Effects of groundwater contamination essay example

Environment, Pollution

Short title- Effects of Groundwater Contamination

Full title- Effects of Groundwater contamination on water quality utilized for drinking purposes

Lab 2 - Experiment 1: Effects of Groundwater Contamination

Hypothesis:

Laundry detergent is responsible for causing maximum groundwater contamination due to the presence of components like, surfactants containing Alkylbenzenesulphonates and bleaches containing Sodium hypochlorite, and bleach activators containing Tetraacetylethylenediamine.

Post-Lab Questions

- Restate your hypothesis. Was it confirmed or denied? How do you know?

As per our hypothesis, laundry detergent is responsible for causing maximum groundwater contamination.

Yes, our hypothesis was confirmed.

This was because of the physical presence of foam and soapy and grassy smell in the water which was mixed with laundry detergent and passed through soil and sieve.

- What affects did each of the contaminants have on the water in the experiment? Which contaminant seemed to have the most potent effect on the water?

In our experiment, cooking oil and vinegar, as contaminants did not have any effect, as a contaminant, on water. However, laundry detergent, as a contaminant, had the most potent effect.

- On a larger scale, what type of affects would these contaminants have on a

town’s water source and the people who drank the water?

On a larger scale, if the town’s water is contaminated with laundry detergent, it can cause gastritis, coughing in the short term. However, long term exposure to sodium hypochlorite, can cause chromosomal aberrations, which can also lead to various forms of cancers (Gul et al. 2009)

- What type of human activity would cause contaminants like oil, acid and detergents to flow into the water supply?

Drainage of household wastes containing cooking oil, spillage of oils from oil extraction plants, leakage of acids from industries and dumping of household washing waste containing laundry detergents, are the various modes that contaminants can flow into the water supply.

- What other items within your house do you believe could contaminate the water supply if you were to dump them into the ground?

Household wastes in the form of municipal solid waste containing batteries, electronic wastes, paints, solvents are potent contaminants if these are dumped into the ground.

Lab 2 - Experiment 2: Water Treatment

Hypothesis:

- When contaminated water is passed through a filtration system, the impurities are left behind, and clear water is obtained.

- When particulate contaminants, present in water, are subjected to alum treatment, the particles settle down by being heavy, and the clear water is left at the top of the container.

Post-Lab Questions

- Restate your hypothesis. Was it confirmed or denied? How do you know?

Contaminated water, when subjected to alum or filtration treatment, gets cleared and free from impurities. This clearing of water is proved by visual appearance of clean water, as well as, quality assessments for pH, hardness, presence of chlorine, phosphate and total iron.

- What are the differences between the “ contaminated” water and the “ treated” water (look at color, smell, visibility, etc.)?

“ Contaminated” water looks turbid, reddish to brownish in color. Also, contaminated water may have a mild to strong odor depending on the type and amount of contaminants present. However, “ treated” clean water looks clear with no odor.

The five steps of water treatment process include screening, coagulation, sedimentation, filtration and disinfection.

The method of coagulation for water treatment involves the use of alum or alum like chemicals to water, which bind to the impurities, and make them settle at the bottom of the storage tank.

Lab 2 - Experiment 3: Drinking Water Quality

Hypothesis:

Acidic or Alkaline pH of water is due to the presence of contaminants.

Post-Lab Questions

- Restate your hypothesis. Was it confirmed or denied? How do you know?

Acidic or Alkaline pH of water is due to the presence of contaminants.

The hypothesis was confirmed from the pH test. Tap water was found to be acidic while both the sources of bottled water had ~ neutral pH.

- After comparing the results of tap water and bottled water, what major differences, if any, do you notice between the two?

Tap water had an acidic pH and high content of undesirable components like ammonia, phosphate, and iron as compared to both the sources of bottled water. Moreover, tap water also showed a greater hardness while both the sources of bottled water were soft.

Indeed, bottled water is a healthier alternative when compared to tap water. This is primarily due to the presence of undesirable components in tap water like unacceptable levels of ammonia, phosphates, iron and chlorides. These undesirable components are responsible to cause imbalances in body metabolism. Accordingly, bottled water is proven to be a healthier choice when compared to tap water.

References

- Gül, S., Savsar, A., and Tayfa, Z .(2009). Cytotoxic and genotoxic effects of sodium hypochlorite on human peripheral lymphocytes in vitro. Cytotechnology, 59, 113–119.