

Acknowledgement:

This Fact Sheet is one of a series developed by an Interagency Committee with representatives from Saskatchewan Health, Regional Health Authorities, Saskatchewan Watershed Authority, Saskatchewan Agriculture and Food, Agriculture and Agri-Food Canada – PFRA and Saskatchewan Environment.

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Dec/07



Government of
Saskatchewan

Sulphate

(For Private Water and Health Regulated Public Water Supplies)

What Is Sulphate?

Sulphate is a naturally occurring substance that contains sulphur and oxygen. It is present in various mineral salts that are found in soil. Sulphate forms salts with a variety of elements including barium, calcium, magnesium, potassium and sodium.

Sulphate should not be confused with *sulphite*. Sulphite also contains sulphur and oxygen, but is chemically different than sulphate. Sulphite is sometimes used as a food preservative. Some people are severely allergic to sulphite.

How Does Sulphate Get Into Water?

Sulphate may be leached from the soil and is commonly found in most water supplies. Magnesium, potassium and sodium sulphate salts are all soluble in water. Calcium and barium sulphates are not very easily dissolved in water.

There are several other sources of sulphate in water. Decaying plant and animal matter may release sulphate into water. Numerous chemical products including ammonium sulphate fertilizers contain sulphate in a variety of forms. The treatment of water with aluminum sulphate (alum) or copper sulphate also introduces sulphate into a water supply. Human activities such as the combustion of fossil fuels and sour gas processing release sulphur oxides to the atmosphere, some of which is converted to sulphate.

How Does Sulphate Affect My Health?

Sulphate is generally considered to be non-toxic. The consumption of drinking water containing high amounts of magnesium or sodium sulphate may result in intestinal discomfort, diarrhea and consequently dehydration. This laxative effect is often observed when someone drinks water that contains greater than 500 milligrams per litre (mg/L) of sulphate. Over time, individuals appear to develop a tolerance to higher concentrations of sulphate. Diarrhea and dehydration are often observed when individuals accustomed to drinking water with low concentrations of sulphate consume water with high amounts of sulphate. It is not advisable to use water that contains high concentrations of sulphate for infant feeding.

Other Considerations

High amounts of various sulphate salts may give drinking water an offensive taste. Depending upon the type of sulphate salt(s) present in the water, most people begin to notice an offensive taste at concentrations ranging from 250 to 1,000 mg/L.

High concentrations of sulphate may interfere in the efficiency of chlorination in some water supplies. Also, sulphate salts may increase the corrosive properties of water.

Sulphate-reducing bacteria are often encountered in water supplies. These bacteria produce hydrogen sulphide that results in an unpleasant taste and odour (rotten egg smell). Hydrogen sulphide also increases the corrosive properties of water.

How Can I Remove Sulphate From My Drinking Water?

Sulphate can only be removed from water by demineralization through the use of reverse osmosis or distillation. Home treatment systems should carry the National Sanitation Foundation certification for sulphate removal (NSF Standard 58 for reverse osmosis, NSF Standard 62 for distillation units).

What Is The Standard For Sulphate In Drinking Water?

The Saskatchewan Drinking Water Quality Standards and Objectives has established an aesthetic objective of less than 500 mg/L of sulphate based upon offensive taste and the potential for laxative effects.

How Can I Find Out The Sulphate Of My Water?

Most water quality testing laboratories can determine sulphate for a water supply. For information on sampling instructions and containers, you should contact an accredited laboratory. If using the Saskatchewan Disease Control Laboratory (Provincial Lab), sample containers are available from the laboratory, local Health Regions, or rural municipalities.

Need More Information?

Health Regulated Public Water Supply

For more information on this fact sheet and/or other water quality issues relating to health regulated public water supplies contact your local health region public health inspector.

Private Water Supply

For more information on how sulphate impacts on human health contact your local health region office. For information on how sulphate impacts agricultural operations contact Saskatchewan Ministry of Agriculture through your Agricultural Business Centre or the Agricultural Knowledge Centre at 1-866-457-2377 or on the internet (<http://www.agriculture.gov.sk.ca/AKC>).

Government of Saskatchewan Water Information website www.SaskH2O.ca	Water Inquiry Line Questions about water? Call 1-866-SASK H2O (1-866-727-5420) to be referred to proper agency.
Saskatchewan Ministry of Health http://www.health.gov.sk.ca/environmental-health Regional Health Offices Saskatoon: Saskatoon (306) 655-4605 Sunrise: Yorkton (306) 786-0600 Kelsey Trail: Melfort (306) 752-6310 Five Hills: Moose Jaw (306) 691-1500 Sun Country: Weyburn (306) 842-8618 Heartland: Rosetown (306) 882-6413 Prairie North: North Battleford (306) 446-6400 Prince Albert Parkland: Prince Albert (306) 765-6600 Cypress: Swift Current (306) 778-5280 Regina Qu'Appelle: Regina (306) 766-7755 Mamawetan Churchill River: La Ronge (306) 425-8512 Keewatin Yatthe: Buffalo Narrows (306) 235-5811	Saskatchewan Watershed Authority, Head Office, Moose Jaw (306) 694-3900 Website: www.swa.ca <i>Regional Offices:</i> http://www.swa.ca/AboutUs/Contact.asp?type=Offices Sask Water Corporation Head Office, Moose Jaw Customer Service 1-888-230-1111 Website: http://www.saskwater.com Prairie Farm Rehabilitation Administration (PFRA) - Agriculture and Agri-Food Canada Website http://www.agr.gc.ca/pfra/water/intro_e.htm <i>Regional Offices:</i> http://www.agr.gc.ca/pfra/sask_e.htm
Saskatchewan Ministry of Health Saskatchewan Disease Control Laboratory, Regina General Inquiry 1-866-450-0000 Phone: (306) 798-2125 // Fax (306) 798-0071 Website: http://www.health.gov.sk.ca/lab	Saskatchewan Ministry of Agriculture General Inquiry 1-866-457-2377 Agricultural Operations Regina (306) 787-4680 Irrigation Development Outlook (306) 867-5500 Website: www.agriculture.gov.sk.ca
Health Canada First Nation and Inuit Health Branch, Regina (306) 780-5434 Website: http://www.hc-sc.gc.ca	Saskatchewan Ministry of Environment Toll-Free 1-800-567-4224 Spill Emergency Toll-Free 1-800-667-7525 Website: http://www.environment.gov.sk.ca