

Compares of Processed Borehole Water for Portable water Supply In Part of Nigeria Kwanzaa, Yenagoa, Bagels State

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Abstract: *In this study, processed water samples were taken from different water producing companies in and around Kpansia, Yenagoa, Bayelsa State for a laboratory test to determine turbidity, color, taste and Ph level which are the physical test for quality and portable water. Methods used for analysis are colorimeter, organoleptic, electrometric, and turbidity. Questionnaire were also submitted to the different water companies to know and compare their purification techniques and storage methods. The samples taken were nicknamed SA for company 1, ST for company 2, and SP for company 3. Results show that the turbidity level for sample ST which is company 2 is higher than that of SA and SP which are company 1 and 3. Also the color, taste and odor for sample ST which is company 2 is also positive making sample ST not suitable for consumption. Furthermore, the purification techniques and storage method used by company 1 and 3 are different from that of company 2. That is what causes the odor, color and taste. Hence, this is a medium to enlighten the general public that visual water inspection cannot determine if water is of appropriate quality.*

Keywords: *Quality of undergroundwater, Borehole water, Turbidity, Odor, Color, Taste, PH level.*

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I. Introduction

Water is an integral part of the environment and its availability is indispensable to the efficient functioning of the ecosphere, it is an important lifeline for human, animals and plants. Water is generally classified into two groups, surface water and groundwater. Surface water are found in rivers, lakes and other surface impoundments while groundwater is the water present beneath the Earth's surface in the soil pore space and in fractures of rock formations. Ground water is recharged from rainfall that soaks to the ground, melting snow which is but a few sources that recharge the supply of groundwater. Water is also of vital importance to all socio-economic sectors, and economic development is simply not possible without a safe, stable and portable water supply. Groundwater has emerged as the most important source of water for drinking purpose and other domestic needs, industrial and agricultural water supply in the world. It also plays a keys role in keeping wet ecosystems sustainable and sometimes as well in maintaining a suitable environment in human settlement. In other to achieve maximum benefit from the groundwater resource, substantial efforts are needed to explore the aquifer systems and to optimize its rational exploration. However, attention is not only needed but as well as a wide spectrum of problems related to groundwater. Groundwater is an important source of water supply throughout the world.

Occurrence Of Groundwater

To describe the occurrence of groundwater necessitates a review of where and how groundwater exists, subsurface extents needs to be considered. The geological zones important to groundwater must be identified as well as and water yielding capability assuming hydrologic conditions furnish water to the underground zone, the subsurface strata govern its distribution and movement, hence the important role of not be over emphasized. Springs, hydrothermal phenomena, water in permanently frozen ground constitute special ground occurrences.

Exploration Of Groundwater

Although groundwater cannot be seen on the earth surface, a variety of techniques can provide information. Concerning its occurrence and under certain condition even its quality from surface or above surface locations. Surface investigation or exploration of groundwater is seldom more than partially successfully in that results usually leave the hydrogeology picture incomplete. However, such methods are normally less costly than subsurface investigations. Geologic methods, involving interpretation of geologic data and field reconnaissance represent an important first step in any groundwater investigation. Remote sensing from aircraft or satellite has become an increasing valuable tool for understanding subsurface water conditions.

Geophysical Exploration

This is the scientific measurement of physical properties of the earth's crust for investigation of mineral deposits of geologic structure. With the discovery of oil by geophysical methods in 1926. Economics pressure for locating petroleum and mineral deposits stimulated the development and of many geophysical methods and equipment. Application of groundwater investigations was slow because the commercial value of oil over shadows that of water. In recent years, however, refinement of geophysical techniques as well as an increasing recognition of the advantages of the method for groundwater study has changed the situation. Today many organizations concern with groundwater employ geophysical methods. The methods are frequently in exact or difficult to interpret, and they are most useful when supplemented by sub surface investigations. Geophysical method detects differences, or anomalies, of physical properties within the earth's crust. Density, magnetism, electricity and electrical sensitivities are properties most commonly measured.

Groundwater Basin Investigations

Ideally, before groundwater is developed in a basin, an investigation of the underground water resources should be made. In practice this rarely occurs, instead, a study is usually initiated either after extensive development with a review toward further development or after over development when a problem threatening the water supply appears imminent. Investigations are seldom concerned with simply locating groundwater supplies. More commonly the concerns involve evaluation the quantity and quality of groundwater resources already known to exist or determining the impact of human plans or activities on the quantity and quality of groundwater.

Measures of Water Quality

In specifying the quality characteristic of groundwater, chemical, physical, and biological analyze are normally required. A complete chemical analysis of a groundwater sample includes the determination of the concentrations of the inorganic constituents present, organic and radiological parameters are normally of concern only where human induced pollution affects quality. Depending on the purpose of water quality investigation, partial analyze of only particular constituents will sometimes suffice. Properties of groundwater evaluated in a physical analysis include temperature, color, turbidity, odor, and taste. Biological analysis includes test to detect the presence of coliform bacteria, which indicate the sanitary quality of water for human consumption. Because certain coliform organisms are normally found in intestines of humans and animals, the presence of these in groundwater is tantamount to its contact with sewage sources.

II. Methodology

Three (3) water samples were collected each from three (3) different water producing companies. SA for company one, ST for company two, and SP for company three making a total nine (9) water sample collected. The basic tools used to evaluate the development of groundwater for portable water supply are as follow: Water samples from different water companies, Colorimeter, Organoleptic, Electrometer, and Turbidity.

III. Data Acquisition and Results

The water samples data acquired and the results analysis from each companies are shown below.

Table 1. Water Analysis report for SA.

PARAMETERS	UNITS	TEST REMARK 1	TEST REMARK 2	TEST REMARK 3	REQUIREMENT	METHODS
Color	Pt.co scale	4	3	4	15	Colorimeter
Odor	Pt.co scale	Negative	Negative	Negative	Odorless	Organoleptic
Turbidity	FTU	1	1	1	5	Turbidity
Taste	Pt.co scale	Normal	Normal	Normal	Tasteless	Organoleptic
pH	Pt.co scale	7	6	6.5	6.5-8.5	Electrometric

Sample 1 shows that all the requirements are up to standard therefore it is good for consumption.

Table 2. Water Analysis report for ST.

PARAMETERS	UNITS	TEST REMARK 1	TEST REMARK 2	TEST REMARK 3	REQUIREMENT	METHODS
Color	Pt.co scale	2	2	2	15	Colorimeter
Odor	Pt.co scale	Positive	Negative	Positive	Odorless	Organoleptic
Turbidity	FTU	4	5	5	5	Turbidity
Taste	Pt.co scale	Abnormal	Abnormal	Abnormal	Tasteless	Organoleptic
pH	Pt.co scale	9	8.5	9	6.5-8.5	Electrometer

Sample 2 shows that more purification is needed before consumption.

Table 3. Water Analysis report for SP

PARAMETER	UNITS	TEST REMARK 1	TEST REMARK 2	TEST REMARK 3	REQUIREMENT	METHOD
Color	Pt.co scale	2	3	2	15	Colorimeter
Odor	Pt.co scale	Negative	Negative	Negative	Odorless	Organoleptic
Turbidity	FTU	1	1	1	5	Turbidity
Taste	Pt.co scale	Normal	Normal	Normal	Tasteless	Organoleptic
pH	Pt.co scale	6	6.5	6.5	6.5-8.5	Electrometer

After the analysis were carried out, the purification techniques and storage methods used by company (1) SA, and company (3) SP are different from that of company (2) ST. The purification methods for SA and SP are normal and good for human consumption while that of ST is not normally purify and well stored. That was the reason why there are odor, color, taste and high turbidity level in company (2) ST sample.

IV. Conclusion

Water samples were taken from different water producing companies in and around kpsansia, yenagoa, Bayelsa State for a laboratory test to determine odor, color, taste, turbidity and pH level which are the physical test for quality and portable water. The methods used for analysis are colorimeter, organoleptic, electrometric and turbidity. The samples taken were named SA for company (1), ST for company (2), and SP for company (3). After the analysis were carried out, results shows that the turbidity level for sample ST which is company (2) is higher than that of SA and SP which are company (1) and (3). Also the color, taste, and odor for sample ST which is company (2) is also positive making sample ST not suitable for human consumption. Hence, water should be more purify and well store for human consumption.

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