



## What are Nitrates?

Nitrates ( $\text{NO}_3$ ) are a vital source of nitrogen (N) for plants. When nitrogen fertilizers are used in the soil, nitrates may be carried by rain, irrigation and other surface waters through the soil into ground water. Human and animal wastes can also add to nitrates in ground water. In Santa Barbara County, agricultural practices and septic systems have been linked to higher levels of nitrates in drinking water. Although any well can become contaminated by nitrates, shallow, poorly constructed, or improperly located wells are more at risk. Nitrates in drinking water can also be a sign of overall water quality problems. Higher levels of nitrates may suggest there are other contaminants such as disease-causing organisms, pesticides, or chemicals that could cause health problems.

## Who is at risk from high nitrates in drinking water?

Nitrate levels at or above the level set by the Environmental Protection Agency (EPA) have been known to cause blood disorder that can be fatal in infants under six months of age called "blue-baby" syndrome (methemoglobinemia). Babies with blue-baby syndrome have reduced oxygen-carrying capacity in their blood. The symptoms of blue-baby syndrome can be subtle and often confused with other illnesses. An infant with mild to moderate blue-baby syndrome may have diarrhea, vomiting, and/or be sluggish or tired. In more serious cases, infants may have a slate-gray or bluish color of the skin, lips or nailbeds and could have trouble breathing. A sample of the infant's blood can easily confirm a diagnosis of blue-baby syndrome. It is difficult to know how often blue-baby syndrome occurs in California because it is not required to be tracked and reported.

Others at risk from excess nitrates in drinking water are:

- Pregnant women
- Individuals with reduced gastric acidity, and
- Individuals with a hereditary lack of methemoglobin reductase.

## Testing recommendations

The EPA has set the Maximum Contaminant Level (MCL) of nitrate as nitrogen ( $\text{NO}_3$ ) at 45 mg/L (or 45 parts per million) for the safety of drinking water. The only way to know if your drinking water exceeds the maximum contaminant level is to have it tested. If you get your drinking water from a well, it is recommended that you test your water for nitrates at least once every 3 years. This is highly recommended if there is an infant or someone is pregnant in the household.

## What to do if you have high nitrates in your drinking water:

If your drinking water sample tested above the MCL for nitrates and you or someone else in your home is at risk of developing health problems due to high nitrates, you should not drink the water. Find a different water supply such as bottled water until you can find a more permanent solution.

There is no simple way to remove all nitrates from your water. Finding and correcting the source of nitrate contamination is the best course of action. Although it is common to think of boiling, softening or filtration as a means of purifying water, none of these methods reduce nitrates. In fact, boiling water that contains high nitrates can actually increase the nitrate levels.

Reverse osmosis, ion exchange and distillation units could provide home treatment for removing nitrates from water. Activated carbon and other simple filters do not remove nitrates to any significant degree. Home treatment units are generally not recommended as a long-term solution to assure nitrate-free water for infant use.

Your only long-term option may be to find a new source of water. This can be achieved by either drilling a new well or connecting to a public water supply system. When selecting a new well (or looking for sources of nitrate contamination around your existing well), be sure to consider ALL possible sources of contamination. Unlike other contaminants, nitrates are not diluted and filtered out as water travels through soil. Therefore, water wells should:

- never be within 100 feet of a septic system **or animal enclosures**, where there may be an opportunity for waste to enter the well.
- have a sanitary seal specifically designed for the top of the well casing. This seal must be correctly positioned, with all openings properly sealed, to prevent the entrance of any contaminant into the well casing and water source.

In addition, inspect areas within a 100 foot radius of the well for sources of pollution such as garbage, animal pens, barns and especially agricultural areas where nitrogen fertilizers can contaminate ground water (this includes your home garden).

For further information and/or assistance contact the Public Health Department's Environmental Health Services Division at 805-681-4900 or 805-346-8460.