

Water Quality Assessment - Case Study PCMC Area

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Abstract: Water is crucial factor in our life. It is one of fundamental needs of human being. As far as our health is concerned the water should be fit for drinking, it should not contain any undesirable substances rendering it unfit for drinking and domestic use. For such water we have to depend on sources of water such as river, lake, well etc. but to make it upto the standards of drinking water it should be treated¹. In big cities municipal corporation supplies water to the people after treating it in treatment plant. In Pimpri & Chinchwad city PCMC treats and supplies water to city. Corporation divided city in 46 sectors to distribute water. Samples were collected from each of these sectors and conducted various tests such as hardness test, chloride content test, etc. To examine the contamination of water at tap sources. In this study it was found that the water is pure upto all standards except residual chlorine in certain sectors. So it is concluded that what care should be taken for distribution to such sectors.

Keywords: pH Test, Alkalinity Test, Chloride Test, Total Dissolved Solids, Total Hardness Test, Residual Chlorine Content.

1. INTRODUCTION

About 72% of earth surface is water cover, out of which 97% is content in ocean remaining 3% is fresh water³, out of only 1% is only available for drinking. Due to industrialization and urbanization the remaining 1% of water is getting polluted and making it unworthy for drinking. Every major city treatment plants to treat this water and supply for drinking in our project we took case study of Pimpri-Chinchwad water supply network. PCMC area is divided into 46 water supply zones. Test to be conducted for the assessment of quality of drinking water

2. METHODOLOGY

2.1 Sampling:

The value of any laboratory results depends on the sampling integrity of sample. The object of sampling is to collect a portion of water small enough in volume to be conveniently handled in the laboratory. It must be collected in such manner that nothing is added or lost in portion collected and no change occurs during the time between collection and laboratory examination. Unless these conditions are met, laboratory results may be misleading and worse than no results⁴.

2.2 Types of Tests:

- a) pH Test
- b) Alkalinity Test
- c) Chloride Test
- d) Total Dissolved Solids

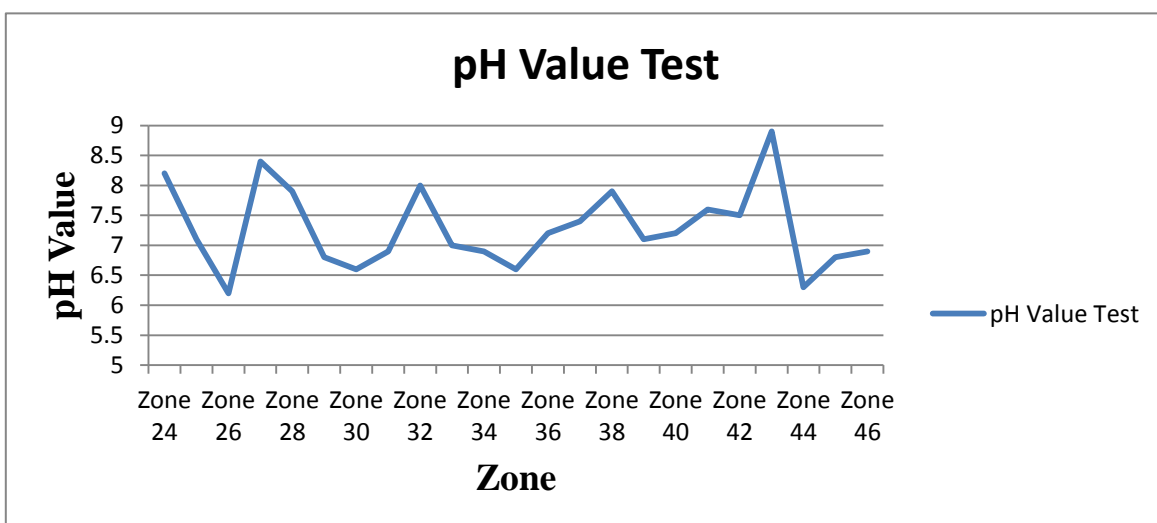
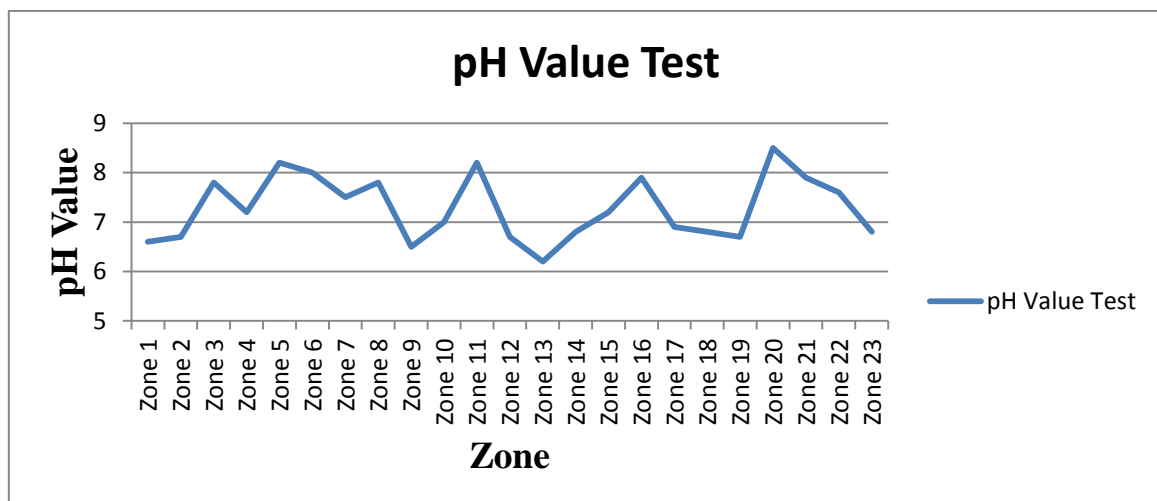
- e) Total Hardness Test
f) Residual Chlorine Content

3. RESULTS

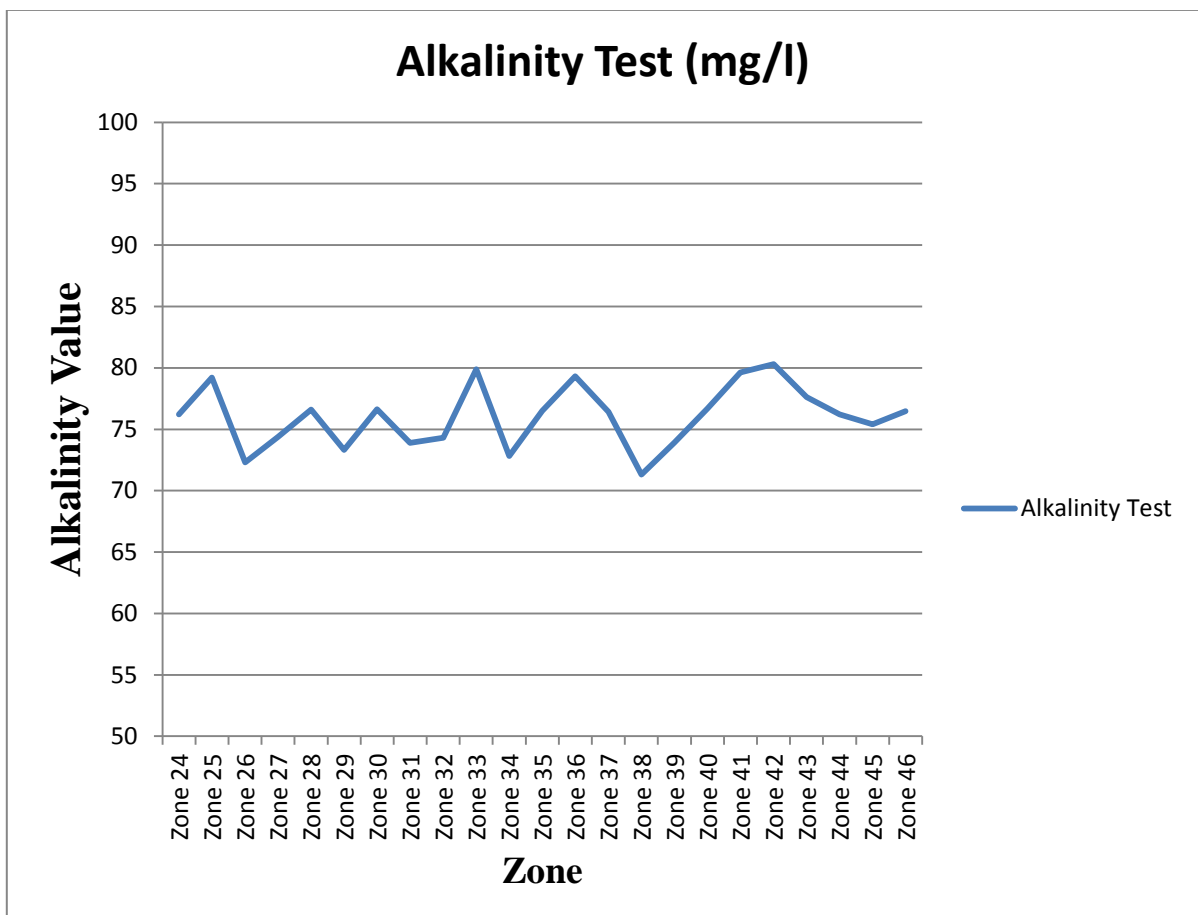
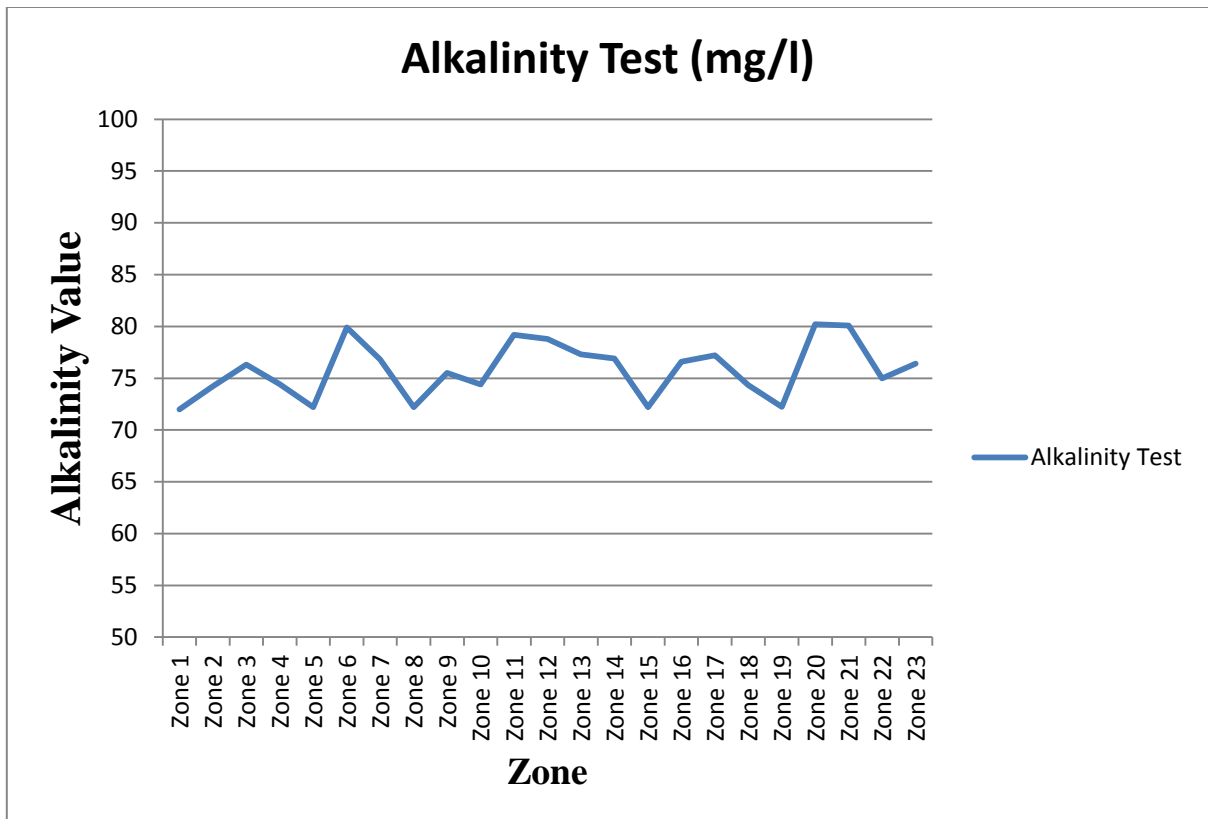
Table No 3.1 Zone Wise Readings.

Zone \ Tests	1	2	3	4	5	6	7	8	9	10
pH	7.2	8.19	8.32	8.2	7.4	8.1	6.7	6.9	7.4	7.8
Alkalinity(mg/l)	79.45	76.32	79.42	75.41	82.4	78.84	72.24	81.42	84.2	74.2
Chloride(mg/l)	11.6	19.6	19	15	12	12	22	14	18	16
TDS(mg/l)	61.2	64.1	73.2	72.91	78.4	65.31	74.23	70.56	69.63	76.20
TH(mg/l)	67	68	63	64	72	64.23	60.2	73.54	52	63.2
Residual chlorine(mg/l)	0.31	0.38	0.61	0.22	0.18	0.16+	0.42	0.44	0.63	0.21

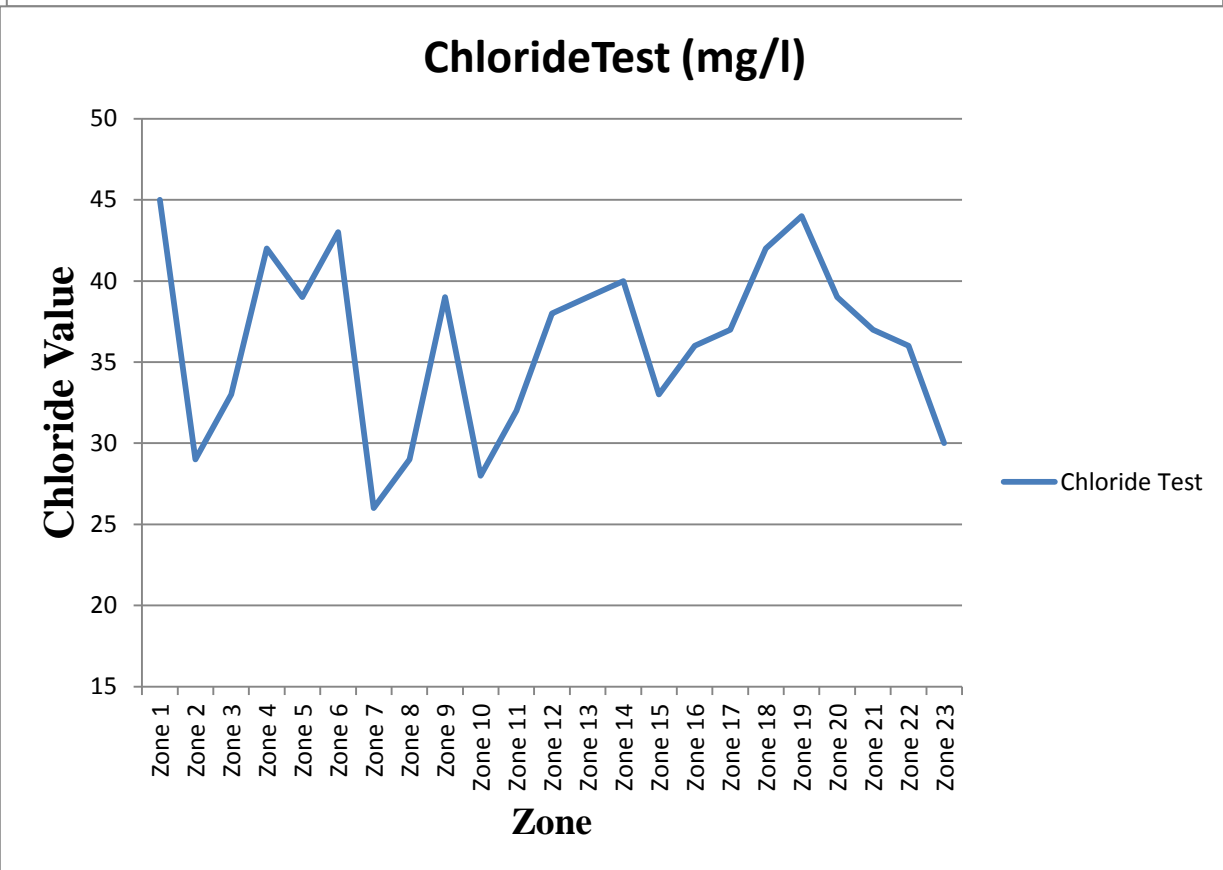
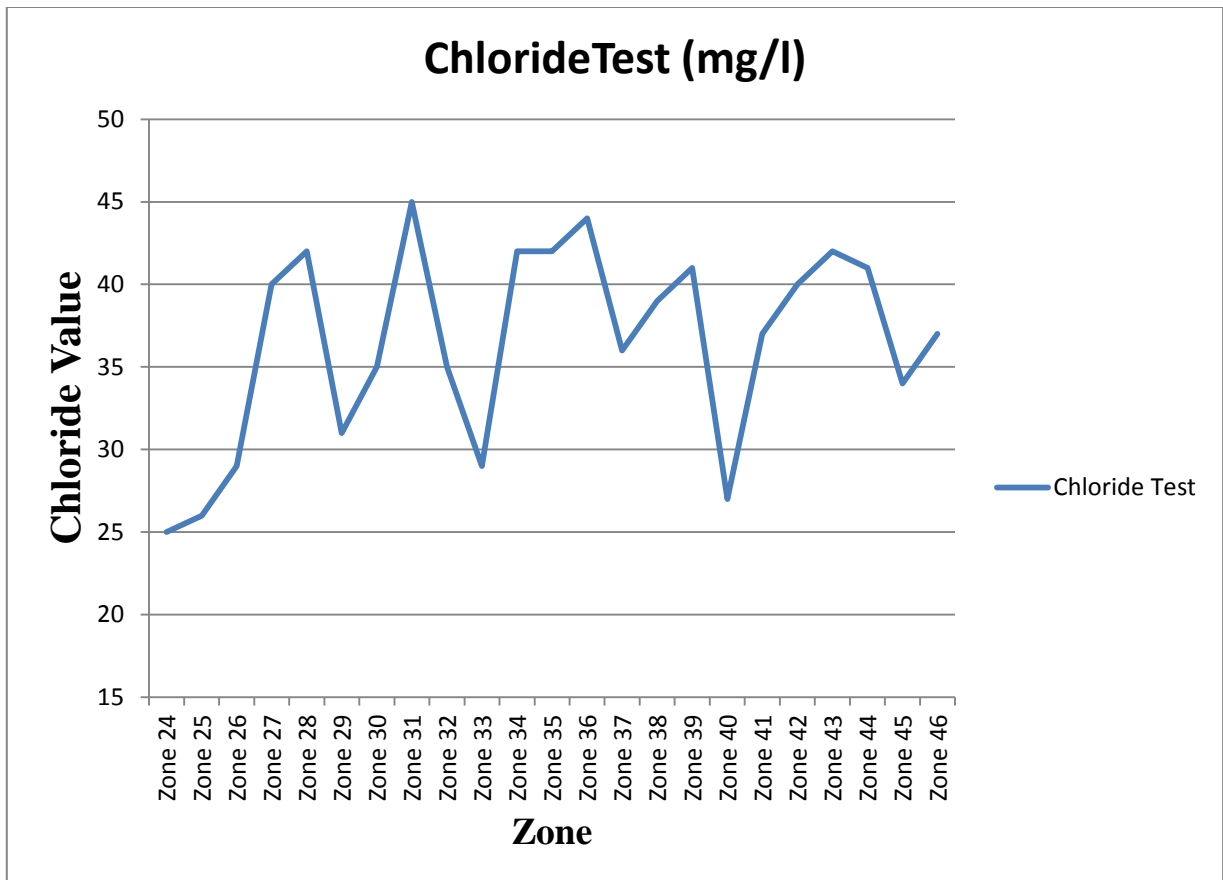
4. RESULT ANALYSIS



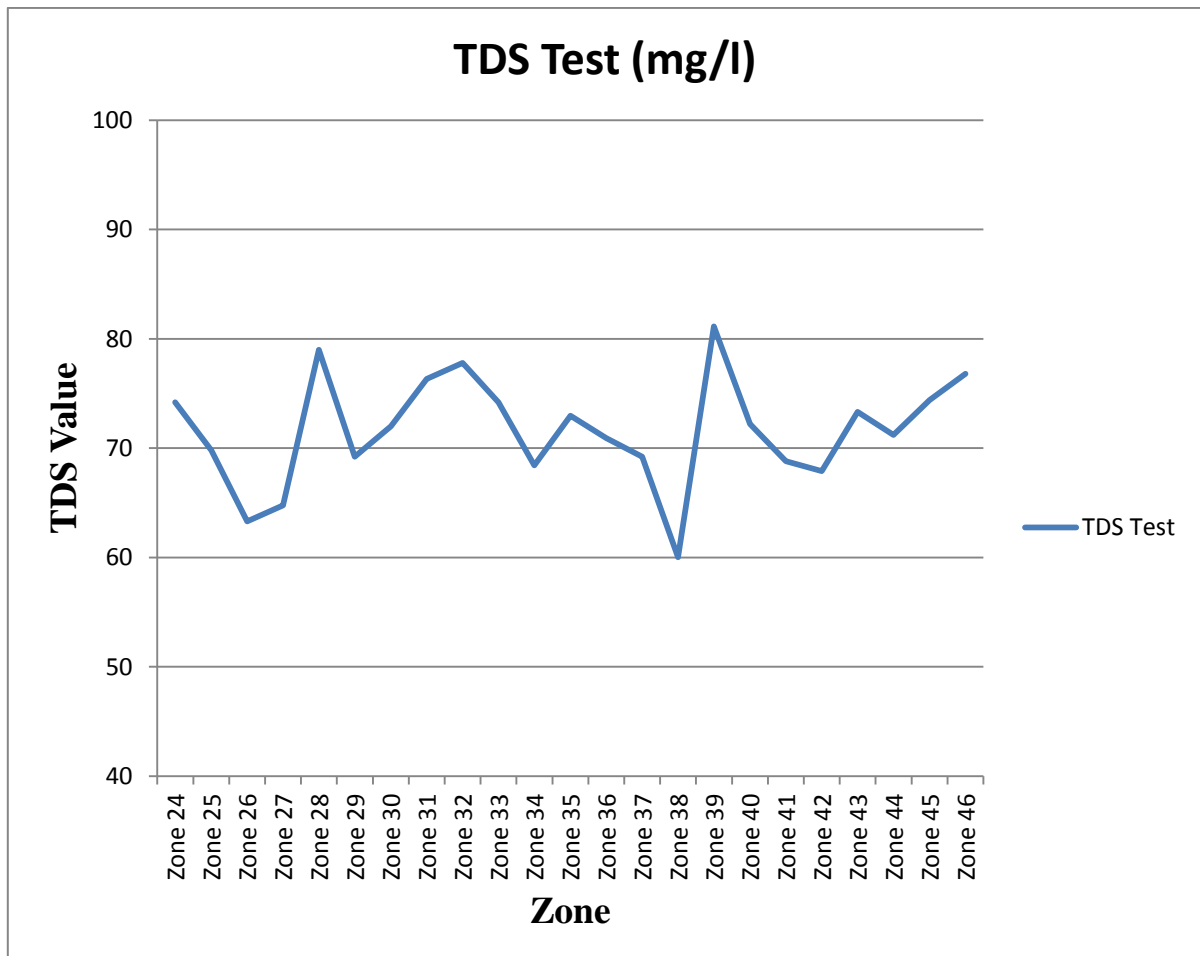
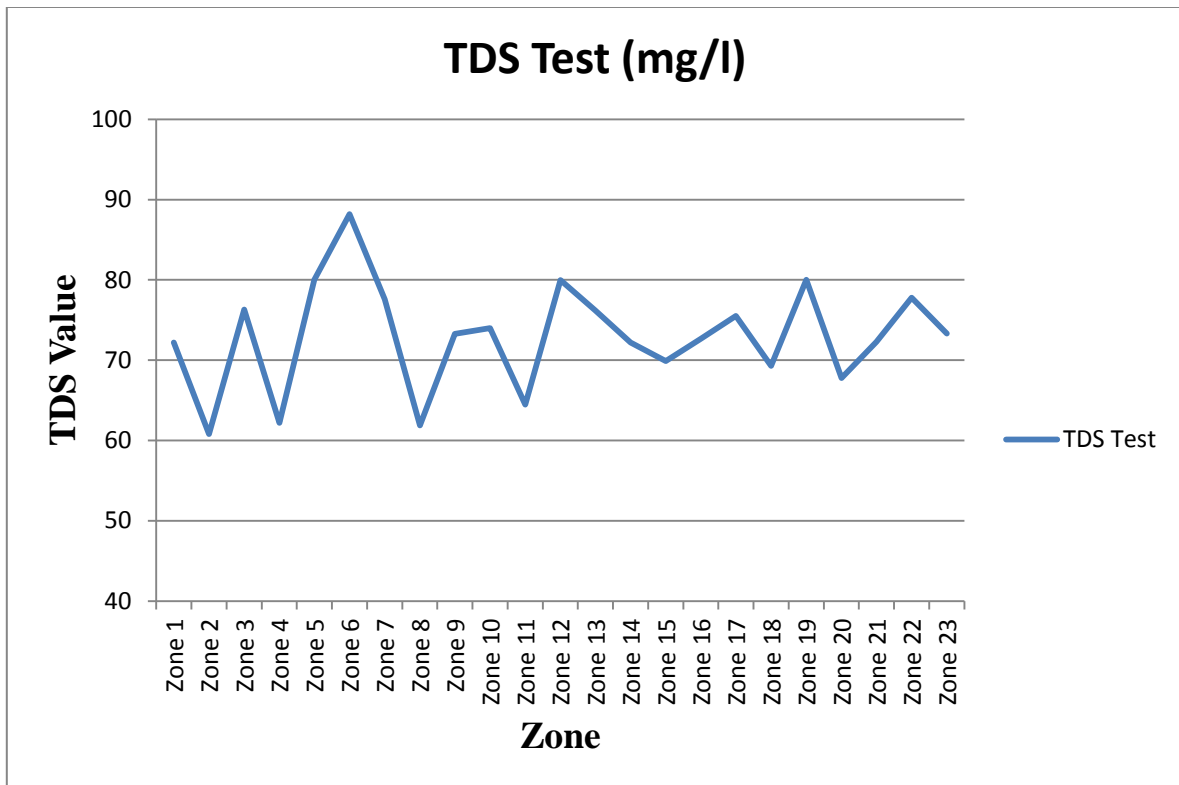
Graph 4.1



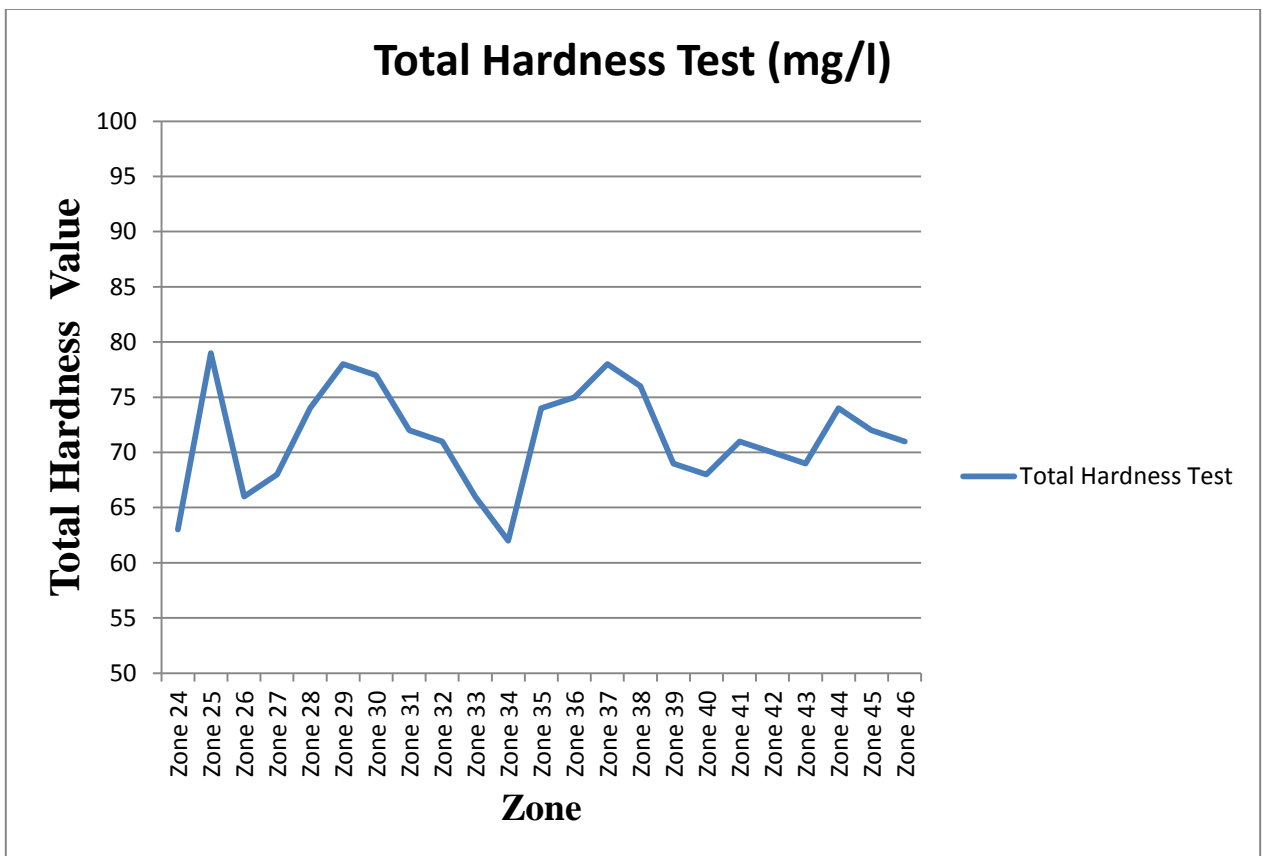
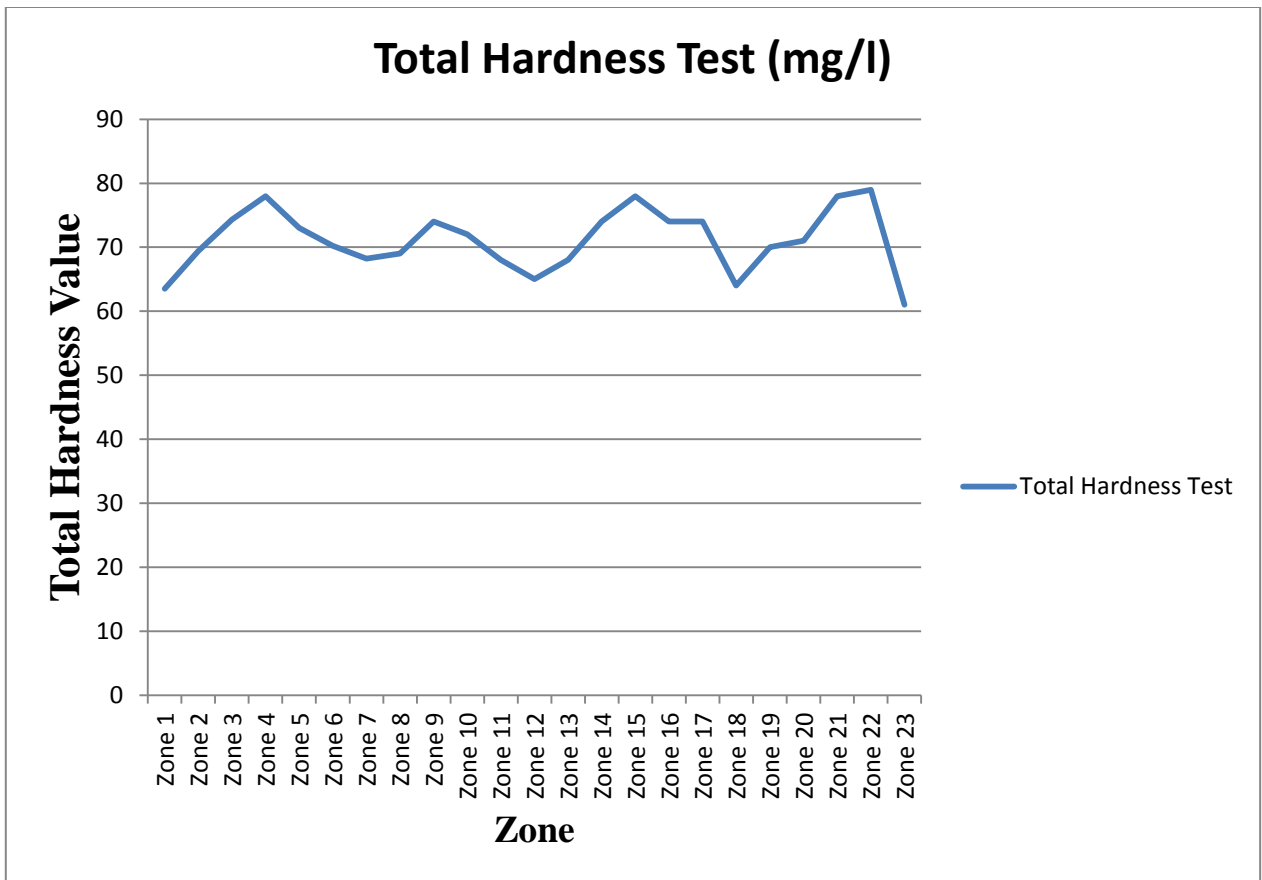
Graph 4.2



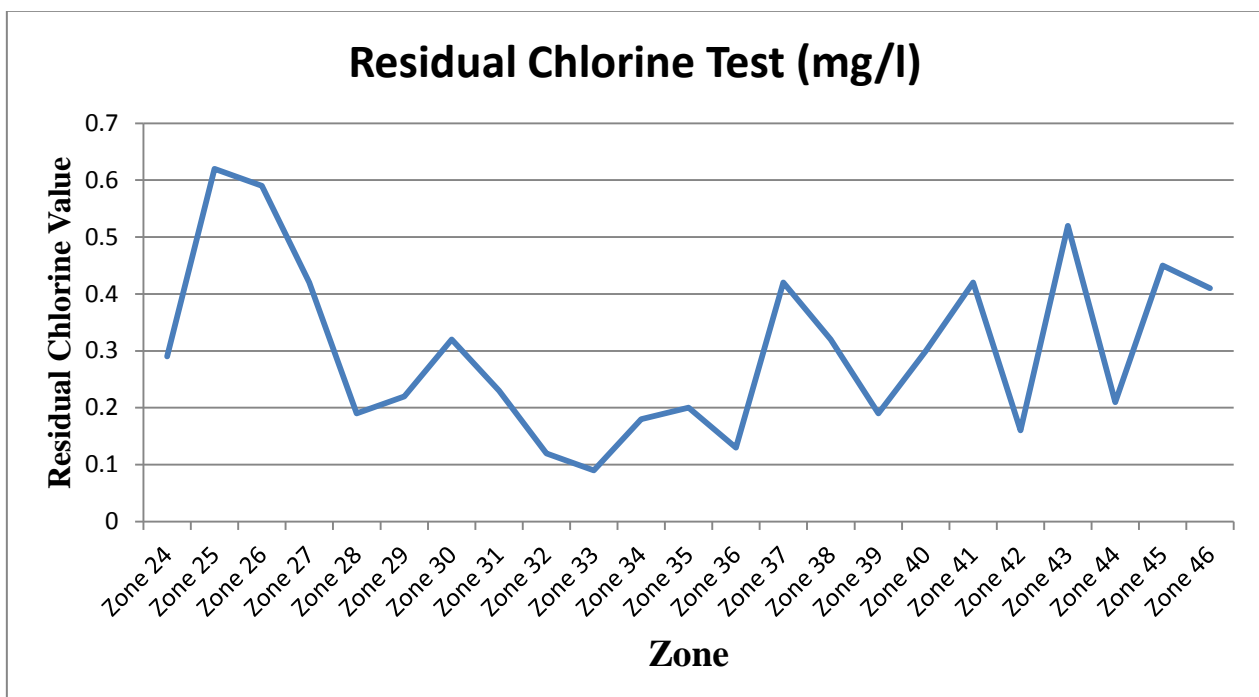
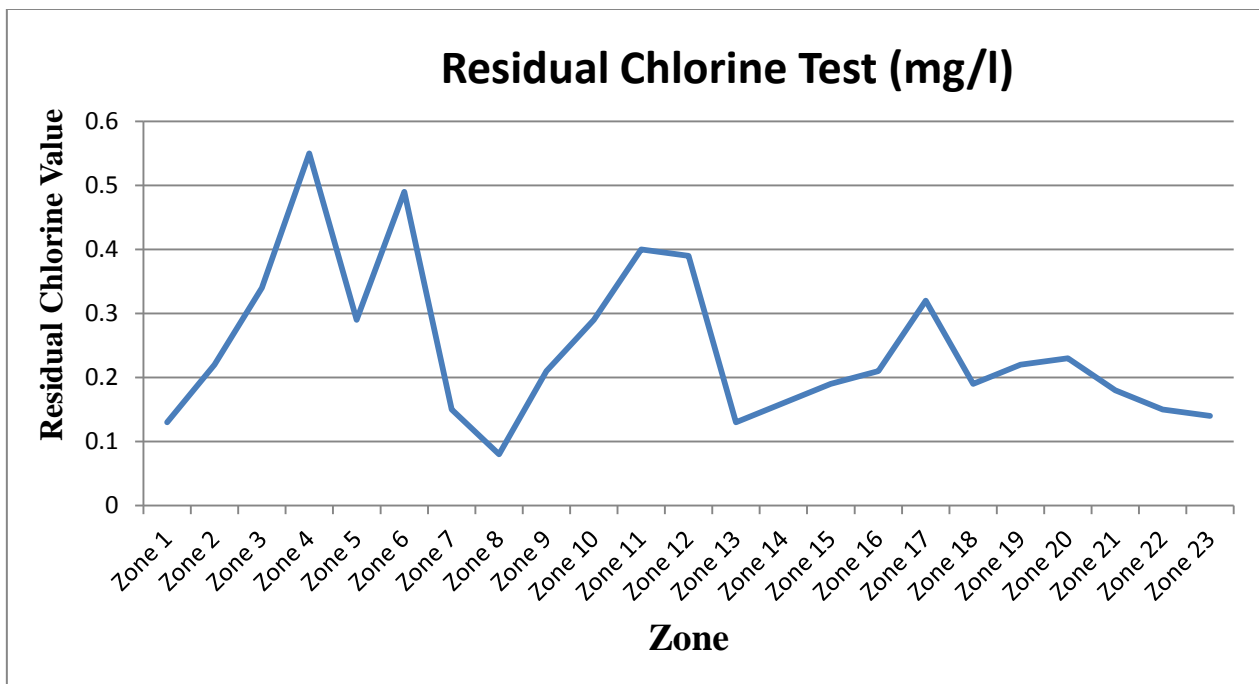
Graph 4.3



Graph 4.4



Graph 4.5



Graph 4.6

4.1 Interpretation of Results:

Chlorine is essentially added in water supply chain to kill any bacteria remaining or may have entered into supply chain. The fresh tap water will contain some amount of chlorine whose value goes on decreasing as time passes. Nearly about pamount of chlorine in supply chain. Many of these areas are closed by treatment plant , as water has to travel less distance to arrive at tap so chlorine content is high.

Whereas some very far away areas have very low chlorine content but some of these areas are underdeveloped or slum areas and are areas which should be having high chlorine contain but due to distance and time taken by water to rich tap is high which reduces chlorine content to very low value.

5. CONCLUSION

1. From above test we are concluding that the test results obtained were within given standard limits except for residual chlorine.
2. In case of residual chlorine the standard value is 0.20mg/lit but in some cases it was obtained to be very high such intake of water with high chlorine content on longer periods can lead to serious health problem as it has been reported to cause *Asthma*⁶, *episodes of dermatitis*⁵, and increase risk of *bladder cancer*⁷.

Thus we conclude that water is safe for drinking

3. We want to recommend that there must be proper check point in distribution system in each zone to check the amount of residual chlorine in water in that zone.
4. Proper mechanism must be put in place so that instead of adding chlorine at treatment plant in concentrated amount, it can be added zone wise in small amounts which will fairly distribute the concentration of residual chlorine

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