HOME DIRECTIONS. inc.
64 SOUTH OLMSTEAD LANE, RIDGEFIELD, CT 06877
"Home Inspections by Professional Engineers"
Main: (203) 431-4042
www.homedirections.net

RESULTS TO FOLLOW

INTERPRETING BACTERIOLOGICAL AND CHEMICAL WATER TEST RESULTS
By Home Directions, Inc.

The following is information that can help you interpret the quality of the well water we tested for you. Normally, we test untreated water with any water conditioning equipment bypassed. This way you can tell from the following write-up what type of equipment might be appropriate or whether any present equipment is necessary at all.

Compare this information and suggestions below to what equipment may presently be in the house. You may want to contact a water conditioning company to help you understand how to maintain any equipment that is present. A phone number of such a water conditioning company may be present on the equipment. Be advised, however, that companies in this business tend in general to be aggressive salespeople and may not have your best interests in mind.

COLIFORM BACTERIA:

The ultimate purpose of testing for coliform bacteria is to find evidence of contamination by human septic or sewage materials which can carry a variety of water-borne diseases, although almost all positive coliform tests indicate a problem other than septic or sewage contamination. One of the most common causes for bacterial contamination is surface water leaking into the well by one of the defects noted in number 4 below. Frequently it is not clear what caused the problem. False positives are possible in the testing process.

If E.coli is present, bacteria from a fecal source has been found. It is especially important if E.coli is present to investigate the source of contamination and fix it.

If your lab report indicates the presence of coliform bacteria, we suggest that you do the following:

1) Notify the seller of the situation. Why not give him one of these sheets, so that he is as informed as you are of our suggestions. We are sometimes hard to contact by telephone.
2) Put a provision in your contract requiring that this situation be satisfactorily resolved.
3) Have a well specialist conduct a detailed inspection. He should look for sources of contamination such as well pits full of muddy water, clogged vent tubes, cracked well casings, broken well caps, a cracked pipe from the well to the house, poorly grouted well casing into the bedrock, fractures in the bedrock near the surface of the well, etc. Just taking another test is insufficient because the bacteria have a short life cycle and may die out in a few days after contamination takes place. Having the well checked for flaws by the well service company is essential.
4) Chlorinate the well if a significant source of contamination is found or if you would be more comfortable with chlorination performed. Otherwise, chlorinating is optional. If you do chlorinate, the well needs to be flushed free from chlorine and retesting the water should not be attempted until the chlorine content of the water is absolutely zero. This is usually done in an occupied house by normal water use for a couple of weeks, or in a vacant house, by running water at a low flow of about half a gallon per minute for a couple of days.
5) Whether or not repairs are necessary, the water should be retested after inspection. The test should be taken within a few days after heavy rain to allow the usual cause of contamination to occur. (See notes on chlorination in item #4).
6) If the retest still shows coliform or the well has chronic, unsolvable intermittent contamination, it can be treated with chlorine injection or ultra-violet devices which kill bacteria. Drinking bottled water is another possibility since the bacteria do not affect other uses of the water supply. Drilling a new well is obviously a possibility in chronic cases. Treatment may cost about $1,500 while a new well could cost $5,000 to $15,000.

ODOR:
Odor is often caused by harmless bacteria which convert tasteless and odorless sulfur compounds (for instance sulfate) in the water to hydrogen sulfide (rotted egg odor) and related odorous sulfur compounds. Taste and odor can also be caused by complex nitrogen compounds formed by harmless bacterial activity. Many taste-forming and odor-forming bacteria are associated with the presence of iron and manganese (the "brown-stainers") in the water supply. In these cases, there are water treatment systems which will remove the iron and manganese as well as taste and odor. Removal of the iron and manganese may not, however, remove taste and odor, depending on the specific method of treatment. Charcoal absorption units work well to remove odor. There is no MCL for odor.

pH:
This is a measure of the relative acidity of the water. A neutral level is 7.0 and a level of 6.5 to 9.0 is considered to be in the normal range. While a pH above 9.0 is very rare, a pH below 6.5 is relatively common. Depending on how low the pH is and how much chloride content adds to corrosiveness, a low pH level might best be treated by the installation of a neutralizer. This will help preserve pipes and prevent leaching of metals such as copper and lead into the drinking water.

TURBIDITY:
Turbidity is raised by the presence of dissolved solids such as iron and manganese and occasionally by the presence of micro-organisms such as bacteria and parasites. Also high turbidity is caused be the presence of suspended matter such as clay, silt or finely divided organic or inorganic matter. From a public health point of view, the presence of micro-organisms is the more important reason for measuring turbidity. Treatment such as a sediment filter will help remove suspended material. Iron and manganese filters are also available if that is the cause of the turbidity.

HARDNESS:
The state-recommended limit is 150 milligrams per liter. This is an arbitrary guideline since hardness is not a health issue but rather an aesthetic and plumbing one. Actually, many people can get used to hardness levels of up to 200 milligrams per liter. Very high hardness levels will cause a white crust build-up in showers and some etching on dishes in the dishwasher as well as require extra soap in the laundry and eventually loss of efficiency of hot water heaters.

If you have too much hardness, we suggest signing up with a conditioning company that can offer an exchange canister program. This water softening exchange canister will exchange sodium for calcium in the water until such time as this canister is used up and exchanged for a new one with the conditioning company. The company then regenerates the softener with sodium chloride at their factory location. The softening process exchanges calcium, magnesium-dissolved ferrous iron and manganese for sodium or potassium ("K-Life" softener). The process does nothing to the chloride content of the water.

The sodium "pollution" of drinking water by conventional water softeners can be eliminated by softening the hot water only. Hot water is what causes problems with the dishwasher, washing machine and shower. Pure cold water can then be used for drinking. The calcium is not bad to drink; only the sodium is. Furthermore, if you soften only the hot water, you will only need to exchange the canister about a third as often (maybe one per quarter-year rather than once a month) since hot water usage tends to be about a third of the total water usage in the home.

CHLORIDES:
Levels of up to 100 are fairly common. Above that, it is considered significantly corrosive to the piping but there is not much to do about it. The State defines 250 as the maximum safe chloride level in drinking water. Over this, the water tastes a bit salty and is considered not potable. Above this level, drink bottled water or install reverse osmosis equipment (the little tank under the kitchen sink that makes five to seven gallons a day) at a cost of about $1,300.

IRON AND MANGANESE:

Iron and manganese are brown metals. They are not generally considered to be a health concern. Iron and manganese are extremely common in local well supplies. Generally, these are considered nuisance metals. Iron levels above 0.3 mg/L will tend to stain laundry as will manganese levels above 0.05 mg/L. Water softeners can take out chemically-dissolved iron and manganese with the water softener's usual side effects. Some iron and manganese is not chemically dissolved but only in particulate suspension. The particulated iron and manganese can be filtered out and chemically-dissolved iron and manganese can be removed with a chemical exchange kind of filter. Various treatment options are available to remove iron and manganese. The most environmentally responsible systems do not discharge chloride waste into the ground water but rather filter out byproducts with activated charcoal. Such systems might cost between $3,000-4,000.

NITRATE:

Nitrate values would preferably be under 1.0; the maximum limit is 10. Anything significantly over 1.0 could be considered elevated. Nitrates are the result of final sewage decay at the end of the nitrogen cycle. High nitrates turn up in densely populated older neighborhoods or in farmland. Also, excessive fertilizing of lawns seems to bring up nitrates. A nitrate level over 10 is dangerous for infants and nursing mothers. If the nitrate level is high, drink bottled water or install reverse osmosis equipment (the little tank under the kitchen sink that makes five to seven gallons per day) at a cost of somewhere around $1,000.

NITRITE:

Significantly elevated levels of nitrite is often an indicator of contamination of the water supply by surface water. It can also be an indication of contamination by sewage. At low "indicator levels", it is not harmful to health, but at higher levels (greater than 0.100 mg/L) it can produce nitrosamines (suspected carcinogens) in the stomach.

SODIUM:

The recommended limit of sodium is 28 for people on a low-salt diet. This is very strict if one considers that milk has around 400 milligrams of sodium per liter. Exceptionally high sodium can be removed by reverse osmosis.

LEAD:

Standards for lead levels in water supplies have been changed to extremely strict levels. Understand that the parts per billion we are testing for with lead is a thousand times more strict that the parts per million we are testing for with other chemicals and minerals. This is so strict that sometimes a microscopic piece of lead will break loose from a solder joint at the time of the test and create what appears to be substantial pollution. A re-test of the water may then indicate no lead at all. If you have an elevated lead reading in the water supply, probably the first thing to do is test again to see if it is consistent contamination.

Another important factor to be assessed before any further action is the pH (acidity) of the water supply. Acidic water (low pH, below pH 6.5) is corrosive to metal plumbing. Although it is not the only factor in corrosion of the plumbing to yield lead in the drinking water, it is very important and should be corrected to target pH = 7.5 before other actions are taken.

If contamination is consistent, then testing water at different stages in the system can be done to isolate the source of the lead. Lead is removed from water by a variety of filters and by a softener. However, the removal treatment should be done near the point of use of drinking water.

There are different ways to draw samples for lead testing. The two most common are what are called "flush tests" and "first draw" tests. "First draw" tests are more conservative and test water that has sat in pipes for a specific number of hours. There is no effective way to control this situation in a home inspection. In a vacant house, for instance, the water may have not been run for weeks, clearly absorbing metals from the piping. On the other hand, if the house is occupied, it is difficult to know if the water was run before you arrived. The "flush test" takes samples of water that has run through pipes. We do the flush tests because they are repeatable and interpretable.

Also, they more closely simulate actual use since health experts suggest running water until it is cool before drawing it for drinking.

HOME
DIRECTIONS, inc.
87 GRAND VIEW DRIVE, RIDGEFIELD, CT 06877
"Home Inspections by Professional Engineers"

Main: (203) 431-4042
Fax: (203) 438-0654
www.homedirections.net

RESULTS TO FOLLOW

INTERPRETING RADON IN WATER TEST RESULTS

By Home Directions, Inc. updated April 2001

The following information is meant to give you a basis for deciding whether or not to take any action to reduce radon levels in the well water. It is not a black and white issue.

AMBIGUITY

It has never been completely clear what a safe level of radon in well water is. The EPA has equivicated for over 10 years about setting a guideline. Believe it or not, some statements from the EPA still suggest that levels up to 40,000 pci/l do not pose a substantial threat while simulatenousy the agency indicates that a level below 300 would be desirable. In the early 1990s, the Connecticut Department of Health Services (in conjunction with the American Lung Association) published a booklet suggesting treatment for private wells with radon levels measuring above 5,000.

AVERAGE LEVELS

The average radon in well water reading locally is somewhere around a few thousand pci/l. Therefore, good or bad, a certain amount of radon is to be expected in well water. Depending on your sensitivity to the issue, it might be reasonable to accept levels up to 5,000 as "coming with the territory". In such a case, one should watch for further developments on the issue. Mitigation equipment could be installed sometime in the future, if appropriate.

HIGH READINGS

If the well water tested indicates radon levels above 5,000 but less than 15,000, a charcoal filtering system can effectively be installed to reduce it. The cost is about $1,500+. Above 15,000, effective aeration equipment is available to remove the radon. The present cost of such equipment installed is somewhere around $3,500.

NEGOTIABILITY

Precedents have been set that radon reduction systems are put in usually at the seller's expense for high readings. The judgemental benchmark most widely used seems to be the state’s guideline of 5,000 pci/l. As time goes on, the norms may change.

TEST RELIABILITY

Actual radon levels in well water should not vary as much from day to day as radon in air levels since underground water is insulated from the weather. Nevertheless, since sampling water to test for radon requires much more care than air testing, results may vary.