II. Toxicity, Exposure and Environmental Disposition Data Sources

The following sources were used for information about toxicity, exposure and environmental disposition for the chemicals evaluated as candidate Priority Chemicals (PCs). A summary was not necessarily available from each source for each chemical. Sources used in evaluating a particular chemical are referenced within the MDH summary for that chemical.

A. United States Sources

1. Centers for Disease Control and Prevention (CDC)

a. Agency for Toxic Substances and Disease Registry (ATSDR)

ATSDR creates Toxicological Profiles for some chemicals, with a total of 310 profiles currently available (Agency for Toxic Substances and Disease Registry [ATSDR]. 2010). A Toxicological Profile is a peer-reviewed document that describes potential toxicity and related adverse health effects for a chemical (ATSDR, 2007). For most chemicals, an abbreviated Public Health Statement, which discusses key points from the Toxicological Profile, is also available. Examples of topics covered are physical and chemical properties, toxicity, exposure pathways, environmental disposition, use, and effects on children. For the PC screening, Toxicological Profiles were useful for information about toxicity, health endpoints, and possible consumer exposures to the chemical.

b. National Health and Nutrition Examination Survey (NHANES**)**

Since 1999, the Centers for Disease Control and Prevention's National Center for Health Statistics has been conducting a survey of human exposure to chemicals as part NHANES. Volunteers provide samples of blood, serum, and urine for analysis (Centers for Disease Control and Prevention [CDC], 2010). The samples are tested for presence of certain environmental chemicals or metabolites and reported in the National Report on Human Exposure to Environmental Chemicals. Some chemicals have been studied since NHANES began in 1999, while other chemicals have been surveyed only in recent years (CDC, 2010). Because one possible criterion for a PC under Minn. Stat. 2010 116.9403 is for the chemical to be found in human tissue or body fluid, data from this survey were useful.

2. Environmental Protection Agency (EPA)

a. Chemical Action Plans – Existing chemicals

Through a comprehensive approach to chemical management being implemented by EPA, chemicals of concern to the public are being identified and evaluated (Environmental Protection Agency [EPA], 2010c). Summaries of plans to manage these chemicals have been created by EPA. These documents outline the chemicals' toxicity to humans and the environment, uses of the chemicals, and EPA plans for managing these chemicals. Currently, there are a total of nine chemicals action plans available. These documents and further information are available at http://www.epa.gov/oppt/existingchemicals/pubs/ecactionpln.html.

b. High Production Volume Information System (HPVIS)

HPVIS is a collection of information maintained by EPA that was obtained during the High Production Volume Chemical Challenge program that began in the late 1990s. Through this program, industries that produced or imported more than one million pounds per year of a

chemical were "challenged" to "sponsor" a chemical. For sponsored chemicals, health and environmental effects data were provided to EPA. EPA used this screening level information to create chemical summaries called "Hazard Characterizations" (HC) and later to produce documents called "Risk Based Prioritizations" (RBP). The HCs were similar to the Screening Information Data Set (SIDS) Initial Assessment Reports (SIAR) produced by the international Organisation for Economic Co-operation and Development (OECD), which include information on toxicity, use, and exposure pathways (EPA, 2010b). The RBPs provided a general ranking for the potential risk associated with a chemical (EPA, 2010a).

c. Inventory Update Reporting (IUR)

Under the Toxic Substances Control Act (TSCA), the EPA has been collecting data on quantities of chemicals manufactured or imported into the U.S. through Inventory Update Reporting (IUR). Manufacturers or importers of certain chemicals must submit this information to the EPA during a reporting year for the previous calendar year. In the past 20 years, there have been five IUR inventories completed (1990, 1994, 1998, 2002 and 2006). The next reporting year is 2011, which will require information from calendar year 2010 (EPA, 2010e).

For the 2006 inventory, importers and manufacturers of quantities of more than 300,000 pounds of an organic chemical were required to report use information for that chemical. This information included general use categories, such as "rubber and plastics," ranges of the percentage of the chemical in the product, and whether the chemical is used in products intended for children up to age 14. Many records from the 2006 IUR inventory show "Not Readily Obtainable" (NRO), however. When available, these data are somewhat useful in ascertaining to which chemicals children might be exposed.

For future inventories, EPA has proposed several changes, such as returning the reporting schedule to every four years, increasing the number of years for which data are collected and broadening requirements for usage reporting. For more information on the IUR proposed changes, see http://www.epa.gov/iur (EPA, 2010d).

d. Integrated Risk Information System (IRIS)

The IRIS program evaluates risk information about exposure to environmental contaminants and effects on human health (EPA, 2010f). For non-cancer health effects, IRIS develops estimates of safe levels of lifetime exposure called Reference Doses (RfDs) (oral exposures) and Reference Concentrations (RfCs) (inhalation exposures). IRIS also assesses the carcinogenic potential of chemicals. More information about IRIS is available at http://www.epa.gov/iris/.

e. National Center for Environmental Assessment (NCEA)

The NCEA provides guidance and risk assessments aimed at protecting human health and the environment (EPA, 2010g). More information is available at http://www.epa.gov/ncea/.

f. Office of Pollution Prevention and Toxics (OPPT)

Under TSCA and the Pollution Prevention Act, OPPT evaluates new and existing chemicals and their risks, in addition to finding ways to prevent or reduce pollution (EPA, 2010h). This program also has information on hazards of certain chemicals, such as lead and cadmium. For more information about this program, see http://www.epa.gov/oppt/.

g. Toxic Release Inventory (TRI) data

Manufacturers that release chemicals into the environment (land, air or water) through production or disposal processes are required to submit a yearly report to the EPA about the releases. The Toxic Release Inventory (TRI) data are intended to help residents of communities understand the types of chemicals being used and released in the area (EPA, 2010i). These data also help illustrate how a chemical is handled, the amount being used, and the way usage changes over time. These data show only chemicals released by manufacturing facilities, and do not reflect the disposition of chemicals used in consumer products. See http://www.epa.gov/tri/ for more information about the TRI.

3. Food and Drug Administration (FDA)

The FDA regulates food, human and veterinary medications, biological products, cosmetics, and sources that emit radiation (FDA, 2010). The FDA has published summary information for certain chemicals. This information was accessed when screening the PC candidate chemicals.

4. National Institutes of Health (NIH)

a. National Library of Medicine (NLM**)**

(1) Hazardous Substances Data Bank (HSDB**)**

The HSDB is maintained by the NLM Toxicology Data Network. Information it contains is derived from current books, technical reports and government documents. This database contains toxicity information, but it also contains information about human exposure, uses of the chemical, environmental fate, emergency response, and several other topics. This peer-reviewed database can be found at http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB (National Library of Medicine [NLM], 2010a).

(2) Household Products Database

Maintained by the NLM, this database contains information about consumer products and the chemicals they contain, which assists in determining general exposure potential. The database can be queried by a chemical's name or Chemical Abstract Service Registry Number (CAS number), as well as a product's brand name. Data are derived from product labels or material safety data sheets (MSDS) (NLM, 2010b). Because information about chemicals in products can be claimed as a trade secret by manufacturers and can change rapidly, the database is not a comprehensive source of information. However, it provides general information useful for screening the Priority Chemicals candidates. This database can be found at http://householdproducts.nlm.nih.gov/index.htm.

b. National Toxicology Program (NTP)

The NTP evaluates environmental toxicants in laboratory studies (National Toxicology Program [NTP], 2010). It creates the Report on Carcinogens and houses the NTP Center for the Evaluation of Risks to Human Reproduction. Results of studies on substances of concern to public health are also available from its website. When available, NTP findings for candidate PCs were reviewed. More information about the NTP is available at http://ntp.niehs.nih.gov/index.cfm.

B. International Sources

U.S. agency sources were used when available. Materials from sources outside the U.S. were also reviewed as supplements, particularly when there was limited information from U.S. sources or newer information from an international source. Information used is referenced in each Minnesota Priority Chemical summary. Sources include the following:

1. Canadian Government

a. Environment Canada

Environment Canada is responsible for protecting the environment, conserving Canada's natural heritage, and providing weather and environmental predictions (Environment Canada, 2010). Environment Canada is working with Health Canada on evaluating hazards of chemicals in commerce. Part of this effort is called the "Challenge." The results of the Challenge are used to determine if regulatory actions to restrict chemical uses are necessary (Government of Canada, 2009). For more information, please see http://www.chemicalsubstanceschimiques.gc.ca/about-apropos/index-eng.php.

b. Health Canada

Health Canada is responsible for maintaining and improving the health of Canadians (Health Canada, 2009). Health Canada is working jointly with Environmental Canada to assess and manage chemicals in the environment. Many substances have been tested and evaluated through the "Challenge" program, where characteristics of chemicals currently in commerce have been screened and characterized. Regulatory action for specific chemicals is implemented when a need is determined (Government of Canada, 2009). Further information can be found at http://www.chemicalsubstanceschimiques.gc.ca/about-apropos/index-eng.php.

2. Europe

a. Joint Research Centre of the European Commission

The European Commission, the executive body for the European Union, conducts risk assessments on some chemicals. These assessments are conducted under the Institute for Health and Consumer Protection within the Joint Research Centre of the European Commission. They are available from the European Commission website through the European Chemical Substances Information System (ESIS), at http://ecb.jrc.ec.europa.eu/esis/index.php?PGM=ein. (Some of the information in this system is now being transferred to the European Chemicals Agency (ECHA) (European Commission, 2010).

b. European Chemicals Agency (ECHA)

ECHA was created to ensure safe use of chemicals and to foster innovation (European Chemicals Agency [ECHA], 2010). ECHA is responsible for administering the Registration, Evaluation, Authorization, and restriction of CHemicals (REACH) program in the European Union. This agency provides summary information about chemicals that were named to the REACH Substances of Very High Concern (SVHC) list. This information was used, when available, in evaluating the candidate PCs. More information about ECHA is available at http://echa.europa.eu/about_en.asp.

3. Organisation for Economic Co-operation and Development (OECD)
The OECD is an international organization with 34 member countries, including the United States. The OECD goals are to support sustainable economic growth, boost employment, raise living standards, maintain financial stability, assist other counties' economic development, and contribute to growth in world trade (Organisation for Economic Co-operation and Development [OECD], 2010a). The OECD has a high production volume chemicals program that evaluates hazards related to chemicals produced in member counties in quantities of more than 1000 tons per year (OECD, 2010b). For evaluated chemicals, Screening Information Data Sets (SIDS) Initial Assessment Reports (SIAR) are available. These summaries were used to evaluate toxicity, possible exposure pathways, and uses of some chemicals. More information is available at http://www.oecd.org/document/21/0,3746,en_2649_34379_1939669_1_1_1_1,00.html.

4. World Health Organization (WHO)
International Agency for Cancer Research (IARC)
IARC promotes international collaboration on cancer research. It uses an interdisciplinary approach to identify the causes of cancer (IARC, 2010). Among IARC publications are chemical monographs that discuss the carcinogenic potential of a chemical. Based on its findings, IARC assigns a chemical one of four categories of carcinogenicity potential. This information was used by MDH in creating the chemical summaries. Information about IARC can be accessed at http://www.iarc.fr/.

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