I. Selection of Priority Chemicals

A. Introduction

In 2009, the Minnesota Legislature passed a bill related to concerns about chemicals used in consumer products, particularly products intended for children. This legislation requires the Minnesota Department of Health (MDH) to create two lists of chemicals: Chemicals of High Concern (CHC) and Priority Chemicals (PC). The legislation also requires the Minnesota Pollution Control Agency (MPCA) to report on options to phase out use of priority chemicals, encourage use of alternative chemicals, and provide recommendations on promoting principles of green chemistry and life cycle analysis. Further, MCPA is required to provide recommendations on potential funding mechanisms for these efforts.

The first list of chemicals that MDH is required to create, called "Chemicals of High Concern", is defined in Minnesota Statute 2010 116.9401. Subd. e:

> "Chemical of high concern" means a chemical identified on the basis of credible scientific evidence by a state, federal, or international agency as being known or suspected with a high degree of probability to:
>
> (1) harm the normal development of a fetus or child or cause other developmental toxicity;
>
> (2) cause cancer, genetic damage, or reproductive harm;
>
> (3) disrupt the endocrine or hormone system;
>
> (4) damage the nervous system, immune system, or organs, or cause other systemic toxicity;
>
> (5) be persistent, bioaccumulative, and toxic; or
>
> (6) be very persistent and very bioaccumulative."

The CHC list was published on July 1, 2010 and contains 1,756 chemicals. The process used for selecting these chemicals can be found in a separate document called "Minnesota Chemicals of High Concern List Methodology." This document is available from the MDH website at http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/highconcern.html, by contacting MDH at 1-800-657-3908, option "4," or by e-mail at health.hazard@state.mn.us.

The list of PCs was to be selected from the CHC list. The statutory criteria for a PC are as follows in Minn. Stat. 2010 116.9403, Subd. (a) and (b):

(a) The department, after consultation with the agency, may designate a chemical of high concern as a priority chemical if the department finds that the chemical:

(1) has been identified as a high-production volume chemical by the United States Environmental Protection Agency; and

(2) meets any of the following criteria:

(i) the chemical has been found through biomonitoring to be present in human blood, including umbilical cord blood, breast milk, urine, or other bodily tissues or fluids;

(ii) the chemical has been found through sampling and analysis to be present in household dust, indoor air, drinking water, or elsewhere in the home environment; or

(iii) the chemical has been found through monitoring to be present in fish, wildlife, or the natural environment.

(b) By February 1, 2011, the department shall publish a list of priority chemicals in the State Register and on the department's Internet Web site and shall update the published list whenever a new priority chemical is designated.

This document describes the selection of the PCs and provides brief summaries about the properties, uses, and toxicity information for each PC.

B. High Production Volume (HPV) Chemicals

According to Minn. Stat. 2010 116.9403, a PC must be a high production volume (HPV) chemical named by the U.S Environmental Protection Agency (EPA). HPV chemicals are those that are produced or imported into the United States at quantities of one million pounds or more per year. Information about the quantities produced or imported is obtained from the EPA Inventory Update Reporting (IUR) data, which has been conducted approximately every four years since 1986. Quantities submitted from all sources for a particular chemical are summed to determine total production and importation for the U.S. during the specified calendar year. If the number is one million pounds or more for that year, the chemical is deemed HPV (Environmental Protection Agency [EPA], 2010d).

EPA has changed the reporting requirements for the IUR over time. One change involved reporting of inorganic chemicals, which was not required until the 2006 IUR inventory. This change was not initially considered by MDH when determining a system for identifying HPV chemicals eligible for the Priority Chemical list as described in "Minnesota Chemicals of High Concern List Methodology." The result of this oversight was that only 414 chemicals on the CHC list were initially identified as HPV. After identifying inorganic chemicals required to be reported only in 2006, there were a total of

443 HPV chemicals. More information about this designation can be found in a document called "October 2010 Updates to the Chemicals of High Concern List" available at http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/chclist/update1010.pdf.

In addition to being an HPV chemical, a PC must also meet additional criteria. Per the statute, a PC must be found a) in human tissues or body fluids, b) in household dust, indoor air, drinking water, or elsewhere in the home environment, or c) in fish, wildlife or the natural environment. Additionally, the PC candidates must not be specifically excluded by statute. There are 11 exclusions related to this statute, which are as follows:

"The requirements of sections Minn. Stat. 2010 116.9401 - 116.9407 do not apply to:

(1) chemicals in used children's products;

(2) priority chemicals used in the manufacturing process, but that are not present in the final product;

(3) priority chemicals used in agricultural production;

(4) motor vehicles as defined in chapter 168 or watercraft as defined in chapter 86B or their component parts, except that the use of priority chemicals in detachable car seats is not exempt;

(5) priority chemicals generated solely as combustion by-products or that are present in combustible fuels;

(6) retailers;

(7) pharmaceutical products or biologics;

(8) a medical device as defined in the federal Food, Drug, and Cosmetic Act, United States Code, title 21, section 321(h);

(9) food and food or beverage packaging, except a container containing baby food or infant formula;

(10) consumer electronics products and electronic components, including but not limited to personal computers; audio and video equipment; calculators; digital displays; wireless phones; cameras; game consoles; printers; and handheld electronic and electrical devices used to access interactive software or their associated peripherals; or products that comply with the provisions of directive 2002/95/EC of the European Union, adopted by the European Parliament and Council of the European Union now or hereafter in effect; or

(11) outdoor sport equipment, including snowmobiles as defined in section 84.81, subdivision 3; all-terrain vehicles as defined in section 84.92, subdivision 8; personal watercraft as defined in section 86B.005, subdivision 14a; watercraft as defined in section 86B.005, subdivision 18; and off-highway motorcycles, as defined in section 84.787, subdivision 7, and all attachments and repair parts for all of this equipment."

These requirements and exclusions were considered when screening the 443 HPV chemicals for PC eligibility. If a chemical was excluded under one use condition, but remained eligible under another, the chemical remained eligible as a PC candidate. For example, if a chemical could be found in a used children's toy and would be excluded under 116.9405 Subd. 1, but could also be found in a new children's toy, the chemical was still considered eligible to be a PC.

C. Evaluation of Chemicals

The 443 HPV chemicals were screened and evaluated as candidate PCs. Information used to evaluate the chemicals was primarily from toxicity and exposure-related reports created by U.S. federal agencies or international sources. These sources, listed below, provide reports that are accessible via the Internet without charge. The sources are described in Section II "Toxicity, Exposure and Environmental Disposition Data Sources":

United States Sources

Centers for Disease Control and Prevention (CDC)
- Agency for Toxic Substances and Disease Registry (ATSDR)
- National Health and Nutrition Examination Survey (NHANES)

Environmental Protection Agency (EPA)
- Chemical Action Plans (Existing Chemicals)
- High Production Volume Information System (HPVIS)
- Integrated Risk Information System (IRIS)
- Inventory Update Reporting (IUR)
- Office of Pollution Prevention and Toxics (OTTP)
- Toxic Release Inventory (TRI)

Food and Drug Administration (FDA)

National Institutes of Health (NIH)
- National Library of Medicine (NLM)
  - Hazardous Substances Data Bank (HSDB)
  - Household Products Database
- National Toxicology Program (NTP)

International Sources

Government of Canada
- Environment Canada
- Health Canada

European Commission
- Joint Research Centre of the European Commission

European Chemicals Agency

Organisation for Economic Co-operation and Development (OECD)

World Health Organization

International Agency for Research on Cancer (IARC)

With the time allotted by statute to name PCs, a complete literature search for each eligible chemical could not be conducted. Rather, MDH relied on summaries produced by the agencies or organizations named above. Most of these summaries drew upon published, peer-reviewed toxicity studies or exposure evaluations. Occasionally, MDH used published materials from journals, as cited in the reference section of each Priority Chemical summary below. Opinions from MDH toxicologists and staff at MPCA were also solicited about the chemicals under consideration.

Another consideration in selecting the PCs was the amount of information available for each chemical. There were a few chemicals identified that met the statutory requirements for a PC and could be of public health interest. However, the amount of information readily available varied by chemical. Those without sufficient information available for an adequate timely assessment were removed from further consideration for the initial PC list.

The intent of the statute was considered when selecting chemicals for the PC list. The statute does not explicitly state that PCs must be found in consumer products, but the language of the statute suggests that this is so. Therefore, consumer products found in the home, particularly those intended for children but also those accessible to children and pregnant women, were considered when evaluating candidate PCs.

Studies related to effects on human health at all life stages, including in-utero, were considered during the evaluation. Actions taken by other agencies were also considered. After final review, the following chemicals were named to the first list of Minnesota PCs:

Name	**Chemical Abstract Service (CAS) Registry Number**
Bisphenol A (BPA)	80-05-7
Butyl benzyl phthalate (BBP)	85-68-7
Cadmium	7440-43-9
Decabromodiphenyl ether (decaBDE)	1163-19-5
Dibutyl phthalate (DBP)	84-74-2
Di (2-ethyhexyl) phthalate (DEHP)	117-81-7
Formaldehyde	50-00-0
Hexabromocyclododecane (HBCD)	3194-55-6
Lead	7439-92-1

Summaries for these chemicals are available in the following pages. Chemical uses or forms that were specifically excluded in Minn. Stat. 2010 116.9405, such as chemicals in foods, beverages or cigarette smoke, were not considered and generally not discussed within these summaries. Research continues on the chemicals named, and new findings will be considered during future revisions of the PC list.