

AHTN and Groundwater

AHTN

6-acetyl-1,1,2,4,4,7 hexamethyltetraline (AHTN or Tonalide) is a musky fragrance used in cosmetics and personal care products such as shampoo and lotion. It is also used in cleaning products such as soap and laundry detergent.

AHTN in Minnesota Waters

The United States Geological Survey measured AHTN in Minnesota drinking water, groundwater, wastewater and surface water. AHTN was found in 18.7 percent of all water samples in this study.¹

AHTN was found twice in untreated drinking water at a concentration of 0.065 µg/L* and 0.036 µg/L.^{1,2} However, only a few studies have looked for AHTN in drinking water.

*One microgram per liter (µg/L) is the same as one part per billion (ppb).

MDH Guidance Value

Based on available information, MDH developed a guidance value of 20 ppb for AHTN in drinking water.³ MDH does not use guidance values to regulate water quality, but they may be useful for situations in which no regulations exist. MDH develops guidance values to protect people who are most vulnerable to the potentially harmful effects of a contaminant. A person drinking water at or below the guidance value would have little or no risk for health effects.

Potential Health Effects

MDH considers the liver the organ most sensitive to AHTN exposure. AHTN has not been found in treated drinking water in Minnesota. The amount found in untreated drinking water (0.065 ppb) is about 300 times lower than the MDH guidance value of 20 ppb. If you drink water containing up to 20 ppb AHTN for up to a lifetime there is little to no health risk, even to your liver.

Potential Exposure to AHTN

The main way to be exposed to AHTN is through using personal care products and cleaning products that contain AHTN.

Using AHTN Safely

Using fragrance free products will reduce your exposure to AHTN. Some fragranced products will result in higher exposure to AHTN than others. For example, the highest amounts of exposure from AHTN are estimated to be from products that are left on the skin (such as lotions). Lower exposures are estimated for products that are washed off (such as shampoos). People are exposed to smaller amounts of AHTN from cleaning products than from personal care products.

AHTN in the Environment

AHTN is washed down the drain when people use personal care and cleaning products containing fragrances. Septic systems and wastewater treatment do not remove all of the AHTN. Therefore, some AHTN remains in wastewater. Wastewater contaminants, such as AHTN, can move into sources of water that may be used for drinking.

Once AHTN is in the environment it tends to stay in the environment; it does not readily break down. AHTN in water or moist soil is likely to attach to sediment in the water or stay attached to soil.⁴ AHTN can build up in fish or other animals in the food chain.^{5,6}

Potential Environmental Impacts of AHTN

AHTN may be an “endocrine active chemical” in fish.⁷ This means that AHTN may have the same effect as a hormone in fish and change the way they grow, develop, and reproduce. Although AHTN may not affect fish immediately, but at low concentrations it may change their normal growth and functioning.⁸ AHTN does not appear to cause these effects in mammals.

Health Risk Assessment Unit

The MDH Health Risk Assessment Unit evaluates the health risks from contaminants in drinking water sources and develops health-based guidance values for groundwater. MDH works in collaboration with the Minnesota Pollution Control Agency and the Minnesota Department of Agriculture to understand the occurrence and environmental effects of contaminants in water.

References

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