Management of Bacteriological Water Quality Considering Depth, Surroundings and Source of Water by Using Original and Modified H2S Strip Test

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Abstract - In recent years, the increasing danger to groundwater quality due to human actions has become a matter of great fear. An enormous common of groundwater quality problems present today are caused by contamination and by over-exploitation, or by combination of both. To understand the problem of contamination, there is a need to know about the different parameters on growth of bacteria which is known as physic-chemical parameters. there are two different methods are used to get the results of fecal coli by using H2S paper strip and modified H2S paper strip test. The sources of water are considered well or hand pump bore well and tap water with also the consideration of toilets. This test provides the results related to the variation of contamination level with respect the depth the water using two different equipments i.e. H2S paper strip and modified H2S paper strip test.

Keywords - Contamination of water, H2S paper strip test, Water quality.

I. INTRODUCTION

The quality of groundwater depends on a large number of individual hydrological, physical, chemical and biological factors. Generally higher proportions of dissolved constituents are found in groundwater than in surface water because of greater interaction of ground water with various materials in geologic strata. The water used for drinking purpose should be free from any toxic elements, living and nonliving organism and excessive amount of minerals that may be hazardous to health. Some of the heavy metals are extremely essential to humans, for example, Cobalt, Copper, etc., but large quantities of them may cause physiological disorders. The contamination of groundwater by heavy metals has assumed great significance during recent years due to their toxicity and accumulative behavior. These elements, contrary to most pollutants, are not biodegradable and undergo a global eco-biological cycle in which natural waters are the main pathways. The determination of the concentration levels of heavy metals in these waters, as well as the elucidation of the chemical forms in which they appear is a prime target in environmental research today.

II. MATERIALS AND METHODOLOGY

The groundwater quality survey locations were chosen (dug wells, open well bore well and tap water) at pravaranagar Loni, Distt. Ahmednagar Maharastra state so that they depict the influence (if any) of the prevailing depth of water sources, effect of surroundings and source of water.

The surveys were carried out for duration of 2 months. Samples were collected from the groundwater structures already in existence. Samples were transported to the laboratories and analyzed for the relevant parameters.Sampling period in Problem Areas: The sampling was done in post-monsoon (Feb and March).

III. RESULT AND DISCUSSION

Effect of Depth On The Level of Contamination

The result on the level of contamination with depth as evaluated by fecal coliform test and H2S original and modified test indicate that water is contaminated up to a level of 55 feet because MPN of fecal coliform is around 10 organism/100 ml which is not acceptable . If water is drawn from a depth of 95 feet is safe in quality as fecal coliforms are not present, Fig 1 indicates modified H2S test also suggest that water drawn at 95 feet is safe. However original H2S test indicates that water is safe at 65 feet which does not correlate with fecal coliform test. The results of experiments done for the determination of level of contamination with depth of water using different methods shows in the fig.1 and fig.2.
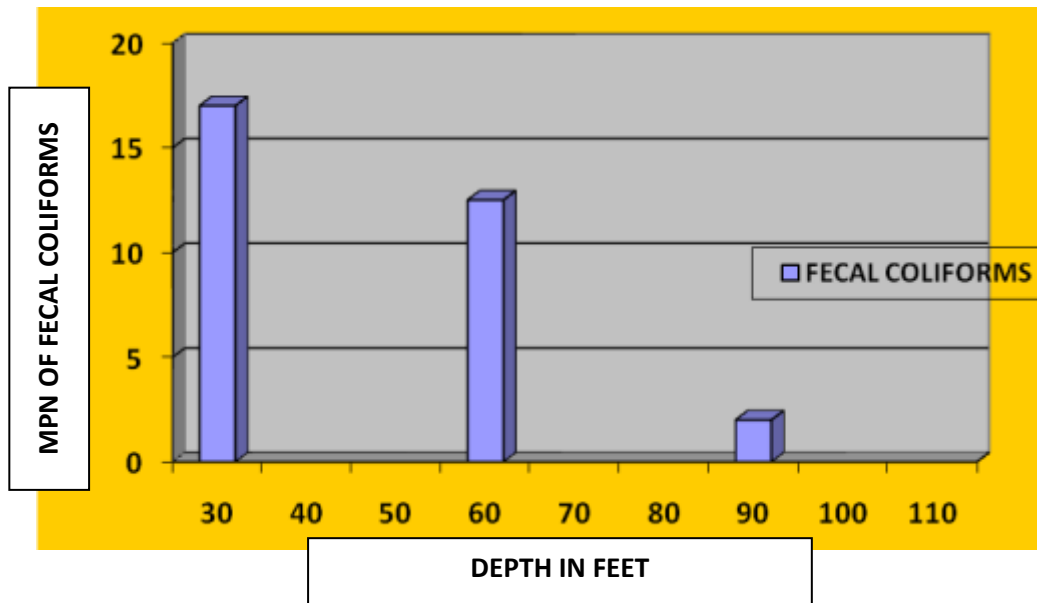
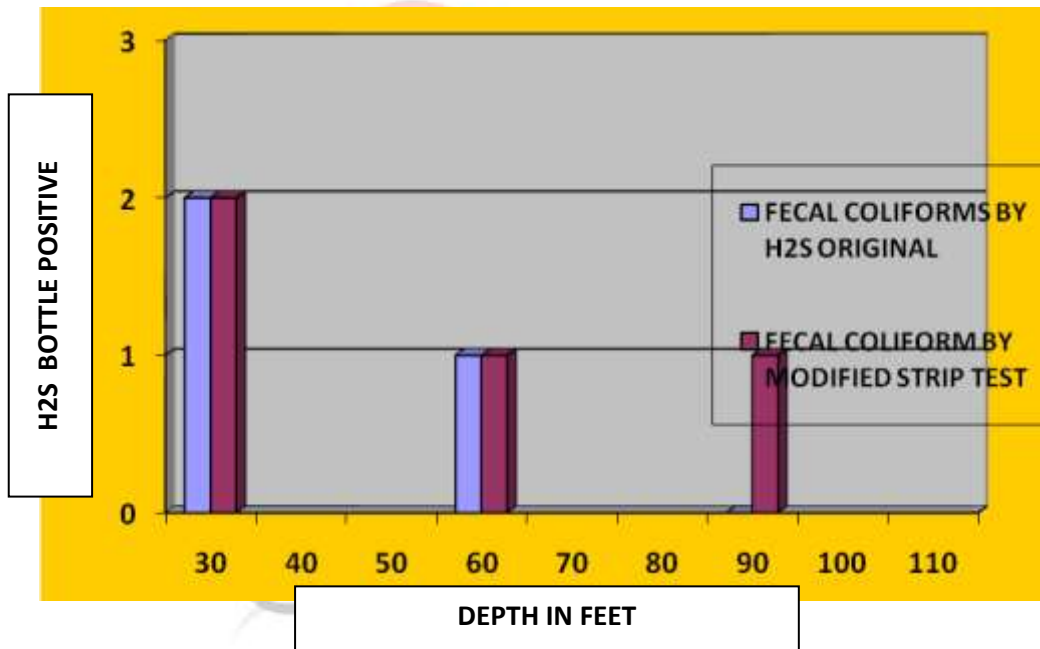**Fig.1. CORRELATION BETWEEN DEPTH OF WELL AND FECAL COLIFORM**

Fig.2.Correlation Between Depth Of Well And H2s Bottle Test

Effect Of Surroundings On Contamination Water
The distance of the toilets from well or dug well is quite important parameter for consideration. The results presented in fig. indicates that the distance of well should be more than 15 feet from the toilets as indicated by the H2S modified test. Results conducted on water samples collected near S.T. stand, PravaranagarLoni Maharashtra. Fig.3. shows the result of variation of surrounding water contamination with the depth of water sample collected.
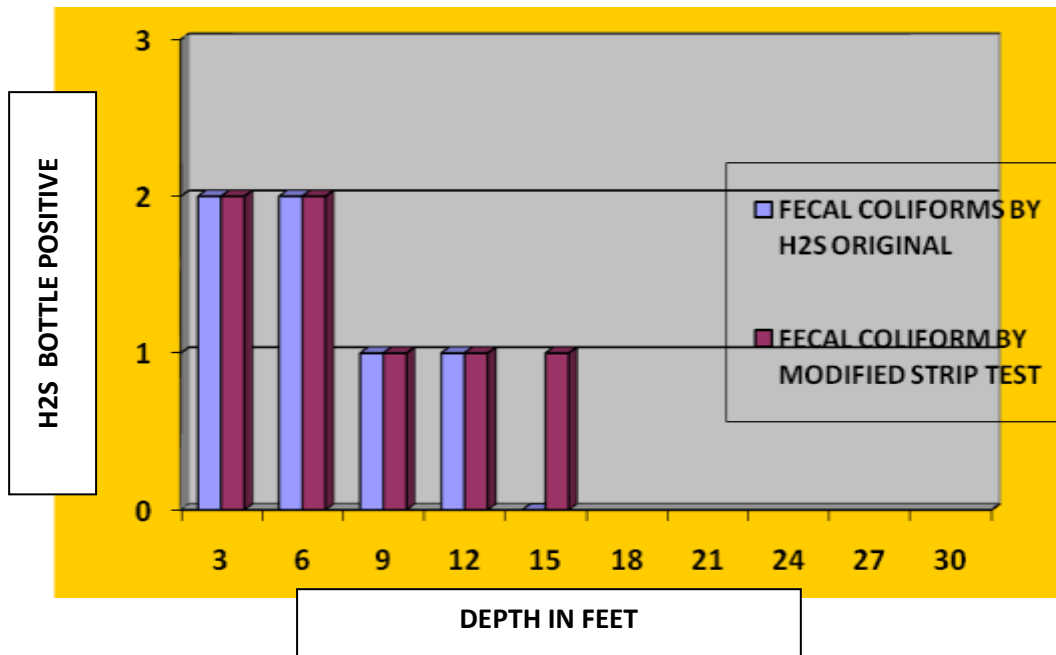
Fig.3.Correlation between Depth Of Well And H2s Bottle Test

Source of Water

The bacteriological quality of water depends upon the source of water. The sources considered in this study include tap water, Dug well, bore well (shallow and deep) and open well. The results via H2S paper strip test indicate that 80 % of dug well, 60% of open well, 40% of bore well and 8% of tap water sample are contaminated. Fig.4. shows the results of contamination of water with respect to the source of water.
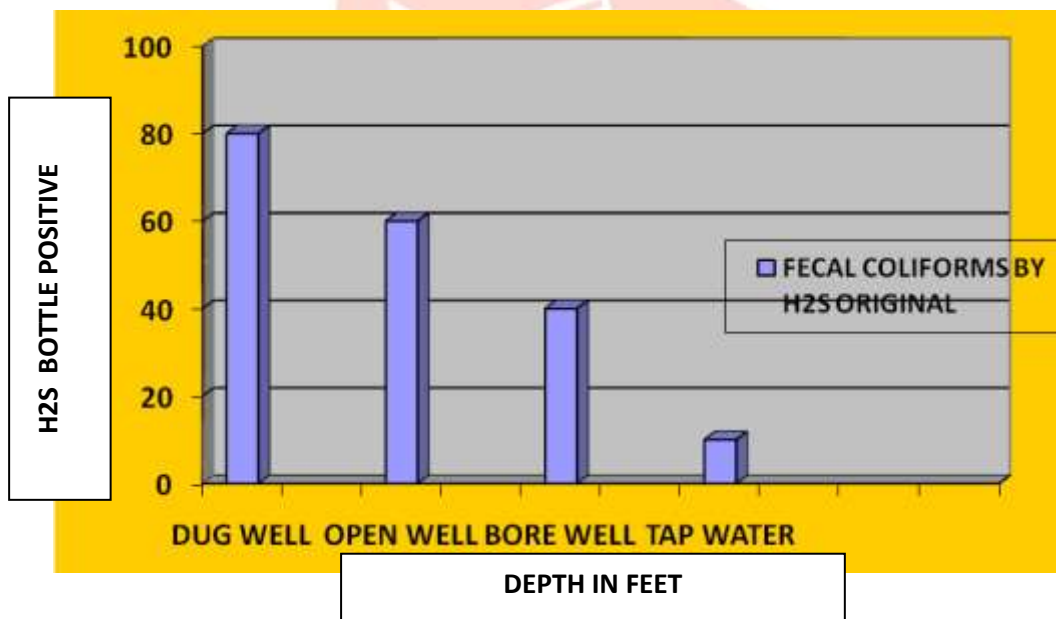

Fig.4. Level of Contamination of Various Water Resources

IV. CONCLUSIONS

On the basis of this study, following conclusions may be drawn:

- Effect of depth on water quality is quite significant. Water drawn from less than 55 feet was invariably found to be contaminated irrespective of the source. Water drawn from depth more than 90 feet was of acceptable quality bore well which draw out water from more than 110 feet yield high quality water.
- Distance of open wells and bore wells from toilet is also an important variable. If the distance is less than 15 feet the water is found contaminated.
- The quality of water depends on the source of water. In general more exposed water sources were found to be more polluted.
- This test can also be used to get a quantitative estimate of the bacterial contamination level.

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