

Quality tests of Groundwater

Ground Water Samples

In urban areas, on-site sanitation systems specially pit latrines, soak pits and leaking septic tanks may sometimes pose significant adverse impact on ground water quality particularly in areas where the geological settings favours migration of the contaminants. The problems can become alarming especially in dense areas where onsite sanitation system and drinking wells are closely located. The present study aims to study the impact of onsite sanitation on groundwater quality.

Sampling Location: Samples will be collected from existing borewells, dugwells or handpump, which are in use. Abandoned well shall not be considered for taking samples. Wells for sampling will be selected in the potentially polluted sites (eg: wells in areas where septic tanks are densely located, wells within slums an area, wells in areas where water table is high, At solid waste dump site etc). Since variation in groundwater quality might by varying in different areas, sampling wells will be selected such that they are uniformly distributed across the entire city. For reference point of non polluted groundwater, sample to be taken from well located outside city limit.

Sampling procedure: Sample from open wells to be collected about 30 cm below the surface of the water. Samples from the tube wells/openwells/handpump will be collected after running the well for about 5 minutes.

Quality Parameters: Following parameters need to tested for ground water samples

Sr.No	Tests		Unit	Measurement Method
1	pH	pH	-	pH meter
2	EC	Electrical conductivity	μS/cm	Conductivity meter
3	TDS	Total dissolved solids , by volume	% and mg/l	Gravimetry
4	Nitrate Nitrogen (as N)	Nitrate Nitrogen	mgN/L	Colorimetry
5	COD	Chemical oxygen demand	mg/l	Potassium dichromate method
6	BOD ₃	BOD 3 at 27 degree Centigrade	mg/l	DO consumption in 3 days at 27 °C
7	Chlorides (as cl)	Chlorides	mg/L	Argentometric titration
8	Total coliforms	Total Coliform	No./100mL	MPN or MF method
9	Faecal coliforms	Faecal coliforms	No. /100 mL	MPN or MF method

Other information to be collected: Log of geology and soil strata to be taken from borewell drilling operator.

	Parameters to be measured	Frequency	Location
1	Field Observation: Weather, Approximate depth of main streams/depths of water table, Colour and intensity, Odor, Visible effluent discharge. Human activities around station, Station Details	Twice in a year – April and Oct	All Location
2	Core Parameters: Temperature, pH, Conductivity DO, BOD, Nitrate –N, Total Coliform, Faecal Coliform.	Twice in a year – April and Oct	All Location

3	<u>General Parameters:</u> COD, TKN, Ammonia, Total Dissolved solids, Total fixed solids, Total Suspended Solids, Turbidity, Hardness, Fluoride Boron, Chloride sulphate, Total Alkalinity, P-alkalinity, Phosphate, Sodium, Potassium, Calcium, Magnesium, SAR. %	Once a year (April)	All Location
4	<u>Trace Metals:</u> Arsenic, Nickel, Copper, Mercury, Chromium, Cadmium, Zinc, Lead, Iron	Once a year (April)	Selected Location
5	<u>Pesticide:</u> Alpha BHC, Beta BHC, Gama BHC(Lindane), OP DDT, PP DDT, Alpha Endosulphan, Dieldrin, Carbaryl (Carbmate), 2.4 D, Aldrin, Malathian, Methyl Parathian, Anilophos, Cloropyriphos	Once a year (April)	Selected Location

Record Form for Ground Water

Sample Code: _____

1. Details of Sampling Location:

a. Date and time of taking sample :

i. Date : _____

ii. Time : _____

b. Sample Location and GPS coordinates (latitude and longitude) and photographs:

2. Details of Source of Sample:

a. Source of Sample(tick the appropriate answer):

i. Open Well/Dug well

ii. Borewell/tubewell

iii. Handpump

b. Well/Handpump is (tick the appropriate answer):

i. Private

ii. Public/Municipal

c. Well/Handpump usage(tick the appropriate answer):

i. Drinking water

ii. Other domestic usage

iii. Bathing/Washing clothes

d. Depth of well _____ mt

e. Diameter of well _____ mt

f. Water level/depth in well _____ mt

g. Lifting device

i. Electric motor _____ hp

ii. Submersible pump _____ hp

iii. Manual

- h. Hours of usage of pump _____ hrs/days
- i. Use of open well / bore well / hand pump (tick the appropriate answer):
 - i. Drinking
 - ii. Cooking
 - iii. Bathing
 - iv. Washing and cleaning
 - v. Others (specify) _____
- j. Activities/uses around Sampling location (tick the appropriate answer):
 - i. Washing clothes
 - ii. Bathing
 - iii. Cleaning Vegetables
 - iv. Cattle breeding/cattle bathing
 - v. Solid waste dumped
 - vi. Others (specify) _____

3. Details of Sampling procedure:

- a. Volume of Sample collected _____ litres
- b. Which type of container was used for sample collection:

- c. Field Preservation Methods (specify)

- d. Sample tested at laboratory :
 - i. Date: _____
 - ii. Time: _____

Name, Signature, Date and Time:

On field recorder: _____ , Received at Lab: _____, tested at lab: _____