Screening Assessment of Six Substances on the Domestic Substances List

Chemical Abstracts Service Registry Number
1582-09-8
1912-24-9
1897-45-6
3691-35-8
72-43-5
87-86-5

Environment Canada
Health Canada

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Introduction

The *Canadian Environmental Protection Act, 1999* (CEPA 1999) (Canada 1999) requires the Minister of the Environment and the Minister of Health to conduct screening assessments of substances that have met the categorization criteria set out in the Act to determine whether these substances present or may present a risk to the environment or human health. Based on the results of a screening assessment, the Ministers can propose to take no further action with respect to the substance, to add the substance to the Priority Substances List (PSL) for further assessment, or to recommend that the substance be added to the List of Toxic Substances in Schedule 1 of the Act and, where applicable, the implementation of virtual elimination.

Under CEPA 1999, screening assessments focus on information critical to determining whether a substance meets the criteria for defining a chemical as toxic as set out in section 64 of the Act, where

> "64. […] a substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions that
>
> (*a*) have or may have an immediate or long-term harmful effect on the environment or its biological diversity;
>
> (*b*) constitute or may constitute a danger to the environment on which life depends; or
>
> (*c*) constitute or may constitute a danger in Canada to human life or health."

The following six substances are among 123 substances on the Domestic Substances List (DSL) that were selected for a DSL screening assessment pilot project. All six substances were determined by Environment Canada to meet ecological categorization criteria for persistence and/or bioaccumulation, and inherent toxicity to aquatic organisms (Environment Canada 2003, 2006), under subsection 73(1) of CEPA 1999. Additionally, four substances (trifluralin, atrazine, chlorothalonil and pentachlorophenol) were identified by Health Canada as inherently toxic to humans (Health Canada 2006). Pursuant to paragraph 74(*a*) of CEPA 1999, the Ministers of the Environment and of Health have completed a screening assessment on trifluralin, atrazine, chlorothalonil, chlorophacinone, methoxychlor and pentachlorophenol.

CAS RN*	Common Name	DSL Name
1582-09-8	trifluralin	benzenamine, 2,6-dinitro-N,N-dipropyl-4-(trifluoromethyl)-
1912-24-9	atrazine	1,3,5-triazine-2,4-diamine, 6-chloro-N-ethyl-N'-(1-methylethyl)-
1897-45-6	chlorothalonil	1,3-benzenedicarbonitrile, 2,4,5,6-tetrachloro-)
3691-35-8	chlorophacinone	1H-indene-1,3(2H)-dione, 2-[(4-chlorophenyl)phenylacetyl]-
72-43-5	methoxychlor	benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-
87-86-5	pentachlorophenol	phenol, pentachloro-

*CAS RN = Chemical Abstracts Service Registry Number

All six substances are registered or have been registered as active ingredients in pest control products under the *Pest Control Products Act* (PCPA) and have undergone an environmental and human health risk assessment by the Pest Management Regulatory Agency (PMRA) as part of

their registration process (Health Canada 2007a). Two of the substances have recently undergone re-evaluation resulting in continued registration for specific applications of atrazine (PMRA 2007) and chlorophacinone (PMRA 2004a, 2006). Three of the substances are currently undergoing re-evaluation, including trifluralin (PMRA 2008a), chlorothalonil (Health Canada 2007a) and pentachlorophenol (PMRA 2008b). All pesticidal uses of methoxychlor have been discontinued as of December 31, 2005, and this substance is no longer registered under the PCPA (PMRA 2004b).

For the screening assessment under CEPA 1999 of registered pesticides on the DSL, the approach of Environment Canada and Health Canada is to conduct an entry characterization of the substances in Canada and then evaluate any non-pesticidal releases and sources. The draft of the entry characterization has undergone a 60-day public comment period. A summary of the critical information used as basis for this screening assessment is presented below.

Summary of Information Used as Basis for this Screening Assessment

An industrial survey conducted under section 71 of CEPA 1999 revealed no non-pesticidal uses of these substances in Canada above reporting thresholds in 2000 (Environment Canada 2001). Entry characterizations consisted of additionally searching for information on releases and sources of the substances in relevant databases and on the internet, and reviewing findings for both Canada and elsewhere. Searches for these substances were conducted up to September 2007, and no information was found on non-pesticidal uses or releases of these substances in Canada (ATSDR 2002; CCOHS 2003; Cornell University 1985; Health Canada 2007b; Howard 1991; HSDB 2007 ; IARC 1991; IPCS 1987, 1990, 1995, 1996; Merck 2001; NIH 1997; PAN 2002, 2007; US EPA date unknown a,b). Therefore, the likelihood of exposure to these substances in Canada resulting from non-pesticidal uses is low.

Since no uses or releases other than those covered by the PCPA have been identified in Canada for the above six substances, no additional efforts were made under CEPA 1999 to collect or analyze information relevant to the persistence, bioaccumulation, and inherent toxicity to human and non-human organisms of these substances beyond what was done for categorization. Therefore, the decisions on the hazard properties for these substances remain unchanged in this assessment (Environment Canada 2003, 2006). All six substances, with the exception of chlorophacinone meet the criteria for persistence (half lives in soil and water $\geq$ 182 days and half life in sediment $\geq$ 365 days) as set out in the *Persistence and Bioaccumulation Regulations* (Canada 2000). Only trifluralin and chlorophacinone meet the criteria for bioaccumulation (BAF, BCF $\geq$ 5000 or log $k_{ow} \geq 5$) as set out in the *Persistence and Bioaccumulation Regulations* (Canada 2000). All six substances are considered to be inherently toxic to aquatic organisms (LC_{50} or EC_{50} <1 mg/L). Four substances (trifluralin, atrazine, chlorothalonil and pentachlorophenol) are considered to be inherently toxic to humans (Health Canada 2006). It should be noted that all of these hazard properties may be re-examined and revised during re-evaluations of these substances under the PCPA.

Conclusion

Based on available information, and until new information is received indicating that any of the substances are entering, or may enter the environment due to applications in Canada not registered under the PCPA, it has been determined that the above six substances are currently not entering, nor are they likely to enter, the environment from applications not registered under the PCPA. Therefore, it is concluded that trifluralin, atrazine, chlorothalonil, chlorophacinone, methoxychlor and pentachlorophenol do not meet the definition of toxic set out in section 64 of CEPA 1999.

As substances listed on the DSL, import and manufacture of these substances in Canada are not subject to notification under subsection 81(1) of CEPA 1999. Given the hazardous properties of these substances, there is concern that new activities for the substances (other than those covered under the PCPA), which have not been identified or assessed under CEPA 1999, could lead to the substances meeting the criteria set out in section 64 of the Act. Therefore, it is recommended that these six substances be subject to the Significant New Activity provisions specified under subsection 81(3) of the Act, to ensure that any new manufacture, import or application of these substances for uses other than the ones covered under the PCPA is notified and will undergo ecological and human health risk assessments as specified in section 83 of the Act, prior to the initiation of this activity in Canada.

References

[ATSDR] Agency for Toxic Substances and Disease Registry. 2002. Toxicological Profile for Methoxychlor, CAS RN 72-43-5 [Internet]. Atlanta (GA): US Department of Health and Human Services, ATSDR. [cited 2007 Oct]. Available from: http://www.atsdr.cdc.gov/toxprofiles/tp47.html

Canada. 1999. *Canadian Environmental Protection Act, 1999*. S.C., 1999, c. 33. Available from: http://canadagazette.gc.ca/archives/p3/1999/g3-02203.pdf

Canada. 2000. *Canadian Environmental Protection Act, 1999: Persistence and Bioaccumulation Regulations*, P.C. 2000-348, 23 March, 2000, SOR/2000-107. Available from: http://canadagazette.gc.ca/archives/p2/2000/2000-03-29/pdf/g2-13407.pdf

[CCOHS] Canadian Centre for Occupational Health and Safety. 2003. CHEMINFO [Internet]. Hamilton (ON): Government of Canada. [cited 2007 Oct]. Available from: http://ccinfoweb.ccohs.ca/cheminfo/search.html

Cornell University. 1985. Chlorophacinone (Rozol®) Chemical Profile 1/85 [Internet]. Ithaca (NY): Cornell University, Pesticide Management Education Program (PMEP). [cited 2007 Oct]. Available from: http://pmep.cce.cornell.edu/profiles/rodent/rodent_A_L/chlorophacinone/chlorophac_prof_0185.html

Environment Canada. 2001. Data collected under the Canadian Environmental Protection Act, 1999, Section 71: *Notice with respect to certain substances on the Domestic Substances List (DSL)*. *Canada Gazette*, Part I, vol. 135, n^{o} 46, p. 4194-4210. Data compiled by: Environment Canada, Existing Substances Branch.

Environment Canada. 2003. Guidance manual for the ecological categorization of organic and inorganic substances on Canada's Domestic Substances List (DSL): Determining persistence, bioaccumulation potential, and inherent toxicity to non-human organisms [CD-ROM]. Gatineau (QC): Environment Canada, Existing Substances Division. Available upon request.

Environment Canada. 2006. Spreadsheets of ecological categorization decisions of substances on the Domestic Substances List – Organic substances [CD-ROM]. Gatineau (QC): Environment Canada, Existing Substances Division. Available upon request.

Health Canada. 2006. Results of the Health-related Components of the Categorization of the Domestic Substances List under CEPA [Internet]. Ottawa (ON): Health Canada, Environmental and Workplace Health. (Proposed July 27, 2006). [cited 2007 Sept]. Available from: http://www.hc-sc.gc.ca/ewh-semt/contaminants/existsub/categor/_result_substance/index-eng.php

Health Canada. 2007a. Public Registry: Pesticide Product Information Database [Internet]. Ottawa (ON): Health Canada, Pest Management Regulatory Agency. [cited 2007 Sept]. Available from: http://www.hc-sc.gc.ca/cps-spc/pest/protect-proteger/publi-regist/index-eng.php

Health Canada. 2007b. Drug Product Database [Internet]. Ottawa (ON): Health Canada, Drugs and Health Products, Drug Products. [cited 2007 Sept]. Available from: http://www.hc-sc.gc.ca/dhp-mps/prodpharma/databasdon/index-eng.php

Howard PH. 1991. Handbook of Environmental Fate and Exposure Data for Organic Chemicals. Vol. III: Pesticides. Chelsea (MI): Lewis Publishers.

[HSDB] Hazardous Substances Data Bank [database on the Internet]. 2007. Bethesda (MD): National Library of Medicine (US). [cited 2007 Sept]. Available from: http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB

[IARC] International Agency for Research on Cancer. 1991. Occupational exposures in insecticide application, and some pesticides [Internet]. IARC Monog Eval Carcin Risks Hum Vol. 53: p 515. [cited 2007 Sept]. Available from: http://monographs.iarc.fr/ENG/Monographs/vol53/volume53.pdf

[IPCS] International Programme on Chemical Safety. 1987. Pentachlorophenol [Internet]. Geneva (CH): World Health Organization. (Environmental Health Criteria 71). Jointly sponsored by the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization. [cited 2007 Sept]. Available from: http://www.inchem.org/documents/ehc/ehc/ehc71.htm

[IPCS] International Programme on Chemical Safety. 1990. Atrazine [Internet]. Geneva (CH): World Health Organization. (Health and Safety Guide No. 47). Jointly sponsored by the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization. [cited 2007 Sept]. Available from: http://www.inchem.org/documents/hsg/hsg/hsg047.htm

[IPCS] International Programme on Chemical Safety. 1995. Chlorothalonil [Internet]. Geneva (CH): World Health Organization. (Health and Safety Guide No. 98). Jointly sponsored by the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization. [cited 2007 Sept]. Available from: http://www.inchem.org/documents/hsg/hsg/hsg098.htm

[IPCS] International Programme on Chemical Safety. 1996. Chlorothalonil [Internet]. Geneva (CH): World Health Organization. (Environmental Health Criteria 183). Jointly sponsored by the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization. [cited 2007 Sept]. Available from: http://www.inchem.org/documents/ehc/ehc/ehc183.htm

Merck. 2001. The Merck Index: Chemistry's Constant Companion. 13th ed. Whitehouse Station (NJ): Merck & Co., Inc.

[NIH] National Institutes of Health (US). 1997. NIH News Advisory. Dec. 5, 1997. Research Triangle Park (NC): US Department of Health and Human Services, National Institutes of Health, National Institute of Environmental Health Sciences. [cited 2007 Oct]. Available from: http://www.nih.gov/news/pr/dec97/niehs-05.htm

[PAN] Pesticide Action Network UK. 2002. Fact Sheet: Atrazine. Pesticides News [Internet]. 56:20-21. June 2002. [cited 2007 Oct]. Available from: http://www.pan-uk.org/pestnews/Actives/atrazine.htm

[PAN] Pesticide Action Network. 2007. PAN Pesticides Database – Methoxychlor [Internet]. San Francisco (CA): Pesticide Action Network North America (PANNA). [cited 2007 Oct]. Available from: http://www.pesticideinfo.org/Search_Chemicals.jsp

[PMRA] Pest Management Regulatory Agency. 2004a. Proposed Acceptability for Continuing Registration: Re-evaluation of Brodifacoum, Bromadiolone, Chlorophacinone, Diphacinone and Warfarin**.** Ottawa (ON): Health Canada, Pest Management Regulatory Agency, Consumer Product Safety. (PACR2004-27; July 14, 2007). [cited 2007 Sept]. To obtain an electronic copy contact: http://www.hc-sc.gc.ca/cps-spc/pest/part/consultations/_pacr2004-27/index-eng.php

[PMRA] Pest Management Regulatory Agency. 2004b. Re-evaluation Note: Discontinuation of Agricultural Products Registered under the *Pest Control Products Act* and Proposed Changes to Maximum Residue Limits under the *Food and Drugs Act*. Ottawa (ON): Health Canada, Pest Management Regulatory Agency, Consumer Product Safety. (REV2004-03; July 16, 2004). [cited 2007 Sept]. To obtain an electronic copy, contact Health Canada.

[PMRA] Pest Management Regulatory Agency. 2006. Re-evaluation Decision Document: Brodifacoum, Bromadiolone, Chlorophacinone, Diphacinone and Warfarin. Ottawa (ON): Health Canada, Pest Management Regulatory Agency, Consumer Product Safety. (RRD 2006-11; March 14, 2006). [cited 2007 Sept]. To obtain an electronic copy contact: http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/rrd2006-11/index-eng.php

[PMRA] Pest Management Regulatory Agency. 2007. Re-evaluation Decision Document: Atrazine (Environmental Assessment). Ottawa (ON): Health Canada, Pest Management Regulatory Agency, Consumer Product Safety. (PACR 2007-05; December 19, 2007). [cited 2007 Sept]. To obtain an electronic copy contact**:** http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/rvd2007-05/index-eng.php

[PMRA] Pest Management Regulatory Agency. 2008a. Proposed Re-evaluation Decision: Trifluralin. Ottawa (ON): Health Canada, Pest Management Regulatory Agency, Consumer Product Safety. (PRVD 2008-22; June 18, 2008). (cited 2008 June). To obtain an electronic copy contact**:** http://www.hc-sc.gc.ca/cps-spc/pest/part/consultations/_prvd2008-22/index-eng.php

[PMRA] Pest Management Regulatory Agency. 2008b. Re-evaluation Note: Update on the Re-evaluation of the Heavy Duty Wood Preservatives Creosote, Pentachlorophenol and CCA. Ottawa (ON): Health Canada, Pest Management Regulatory Agency, Consumer Product Safety. (REV 2008-08; April 22, 2008). (cited 2008 June). Available from: http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/rev2008-08/index-eng.php

[US EPA] US Environmental Protection Agency. [date unknown a]. Trifluralin: 1582-09-8 [Internet]. Washington (DC): US Environmental Protection Agency, Technology Transfer Network, Air Toxics Web Site. [cited 2007 Sept]. Available from: http://www.epa.gov/ttn/atw/hlthef/trifural.html#ref4

[US EPA] US Environmental Protection Agency. [date unknown b]. Technical Fact Sheet on: Atrazine [Internet]. Washington (DC): US Environmental Protection Agency, Office of Water, Office of Ground Water and Drinking Water. [cited 2007 Sept]. Available from: http://www.epa.gov/OGWDW/dwh/t-soc/atrazine.html