South and West Devon Health Authority

URANIUM IN DRINKING WATER

FACT SHEET

South and West Devon Health Authority
January 2001

URANIUM IN DRINKING WATER

This fact sheet has been given to you because you may have been exposed to low levels of naturally occurring uranium in your drinking water.

This sheet explains about the substance and possible effects from exposure.

If you do not understand anything on this sheet, ask a doctor or an environmental health officer to explain.

What is Uranium and how can it affect me?

Uranium is a naturally occurring metal, which is widespread in nature. It is present in the ocean and certain types of soils and rocks, especially granite. Natural uranium is also released into the environment from various activities such as the use of phosphate fertilisers, mining, and combustion from coal and other fuels.

Uranium levels are naturally high in many areas in the UK, particularly where radon levels are high and the underlying rock is predominantly granite. Natural uranium decays to release radon gas into the environment. In other parts of the world, especially in certain areas of the USA and Canada, natural uranium levels in water are particularly high due to the sedimentary rocks.

Most exposure to natural uranium is from food and water, and to a certain extent from air. These exposures can be through the air we breath, food and drink, and to a lesser extent through the skin.

Adverse health effects from natural uranium can be from its radioactive properties or its chemical properties. Radioactive effects are very small from natural uranium; chemically it can be harmful to the kidneys from large exposures.

What are the health effects?

Studies of humans exposed to abnormally high levels of uranium and laboratory animal studies show that uranium can be chemically toxic to the kidneys. There have been few studies addressing long-term low level exposure of the kind likely to be associated with exposure to uranium in drinking water in the UK. Studies in other parts of the world where levels of uranium in water are much higher than those detected in West Devon have not shown there to be an increased risk of kidney disease. However these studies suggest that there may be minor damage to kidney tissue which does not affect kidney function, at those higher levels.

We would not expect to see evidence of an increased risk of kidney damage associated with the levels of uranium found in drinking water in West Devon; the prevalence of kidney failure is similar to that in areas not affected by uranium in the South West.

There is no evidence to suggest that exposure to low levels of naturally occurring uranium is associated with cancer. Uranium is radioactive, but your exposure to radioactivity from the uranium in your drinking-water is insignificant compared with your everyday overall exposure to radioactivity from natural sources in the environment.

Uranium in Food and Vegetables

Small amounts of natural uranium are present in some food, especially shellfish and other fish, fresh vegetables and cereals. Most people are exposed to no more than 3 micrograms (mcg) per day of uranium from food.

Although uranium is present in fresh vegetables, it is unlikely that growing them in soil with a high level of natural uranium in it will lead to an increased exposure; the small amount in the soil would be removed with normal washing and peeling of the vegetables.

Uranium in water

The natural weathering of rocks (such as granite in the South West) dissolves the natural uranium, which goes into the groundwater. Once in the water uranium does not transfer into the air.

Uranium can then be present in water supplies; it is not present in the sources of mains water in Devon and Cornwall.

The World Health Organisation (WHO) recommends that uranium in drinking water should not exceed 2 mcg/l. However, in the USA the recommended level is 20mcg/l. These levels are set to represent a concentration that does not result in any significant risk to health over a lifetime of drinking the water. There are no European or UK recommended levels.

The WHO value for uranium concentration in drinking water is based on a "Tolerable Daily Intake" (TDI) of 0.6mcg/kg bodyweight. The TDI is an estimate of the amount that can be consumed daily over a lifetime without appreciable health risk. This is a TDI of 36mcg for an average adult weighing 60kg. The intake of uranium from food is usually below 3mcg per day. For a typical daily water consumption of 2 litres per day, the WHO limit of 2mcg/l leaves a considerable safety margin.

Children and natural uranium exposure

Children may be more susceptible to health effects from exposure to large amounts of natural uranium. However, the results from this initial study in the South West suggest that the levels are unlikely to be high enough to affect children.

Animal studies suggest that bottle-feeding babies with the water levels found in this study is unlikely to cause harm to babies. There have been no human studies.

Are there any potential complications if I am pregnant?

There is no human evidence of increased complications in pregnancy due to exposure to low levels of natural uranium.

Further Advice

There are methods of reducing natural uranium in water supplies and your local Environmental Health Department is able to advise individuals on these methods and the costs:

West Devon Borough Council 01822 813600

South Hams District Council 01803 861234

Teignbridge District Council 01626 361101

If you are concerned or have any further questions, please contact

your local Environmental Health Department or

the Health Authority Public Health Department on: 01803 861833