

WATER WELL MONITORING

- The primary objective of constructing a monitoring well is to provide an access point for procuring ground water samples.
- A monitoring well should be developed to allow the collection of turbidity-free representative ground water samples.
- Development should continue until visibly clear water is discharged.
- However, obtaining a representative sample can be difficult. How do we know what is representative?
 1. Some workers believe that a representative sample can be obtained after several casing volumes of water have been purged from the well.
 2. Still others believe that the sample should be obtained after temp-specific conductance-pH has stabilized
- Whatever the rationale it is clear that simply taking a sample from a tap may not obtain a representative sample.

PURGING

- After the well is constructed and a representative sample is to be obtained, it may be necessary to purge the well.
- Purging is the process of removing stagnant water from a well prior to sampling.
- One of the first issues on sample collection is well purging protocol.
- Purging is necessary because a ground water sample must be representative of the formation water.
- The stagnant water above the screen is usually there for extended periods of time. This stagnant water has a:
 1. different temp
 2. pH
 3. oxidation-reduction potential
 4. and TDS content than formation water

All these factors can affect lab analysis.

- VOC and dissolved gases in the stagnant water can volatilize or effervesce.

PURGE VOLUMES

Basically, two primary philosophies:

1. Borehole volumes
Ranges from less than 1 to more than 20
In general purge volumes should be 3 to 6 borehole volume
2. Stabilization of indicator parameters.
Well should be purged until certain field-measured parameters have stabilized
Temp-pH specific conductance
pH is a measure of what ion-hydrogen

There are other methods, but these are the most common

LOW VOLUME WELLS

- Low volume-slow recovery wells provide special consideration. It may be beneficial not to purge these wells: at least do not lower water past top of screen. May take several hours to recover; causing aeration of formation water.

PURGING EQUIPMENT

- Criteria for choosing purging equipment is essentially the same as those for sampling.
 1. Based upon volume-depth-top or bottom of screen-contaminant.
- Most common is a bailer. Can be constructed of almost any material.
- Suction lift and vacuum pumps are also common; but are restricted to depths of less than 25 feet.

DECONTAMINATION

- Decontamination is very important in most groundwater investigations.
- This is also the most overlooked component.
- Without decontamination procedures, any data generated is subject to scrutiny. Therefore, decontamination procedures must be 'incorporated into every aspect of sample collection.
- The purpose of decontamination is: (remember sampling for ppm or ppb)
 1. To prevent cross-contamination of different sites using common equipment.
 2. Ensure representative samples are collected for analysis.
 3. Ensure proper operation of equipment
 4. Reduce exposure hazards.
- Only materials that can be decontaminated should be used for sampling. Most organic materials cannot be decontaminated.
- Acceptable material would be PVC-Teflon-Stainless Steel
- Decontamination cleaning solutions vary depending upon the contamination. Examples are:
 - Clean potable water
 - Detergents like Alconox Hydrochloric acid
 - Distilled water
- Common sense decontamination
 - Microbiological contamination is coliform bacteria.
 - Coliform bacteria can be introduced into a water system by just about any activity
 - Sample bottles should also be handled with care to prevent contamination.
DON'T USE CL ON BOTTLES
DON'T WASH THEM

WATER LEVEL DATA

- Water level data is important for various reasons one of which it shows the changes in groundwater regions and resources influenced by human activities.
- Piezometers are specialized monitoring installations designed specifically to take water level measurements.
- Wells also are used for taking measurements and other uses.
- All observation wells constructed for the purpose of measuring water levels should be fitted with a watertight cap to prevent ground water contamination.