



**What is perchlorate?** Perchlorate can be man made or naturally occurring. It forms when chloride and oxygen join together. It is commonly found as part of other substances, to include ammonium perchlorate, potassium perchlorate, sodium perchlorate, and perchloric acid. Perchlorate dissolves easily and moves quickly in underground water and surface water. It breaks down very slowly in the environment.

**What is perchlorate used for?** Ammonium perchlorate is an oxygen-adding compound used for decades as part of the United States (U. S.) national defense and space programs. It is a major component of propellants in solid fuel for rockets and missiles.

Perchlorate is also used in the production of explosives and fireworks. It adds the blue color to firework displays.



Potassium perchlorate was once used to treat thyroid disorders in people suffering from Graves' disease. Potassium perchlorate is still used today under limited conditions to test for thyroid hormone production in patients.

Additional uses include the production of matches, dyes, lubricating oils, air bag inflators, electroplating, rubber manufacturing, paint production, and certain chemical fertilizers.

### **How can I be exposed to perchlorate?**

Perchlorates have been made, used, or shipped to companies in at least 44 of the 50 states. It is suspected that the highest potential for the release of perchlorate at DOD sites is during the removal, recovery, and disposal of propellant from the solid rocket motors.



Perchlorate was first detected in underground water and surface water in California and other western states, such as Nevada and Utah, in the early to mid-1980's. There are currently 14 states with confirmed releases of perchlorate in underground or surface water.

People who live near areas that have used, tested, manufactured, or disposed of perchlorates may be exposed to perchlorates in their drinking water.



**How do I know if perchlorate is in my water?** In most cases, the presence of perchlorate in water supplies has not been easy to identify. This is because laboratory testing methods could not detect low levels of perchlorate in water.



In 1997 a new technique was developed that can detect extremely low amounts of perchlorate in water. As a result, additional water sources containing perchlorate can be identified. However, this method has not yet been officially accepted by the U.S. EPA for all types of water samples.

Currently, no practical and cost effective means for removing low levels of perchlorate from drinking water exist. Research is ongoing to find suitable techniques.

### **Can exposure to perchlorate affect my health?**

At present, limited data are available on the health effects of perchlorate. Human studies using data from medical patients given perchlorate to treat



Graves' disease indicate that high doses can damage the thyroid gland. This can affect metabolism, growth, and development of the human body. In addition, long-term exposure to high levels of perchlorate taken as medication has been linked to potentially serious bone marrow problems. The science of perchlorate and the potential human health impact of exposure to low levels in the parts per billion (ppb) range in drinking water is a

developing issue. No human studies have been completed that address the health effects from drinking water containing the low levels of perchlorate typically found in the U.S.

### **What are the laws regulating perchlorate?**

Currently, there are no federal drinking water standards for perchlorate. In March of 1998, perchlorate was placed on the U.S. Environmental Protection Agency (EPA) Office of Water's Contaminant Candidate List (CCL). The Safe Drinking Water Act required EPA to publish the CCL. The list includes compounds that may require regulation, based on their known or suspected presence in public drinking water supplies.

The EPA is conducting on-going research and evaluation of perchlorate health issues. An initial draft human health risk assessment (HHRA) was completed by the EPA in December, 1998. A peer review in February, 1999 recommended that additional work be conducted on the perchlorate health issues. At that time, the EPA requested that a second peer review and evaluation of perchlorate be conducted. This evaluation is tentatively scheduled to be completed in early 2000. The final HHRA will be reviewed at that time. After this review is complete, the EPA is expected to establish a drinking water standard called a maximum contaminant limit (MCL). This limit will set the maximum amount of perchlorate the EPA will allow in drinking water, to ensure the protection of human health.

In the interim, the California Department of Health Services (DHS) adopted an advisory "action level" of 18 ppb of perchlorate in drinking water. The DHS determined that perchlorate concentrations lower than 18 ppb are not considered to pose a health concern for the public, including children and pregnant women.

**For more information**, please Navy Environmental Health Center, Environmental Programs Directorate at (757) 953-0932 or visit the EPA perchlorate web site at

[www.epa.gov/ogwdw000/ccl/perchlor/perchlo.html](http://www.epa.gov/ogwdw000/ccl/perchlor/perchlo.html).