

Clarification of the relationship between bis(2-chloro-1-methylethyl) ether (CASRN 108-60-1) and bis(2-chloroisopropyl) ether

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Bis(2-chloro-1-methylethyl) ether [also called 2,2'-oxybis(1-chloropropane)], CASRN 108-60-1, and bis (2-chloroisopropyl) ether [also called 2,2'-oxybis(2-chloropropane)], CASRN 39638-32-9, are two distinct but structurally similar chemicals. The name “bis(2-chloroisopropyl) ether” has been used by multiple sources to refer to both chemicals identified by CASRN 108-60-1 and CASRN 39638-32-9 (e.g., Sigma-Aldrich Company 2016, Chemical Book 2016, Florida Spectrum Environmental Services 2016, Restek Corporation 2016, Toronto Research Chemicals 2016).

When EPA published the priority pollutant list on July 31, 1979 (44 FR 44501), the chemical listed as the priority pollutant was identified by name only as “bis(2-chloroisopropyl) ether.” In 1980, EPA issued CWA section 304(a) recommended criteria for the pollutant “bis(2-chloroisopropyl) ether” based on toxicity data for bis(2-chloro-1-methylethyl) ether, CASRN 108-60-1 (U.S. EPA 1980). The use of the CASRN 108-60-1 chemical structure is made clear in Table 1, “Chloroalkyl Ethers Covered in this Document,” in which bis(2-chloroisopropyl) ether (BCIE) and bis(2-chloro-1-methylethyl) ether are listed as synonymous and the chemical structure for bis(2-chloro-1-methylethyl) ether, CASRN 108-60-1, is drawn (U.S. EPA 1980, page C-2). Furthermore, the underlying toxicity data for EPA’s 1980 recommended criteria for “BCIE” presented in Table 7 (U.S. EPA 1980, page C-26) are from a National Cancer Institute report, “Bioassay of Technical-Grade Bis(2-chloro-1-methylethyl) ether for Possible Carcinogenicity,” which also identifies the chemical as CASRN 108-60-1 and depicts the associated chemical structure in the text of the report (NCI, 1979).

The EPA has continued to update the underlying science for 304(a) criteria for bis(2-chloro-1-methylethyl) ether (CASRN 108-60-1), most recently in 2015 (U.S. EPA, 2015). In 2002, the Agency identified this issue for the public and corrected the CAS number in the human health criteria matrix: “Correction of Chemical Abstract Services Number: The Chemical Abstract Services number (CAS) for bis(2-chloroisopropyl) ether, has been revised in IRIS and in the table. The correct CAS number for this chemical is 108-60-1. The previous CAS number for this pollutant was 39638-32-9” (U.S. EPA, 2002).

The Agency has never issued a recommended 304(a) criterion based on toxicity information for the chemical with CASRN 39638-32-9. EPA is unaware that 2,2'-oxybis(2-chloropropane), CASRN 39638-32-9, has ever been in industrial production, and it is not possible to procure an analytical standard reference material for this compound. The compound with CASRN 39638-32-9 is therefore unlikely to be of monitoring concern. Based on the long history of issuing recommended 304(a) criteria for the chemical with the CASRN 108-60-1, it is EPA’s best scientific judgment that the chemical bis(2-chloro-1-methylethyl) ether with CASRN 108-60-1 was the intended priority pollutant listed in 1979, and not the chemical 2,2'-oxybis(2-chloropropane) with CASRN 39638-32-9.

In February 2015 EPA disapproved, for all waters in Indian lands, all human health criteria in Maine DEP Rule Chapter 584, Surface Water Quality Criteria for Toxic Pollutants, Appendix A, submitted to EPA on January 11, 2006. Table 1 of Appendix A contained criteria for priority pollutants listed pursuant to section 304(a) of the Clean Water Act, including the chemical identified as bis(2-chloroisopropyl) ether with CASRN 108-60-1. As Maine patterned the criteria in Appendix A after EPA's CWA section 304(a) National Recommended Water Quality Criteria for Priority Toxic Pollutants, and in light of the action taken by EPA in June 2015 to clarify the name of the priority pollutant associated with CASRN 108-60-1 (described above), EPA assumes that Maine effectively repeated EPA's nomenclature error in 2006 and the correct chemical name likely intended by Maine DEP Rule Chapter 584 Appendix A associated with the chemical having CASRN 108-60-1 should have been bis(2-chloro-1-methylethyl) ether and not bis(2-chloroisopropyl) ether. As such, in April 2016 EPA proposed criteria for waters in Indian lands for the chemical with CASRN 108-60-1 and used the name bis(2-chloro-1-methylethyl) ether in our proposal consistent with its status as a priority pollutant pursuant to section 304(a) of the Clean Water Act. We are including this chemical in the final rule to ensure that all human health criteria applicable to tribal waters in Maine, regardless of priority or non-priority status, protect tribal sustenance fishers.

Chemical Book. 2016. Bis-(2-chloroisopropyl) ether: CAS 108-60-1. Accessed July 28, 2016. http://www.chemicalbook.com/ChemicalProductProperty_EN_CB2184898.htm

NCI (National Cancer Institute). 1979. *Bioassay of Technical-Grade Bis(2-chloro-1-methylethyl) ether for Possible Carcinogenicity*. Division of Cancer Cause and Prevention. Bethesda, MD. NIH-79-1747.

Florida Spectrum Environmental Services, Inc. 2016. CAS 108-60-1 Chemical Fact Sheet. Accessed July 28, 2016. <http://www.speclab.com/compound/c108601.htm>.

Restek Corporation. 2016. Bis-(2-chloroisopropyl) ether: CAS 108-60-1. Accessed July 28, 2016. [http://www.restek.com/compound/view/108-60-1/Bis\(2-chloroisopropyl\)%20ether](http://www.restek.com/compound/view/108-60-1/Bis(2-chloroisopropyl)%20ether)

Sigma-Aldrich Company. 2016. Product comparison guide: Bis-(2-chloroisopropyl) ether: CAS 108-60-1. Accessed July 28, 2016. <http://www.sigmaaldrich.com/catalog/substance/bis2chloroisopropylether171061086011?lang=en®ion=US>

Toronto Research Chemicals. 2016. Bis-(2-chloroisopropyl) ether: CAS 108-60-1. Accessed July 28, 2016. <http://www.trc-canada.com/product-detail/?CatNum=B419020>

U.S. EPA. 1980. *Ambient Water Quality Criteria for Chloroalkyl Ethers*. EPA 440/5-80-030. U.S. Environmental Protection Agency, Office of Water, Regulations and Standards Division, Washington, DC.

U.S. EPA. 2002. *National Recommended Water Quality Criteria: 2002*. EPA-822-R-02-012. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, Washington, DC.



U.S. EPA. 2015. *Update of Human Health Ambient Water Quality Criteria: Bis(2-chloro-1-methylethyl) Ether 108-60-1*. EPA 820-R-15-019. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, Washington, DC.