

DRAFT: FOR CONSULTATION PURPOSES ONLY - NOT A FINAL DOCUMENT

LEAD RISK REDUCTION STRATEGY

Consumer Product Safety Bureau
Healthy Environments & Consumer Safety Branch
Health Canada
Ottawa, Ontario
K1A 0K9

February 2002

DRAFT: FOR CONSULTATION PURPOSES ONLY - NOT A FINAL DOCUMENT

TABLE OF CONTENTS

	<u>Page</u>
List of Figures	iii
List of Appendices	iv
Executive Summary	v
1.0 Issue	1
2.0 Background	1
2.1 Properties and Uses of Lead	1
2.2 Toxicity of Lead	2
2.3 Exposure to Lead	3
2.4 Lead Exposure in Canada	6
3.0 Hazards Associated with Leaded Consumer Products	7
3.1 Introduction	7
3.2 Incidents Involving Lead in Children’s Products	8
3.2.1. Exposure through Lead Shot, Jiggers and Sinkers	
4.0 The Lead Risk Reduction Strategy	10
4.1. Health Canada’s Lead Risk Management Policy	10
4.2 The Need for a Lead Risk Reduction Strategy for Consumer Products	11
5.0 Development of the Lead Risk Reduction Strategy	12
5.1 Background	12
5.2 Risk Management Options Considered under the LRRS	13
5.2.1. Regulatory Controls on Lead Content of Consumer Products	13
5.2.2. No change in Current Management Practices	13
5.2.3. Voluntary Compliance Program	14
5.2.4. Combined Voluntary Compliance and Regulatory Program	15
6.0 Proposed Regulations under the Lead Risk Reduction Strategy (LRRS) for Consumer Products	15

DRAFT: FOR CONSULTATION PURPOSES ONLY - NOT A FINAL DOCUMENT

6.1	General Considerations	15
6.2	Proposed Regulations	17
6.2.1.	Group 1: Products Likely to be Ingested in Significant Quantities	17
6.2.2.	Group 2: Products Intended to be or likely to be place in or near the Mouth	18
6.2.3.	Group 3: Children’s Equipment, Furniture, Toys, and other Items intended for use by a child in learning or play	20
6.2.4	Group 4: Products that are intended for use in preparing, serving, consuming, or storing food or beverages	21
6.2.5	Group 5: Consumer Products Intended to be or likely to be or Burned in Enclosed Spaces	23
7.0	Implementation of the Lead Risk Reduction Strategy	25
	References	26

LIST OF FIGURES

	<u>Page</u>
FIGURE 1: Health Effects of Lead on Adults and Children	2
FIGURE 2: Routes of Lead Exposure	4
FIGURE 3: Lead in the Body	5
FIGURE 4: Canadian Trends in Concentration of Lead in Canadian air, 1975-1990	6

DRAFT: FOR CONSULTATION PURPOSES ONLY - NOT A FINAL DOCUMENT

LIST OF APPENDICES

	<u>Page</u>
APPENDIX A: Definitions	35
APPENDIX B: Products Currently Regulated for Lead Content under the federal <i>Hazardous Products Act</i>	36
APPENDIX C: Lead Toxicity	37
APPENDIX D: Federal Legislation and Guidelines related to Lead Exposure	43
APPENDIX E: The Lead Strategy - Results of the 1998 Public Consultation Process	45
APPENDIX F: Product Grouping Summary	58
APPENDIX G: Human health risks associated with lead shot, sinkers, and jigs	61

EXECUTIVE SUMMARY
Lead Risk Reduction Strategy for Consumer Products

Lead is a soft, heavy, inexpensive metal which has many industrial uses, but which can cause a variety of adverse health effects in humans, particularly in young children. The adverse effects of lead become more severe as the amount of exposure increases, but even at very low levels of exposure, lead can have harmful effects on the physical, intellectual and behavioural development of children. Lead also has a variety of harmful effects on adults, particularly on the nervous and reproductive systems and the kidneys.

Over the past 25 years, Health Canada, Environment Canada, and other Canadian regulatory agencies have substantially reduced Canadian's exposure to lead by legislating and enforcing maximum lead concentrations in gasoline and house paints. The use of lead-soldered food cans has been virtually eliminated through a agreement negotiated with Canadian canneries. However, since lead has potential uses in many consumer products, there is still a risk that Canadians, especially children, will be exposed to lead through consumer products. Young children are at greater risk of exposure to lead through consumer products because of their natural tendency to mouth objects with which they come into contact.

It is Health Canada's mandate, through the *Hazardous Products Act* and *Regulations*, to provide some measure of protection to Canadians from health hazards in consumer products; however, the scope of the current *Regulations* is too limited to adequately protect children against exposure to lead in consumer products. Currently the *Hazardous Products Act & Regulations* prescribe maximum lead content limits for only a few consumer products, including glazed ceramics and glassware, kettles, paints and other liquid coating materials, toys, furniture and equipment for use by children in learning or play, and paints or other liquid coatings on pencils and artists' brushes. Some of the prescribed limits are considered, in the light of current knowledge, to be too high to provide adequate protection for children against lead exposure.

In 1998 Health Canada commissioned the Delta Group to carry out stakeholder consultations on the management of the risks to children associated with lead in consumer products. All major stakeholders, including industry groups, consumers, and public health agencies, agreed that regulations should be developed under the *Hazardous Products Act* to control the lead content of all children's products. In response to this consultation and to other stakeholder input, the Consumer Product Safety Bureau of Health Canada has drafted the attached Lead Risk Reduction Strategy (LRRS) paper. The intent of the LRRS is to protect children from exposure to lead through consumer products by regulating, under the *Hazardous Products Act*, the lead content of five categories of consumer products with which children are most likely to interact. The proposed regulations would be enforced by the Consumer Products Safety Division.

The LRRS has been peer reviewed for scientific accuracy. It will be distributed for comment to stakeholders, including manufacturers, importers, distributors, and sellers of the affected products, other government agencies, and consumer and public health organizations, and will be revised as necessary once stakeholder input has been received. The finalized document will serve as the foundation for new lead regulations under the *Hazardous Products Act*.

LEAD RISK REDUCTION STRATEGY¹

1.0 THE ISSUE

There are two issues related to controlling human exposure to lead through consumer products:

1. Under the federal *Hazardous Products Act and Regulations (HPA)*, the lead content of consumer products is regulated only for a few specific products: kettles, glazes on ceramics and glassware, paints, enamels, and other liquid coating materials, toys, furniture, and equipment for use by a child in learning or play, and paints or other liquid coating materials on pencils and artists' brushes. (See Appendix B for a summary of *HPA* regulations on lead.) This prevents Health Canada from effectively controlling risks to human health, especially children's health, through exposure to lead in other consumer products.
2. The lead content limits prescribed for certain products under existing *HPA* regulations are considered to be too high to protect consumers, especially young children.

2.0 BACKGROUND

2.1. Properties and Uses of Lead

Elemental lead is a heavy, soft inexpensive metal which occurs naturally in the earth's crust worldwide. Lead has been mined and processed for thousands of years, although its use greatly increased with the development of modern industry. Industrial demand for lead increased by 25% between 1970 and 1990 (75). Lead is used in the manufacture of lead-acid batteries, solder, radiation shields, pipes, telephone and television cables and filler in automobile industry. Lead-acid batteries account for about 68% of global lead consumption. Many consumer products contain lead in elemental form, in metal alloys such as bronze, brass or steel, or in one of many lead compounds. Lead salts such as lead chromate are used for hard-wearing pigments and paints. Lead in consumer products is generally found in its elemental state or as inorganic compounds such as lead monoxide, lead dioxide, lead tetroxide and lead chromate.

Over 50% of lead used in industry is recycled lead. Canada is a major producer of lead, which it mines as a by-product of zinc. Canada's lead production in 1998 was 268,000 tons, of which about 90% is exported, mainly to the United States (17).

Because of the widespread natural occurrence of lead and its extensive use in modern industry, lead is found, usually at very low concentrations, everywhere in the human environment.

¹ See Appendix A for contextual definitions of terms used in this document.

2. 2. Toxicity of Lead

Lead has no known function in the human body. It disrupts enzyme systems mediated by other metals like calcium, zinc, and iron, and can have harmful effects on almost all body systems, especially the nervous system, the kidneys, and the reproductive system. **Figure 1** below shows the health effects for children and for adults associated with various concentrations of lead in the blood.

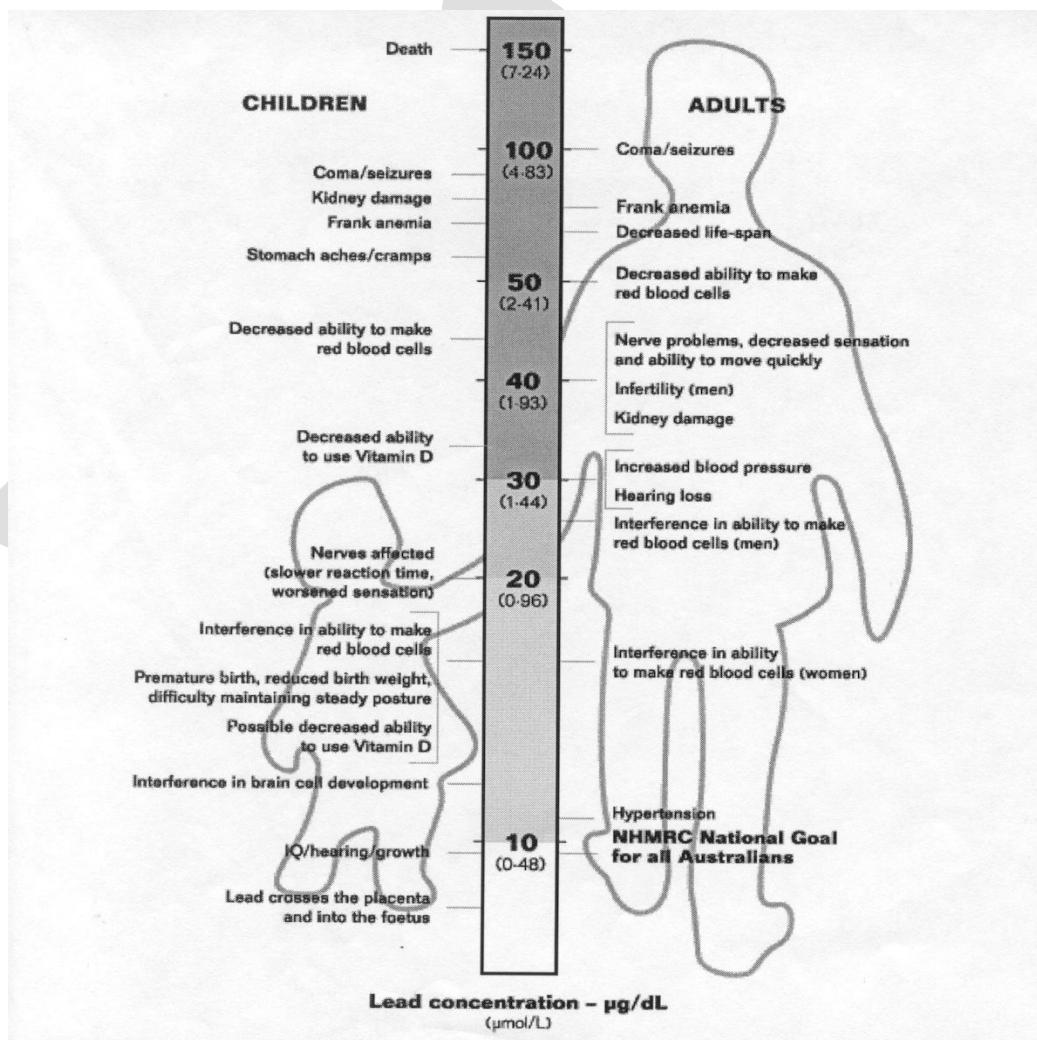


Figure 1. Health Effects of Lead on Adults and Children
(used by permission of the government of New South Wales, Australia)

DRAFT: FOR CONSULTATION PURPOSES ONLY - NOT A FINAL DOCUMENT

At a given blood lead level, the adverse health effects of lead are significantly more severe for children than for adults. Since development of young children's organs and systems is incomplete, they are less able to eliminate lead from the body. While only about 10% of the lead ingested by adults is absorbed from the intestine into the blood, about 40% of ingested lead is absorbed by the bodies of preschool children (71). The blood and nervous systems of children have lower thresholds for lead toxicity. The developing nervous systems of young children are particularly susceptible to the harmful effects of lead. Exposure to even very low levels of lead may be associated with harmful effects on their intellectual development, growth, and behaviour. Children's smaller skeletons store less lead, so that they retain more lead in the blood and in soft tissues, where it is most harmful.

The toxic effects of exposure to high levels of lead have been recognized for centuries. Today, acute cases of lead poisoning are rare because of better safety practices in industries where workers may be exposed to lead. However, lead is toxic even at low levels of exposure which do not produce any specific symptoms. In fact, recent research appears to indicate that, at least for children, there is no safe blood lead level (59).

See Appendix C for a more complete discussion of lead toxicity.

2.3 Exposure to Lead

Children are doubly at jeopardy from lead because their behaviour makes it more likely that children will be exposed to lead. Young children have a normal, exploratory habit of mouthing or chewing objects with which they come into contact. In addition, 10 to 30% of children between one and six years exhibit *pica*, an eating disorder described as a tendency to mouth or attempt to consume non-food objects such as paint chips, furniture, or toys (62). Lead has a sweetish taste which encourages young children to mouth objects containing lead.

Household dust and soil are significant sources of lead exposures for small children. Airborne lead dust settles onto food, water, clothing and other objects and may subsequently be transferred to the mouth. Young children are most at risk from lead-containing dust because (i) they occupy space close to the floor, where lead-containing dust is most likely to settle (ii) their normal hand to mouth behaviour greatly increases the likelihood of ingesting dust, and (iii) they breathe in more air per unit body weight than do adults. The presence of leaded dust or other sources of lead exposure in the home represents a hazard for the entire household. Exposure to lead in women of childbearing age may result in lead being transmitted to their unborn children through the placenta.

Figure 2 on the following page shows major sources of lead exposure for the general public.



Figure 2. Routes of Lead Exposure (Used by permission of the Government of New South Wales, Australia)

Lead may enter the body through ingestion, inhalation, dermal contact, or to the fetus via the placenta. Lead uptake by the fetus begins as early as the twelfth week and continues throughout development. In the Canadian general population the main exposure routes are the gastrointestinal tract and respiration. **Figure 3** on the following page shows routes entry of lead into the body and its absorption within the body. Cases of lead absorption through the skin is rare in the general population.