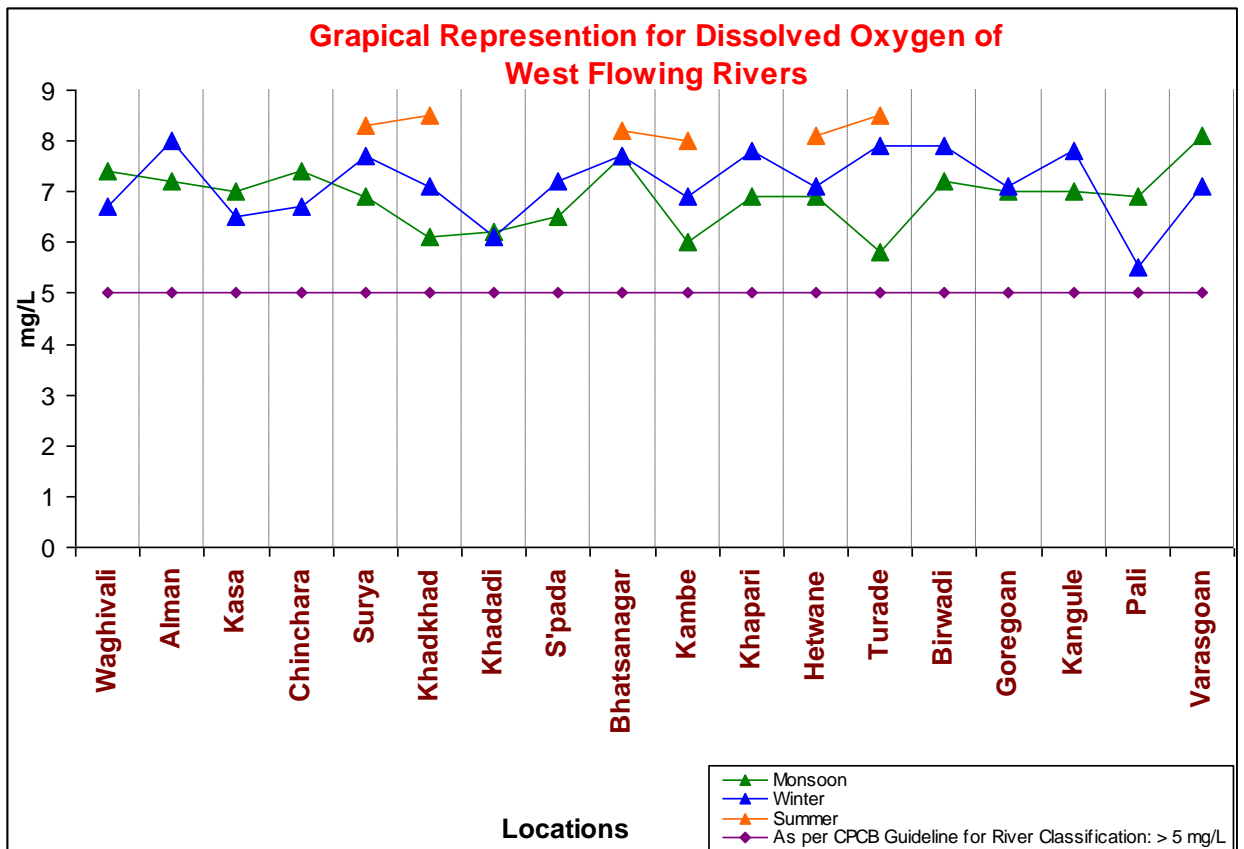
It can be seen that the Ph values are within the prescribed limits during all the seasons.

2. EC



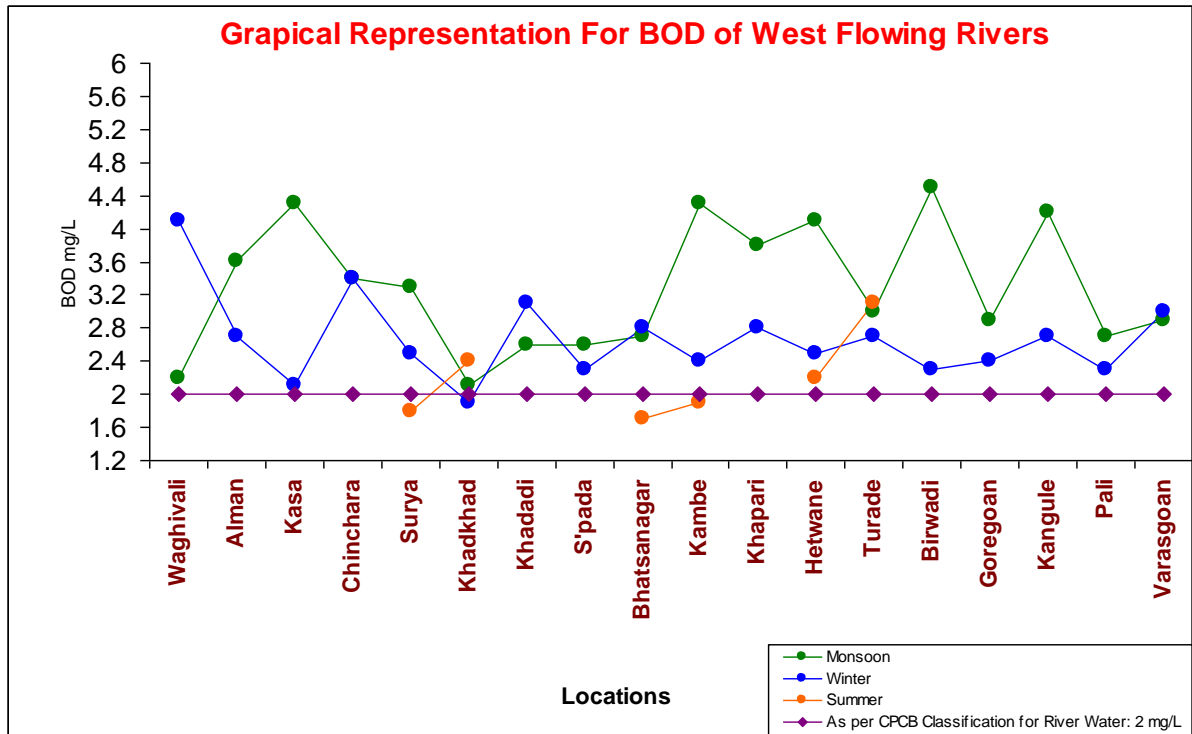
From the above graph it can be observed that the value of Electrical Conductivity is within the prescribed limit as per ICAR Standards during all the seasons.

3. Dissolved Oxygen



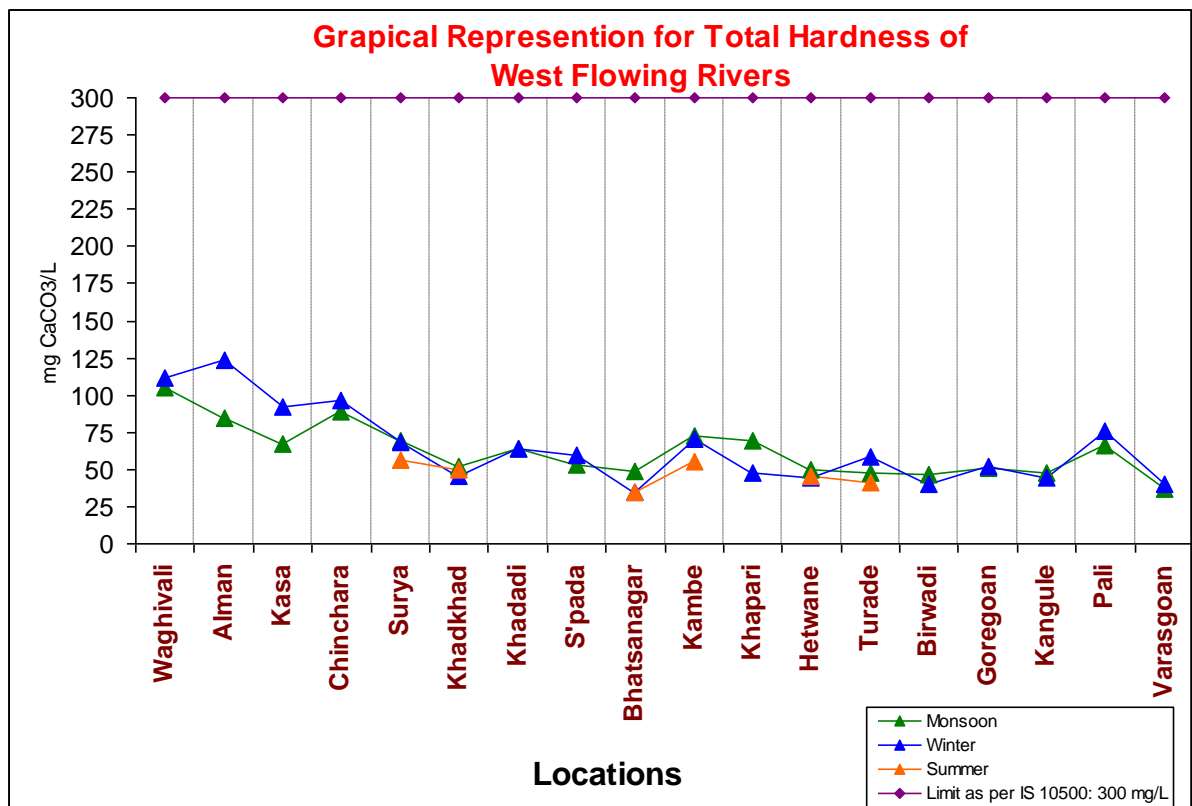
From the above graph it can be observed that at all the locations the value of Dissolved Oxygen is $>5\text{mg/L}$ (as prescribed in the CPCB Guidelines for River Classification) during all the seasons.

4. Biological Oxygen Demand



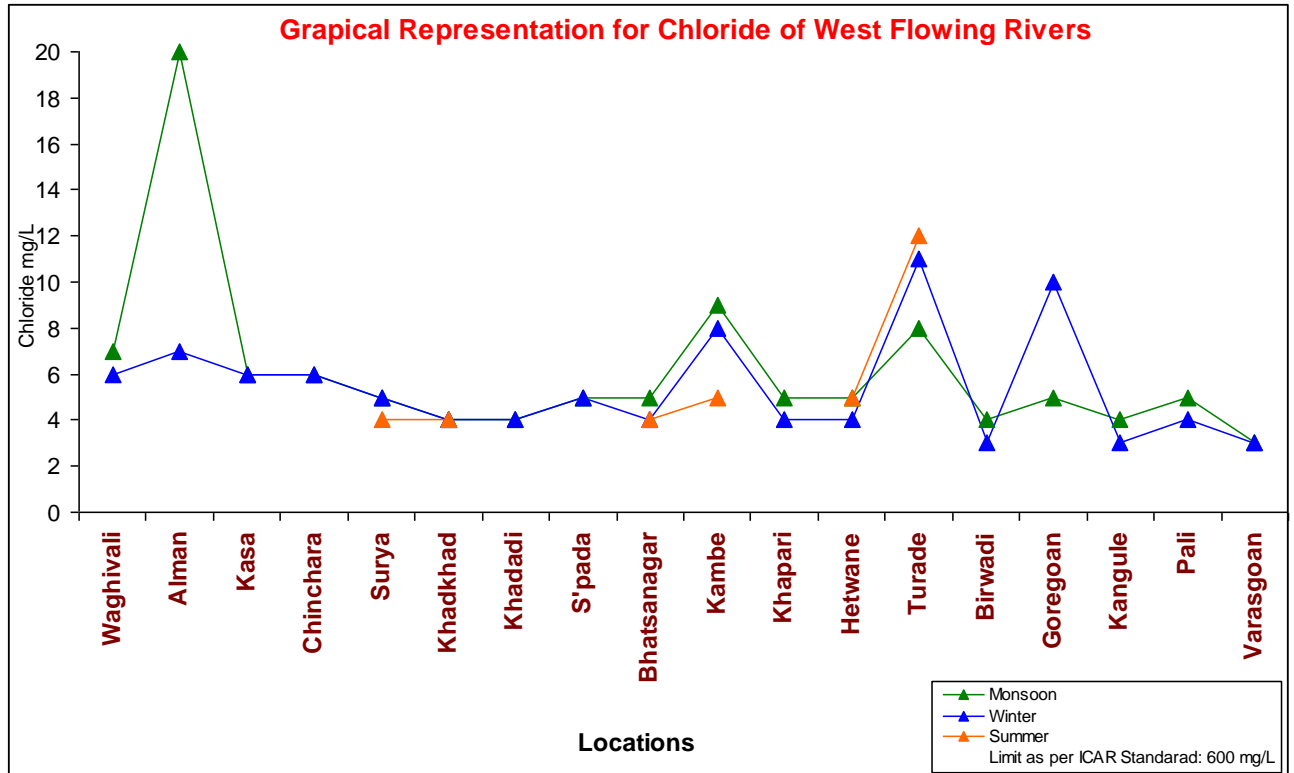
From the above graph it can be observed that, the value of Biological Oxygen Demand at Bhatsanagar Dam, Surya Dam & Kambe during the summer season and at Khadkhad during the winter season are within the prescribed limit of 2 mg/L and are exceeding the prescribed limit of 2mg/L at the remaining locations during all the seasons.

5. Total Hardness



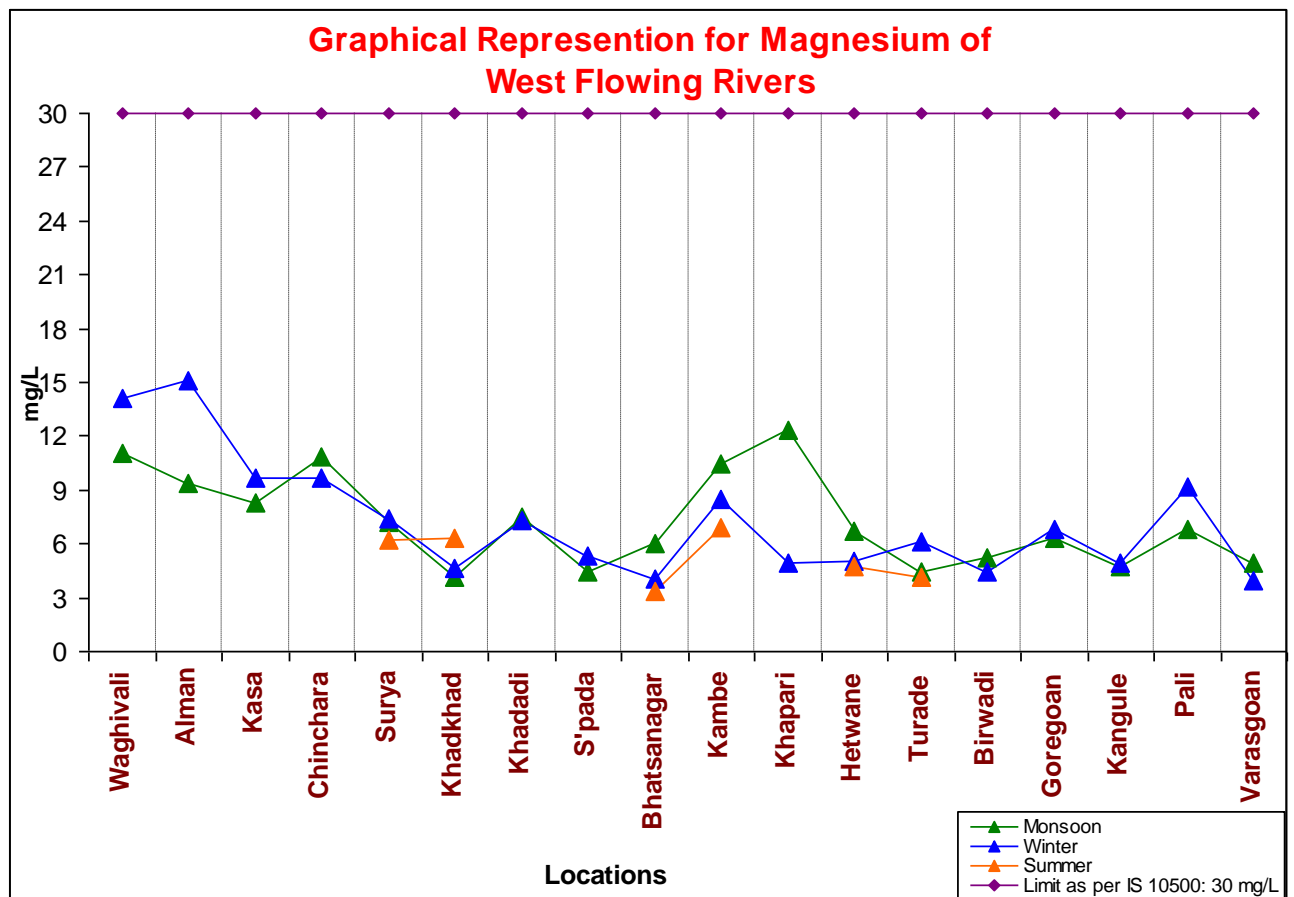
From the above graph, it can be observed that at all the locations during all the seasons the value of Hardness is within the prescribed limit.

6. Chlorides



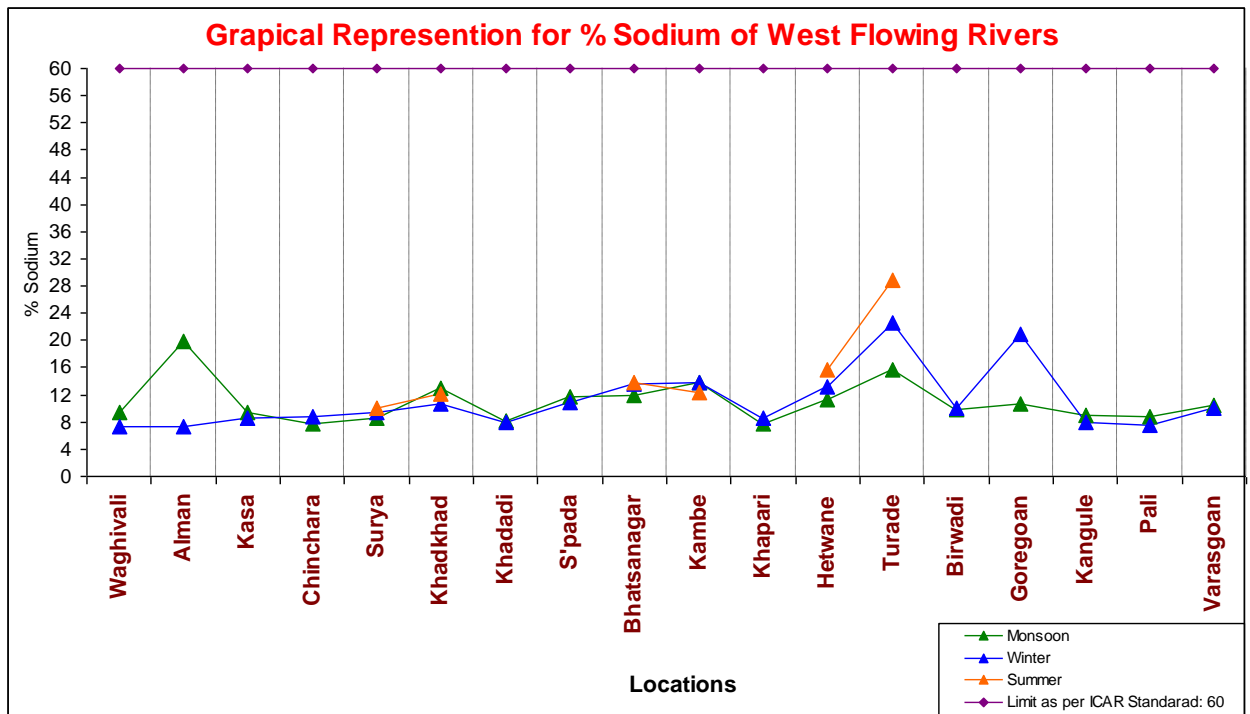
From the above graph, it can be observed that at all the locations during all the seasons the value of Chlorides is well within the prescribed limit.

7. Magnesium



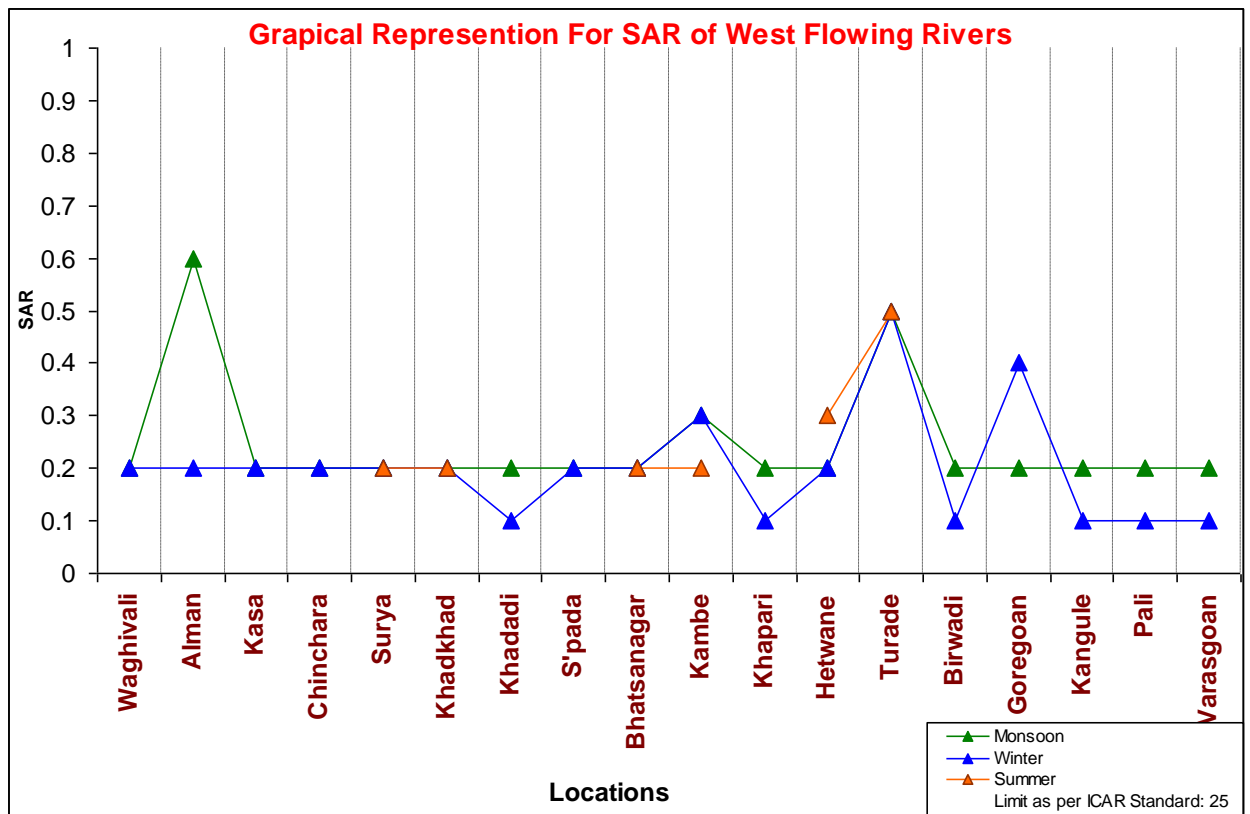
From the above graph, it can be observed that at all the locations during all the seasons the value of Magnesium is within the prescribed limit.

8. % Sodium



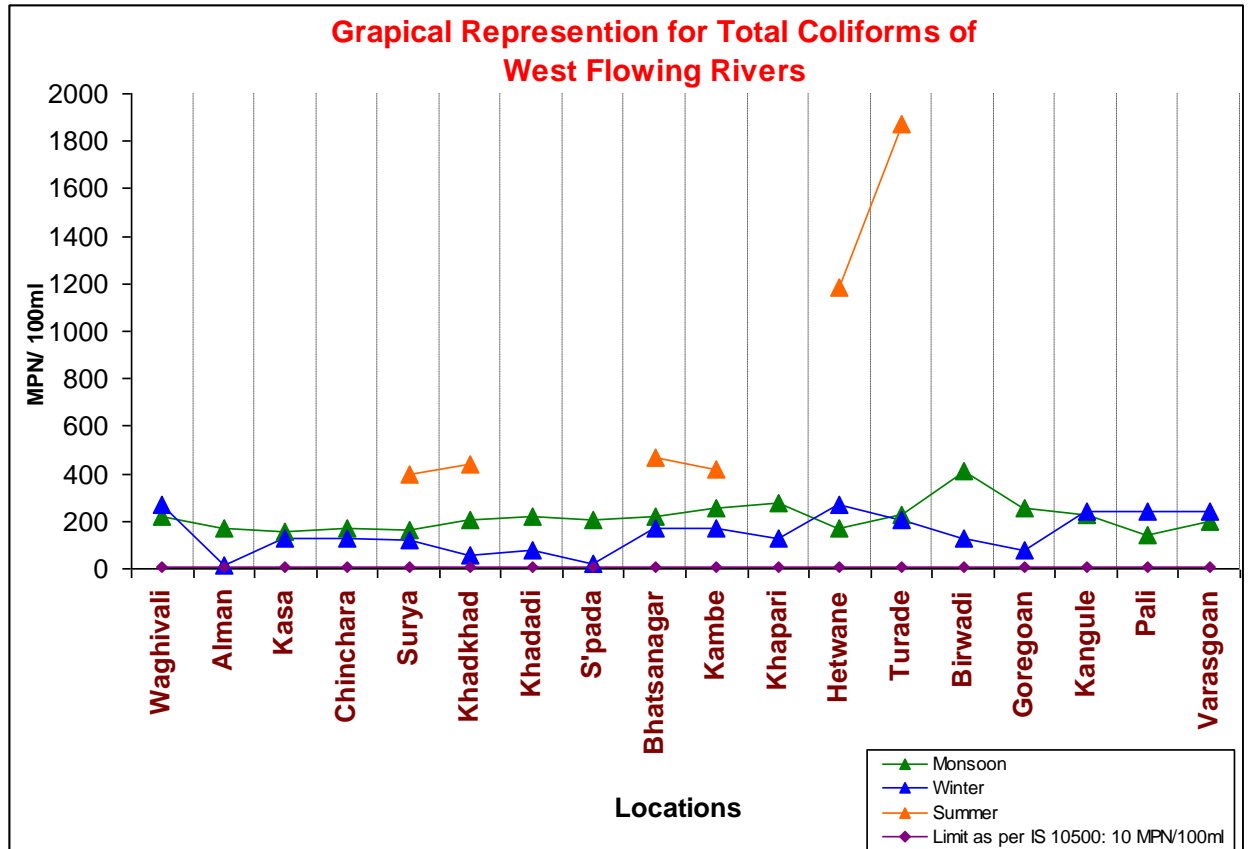
From the above graph it can be observed that at all location the values of % Sodium are within the prescribed limit during all the seasons.

9. Sodium Absorption Ratio



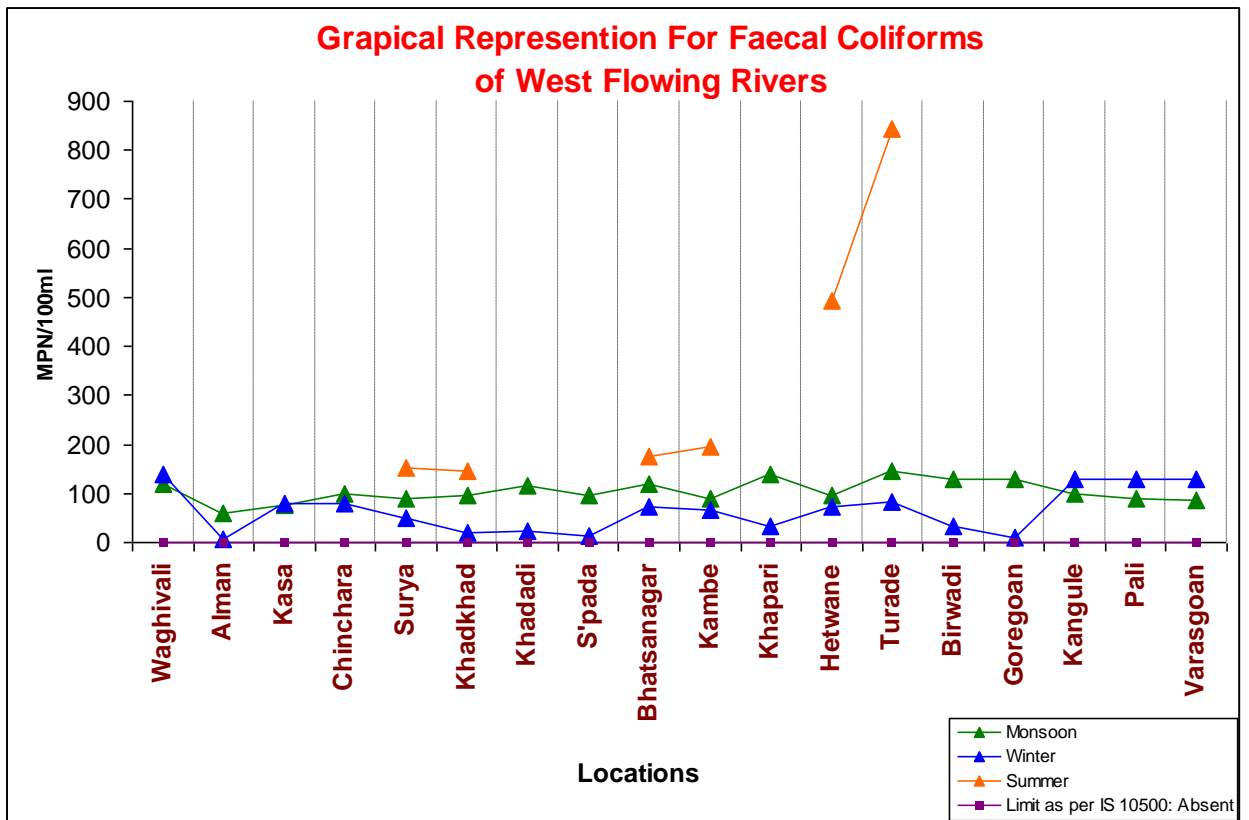
From the above graph it can be observed that at all location the SAR are within the prescribed limit during all the seasons.

10. Total Coliforms



From the graph it can be observed that values of Total Coliform are exceeding at all location during all seasons.

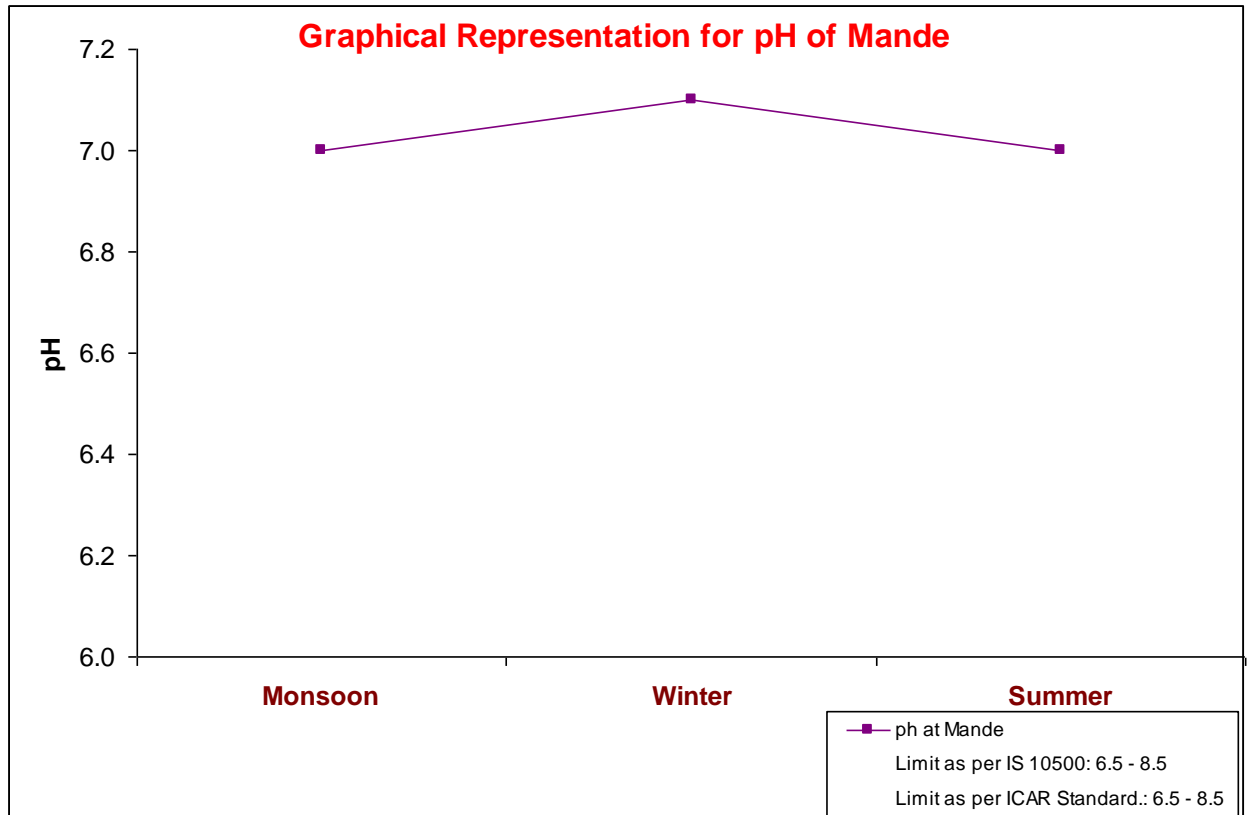
11. Faecal Coliforms



From the graph it can be observed that values of Total Coliform are exceeding at all location during all seasons.

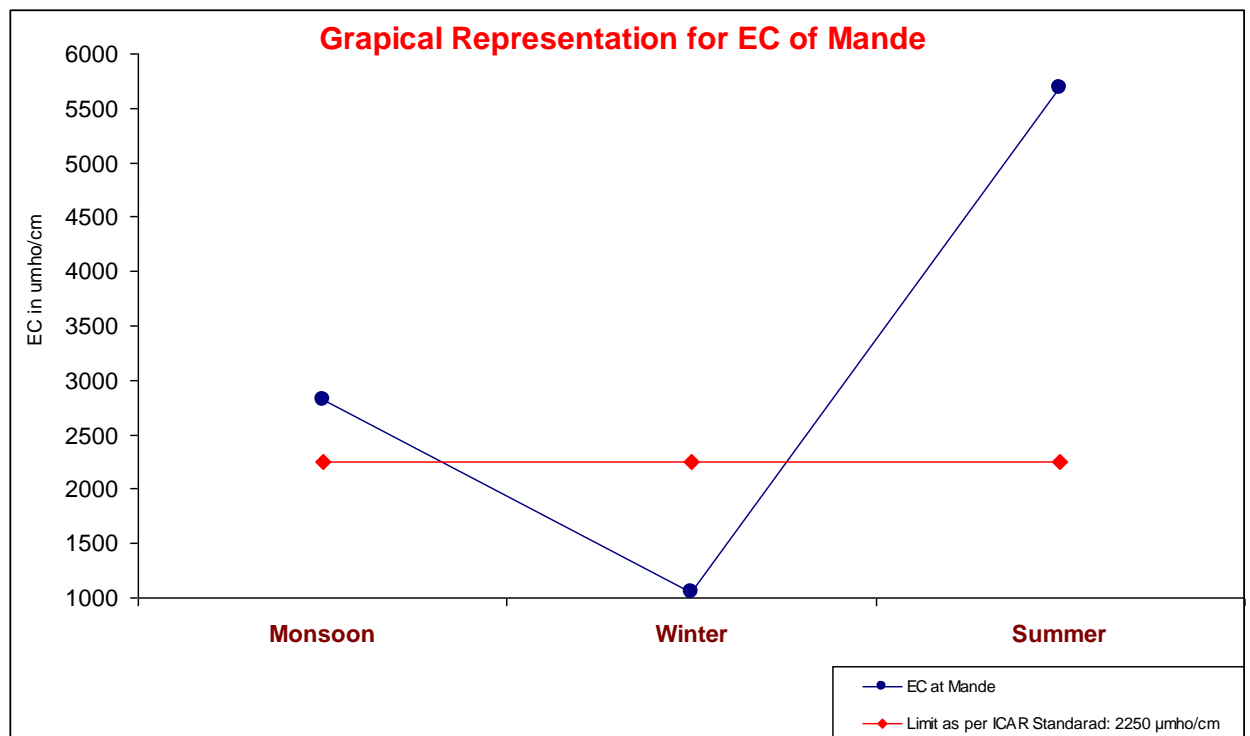
MANDE

1. pH



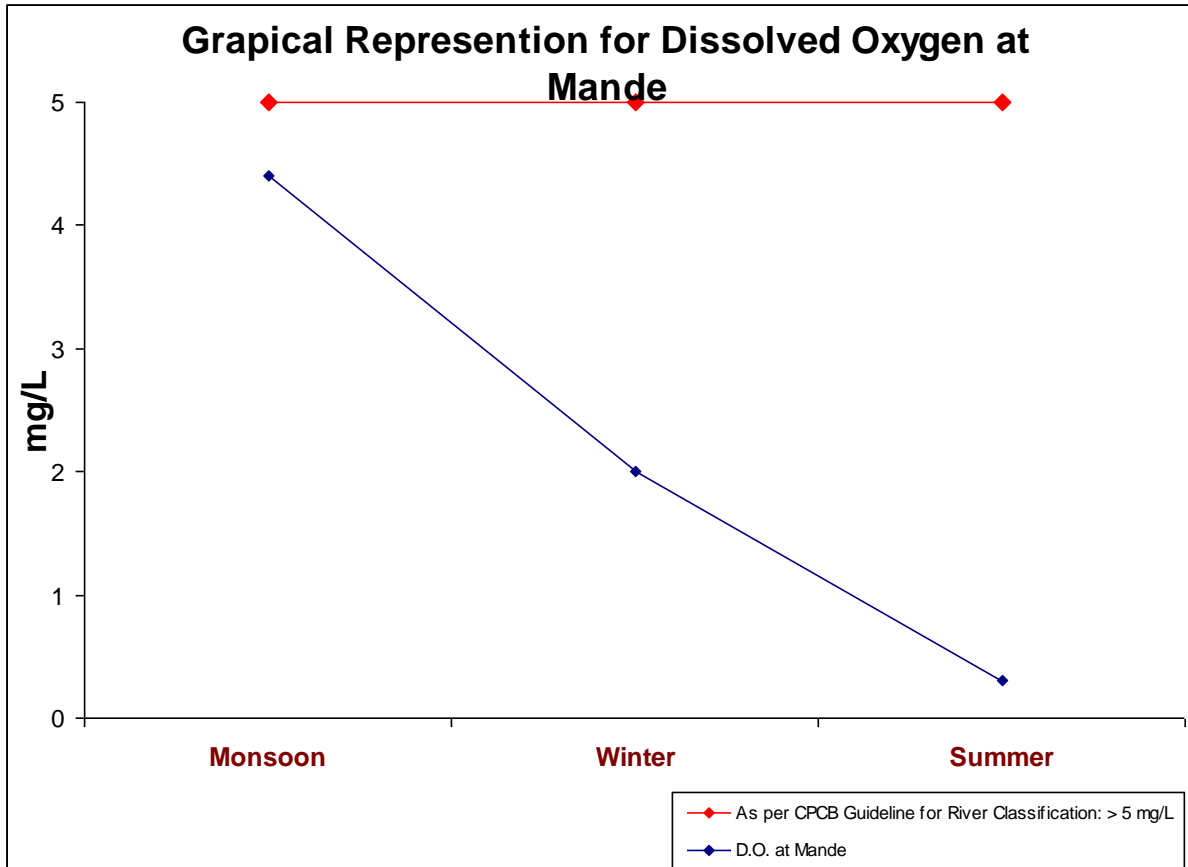
It can be seen that the Ph values are within the prescribed limits during all the seasons.

2. EC



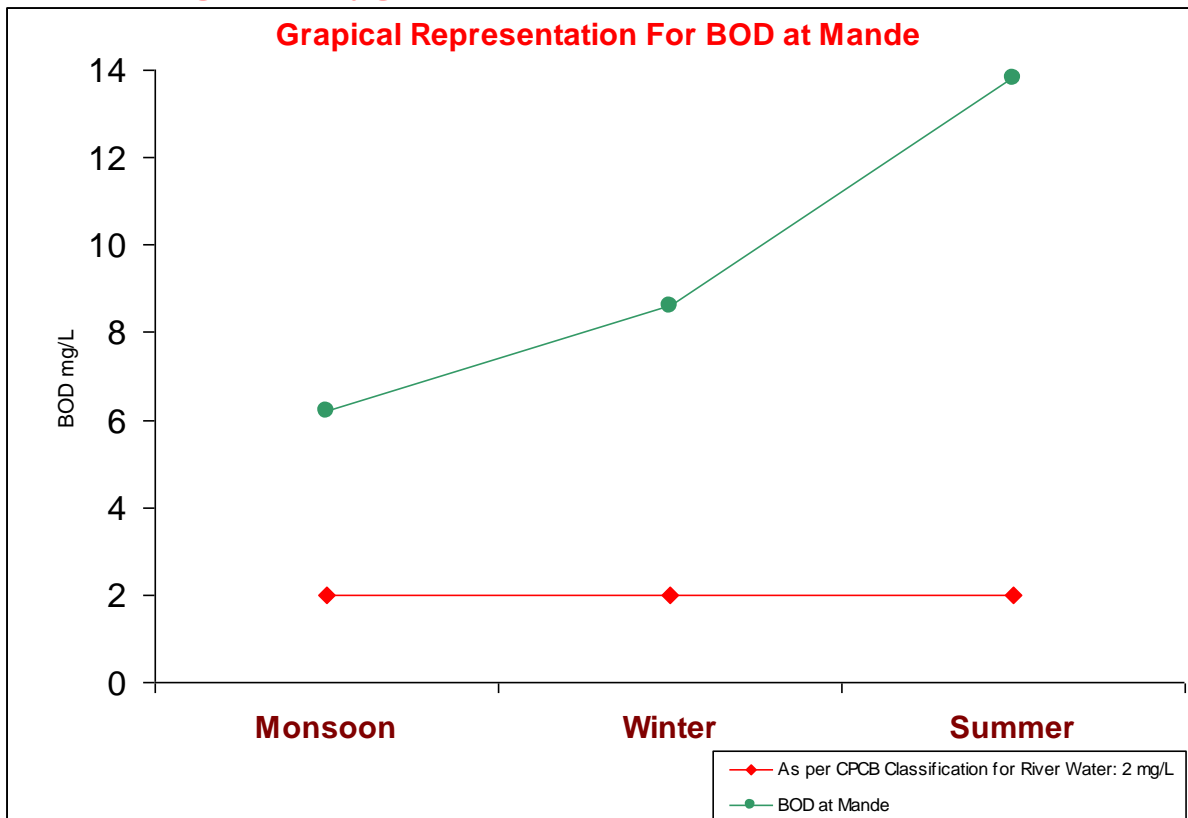
From the above graph it can be observed that at Mande location value of Electrical Conductivity exceeds the prescribed limit as per ICAR Standards during monsoon & summer seasons.

3. Dissolved Oxygen



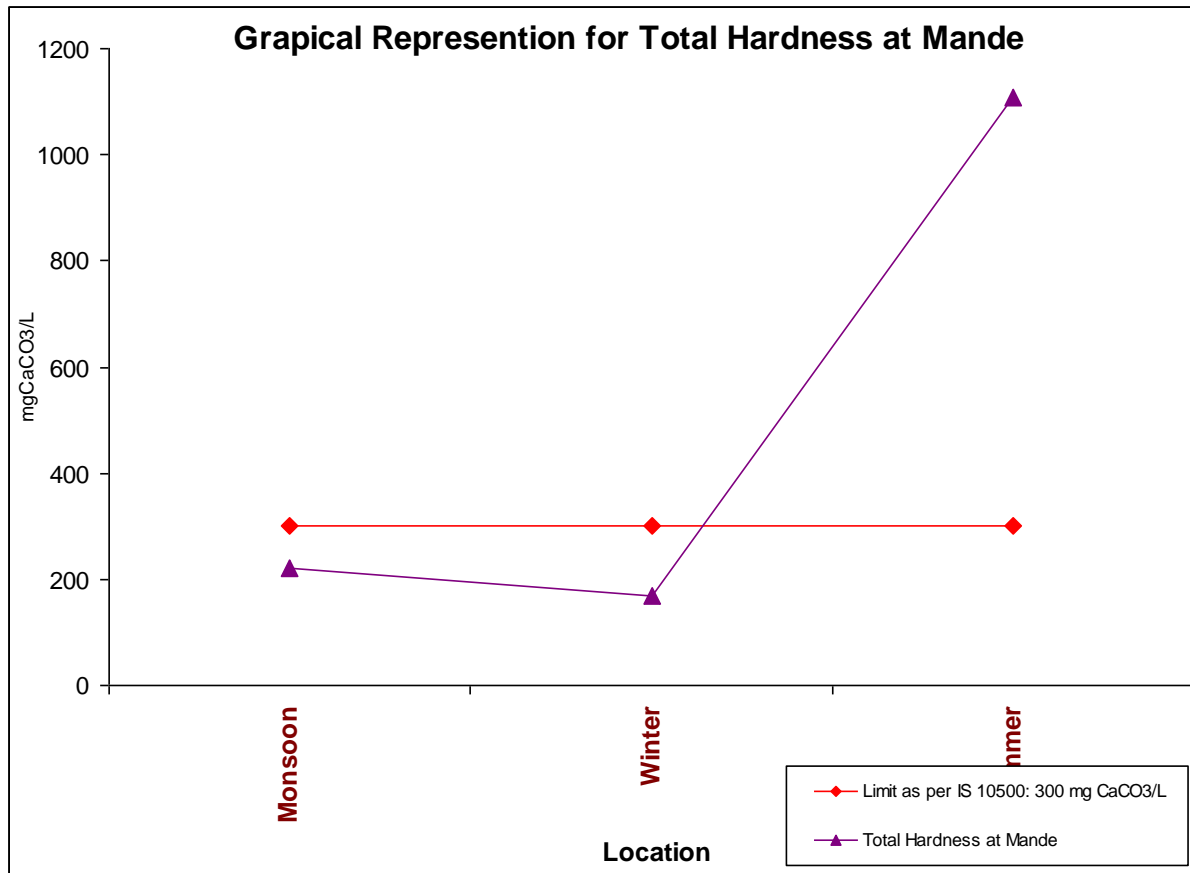
From the above graph it can be observed that at Mande location the value of Dissolved Oxygen is much less during all seasons.

4. Biological Oxygen Demand



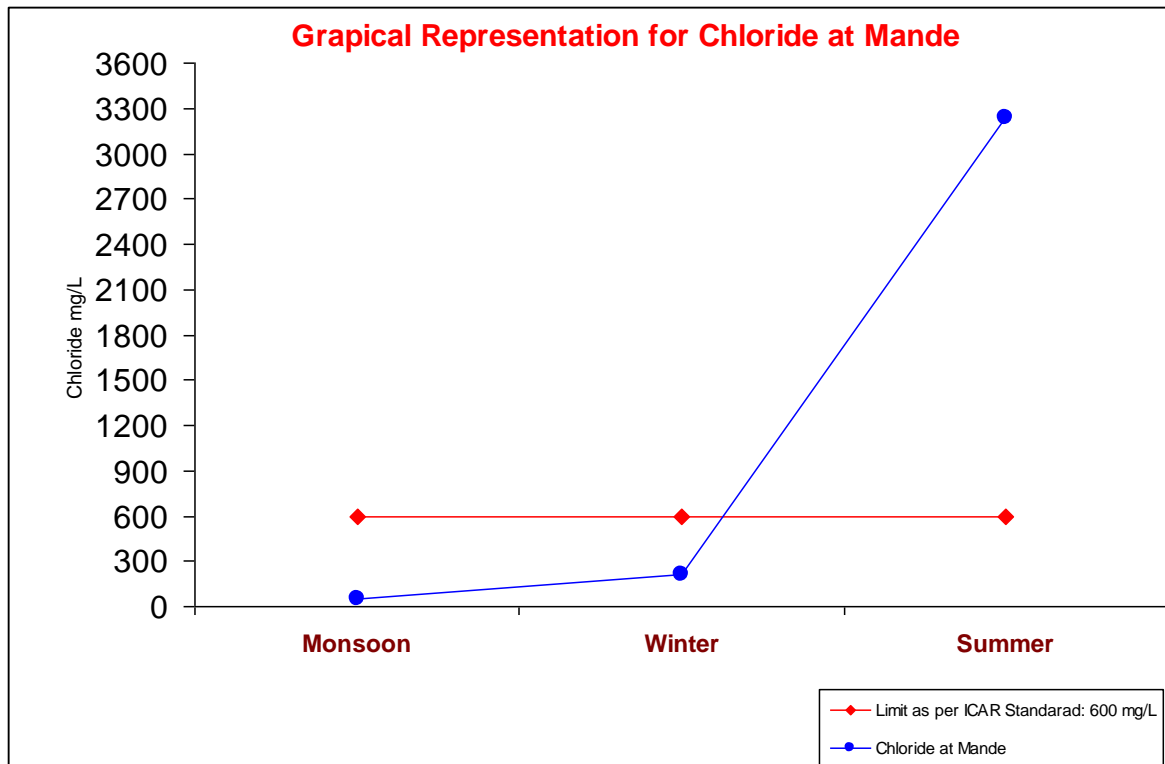
From the above graph it can be observed that, at Mande the value of Biological Oxygen Demand is exceeding the prescribed limit during all the seasons.

5. Total Hardness



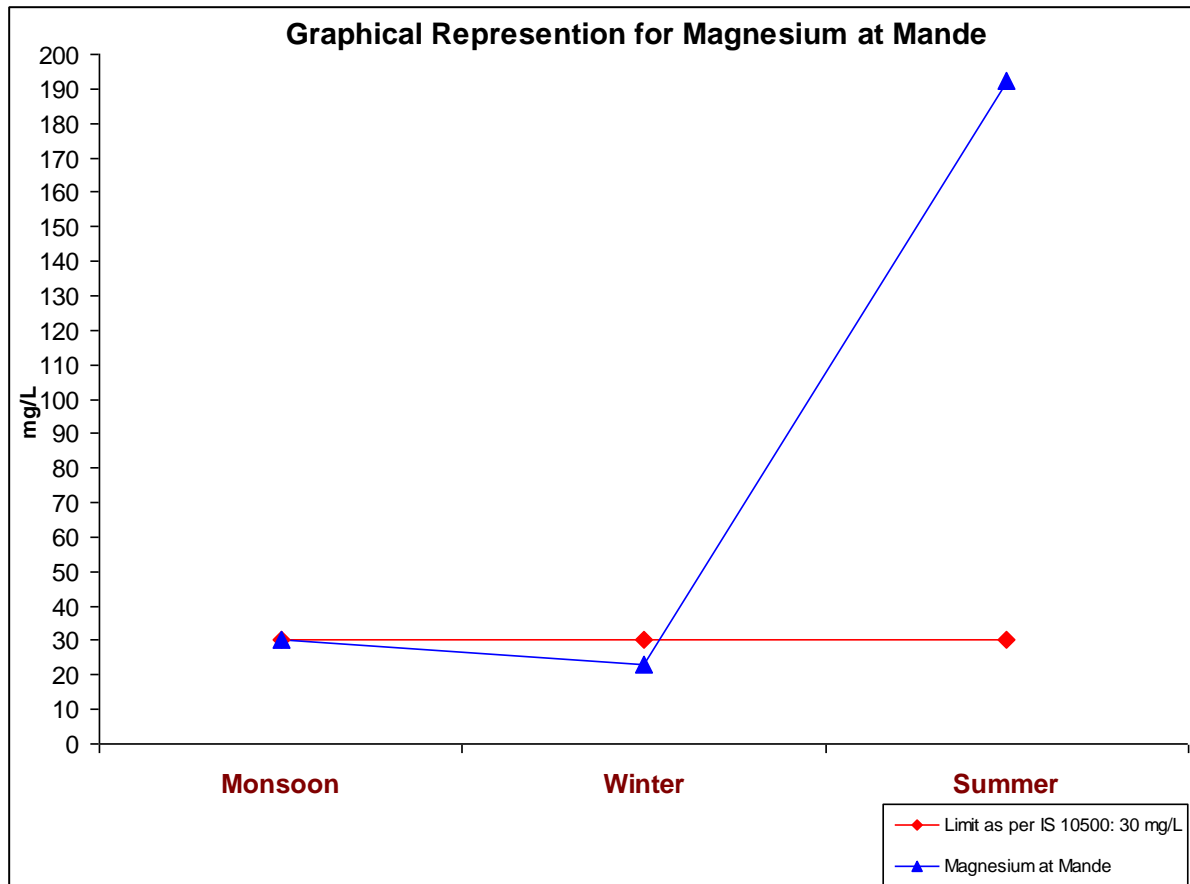
From the above graph, it can be observed that during summer at Mande location the value of Hardness exceeding the prescribed limit.

6. Chlorides



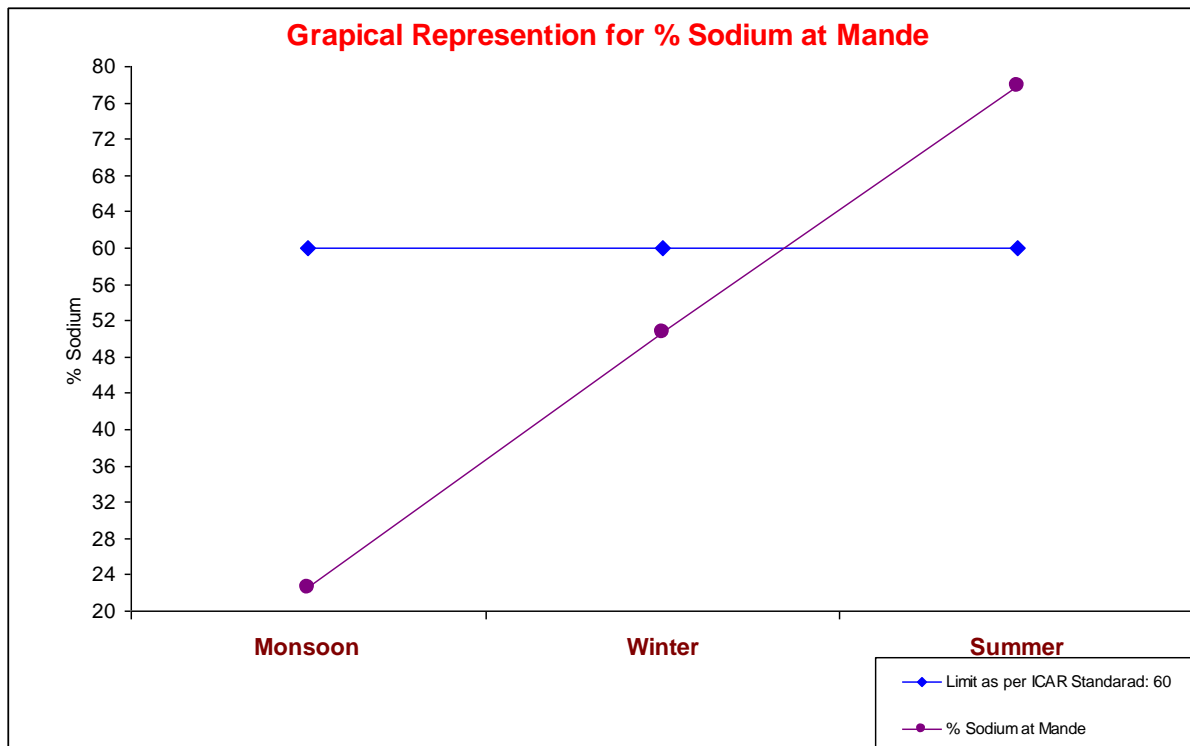
From the above graph it can be observed that Mande location is exceeding the value of chloride as per IS 10500 & ICAR Standards during summer season.

7. Magnesium



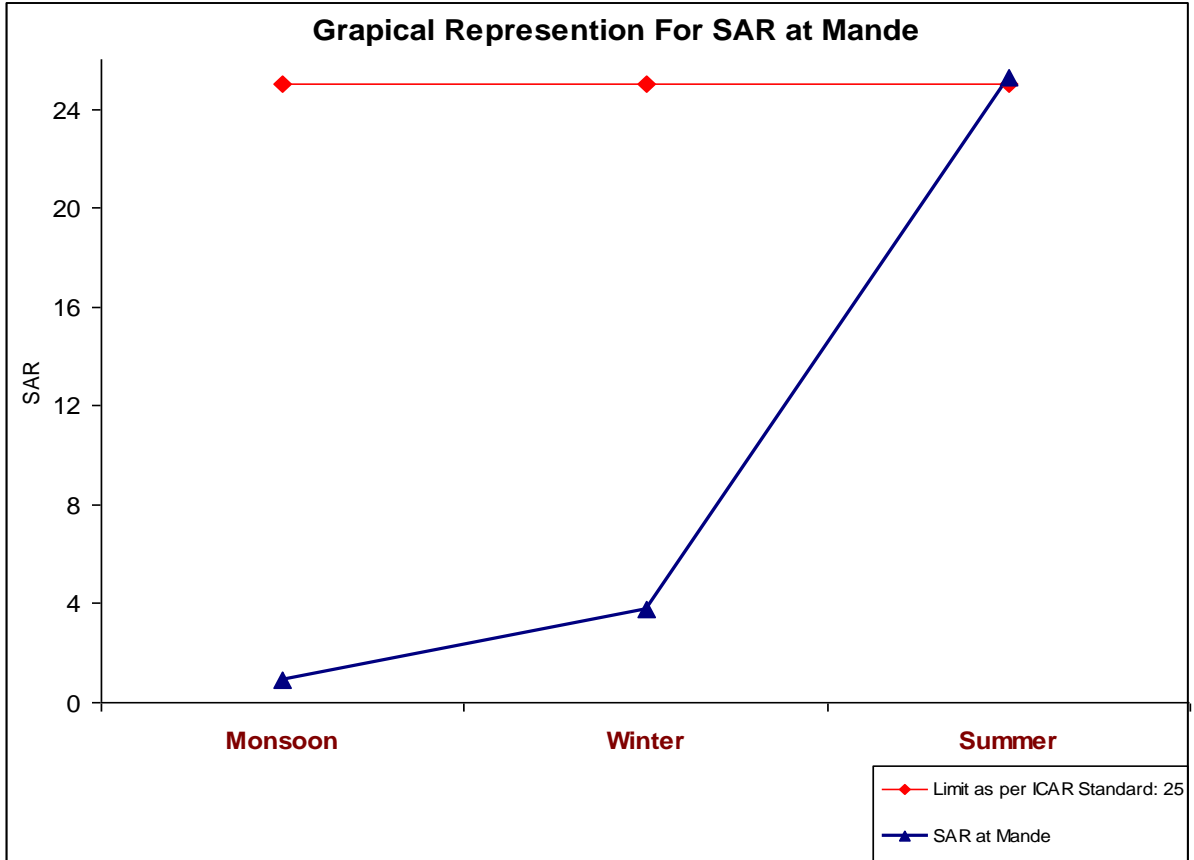
From the above graph, it can be observed that at Mande location the value of Magnesium exceeding the prescribed limit in summer season.

8. % Sodium



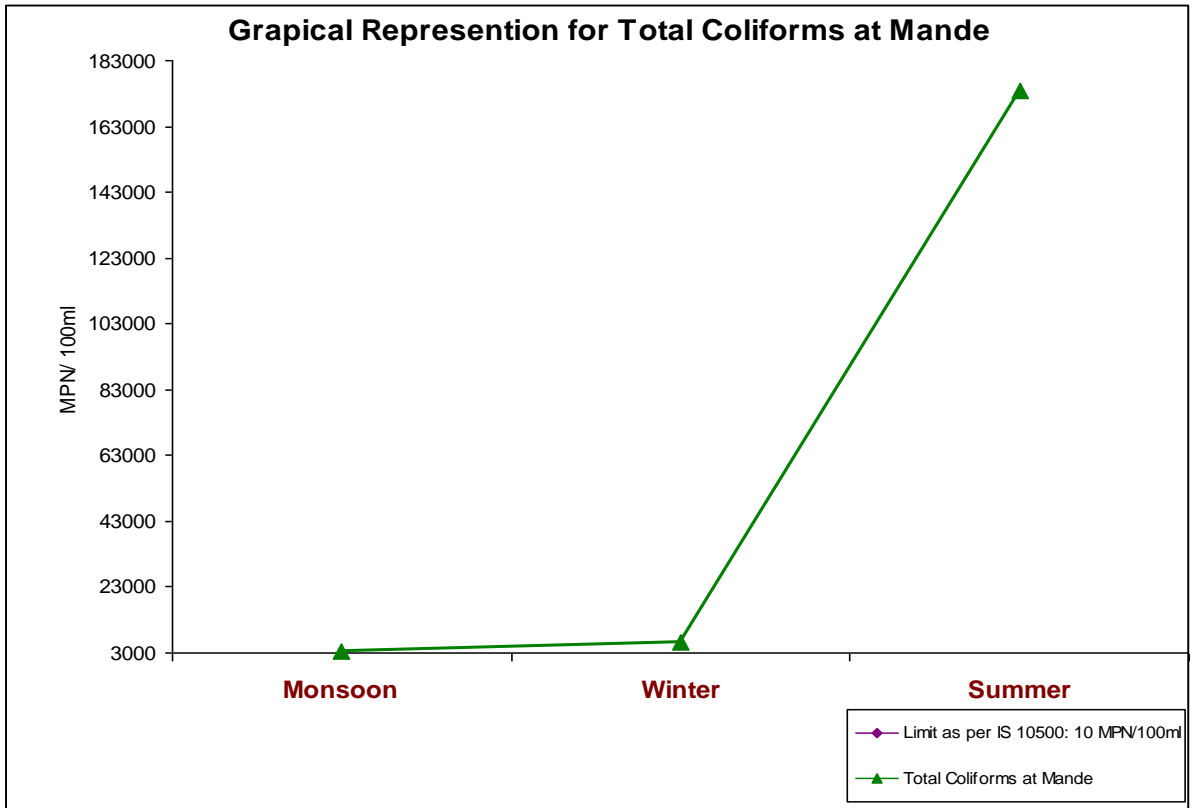
From the above graph it can be observed that Mande location is exceeding the prescribed limit during summer season.

9. Sodium Absorption Ratio



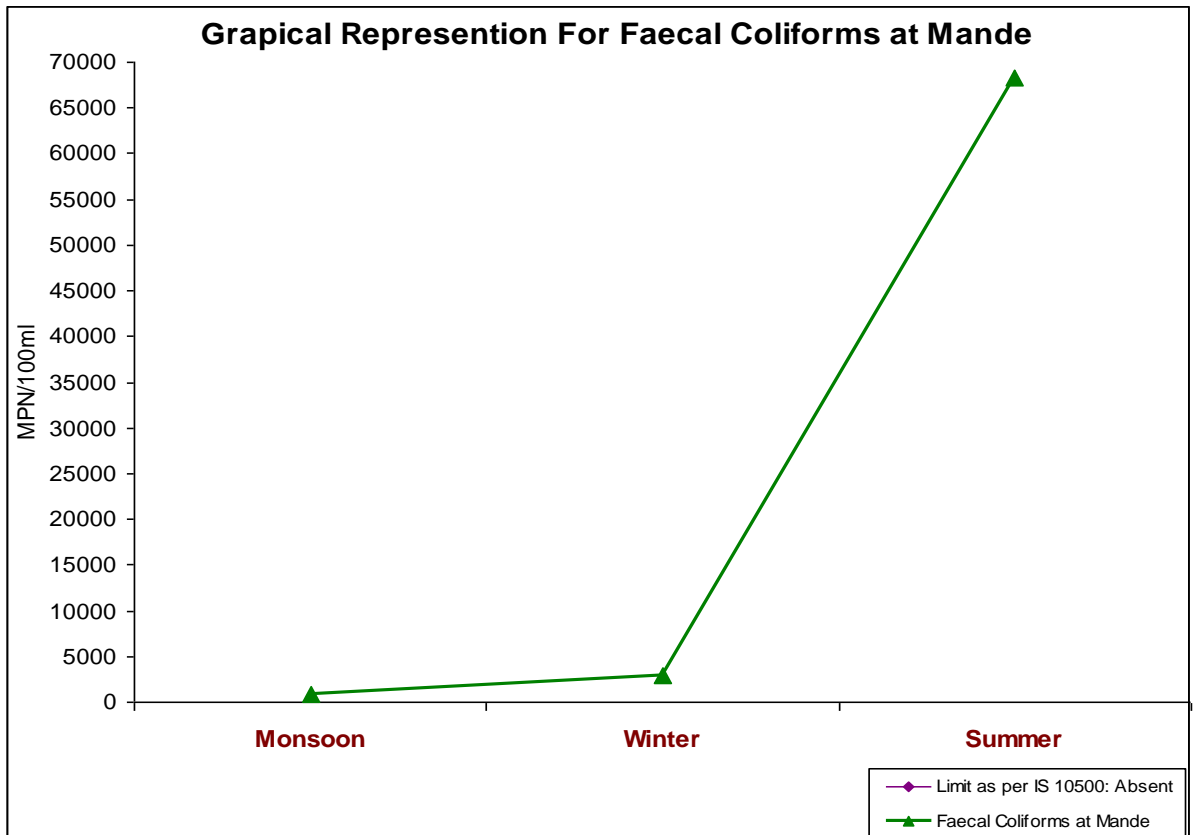
From the above graph it can be observed that at Mande location value of SAR is exceeding the limit during summer season.

10. Total Coliforms



From the graph it can be observed that the Total Coliforms at Mande are exceeding during all seasons.

11. Faecal Coliforms



From the graph it can be observed that the Faecal Coliforms at Mande are exceeding during all seasons.

CHAPTER - 5

CONCLUSION

CONCLUSION

The pH values at all locations are within the specified CPCB limits. EC value of trend locations increases in summer than winter. Due to biological activities, EC at Dam locations also shows variation in summer & winter season. Alkalinities of trend and dam samples are under the CPCB limit.

Most of the chemical parameters at all the locations except Mande are within tolerance limit (IS 10500).

Total Coliforms & Faecal Coliforms at all locations contain higher bacterial count which is mainly due to discharge of sewage, drainage in to water body. Water having excess bacterial count is not fit for human consumption. The analysis report of all location shows that BOD at every location is also exceeding the permissible limit due to presence of organic matter.

The locations of Mande shows increase in value of Biological Oxygen Demand, Total Coliforms & Faecal Coliforms. 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.

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.

CHAPTER – 6
OTHER ACTIVITIES

OTHER ACTIVITIES OF W.Q Lab. level – II, Kalwa (Thane)

6.1 REVENUE GENERATION TO GOVERNMENT OF MAHARASHTRA

Apart from monitoring of water quality network for Water Quality lab level II at Kalwa (Thane), the infrastructure facility is 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, STP purpose.

During the period June 2010 to May 2011, some clients approached to the laboratory. Total revenue of Rs. 6432 has been generated during this period.

The valuable clientele who availed the facilities of this laboratory are as per Annexure-I.

ANNEXURES

Chapter	Particulars	Page No.
1	List of Clients 2009-10	
2	Jurisdiction Map of Laboratory	

List of Client 2009-2010

Sr. No.	Name of Client	Purpose of Analysis
1	Sub-Divisional Officer, Irrigation Research Sub-Division, Khed	Comparative study of Rain water & Dam Sample
2	Minor Irrigation Sub-Division, Mangaon	For Kal Hydroelectric Project
3	Mehta Group, Thane	Analysis For STP Purpose
4	Raigad Irrigation Division, Kolad	For checking quality for Irrigation Purpose
5	Mr. Chandrashekhar Sathe, Kalwa	Analysis of Bore well Sample
6	Sub-Divisional Officer, Minor Irrigation Sub-Division, Wada	Tulyachapada M.I. Tank testing of leakage water
7	Executive Engineer, M.I. Division, Kalwa	Analysis of sample from Mohane Bandhara at Kalyan
8	Mr. Manish Gore, Kalwa	Water sample from Powai Lake for study purpose
9	Mr. Mohan Borse, Nashik	Analysis of Bore well Sample
10	Mr. S.B. Salunkhe, Thane	For M.Tech study purpose
11	Mr. Suresh Gharote, Nashik	Water tested for Drinking purpose
12	M/s Karsandas Mavji, Kalyan	Outlet of ETP
13	Mr. Vasant Shedge, Kalwa	Analysis of Bore well Sample

**Jurisdiction Map Of Water Quality Lab Level-II, Kalwa
(Thane)**