

Amitriptyline Screening Profile

Amitriptyline is a contaminant that could be present in potential drinking water sources in Minnesota. The information in this profile was collected for the screening process of the Minnesota Department of Health's Contaminants of Emerging Concern (CEC) program in January 2016. The chemicals nominated to the CEC program are screened and ranked based on their toxicity and presence in Minnesota waters. Based on these rankings, some chemicals are selected for a full review. CEC program staff have not selected amitriptyline for a full review.

Amitriptyline Uses

Amitriptyline is a pharmaceutical used to treat depression, chronic pain, eating disorders, and attention deficit hyperactivity disorder (ADHD). Amitriptyline was formerly known by the brand name Elavil®.

Amitriptyline in the Environment

Amitriptyline enters the environment through normal human use and excretion and through the disposal of unused medications into toilets, sinks, and landfills. Unused medications containing should be disposed of properly, following the recommendations from the Minnesota Pollution Control Agency (MPCA).¹

Amitriptyline has been looked for in a small number of samples of groundwater, surface water, and drinking water in Minnesota. In a 2013 study of Minnesota lakes, the maximum concentration of amitriptyline detected was 0.0041 parts per billion (ppb).² Low levels (less than 0.001 ppb) of amitriptyline have been detected in Minnesota rivers upstream and downstream of wastewater treatment plants.³ Amitriptyline has not been detected in Minnesota groundwater or drinking water.

Amitriptyline is likely to move into and bind to soil or sediment after entering the environment. Conventional wastewater treatment may be effective at removing amitriptyline from raw wastewater.

Exposure to Amitriptyline

Exposure to amitriptyline occurs when taking medication containing amitriptyline or with ingredients derived from amitriptyline.

Amitriptyline may be present in the breastmilk of women taking the medication.⁴ Nursing mothers should talk to their doctor about any medications they are taking while nursing.

Potential Health Effects

As a prescription medication, amitriptyline has health benefits for people taking it. Side effects are known at therapeutic doses, but there is little information on the health effects of amitriptyline at the lower levels found in the environment.

MDH developed a water screening value of 0.2 ppb for amitriptyline in drinking water.⁵ Water screening values are likely to be lower than values resulting from a full review by MDH. Concentrations at or below 0.2 ppb are unlikely to pose a health risk.

Based on the screening assessment, available information on amitriptyline is likely sufficient for a full review; however, it is ranked lower than other nominated CEC chemicals at this time.

References

1. MPCA. Disposal of Household Hazardous Waste. <http://www.pca.state.mn.us/index.php/living-green/living-green-citizen/household-hazardous-waste/disposing-of-unwanted-medications.html>
2. MPCA, 2015. Pharmaceuticals, Personal Care Products, and Endocrine Active Chemical Monitoring in Lakes and Rivers: 2013. <https://www.pca.state.mn.us/sites/default/files/tdr-g1-18.pdf>
3. Ferrey, M.L., 2013. Pharmaceuticals and Endocrine Active Chemicals in Minnesota Lakes. <https://www.pca.state.mn.us/sites/default/files/tdr-g1-16.pdf>
4. National Library of Medicine. Toxnet. Amitriptyline. Accessed February 2016. <http://toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+lactmed:@term+@DOCNO+312>
5. MDH. Pharmaceutical Water Screening Values Report. 2015. <http://www.health.state.mn.us/divs/eh/risk/guidance/cdwecc/pharmwaterrept.pdf>

Minnesota Department of Health
Contaminants of Emerging Concern Program
Environmental Health Division
health.legacy@state.mn.us
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Contaminants of Emerging Concern Program

Chemical Review Process

The Contaminants of Emerging Concern (CEC) program investigates the potential health concerns of contaminants of emerging concern in drinking water. This investigation includes a rapid assessment ('screening') to prioritize nominated chemicals for in-depth research and evaluation that result in drinking water guidance and information about exposure.

Chemical Nomination and Eligibility

Minnesota risk managers, stakeholders, and the public are encouraged to nominate contaminants for review. After chemicals are nominated, MDH program staff determine eligibility by examining the likelihood that the chemical will enter Minnesota waters and whether adequate guidance already exists.

Screening and Risk Based Selection

Program staff conduct a screening of where and how a contaminant is used in the state, its potential to enter the water supply, and its potential to harm humans. The results from the screening are used to prioritize nominated chemicals.

Chemicals having higher exposure and harm potential are selected for in-depth review and development of guidance (a contaminant water concentration that is not harmful to people). Chemicals that rank lower remain candidates for future in-depth review. For some contaminants, however, the information is too limited. For chemicals that are not selected for in-depth review, the results of the screening assessment are summarized in a Screening Profile. The screening and prioritization process is repeated as additional chemicals are nominated and screened.

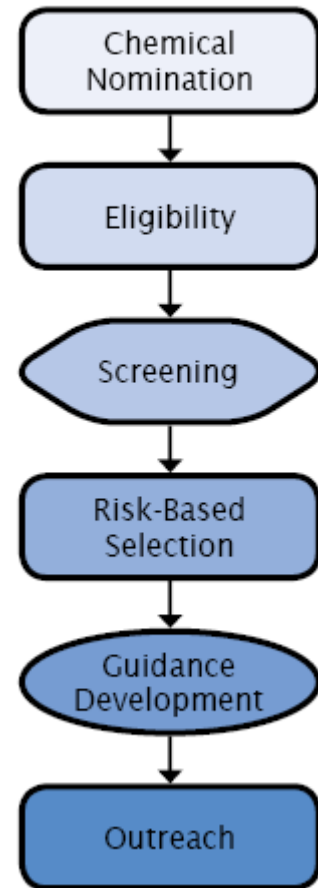
Guidance Development

When a chemical is selected for a full review, program staff carefully review exposure and toxicological information to understand how humans may be exposed and what adverse health effects occur from exposure. Staff combine the results of in-depth analyses of toxicity and exposure to calculate a guidance, a level of contaminant in water that causes little to no harm to someone drinking the water.

Outreach

CEC program staff work to communicate the results of the chemical review process. This includes making key findings publicly available on web pages and at a variety of meetings and events. An email subscription service (GovDelivery) is also used to alert the interested public (subscribers) of chemical review activities and guidance values.

Chemical Review Process



Subscribe to the CEC Program GovDelivery service to receive notification when reviews are initiated for water contaminants and other announcements by visiting: <http://www.health.state.mn.us/cec>