



GOVERNMENT OF MAHARASHTRA
WATER RESOURCES DEPARTMENT
HYDROLOGY PROJECT (SW)

Chief Engineer, Planning & Hydrology, Nashik

WATER QUALITY LAB LEVEL-II, NASHIK
ANNUAL REPORT
June 2011- Jan 2013



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Preface

When Neil Armstrong saw the Earth from the Moon, it appeared blue! This is because water covers more than two-thirds of the Earth's surface. But fresh water represents less than 0.5% of the total water on Earth. The rest is either in the form of seawater or locked up in icecaps or the soil, which is why one often hears of water scarcity in many areas.

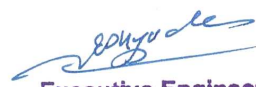
Water is continuously moving around the earth and constantly changing its form. It evaporates from land and water bodies and is also produced by all forms of life on Earth. This water vapour moves through the atmosphere, condenses to form clouds and precipitates as rain and snow. In time, the water returns to where it came from, and the process begins all over again. Although water is constantly moving, its total quantity on Earth's surface is constant.

The water quality criteria have been prepared by taking into consideration various designated uses. In order to assess the quality of water, various government agencies are working at National and State levels. This report includes water quality data generated in Maharashtra State through the Office of the Chief Engineer, Hydrology Project (SW), Nashik (Maharashtra). The data has been interpreted to know the 'Surface Water Quality Status in Maharashtra' with respect to various uses and criteria of CPCB, ICAR for various Water Uses.

Therefore it is a great pleasure to handing over this precise report on analysis of water samples at WQ Laboratory Level – II at Nashik which is established in JalVigyan Bhavan.

This booklet attempts to briefly describe an over view and general conclusion based on the basis of one year quality data of water samples collected from selected locations and define frequencies.

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


Executive Engineer
Hydrology Project Division
Aurangabad.

ANNUAL REPORT

**On Water Quality Monitoring through Water Quality Lab Level-II, Nashik for the
June 2011- January 2013**

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CHAPTER-1
EXECUTIVE SUMMERY

Annual Report

**On Water Quality Monitoring through Water Quality Lab Level-II, Nashik for
the Year June 2011- May 2012& June 2012 –January 2013**

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 are recorded and 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.

1.2 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, Nashik 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 year June 2011- January 2013. 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 June 2011- January 2013.

TABLE SHOWING SAMPLES ANALYSED DURING THE REPORTING PERIOD

Sr. No.	Period	Trend Sample (First Round)	Trend Sample (Balance Round)	Dam Sample (First Round)	Total
1.	June 2011-May 2012	83	36	96	215
2.	June 2012-January 2013	71	24	64	159
Total Samples analyzed during reporting period					374

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 Procedure, Instrument Operating Instructions, HIS Manuals, CPCB Guidelines and APHA, 21st Ed., 2005.

Data analyzed further validated with prescribed method as per Water Quality Manuals to verify various Ratios manually and then it 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.

Further more 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.

1.5 Result and Observation:

After observing all this data the physiochemical parameters like Biological Oxygen Demand exceeds its tolerance limit in all season at all location. Turbidity exceeds its prescribed limit at in all season at Nasardi, in summer and monsoon at Kushawarta, in monsoon and winter at Takali, Akkalpada and Malegaon and in monsson only at Sukhwad, Dhule and Supale , At Kushawarta, Takali and Nasardi dissolved oxygen

observed less than its desirable limit. Total alkalinity at Takali and Nasardi exceeds its limit in all season and D/s of Eklahare exceeds its limit in summer and monsoon season.

Bacteriological parameters i.e. Total coliforms & Faecal coliforms exceeds its prescribed limit at all location in all season

1.6 Conclusion

After observing all the results it can be concluded that, the value of Biological Oxygen Demand is very high, even exceeding beyond desired limit is due to the presence of organic matter, which reduces oxygen content in the water. Water having excess Biological Oxygen Demand is not fit for human activities or consumption. The domestic waste may add great quantity of organic & some inorganic materials that contribute turbidity. Under certain conditions, natural water may contain appreciable ammonia of carbonate & hydroxide alkalinity.

Analysis results from all the locations have shown increase in value of Total Coliforms & Faecal Coliforms because the discharge of sewage drainage waste into the water source even increase in domestic discharge bacteria's of various types increased.

With reference to Wilcox technique, it is observed that 3 locations such as Kushawarta, Nasardi & Nandurmahadmeshwar belongs to class C2 & S1. This indicates that the water flowing along these locations is mostly suitable for irrigation purpose. For drinking purpose, it should be treated before use.

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 salt tolerance crop and is recommended based on special study.
- Use of direct source of water is to be avoided.
- Bathing at such location should be restricted.

- Tree plantation may be done on banks of rivers to minimize soil erosion and to improve the area aesthetically.
- The artificial recharge of ground water through integrated watershed management programme and rainwater harvesting will help to improve the ground water quality in the area where the problem exists.

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.
- Measures for sustainable use of water resources are necessary
- Measures for water conservation, recycling and optimal conjunctive use of surface and ground water for specific uses are necessary.
- Farmers in the catchment area should be educated against use of extensive amount of pesticides and chemical fertilizers. They should be encouraged to use organic manures.
- To create Environmental consciousness through education and mass awareness programmes may be planned
- Besides the regular ground water quality monitoring, special studies should be undertaken on micro-level basis where ground water quality has undergone. Deterioration to ascertain the reasons, extent and remedial measures thereafter.
- The lack of facilities and awareness for proper disposal of waste and wastewater is mainly causing the ground water quality deterioration in the state. Hence, it is suggested that people in the rural and urban parts of the State should be made aware about the pollution of the ground water and its impacts. Strict regulations must be observed to stop pollution of ground water.

CHAPTER-2

INTRODUCTION

2.1 General:

The water quality monitoring is being carried out under Hydrology Project. Hydrology Project SW, Maharashtra takes care of Surface Water Quality monitoring through 163 locations spread over the state throughout the year. In accordance with decision taken in 1st meeting of Water Quality Review Committee of state of Maharashtra, "The Uniform Protocol" for water monitoring finalized by the Water Quality Assessment Authority formulated by the Ministry of Water Resources is made available to Hydrology Project Surface Water, Maharashtra. 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 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, Nashik 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 CPCB, Delhi.

2.3 Water Quality Monitoring - Scope

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 June 2011 to May 2012 and June 2012 to January 2013.

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 Nashik, 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, construction purpose, swimming tanks, irrigation purpose & study purpose.

During the period June 2011 to May 2012 and June 2012 to January 2013 many clients approached to the laboratory. The valuable clients availed the facility of the laboratory are as below;

1. Nashik Municipal Corporation
2. National Thermal Power Station
3. Various International School in Nashik City
4. Medical Institute like Ayurved College
5. KTHM College for study purpose.
6. Client from MIDC, Satpur.

REVENUE GENERATED DURING THE REPORTED PERIOD

Sr. No.	Period	No. of clients approached	Amount Received
1.	June 2011 to May 2012	107	3,09,782/-
2.	June 2012 to January 2013	83	1,14,590/-

2.5 Extended Scope of Laboratory

Under Hydrology Project(SW) Maharashtra Water Quality Monitoring is being carried out with prescribe W.Q. Network with 6 Level-II & 38 Level-I Labs followed by 163 sampling locations spread all over the State.

During the meeting of WQRC held in Mumbai Water Quality Lab Level-II, Nashik has recommended to be a Referral Lab for the State of Maharashtra. Hence Government of Maharashtra has approved the proposal of up gradation of this level II lab to Level-II⁺ with provision of sophisticated instruments like AAS, GC and Laminar Flow unit with raised lay out as per prescribed norms of towards recommended by MoEF & NABL accreditation as per Uniform Protocol.

AQC Exercise organized by CPCB – This lab participated in AQC Exercise organized by CPCB during the reported period and scored 91% and recently participated and results are awaited.

Training and Visits: Infrastructure facility is made available to the college student for in plant training and their research purposes. Many visitors from various sectors visited the lab and appreciated the efforts taken by this lab.

The infrastructure facility is also made available to all institutional organization for visit and study purposes and the generated data of water quality is also made available to the users who are a member of Hydrology Data User Group (HDUG) of Hydrology Project, Nashik.

ANNUAL REPORT FOR THE PERIOD OF June 2011- January 2013

Water Quality Laboratory Level II at Nashik

Salient Feature:

1. General Structure of Laboratory:

- 1) Sampling Locations as per Water Quality Network covered in this Lab:-18
- 2) Monthly sample collection: - 18 samples.
- 3) Frequency of sampling: - **Trend:** Monthly

Dam samples: Fortnightly

- 4) Govt. staff related to Laboratory during reported period

1. Mr. A.S. Suryawanshi (Superintending Engineer)
2. Mr. V.P. Kulkarni (Executive Engineer)
3. Mr. S.V. Bachhav (Sub Divisional Engineer)
4. Mr. S.K. Kshirsagar (Govt. Analyst)

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

a) Indoor Work :-

1. Mr. H.P. Bhavsar (Branch Manager, Nashik Branch)
2. Mrs. C.A. Ekhande (Chief Analyst)
3. Mrs. N. Y. Mandlik (Jr. Analyst)
4. Ms. S. Patil (Microbiologist)
5. Mr. R.N. Patil (Lab. Assistant)

b) Outdoor Work: -

1. Mr. S.A. Shelar (Chemist & Outdoor work Coordinator)
2. Mr. K. N. Gujar (Chemist)
3. Mr. B. G. Jadhav (Chemist)
4. Mr. R. P. Bhalerao (Khalashi)
5. Mr. M. A. Albad (Khalashi)
6. Mr. P. D. Dhongde (Khalashi)

2. Scope of Work: Operation and Maintenance of Water Quality Laboratory
Level-II, Nashik

2.1 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.

2.2 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.
- Documents as per ISO 9001:2008 mandates.

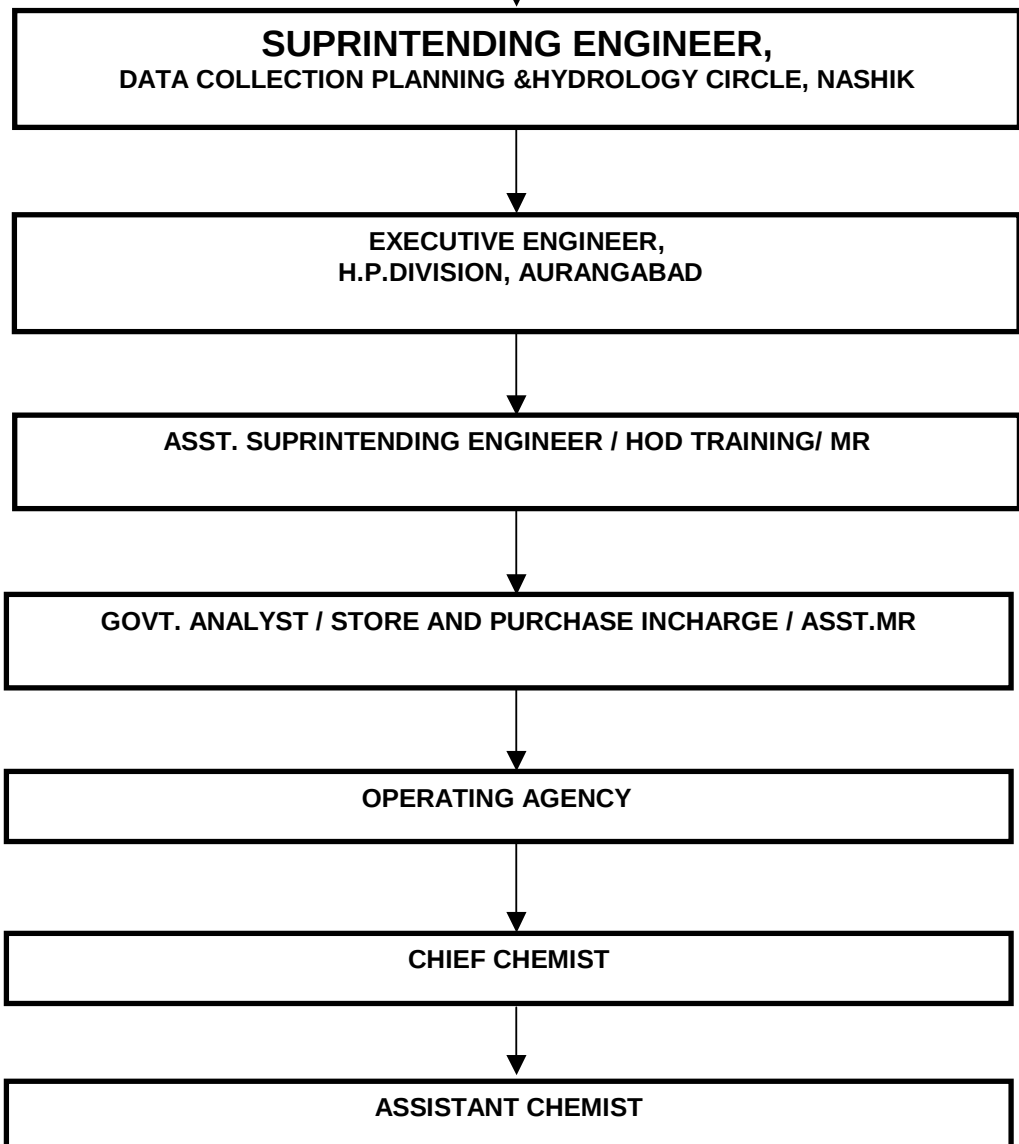
i) Within Laboratory AQC ii) Intra Laboratory AQC iii) AQC by CPCB

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

DATA COLLECTION PLANNING & HYDROLOGY CIRCLE, NASHIK
WATER QUALITY LAB, LEVEL - II NASHIK

ORGANISATION CHART



METHODOLOGY

3.0 General:

This laboratory covers Surface Water component which covers River and Reservoir Locations in Godavari basin up to Kopergaon & Dhule district, a pan of Tapi Basin.

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, Panzara & 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, Nashik 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.

3.3 Methodology:

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Data analyzed further validated with prescribed method as per Water Quality Manuals to verify various Ratios manually and then it 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 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 and June 2012 to January 2013 are considered.

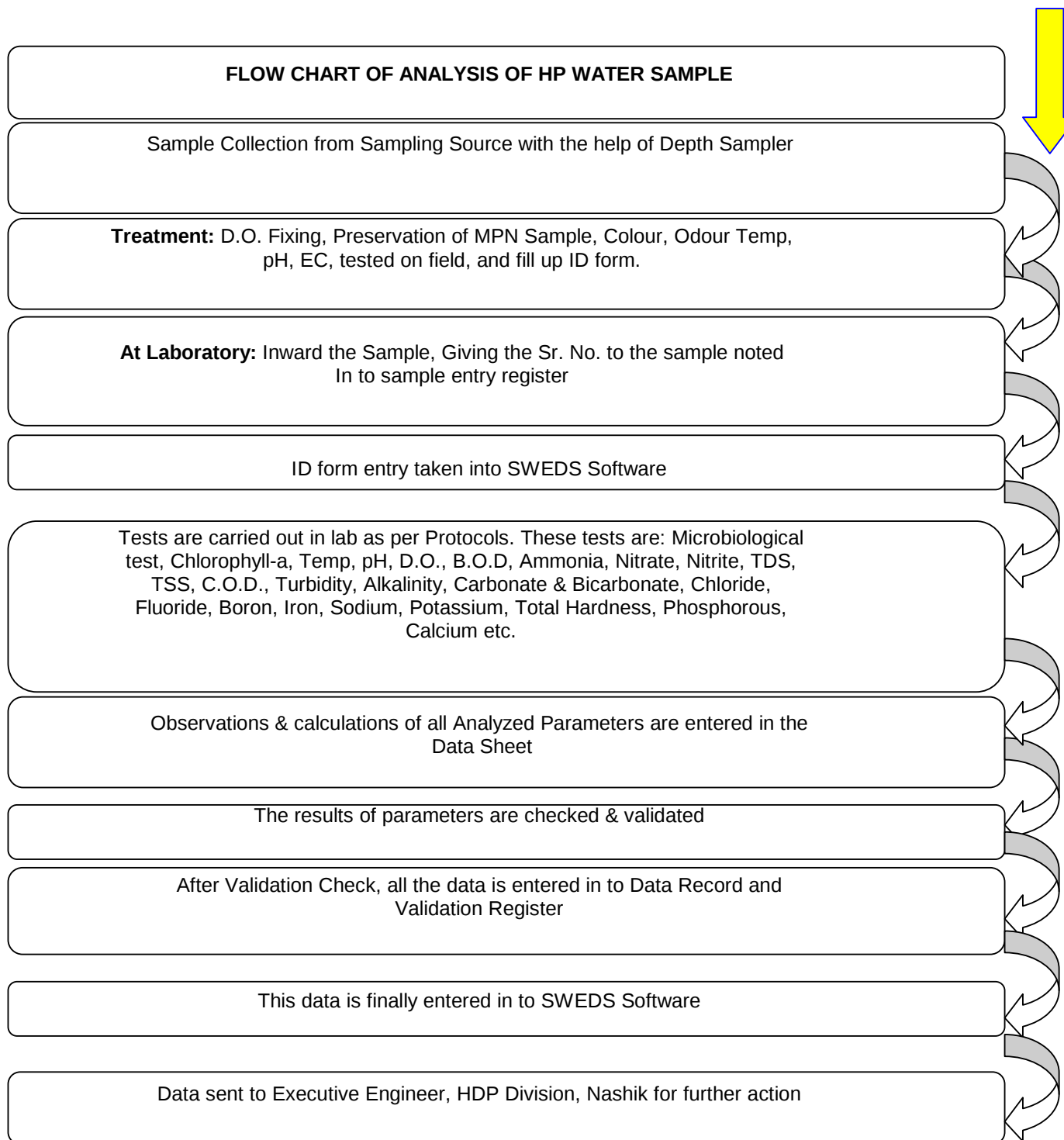
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Total Samples analyzed during reporting period					374

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 performs as per guidelines of world bank with HIS manuals and APHA, 21stEd, 2005 as a standard procedures for analysis of samples.

As well refers BIS standards IS:10500 and other relevant BIS standards for analysis of various samples received from users for various purposed like Drinking, Irrigation, Ice preparation, Bathing (Swimming Tank),Construction, study and various R & D Activities.



Methodology for the analysis of Water Quality samples the following parameters were analyzed during the Period 2011–2012

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 HCO 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, Nashik.**

Sr. No.	Name of Location	Frequency of sampling
1	Kushawarta	Fortnightly
2	Gangapur	Fortnightly
3	Nasardi	Fortnightly
4	Takali (Nashik)	Monthly
5	D/S of Eklahare	Fortnightly
6	Darna (Pimpalgaon)	Fortnightly
7	Nandurmadhmeshwar	Fortnightly
8	Kopargaon	Monthly
9	Bhandardara	Fortnightly
10	Mula	Fortnightly
11	Kadwa	Fortnightly
12	Sukwad	Monthly
13	Akkalpada	Monthly
14	Dhule	Monthly
15	Suple	Monthly
16	Malegaon	Monthly
17	Girna	Fortnightly
18	Upper Vaitarna	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 are recorded and 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.

4.2 Water Quality status- Stations wise Exercise

In order to study water quality status station wise, all locations covered under this lab during the year 2011-2012 and June 2012 to January 2013. 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 analyzed for each location individually & interpretation of data to identify seasonal trend. Also critical parameters are identified at every location, including finding out 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, like Takali, Nasardi & Kopergaon etc.

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 Faecal 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
1	Kushawarta	C2 & S1	B
2	Gangapur	C1 & S1	A
3	Nasardi	C2 & S1	B
4	Takali (Nashik)	C2 & S1	B
5	D/S of Eklahare	C2 & S1	B
6	Darna (Pimpalgaon)	C1 & S1	A
7	Nandurmadhmeshwar	C2 & S1	B
8	Kopargaon	C2 & S1	B
9	Bhandardara	C1 & S1	A
10	Mula	C1 & S1	A
11	Kadwa	C1 & S1	A
12	Sukwad	C2 & S1	B
13	Akkalpada	C2 & S1	B
14	Dhule	C2 & S1	B
15	Suple	C1 & S1	A
16	Malegaon	C1 & S1	A
17	Girna	C2 & S1	B
18	Upper Vaitarna	C1 & S1	A

Note: A: Water is Good for Irrigation Purpose.

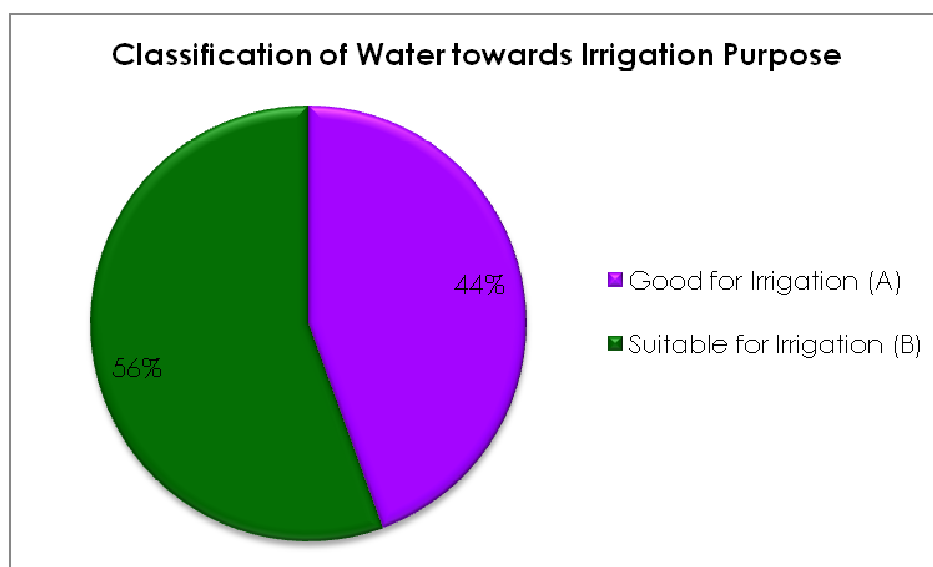
B: Water is Suitable for Irrigation Purpose.

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)	Total
1	8	10	18



CPCB Water Quality Criteria

Designated best use	Quality Class	Primary Water Quality Criteria
Drinking water source without conventional treatment but with chlorination	A	➤ 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	➤ 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	➤ 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	➤ 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	➤ 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	Micromhos/cm
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	-

Summary of Result on the basis of Graph

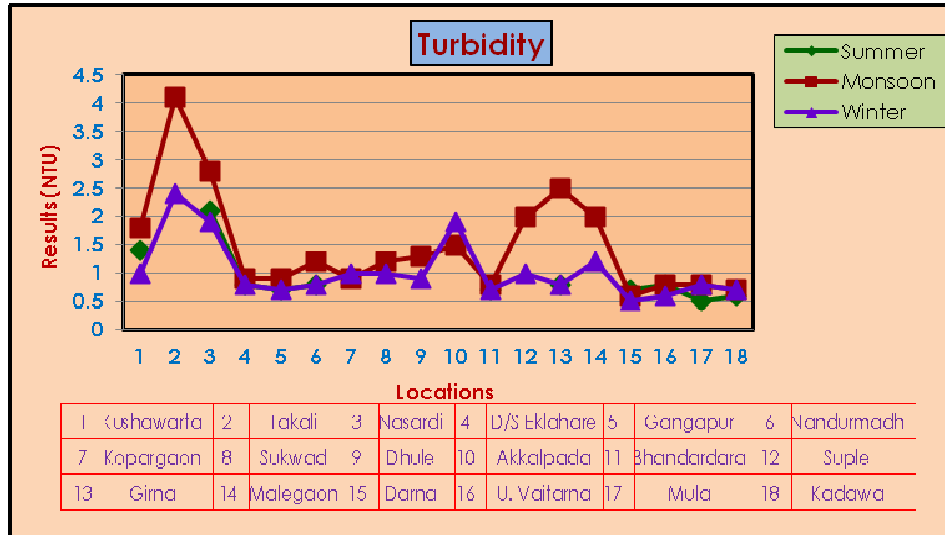
Sr. No.	Parameters	Limits			Name of Critical Location Identified	Result	Unit
		As per ICAR	As per 10500 Standard	CPCB Water Quality Criteria			
1.	Dissolved Oxygen	-	-	>6	Kushawarta	4.4	mg/L
					Takali	0.8	
					Nasardi	0.9	
2.	Biological Oxygen Demand (3 days at 27°C)	-	-	2	Kushawarta	17.5	mg/L
					Takali	19	
					Nasardi	30.2	
					D/S of Eklahare	20.6	
					Gangapur	8.1	
					Nandurmadhmeshwar	11.2	
					Kopargaon	8.2	
					Sukwad	7.6	
					Dhule	6.4	
					Akkalpada	4.1	
					Bhandardara	7	
					Suple	7.9	
					Girna	11.1	
					Malegaon	9.4	
					Darna (Pimpalgaon)	8	
					Upper Vaitarna	8.7	
					Mula	10	
					Kadawa	8.1	
3.	Total Alkalinity	-	200	-	Nasardi	232.9	mg/L
					Takali	218.1	
					D/s of Eklahare	205.2	
4.	Turbidity	-	1	-	Kushawarta	1.4	NTU
					Nasardi	2.3	
					Takali	2.2	
					Sukwad (monsoon)	1.2	
					Dhule (monsoon)	1.3	
					Akkalpada	1.7	
					Supale	2	
					Girna	2.5	
					Malegaon	1.6	

Summary of Result on the basis of Graph

Sr. No.	Parameters	Limits			Name of Critical Location Identified	Result	Unit
		As per ICAR	As per 10500 Standard	CPCB Water Quality Criteria			
5.	Total Coliform		Absent	50	Kushawarta	201778	MPN /100 ml
					Takali	321817	
					Nasardi	615066	
					D/S of Eklahare	42473	
					Gangapur	1013	
					Nandurmadhmeshwar	2149	
					Kopargaon	32500	
					Sukwad	147400	
					Dhule	23284	
					Akkalpada	4450	
					Bhandardara	1252	
					Suple	7457	
					Girna	1587	
					Malegaon	14329	
					Darna (Pimpalgaon)	1220	
					Upper Vaitarna	327	
					Mula	976	
					Kadawa	1853	
6.	Feacal Coliform	-	Absent	-	Kushawarta	52394	MPN/ 100 ml
					Takali	166400	
					Nasardi	347843	
					D/S of Eklahare	26657	
					Gangapur	667	
					Nandurmadhmeshwar	1399	
					Kopargaon	20834	
					Sukwad	96192	
					Dhule	9909	
					Akkalpada	2334	
					Bhandardara	729	
					Suple	1765	
					Girna	762	
					Malegaon	11875	
					Darna (Pimpalgaon)	248	
					Upper Vaitarna	196	
					Mula	624	
					Kadawa	1351	

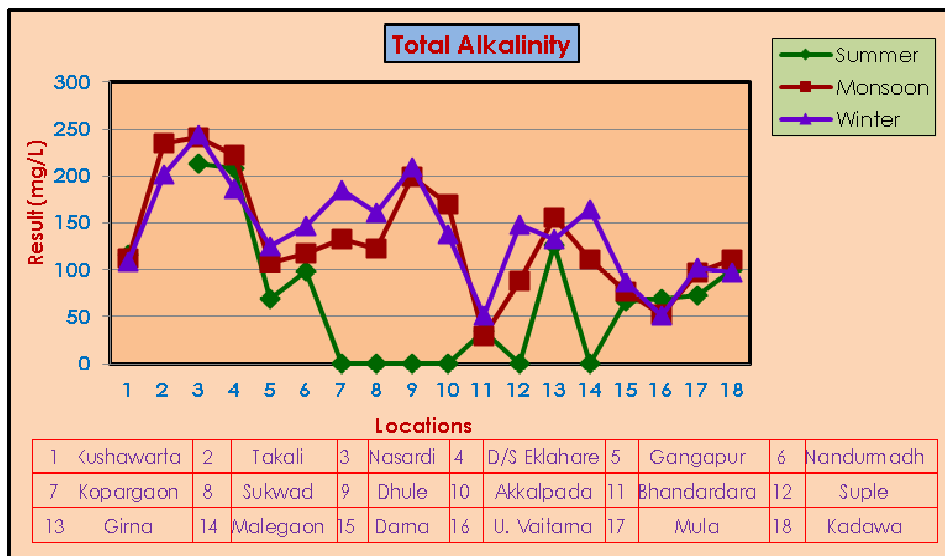
RESULTS OBTAINED DURING 2011-2012

1. Turbidity:



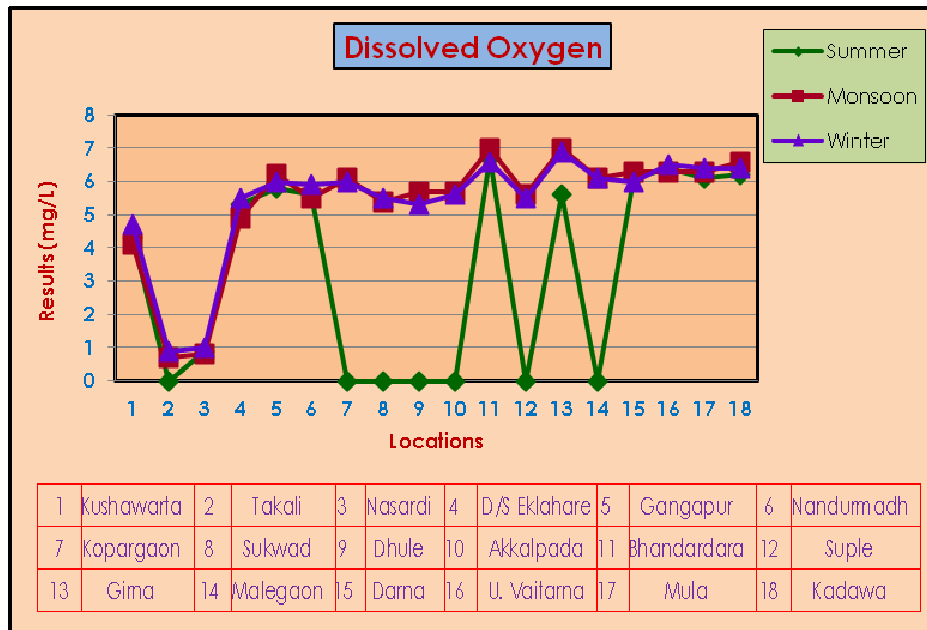
From the above graphical representation, it can be observed that the value of turbidity exceeds its limit in all season at Nasardi, in monsoon and summer at Kushawarta, in monsoon and winter at Takali, Akkalpada and Malegaon and in monsoon only at Sukwad, Dhule, Supale and Girna.

2. Total Alkalinity:



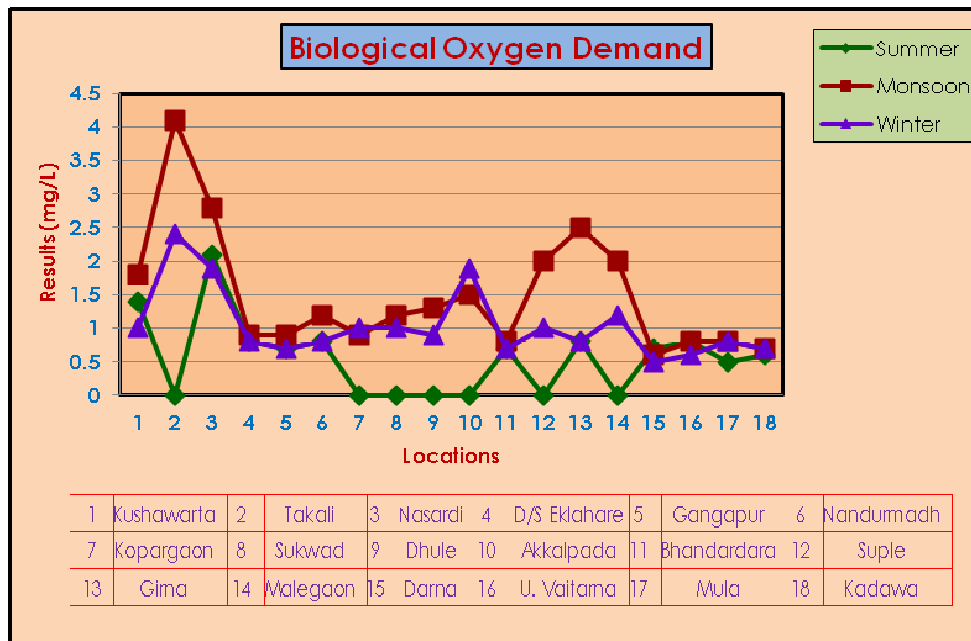
From the above graphical representation, it can be observed that the value of Total Alkalinity is within the limit except Takali, Nasardi and Eklahare in summer and monsoon season.

3. Dissolved Solids:



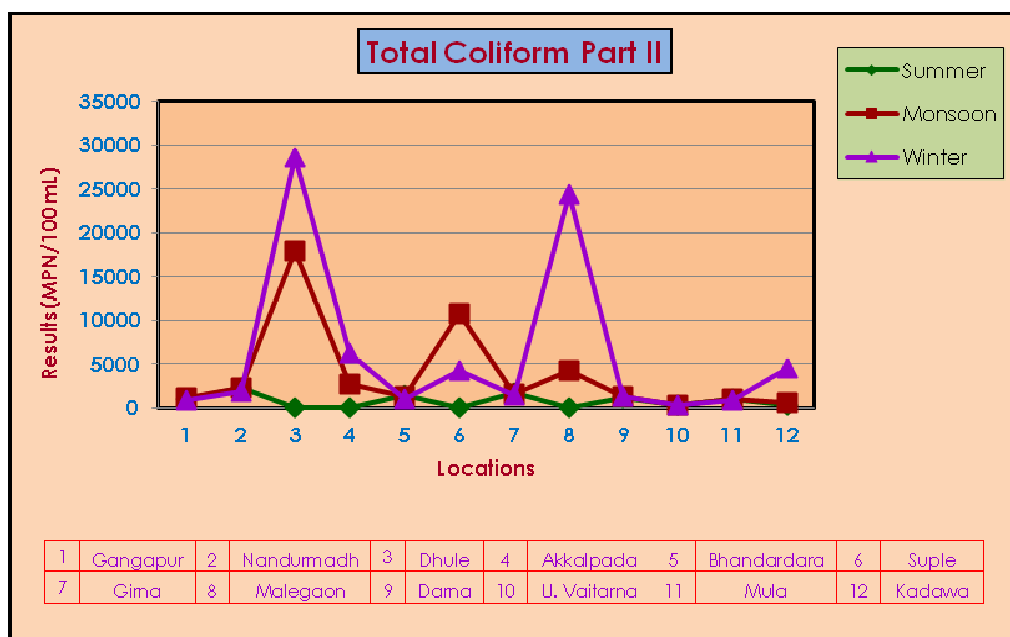
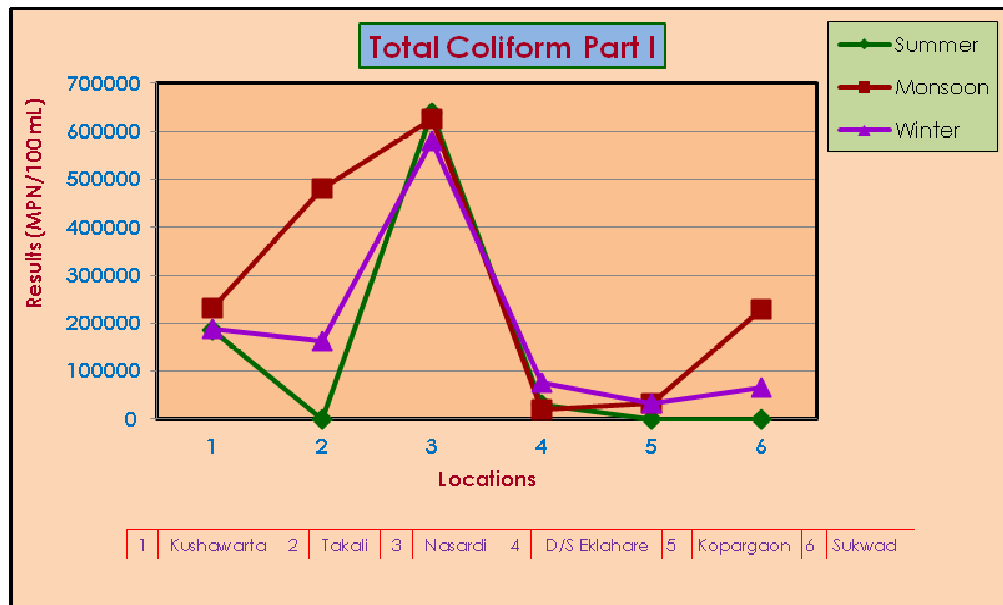
From the above graphical representation, it can be observed that during all season the value of Dissolved Oxygen is less at Kushawarta, Takali and Nasardi.

4. Biological Oxygen Demand:



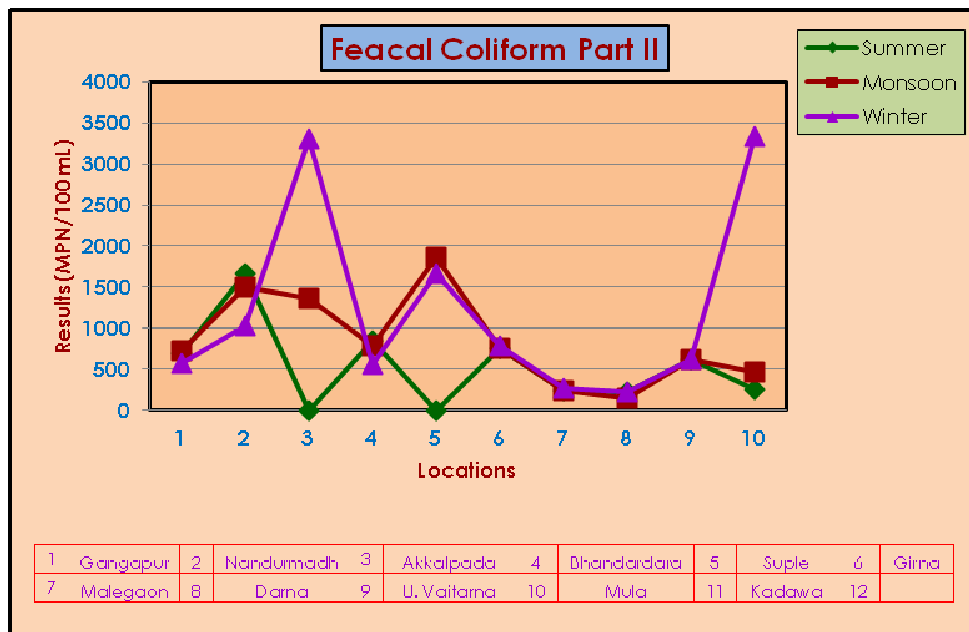
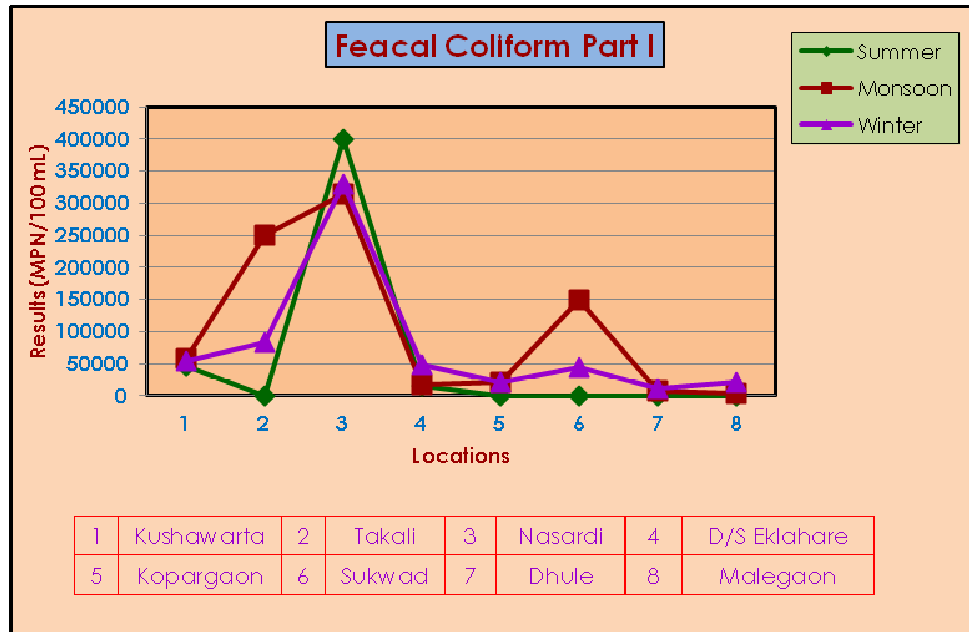
From the above graphical representation, it can be observed that the value of Biological Oxygen Demand is exceeds its limit in all season and at all locations.

5. Total Coliforms:



From the above graphical representation, it can be observed that the value of Total Coliform exceeds its limit in all season and all the locations.

6. Feecal Coliforms:



From the above graphical representation, it can be observed that the vale of Feecal Coliforms exceeds limit in all season and at all the locations.

CHAPTER - 5

CONCLUSION

Observing Results of all the locations & the parameters tested during reported period, it can be concluded that the value of chemical parameters exceeding the desired limits. This 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 direct consumption.

Biological parameter i.e. Total Coliform & Faecal Coliform at every location exceeds the prescribed limit as per IS 10500 of Drinking Water Standard. This is mainly due to discharge of sewage; drainage in to water sources through Non-Point Sources needs to be identified.

As per classification on the basis of Wilcox Technique water at 4 locations out of 23 location is suitable for irrigation purpose & at 19 location water is good for irrigation purpose.

Overall trend of water quality in reported period for covered location is indicating suitability of water for irrigation purpose.

Finally, it can be concluded that water from all these locations is not suitable for drinking purpose without treatment. It requires treatment before use. Secondly water flowing at there location can be used for irrigation purpose followed by traditional irrigation method.

CHAPTER - 6

OTHER ACTIVITIES

6.1 REVENUE GENERATION TO GOVERNMENT OF MAHARASHTRA

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

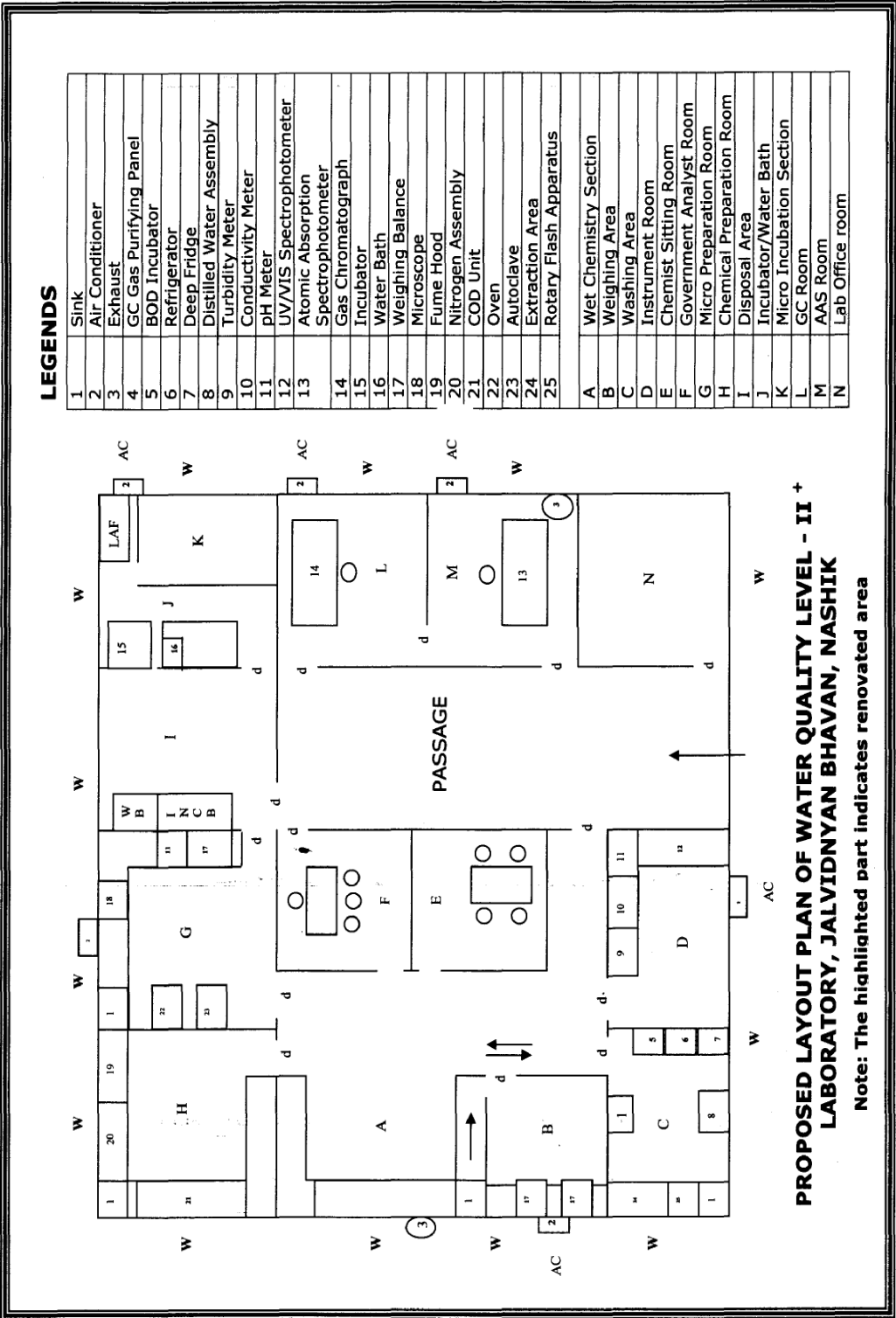
The facility is availed by many users with testing of sample towards drinking purpose, construction purpose, swimming tanks, irrigation purpose & study purpose.

During the year June 2011 to May 2012 and June 2012 to January 2013 many clients approached to the laboratory. The valuable clients availed the facility of the laboratory are as below;

1. Nashik Municipal Corporation
2. National Thermal Power Station
3. Various International School in Nashik City
4. Medical Institute like Ayurved College
5. KTHM College for study purpose.
6. Client from Satpur MIDC
7. Sandharbh Seva Rugnalaya, Nashik

6.2 REVENUE GENERATED DURING THE REPORTED PERIOD

Sr. No.	Period	No. of clients approached	Amount Received
1.	June 2011 to May 2012	107	3,09,782/-
2.	June 2012 to Jan. 2013	83	1,14,590/-



List of Client June 2011- January 2013

Sr. No.	Name of Clients
1.	L.G. Chajed
2.	Gondwana Engineers 52 MLD, Tapovan, Nashik
3.	Gondwana Engineers 20 MLD, Chehedi, Nashik
4.	Gondwana Engineers 21 MLD, Panchak, Nashik
5.	Ashok BaburaoKakad, Sinnar, Nashik
6.	Seven Hills Nashik
7.	M/s A.V. Panade, Nashik
8.	MangaldasUttamNikam
9.	Ashoka Universal School, Chansi, Nashik
10.	Sub Div. Officer, Udanchand, Ghatghar
11.	KeshavTukaramGaikwad
12.	Devatma Society, Nashik
13.	Udasin Baba Shradhashram Ashram, Nashik
14.	Sarpanch Gram PanchayatNanegaon, Nashik
15.	Sunil sudhakar Deshmukh
16.	Gondwana Engineers 20 MLD, Chehedi, Nashik
17.	Jivan Natthu Patil, Satpur, Nashik
18.	Vipashyana Dhammagiri, Igatpuri
19.	Vasan & Sons, Nashik
20.	Ashoka Universal School, Nashik
21.	Pune Vidhyarthi Griha, Nashik
22.	Kisan Choudhari, Palase, Nashik
23.	Ashoka Universal School, Nashik
24.	Atul Industries, Nashik

Sr. No.	Name of Clients
25.	Empire Exports, Kokangaon, Nashik
26.	Vijay Narendra Gokhale
27.	Vijay Akade, Pimpalgaon, Nashik
28.	Union Bank of India, Nashik
29.	Rajan Bhaskar Chopadskar, Nashik
30.	Bhaskar Kashinath Gosavi, Sinnar, Nashik
31.	Shakha Abhiyanta, Sub Div-Yeola, Nashik
32.	Manish Suresh Mahajan, Nashik
33.	Rekha Bhanu, Nashik
34.	R.B.Shukla, Dindiri Road, Nashik
35.	Sachin Waljhade, Nashik
36.	Mahesh Vishnu Londhe, Sinnar, Nashik
37.	Ashoka Universal School, Chandsi, Nashik
38.	Rajendra Goikane, Igatpuri, Nashik
39.	Yogesh Chopda, Gole Colony, Nashik
40.	Jagannath Khurdal, Nashik
41.	Sarveshvari Village Industries, Niphad, Nashik
42.	Up Karyakari Abhitanta, Dhule Madhyam Prakalp, Dhule
43.	Pawan N. Bhavsar, Nandurbar
44.	Chairman Indrayani Society, Kathe Lane, Nashik
45.	Dattatray More, Nashik
46.	Ramachandra KeshavRayte
47.	Bhausahab Bandal, Nashik
48.	Kishor Suryavanshi International School, Nashik
49.	Abhishek Deshmukh, Ozar, Nashik
50.	R.K Enterprises , Nashik
51.	Anil Pandharinath More
52.	Parag Mule

Sr. No.	Name of Clients
53.	Padmavati Housing Society, Devlali, Nashik
54.	P.N Narkhede, Nashik
55.	D.D. Bytco College ,Nashik
56.	Pushpatai Hire, Hatgad, Nashik
57.	Vibhagiya Sandharbh Seva Rugnalaya, Nashik
58.	Asmita Agrovat, chichpur, Sangamner
59.	Balaji Chilled Water Services ,Nashik
60.	Chandrakant Suryavanshi, Nashik
61.	Yadav Gopinath Vidhate
62.	Shekh Babulsmiel Nashik
63.	Amjad Abdul Gaffar
64.	Taknoshi, Ambad, Nashik
65.	Ganpat Mukunda Devkar, Nashik
66.	Yashraj Foods, Chicholi
67.	Sub Div-Ghatkhar, Chodhe
68.	Sachin Waljhade, Nashik
69.	Vilas Tile, Nashik
70.	AjitTipre, Ekta Greenville, Nashik
71.	Vibhagiya Sandharbh Seva Rugnalaya, Nashik
72.	Samridhi Paper & Pulp, Gonda
73.	Guruvarya DadasahebBiba
74.	J. R .Karva, Nashik
75.	Gram Panchyat, Sadarwadi
76.	Chetan Vaishanpayan
77.	Gabreil India Ltd
78.	Sandharbh Seva Rugnalaya, Nashik
79.	Jyoti Ceramics, Nashik
80.	College of Engineering Kopargaon

Sr. No.	Name of Clients
81.	Annasaheb Suryabhan Gadakh, Nashik
82.	Ayukta-MNC, Jalgoan
83.	Bharat Heavy Electricals, Sinnar
84.	Mahindra Sona, Satpur, Nashik
85.	Executive Engineer, Pani Purvatha Vibhag, NMC Nashik
86.	B.H.E., Indiabulls, Research Ltd, Malegan. Sinnar
87.	Sub. Div-Ghatkhar, Udarchand Jalvidyut Prakalp Chonde
88.	Varun Agro Processing Foods, Pvt. Ltd. Nashik
89.	Rane Dairy, Gangapur Raoad, Nashik
90.	Balasaheb Rahane, Yaola, Nashik
91.	Pracharya Javahar Navaday Vidyalaya, Khedgaon
92.	Mirebai Khandve, Pipalnaner, Dindori, Nashik
93.	N.I.T College ,Nashik
94.	Anil Tea House, Ingalner, Jail Road, Nashik
95.	Ashoka Biogreen, Nashik
96.	General Manager, Panchvati Elitel Pvt. Ltd., Nashik
97.	Mukhya Abhiyanta, Pra. V. Su., Chemari No-1 Eklahra, Nashik
98.	Chairman, Gramin Pani Purvatha Vibhag, Malsakore
99.	Rajendra Goikane
100.	Bela Auto Services
101.	Sunil Krushnavtar Madan, CIDCO, Nashik
102.	Sunil Krushnavtar Madan, CIDCO, Nashik
103.	K.K. Wagh Mahavidyalaya, Nashik
104.	Koushik Karva, Nashik
105.	Gokhale Education Society, Nashik
106.	Shree Saptshrigi Nivas, Nashik
107.	Hotel Sainy Nashik
108.	Samgivani Motels & Hotels Nashik

Sr. No.	Name of Clients
109.	Ashoka Biogreen ,Nashik
110.	Dilip Kulakarni, Pandit Colony Nashik
111.	Prakashdeep Apartment, Hirawadi Nashik
112.	Soni Shiv kishor, Nashik
113.	Uday Shantaram Kharote, Nashik
114.	Gourav Dixit, Nashik
115.	Naik, Nashik
116.	C.T, Care Hospital ,Nashik
117.	Vibhagiya Sandharbh Seva Rugnalaya, Nashik
118.	Mukhya Abhiyanta, Trianing Center, Eklahre, Nashik
119.	Hemant Developers, Nashik
120.	Pricipal,AbhinavBalvikasShala No. 2, Nashik
121.	Uday Karad, Niphad, Nashik
122.	Dynamics, Nashik
123.	Mahindra Sona, Satpur, Nashik
124.	Ayukta-MNC, Jalgoan
125.	Advocate Pipatha, Nashik
126.	Tithpal Sigh Birandri, Satpur, Nashik
127.	Om Sai Poyfiber, Sinnar, Nashik
128.	NDCC Bank ,Nashik
129.	Gaikwad Chok, Manmad

Annexure - III

It is a well managed organisation.
Serving a noble cause. Best wishes
for future.

3/9/2012
Audit Officer.
% The A-G (Audit) II, Nagpur

It is a well managed organization. Serving a valuable course. Best wishes for future.

Audit Officer
The A.G. (Audit) II, Nagpur

Very good project and smart's
Set new information about water
and resource of water. 12th and
11th sci students get idea about
how to save water, they also
know about purification of water,
storage of water and all the things
about this. So we wish all the
best for this project and
best wish for future..

07/09/12
(G.P. Pagare)
PRT PRT
SKIN PRT
Admission Colony
Nashik - 4

Very good project and get new information about water and resource of water. 12th and 11th science students get idea about how to save water, also know about purification of water, storage of water and all the things about this. So we wish all the best for this project sand best wish for future.

(G.P. Pagare)
Nashik

18/11/2013.

It was very nice to visit Hydrological & WQ Lab level II Nashik. We thank all the staff of your department for providing technical knowledge. It will be really useful for them in their future work.

Prof. A.S. Jadhav
G. N. Sapkal C.O.E
Nashik

It was very nice to visit Hydrological & WQ lab level II Nashik. We thank all the staff of your department for providing technical knowledge. Most well really useful for them in their future work.

Prof. A.S. Jadhav
G.N. Sapkal College of Engineering
Nashik

18/01/13

The co-ordination, assistance, help, presentation, explanations that have been provided are really good. Thank you very much for all the officials, laboratory staffs and the persons for rendering such an wonderful opportunity for my college beloved students to get benefit. Thank you all so much.



Prof. C. Nirmala Rani
G.N. Sapkal College of Engg
Nashik.

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Prof. C. Nirmala Rani
Sapkal College of Engg. Nashik

CERTIFICATE OF COMPLIANCE



INTERNATIONAL CERTIFICATION SERVICES PVT. LTD.

This is to certify that the
QUALITY MANAGEMENT SYSTEM of

**HYDROLOGY PROJECT CIRCLE (COLLECTION)
WATER QUALITY LAB LEVEL II - NASHIK**

Jalvidnyan Bhavan, Dindori Road, Nashik – 422 004, Maharashtra,
India.

has been assessed and registered as complying with the requirements of the following International Standard:

ISO 9001:2008

The Quality Management System applicable to:

**Scope: Collection, Testing And Analysis Of Water And Waste Water
Sample.**

Registration No. : RQ91/6401
Registered Date : 11th February, 2010
Reassessment Date : 08th March, 2013
Issue Date : 08th March, 2013
Expiry Date : 10th February, 2016



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Shubh Kataria

Director

International Certification Services

Accredited by Joint Accreditation System of Australia and New Zealand

Validity of this certificate is based on periodic audits of the management system defined by the above scope and is contingent upon prompt, written notification of significant changes to the management system and/or its components thereof shall be immediately communicated to ICS.
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