Well Maintenance and Disinfection

Introduction

If a well is not properly maintained, one will eventually notice a creeping loss in productivity, often accompanied by an increase in bacteria count. Many of the bacteria frequently found in well water coat the well casing with slime (called “biofilm”), which contributes to the loss of productivity. The biofilm protects the bacteria from hostile environments, including offering protection against shock chlorination. The purpose of this flyer is to show that alternatives exist.

This picture shows the mud and froth that was pumped out of a private well in Manitoba after the chlorine dioxide disinfection and cleaning solution had acted in the well for one hour.

Common Well Problems

- Increasing or at least persistent bacteria count (HTP, slime, iron bacteria)
- Scaling

Preventative Maintenance

- Aquifer mapping
- Regular well water analyses (chemical and biological)
- Well cleaning and conditioning

Cleaning and Disinfection Aspect

Well cleaning requires a slightly acidic solution - very much like the cleaning of the kettle from scale with dilute vinegar. PLEASE NOTE: Hypochlorite (bleach) must not be used under even slightly acidic conditions - DANGER OF CHLORINE GAS DEVELOPMENT! Because of this instability, commercial hypochlorite solutions (including bleach) are strongly alkaline. As a consequence, the commonly used shock chlorination causes the precipitation of lime (”hardness” of the water). This incrustation protects bacteria, resulting in a predictable re-infection.

Unlike hypochlorite (bleach), chlorine dioxide works under acidic conditions, thus cleaning the well while disinfecting it. With chlorine dioxide, there is no danger of developing poisonous chlorine gas.

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The well cleaning and disinfection kit contains

1. Well Disinfection Solution A (the small bottle in the right lower corner of the picture);
2. Well Disinfection Solution B (the 20 L canisters);
3. Test tablets;
4. Material Safety Data Sheets.

The procedure is as follows:

1. Pour the content of the bottle labelled “Well Disinfection Solution A” into the canister labelled “Well Disinfection Solution B”. Close the bottle and the canister tightly.
2. Shake the black canister and let rest for 5 - 10 minutes. During this time, the disinfectant (chlorine dioxide) develops. If the solutions are cold (less than ambient temperature), wait additional 5 - 10 minutes.
3. Use a hose (a garden hose will do the job) that you let down to the bottom of the well. With a funnel, pour the mixed solution into the hose so that it fills up the well from the bottom.
4. Wait 2 hours and pump the chemicals and the mud out of the well. Repeat if necessary.
5. The tablets allow testing for chlorine dioxide. As long as they turn pink, chlorine dioxide is present in measurable quantities.

Selected Properties of Chlorine Dioxide:

Unlike chlorine and bleach, does not react with organic compounds to form trihalomethans (THM).
Unlike chlorine and bleach, does not react with ammonia in the water.
Unlike chlorine and bleach, can be used in an acidic environment as required for well cleaning.

Comparison of disinfection effect on different micro-organisms:

Disinfection Power	Chlorine	Chlorine Dioxide
Bacteria	Yes	Yes
Virus	No	Yes
Protozoa	No	Yes
Required Concentration	Not less than 0.5 mg/L	0.2 mg/L

Do you require additional information?
Can we give a presentation to YOUR council about our Well Cleaning and Disinfection Technology?

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