Human Health Impacts of Contaminants Found in Local Drinking Water Supply

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**THINK BEFORE YOU DRINK: WHAT’S IN YOUR WATER?**

A thorough analysis of over 22 million tap water quality tests performed by the Environmental Working Group, an environmental watchdog organization, found 260 contaminants in public drinking water supplies, many in concentrations approaching or exceeding health-based limits set by the EPA.

**Kennebec Water District Supplier**
- Water supplied from China Lake, serves 22,478 people
- 18 contaminants detected between 1998 and 2002
- 3 contaminants found in concentrations exceeding health-based limits
  - Arsenic
  - 2 Trihalomethanes: Bromodichloromethane and Chloroform

**WHERE DO THESE CONTAMINANTS COME FROM?**
In addition to being naturally occurring, contaminants may enter drinking water supplies through industrial sources, agricultural practices, urban pollution, sprawl, and water treatment byproducts.

**WHEN AM I EXPOSED TO THESE CONTAMINANTS?**
Exposure occurs through ingestion, as well as dermal absorption and inhalation while bathing.

**SO WHAT?**
Health risks for the general public include skin damage, increased risk of cancer, circulatory problems, and multiple toxicities. Some peoples such as children, pregnant women, and those with compromised immune systems are more vulnerable to the health risks associated with these contaminants.

**WHAT CAN YOU DO?**

**Alternatives**
- Private well
- Water dispenser
- Bottled water

**Reducing Exposure**
- Activated carbon filter
- Ion exchange unit
- Reverse osmosis unit
- Distillation unit
- UV disinfection unit
- Combination treatment units

**LEARN MORE!**
EWG: http://www.ewg.org/tapwater/yourwater/index.php
EPA: http://www.epa.gov/ebtpages/water.html
Kennebec Water District: www.kennebecwater.org

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This fact sheet was created by Liza Benson & Dylan Harrison-Atlas for ES266: The Environment & Human Health, Colby College May 2007.
RESULTS

Ion Exchange Unit

The Kennebec Water District Supplier, a Water supply from Castine, ME, served 22,479 people in Waterville, Winslow, Fairfield, Benson, Vassalboro, and Oakland. 26 contaminants detected between 1998 and 2002.

The water contained contaminants exceeding health-based limits (Table 1).

3 Arsenic
3 Trihalomethanes: Bromodichloromethane and Chloroform

Health Impacts

Arsenic: Exposure linked to increased incidences of liver, lung, bladder, and kidney cancers; causal relationship with skin cancer. 3 Health risks for the Kennebec Water District Supplier include skin damage, increased risk of cancer, circulatory problems, and multiple toxicities.

WQC (ppb)

0.02 1.4

Compliance to nationwide levels, Kennebec Water District drinking water supply is relatively less contaminated. Concerned citizens can use alternative to public drinking water supplies, or actively decrease their exposure. Furthermore, it is recommended that local residents choose to monitor their water quality via websites like the Environmental Working Group's Tapwater database (http://www.ewg.org/tap/safe) or through local sources. Additionally, the EPA's Right to Know laws provide information about possible chemical exposures. A result is that tapwater contaminants is not limited to ingested exposure; there are many other ways to limit the risk of health impacts associated with drinking water contaminants, including the use of several viable alternatives to public drinking water.

Alleviation

Alleviation includes the bottled drinking water, bottled water at grocery stores, and filtered drinking water (see sidebar). These alternatives are generally more expensive compared to water from the public water system. The FDA regulates bottled water used for drinking, but there are still potential risks as bottled water do not undergo the same testing and reporting as treated public water supplies.

Table 1:

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Avg. conc.</th>
<th>Max. conc.</th>
<th>EPA Human Health WQC (ppb)</th>
<th>NCC</th>
<th>Health Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>0.57</td>
<td>0.02</td>
<td>1.4</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Trihalomethanes</td>
<td>0.02</td>
<td>0.02</td>
<td>1.4</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>


goals

This research project was conducted in order to learn more about our local drinking water and to characterize our exposure to contaminants. We hope to increase public awareness of water quality issues by educating the local residents about their drinking water in order to promote public health and minimize exposure to contaminants contained within public water supplies.

conclusions

Compared to nationwide levels, Kennebec Water District drinking water supply is relatively less contaminated. Concerned citizens can use alternative to public drinking water supplies, or actively decrease their exposure. Furthermore, it is recommended that local residents choose to monitor their water quality via websites like the Environmental Working Group's Tapwater database (http://www.ewg.org/tap/safe) or through local sources. Additionally, the EPA's Right to Know laws provide information about possible chemical exposures. A result is that tapwater contaminants is not limited to ingested exposure; there are many other ways to limit the risk of health impacts associated with drinking water contaminants, including the use of several viable alternatives to public drinking water.

Alternatives

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private wells

Private wells are not subject to EPA standards and unlike the public drinking water systems they do not have experts regularly checking the water’s source and its quality before it is sent to the tap. Households using private wells should take special precautions to ensure the protection and maintenance of their drinking water supplies. The same contaminants existing in public drinking water systems exist in private wells. The risk of having problems with contaminants depends on the wells construction, location, and the near area may influence well water quality. The quality of the aquifer from the water draw, as well as human activities in the nearby area may influence well water safety. Identifying the evident as well as less obvious threats will help you decide the types of tests needed.

Table 2:

<table>
<thead>
<tr>
<th>Treatment Device</th>
<th>Purpose</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>activated carbon filter</td>
<td>removes tastes and odors, reduces disinfectants, solvents, and pesticides</td>
<td>$50 - $150</td>
</tr>
<tr>
<td>ion exchange unit</td>
<td>removes alkalinity, hardness, and acid-forming minerals</td>
<td>$200 - $300</td>
</tr>
<tr>
<td>uv disinfection unit</td>
<td>removes bacteria, viruses, and some chemicals</td>
<td>$3,000 - $5,000</td>
</tr>
<tr>
<td>combination treatment units</td>
<td>removes bacteria, viruses, tastes, and odors</td>
<td>$5,000 - $10,000</td>
</tr>
</tbody>
</table>

References