Haloacetic Acids

(For Private Water and Health Regulated Public Water Supplies)

What Are Haloacetic Acids (HAAs)?

Haloacetic acids (HAAs) are formed when hydrogen atoms in acetic acid (vinegar) CH_3COOH are replaced by atoms from the halogen group.

In water the HAAs are stable with the five most common referred to as HAA5 which are monochloroacetic acid (MCA) $ClCH_2COOH$, dichloroacetic acid (DCA) $Cl_2CHCOOH$, trichloroacetic acid (TCA) Cl_3CCOOH, monobromoacetic acid (MBA) $BrCH_2COOH$ and dibromoacetic acid (DBA) $Br_2CHCOOH$.

How Do Haloacetic Acids Get Into Water?

HAAs can be formed by chlorination, ozonation or chloramination of water with formation promoted by slightly acidic water, high organic matter content and elevated temperature. Chlorine from the water disinfection process can react with organic matter and small amounts of bromide present in water to produce various HAAs.

How Do Haloacetic Acids Affect My Health?

When consumed in drinking water HAA are easily absorbed into the bloodstream. Links have been made between exposure to HAA concentrations above the maximum contaminant level and injury to the liver, kidney, eyes, nerves and the reproductive system. There is not a significant risk of HAAs in drinking water to be absorbed through the skin.

Animal studies have shown that prolonged exposure to DCA and TCA in drinking water resulted in liver cancer.

How Can I Remove Haloacetic Acids From My Drinking Water?

The most effective way to reduce HAA concentrations is to remove the organic precursor compounds that result in the HAA formation. Organic matter can be reduced by conventional treatment (coagulation, sedimentation and filtration).

Activated carbon filters can be used to remove HAAs after formation as can a reverse osmosis unit, while biofiltration using anthracite, sand or garnet is also effective in HAA reduction.

What Is The Standard For Haloacetic Acids in Drinking Water?

Health Canada has proposed a maximum acceptable concentration for the total concentration of the HAA5 compounds of 80 µg/L based on an annual average of at least four samples.

How Can I Find Out If There Are Haloacetic Acids In My Water?

Testing of haloacetic acids requires highly specialized and sensitive testing procedures and is only offered as a standard test at a few laboratories at a cost of several hundred dollars per sample. For information on sampling instructions and containers, you should contact an accredited laboratory. If using the Saskatchewan Disease Control Laboratory (Provincial Lab), by special request, sample containers are available directly from the laboratory.

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, Agriculture and Agri-Food Canada – PFRA and Saskatchewan Environment.

Dec/07

Government of Saskatchewan

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 HAA impacts on Human Health contact your local Regional Health Authority. For information on how HAA impacts Agricultural Operations contact Saskatchewan Ministry of Agriculture through your Agricultural Business Centre (http://www.agriculture.gov.sk.ca/AKC/) or the Agricultural Knowledge Centre at 1-866-457-2377).

<table>
<tr>
<td>Government of Saskatchewan
Water Information website
www.SaskH20.ca</td>
<td>Water Inquiry Line
Questions about water? Call 1-866-SASK H2O
(1-866-727-5420) to be referred to the proper agency.</td>
</tr>
<tr>
<td rowspan="4">Saskatchewan Ministry of Health
http://www.health.gov.sk.ca/environmental-health

Regional Health Authorities
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
Parkland - Prince Albert (306) 765-6600
Cypress - Swift Current (306) 778-5280
Regina Qu'Appelle – Regina (306) 766-7755
Mamawetan Churchill River - LaRonge (306) 425-8512
Keewatin Yatthe - Buffalo Narrows (306) 235-5811</td>
<td>Saskatchewan Watershed Authority
Head Office, Moose Jaw
Ph (306) 694-3900
www.swa.ca</td>
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<tr>
<td>Saskatchewan Watershed Authority
Regional Offices:
www.swa.ca/AboutUs/Contact.asp?type=Offices
Rural Water Quality office
Toll-Free 1-866-TESTH2O (1-866-387-8420)</td>
</tr>
<tr>
<td>Sask Water Corporation (SWC)
Head Office, Moose Jaw
Phone (306) 694-3098
www.saskwater.com</td>
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<tr>
<td>Prairie Farm Rehabilitation Administration (PFRA) - Agriculture and Agri-Food Canada
www.agr.gc.ca/pfra/water/intro_e.htm
Regional Offices Contact:
www.agr.gc.ca/pfra/sask_e.htm</td>
</tr>
<tr>
<td>Saskatchewan Ministry of Health
Saskatchewan Disease Control Laboratory, Regina
General Inquiry: 1-866-450-0000
Ph: (306) 798-2125 // Fax: (306) 798-0071</td>
<td>Saskatchewan Ministry of Agriculture
General Inquiry - (306) 787-5140 in Regina
Agricultural Operations - (306) 787-4680 in Regina
Irrigation Development - (306) 867-5500 in Outlook
www.agriculture.gov.sk.ca</td>
</tr>
<tr>
<td>Health Canada
First Nation and Inuit Health Branch, Regina
(306) 780-6561</td>
<td>Saskatchewan Ministry of Environment,
Head Office, Regina (306) 787-6504
Toll-Free 1-800-567-4224
Spill Emergency Toll-Free 1-800-667-7525
www.environment.gov.sk.ca or www.SaskH20.ca</td>
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