

## Research Paper

## A case study of quality of Ground Water Resources of Khandesh Oil Extraction Plant Region Chalisgaon

**DR.WAYKAR B.B**

Depart. of Zoology Y.N. Chavan Arts,  
Sci. & Com. College, Chalisgaon

**G.J. NIKAM & DR.S.M.LAWANDE,**

Depart. of Geography Y.N. Chavan Arts,  
Sci. & Com. College, Chalisgaon

### ABSTRACT

*The water is one of the nature's free gifts to the human race. It is an essential for survival of each soul. Hence, a number of physical and chemical parameters were studied as a part of drinking water monitoring program at Chalisgaon, Adarshnagar & Shanti nagar area. There has Oil Extraction Plant the created the problem of water pollution. The people get their water supply through the municipality, but some of the people who never get enough water supply from municipality, depend upon either tube well or well water.*

A systemic analysis of water quality from different places was conducted during August to Sept.2005. Tube wells and wells water from different places were selected for sampling purpose. The result revealed that, total hardness, calcium, calcium hardness, magnesium hardness, chloride, salinity and total alkalinity were higher in sample water which are situated near the oil extraction plant. This water needs treatment before consumption.

#### INTRODUCTION -

Water, the most vital resource of all kinds of life on this planet, is also the resource, adversely affected both qualitatively and quantitatively by all kinds of human activities on land, in air or in water.

Pollution of surface and ground water system in one of the major environmental problems. Water quality affects the abundance, species composition, stability, productivity and physiological conditions of indigenous populations of aquatic organisms. Therefore, the nature and health of the aquatic communities is an expression of the quality of the water (APAH, 1989).

Both nationally and internationally reliable and safe water supply is an essential base for development and stability. The World Health Organization (WHO) estimated the burning dung and drinking contaminated water together cause eight million deaths per year (Heart, 1987).

Seventy percent of India's fresh water is polluted as per conventional standard. Hence there is an immediate need to survey and document quality of water for future implementation program. A large numbers of parameters signifying the quality of water in various uses have been proposed. A regular monitoring of some of them not only prevents diseases and hazards but also checks the water resources from going further polluted.

In Maharashtra, in most of the region people facing the drinking waters problems. Now days there are wide variations in rainfall. So a person depends on underground water supply. Where we residing at Chalisgaon, Adarshnagar & Shanti nagar region numbers of people making well and bore wells. In that area khandesh oil extraction Plant was established which effluents cause considerable ground water pollution.

#### OBJECTIVE OF THE STUDY -

- \* As a planning tool for managing water resource use.
- \* Assessing changes in the quality of the water at different places.
- \* To evaluate the performance of pollution control programmers.
- \* Communicating water quality information to the public and to decision makers.

The study has been used to find out the water quality of Adarshnagar & Shantinagar area of Chalisgaon, where Khandesh oil extraction plant is established. The potability of water was assessed, because industrial waste effluents are continuously discharged into the earth surface effluents reservoir.

Keeping in view, the necessity of restoring the water quality of bore well and well water of Adarsh Nagar & Shanti Nagar area. The present study aims to Asses the underground water quality in order to asses the suitability of its water for human use.

#### OBJECTIVE OF THE STUDY -

- \* As a planning tool for managing water resource use.
- \* Assessing changes in the quality of the water at different places.
- \* To evaluate the performance of pollution control programmers.
- \* Communicating water quality information to the public and to decision makers.

The study has been used to find out the water quality of Adarshnagar & Shantinagar area of Chalisgaon, where Khandesh oil extraction plant is established. The potability of water was assessed, because industrial waste effluents are continuously discharged into the earth surface effluents reservoir.

Keeping in view, the necessity of restoring the water quality of bore well and well water of Adarsh Nagar & Shanti Nagar area. The present study aims to Asses the underground water quality in order to asses the suitability of its water for human use.

#### MATERIAL AND METHOD

Water samples were collected in August to September 2005 for Physico-Chemical

Please cite this Article as : G.J. NIKAM & DR.S.M.LAWANDE , DR.WAYKAR B.B , A case study of quality of Ground Water Resources of Khandesh Oil Extraction Plant Region Chalisgaon : Golden Research Thoughts (Feb ; 2012)

analysis from 5 sampling stations.

I - Nala water

II - Well 1200 ft. away from effluents reservoirs to South.

III - Well 110 ft. away from effluent reservoirs above the station II.

IV - Well 1600 ft. away from effluent reservoirs.

V - Bore well 350 ft near to mill gate.

Water samples were collected in one litre plastic bottles. Sample collection was usually completed during morning hours between 8.00 a.m. to 10.00 a.m. every time. PH, DO, CO<sub>2</sub>, total hardness, calcium hardness, Magnesium hardness, total alkalinity, chloride and salinity were analyzed in accordance with Trivedy & Goel (1986), Kodarkar et al (1998) & APHA (1992).

#### RESULT AND DISCUSSION

The Physico - chemical parameters obtained from different well & bore well of different regions are mentioned in table no.2 & WHO standard in table No.1.

PH -

PH serves as an Index for pollution, which ranges 7.4 to 8.1. The factors like photosynthesis, exposure to air, and disposal of industrial waste affect PH [Saxena, 1987].

DO -

In natural water resources the concentration of dissolved oxygen depends upon physical, Chemical and biological activities prevailing in the water body. Dissolved oxygen is essential to maintain higher forms of biological life in the water. In present investigation it was observed that all sample stations have very low oxygen content in water as comparable to WHO standard; it was 0.6, 3.28, 3.5, 2.8, 2.36, mg/L from sample stations no. - 1, 2, 3, 4, 5 respectively. These results clearly indicate that inorganic reductants and oxidisable substance may be present which tends to decrease dissolved oxygen; this may be proving harmful to human health.

#### Free CO<sub>2</sub> -

Free carbon dioxide is an important parameter after oxygen. The level of carbon dioxide is very high, in almost all sample station, indicating pollution load in the water (Singh & Srivastava 1988, Michel 1966) reported that, due to biological oxidation of organic matter that might have caused an elevation of carbon dioxide level.

#### Total alkalinity -

The observed values of total alkalinity are found higher than the permissible limit of WHO standard. Higher values of total alkalinity might be due to presence of excess of free CO<sub>2</sub> produced as result of decomposition process coupled with mixing of industrial effluent (Singh 2002). The high level of total alkalinity indicates high pollution load.

#### Hardness -

In present study, calcium, total hardness, calcium hardness & Magnesium hardness were analyzed. It was observed that almost sample stations having very high level of hardness as compared to WHO standard. From the result, it was observed that Magnesium hardness is very high, it indicate, magnesium may be released in large amount in industrial water. The higher the concentration of calcium may favour the growth of bacterium. The hard water is unsuitable for washing, drinking & for irrigation.

#### Chloride -

Concentration of chloride were found to be very high, the higher the value of chloride can be attributed to sure indicators of amount of industrial effluents being carried out in underground water.

#### Salinity -

In present study, it was found that almost all sample

stations having high level of salinity, such water is unsuitable for drinking & irrigation purpose.

#### DISCUSSION

From the present investigation, it can be concluded that water quality of Adarsh Nagar & Shanti Nagar near Khandesh Oil Extraction plant area at Chalisgaon is under stress of severe pollution. The water is not suitable for drinking, bathing swimming, pisci culture & irrigation. In order to save this area's well & bore well, from further deterioration effective pollution control measures must be taken in the future.

#### From the study following conclusions have been drawn -

1) The well as well as bore well water in the proximity of Khandesh Oil Extraction plant was contaminated, the higher concentration of total hardness, calcium hardness, magnesium hardness, chloride, salinity & total Alkalinity, which is greater than the WHO permissible limit.

2) In the present investigation it was noted that, sample water from all station have higher content of magnesium, which is higher than the permissible limit of WHO, magnesium rich water may cause the gastrointestinal irritation & also cause diarrhea amongst the consumers.

3) The ground water which was near the industries, sampling station no.1 severally contaminated by the presence on higher concentration of total hardness, calcium hardness, Magnesium hardness, chloride, salinity and total alkalinity. The concentration of these parameters in the ground water was found to be greater than the WHO standards. This study also indicate the under ground inflow of water is from source of storage reservoir to station no.5 to station no.4 and also covers area up to station no.2, the station no.3 has comparatively less pollutant, which is situated north to source.

1) The quality of ground water located in the proximities of industries is not satisfactory and not suitable for human and animal consumption due to the presence of higher concentrations of above mentioned parameters. People, who are not accustomed to high chlorine in water, are subjected to laxative effect.

2) The storage of waste water earth legroom and dumping of waste in open and low laying areas increases the pollutant in underground water.

3) In general the hydrological studies revealed that the Adarsh Nagar & Shanti Nagar, nearby Khandesh Oil Extraction Plant is highly polluted by magnesium, calcium, and chloride: (oil)

4) From the study it was also concluded that as this water have higher concentration of salinity, this water is also unsuitable for irrigation; for further use, necessary measures should be taken to treat the waste water of nearby industry. Further, strict monitoring of the waste water treatment plants by done so as to control water pollution.

#### REFERENCES

APHA (1992) : Standard method for examination of water & wastewater, NewYork. Saxena M.M. (1987) : Environmental analysis of water & air Agro - Bot. Public India. Trivedy R.K. & P.K. (1986) Chemical & Biological method for water pollution studies Env. Public Karad.

W.H.O. (1985) : Guidelines for drinking water qualities, CBS publisher distributors.

Please cite this Article as : G.J. NIKAM & DR.S.M.LAWANDE , DR.WAYKAR B.B , A case study of quality of Ground Water Resources of Khandesh Oil Extraction Plant Region Chalisgaon : Golden Research Thoughts (Feb ; 2012)

