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ENVIRONMENT DIRECTORATE
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THE WORKING PARTY ON CHEMICALS, PESTICIDES AND BIOTECHNOLOGY

LEAD RISK MANAGEMENT ACTIVITIES IN OECD MEMBER COUNTRIES
(1993 to 1998)

PART ONE

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OECD Environmental Health and Safety Publications

Series on Risk Management

No. 12

**LEAD RISK MANAGEMENT ACTIVITIES
IN OECD MEMBER COUNTRIES
(1993 TO 1998)**

IOMC

**INTER-ORGANIZATION PROGRAMME FOR THE
SOUND MANAGEMENT OF CHEMICALS**

A cooperative agreement among
UNEP, ILO, FAO, WHO, UNIDO, UNITAR and OECD

**Environment Directorate
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT**

Paris 1999

**Other Environmental Health and Safety publications related
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ABOUT THE OECD

The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental organisation in which representatives of 29 industrialised countries in North America, Europe and the Pacific, as well as the European Commission, meet to co-ordinate and harmonize policies, discuss issues of mutual concern, and work together to respond to international problems. Most of the OECD's work is carried out by more than 200 specialised Committees and subsidiary groups made up of Member country delegates. Observers from several countries with special status at the OECD, and from interested international organisations, attend many of the OECD's Workshops and other meetings. Committees and subsidiary groups are served by the OECD Secretariat, located in Paris, France, which is organised into Directorates and Divisions.

The work of the OECD related to risk management is carried out by the Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology, with Secretariat support from the Environmental Health and Safety Division of the Environment Directorate. As part of its work on risk management, the OECD has issued "status report" monographs on five substances that were, or continue to be, the subject of review: **lead, cadmium, mercury, selected brominated flame retardants and methylene chloride**. It has also published two volumes of the **proceedings of the OECD Cadmium Workshop** held in Saltsjöbaden, Sweden, in 1995 and a **survey report on methylene chloride**, supplementing the information presented in the Risk Reduction Monograph on methylene chloride. In 1996, OECD Environment Ministers endorsed a **Declaration on Risk Reduction for Lead** to advance national and co-operative efforts to reduce the risks from lead exposure.

The Environmental Health and Safety Division publishes documents in several different series, including: **Testing and Assessment; Good Laboratory Practice and Compliance Monitoring; Pesticides; Risk Management; Harmonization of Regulatory Oversight in Biotechnology; PRTRs (Pollutant Release and Transfer Registers); and Chemical Accidents**. More information about the Environmental Health and Safety Programme and EHS publications is available on the OECD's web site (see next page).

This publication was produced within the framework of the Inter-Organization Programme for the Sound Management of Chemicals (IOMC).

This publication is available electronically, at no charge.

For the complete text of this and many other Environmental Health and Safety publications, consult the OECD's web site (<http://www.oecd.org/ehs>)

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The Inter-Organization Programme for the Sound Management of Chemicals (IOMC) was established in 1995 by UNEP, ILO, FAO, WHO, UNIDO, UNITAR and the OECD (the Participating Organizations), following recommendations made by the 1992 UN Conference on Environment and Development to strengthen co-operation and increase international co-ordination in the field of chemical safety. The purpose of the IOMC is to promote co-ordination of the policies and activities pursued by the Participating Organizations, jointly or separately, to achieve the sound management of chemicals in relation to human health and the environment.

FOREWORD

In 1998, the OECD surveyed Member countries, the European Commission and industry to determine what actions had been taken to implement the 1996 OECD Environment Ministers' Declaration on Risk Reduction for Lead. Twenty-three countries and the EC responded to the Member country questionnaire; thirteen companies and nine industry associations responded to the lead industry questionnaire. Their responses are summarised in this report.

The questionnaires were designed to obtain information on activities completed since 1992 or still ongoing. It should be emphasised that the purpose of this report is not to give a complete picture of lead risk management activities in Member countries and the lead industry. The information presented here serves to update the OECD Lead Monograph, published in 1993. Like this report, the Lead Monograph is accessible on the OECD Environmental Health and Safety Division's web page.

ACKNOWLEDGEMENT

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TABLE OF CONTENTS

PART ONE

ABOUT THE OECD	5
FORWARD	7
EXECUTIVE SUMMARY	11
SUMMARY RESPONSES	15
A. Questionnaire Responses by Member Countries	17
B. Questionnaire Responses by Lead producing and Using Industries	27
ANNEX A: COLLATION OF OECD MEMBER COUNTRY RESPONSES	35
Australia	37
Austria	46
Belgium	85
Canada	122
Czech Republic.....	164
Denmark	171
European Commission	174
Finland.....	191
France	205
Germany	218
Hungary	240
Ireland.....	251
Italy.....	256
Japan.....	286
Republic of Korea	296
Mexico.....	316
The Netherlands	326
New Zealand.....	339
Norway	356
Sweden	365
Switzerland.....	406
Turkey	417
United Kingdom.....	421
United States.....	435

PART TWO

ANNEX B: COLLATION OF INDUSTRY RESPONSES	471
American Industrial Hygiene Association.....	473
Asarco.....	476
Britannia Refined Metals.....	522
Britannia Zinc.....	525
Battery Council International	528
Cominco Ltd (Canada)	539
Coalition for Safe Ceramic Ware	555
The Doe Run Company	569
Elf Atochem	577
F.X. Nachtmann GmbH.....	581
Glassexport Co Ltd.....	585
Hadeland Glassverk.....	588
International Crystal Federation	591
International Lead Management Center (ILMC).....	599

Johnson Controls Battery Group, Inc.	623
Lead Development Association International	625
Lead Industries Association, North American	628
Metallic Cans National Association, Mexico	643
Met-Mex Peñoles	645
National Artisans Fund (Fondo Nacional para el Fomento de las Artesanias).....	651
Pasminco	653
Penarroya Oxide	656
ANNEX C: MEMBER COUNTRY QUESTIONNAIRE	660
ANNEX D: INDUSTRY QUESTIONNAIRE	668
ANNEX E: COUNCIL RESOLUTION/MINISTERIAL DECLARATION	676

EXECUTIVE SUMMARY

In February 1996, OECD Environment Ministers adopted a Declaration on Risk Reduction for Lead. The purpose of this Declaration was to advance national and co-operative efforts to reduce risks from lead exposure. The Ministers declared that they would:

- develop, continue or strengthen national and co-operative efforts to reduce risks from exposure to lead;
- give highest priority to actions addressing the risk of exposure from food and beverages, water, air, occupational exposure and other potential pathways;
- continue to review lead levels in the environment, and the exposure to lead of sensitive and high risk populations;
- promote and maximise the use of environmentally sound and economically viable collection and recycling programmes for lead and lead-containing products;
- extend co-operative efforts to share (including with non-OECD countries) information about exposures of concern, risk reduction options, and environmentally sound and economically viable technologies;
- encourage the lead producing and using industries to make best use of their expertise on the management of risks from lead, and to make this expertise available to OECD and non-OECD countries;
- work with the lead producing industry to develop its voluntary action programme to reduce exposure to lead (which will be implemented in co-operation with national authorities in OECD and interested non-OECD countries) and encourage user industries to develop similar programmes.

They also declared that the OECD should review progress made by Member countries in pursuance of the Declaration three years after adoption and assess the need for further action.

An OECD Council Resolution [C(96)42/FINAL], adopted in March 1996, linked the Environment Ministers' Declaration to the OECD and specifically instructed the OECD's Environment Policy Committee (EPOC) to review Member countries' progress, as well as to assess the need for further action.

To carry out the review, two questionnaires were developed by the OECD Secretariat in conjunction with Member countries. The questionnaire sent to governments of Member countries and to the European Commission was designed to solicit information on how countries were implementing the terms of the Declaration. The lead industry questionnaire sought information on its risk management activities in light of the Declaration. Both questionnaires were concerned with activities completed since 1992 or still ongoing.

The purpose of this report is not to present a complete picture of lead risk management activities in Member countries and the lead industry. Rather, the information gathered serves to update the 1993 OECD Lead Monograph.

Survey results

This report summarises the responses to the Member country and industry questionnaires. There is a tabular collation of the responses, taken directly from the completed questionnaires, in *Annexes A and B*. Copies of the two questionnaires, and of the 1996 Environment Ministers' Declaration and OECD Council Resolution, are included as *Annexes C through E*.

Twenty-three countries and the European Commission responded to the Member country questionnaire; thirteen companies and nine industry associations responded to the lead industry questionnaire. The majority of countries reported on programmes to monitor lead exposure of the general population and of children, as well as occupational exposure. Most also reported on programmes to monitor lead in environmental media and in drinking water. Average blood lead levels in the general population have fallen in OECD countries during the past two decades. This was attributed to phasing out of leaded gasoline and to other actions intended to reduce exposure to lead. Exceptions to the downward trend in blood lead levels were reported in populations adjacent to major industrial facilities. A similar pattern was reported with regard to air lead levels.

Children's blood lead levels were often elevated if they lived adjacent to major industrial sources. Other risk factors identified for children included poverty, living in old deteriorating buildings, and (by one country) lead exposure from tap water.

Lead producing and using companies have undertaken environmental and worker monitoring programmes, usually as a regulatory or licensing requirement. In some cases, they have directly implemented (or provided financial assistance to) programmes for monitoring lead levels in the general population and/or in children living near facilities. Risk management activities reported by industry associations were targeted towards education and information exchange. These included informing consumers, workers and the medical profession about risks associated with lead exposure and how to minimise this exposure. One umbrella association had initiated a voluntary occupational exposure programme, aimed at lowering the blood lead levels and return levels of participating companies' workers. Another supports major pilot programmes in several countries to help those countries find ways to minimise risks.





The 1993 Lead Monograph described actions taken, as of 1992, to manage risks with respect to lead exposure. Table 1 provides a *rough* comparison of the information in the Lead Monograph with that provided by the survey respondents. However, some limitations should be kept in mind. First, while the table indicates that countries have taken certain actions, no attempt has been made to evaluate these actions' effectiveness. Second, where activities are not shown for a particular country, this only means that *information on these activities was not provided*. In addition, a few countries were not OECD members in 1992. Finally, since the questionnaires were not organised in exactly the same way as the Lead Monograph, direct comparisons are not always possible.

Table 1: Summary of lead monitoring and risk management activities reported by countries

	Monitoring										Risk management activities														
	General population♣	Children	Worker	Air∅	Soil	Food	Drinking water♣	Biota♣	Other‡	Lead in gasoline	Exposure of children♣	Exposure from food packaging	Lead in paint	Ceramic ware and crystal ware♣	Lead shot and sinkers	Drinking water♣	Occupational exposure	Emissions from major sources (air)	Historic use in buildings	Recycling	Product and/or use regulation♦	Research/education♣	Ambient air∅	Water point sources	
Australia																									
Austria																									
Belgium																									
Canada																									
Czech Republic																									
Denmark																									
European Commission		P																		P					P
Finland																									
France																									
Germany																									
Greece ▼																									
Hungary																									
Iceland ▼																									
Ireland																									
Italy																									
Japan																									
Korea																									
Luxembourg ▼																									

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	General population♣	Children	Worker	Air◇	Soil	Food	Drinking Water♣	Biota♣	Other‡	Lead in gasoline	Exposure of children♣	Exposure from food packaging	Lead in paint	Ceramic ware and crystal ware♣	Lead shot and sinkers	Drinking water♣	Occupational exposure	Emissions from major sources (air)	Historic use in buildings	Recycling	Product and/or use regulation◆	Research/education♣	Ambient air◇	Water point sources
Mexico			■				■			■								■						■
Netherlands			■	■						■								■		■	■			■
New Zealand			■	P		■	■					■				■					■			
Norway			■						■							■					■			■
Poland ▼																								
Portugal ▼																								
Spain ▼			■				■						■					■						■
Sweden			■				■				■		■		■			■			■			■
Switzerland			■			■	■		■				■		■			■		■	■		■	■
Turkey			■																					
United Kingdom		■	■	■		■	■					■	■		■		■			■	■		■	■
United States		■	■		■	■	■			■		■	■		■		■	■		■	■		■	■

-  No activity reported in the Lead Monograph or in the questionnaire response.
-  Activity reported in the Lead Monograph.
-  Activity reported in the questionnaire response.
-  Activity reported in the Lead Monograph, *and* new/updated activity reported in the questionnaire response.
- ‡ Other monitoring programmes include dust and surface waters, as indicated in Table 5.1 of the Lead Monograph.
- ♣ Activities not specifically included in Table 5.1 of the Lead Monograph.
- ◆ Includes the following categories, as shown in Table 5.1 of the Lead Monograph: pesticides, miscellaneous, sewage sludge, lead-containing waste, foodstuffs or feed.
- ◇ These activities should be read together.
- ♠ These activities should be read together.
- ▼ Member countries that did not respond to the questionnaire.
- P Activities indicated as “proposed” in the Lead Monograph.

SUMMARY OF RESPONSES

Introduction

This report presents the results of an OECD survey on lead risk management activities in Member countries and in the lead producing and using industry. It was prepared in response to the OECD Council Resolution concerning the Declaration on Risk Reduction for Lead (see Annex E).

Twenty-three countries¹ and the European Commission returned the Member country questionnaire. Thirteen companies² and nine industry associations³ responded to the lead industry questionnaire.

Background

In February 1996, Environment Ministers of OECD Member countries adopted a Declaration on Risk Reduction for Lead in order to advance national and co-operative efforts to reduce risks from lead exposure. The OECD Council adopted a Resolution [C(96)42/FINAL] in March 1996 linking this Declaration to the OECD. The Council Act specifically instructs the Environment Policy Committee (EPOC) to review progress by Member countries in pursuance of the Declaration three years after its adoption and to assess the need for further action.

The OECD Secretariat, in conjunction with Member countries, developed two questionnaires. One questionnaire, for Member countries, sought information on how they were implementing the terms of the Declaration; the other, for the lead industry, asked for information on its risk management activities in light of the Declaration.

The questionnaires were designed to cover activities completed after 1992 or ongoing. Thus, the survey would serve to document activities not already described in the 1993 OECD Lead Monograph⁴ or to update the information in that publication. Some countries' responses were co-ordinated across several relevant environmental or health ministries; others were submitted by only one ministry. Some respondents furnished more information, or different types of information, than had been requested.

-
1. Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Korea, Mexico, the Netherlands, New Zealand, Norway, Sweden, Switzerland, Turkey, the United Kingdom and the United States. All 29 Member countries are listed in Table 1.
 2. Asarco Incorporated, Britannia Refined Metals Ltd, Britannia Zinc Ltd, Cominco Ltd, The Doe Run Company, Elf Atochem, F.X. Nachtmann GmbH, Glassexport Co Ltd, Hadeland Glassverk, Johnson Controls Battery Group Inc, Met-mex Peñoles, Pasminco Ltd and Penarroya Oxide.
 3. The American Industrial Hygiene Association, the Battery Council International, the Coalition for Safe Ceramic Ware, the International Crystal Federation, the International Lead Management Center, the Lead Development Association International, the Lead Industries Association Incorporated, the Metallic Cans National Association (Mexico), and the National Artisans Fund (Mexico).
 4. *Risk Reduction Monograph No. 1: Lead. Background and National Experience with Reducing Risk*, OCDE/GD(93)67 (1993). The Lead Monograph, like this report, is available on the OECD web site (<http://www.oecd.org/ehs>).

If particular types of activities were not reported, either in response to the questionnaire or during the preparation of the Lead Monograph, this does not necessarily mean that such activities have not been undertaken.

The Lead Monograph should be consulted to obtain a more complete picture of some countries' lead risk management activities.

Structure and content of the report

This report is divided into two sections:

- A summary of responses by Member countries, the European Commission and industry. The responses are summarised in Tables 1-5.
- Annexes containing:
 - a tabular collation of the Member country and EC responses (Annex A);
 - a tabular collation of the industry responses (Annex B);
 - the Member country questionnaire (Annex C);
 - the industry questionnaire (Annex D);
 - the 1996 OECD Council Resolution and Ministerial Declaration (Annex E).

A. *Questionnaire Responses by Member Countries and the EC*

PART I -- LEVELS OF EXPOSURE

Human health monitoring

Most Member countries reported on blood lead level monitoring programmes for the general population and children, as well as for occupational exposure.

General population

The type and frequency of monitoring of blood lead levels in the general population varies among countries. Australia conducted a national review of public exposure to environmental lead in 1993. The purpose of this review was to establish a comprehensive database of exposure to environmental lead, and to allow an assessment of the extent of lead exposure in that country. Other countries monitor the general population's exposure to lead on an annual, biennial or triennial basis within a national framework for environmental health monitoring. The Czech Republic screens the general population for exposure to a number of pollutants (including lead) as part of its nation-wide Environmental Health Monitoring programme.

An overall decline in blood lead levels in the general population has taken place in OECD countries over the past two decades. This was attributed to the phase-out of unleaded gasoline and to other actions aimed at reducing exposure to lead. Exceptions to the downward trend in blood lead levels have occurred in areas adjacent to major industrial sources such as smelters.

Children

Monitoring children's exposure to lead is often a part of monitoring programmes for the general population. As in the general population, children's blood lead levels are frequently elevated if they live near major industrial sources. Poverty and living in old deteriorating buildings are other risk factors identified for children. France reported that tap water consumption is a main risk factor for lead exposure of children. In many parts of Mexico, high blood lead levels have been found in children whose meals were prepared using lead-glazed pottery.

Countries have a variety of programmes to address elevated blood lead levels in children. The Czech Republic reported that it was implementing a public health campaign on child lead exposure at an environmental hot spot near a secondary lead smelter. This entailed systematic supervision by public health authorities, including monitoring of lead in the environment, technological improvements at the smelter, and the extension of screening- or regime-based intervention. Turkey has carried out a project to determine lead concentrations in surface dust in play areas (e.g. parks and schools near major highways). Among other activities, the United States has sponsored a grant programme for state and local health departments concerned with blood lead level screening, especially of children determined to be at risk for lead exposure.

Workers

Monitoring occupational exposure to lead is the subject of regulation in countries that reported on activities in this area. Regulations typically stipulate levels of concern, monitoring requirements, and remedial

actions to be taken if levels of concern are exceeded. In Sweden, the frequency of medical examinations required for men and women over 50, and for women under 50, depends on their most recent blood lead level reading. For example, a woman under 50 whose blood lead level ($\mu\text{mol/litre}$) was above 1.5 in three consecutive tests would be suspended from work and only allowed to return when it fell below 1.2.

The United Kingdom recently implemented a regulation introducing tighter controls to protect the health of workers exposed to lead. Doctors responsible for medical surveillance of lead workers provide the Health and Safety Executive with a statistical return for the previous 12 months, indicating the number and gender of workers under surveillance, the lead sector where they are employed, the distribution of their blood lead measurements, and the number of persons suspended from work because their blood lead levels had reached the suspension level established by regulations. The Health and Safety Executive publishes summaries of this information in its annual Health and Safety Statistics.

Levels of exposure: environmental monitoring

Air

Most of the responding countries reported on air quality monitoring programmes. For instance, Japan conducts one day (24 hours) per month sampling with high-volume samplers at 23 national monitoring sites. Overall, ambient air lead levels in OECD countries generally did not exceed levels of concern (as set by national or international standards) except in areas adjacent to major industrial sources. Many countries have seen air lead levels fall dramatically. In Mexico, they averaged $1.26 \mu\text{g/m}^3$ in 1990 but had fallen to $0.22 \mu\text{g/m}^3$ by 1995. In Sweden, where air lead levels are very low since the almost total phase-out of leaded gasoline, measuring them has lost much of its usefulness.

Drinking water

Most countries reported on programmes or regulatory requirements for monitoring lead concentrations in drinking water. Monitoring regimes vary in sampling frequency, usually depending on the capacity of the drinking water plant or on previous monitoring results. They also vary according to sampling location (the plant and/or the consumer's tap) and sample type (first flush or after flushing).

In the UK, it is the responsibility of water companies to monitor for lead at the consumer's tap in accordance with regulations. Water samples must be taken from randomly selected properties, which may or may not have lead pipework. In the US, water samples must be taken from those homes most likely to have high lead levels at the tap (such as those served by lead service lines and/or containing lead or copper pipes with lead solder installed after 1982). Most countries reported that lead concentrations in drinking water are consistently below national or international standards. In the US, however, lead levels in the drinking water from approximately 25-30% of community and non-transient, non-community water systems exceeded levels of concern.

Food

Most countries reported on programmes to monitor lead levels in food. These are usually the responsibility of the agriculture or health ministry. Food samples are taken from both the food processing and food distribution chains. Small percentages of food samples were reported to exceed national or international standards, but they were not considered significant.

Other monitoring programmes

Countries reported on a number of programmes concerned with monitoring lead levels in soil, surface water, precipitation, marine waters and biota. These programmes were designed to meet countries' specific needs or to fulfil international obligations.

PART II -- DISTINCT RISK MANAGEMENT ACTIVITIES IN MEMBER COUNTRIES**Lead in gasoline**

By 1992, most Member countries had introduced programmes aimed at progressively phasing down the use of lead in gasoline. Leaded gasoline was phased out in 1993 by Austria, where positive effects have since been detected in soil. It was phased out in 1994 by Sweden (except for use by certain aircraft and military vehicles and in drag racing) and in 1995 by New Zealand. The EC developed a common position in 1997, with a view to total phase-out by 2005. Significant declines in the sale of leaded gasoline were reported in countries where both leaded and unleaded were available. A tool commonly used to encourage unleaded gasoline use is the application of a price differential. In some countries, regulations have been introduced that reduce the amount of lead permissible in leaded gasoline. Other initiatives include:

- Australia conducted a national campaign in 1994-95 to encourage drivers of pre-1986 cars to use unleaded gasoline if possible (all cars manufactured after 1985 were required by law to use unleaded gasoline).
- The Hungarian Oil Company (MOL Rt), which produces nearly 90% of the fuel sold in Hungary, decided in 1996 to produce gasoline without any lead additives from 1 January 1999.

Exposure of children

A number of countries reported on activities whose purpose is to minimise or eliminate the exposure of children to lead. Belgium has established a series of norms for lead content in (and migration from) toys. Canada reported the ongoing development of a national strategy to reduce unacceptable risks to children's health from exposure to lead in children's and other consumer products. Korea prescribes the lead content in paint and lacquer that are often used on toys, go-carts and baby carriages. New Zealand sets maximum lead levels for toys, crayons and water-colour paints. In the US, surveillance and monitoring programmes are in place to evaluate the lead content of products intended for use by children. The US also works with manufacturers to develop voluntary standards to reduce risk. It has collaborated with the makers of vinyl mini-blinds to eliminate lead from the vinyl formula.

In France, lead-based paint in the home is considered a main risk factor for children. Targeted screening of children (selected on the basis of individual risk assessment) has been carried out since 1992 with the objective of preventing their exposure to lead and reducing the harmful effects of elevated blood lead levels when these occur. Tap water consumption is also considered a main risk factor for lead exposure of children in France.

Exposure from food packaging

Several countries reported on activities aimed at minimising or eliminating lead exposure from food packaging. Belgium has standards for the content and migration of substances, including lead, in materials and objects destined to enter into contact with food. In Sweden, large wholesale dealers halted the import of lead-soldered tin cans in conformity with their own health and environmental policies. A US regulation of 1995 prohibits use of lead solder in the manufacture of cans intended for food packaging; this was followed in 1996 by a regulation that prohibits use of tin-coated foil capsules on wine bottles. The US is working with the candy manufacturing industry to end the use of lead print on candy wrappers.

Lead in paint

Several countries reported on activities whose purpose is to reduce or ban the use of lead in paint. Australia's Lead Abatement Taskforce has included an education campaign on health issues related to lead-based paint. The Swedish government is working with the Swedish Paint and Printing Ink Makers Association to phase out all uses of lead in paint, lacquer and rust-proofing agents. Use of lead oxide as a rust-proofing agent in Sweden decreased by 60% between 1988 and 1995; use of lead chromate and lead siccatives also decreased by 80-85%.

Ceramic ware and crystal ware

Several countries reported on activities aimed at restricting exposure to lead from ceramic ware and crystal ware. In Austria, maximum concentrations have been established for lead leaching from ceramic objects that come into contact with food. In 1998, Canada introduced new glazed ceramic and glassware regulations. In 1994, Mexico issued a standard prohibiting the use of lead in pottery by 1997; today a special seal indicates that ceramic products do not contain lead. The Swedish glass industry, which is working towards phasing out lead completely to comply with government regulation, voluntarily agreed not to use lead in manufacturing semi-crystal after 1991. It is testing alternative compositions for full lead crystal and plans to work for an amendment to the EU Directive on crystal glass, such that the quality label will designate physical properties rather than chemical composition. A US compliance policy of 1995 established new limits for leaching of lead from lead-glazed ceramic ware.

Lead shot and sinkers

Several countries reported that they had banned the use of lead shot to hunt waterfowl. In Belgium, lead shot is prohibited in regions identified under the RAMSAR Convention on Wetlands. In 1997, Canada banned the use of lead shot for hunting most migratory game birds within 200 metres of any watercourse or water body. As of September 1999, the possession and use of shot (other than the non-toxic kind) for the purpose of hunting most migratory game birds was prohibited throughout Canada. In Sweden's new Environment Bill, a total ban on the use of lead shot in hunting from the year 2000, and in short shooting from 2004, has been proposed.

Canada also prohibits the use and possession of small lead fishing weights (<50 grams) while fishing in National Wildlife Areas and National Parks. Sweden and the US are implementing programmes designed to increase awareness of risks to human health and wildlife from the use of lead shot and sinkers. The Swedish government is working with the Swedish Anglers' Association and the Swedish Fishing Waters' Proprietors Federation to phase out the use of lead weights in fishing. Sweden's National Chemicals Inspectorate and the Swedish Anglers' Association conducted an information campaign in 1993 and planned another one (together with the Swedish Fishing Waters' Proprietors Federation) in 1999. The US has proposed prohibiting the manufacture of lead fishing sinkers one inch or less in any diameter.

Drinking water

Several countries reported on activities intended to minimise exposure to lead from drinking water. France has implemented a regulation prohibiting use of lead pipes in new installations (since April 1995) and use of lead solder in new installations (since August 1997). France indicated that tap water consumption is a main risk factor for lead exposure of children. While Sweden sets limit values for lead concentrations in drinking water, and for the leaching properties of material in contact with the water, no special activities have taken place since 1992; there are few lead pipes in Sweden, and lead in drinking water is considered a minor problem. The US prohibits the use of lead pipe, solder or flux in the installation or repair of public water systems, residential plumbing, or a non-residential facility providing water for human consumption.

Occupational exposure

A number of countries reported on activities concerned with occupational exposure to lead. Maximum blood lead levels are usually stipulated by regulations, along with the scope of the medical surveillance programmes that should be implemented. Companies are committed to further reductions in the future. The EC is evaluating the limit values established in Directive 82/605/CEE concerning protection of workers from risks related to exposure to metallic lead and its ionic compounds at work, in accordance with new scientific data. The UK plans to evaluate the effectiveness of its new Control of Lead at Work Regulations 1998. Under this programme, workers' blood lead levels will be monitored from 1998/99 to 2000/01, the Regulations' effectiveness will be evaluated in 2001/02, and a proposal will be made (for consultation) to further tighten workplace controls to come into force by April 2003.

Emissions from major sources (air)

A number of countries and the EC reported on regulatory initiatives to manage and/or reduce air emissions from major sources. These usually involve setting emission limits for specific industrial sectors. Since 1992, Austria has had emission limits for the cement, founding, iron and steel, and non-ferrous metal industries. In 1993, Canada finalised negotiation of ARET (Accelerated Reduction and Elimination of Toxics) with industry and other stakeholders. By 1997, the Australian mining industry reported lead emission reductions of 67% compared with the base year - which varied between 1988 and 1993, depending on the availability of data. The companies have committed to further reductions in the future. EC countries, under the UN-ECE's Convention on Long-Range Transboundary Air Pollution (Protocol on Heavy Metals), are required to reduce total annual emissions of lead from point sources. They are also required to apply best available techniques to certain major stationary sources, as well as emission limit values or equivalent reduction strategies. Germany has a Federal Ordinance on limiting lead emissions from waste combustion plants (both old and new) in accordance with best available technology.

Historic use in buildings

Some countries indicated that they have activities related to the risks associated with historic use of lead-containing materials in buildings. In France, lead-based paint in the home is considered a main risk factor for children. While all paint manufacturers in New Zealand have voluntarily reduced lead levels as low as possible, renovation of old buildings formerly painted with lead-based paint remains an issue. The US Toxic Substances Control Act was amended in 1992 by Title X, which focuses on reducing the hazards of existing lead-based paint. The goal is to establish strategies, including public information programmes, to abate significant exposures from the historic use of lead-containing materials in buildings.

Recycling

Several countries reported on lead recycling activities which were focused on lead-acid batteries. In Canada, some retailers have voluntarily applied a CAD 5.00 deposit on new batteries of this type. In Germany and Switzerland, there is a legal requirement that battery manufacturers accept all the used batteries returned to them. There is also a requirement that Swiss consumers return used batteries. Charges on batteries levied in Hungary and Sweden are used to support recycling schemes.

Product and/or use regulation

There are many examples of the regulation of lead-containing products and of particular uses of lead such as:

- In Austria, there are restrictions on the lead content of fertilisers, as well as on the use of sewage sludge if the heavy metal content in either the soil or the sludge exceeds certain limits.
- In Denmark, a regulation on lead-containing products is under way. The draft regulation contains a general prohibition (with exemptions) on the sale of products containing lead substances. The sale of a range of specified products containing metallic lead is also prohibited. These prohibitions will take place in the period 1999-2003.
- A 1994 EU Directive is intended to ensure that the sum of concentration levels of lead, cadmium, mercury and hexavalent chromium in packaging and packaging waste do not exceed set levels.
- In 1994, Finland restricted the use of sewage sludge in agriculture if the heavy metal content in either the soil or sludge exceeds certain limits. The main objective is to reduce lead concentrations in fields, in order to prevent contamination of agricultural products.
- In Sweden, there are initiatives to phase out lead use in many products including cables, solder, light bulbs, cathode rays and keels.

Research/education

Several countries reported on research and/or education activities concerned with lead risk management. Public information campaigns in Australia and Canada (in the form of advertising or information provision) have increased community awareness of lead issues, especially health issues related to lead in paint. Canada has published fact sheets and produced videos on various aspects of lead risk through its National Environmental Health Programme. Hungary has a research programme to develop and implement a model initiative concerning environmental health. Its goal is to enhance awareness and provide training to various groups, helping them to recognise hazard more readily, assess it properly, and protect themselves against harmful effects. Japan is carrying out a research project on the effect of lead poisoning on waterfowl. Norway plans a research programme to assess the risk of lead exposure from food in the general population. If necessary, appropriate risk management activities will be initiated.

Ambient air

Several countries and the EC reported on activities related to lead levels in ambient air. In 1998, an Australian National Environment Protection Measure (NEPM) for Ambient Air Quality established an ambient air quality standard for lead of $0.5 \mu\text{g}/\text{m}^3$ averaged over one year, with no allowable exceedences. A proposed EU Directive establishes an annual limit value for protection of human health of $0.5 \mu\text{g}/\text{m}^3$ for lead, to be met by 1 January 2005 (with derogations around nominated industrial sites). Member States will

be required to prepare and implement detailed action plans designed to achieve the limit value by the attainment date. Finland set an outdoor air quality limit of $0.5 \mu\text{g}/\text{m}^3$ in 1996. Italy establishes attention and alarm limit values for several common air pollutants, including lead.

Water point sources

Some countries reported on activities aimed at reducing lead emissions to surface waters. In Austria, one general and 53 specific ordinances have been enacted for a number of different branches of industry; they contain emission limits for lead based on best available techniques. Germany has increased the cost of discharging noxious substances (i.e. wastewater that contains lead) to a water body, in order to strengthen the economic incentive for the polluter to purify wastewater using the best available technology

Table 2: Summary of monitoring programmes reported in countries' survey responses*

	Type of monitoring programme								
	Human health			Environmental					
	General population	Children	Worker	Air	Soil	Food	Drinking water	Biota	Other
Australia	X	X		X	X				
Austria	X	X	X	Z	X	XZ	X	Z ¹	Z ²
Belgium	Z ³	Z ³	X	X		X	X	X	X ¹ Z ⁴
Canada		XZ	X	X	XZ	X	X		
Czech Republic	X	XZ		X		X	X		
Denmark									
European Commission									
Finland	X	X	X	X	X	X	X		X ²
France	X	X				X	X		
Germany	X			X	X		X	X	
Hungary		X	XZ ⁵		X	X	X		Z ⁵ X ³
Ireland			X	X			X		
Italy	XZ ⁶	XZ ⁶	X	X ³ Z ⁵	XZ ⁵	XZ ⁷	X	XZ ⁷	XZ ⁷
Japan				XZ					
Korea	X		X	X	X	XZ	X		
Mexico	X	X	X	X					
Netherlands									
New Zealand			X			X	X		
Norway				XZ		X	X	X	X ⁴
Sweden		X	X	X		X			X ⁵
Switzerland			X	X	X	X	X		Z ⁸ X ⁶
Turkey	Z		Z	Z	Z		Z		
United Kingdom	X	X	X		X	X	X		
United States	X	X	X	X		X	X		X ⁷

* This table concerns the exposure monitoring programmes described in the questionnaire. Only countries that responded to the questionnaire are listed. The OECD Lead Monograph can be consulted for a further description of some countries' activities.

Note:

- X* Response provided in Part I of the questionnaire
- Z* Response provided in Part II of the questionnaire

- X*¹ Dust, aquatic emissions
- X*² Surface water
- X*³ Suspended dust
- X*⁴ Precipitation
- X*⁵ Moss
- X*⁶ Surface waters
- X*⁷ National Human Exposure Assessment Survey

- Z*¹ Spruce needles, moss
- Z*² Precipitation, game
- Z*³ General population, children
- Z*⁴ Marine
- Z*⁵ Large monitoring programme: air, dust, soil, children
- Z*⁶ General population, children
- Z*⁷ Venice, hygienic
- Z*⁸ Deer

Table 3: Summary of distinct risk management activities reported in countries' survey responses*

	Australia	Austria	Belgium	Canada	Czech Republic	Denmark	European Commission	Finland	France	Germany	Hungary	Ireland	Italy	Japan	Korea	Mexico	Netherlands	New Zealand	Norway	Sweden	Switzerland	Turkey	United Kingdom	United States
Lead in gasoline	X	X	X	X			X	X		X	X	X	X		X	X	X	X		X	X	X		X
Exposure of children		X	X	X									X		X	X		X		X				X
Exposure from food packaging			X										X				X		X	X				X
Lead in paint	X	X	X										X				X		X	X				X
Ceramic ware and crystal ware		X		X												X				X	X			X
Lead shot and sinkers			X	X				X					X							X	X			X
Drinking water		X							X				X					X		X	X		X	X
Occupational exposure		X	X				X	X				X	X		X						X		X	X
Emissions from major sources (air)		X		X			X			X			X	X	X						X			X
Historic use in buildings									X									X						X
Recycling				X						X	X		X							X	X			
Product and/or use regulation		X	X			X	X	X		X			X				X		X	X	X			
Research/education	X			X							X			X					X		X			
Ambient air	X						X	X					X		X						X			
Water point sources		X								X			X		X						X			

* This table concerns distinct risk management activities described in the questionnaire. Only countries that responded to the questionnaire are listed. The OECD Lead Monograph can be consulted for a further description of some countries' activities.

B. Questionnaire Responses by Lead Producing and Using Industries

PART I -- LEVELS OF EXPOSURE

Human health monitoring

The companies that responded to the questionnaire reported carrying out medical surveillance of their employees as a regulatory requirement. Most stated that the frequency of monitoring a particular employee varied depending on previous blood lead level; the higher the previous reading, the more frequently the employee was monitored. Asarco, Cominco and Pasmenco reported either conducting a general population monitoring programme in the vicinity of their plants or, alternatively, funding monitoring programmes run by local health authorities. The International Lead Management Center assists companies and governments in designing and implementing monitoring programmes.

Environmental monitoring

Almost every company indicated that it monitored lead levels in air and water; this was less true for soil.

PART II -- DISTINCT RISK MANAGEMENT ACTIVITIES BY THE LEAD INDUSTRY

Education/information exchange

Education and information exchange activities were the focus of lead risk management activities of the responding lead industry associations. The target audiences were consumers, industry and the medical profession. Specific examples include:

Consumers

The Coalition for Safe Ceramic Ware developed a brochure, "The Consumer's Guide to Safety, Beauty and Satisfaction with Dinnerware", and distributed it to retailers. The brochure described how to minimise the potential for lead release from dinnerware, and how to obtain test values for particular patterns. The objective of this initiative was to furnish retailers with information they could use to respond to consumer inquiries.

Industry

The Lead Industries Association provides videos to downstream lead users and hobbyists on lead exposure reduction. It also disseminates printed material and videos to lead producing and using companies for worker education efforts aimed at reducing lead exposure.

The Battery Council International sponsors a two-day programme to discuss the latest advances in environmental engineering and health and safety issues. The objective is to provide up-to-date information on occupational health and environmental protection.

Since 1991, the International Crystal Federation has sponsored ten technical exchange conferences dedicated to sharing information on techniques for reducing lead release from crystal, and on methods for reducing environmental and workplace exposure to lead. The conferences are designed to disseminate knowledge on state-of-the-art manufacturing methods, and on controls aimed at reducing potential lead exposures attributable to the manufacture and use of crystal tableware articles.

The International Lead Management Center provides general support services in response to industry, governmental, academic and general public inquiries. These include arranging consultations with qualified experts, providing speakers for workshops and symposia, and offering access to ILMC information archives. There is a visitor exchange programme for individuals who want to learn more about the Center or about specific lead risk reduction issues: they can visit the ILMC or its member companies for training and/or consultation. Information about the ILMC is also available through a web site, brochures and newsletters. Materials are available in English, Spanish and Russian. A recent initiative concerns dissemination of information on the phase-out of lead in gasoline. The ILMC has developed issue papers on phase-out strategies, an annotated bibliography that will serve as a guide to technical resources, information packages on engine technology, refinery technology and fuel stocks, and an information clearinghouse on lead in gasoline.

Medical

The Lead Development Association International runs educational seminars for doctors, industrial hygienists and company managers. The objective is to teach them about new or existing legislation, in order to help reduce blood lead levels at the workplace and reduce emissions to the environment.

The Lead Industries Association has produced a booklet, "Lead and Your Health", and distributed it to urban health clinics. It is designed to make free information on lead exposure available to low-income urban parents.

Recycling

Four companies and two industry associations reported recycling initiatives or activities. Examples include:

- The Battery Council International provides an in-depth study and report on lead-acid battery collection and recycling in the US every year. This report is used to evaluate the success of its lead battery collection and recycling programme.
- Cominco processes scrap battery materials and other lead wastes. The battery system includes a government organised and regulated collection system, an off-site independent breaker that furnishes Cominco with lead metallics, paste and waste acid, and a smelter operation in which lead is reprocessed. The objective of this programme is to process waste batteries collected in British Columbia and elsewhere.
- The International Lead Management Center, in co-operation with UNCTAD, has been working with the major lead-acid battery recycling industries to assess current performance and identify strategies that can lead to improved environmental performance.

Technology/product development

Five companies reported technology and/or product development initiatives aimed at reducing or eliminating lead emissions from their plants or in their products. Asarco has developed a number of lead-free products that could offer alternatives to traditional lead products. These include a lead-free alloy to replace lead in brass, bismuth tin shot to replace lead shot, and an assay grade bismuth oxide that could be used as a non-toxic alternative to lead oxide. Hadeland Glassverk has a long-term goal of eliminating lead from its crystal. The Doe Run Company has reduced lead and zinc losses to slag through process improvements. In Mexico, the National Artisans Fund (Ceramics) and the Metallic Cans National Association have developed processes that eliminate lead use in these products.

Occupational exposure

The Lead Industries Association initiated a voluntary occupational health and safety programme whereby 43 companies, including Asarco, volunteered to participate in a five-year programme to lower workers' blood lead and return levels. In 1997, the programme's first year, 24 more workers were removed from the workplace, and 12% less had blood lead levels above 40 µg/dL, as compared to 1996. Britannia Zinc participates in a similar voluntary programme whose aim is for all employees to have a blood lead level below 40 µg/dL by the year 2000. Cominco is implementing a lead exposure management initiative through its Trail Operation's Health Protection Programme. This programme was developed as a unique partnership among Cominco, union representatives, and workers compensation officials.

Environmental Management Systems

Five companies reported implementing Environmental Management Systems (EMS) or, alternatively, emission abatement measures at their facilities. At its Missouri plant, Asarco installed additional controls at its smelter to control air emissions; at its East Helena plant, it enclosed buildings, constructed baghouses and implemented process improvements to capture lead emissions more effectively. The Johnson Controls Battery Group is implementing ISO 14001. Met-mex Peñoles and Penarroya Oxide are implementing a variety of monitoring programmes.

Performance standards

The Coalition for Safe Ceramic Ware and the International Crystal Federation reported on activities related to performance standards. In 1998, the Coalition for Safe Ceramic Ware adopted a voluntary standard of 4 ppm for leachable lead in the lip-rim area of ceramic cups and mugs. The International Crystal Federation adopted voluntary lead release limits for its members' products that were only a fraction of those in ISO 7086.

Partnerships

Asarco and Cominco provided information on community or government partnership activities. At its smelter in Trail, British Columbia, Asarco implemented a co-operative and comprehensive programme to manage exposure risk and develop risk reduction remedial strategy through a multi-stakeholder, community-based task force. At its East Helena plant, it initiated a residential soil removal project whereby the soil is removed if soil lead is >1000 ppm and a child of six years of age or less lives at the residence in question. Asarco also participated in the US EPA's 33/50 Programme. It committed itself to a 30% reduction, by 1995, of air and water emissions of 17 target chemicals including lead and lead compounds.

The International Lead Management Center has several pilot programmes under way: i.e. regional demonstration projects in which ILMC staff work with stakeholders (industry, government, academia and

environmental interests) on a voluntary basis to design and implement risk management programmes. The focus and scope of individual programmes is determined by the stakeholders that requested ILMC assistance. Active programmes are in place in the Philippines and Mexico. Implementation of a pilot programme in Russia was pending at the time of the survey, and efforts were scheduled for India in mid 1999.

Table 4: Summary of monitoring programmes reported by industry

	Type of industry	Geographic region	Medical Surveillance		Environmental Monitoring			Other			
			Occupational exposure	General population	Air	Water effluent	Soil	Continuous monitoring	EMS	Control air emissions	Dispose of lead containing residues
Asarco Inc	Mining Smelting Refining High-purity metals and specialty compounds	North America	X	X	X	X	X	No	Yes ¹	Yes	Yes ²
Britannia Refined Metals Ltd	Smelting Refining Recycling	England	X		X	X		Yes	Yes	Yes	Yes
Britannia Zinc Ltd	Smelting	Bristol, UK	X								
Cominco Ltd	Mining Smelting Refining Recycling Integrated zinc-lead operation with many co-products of metal and chemicals, fertilisers	British Columbia, Canada	X	X	X	X	X	Yes	Yes	Yes	No
The Doe Run Company	Mining Smelting Refining Recycling Fabricated products	Missouri, Arizona, Washington, Peru	X		X		X	No	Yes	Yes	Yes
Elf Atochem	Manufacture of rigid and flexible PVC compounds (granules and powders)	7 locations in 5 Western European countries	X					No	No	No	Yes
F.X. Nachtmann GmbH	Crystal ware	Germany	X		X	X		No	No	Yes	Yes

Glassexport Co Ltd		Czech Republic									
Hadeland Glassverk	Smelting Crystal ware	Norway	X					No	Yes	No	
International Lead Management Center	Not-for-profit organisation	Global	X ¹	X ¹	X ¹	X ¹	X ¹		X ¹		
Johnson Controls Battery Group, Inc	Battery manufacturing	US	X		X	X	X	No	Yes	Yes	Yes
Metallic Cans	Metal cans	Mexico									
Met-mex Peñoles	Smelting Refining		X		X	X	X	Yes	No	Yes	Yes
National Artisans Fund	Ceramics	Mexico									
Pasminco Ltd	Mining Smelting Refining Recycling	Australia	X		X	X	X	Yes	Yes	Yes	Yes
Penarroya Oxide	Lead oxide		X		X	X		No	No	Yes	Yes

¹ Being put in place at the time of the survey

² Except at Sweetwater and Westfork

X¹ ILMC assists companies in designing programmes and, where necessary, conducts surveillance/monitoring.

Table 5: Summary of distinct risk management activities reported by industry

	Company name											Industry association											
	Asarco Inc.	Britannia Refined Metals Ltd	Britannia Zinc Ltd	Cominco Ltd	The Doe Run Company	Elf Atochem	FX Nachtmann GmbH	Glassexport Co. Ltd	Hadeland Glassverk	Johnson Controls Battery Group Inc	Met-mex Peñoles	Pasminco Ltd	Penarroya Oxide	American Industrial Hygiene Association	Battery Council International	Coalition for Safe Ceramic Ware	International Crystal Federation	International Lead Management Center	Lead Development Association International	Lead Industries Association Inc	Metallic Cans National Assoc.	National Artisans Fund	
Education/information exchange																							
Recycling				X	X	X								X	X		X	X	X				
Technology/product development	X				X				X						X			X			X	X	
Occupational exposure	X		X	X														X				X	
Environmental Management System	X			X						X	X		X					X					
Performance standards																X	X	X					
Partnerships	X			X														X					

X¹ Provides technical material and policy guidelines

ANNEX A

COLLATION OF OECD MEMBER COUNTRY RESPONSES

Please note:

Questionnaires were divided into two parts: “Part I: Levels of Exposure” and “Part II: Description of Distinct Activities”. A few respondents did not fill in both parts.

Some respondents (both in Member governments and in industry) attached appendices, brochures, and other pertinent material.
No attempt has been made to extract information from any of the attached material for inclusion in the report.

Respondents were given the opportunity to review the information in this report and submit changes or comments previous to publication.

Australia

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Surveys of blood lead concentration are employed as a useful surrogate for measuring community exposure to lead. In 1993, a national review of public exposure to lead in Australia was conducted to establish a comprehensive database of studies of Australian exposure to environmental lead, and to allow an assessment of the extent of lead exposures around the country. The review focused on non-occupational exposures to inorganic lead in children under the age of four years. The findings of the review suggested that there might be up to 630,000 children (with a lower estimate of 310,000) in Australia under the age of four years with blood lead levels greater than or equal to 10µg/dL. Children living in towns with smelters were identified as being in the highest exposure category.</p> <p>In 1993 the National Health and Medical Research Council (NHMRC) revised its 1979 (and 1987) blood lead level of concern, of 25µg/dL, and recommended a blood lead goal of less than 10µg/dL for all Australians. It recommended that the first target for achieving this goal should be a reduction of lead in all Australians to less than 15µg/dL by the end of 1998. Because of the increasing evidence of adverse effects on children, the NHMRC identified a particular urgency in reaching this level in children aged one to four, and recommended that 90% of all children in this age group have blood lead levels of below 10µg/dL by 1998.</p> <p>In 1995 the Australian Institute of Health and Welfare conducted a national random survey of lead in 1,575 Australian children on behalf of the Commonwealth Government. The survey found that 92.7% of children had blood lead levels of less than 10µg/dL. The NHMRC's first target of having 90% of children under the lead limit by 1998 was met ahead of schedule.</p>

Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>In June 1998 a National Environment Protection Measure (NEPM) for Ambient Air Quality was agreed by Australia’s Environment Ministers meeting as the National Environment Protection Council (NEPC). This NEPM established a set of national ambient air quality standards for the six core atmospheric air pollutants: carbon monoxide, nitrogen dioxide, photochemical oxidants (such as ozone), sulfur dioxide, particles as PM₁₀ and lead.</p> <p>The standard for lead contained in the NEPM for Ambient Air Quality is 0.5µg/m³ averaged over one year, with no allowable exceedences. Lead sampling must be carried out for a period of 24 hours at least every sixth day, and must be measured on Total Suspended Particles (TSP) or its equivalent.</p> <p>The NEPM for Ambient Air Quality includes a requirement for monitoring, and each jurisdiction must submit a report on its compliance in an approved form to the NEPC by the 30 June following each reporting year (calendar year). The report must include reasons for any exceedences and a statement of progress towards achieving the goal. Monitoring methods used must be the Australian Standard Methods or internationally recognised methods, as specified in the NEPM for Ambient Air Quality. Jurisdictions have three years from commencement to put in place suitable infrastructure with which to undertake monitoring of all six ambient air pollutants.</p> <p>Known areas of concern in terms of lead emissions from broad scale sources (for example, smelters, mining operations, and waste incinerators), or localised sources (such as secondary lead processing and manufacture of lead products), are monitored by the State, Territory or Local Government responsible.</p> <p>Lead levels in soils will be addressed via a National Environment Protection Measure for Contaminated Sites, which is currently under development.</p> <p>Details of the NEPMs may be downloaded from the NEPC web site at www.nepc.gov.au.</p>

Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>In 1979 the NHMRC recommended an ambient air quality goal for lead of $1.5\mu\text{g}/\text{m}^3$ based on a three month average; it was adopted Australia wide, and was consistent with the United States standard set in 1978. This standard has now been reduced, as part of the NEPM for Ambient Air Quality, to $0.5\mu\text{g}/\text{m}^3$ averaged over a one year period and reported as a fraction of total suspended particles (TSP), and is in line with the European Commission.</p> <p>While exceedences of the 1979 NHMRC goal were detected in heavy traffic in most major cities prior to the late 1980s-early 1990s, lead levels in urban areas have declined significantly in the past five to ten years, as a result of decreases in mobile source emissions (see Part II). Current monitoring (three month average) indicates that with respect to metropolitan areas, ambient lead levels are generally below $1.0\mu\text{g}/\text{m}^3$ and falling, and that in the capital cities they are already below $0.5\mu\text{g}/\text{m}^3$. Monitoring indicates that levels in major urban areas continue to decline and together with declining sales of leaded petrol, levels are expected to become negligible and meet the new target in most parts of Australia over the next decade. This reflects the success of programmes to reduce lead emissions from motor vehicles (see Part II).</p> <p>At present, exceedences continue to occur adjacent to major point sources, in particular lead smelters in Port Pirie in South Australia and Boolaroo in New South Wales, where airborne lead levels may be as high as $10\mu\text{g}/\text{m}^3$ immediately adjacent to the smelter.</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>See response to Part II.</p>

Australia

Part II: Description of Distinct Activities

PHASE-OUT OF LEADED FUEL/ALTERNATIVE FUELS/MANAGING POINT SOURCE EMISSIONS/EDUCATION	
Main elements	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	<p><u>Introduction of unleaded petrol</u></p> <p>In urban areas in Australia about 90% of atmospheric lead comes from emissions from motor vehicles using leaded petrol (LP), and the Commonwealth Government has been active in implementing strategies to address this issue over recent years.</p> <p>Unleaded petrol (ULP) was introduced in Australia in July 1985, coupled with the requirement for its use in all post-1985 cars. All post-1985 cars were also required to be fitted with exhaust catalytic converters in order to meet the emission requirements of Australian Design Rule 37/00. This had the benefit of progressively removing motor vehicles as a source of airborne lead. The turnover of Australia's motor vehicle fleet has meant that lead from motor vehicle sources has been progressively reduced over the last decade, and in the near future lead will no longer be an urban air quality issue except where other sources, namely industrial sources, exist.</p> <p>Other strategies used to encourage a change to ULP from LP include the following:</p> <ul style="list-style-type: none"> • a price differential of 2 cents per litre (which is still maintained), introduced in 1994; • a requirement that ULP nozzles are of a smaller diameter than LP nozzles, and that fuel filler inlet restrictors be installed on cars post-1985 to prevent LP nozzles from being inserted and ensure that only ULP is used in cars fitted with catalytic converters; • a mandate that service stations sell ULP as well as LP; and • a national campaign run in 1994-1995 to encourage drivers of pre-1986 cars to use ULP if their car could run on it.

Reduction of lead in leaded petrol

In addition, lead emissions from motor vehicles have been progressively reduced by reducing the lead content of LP. This has resulted in a significant decline in lead emissions from motor vehicles, so that in 1996 the actual average levels of lead in LP were half of the 1993 levels.

Phase-out of leaded petrol

According to the Australian Bureau of Statistics, sales of LP have steadily declined across Australia, with 14,772 megalitres sold in 1980 and 7,542 megalitres sold in 1995. LP now accounts for less than 40% of all petrol sold in Australia, and industry predictions are that by 2003-2005 LP will no longer be commercially viable in Australia, even without further Government intervention. It is anticipated that a mandatory phase-out date for LP will be set following a review of Australian fuel quality due to be completed in 1999.

Introduction of new Australian Design Rules and new fuel specifications

In 1986 Australia introduced ADR 37/00 for passenger and some light commercial spark ignition (petrol) vehicles. ADR 37 was equivalent to US 75 emission controls and required the introduction of unleaded petrol to enable the use of catalyst technology. In 1997, ADR 37/01 was introduced, which brought vehicle emission requirements in spark ignition vehicles in Australia in line with US 1993 standards. These emission levels were achieved through careful refinements of engine management parameters.

No diesel vehicles are manufactured in Australia. Emissions from imported diesel vehicles had been regulated through ADR 30, which controlled visible smoke. In June 1996, ADR 70/00 was introduced to regulate gaseous and particulate emissions from diesel vehicles. These controls were equivalent to diesel standards applying in Europe, the US and Japan.

The Motor Vehicle Environment Committee (MVEC) is currently reviewing ADR 37 for spark ignition vehicles and ADR 70 for diesel vehicles, and proposing to align emission standards to those applying in Europe.

	<p>Changes in vehicle technology will require fuel standards to be specified more tightly. Introduction of ADR 37/02 may require increased availability of 95 RON unleaded petrol to operate vehicles complying with EURO II. Currently, this grade of petrol only has about 3% of the market and is sold at a significantly higher price than 91 RON unleaded petrol. Diesel with a maximum of 500 ppm sulfur will also be required to ensure diesel vehicles comply with EURO II. Environment Australia is funding a comprehensive review of possible new fuel specifications for Australia, designed to reduce emissions of greenhouse gases and air pollutants from Australian road transport, over the next year. The project will assess the impact on Australian refineries, vehicle manufacturers, consumers and the economy-wide effects of changing fuel specifications for petrol and diesel, as well as analyse impacts on air pollutants and greenhouse emissions.</p> <p>Several strategies are in place which are progressively reducing the environmental impacts of new motor vehicles. The introduction of new Australian Design Rules (ADRs) and initiatives by motor vehicle manufacturers have led to the development of motor vehicles which are more fuel efficient and which have more effective emissions management systems than their predecessors.</p> <p><u>Regular servicing of the motor vehicle fleet</u></p> <p>Environment Australia supports the regular servicing and tuning of vehicles, according to the manufacturers' specifications, and the development of mandatory in-service testing of motor vehicles, as these actions can lower emissions from motor vehicles.</p> <p><u>Alternative fuels</u></p> <p>The use of alternative fuels is being actively encouraged in Australia. Funding has been committed by the Commonwealth Government to facilitate infrastructure for compressed natural gas refueling networks in urban areas. The lack of such facilities has been identified as a major problem in encouraging the uptake of compressed natural gas as a cleaner replacement for traditional fuels.</p>
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Management of point source emissions

Management of point source emissions of lead has focused on reductions in process emissions through regulatory based particulate emission programmes and improvements in handling and storing of lead to address fugitive emissions.

In 1993, Canada finalised the negotiation of Accelerated Reduction and Elimination of Toxics (ARET) with industry and other stakeholders. By 1997, the mining industry had reported lead emission reductions of 67% compared with the base year - which varied between 1988 and 1993, depending on the availability of data on each company facility prior to 1993.

Lead Abatement Taskforce

In 1994, the Commonwealth Government, through Environment Australia, launched a national public education campaign to raise awareness of lead issues within the community. The programme ran for two years and focused mainly on health issues related to lead based paint, as well as educating the public about switching to ULP where possible. Although the campaign has now wound down, the issue still generates a lot of public interest, rating as the second most frequently asked after topic with the Department's Community Information Unit.

The main elements of the programme were to:

- answer general queries from the public via a toll free hotline (this is still operational);
- alert people to the health effects of lead;
- provide people with an opportunity to determine the lead level of paints using a test kit available from paint shops;
- alert both professional painters and householders to the health risks of disturbing old lead based paint present in many older homes, and educate them about the safety measures required to remove or stabilise flaking paint;
- determine accurate indications of blood lead levels of children across the country via a national survey; and
- encourage owners of pre-1986 cars to switch from LP to ULP where possible.

Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programmes described above?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	

Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>The Director Air Quality Section Environment Australia GPO Box 787 Canberra ACT 2601</p> <p>Telephone: + 61 2 6274 1890 Facsimile: + 61 2 6274 1172</p>

Austria

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Biological monitoring of lead exposed workers regulated by Workers Protection Act. Every worker who is exposed to lead, lead fumes, dust or lead compounds has to undergo a medical observation in advance of taking up his post and then regularly. Survey methods: general medical and neurological examination, several parameters in blood and urine. Medical reports and results are distributed to local authorities. See also Part II.</p> <p>Investigations of blood lead levels and other biomarkers of exposure in the general population or in children are conducted occasionally. At the time there are plans for an investigation of lead in breast milk in Vienna. See also Part II.</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>In soil, air, water, food, drinking water (see Part II).</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>In some cases, levels of lead in blood of workers exceed international standards. There are actions which follow in such a case, e.g. workplace evaluation, examination of protective equipment. Limits in environmental media in most cases fall below. See Part II.</p> <p>Blood lead of children in Carinthia (area of Arnoldstein) exceeded levels of concern 1992 and 1994. These levels changed for the better in 1998 as a result of actions taken to reduce exposure to and releases of lead. See Part II.</p>

Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	Lowering of Maximum Workplace Concentration value for tetramethyl lead and tetraethyl lead from 00.1 mg/m ³ air to 0.005 mg/m ³ is proposed. Further decrease of lead emission levels by industry. Increase of hygiene awareness.

Austria

Part II: Description of Distinct Activities

EMISSIONS FROM MAJOR SOURCES	
Regulations concerning emissions from point sources to air; monitoring of air pollution	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Ordinances to laws governing trade and industry regulations for specific branches of industry to fix maximum permissible emissions or - in general – state of the art techniques.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Limits for specific branches of industry (newly established Ordinances since 1993): <ul style="list-style-type: none"> • Cement industry: 1 mg/m³ Pb + As + Co + Ni + their compounds; • Founding industry: 5 mg/m³ Pb + Cr + Cu + Mn + V + Sn + their compounds at a mass flow of 25g/h or more; • Iron + steel industry: 5 mg/m³ Pb + Cr (except Cr VI) + Cu + Mn + V + Sn + their compounds; • Non-ferrous metal industry: 5 mg/m³ Pb + Cr (except Cr VI) + Cu + Mn + V + Sn + their compounds.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Mentioned here are ordinances established since 1993. NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Air quality is regularly monitored. According to Air Pollution Act 115/1997, the limit for long-term protection of human health annual average in dust for lead is 0.001 mg/m ³ . CORINAIR Report of the Federal Environment Agency R139/1997: Estimation of Heavy Metal Emissions in Austria.
Programme results	
What are the results of the monitoring programme(s) described?	Lead emissions were estimated with CORINAIR 94; total amount of lead emissions: 24,293 kg.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	

Further information	
Who can be contacted for more information?	<p>Dr. Waltraud Petek Federal Ministry of Environment, Youth and Family Department I/1 Stubenbastei 5 A-1010 Vienna</p> <p>Telephone: +43 1 515 22-2123 Facsimile: +43 1 515 22-7122 E-mail: waltraud.petek@bmu.gv.at</p>

PRODUCT AND/OR USE REGULATION	
Reduction of lead content in industrial fertilisers and limits for lead content in sewage sludge and compost	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Prescribe lead content in organic and inorganic fertilisers and lead loading (g/ha/y) through Fertilisers Act 513/1994 and Fertilisers Ordinance 1007/1994.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>Reduction of lead entering farmland through limits on content for different kinds of fertilisers:</p> <ul style="list-style-type: none"> • 100-150 mg/kg dry substance • loading limits: farmland: 1250 g/ha/2y • meadowland, fruit + vegetable growing: 625 g/ha/2y <p>Eleven years after Ordinance 1007/94 came into effect (i.e. 2005), the following limits will be valid:</p> <ul style="list-style-type: none"> • farmland: 625 g/ha/2y • meadowland: 315 g/ha/2y
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1994 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Within the framework of fertiliser control monitoring of lead content in composts in 1995 at 42 sites: results (mg/kg): min.: 14.0; max.: 209.0; mean value: 71.5. A report is under preparation.
Programme results	
What are the results of the monitoring programme(s) described?	<ul style="list-style-type: none"> • Average lead content of different commonly used industrial fertilisers: 0.9-31 mg/kg • Spot check samples of dung/liquid manure: 3.7/3.4-5.2/4.6 mg Pb/kg dry substance • Estimated average loading through fertilisers: 12.33 g/ha/y (1993/94) • Estimated entire loading through industrial fertilisers: 1869 kg/y (1997).
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	

Further information	
Who can be contacted for more information?	<p>Dipl. Ing. Dr. Michael Dachler Federal Agency + Research Centre for Agriculture Spargelfeldstraße 191 A-1226 Vienna</p> <p>Telephone: +43 1 288 16-3159 Facsimile: +43 1 288 16-5194 E-mail: mdachler@bfl.gv.at</p> <p>Dr. Wilgelm Vogel Federal Environment Agency Spittelauer Lände 5 A-1090 Vienna</p> <p>Telephone: +43 1 313 04-3550 Facsimile: +43 1 313 04-5400 E-mail: vogel@uba.ubavie.gv.at</p>

ENVIRONMENTAL MONITORING Lead in spruce needles	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Samples from 24 sites.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Within the framework of an investigation of persistent organic pollutants, <i>inter alia</i> lead content in spruce needles was analysed.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1993 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Dr. Wilgelm Vogel Federal Environment Agency Spittelauer Lände 5 A-1090 Vienna</p> <p>Telephone: +43 1 313 04-3550 Facsimile: +43 1 313 04-5400 E-mail: vogel@uba.ubavie.gv.at</p>

PRODUCT AND/OR USE REGULATION	
Control of lead content in food, drinking water, cosmetics and items of practical use	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Working out levels of concern in food, regular publication.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Examples of levels of concern in food (mg/kg or mg/l): milk: 0.03; infant food: 0.03-0.25; vegetables: 0.1-0.3; freshwater fish: 0.1; fruits: 0.2; honey: 0.25; grains: 0.3-0.5; meat: 0.25; entrails: 0.5; sea food: 0.5-0.8; limit for drinking water: 0.05mg/l.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Current version: 1998 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Regular investigation of food and drinking water. Special investigations with main focus on certain parameters, e.g. lead.

Programme results	
What are the results of the monitoring programme(s) described?	Limits are exceeded only in isolated cases.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Dr. Grossgut Federal Institute for Food Control and Research Kinderspitalgasse 15 A-1090 Vienna</p> <p>Telephone: +43 1 404 91-547 Facsimile: +43 1 404 91-540</p>

ENVIRONMENTAL MONITORING	
Biomonitoring of lead deposition in moss	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Monitoring of atmospheric heavy metal deposition, with mosses serving as bioindicators - part of a European project initiated by the Nordic Council of Ministers.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Nation-wide assessment of heavy metal deposition - 220 monitoring sites (2.5 per 1000km ²).
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1990/91 1995
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	At 30 of the monitoring sites samples were already taken in 1991; compared with the samples of 1995, a 44% reduction of lead deposition can be detected.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Mag. Alarich Riss Federal Environment Agency Spittelauer Lände 5 A-1090 Vienna</p> <p>Telephone: +43 1 313 04-3650 Facsimile: +43 1 313 04-5400 E-mail: riss@uba.ubavie.gv.at</p>

ENVIRONMENTAL MONITORING	
Lead content in precipitation	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Project: harmful chemicals and precipitation.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	10 monitoring sites, WADOS method.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1991 1998
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	Report is in preparation. No trend can be detected over the years.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Dr. Wilgelm Vogel Federal Environment Agency Spittelauer Lände 5 A-1090 Vienna</p> <p>Telephone: +43 1 313 04-3550 Facsimile: +43 1 313 04-5400 E-mail: vogel@uba.ubavie.gv.at</p>

ENVIRONMENTAL MONITORING	
Lead levels in soil	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Inventory of condition of soils (monitoring programme carried out by each province, covering the entire area of Austria, since 1986; current version: 1993). Inventory of condition of forest soils (also covering the area of Austria, 1992). Levels of concern for farmland.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Get information about condition of soils in Austria. Level of concern for farmland: 100 mg/kg Suspected anthropogenic influence: 50 mg/kg
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	See particular case. NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	<p>Work has already started on the establishment of a soil information system (BORIS) in order to standardise the methods of the soil condition inventories. At the time there are data available on 9000 samples from 3000 locations.</p> <p>Particular case studies:</p> <ul style="list-style-type: none"> • Heavy Metals in Soils in the Region of Arnoldstein (1993, metal smelting works since 15th century, Monograph No. 33, Federal Ministry of Environment, Youth and Family) • Clay pigeon shooting – effects on the environment (1995, Federal Environment Agency, Salzburg) • Investigation of soil on children's playgrounds (1997, Amt der Salzburger Landesregierung)
Programme results	
What are the results of the monitoring programme(s) described?	<p>BORIS: 757 samples are above 100 mg/kg</p> <p>Increased lead content is especially found in forest soils and areas influenced by traffic; transboundary pollution plays a considerable role.</p> <p>Positive effects originating from the ban on leaded gasoline (phased out in 1993) can already be seen.</p>
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Dr. Wilgelm Vogel Federal Environment Agency Spittelauer Lände 5 A-1090 Vienna</p> <p>Telephone: +43 1 313 04-3550 Facsimile: +43 1 313 04-5400 E-mail: vogel@uba.ubavie.gv.at</p> <p>HR Univ. Doz. Dr. Otto Danneberg Federal Agency + Research Centre for Agriculture Spargelfeldstraße 191 A-1226 Vienna</p> <p>Telephone: + 43 1 288 16-2000 Facsimile: + 43 1 288 16-5194 E-mail: odanneberg@bfl.gv.at</p>

PRODUCT AND/OR USE REGULATION	
Waste classification	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Ordinance 227/1997 on the classification of hazardous wastes. Ordinance 164/1996 on the assignment of wastes to different types of waste disposal sites.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Wastes with a lead content lower than 10 000 ppm can be removed from the range of hazardous wastes. There exist eight categories of waste disposal sites for which different lead contents (between 1.0 and 3000 mg/kg Pb) are suitable.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	See above NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Mag. Franz Mochty Federal Ministry of Environment, Youth and Family Affairs Stubenbastei 5 A-1010 Vienna</p> <p>Telephone: + 43 1 515 22-3536 Facsimile: + 43 1 515 22-3003 E-mail: franz.mochty@bmu.gv.at</p>

WATER POINT SOURCES	
Limitation and control of lead in wastewater discharge	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>General ordinance on limitation of wastewater emissions 186/1996: 0.5 mg/l.</p> <p>Special limitations for certain branches of industry (53 ordinances in the years 1992-99): 0.1-0.5 mg/l.</p> <p>Introduction of best available techniques in wastewater treatment through amendment of Water Act 1990.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>Limitation of lead in wastewater discharge.</p> <p>The emission ordinances contain certain transition periods (usually five years) for the adaptation of existing installations to the prescribed emission standards.</p>
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	<p>Within the framework of state-managed water quality control, lead is monitored four to six times per year in running water and ground water. The network of monitoring stations contains 244 stations for running water and 2000 for ground water. In running water, lead is also monitored in sediment.</p>

Programme results	
What are the results of the monitoring programme(s) described?	Detailed results are shown at http://www.ubavie.gv.at - State of the environment in Austria. Limits generally fall below.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Min. Rat Dipl.-Ing. Tomek Federal Ministry of Agriculture and Forestry Department IV/A/1 Marxergasse 2 A-1030 Vienna Telephone: + 43 1 714 09 50-17 Facsimile: + 43 1 714 09 50-30

ENVIRONMENTAL MONITORING Game	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Monitoring the lead content in liver and kidneys of chamois, red deer, roe deer and smaller game animals.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To get general information on lead levels in the living environment. To be able to compare data in different regions, especially with respect to pollution through transit routes, in order to see the long-time development.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Further investigation will be necessary to prove the effects that have originated from the ban on leaded gasoline.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Univ. Prof. Dr. Frieda Tataruch University of Veterinary Medicine Research Institute of Wildlife Ecology Savoyenstraße 1 A-1160 Vienna Telephone: + 43 1 489 0915-0 Facsimile: + 43 1 489 0915-59 E-mail: fiwi@vu-wien.ac.at

OCCUPATIONAL EXPOSURE	
Protection of lead exposed workers; monitoring of workers' lead blood levels	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Routine programme in workers exposed to lead and lead compounds established according to Act on Protection of Workers (new version 1997). These medical examinations are specified in the Ordinance (27/1997) on Health Control at the Workplace. For juvenile male workers, female workers and juvenile female workers there exist different gradations of restrictions and bans. Work with lead and its compounds is prohibited also for home workers.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Individual protection of lead exposed workers, reduction and control of exposure, progress in occupational health care, improvement of workplace conditions. Maximum Workplace Concentration: 0.1 mg/m ³ .
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Updated 1997 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	A first medical investigation is made before a worker can start work with lead or its compounds. This investigation (consisting of a general medical examination, an examination of the neurological status and nine specific parameters in blood and urine) is repeated every six months; in special cases this interval is shorter.
Programme results	
What are the results of the monitoring programme(s) described?	In 7-10% of investigations blood lead levels are exceeded, but this number is declining. The number of workers exposed to lead or its compounds is declining as well.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Exposure reduction through technical improvements. A reduction of the Maximum Workplace Concentration value for tetramethyl and tetraethyl lead from 0.1mg/m ³ air to 0.005 mg/m ³ air is being considered.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	

Further information	
Who can be contacted for more information?	<p>Dr. Dipl.-Ing. Elke Schneider Federal Ministry of Labour, Health and Social Affairs Central Labour Inspectorate Praterstraße 31 A-1020 Vienna</p> <p>Telephone: + 43 1 711 00-5585 Facsimile: + 43 1 711 00-2190</p> <p>Dipl.-Ing. Mag. Dr. Alfred Großkopf Allgemeine Unfallversicherungsanstalt Abteilung für Unfallverhütung und Berufskrankheitenbekämpfung Adalbert-Stifter-Straße 65 A-1201 Vienna</p> <p>Telephone: +43 1 331 11-446 Facsimile: +43 1 331 11-347 E-mail: Alfred.Grosskopf@auva.sozvers.at</p>

PRODUCT AND/OR USE REGULATION Limitation of lead content in animal feed	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Limits on lead content in feed through Animal Food Ordinance 223/1994, amended 1997.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Reduction of lead content in animal food. Feed with more than 8% phosphorus: 30ppm; others: 10ppm; green fodder, silage, hay: 40 ppm; single feed: 5 ppm; mineral feed: 30 ppm; other additional feed: 10 ppm.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1994 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Lead content of animal food is monitored within the framework of feed control.

Programme results	
What are the results of the monitoring programme(s) described?	Lead contents are always far below the limits.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Dipl.-Ing. Dr Michael Dachler Federal Agency + Research Centre for Agriculture Spargelfeldstraße 191 A-1226 Vienna</p> <p>Telephone: + 43 1 73 216 – 3159 Facsimile: + 43 1 73 216 – 5194</p>

LEAD IN PAINT Ban on lead white	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Ordinance 855/1993
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Lead white: Certain substances and preparations which are intended to be used as paint and which contain lead carbonate, lead sulfate or their alkaline mixed salts (lead hydroxy compounds) must neither be manufactured, nor put into circulation, nor used. Exemptions shall be circulation and use as artists' colours or colours for true-to-original restoration of art work.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1 January 1994 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Dr. Raimund Quint Ministry of Environment, Youth and Family Department I/2 Stubenbastei 5 A-1010 Vienna</p> <p>Telephone: + 43 1 515 22 – 2331 Facsimile: + 43 1 515 22 – 7334 E-mail: raimund.quint@bmu.gv.at</p>

Monitoring of long-term effects in the area of Arnoldstein	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Since the 15th century, there have been metal smelting works in the area of Arnoldstein, Carinthia. After cleaning up the major impact sources, blood lead levels in children and concerned adults as well as lead in food, drinking water and air are monitored by the local Carinthian Government. (See also lead levels in soil.)
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Blood lead levels were surveyed in 1992, 1994 and 1998. Lead levels of soil and food in Arnoldstein were monitored in 1992. Drinking water is monitored regularly; there is no lead contamination at present. Air is monitored continuously for lead particles and other contaminants in the area.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1992 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	<p>In 1992 and 1994, children showed partially excessive levels of lead in their blood according to the CDC/EPA limit of 10 µg/100ml. Measures taken for improvement of the environment succeeded so that the 1998 blood level control of 250 children showed no child exceeding the CDC/EPA limit.</p> <p>Published data: O. Feenstra et al. "Chronic lead transfer from polluted soils to humans by means of inhalation and ingestion" in <i>Contaminated Soils</i>, R. Prost, ed. (Les Colloques No. 85), INRA, Paris, 1997.</p>
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	

Further information	
Who can be contacted for more information?	<p>Dr. Odo Feenstra Amt der Kaerntner Landesregierung Abteilung 12-UA Umweltmedizin Hasnerstrasse 8 A-9021 Klagenfurt</p> <p>Telephone: +43 463 503 054 Facsimile: +43 463 503 054-70 E-mail: odo.feenstra@ktn.gv.at</p>

Limitation of lead leaching in toys	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Toys Ordinance 823/1994
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Maximum daily bioavailability: 0.7 mg lead
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	October 12, 1994 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Min. Rat Dipl.-Ing. Dr. Anrulf Sattler BKA (Federal Chancellery) Department VI/B/1 Radetzkystrasse 2 A-1030 Vienna Telephone: +43 1 711 72 4805 Facsimile: +43 1 711 72 4681

Limitation of lead leaching into foodstuffs (from ceramics or enamel)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Ceramics Ordinance 893/1993
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Maximum concentrations have been set for lead leaching from items of practical use which come into contact with food, i.e. ceramics or enamel: 0.8 mg/dm ² max. for small items (not fillable or fillable to 25 mm) 4 mg/l max. for items fillable with more than 25 mm 1.5 mg/l max. for large items with a volume of more than 3 litres
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	December 23, 1993 NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Min. Rat Dipl.-Ing. Dr. Anrulf Sattler BKA (Federal Chancellery) Department VI/B/1 Radetzkystrasse 2 A-1030 Vienna Telephone: +43 1 711 72 4805 Facsimile: +43 1 711 72 4681

Belgium

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p><u>Scientific Institute of Public Health-Louis Pasteur (IPH)</u></p> <p>Current levels found in the 1996 survey of blood lead in humans in the general population are presently distributed as follows:</p> <p>Percentile 5 : 19.5 µg/l; Percentile 25 : 33.9 µg/l; Percentile 50 (median) : 47.8 µg/l; Percentile 75 : 67.6 µg/l; Percentile 95 : 112.3 µg/l</p> <p>In children living in poor conditions, and according to CDC guidelines for environmental lead exposure, the distribution per class of risk is as follows: <100 µg/l : 47.3%; 100-149 µg/l : 18.9%; 150-199 µg/l : 12.2% ; 200-249 µg/l : 5.4%; 250-449 µg/l : 12.2%; = 450 µg/l : 4.1%</p> <p>(See Part II, Human Health Monitoring)</p>

	<p><u>Occupational exposure</u></p> <p><u>Workers</u></p> <p>See Art 183 quinquies and sexies - R.G.P.T. (Annexes 15 and 16) as well as the summary of professional illness declarations from 1990 to 1996.</p> <p>Declaration of professional illness ensues when excess levels of lead are identified in workers; however these excess levels probably result from previous exposure.</p> <p>Number of declarations of professional illness per diagnostic:</p> <table border="0"> <tr> <td>1996</td> <td>1995</td> <td>1994</td> <td>1993</td> <td>1992</td> <td>1991</td> <td>1990</td> </tr> <tr> <td>37</td> <td>27</td> <td>35</td> <td>19</td> <td>31</td> <td>30</td> <td>53</td> </tr> </table> <p>Since 1988 a programme has progressively been implemented to reduce and eliminate risk related to exposure to lead at the workplace. According to this programme, occupational doctors would remove workers from the workplace until their blood lead levels go down to less than the 70 µg/dL biological limit value; in these cases the illness can be declared to the professional illness fund.</p> <p>The gradual implementation of this procedure of declaring blood lead levels, as of limit levels lower than those used before 1988, could explain the fluctuating results observed.</p> <p><u>Air at the workplace</u></p> <p>Please refer to:</p> <p>Art 148 decies 2.6.4-RGPT (annex 12)</p> <p>Art. 148 decies 2.6.6. and 2.6.7-R.G.P.T (annex 13)</p> <p>(See Part II, Occupational Exposure)</p>	1996	1995	1994	1993	1992	1991	1990	37	27	35	19	31	30	53
1996	1995	1994	1993	1992	1991	1990									
37	27	35	19	31	30	53									

Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>In the framework of the “joint monitoring programme” of the Paris Convention for prevention of marine pollution, lead is monitored in blue mussel, cod liver and flounder liver from Belgian coastal waters. The programme started in 1979 for mussel and in 1983 for fish and is carried out once a year on 400 mussels and 25 fish. From 1979 to 1996, a decrease of 50% (2 to 1mg/kg dry weight) was noted in mussel. From 1983 to 1996, decreases of 79% (0.07 to 0.015 mg/kg wet weight) and 85% (0.20 to 0.03 mg/kg) were observed in cod and flounder liver respectively. Since 1979, lead concentrations are also assessed in sediments from 13 stations on the Belgian Continental Shelf. The <2mm fraction was used. An average decrease of 36% was noticed between 1979 and 1996 (11.8 to 7.6 mg/kg dry weight).</p> <p>Dr. ir. W. Vyncke, wnd. Departementshoofd Ministerie Van Middenstand en Landbouw-Bestuur Onderzoek en Ontwikkeling Centrum voor Landbouwkundig Onderzoek-Gent Departement Zeevisserij Ankerstraat 1 B-8400 Oostende</p> <p>Telephone: + 32 (59) 32 08 05; 32 03 88 Facsimile: + 32 (59) 33 06 29</p>
	<p>Lead levels are monitored in suspended dust and dust deposition.</p> <p>About 30 measuring stations of suspended dust are actually operational. The lead is measured by wavelength-dispersive X-ray fluorescence. Levels of lead decreased significantly in the last decade. The measured levels are all well below the European limit value of $2\mu\text{g}/\text{m}^3$. Except at two places near a non-ferro plant, the levels are also well below the WHO guide value of $0.5\mu\text{g}/\text{m}^3$.</p>

	<p>Lead in dust deposition is measured by sampling in NILU jars and analyses by AAS. Elevated levels of lead deposition are found in the vicinity of two non-ferro plants.</p> <p>Near the non-ferro plant with high lead levels in the vicinity, lead is also measured in grass and vegetation during the growing season.</p> <p><u>Sea water</u></p> <p>Programmes to monitor lead concentrations in the environment exist for sea water, biota and sediments.</p> <p>The programme specific to sea water is described below. A new programme for measuring the presence of heavy metals in sea water was produced in 1994. A laboratory was built inside a container installed on the ship assigned to measurement in the North Sea, the <i>Belgica</i>. It was finalised at the end of 1994 and provided its first results in 1995. Levels of dissolved lead and of lead particles in sea water are monitored at about 20 measuring stations on the Belgian continental platform on the North Sea, and at 10 stations in the Escaut Estuary; the <i>Belgica</i> carries out at least four measurement campaigns yearly.</p> <p><u>Sampling procedures:</u> The type of sampling recipient used is the go-flo; a winch is used to deploy the sampler.</p>
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	<p><u>Aquatic emissions</u> Study: Esher Antes Lead (card 5) VMM Technical North Sea Commission. The aim of the study carried out by ESHER and ANTES was to quantify atmospheric emission and discharge of lead into surface waters.</p> <p>This study indicates a strong decrease of atmospheric emissions in Belgium (1707 T in 1985, 793 T in 1990 and 605 T in 1995), due in particular to distribution of unleaded gasoline as well as to a reduction of emissions in the non-ferrous sector. It also indicates a reduction of lead emissions to surface water (103 T in 1985, 96 T in 1990 and 74 T in 1995).</p> <p><u>Food and drink</u> Programmes have been implemented to monitor the presence of lead in food and drink. They are carried out by the <i>Inspection des Denrées alimentaires</i> (Food Inspection Service). Samples are selected at random and analysed in a certified laboratory. The samples are subjected to acid digestion and analysed by atomic absorption spectrometry (AAS). The quality of the analyses is monitored.</p> <p>Table 2 Contribution from the Food Inspection Service Heavy metals in food products The Royal Decree dated 2 December 1991 fixed the maximum content of certain heavy metals in food products (expressed in mg/kg). The data, which come from the Institute of Veterinary Expertise, are included below. Programme: Directive 86/469: Residue control. Method used: AAS. Samples used: at random.</p>
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	<p>Table 3</p> <p>Contributed by the Institute of Veterinary Expertise Programme for lead in food</p> <p>Directive 96/23/EEC of 29 April 1996: Monitoring of certain substances and residues of these substances in animals and animal products</p> <p>Method: Humid digestion and GF-AAS determination</p> <p>Sampling of liver and fresh meat: 375 samples per year of sea fish: 50 samples per year</p> <p>Results: below the maximum levels authorised in Belgium</p> <p>Limit levels: a) liver: beef 1000µg/kg; pork 500 µg/kg b) fresh meat: 300µg/kg c) sea fish: 500µg/kg</p> <p>Contributed by the ISSP.</p> <p><u>Lead in toys</u></p> <p><u>Programmes for analysis of lead levels in toys and certain everyday objects.</u></p> <p>About 30 samples are taken every year for the General Food Inspection, to be analysed for their heavy metal content. The analysis method is the one described in rule EN 71-3 concerning toys. So far results have always been negative.</p>
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Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>The measured levels are all well below the European limit value of $2 \mu\text{g}/\text{m}^3$. Except at two places near a non-ferro plant, the levels are also well below the WHO guide of $0.5 \mu\text{g}/\text{m}^3$. In the vicinity of one non-ferro plant, there is concern that smaller children are at risk due to an elevated oral dust intake. In this place there is also an elevated level of lead deposition.</p> <p><u>Sea water</u></p> <p>The Paris and Oslo Conventions for marine pollution prevention have fixed ecotoxicological evaluation criteria for trace metals. These criteria should be applied to identify potential risk areas and to indicate which substances should be given priority for political action.</p> <p>The ecotoxicological evaluation criterion for water is $0.5\text{-}5\mu\text{g}/\text{l}$. The lead concentrations measured did not exceed this level and were even largely inferior to it.</p> <p><u>Air</u></p> <p>The study of the Wallonia region allows us to conclude that the norms and goal values are achieved as far as lead in air is concerned.</p> <p><u>Food</u></p> <p>Current lead concentrations in food do not exceed maximum levels authorised by the Royal Decree of 2 December 1991, which establishes maximum levels of certain heavy metals in food.</p> <p><u>Toys</u></p> <p>The analyses carried out in Belgium on toys do not reveal excess lead.</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p><u>High risk groups of the population</u> IPH Epidemiology Unit</p> <p>Scientific Institute of Public Health-Louis Pasteur (IPH)</p>

	<p>Systematic screening in the population at risk (criteria for children at risk have to be precise) and legislation should be signed giving the lead levels and action to be undertaken.</p> <p>No proposal of legislation or action in this domain is foreseen (to my knowledge). Only this very small programme of children at risk screening in the centre of Brussels is ongoing with one part-time staff person.</p> <p>The non-ferro plant with high lead emission levels in its vicinity is changing its production process.</p> <p><u>Food</u></p> <p>Belgium is in favour of a modification of the maximum authorised levels at European and/or Codex Alimentarius level (currently being established). The maximum levels could be brought down to the lowest reasonably attainable level.</p> <p><u>Toys</u></p> <p>Three types of measures could be considered:</p> <ul style="list-style-type: none">- Offences can be recorded and the offender fined;- The product can be sent back to the manufacturer;- The product can be destroyed and declared toxic. <p>The discovery of a potentially dangerous product liable to be distributed on the European market must be notified to the European Union (RAS or REIS).</p>
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Table 1

Low levels	High levels	Very high levels
$0.25\mu\text{g}/\text{m}^3 < \text{yearly average}$	$0.25\mu\text{g}/\text{m}^3 \leq \text{yearly average} < 0.50\mu\text{g}/\text{m}^3$	$\text{yearly average} \geq 0.50\mu\text{g}/\text{m}^3$

Table 2

Year	Product	Number of samples	Average (mg/kg)	Maximum (mg/kg)
1993	Canned fruit	25	0.067	0.136
1993	Canned tuna fish	21	0.028	0.054
1994	Canned tuna fish	31	<0.025	0.089
1994	Canned fruit	39	0.063	0.2 (peaches)
1994	Canned mussels	11	0.369	0.880
1994	Canned squid	8	0.059	0.090
1995	Canned squid	8	0.042	0.093
1994	fresh lettuce	74	0.039	0.170
1995	Canned milk	16	0.029	0.048
1996	fresh potatoes	30	<0.020	<0.020
1996	Bread	40	<0.020	0.049
1996	fresh celery root	25	0.031	0.069
1997	Baby food (especially cereal-based)	32	0.028	0.143
1997	Wheat cereal	54	<0.1	0.24 (1 positive)
1997	Orange juice	30	<0.1	0.30 (5 positive)

Canned peeled tomatoes

Year	Number of samples	Average (mg/kg)	Max (mg/kg)
1993	37	0.048	0.140
1994	18	0.050	0.113
1995	16	0.035	0.080

Canned tomato paste

Year	Number of samples	Average (mg/kg)	Max (mg/kg)
1993	29	0.031	0.086
1994	15	0.035	0.187
1995	16	0.044	0.112

Canned crab meat

Year	Number of samples	Average (mg/kg)	Max (mg/kg)
1993	5	0.066	0.160
1994	24	0.055	0.129
1995	8	0.023	0.046

Canned shrimp

Year	Number of samples	Average (mg/kg)	Max (mg/kg)
1993	1	<0.025	
1994	15	0.056	0.186
1995	6	0.030	0.077

Table 3

Results:

Data	1992	1993	1994	1995	1996
Number of samples	125	114	132	125	130
Results	1 pig	0	1 horse	0	1 horse 1 sheep

Belgium

Part II: Description of Distinct Activities

HUMAN HEALTH MONITORING Monitoring programme of the general population undertaken every year since 1978 and every three years since 1990 Monitoring programme in a population of children at risk (old housing with lead paint chips) in Brussels	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Biological monitoring of environmental lead exposure
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	NA
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Monitoring of the general population: 1979 - ongoing Monitoring of a child population at risk: 1990 - ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	No action but biological monitoring of environmental lead exposure in two groups: a. Blood donors in general population; b. Children from ONE centres in poor urban areas.
Programme results	
What are the results of the monitoring programme(s) described?	Environmental lead exposure appears to have significantly decreased during the last two decades. Results of blood lead levels since 1978 can be obtained on request or in annex.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Malta
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	“EUROMETAUX” (The European Association of Non-ferrous Metals Industries)
Further information	
Who can be contacted for more information?	Francoise Claeys or Francis Sartor IPH 14, Rue J. Wytsman B-1050 Brussels Telephone: + 32 2 642 50 23-642 57 23 Facsimile: + 32 2 642 54 10

<p>OCCUPATIONAL EXPOSURE Regulatory text on worker protection:</p> <p>Art. 364 to 386 of the RGPT (General Regulation on Worker Protection) concerning lead ore, storage batteries, metal and electrolytic deposit polishing (annexes 6 and 7)</p> <p>Law of 30 March 1926 (annex 5)</p> <p>Art 397 to 433 of RGPT (annexes 6 and 7)</p> <p>Art 723bis 15 Oara, 11 of RGPT (annexes 17 and 18)</p> <p>Art 723bis 16 and 17 of RGPT (annexes 28 and 29)</p> <p>7.a</p> <p>Art 723 bis of RGPT (annexes 30 to 41)</p> <p>Art 393 of RGPT (annexes 8 to 10)</p> <p>Art 148 decies 2,6,9 of RGPT (annex 13)</p>	
<p>Main elements</p>	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	
<p>Objectives</p>	
<p>What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).</p>	<p>To establish means of action to reduce and eliminate risk related to exposure to lead at the workplace.</p>

Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1988 Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Statistics on professional illness declarations, to be interpreted with caution.
Programme results	
What are the results of the monitoring programme(s) described?	Distinct improvement of the situation in the field regarding worker exposure to lead.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Continued efforts in this direction.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

LEAD SHOT Decree of the Flemish Executive	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p><u>Regulatory test regulating the use of lead shot in humid areas based on the RAMSAR Convention.</u></p> <p>There is no regulation currently applicable in the Wallonia region (absence of the appropriate habitat for water game) or in the Brussels region.</p> <p>In Flanders, there is a decree which prohibits the use of lead shot in certain “humid” areas, based on the RAMSAR Convention.</p> <p>It is forbidden to use lead cartridges for hunting water game in the areas, located in Flanders, mentioned in the Royal Decree of 27 September 1984 designated as humid zones of international importance by the Flemish Executive decree of 27 May 1987 modifying the limits of certain Ramsar zones. These provisions will soon be reinforced in a Decree to be published shortly.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To control and reduce the use of lead shot which may cause intoxication of water game, taking into consideration the risk factors related to the concentration of game and the concentration of hunters.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	To evaluate the risk/benefit ratio of substitute products. To finance awareness and information campaigns in the weapons industry. The option proposed is the prohibition of the use of lead shot for water game hunting in (certain) humid zones, while considering the progressive introduction of non-toxic shot.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

ENVIRONMENTAL MONITORING	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Lead concentration monitoring programmes
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The data provided by the monitoring programme are used to evaluate in time and space the concentrations of heavy metals (including lead) in the marine environment of the North Sea. The objective is to prevent pollution of the marine environment by continuous reduction of rejects, emission and leakage of dangerous substances, with the ultimate goal of reaching concentrations close to sea bottom levels for substances naturally present in this environment and near zero for synthetic substances which are not natural components of the marine environment.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1994 Expected in 1999
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

LEAD IN GASOLINE	
Royal Decree regulating the content and characteristics of lead in gasoline for motor vehicles (21 February 1992)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The Decree provides maximum authorised levels of lead compounds calculated in lead (0.15 g of lead/l) as well as conformity specifications (NORM NBN-T-52705 petroleum products, gasoline for motors). Infringements are sought, recorded, prosecuted and punished in accordance with the law of 28 December 1964 against air pollution.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To reduce exposure to lead due to air pollution. The use of lead in gasoline is progressively being abandoned as new cars are no longer equipped or adapted for the use of leaded gasoline.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	21 February 1992 After the use of leaded gasoline has been completely eliminated.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Some type of monitoring data could be envisaged to measure progress in connection with this activity, such as: conclusions of the population monitoring survey, carried out by the epidemiological section of the ISSP); conclusions of the studies by ESHER and ANTES, the objective of which was to quantify atmospheric emissions and the discharge of lead into surface waters.
Programme results	
What are the results of the monitoring programme(s) described?	A marked decrease in atmospheric and aquatic emissions of lead has been reported, related to the decrease in the lead content of gasoline and to the use of unleaded gas.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Continued move towards complete replacement of leaded gas by substitutes once these have been evaluated and completely established as being unarmful.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

LEAD IN GASOLINE	
Economic incentive: higher sales price for leaded gas than for unleaded	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	This measure was adopted when the Royal Decree on structure and rates of excise rights on mineral oils was published (29 Dec. 92).
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To encourage motor vehicle users to use unleaded gas in order to reduce atmospheric pollution by lead.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1992 After complete elimination of the use of leaded gas, and complete modification of the manufacture of motor vehicles.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Monitoring programmes could be envisaged to evaluate progress made by implementation of this activity. <ul style="list-style-type: none"> • Evaluation of lead emissions (see Esher Antes study) • Graph of sales percentage of leaded gas in Belgium (decreasing curve) • Evaluation of blood lead levels (see study of BLL on the general population - Epidemiological Service of the ISSP).
Programme results	
What are the results of the monitoring programme(s) described?	Significant decrease in sales of leaded gas in Belgium.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	These measures have proved to be effective and will become unnecessary when all automobiles are equipped for the use of unleaded gas.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

LEAD IN GASOLINE	
Fitting of all automobiles for use of unleaded gas	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	This measure was implemented based on European legislation, in particular Directive 89/458/EEC.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Progressive, and ultimately complete, replacement of cars fitted for use of leaded gas by cars no longer fitted for the use of leaded gas.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Total replacement expected by the year 2000; followed by a monitoring programme.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	The connection between the use of unleaded gas and the decrease in BLL could be studied.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Definitive evolution towards automobiles no longer fitted for the use of leaded gas.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

PRODUCT AND/OR USE REGULATION	
Regulatory text (Royal Decree of 11 May 1992) on materials and objects destined to enter in contact with food (current legislation)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Royal Decree establishing norms to be respected regarding content and migration of elements such as lead. Infringements to the provisions of this decree are identified, prosecuted and punished in conformity with the law of 24 January 1977 on health protection of consumers with respect to food and other products.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	By legislation destined to reduce exposure to lead due to food containers, and by establishing norms for content in, and migration of, elements such as lead.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	11 May 1992 Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	A series of studies carried out by the Food Inspection of the Pharmacobromatological Department of the ISSP keep annual records of the evolution of lead content, particularly in canned foods, milk products, tomatoes, bread, potatoes, etc.

Programme results	
What are the results of the monitoring programme(s) described?	These monitoring programmes reveal that lead levels in food products do not exceed maximum levels authorised by the Royal Decree of 2 December 1991.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	To promote reduction of the maximum levels presently authorised to a value reasonably acceptable at the European level as well as at the level of the Codex Alimentarius (in progress).
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

EXPOSURE FROM FOOD PACKAGING (AND/OR FOOD) Regulatory test - Royal Decree of 2 December 1991	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Decree establishing maximum contents allowed in food for certain heavy metals. Infringements to these provisions are identified, prosecuted and punished in accordance with the law of 24 January 1977 on health protection of consumers with respect to food and other products.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Legislation destined to reduce exposure to lead due to food.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	2 December 1991 Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	A series of studies carried out by the Food Inspection Department of Pharmacobromatology of the ISSP records the annual evolution of lead content, particularly in canned foods, dairy products, tomatoes, bread, potatoes, etc.

Programme results	
What are the results of the monitoring programme(s) described?	These monitoring studies reveal that lead levels in food do not exceed maximum levels authorised in the R.D. of 2 December 1991.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	To move towards the reduction of the maximum levels presently authorised to a value reasonably acceptable at the European level as well as at the level of the Codex Alimentarius (in progress).
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

a. Modification of the legislation	
b. Monitoring and implementation programmes	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>a. Active participation in meetings preparing the fine-tuning of European legislation. Belgium aims to lower the maximum levels of lead to the lowest level that can reasonably be considered achievable. Belgium also favours the harmonisation of legislation at the European and even world-wide level (Codex Alimentarius). Belgium delegates a representative to the meetings of the Codex Alimentarius dealing with lead levels.</p> <p>b. During previous years, follow-up consisted mainly in monitoring conformity to the legislation. Until the legislation is modified, monitoring programmes will serve mainly as a means to prepare new legislation, for example by monitoring important foods that are still not subject to agreement. Another example is the use of samples to follow up complaints (for instance, Chinese food supplement).</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	

Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

EXPOSURE OF CHILDREN	
Law of 29 June 1990 on toy safety; Royal Decree of 9 March 1991 concerning toy safety (updated)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The R.D. establishes a series of norms for heavy metal (lead) content and maximum content for migration. Infringement is punished in accordance with the 1991 law on toy safety.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Reduction of the use of lead in toys.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1991 No end date
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

LEAD IN PAINT	
Planning and analysis; regulatory texts (Royal Decrees)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>In Belgium the use of lead ceruse as well as white lead-based pigments is prohibited by a Royal Decree (5 November 1990)</p> <p>Labelling procedures were established in the RD of 11 January 1993, regulating the classification, packaging and labelling of dangerous preparations in view of their marketing or use. These were modified by the RD of 23 June 1995 based on EEC Directives relative to dangerous preparations – these provisions establish that, for preparations containing lead (paints and varnish):</p> <p style="padding-left: 40px;">the label of packaging of paint and varnish having a higher lead content than that established by the ISO norm 6503-1984, i.e. 0.15% (expressed in lead weight) of the total weight of the preparation, must bear the following information:</p> <p style="padding-left: 40px;"><i>“Contains lead. Do not use on objects that could be chewed or sucked by children.”</i> On packages containing less than 125 millilitres (i.e. of paint or varnish), the indication must be: <i>“Warning! Contains lead.”</i></p> <p>Directive 94/60/EC of the European Parliament and Council of 20 December 1994 containing the 14th amendment to Directive 76/7690/EEC concerning the harmonisation of the legislative, regulatory and administrative provisions of Member States regarding the limitation of the marketing and use of certain dangerous substances and preparations, which is presently being transposed in Belgium, provides restrictions on use. Substances labelled with the risk phrase R60 “can alter fertility” and/or R61 “risk during pregnancy of harmful effects on the child” and classified “toxic for reproduction category 1” or “toxic for reproduction category 2” (repeated in lists 5 and 6 respectively) are prohibited in substances and preparations marketed and destined to be sold to the general public in concentrations equal to or higher than 0.5% of the weight.</p>

Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objective of the application of these provisions is to eliminate the problematic situations which occurred previously due to exposure to lead-based paints within the framework of normal usage of paints (not by accidental ingestion).
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	No dates foreseen.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The lead by-products content tolerated in paints has been severely restricted since the publication of European Directive 94/60/CE; this should halt problems related to exposure to lead in paint. The efficiency of measures to monitor this action are directly related to the efficiency of control measures. Therefore, an inspection service is being put together within the "Risk Control" section of the Belgian federal environment departments.
Programme results	
What are the results of the monitoring programme(s) described?	

Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	<p>As substitute products do exist, after evaluation of their innocuity, measures aiming at complete replacement of lead in paint by such substitute products should be undertaken.</p> <p>Substances presenting reproductive toxicity:</p> <p>lead hexafluorosilicate (II) lead fluosilicate (II) basic lead acetate; lead sub-acetate lead alkyl derivates lead azoture (II); lead azide lead chromate lead diacetate lead 2,4,6-trinitroresorcinat lead methanesulfonate (II) (tri-)lead orthophosphate</p>
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

Canada

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>As the OECD lead monograph indicates, actions taken as a whole in Canada have had a significant health benefit; average blood lead level of Canadian children has declined since 1972, and was 6µg/dL in 1988. At the national level, market basket surveys representative of the total Canadian diet are undertaken to monitor levels of lead and other elements in food. Because of the uniqueness of infant exposure, a more detailed survey of lead levels in infant foods has been initiated. National surveys of lead in consumer products have also been done, along with an exposure assessment at race tracks that use leaded racing fuels and are exempted from gasoline regulations under the Canadian Environmental Protection Act. At the provincial level, work is ongoing to monitor blood lead levels in smelter communities and the workplace. A blood lead survey of children was planned for fall 1998 in Saskatchewan. Generally, provincial Occupational Health and Safety Regulations require employers to monitor worker exposure to harmful substances.</p> <p style="text-align: center;"><u>Alberta</u></p> <p>Surveys have been conducted in relation to specific contaminated sites or suspected exposures. One detailed survey was conducted in 1991 by Calgary Health Services in relation to a heavily contaminated battery crushing site situated near a residential area. Blood samples taken by community health nurses from exposed and non-exposed individuals (about 30 individuals volunteered from each group). Blood lead levels were screened against US Public Health Service (Centers for Disease Control) benchmarks (10, 15 and 40 programme lead/dL blood as upper limits of normal for humans 0-36 mos., 36-72 mos., ≥72 mos., respectively). All blood lead levels were within normal ranges, with most observations below on average Canadian value of 6µg/dL. A few adults registered up to 15µg/dL. These individuals apparently were exposed in other ways such as during hobby activities with ceramics or ammunition.</p>

British Columbia (B.C.)

B.C. Environment/B.C. Ministry of Health/Cominco Ltd./City of Trail have supported annual blood lead monitoring clinics for children residing in Trail, B.C. since 1990. Trail is the location of Cominco Ltd. British Columbia Lead/Zinc smelting operations. Trail Blood Lead clinics are implemented by the Trail Community Lead Task Force. This task force has been instrumental in developing educational monitoring and lead exposure abatement programmes since 1990 and has achieved progressive declines in Trail residents' blood lead values.

Northwest Territories

Cord/maternal blood monitoring was carried out in various regions of the Northwest Territories from 1994 to present.

Quebec

The law on occupational health and safety calls for regular monitoring of workers exposed to lead at their workplace, using exposure reference marks (mainly blood tests) in order to evaluate their potential exposure to lead. The only monitoring carried out on a continuous basis for the general population is based on the system of declaration of illness (Illnesses Requiring Compulsory Declaration, MADO - Maladie à Déclaration obligatoire). Presently, intoxication by lead is an illness which must be declared when the blood lead level is higher than 30µg/dL. This level is currently being revised with the intention of bringing the level of compulsory declaration down to 10µg/dL. Until now the data gathered within the framework of this monitoring procedure have not given rise to a specific report. In fact, most of the cases declared are workers exposed to lead in their work environment. However, periodically, certain cases of exposure of the general population have been declared within this system. It is also possible to use the data contained in the files of hospital laboratories to verify the diagnoses of lead intoxication, which are very rare in Quebec. Ad hoc studies have also been carried out on various groups of the population, particularly those exposed to lead, or to evaluate the exposure of various groups (a cross section) of the population.

	<p><u>Yukon</u></p> <p>Blood lead monitoring has been conducted at a number of mines in the Yukon, and continues at one or two locations. The requirement for monitoring is for once per year reporting where there is an occupational exposure to lead. The monitoring is done by the companies and Yukon Occupational Health and Safety review the data and do occasional audits. At the Faro lead/zinc mine, by far the largest exposure risk in terms of numbers of individuals, the company was monitoring blood levels, for those exposed to lead, four times per year. The blood levels were generally low and only on rare occasions were individuals removed from exposure. The removal of individuals from exposure was based on new exposure levels that will be coming into force in the near future, more strict than existing threshold levels.</p>
<p>Environmental monitoring programmes</p>	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>In general, monitoring programmes have been carried out for air, water, soil and other environmental media on a case-by-case basis depending on the specific circumstances. For example, lead in air levels may be monitored around a smelter whereas soil lead levels are monitored at specific contaminated sites. At the national level, the OECD lead monograph indicates, the average levels of lead in air in Canada have steadily declined in the last few decades and were well below $0.1\mu\text{g}/\text{m}^3$ by 1990. The following are examples of monitoring being done to address local issues or specific circumstances.</p> <p><u>Lead in Air at Automobile Racing Facilities.</u></p> <p>The use of lead in gasoline is prohibited in Canada, with only minor exceptions. In the spring of 1997, Health Canada carried out an air and soil quality monitoring programme at two racing facilities in Canada at which leaded racing gasoline is permitted to be used.</p> <p>Manual air samplers with size selective inlets measured inhalable/respirable particulate matter (PM_{10}) in ambient air at each track at three locations within 100 m of the track and at two other locations within 500 and 1200 m of the track. Locations of the samplers were selected to measure potential exposure to lead in airborne particulate matter by drivers, officials, crew, spectators and nearby residents. Samples were analyzed for lead fraction in PM_{10}.</p> <p>Surface soil samples were taken at several locations from 300 to 1200 m of both tracks. Soil lead concentrations were mainly 5-20 mg/kg near both the drag strip and the oval track.</p>

All measured values were within the Canadian Council of Ministers of the Environment (CCME) recommended Canadian Soil Quality Guidelines for residential land use of 140 mg/kg.

The 24-hour average lead concentrations were within provincial ambient air quality criteria on all monitoring days at both the oval and straight-line tracks (B.C.: 4 µg/m³; Ontario: 5 µg/m³)

The maximum race period lead concentration measured at the straight-line track in Mission, B.C. was 1.9 µg/m³ during a 12-hour period on May 2. The maximum race period lead concentration measured at the oval track in Cornwall, Ontario, was 9.4 µg/m³ during a 5-hour period on June 22.

Alberta

When workplace airborne sampling is carried out, NIOSH methods or methods acceptable to the Director of Occupational Hygiene must be used to ensure validity.

Concentrations of lead in soil have been measured in two survey programmes. The first programme was developed to assess rural land for suitability to receive sewage sludge; metals including lead were measured at over 200 sites throughout Alberta. A mean concentration of 9 mg/kg and 99th percentile of 20 mg/kg were reported in 1994. A second programme was launched in 1995 to determine soil lead levels in various land use categories – rural and urban parks, commercial areas and transportation corridors outside urban areas. Mean lead concentrations:

Soil Depth	Rural Parks	Urban Parks*	Commercial	Transportation
0-5 cm	9.5	25.8	85.8	16.1
5-15 cm	9.5	16.2	40.4	7.2

* established prior to 1945

All data are from strong acid digests

	<p><u>British Columbia (B.C.)</u></p> <p>B.C. Environment requires ongoing monitoring of lead air emissions in Trail as a component of Cominco Ltd.'s waste discharge permit. In addition, B.C. Environment/B.C. Ministry of Health have conducted a number of scientific studies of soil, air, house dust and dustfall quality in the Trail area. These studies have been conducted in order to determine levels of heavy metal contamination including lead to which Trail residents are exposed. Also, the Trail Community lead Task Force has a number of ongoing soil/air/dust sampling programmes in effect for lead and has developed sophisticated GIS analytical systems to identify and tract lead contaminated areas within the Trail area.</p> <p><u>Manitoba</u></p> <p>Air and soil monitoring for lead is carried out periodically, and mostly in relation to point sources and areas where risk of exposure is high. Garden grown vegetables are monitored on a limited basis. Drinking water is tested at contaminated sites where lead contamination from current or past sources may have existed.</p> <p><u>Northwest Territories</u></p> <p>Lead isotope studies in Nunavut (east Arctic) have been carried out to identify sources of lead.</p> <p><u>Ontario (Ministry of Labour)</u></p> <p>Where lead is used in the workplace, sampling of airborne inorganic lead particulate must be performed according to the method prescribed in the Regulation governing occupational exposure to lead. This has been part of the Regulation since 1981.</p> <p><u>Quebec</u></p> <p>Lead concentration is monitored based on the provincial air quality control system. Information can be obtained from the Ministry of the Environment and Fauna of Quebec. Data are also collected on ground contamination at different sites where contamination is possible, notably old industrial locations. There are also data on water quality contamination. In this regard, a huge provincial study which was initiated in 1992, allowed for the evaluation of levels of lead in first flush water and water tested after having let the tap run for a while in various municipalities in Quebec.</p>
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Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>As the OECD lead monograph indicates, average levels of lead in human blood and environmental media in Canada are within national and sub-national standards. Reported elevated levels tend to be local in nature and are generally addressed at the local or sub-regional level.</p> <p><u>Alberta</u></p> <p>Ambient soil concentrations are significantly increased over background in some cases but are within CCME (national) guidelines applicable to those land uses. We don't know yet if levels are improving as a result of abatement-particularly phase-out of tetraethyl lead in gasoline.</p> <p><u>British Columbia</u></p> <p>Exceedence of Cominco Ltd.'s permitted lead emissions have occurred, on occasion in the past. Also, soil quality in many areas in Trail exceeds the Ministry's Contaminated Sites Regulation standards for a number of metals, including lead.</p> <p><u>Manitoba</u></p> <p>Levels of lead in soil at some sites exceeds the recommended Canadian Soil Quality Guidelines. Levels of lead in soil have showed slight decreases as a result of controlling releases.</p> <p><u>Ontario</u></p> <p>The data obtained by the Ministry of Labour suggests that in general, occupational exposure to lead in workplaces does not exceed current standards.</p> <p><u>Quebec</u></p> <p>The level of blood lead used as a basis for action is 10 µg/dL. With the exception of the workplace, there have not been many cases of population exposure to levels higher than 10 µg/dL. A few cases have been detected of an increased blood lead level (but no clinical symptoms) in various studies: either after cases of ground contamination, or of water</p>

	<p>contamination, but these are isolated incidences. The measures which have been taken generally consist of the reduction in contamination of the environment, or in the case of water: removal of lead pipes and prohibition of lead soldering; and in the case of soil: soil decontamination. Sometimes the exposure can be reduced without modification of the source, either by setting up a barrier between the contamination and the exposed population (i.e. confinement of the grounds) or by creating conditions which reduce the diffusion of the contamination towards the population (i.e. recommending to let the tap water run for a while in the morning).</p>
<p>Future actions to reduce exposure</p>	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>Actions to further reduce risks from exposure to lead are determined by the specific circumstances and are addressed at the appropriate national, provincial or local level.</p> <p><u>Alberta</u> Occupational Exposure Limits for lead were lowered in 1993. Ambient soil concentrations are significantly increased over background in some cases, but are within CCME (national) guidelines applicable to those land uses. We don't know yet if levels are improving as a result of abatement - particularly phase-out of tetraethyl lead in gasoline.</p> <p><u>British Columbia</u> Cominco Ltd has recently implemented a new lead smelter for its Trail operations. This new smelter technology will significantly decrease lead and other heavy metal emissions in the Trail area.</p> <p><u>Manitoba</u> Ongoing efforts to control emissions by increasing capture of particulates from industrial services. Where sites are contaminated, remedial measures are undertaken to manage any risks that are posed.</p>

	<p><u>Quebec</u></p> <p>No new activity has been proposed besides those usually carried out, such as monitoring of the environment by the Ministry of the Environment and Fauna, mainly regarding ground and water contamination. Current data on air contamination reveal very low levels. Activities initiated due to the discovery of water and soil contamination are now well identified along with the protocols describing the various levels of action and types of management programmes.</p>
Further information	
Who can be contacted for further information?	<p>Nichole Ritchie Environmental Health Department Baffin Island Regional Health Board Bag #200 Ikalut, Northwest Territories, X0A 0H0</p> <p>Telephone: +1 (867) 979-7654</p> <p>Patrick Levallois, MD, FRCPC Centre de santé publique de Québec 2400 d'Estimauville Beauport, Qc, G1E 7G9</p> <p>Telephone: +1 (418) 666-7000 poste 210 Facsimile: +1 (418) 666-2776 E-mail: patrick.levallouis@msp.ulaval.ca</p>

	<p>Michèle Bélanger Direction de la protection de la santé Ministère de la Santé et des Services sociaux 1075, chemin Ste-Foy Québec, Qc, G1S 2M2</p> <p>Telephone: +1 (418) 643-6390 Facsimile: +1 (418) 666-2776</p> <p>See Part II for other contacts.</p>
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Part II: Description of Distinct Activities

EMISSIONS FROM MAJOR SOURCES	
Addressing risk of lead exposure from air; limiting air emissions from major point sources (British Columbia)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Lead air emissions from the Cominco lead smelter in Trail are authorized under permit issued pursuant to the ministry's Waste Management Act. To encourage Cominco to incorporate "state of the art" emission control technologies, permitted emission limits have been progressively decreased by B.C. Environment.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Cominco has installed a new low emission smelter facility in Trail (1997). Early air quality monitoring results suggest this new smelter will reduce lead emissions by up to 70%.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1994 1999
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Air quality monitoring in Trail, B.C. area is a required activity under Cominco Ltd.'s Waste Management permit.
Programme results	
What are the results of the monitoring programme(s) described?	Determining final operating efficiency of the new Trail lead smelter requires collection of one year's air quality data. Data will be collected during 1998 with final efficiency being determined in 1999. Early results projected that reductions in smelter emissions are being achieved.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Future risk management in the Trail area is likely to focus on remedial activities for historic lead contamination. This will be achieved through risk assessment/risk management programmes in accordance with requirements of the ministry's Contaminated Sites Regulation.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	The Trail Community Lead Task Force has published studies relating to its activities and communicates freely with all interested parties
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	For information related to Cominco activities in Trail B.C.: Graham Kenyon Cominco Ltd. Trail, B.C. Telephone: +1 (604) 364-4238

Further information

Who can be contacted for more information?

Rick Crozier
Manager Environmental Protection
B.C. Environment
Nelson, B.C.

Telephone: + 1 (250) 354-6355

Facsimile: + 1 (250) 354-6367

For further information concerning Trail Community Lead Task Force activities:

Steve Hilts
Trail Lead Programme Office
300-843 Rossland Ave
Trail, B.C.

Telephone: + 1 (250) 368-5325

Facsimile: + 1 (250) 368-6515

Remediation of sites contaminated by lead	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Environmental site assessments carried out in response to re-development, land transfer or complaint have revealed some sites contaminated by lead. Under contaminated sites provisions of Alberta’s Environmental Protection and Enhancement Act, responsible parties must remediate. Successful management is acknowledged by the government. Monitoring required where risks managed on-site.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Prevention of adverse effects to health, environment, property or safety. Although all lead-contaminated sites may not have been found, all sites identified to date have been appropriately managed.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1993 Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Yes. There is a preference for treatment and recovery of lead from contaminated sites – although this is not a legislated requirement. The requirement is for prevention/mitigation of adverse effects.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Cleanups may be conducted to conservative, generic criteria (where adverse effects are extremely unlikely) or to site-specific risk based criteria. In the latter case, contamination is usually managed through prevention of exposure via institutional or engineered controls. Monitoring of the effectiveness of such controls is required.

Programme results	
What are the results of the monitoring programme(s) described?	In all cases to date, only engineered barriers have been used for site-specific risk management. Monitoring programmes have confirmed these are effective.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	1) Generic criteria based on formal and transparent risk analysis are being introduced. 2) Formal certificates of remediation are being introduced via a specific regulation.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Canadian and Albertian approaches to contaminant management have recently been presented to several non-OECD countries of Asia.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Walter Ceroici Alberta Environmental Protection 9820-106th Street Edmonton, Alberta T5K 2J6 Telephone: + 1 (403) 427-9759 Facsimile: + 1 (403) 422-5120 E-mail: wceroci@env.gov.ab.ca

LEAD SHOT	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Lead in ammunition for hunting birds has been phased out under the Migratory Waterfowl Legislation (federal). Provincially, this requirement is stated in the hunting regulations and enforced by Alberta Environmental Protection (AEP).
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Prevention of lead shot accumulation in wetlands/soils with subsequent exposure to birds and other wildlife. Status: implemented.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1995 ? Indefinite
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Surveillance, enforcement by AEP

Programme results	
What are the results of the monitoring programme(s) described?	Because domestic lead shot ammunition supplies are being or have been entirely depleted, compliance among hunters is very high.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Alternative shot loads are being manufactured and distributed by the major suppliers (e.g. C-I-L).
Further information	
Who can be contacted for more information?	Lorne Fitch Alberta Environmental Protection 2nd Floor, YPM Place Lethbridge, Alberta T1J 2J8 Telephone: + 1 (403) 382-4258 Facsimile: + 1 (403) 381-5723

LEAD IN GASOLINE	
Amendments to Gasoline Regulations (requiring the reporting of sale, import and manufacture of leaded gasoline and extend the exception that allows the use of leaded gasoline in racing vehicles up to the end of year 2002)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	The lead monitoring programme and lead exposure assessment in Part I provided the justification re. the decision to extend the exemption allowing the use of leaded gasoline in racing vehicles. Reporting provisions under the Gasoline Regulations will allow EC to react to any increase in use of leaded gasoline.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Josée Lavergne, Head Controls Development Section Commercial Chemicals Evaluation Branch Environment Canada Hull, Quebec K1A 0H8</p> <p>Telephone: + 1 (819) 953-1651 Facsimile: + 1 (819) 953-4936 E-mail: Josée.Lavergne@ec.gc.ca</p>

ENVIRONMENTAL MONITORING Soil monitoring at approved facilities	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Activities requiring an approval under the Alberta Environmental Protection and Enhancement Act must provide monitoring information periodically. Those using lead and with potential to contaminate soil/groundwater submit soil monitoring information every five years.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Non-degradation of the soil resource. Results are assessed against multifunctional land use guidelines and land use-based guidelines. Where exceedances occur. Appropriate management action taken where land are based guidelines exceeded.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1992 Indefinite
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Approval holder evaluates own progress in monitoring reports. All approval-related monitoring data are reviewed by Alberta Environmental Protection.

Programme results	
What are the results of the monitoring programme(s) described?	The majority of facilities reporting have soil lead concentrations below guidelines. About 20% of reported data exceed 50 mg/kg, which has been used as an upper threshold for multifunctional use. Only a small number of industrial guideline exceedances have occurred; these have been addressed by approval holders
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	No changes planned for this programme.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Because soil contamination is costly to deal with, approval holders have often made changes to waste and feedstock management subsequent to discovery of significant contamination. These changes vary with facility type and ownership, however.

Further information	
Who can be contacted for more information?	<p>Gerry Lutwick Alberta Environmental Protection 200-5th Avenue South Lethbridge, Alberta T1J 4K1</p> <p>Telephone: + 1 (403) 382-4240 Facsimile: + 1 (403) 382-4428 E-mail: glutwick@env.gov.ab.ca</p>

OCCUPATIONAL EXPOSURE	
Reduction of levels of lead in occupational settings	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Every work site inspection is documented using a standard “client contract report”. The identification and control of lead hazards by employers required by the Chemical Hazards Regulations are among items to be checked and documented in the report by officers.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The goal of the programme is to increase awareness of the occupational hazards of lead.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Non-compliance is followed up with corrective action by employers. The percent compliance in identifying and controlling lead exposure hazards in the workplace is compiled for monitoring purposes.

Programme results	
What are the results of the monitoring programme(s) described?	<p>The overall results are expressed as:</p> <ul style="list-style-type: none"> • % work sites inspected with lead hazards • % work sites inspected with adequate control of lead hazards. <p>Results are compared from year to year and with other occupational hazards.</p>
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	No specific activities at present.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	No specific efforts at present.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	No specific programmes at present.
Further information	
Who can be contacted for more information?	<p>Yan Lau Alberta Labour, Workplace Health, Safety and Strategic Services 902, 10808-99 Avenue Edmonton, Alberta T5K 0G5</p> <p>Telephone: + 1 (780) 415-0593 Facsimile: + 1 (780) 427-5698 E-mail: lauy@lab.gov.ab.ca</p>

RESEARCH/EDUCATION	
Research programme to assess hazards of lead in Canadian housing and how best to avoid or reduce exposure	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	A series of research projects were undertaken and published. A guide for consumers was published in the early 1990s, and then revised, updated, and re-issued in 1997.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The goal was to better inform the Canadian public on residential lead hazards, particularly with respect to lead in paint. The main paint exposure route was seen to be during renovation activities in older houses. Research and information transfer was developed to reduce these impacts.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1991 1997
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No, although we did two studies on how consumers could effectively pick up leaded dust in their houses using available equipment.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Other than broad information transfer, there was no particular result or evaluation of the research initiative. Blood lead levels, as measured in studies by other agencies, were low at the start of the research and at the end of the research. No particular national intervention was needed.

Programme results	
What are the results of the monitoring programme(s) described?	One of the last projects monitored lead and blood lead levels amongst families in Saint John, N.B.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	None are planned for lead.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	A flyer jointly produced by CMHC and the Canadian Paint and Coating Association was sent out through paint shops. At least 50,000 copies were made and distributed.
Further information	
Who can be contacted for more information?	<p>Don Fugler CMHC Research Division 700 Montreal Road Ottawa, Ontario K1A 0P7</p> <p>Telephone: + 1 (613) 748-2658 Facsimile: + 1 (613) 748-2402 E-mail: dfugler@cmhc-schl.gc.ca</p>

Municipal toxics round-ups	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Voluntary collection of domestic toxics (including lead-based paints) by municipalities. Items collected are either treated, recycled or disposed, as appropriate.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Minimizing potential human exposure and/or environmental damage. Status: ongoing.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Various dates in different communities. Indefinite.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Yes. Solvent portions are generally recovered or used as fuel.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Municipalities track the amount of toxic material recovered.

Programme results	
What are the results of the monitoring programme(s) described?	Not available
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Dave Reynolds City of Calgary P.O. Box 2100, Station M Calgary, Alberta T2P 2M5</p> <p>Telephone: + 1 (403) 268-8050 Facsimile: + (403) 268-1529 E-mail: dreynolds@env.gov.ab.ca</p>

RECYCLING	
Lead-acid battery recycling (voluntary initiative)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Evaluation of battery recycling was undertaken in 1994. Recovery of batteries for recycling estimated from TDGR manifests. Estimated from sales of batteries/new cars that $\geq 70\%$ recycled. Drivers: Landfill regulations (essentially not "landfillable"), recovery value of CAD 2.00/battery. Many retailers voluntary charge CAD 5.00 deposit on new batteries – waived if old battery returned.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Competitive rates of recycling are the required minimum. Long-term objective is full life cycle management/100% recovery.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	(Survey) 1994 Ongoing voluntary recycling, monitoring through manifest system.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Yes, as explained above, programme driven by economics.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Because all lead recycling is done out-of-province and must be manifested, the TDGR manifest system will continue to estimate recycle problems.

Programme results	
What are the results of the monitoring programme(s) described?	Lead in batteries recycled at $\geq 70\%$.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	None planned at present.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Several retailers have voluntarily instituted a deposit fee of CAD 5.00 against purchase of new lead-acid storage batteries. The fee is waived if a used battery is provided at time of sale.
Further information	
Who can be contacted for more information?	<p>Bob Rippon Alberta Environmental Protection 9820 106 Street Edmonton Alberta</p> <p>Telephone: + 1 (403) 427-0606 Facsimile: + 1 (403) 422-5120 E-mail: brippon@env.gov.ab.ca</p>

LEAD SHOT AND LEAD FISHING SINKERS	
Regulatory action prohibiting use of lead shot for hunting most migratory game birds in Canada	
Main elements	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	<p>In 1990, Environment Canada, in consultation with the provinces and the territories, began regulating the use of lead shot for hunting migratory game birds under the authority of the Migratory Birds Convention Act, using a “hot-spot” approach to establish non-toxic shot zones in areas of demonstrated lead poisoning or high lead exposure of waterfowl or their predators. A change in Environment Canada’s management approach resulted from new scientific evidence on the extent of lead poisoning of waterfowl and their raptorial predators in Canada, which was summarized in a 1995 scientific document entitled “A review of the environmental impacts of lead shotshell ammunition and lead fishing weights in Canada”, published by Environment Canada. In July 1995, Environment Canada announced its intention to ban the use of lead shot for hunting all migratory game birds. The ban was phased in, starting with National Wildlife Areas in the fall of 1996 under the authority of the Migratory Birds Convention Act. In 1997, the use of lead shot for hunting migratory game birds, except woodcock, band-tailed pigeons, and mourning doves, was prohibited within 200 metres of any watercourse or waterbody. This ban will be extended to all areas of the country in September 1999.</p>

Objectives	
<p>What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).</p>	<p>Objectives of activity:</p> <p>Reduction in lead poisoning of waterfowl and their raptorial predators; Reduction in lead deposition into the environment through spent lead shot.</p> <p>Status in meeting objectives:</p> <p>Monitoring lead exposure in migratory game birds and their predators will continue following full implementation of the national ban in 1999, in order to assess the effectiveness of the ban.</p> <p>Annual lead deposition into the environment from waterfowl hunting will be reduced by approximately 800-1000 tons in 1999, with the full implementation of the national ban on the use of lead shot for harvesting most migratory game birds.</p> <p>An estimated 1300 tons of lead in the form of spent lead shot will, however, continue to be deposited into the environment through upland game bird and small mammal hunting activities, and target shooting, for which continued use of lead shot will be allowed after 1999.</p>
Duration	
<p>What year did the project begin and what year did it end (or is it expected to end)?</p>	<p>Initiation of non-toxic shot zones prohibiting the use of lead shot began in 1990. Implementation of regulatory action for the national ban began in 1995.</p> <p>Regulatory actions under the Migratory Birds Convention Act will cease with full implementation of the national ban in 1999, although communication/education efforts, and environmental monitoring, will continue beyond that time. Ongoing research may indicate that even broader bans on the manufacture, sale, and/or use of lead shot, using other regulatory measures, such as CEPA, may be appropriate.</p>

Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No collection or recycling programmes exist for lead shot.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	<p>Compliance monitoring is routinely conducted by federal and provincial/territorial wildlife enforcement officers to deter continued use of lead shot for hunting most migratory game birds.</p> <p>Environmental monitoring of lead concentrations in waterfowl, and their predators, is anticipated following 1999 ban.</p>
Programme results	
What are the results of the monitoring programme(s) described?	Compliance monitoring from non-toxic shot zones would indicate that the use of lead shot for hunting migratory game birds within zones, prior to implementation of 1997 ban, had decreased. Compliance with the 1997 phase of the ban was believed to be relatively low, although it is anticipated to increase by 1999 with increased availability of alternative non-toxic shot products and general prohibition of lead shot use for most migratory game birds in all areas of Canada.

Future risk management activities	
<p>Summarise any future risk management activities you may be considering, including supporting rationale.</p>	<p>Environment Canada will continue to monitor other uses of lead shot and will assess the need for additional regulatory action.</p> <p>An estimated 1300 tons of lead will continue to be deposited into the environment through upland game bird and small mammal hunting, and clay target shooting, for which continued use of lead shot will be allowed after 1999. After 1999, lead deposition from the continued use of lead shot for hunting will represent an increasing proportion (exceeding 40%) of the total amount of lead discharged into the environment.</p> <p>The impacts of lead shot use on upland game birds are less well documented than for waterfowl. However, results from a study on woodcock conducted in 1995/96 revealed a higher frequency of lead contamination than previously found in dabbling ducks. Approximately 30% of a sample size of almost 1000 young-of-the-year woodcock had greater than 20 mg/g in their bones. Lead isotopic analyses conducted on a subset of this sample revealed isotope ratios consistent with exposure to lead shot and not consistent with lead exposure from gasoline combustion.</p> <p>In an extensive national survey of contaminants in game birds, 11% of breast muscle tissue samples were found to exceed 0.5 ppm, Health Canada's lead residue guideline for fish protein. Elevated lead concentrations were attributed to embedded fragments of lead shot used to harvest the birds. Human ingestion of lead pellets or fragments, through consumption of game harvested with lead shot, has been reported in the literature since 1842. Lead fragment ingestion has been reported in Canada and other countries in populations which consume harvested game. Within some communities, the ingestion rate of lead pellets or fragments reached 15% of the surveyed population. Ingestion of lead shot pellets and fragments has resulted in elevated blood lead levels and gastrointestinal complications in some individuals. The role which consumption of game harvested with lead shot plays, in relation to elevated blood lead concentrations reported within several northern communities, is currently being investigated.</p>

Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Environment Canada has contributed information to two lead Poisoning in Waterfowl Update Reports, prepared by the International Waterfowl and Wetlands Research Bureau, which have received wide distribution to OECD and non-OECD countries. Environment Canada will continue to provide status reports for future publications.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Industry responded to prohibitions on the use of lead shot by increasing the availability of alternative shot products and the development of additional shot materials. A toxicity testing protocol for candidate shot materials was developed in Canada in 1993, which required all alternative shot products to be subject to testing and review prior to approval for use. This protocol is currently undergoing revisions as Canada and the United States harmonize their testing protocols. Environment Canada has been working closely with industry representatives in assessing all candidate shot types to insure that they are non-toxic.
Further information	
Who can be contacted for more information?	<p>Birgit Braune, Ph.D. National Wildlife Research Centre Canadian Wildlife Service Environmental Conservation Service Environment Canada 100 Gamelin Boulevard Hull, Quebec K1A 0H3</p> <p>Telephone: + 1 (819) 953-5959 Facsimile: + 1 (819) 953-6612 E-mail: Birgit.Braune@ec.gc.ca</p>

LEAD SHOT AND LEAD SINKERS	
Regulatory action prohibiting the use of lead fishing sinkers and jigs	
Main elements	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	<p>Scientific evidence on the extent of lead poisoning of waterbirds from ingestion of lead fishing weights was summarized in a 1995 scientific document entitled "A review of the environmental impacts of lead shotshell ammunition and lead fishing weights in Canada" published by Environment Canada.</p> <p>Lead poisoning from ingestion of small lead sinkers or jigs weighing less than 50 grams has been documented in common loons in several Canadian provinces, namely Ontario, Quebec, Nova Scotia, and New Brunswick.</p> <p>In 1997, Environment Canada, in a precautionary initiative, responded to the unnecessary lead poisoning of loons and other waterbirds by prohibiting the use of small lead fishing weights (< 50g) while fishing in National Wildlife Areas. In a parallel initiative, Parks Canada of the Department of Canadian Heritage amended the National Parks Fishing Regulations, to prohibit the possession and use of small lead fishing sinkers and jigs while fishing in National Parks in February of that same year.</p> <p>Environment Canada has considered the option of placing a broader ban on lead sinkers and jigs, using other existing legislation. This option, however, is not recommended at this time. In order to put in place broader based restrictions on the use of lead fishing sinkers and jigs, a longer-term strategy needs to be developed and negotiated with the provinces and the territories, with organizations representing the interests of recreational anglers, and with manufacturers and distributors of fishing tackle.</p> <p>As a result, the optimal alternative for Environment Canada was to take a leading role by proactively restricting the use of small lead fishing sinkers for recreational angling on lands under its direct control.</p>

Objectives	
<p>What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).</p>	<p>Objective: Reduction in lead poisoning of waterbirds</p> <p>Status: Environment Canada will continue to work cooperatively with the provinces, territories and non-government organizations toward the goal of eliminating the small lead fishing weights through educational efforts, to ensure anglers understand the benefits of using non-toxic alternatives, as well as to urge manufacturers and distributors to increase availability of alternatives.</p> <p>Environment Canada will continue to monitor the issue and collect additional data pertaining to the problem, to determine the need for additional regulatory intervention.</p> <p>Prohibition of lead fishing weight use in National Wildlife Areas and National Parks should reduce lead exposure in certain areas. However, lead sinkers and jigs may still be used over most of the country. Broader based voluntary or regulatory initiative will be required to further reduce exposure</p> <p>CWS is continuing research to further document the extent of the problem, especially in areas of Canada where poisoning incidents from sinker ingestion have not been previously documented such as in the Prairie provinces.</p>
Duration	
<p>What year did the project begin and what year did it end (or is it expected to end)?</p>	<p>Assessment of the issue began in 1994.</p> <p>Current regulatory action completed in 1997. However, environmental monitoring and educational activities continue.</p>
Aimed at recycling?	
<p>Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.</p>	<p>A collection and recycling programme was developed in Ontario prior to the regulatory action taken in 1997. This pilot project has since been adapted and used in National Parks, and by non-government organizations to encourage anglers to switch to non-lead fishing weights. Collection and recycling programmes, coupled with broad educational campaigns, were initiated by Parks Canada in 1996, leading up to their regulation in 1997. In addition, several small angling associations and other non-government groups have embraced the issue, setting up collection stations for specific events.</p>

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	A lead exposure monitoring programme for loons was established between Environment Canada and wildlife veterinarians and rehabilitors to report cases of lead exposure. These monitoring efforts will continue.
Programme results	
What are the results of the monitoring programme(s) described?	Lead poisoning in waterbirds, particularly in common loons, has occurred in the past as described previously. It is too soon following the regulatory action to determine the effects of the prohibitions.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Not considering any further regulatory action at this time; however, initiatives to educate the public on the problem, and to promote the voluntary manufacture and use of non-toxic sinkers, will continue.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	No specific efforts to share information.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Industry has responded to regulatory action by providing alternative fishing weights.

Further information	
Who can be contacted for more information?	<p>Birgit Braune, Ph.D. National Wildlife Research Center Canadian Wildlife Service Environmental Conservation Service Environment Canada 100 Gamelin Boulevard Hull, Quebec K1A 0H3</p> <p>Telephone: + 1 (819) 953-5959 Facsimile: + 1 (819) 953-6612 E-mail: Birgit.Braune@ec.gc.ca</p>

EXPOSURE OF CHILDREN	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Regulations - New regulations are in place for glazed ceramic and glassware. Development of new Liquid Coating Materials Regulations is in progress.</p> <p>Policy - A National Strategy is being developed for reducing unacceptable risks to children's health from exposure to lead in children's and other consumer products. The focus of the Strategy is on children, but the strategy also addresses the Canadian public in general.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To reduce risks to children's health from exposure to lead to the lowest practical level in toys and children's products.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Inspection under Hazardous Products Act

Programme results	
What are the results of the monitoring programme(s) described?	Products generally in compliance. One product (mini-blinds) was withdrawn because of health risks from leaded dust on the blinds. Survey of PVC products for children indicates no level of concern.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Further development of lead strategy for reducing risk to children's health from exposure to lead in consumer products. Public consultation is underway.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Frequent interaction with international consumer product organisations.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Allan Cotterill, A/Director Consumer Product Safety Division Product Safety Bureau, HPB Block 1100, Main Stats Bldg Tunney's Pasture Ottawa ON KIA 0L2</p> <p>Telephone: + 1 (613) 957-4469 Facsimile: + 1 (613) 952-3039 E-mail: alan_cotterill@hc-sc.gc.ca</p>

RESEARCH/EDUCATION	
National environment health education programmes	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Education information, communication through targeted distribution of fact sheets, booklets and a video, "Plumbum Conundrum", in June 1998.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To increase understanding of health risks associated with lead and contribute to improved risk management (e.g. renovating old homes).
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Demand figures for publications and video.

Programme results	
What are the results of the monitoring programme(s) described?	Too early to say since video is just released.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Update and revision of fact sheets designed for public.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Dr Tony Myres - Co-ordinator, Special Projects EHC Bldg. #8 Room 233, AL 0801C2 Tunney's Pasture Ottawa ON KIA 0L2</p> <p>Telephone: + 1 (613) 954-1759 Facsimile: + 1 (613) 954-2486 E-mail: tony_myres@hc-sc.gov.ca</p>

Czech Republic

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Besides industrial hygienic measurements in working settings where exposure to lead is still unavoidable (secondary lead smelter, battery makers, glassmakers), measurements of concentrations of α-amino-levulinic acid in urine are widely used as the screening for elevated exposures to lead. Based on the outcomes of this screening test, additional biomarkers of exposure such as blood lead levels and porphyrines are used to determine an extent of exposure.</p> <p><u>General Population</u></p> <p>The general population is screened for exposure to a number of environmental pollutants in the framework of nation-wide Environmental Health Monitoring, which covers the adult population aged 20 to 45 years (participants are usually recruited among voluntary blood donors) and children aged 8 to 10 years living in selected districts of the Czech Republic. Blood lead level has been chosen as the most suitable biomarker of exposure in that population. Outcomes of the Environmental Health Monitoring are annually published by the National Institute of Public Health. It has been shown that in comparison with other developed countries, environmental exposure to lead is low. A geometric mean of blood lead levels lower than 40 $\mu\text{g/L}$ has been found in children, and a downward trend in exposure to lead seems apparent.</p> <p>Specific public health programmes concerning child lead exposure at the environmental hot spot around the secondary lead smelter near the District Town of Pribram were implemented. Three kinds of activities were dominant: determination of the lead distribution in the environment; an evaluation of child lead exposure based on blood and teeth lead levels; and regime based intervention.</p>

Environmental monitoring programmes

Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.

There are several independent sources of information regarding these issues. The most important one is, naturally, the Hygienic Service (the Czech Public Health Authorities), which follows more or less systematically the lead levels in environmental media over decades. However, the already mentioned Environmental Health Monitoring, which meets requirements on good epidemiological practice, has brought dramatic improvement of knowledge.

For instance, the dietary intake of lead has been evaluated based on knowledge of the food basket for the Czech Republic, and market samples of food obtained in 12 representative towns, analyzed in one central laboratory for monitoring of dietary exposure which is involved in a strict QA/QC system. It is estimated that dietary exposure to lead is about 9-15% of the WHO standard (PTWI = 0.025 mg Pb/kg b.w./week). The most important sources of dietary exposure have been detected. With regard to absolute exposure doses, common bread and rolls and other cereals belong to the most significant foods. Furthermore, exposure to lead is associated with consumption of potatoes, pastries and vegetables.

Air and water quality has been monitored systematically by the Hygienic Service and Hydro-Meteorological Institute. Both institutions dispose of independent measurement nets. Concentrations of lead in drinking water, as well as air lead pollution, are low. The WHO standard for lead in drinking water is exceeded neither in general nor in the above described hot spot around the lead smelter. Available data on air pollution also do not suggest an environmental problem. Except for very limited areas near the Příbram lead smelter, the WHO requirements for ambient air quality are met.

Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>The vicinity of the lead smelter located near Pribram has been recognized as the area where human lead exposure poses a health hazard. Epidemiological studies revealed that a blood lead level of 100 µg/L was exceeded in a substantial proportion of children living in a zone within 3 km of the smelter. (Village of Lhota u Pribrami, 44.40%, Village of Nove Podlesi, 70%, Village of Podlesi, 21.40%). The voluntary screening and regime based intervention programme were implemented in that area. A decrease of 17.5 µg/L in mean blood lead level was found in 92 children involved in the programme.</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>Technical measures at the source (the lead smelter) have effectively reduced lead releases to environment. Nevertheless, operations such as manipulation and transportation of separated lead dusts, and soil contamination, associated with other historical sources of lead contamination, have been recognized as major problems at present. Systematic supervision by public health authorities, including monitoring of lead in the environment, technological improvements at the smelter, and the extension of screening/regime based intervention are expected to be effective in reducing exposure of children in that area.</p>

Czech Republic

Part II: Description of Distinct Activities

HUMAN HEALTH MONITORING*	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p><u>The National Integrated Programme on Environment and Health in the Czech Republic, the Programme to Reduce Environmental Lead Exposure in Children Living in Contaminated Areas</u></p> <p>As the reliability of past data on levels of human exposure to lead in the Pribram area was questionable, additional research was needed. The National Integrated Programme on Environment and Health in the Czech Republic, and the Programme to Reduce Environmental Lead Exposure in Children Living in Contaminated Areas was implemented in 1992-94. The evaluation of child lead exposure in the vicinity of the lead smelter in Pribram and the demarcation of areas where exposure to lead poses a health risk were the major goals of the programme. The cross-sectional epidemiological study using blood lead levels and teeth lead levels as biomarkers of exposure was performed on a random sample of children living in the District of Pribram. Furthermore, the investigation focused on factors associated with elevated exposure, and a statistical model evaluating the importance of different sources of exposure and routes of exposure was developed.</p> <p><u>Regime Based Intervention in the Child Population Exposed to Environmental Lead in the Pribram Area</u></p> <p>Based on the outcomes of the previous programme, the Regime Based Intervention in the Child Population Exposed to Environmental Lead in the Pribram Area was implemented in 1995-97. Early identification of children with elevated blood lead levels, and testing the efficacy of regime based intervention in the case of such children, were among the objectives of the programme.</p>

* *The Environmental Health Monitoring programme was developed and implemented as an essential source of information on exposure to environmental pollutants, including lead. With respect to human lead exposure, the programme has a character repeated cross-sectional study. A complete description of the Environmental Health Monitoring programme is beyond the range of this questionnaire.*

Objectives	
<p>What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).</p>	<p>As follows from the outcomes of the Environmental Health Monitoring programme, exposure to environmental lead is not a public health priority. Nevertheless, the National Integrated Programme on Environment and Health in the Czech Republic, the Programme to Reduce Environmental Lead Exposure in Children Living in Contaminated Areas, and Regime Based Intervention in the Child Population Exposed to Environmental Lead in the Pribram Area were implemented as basic instruments to gather information needed for effective reduction of exposure of children to lead. Both programmes provided a consistent picture of exposure sources and routes, which make it possible to tailor specific intervention measures. The effectiveness of the intervention seems evident. A decrease of 1.75 µg/L in mean blood lead level was recorded in children who were the subject of intervention.</p>
Duration	
<p>What year did the project begin and what year did it end (or is it expected to end)?</p>	<p>The National Integrated Programme on Environment and Health in the Czech Republic, the Programme to Reduce Environmental Lead Exposure in Children Living in Contaminated Areas: 1992-94</p> <p>Regime Based Intervention in the Child Population Exposed to Environmental Lead in the Pribram Area: 1995-97</p>
Aimed at recycling?	
<p>Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.</p>	<p>No</p>

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Public health authorities' supervision of the Pribram smelter, environmental monitoring around the smelter. Voluntary blood lead screening was supported by a grant of the Major Hygienic of the Czech Republic and finished by the end of 1997.
Programme results	
What are the results of the monitoring programme(s) described?	The most important outcomes of the above described activities are: <ul style="list-style-type: none"> • demarcation of the area where lead contamination poses a health risk; • detailed knowledge on the distribution of lead in environmental media; • identification and quantification of sources and routes of exposure; • evaluation of the efficacy of regime based intervention in children.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Implementation of routine screening of blood lead levels around the smelter should be considered. Testing of blood lead levels is a cheap method of identifying children at risk. Furthermore, knowledge of individual exposure level substantially facilitates the willingness of parents to co-operate and makes it possible to control the effectiveness of recommended measures.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	<p><u>Publications</u></p> <p>Environmental Health Monitoring - Annual Reports.</p> <p>Cikrt M., Smerhovsky Z., Blaha K., Nerudova J., Sediva V., Fornuskova H., Knotkova J., Roth Z., Kodl M., Fitzgerald E.: Biological monitoring of child lead exposure in the Czech Republic. <i>Environmental Health Perspectives</i> 105:406-411 (1997).</p> <p>Smerhovsky Z., Cikrt M., Vavřinová J.: Health effects of lead coming from mining wastes. <i>Centr. Eur. J. Publ. Hlth</i> 6:168-171 (1998).</p> <p>Lead and Health in the Czech Republic. A Summary Report (Blaha K., Report Co-ordinator). Ministerial Conference "Environment for Europe", Sofia, October 23-25, 1995.</p>

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	None
Further information	
Who can be contacted for more information?	<p>Zdenek Smerhovsky National Institute of Public Health Srobarova 48, 100 42 Prague 10</p> <p>Telephone: + 4202 673 11 467 E-mail: blaha@env.cz</p> <p>Karel Bláha, PhD, Director Dept. of Environmental Risks, Ministry of Environment of the Czech Republic Vrsovicka 65, 100 10 Prague 10</p> <p>Telephone: + 420 2 6712 2535 Facsimile: + 420 2 6731 0013 E-mail: blaha@env.cz</p>

Denmark

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>Regulation of use and sale of lead and lead-containing products</p>

Denmark

Part II: Description of Distinct Activities

PRODUCT AND/OR USE REGULATION	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	A regulation on lead-containing products is under way. The draft regulation contains a general prohibition – with exemptions – on the sale of lead-containing products. It also prohibits the sale of a range of specified products containing metallic lead. The prohibitions will take place in the period 1999-20003.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting objectives, goals and/or targets (e.g. prohibition on selling lead-based paint).	To reduce lead contamination of the environment.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1997 1999 (entry into force; see above)
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	This is not the main target, but also important. The reuse of some products is impossible at the moment due to too high lead content.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The use of lead has been monitored. This will be repeated at a later date

Programme results	
What are the results of the monitoring programme(s) described?	The results will not show until some years from now.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	A cleaner products programme has just started. This programme will include projects to eliminate lead by using and/or developing alternatives to lead.
Further information	
Who can be contacted for more information?	<p>Henri Heron Danish EPA Cleaner Technology and Products Strandgade 29 DK-1401 Copenhagen K</p> <p>Telephone: + 45 32 66 05 45 Facsimile: + 45 32 66 05 31 E-mail: hh@mst.dk</p>

European Commission

Part II: Description of Distinct Activities

OCCUPATIONAL EXPOSURE*	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	As requested by the Council, DG V/F/5 is currently evaluating the limit values established in Directive 82/605/CEE in accordance with the new scientific data.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	NA
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No

* Council Directive 82/605/EEC of 28 July 1982 (Official Journal No. L 247, 23/08/1982 P.0012-0020) on the protection of workers from the risks related to exposure to metallic lead and its ionic compounds at work (first individual Directive within the meaning of Article 8 of Directive 80/1107/EEC). The above mentioned Directive has been consolidated by Directive 98/24/CE (Official Journal No. L 131, 05/05/1998 P.0011-0023) on the protection of workers from the risks of chemicals at work and should be transposed by the Member States before 5 May 2000.

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Dr Giorgio Aresini European Commission - DGV/F5 Euroform Building 3288 10 rue Stumper L- 2557 Luxembourg</p> <p>Telephone: + 352 4301 32260 Facsimile: + 352 4301 342 59 E-mail: giorgio.aresini@lux.dg5.cec.be</p>

LEAD IN GASOLINE*	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Reference: Common Position (EC) No. 39/97 OJ C351 19.11.97 Article 3</p> <ol style="list-style-type: none"> 1. ban of leaded petrol by 1 January 2000 2. derogation allowed by Commission till 1 January 2005 for a Member State if it can demonstrate that the introduction of a ban would result in severe socio-economic problems or would not lead to overall environmental or health benefits because, <i>inter alia</i>, of the climatic situation in that Member State 3. lead content in leaded petrol should not exceed 0.15 g/l 4. automatic derogation in Member States for small quantities of leaded petrol to a maximum of 0.5% of total sales, to be used by old vehicles of a characteristic nature and to be distributed through special interest groups
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Total ban of lead from 2005
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>2000</p> <p>2005</p>

* *Ban of leaded petrol is in the provisions of the proposal for a Directive related to fuels quality and agreed on 29 June 1998 by the Council and European Parliament during the Conciliation process.*

Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Monitoring must exist in each Member State for compliance with current Directive (namely on leaded petrol) 85/210/EEC (Official Journal No. L 096, 03/04/1985 P. 0025-0029) and should continue in the future.
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Pre-accession discussions with non-OECD countries imply automatically that they subscribe to respect the “environmental acquis communautaire” current and future.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Mr J-M Mackowski European Commission DG XI.D.3 Bd du Triomphe 174-01/26C 1160 Bruxelles Belgium</p> <p>Telephone: + 32 2 296 8685 Facsimile: + 32 2 296 95 54 E-mail: jean-marie.mackowski@dg11.cec.be</p> <p>DG XVII.B.2 Mr. M. Supponen European Commission Avenue de Tervuren 226-236 1150 Bruxelles Belgium</p> <p>Telephone: + 32 2 299 27 43 Facsimile: + 32 2 296 43 37 E-mail: matti-supponen@dg17.cec.be</p>

EMISSIONS FROM MAJOR SOURCES*	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<ul style="list-style-type: none"> • Reduction of total annual emissions of lead, cadmium and mercury from point sources; • Apply best available techniques to certain major stationary sources, as well as emission limit values or equivalent reduction strategies to such sources; • Apply product management measures to leaded petrol and to mercury-containing batteries.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	NA
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>Signed in Aarhus, DK in June 1998.</p> <p>Ratification from 21 December 1998.</p> <p>Entry into force on 90th day following date of deposit of 16th instrument of ratification.</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

* *Follow-up after signature of the UN-ECE Protocol on Heavy Metals under the Convention on Long-Range Transboundary Air Pollution (Geneva Convention 1979).*

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Reviews will be carried out by the Implementation Committee established by Decision 1997/2 of the Executive Body for the Convention on Long-Range Transboundary Air Pollution.
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Mrs K. Tierney European Commission DGXI/E/1 Beaulieu 5-02/124 Rue de la Loi 200 B-1049 Bruxelles Belgium</p> <p>Telephone: + 32 2 2968118 Facsimile: + 32 2 2991067 E-mail: Kathryn.tierney@dg11.cec.be</p> <p>Mr. G. Schnabl European Commission DGXI/E/1 Beaulieu 5-02/151 Rue de la Loi 200 B-1049 Bruxelles Belgium</p> <p>Telephone: + 32 2 2992725 Fascimile: + 32 2 2991067 E-mail: gernot.schnabl@dg11.cec.be</p>

PRODUCT AND/OR USE REGULATION*	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Member States shall ensure that the sum of concentration levels of lead, cadmium, mercury and hexavalent chromium present in packaging or packaging components shall not exceed: - 600 ppm by weight two years after the implementation of Directive (before 30 June 1996) - 250 ppm by weight three years after the implementation of Directive (before 30 June 1996) - 100 ppm by weight five years after the implementation of Directive (before 30 June 1996)
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Reduction of the quantity of above mentioned substances in packaging and packaging waste
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1998 2001
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

* *European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste (Official Journal No L 365, 31/12/1994 P.0010-0023)*

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Mr M. Onida European Commission-DGXI/E/3 Beaulieu 9-02/188 Rue de La Loi 200 B-1049 Bruxelles Belgium</p> <p>Telephone: + 32 2 2994833 Facsimile: + 32 2 2991068 E-mail: Marco.Onida@dg11.cec.be</p>

PRODUCT AND/OR USE REGULATION*	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Member States shall ensure that lead, mercury, cadmium and hexavalent chromium contained in vehicles put on the market after 1 January 2003 are prevented from being shredded in vehicle shredders and from being disposed of in a landfill or in any installation incinerating or co-incinerating waste, with or without energy recovery.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Encourage vehicle manufacturers, in liaison with material and equipment manufacturers, to control the use of hazardous substances in vehicles
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Adoption of future Directive NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

* *Proposal for a Council Directive on end of life vehicles (including their components and materials) COM(97)358 (Official Journal No. C337, 07/11/1997 P.0003)*

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Mr M. Onida European Commission - DGXI/E/3 Beaulieu 9-02/188 Rue de La Loi 200 B-1049 Bruxelles Belgium</p> <p>Telephone: + 32 2 2994833 Facsimile: + 32 2 2991068 E-mail: Marco.Onida@dg11.cec.be</p>

AMBIENT AIR*	
Main elements	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	<p>The proposed Directive sets an annual limit value on the protection of human health of 0.5 µg/m³ for lead, to be met by 1 January 2005. There is a derogation until 1 January 2010 for meeting the limit value for lead around nominated industrial sites. The new limit value will replace the existing limit value under Directive 82/884/EEC on a limit value for lead in the air, Official Journal No. L 378, 31/12/1982.</p> <p>Member States will be required to prepare and implement detailed action plans designed to achieve the limit value by the attainment date.</p> <p>The proposed Directive sets out basic requirements for air quality monitoring and for the use of other methods of air quality assessment. It includes provisions requiring that the public have easy access to up-to-date information about concentrations of air pollution.</p> <p>The Commission will be required to submit by the end of 2003 a report reviewing the application of the Directive, and the provision of the Directive in the light of the most recent scientific research. The review will also consider technological developments, including progress achieved in regard to methods of measuring and assessing the deposition of lead on surfaces. The report will be accompanied as appropriate by proposals to amend the Directive.</p>

* As required by the Council Directive on Ambient Air Quality Assessment and Management (96/62/EC), Official Journal No. L 296, 21/11/1996, the Commission has put forward a proposal for a Council Directive relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (COM(97)500), Official Journal No. C 009, 14/1/1998. The limit values are based on WHO air quality guidelines, and are designed to avoid, prevent or reduce harmful effects on human health and the environment. At its meeting on 16 June 1998, the Council reached a political agreement on the proposal with a view to adopting a Common Position.

Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The proposed Directive sets air quality limit values (see above). Member States will be required to achieve the limit values by the attainment date. It is up to Member States to decide which measures/policies are most appropriate for their particular circumstances.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>Member States will be required to bring into force the laws, regulations and administrative provisions necessary to comply with the proposed Directive by 24 months after the entry into force of the Directive.</p> <p>Member States will be required to meet the ambient air quality limit value for lead by 1 January 2005 (1 January 2010 around nominated industrial sites). Thereafter, Member States will be required to ensure that concentrations of lead in the air do not exceed the limit value.</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	<p>Member States will be required to assess ambient air quality in accordance with Article 6 of Council Directive 96/62/EC.</p> <p>The Commission will monitor the progress of action plans submitted by Member States.</p> <p>The Commission will publish annually a list of zones which exceed the limit values and a wider report on the state of European ambient air quality every three years.</p>

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Countries aspiring to join the European Union must align their national laws, rules and procedures in order to give effect to the entire body of EU law contained in the <i>acquis communautaire</i> . Pre-accession discussions with non-OECD countries are providing an opportunity for those countries to familiarise themselves with EU environmental legislation and to commence the process of approximation.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Ms Lynne Edwards European Commission DGXI.D.3 Rue de la Loi 200 Bureau TRMF 1/26 B-1049 Brussels Belgium</p> <p>Telephone: + 32 2 296 86 98 Facsimile: + 32 2 296 95 54 E-mail: lynne.edwards@dgl1.cec.be</p>

Finland

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Persons other than occupationally exposed: study in 1992 measuring blood lead concentration. Mean concentration was 0.17μmol/l for men and 0.11μmol/l for women.</p> <p>The blood lead concentration for nursery children living in an urban area was measured in 1983, 1988 and 1997. The average concentrations were (1983) 48μg/l, (1988) 30 μg/l and (1997) 26μg/l. The results show that levels in 1997 are very low. The main reason for the decreasing levels is the reduction and finally (in 1996) cessation of use of lead in gasoline.</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p><u>Food</u></p> <p>In the survey conducted in 1994, daily intake of lead was assessed. The mean daily intake of lead from food by the Finnish consumer was 19.5 μg. The most important single source of lead was fish; other groups were grain, meat and berries.</p> <p>In another survey, to be published, lead intake via food was measured in 1996, the amount being 14μg/d. Significant reduction can be seen from values estimated in the 1970s (66μg/d) and also from values of the 1980s (20μg/d).</p> <p>Lead and cadmium content in milk, cheese and eggs on the Finnish market was determined. Mean lead content was 1.7μg/kg in milk, 17μg/kg in Finnish cheese, 17-60μg/kg in imported cheese, 1μg/kg in eggs, and 6-72μg/kg in imported dry egg products.</p> <p>The content of lead and cadmium in the main fish species consumed in Finland was determined. The mean lead content in domestic fish species was <LOD (1μg/kg) - 9.4μg/kg; in imported fish <LOD - 8 μg/kg; and in imported canned or salted fish 4-8μg/kg.</p> <p>The lead content in pork muscle, liver and kidney was measured in 1987-96.</p>

	<p>The study conducted in 1996 investigated the hygienic quality of 65 tea mixtures, and the lead and cadmium content of 30 tea mixtures on sale in Finland. According to the study, lead and cadmium contents were low; the highest content was found in foreign tea (3mg/kg).</p> <p>Another study was carried out concerning the heavy metal content of edible wild mushrooms in Finland in 1993-94. According to the results, the contents of mercury, cadmium and Lead varied considerably, with the average lead concentrations being 0.39 +/- 0.39mg/kg dry matter (0.030 +/- 0.027mg/kg fresh weight)</p> <p><u>Drinking water</u></p> <p>As a water utility begins to be used, a wide range of parameters are analyzed. According to these surveys, a monitoring programme is established for each utility. The average concentration of lead in raw ground and surface waters to be treated for drinking is 0.5µg/l.</p> <p><u>Surface water</u></p> <p>National monitoring data on around 30 rivers flowing to the Baltic Sea were collected for 1994-97. The mean concentration in all rivers was 0.66µg/l.</p> <p>The study “Sources of Trace Metals in Streams and Headwater Lakes in Finland” investigated the distribution of some metals in Finnish surface waters. The lead concentrations in headwater lakes are mainly of airborne anthropogenic origin. The concentrations were: in lakes, 0.33µg/l (0.03-2.00µg/l) and in streams, 0.23µg/l (0.05-8.72µg/l) .</p> <p>Concentrations of trace metals in Finnish lakes were measured in two studies. Concentrations generally followed the pattern of atmospheric deposition. They correlated well with lake water acidity as well as with the organic carbon concentration.</p>
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	<p><u>Air</u></p> <p>Air pollutant concentrations have been measured at background stations since the beginning of the 1970s. Lead concentrations are measured at seven stations throughout Finland. Annual depositions in 1996 were between 90 and 1700 µg/m².</p> <p>The main cities monitor their air quality, as well lead concentrations among other parameters. Information can be obtained on request.</p> <p><u>Soil</u></p> <p>In a study, samples from 153 cultivated land sampling areas were analysed. Lead concentrations had decreased from the 1970s, and the levels are higher in southern compared to northern Finland. The mean concentration of lead in cultivated land sampling areas was 2.1 mg/l. In the 1970s, the average level was 3.6 mg/l (4.4 mg/l).</p> <p>Monitoring of cultivated Finnish soils took place in 1974 and 1987. In 1997-99, the samples were taken again. Samples will be collected and analysed for nutrients, trace elements and heavy metals.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Current levels do not exceed levels of concern. Studies show that the levels are now lower than, for example, ten years ago.</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>Levels are already low, and no further actions are being proposed.</p>

Finland

Part II: Description of Distinct Activities

LEAD IN GASOLINE	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Act 1472/1994 on the excise tax of liquid fuels (and its amendments) sets the taxes per litre of liquid fuels. Leaded fuel is taxed 18% more than unleaded fuel.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The main reason is to promote the use of unleaded fuel in order to reduce the lead load to the environment.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1994
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	<ol style="list-style-type: none"> 1. Statistics on sold fuel 2. Surveys of lead concentrations, described in Part I

Programme results	
What are the results of the monitoring programme(s) described?	1. Placing on the market of leaded fuel ceased in 1996 2. Described in Part I
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	The Finnish refinery produces unleaded fuel only. Also, imported fuel is unleaded.
Further information	
Who can be contacted for more information?	Finnish Petroleum Federation P.O. Box 188 FIN-00131 Helsinki Telephone: +358 9 6226150 Facsimile: +358 9 62261510

OCCUPATIONAL EXPOSURE	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Council of State Decision 1672/1992 on health examinations for workers in workplaces with special risks Council of State Decision 1154/1993 on work with lead
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In working places where harmful substances (for example, lead) are handled or circumstances are harmful for physical or biological reasons, specific health examinations shall be carried out at one to three year intervals. In working places where lead or its inorganic compounds are used or handled, taking of all measures to prevent exposure of workers to lead. Measures are further described in the Decision.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1993 1994
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The medical examinations themselves will give information on the progress and efficacy of the Decision. In working places where lead is used or handled, the lead content of workers' blood is measured every six months. If there is a finding of a concentration above 40µg/l, specific measures have to be taken. Also, the workplace air concentrations have to be analyzed every three months.

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Matti Kajantie Ministry of Labour PL 524 00101 Helsinki Telephone: + 358 9 18561 Facsimile: + 358 9 1856 7950 E-mail: matti.kajantie@mol.fi

AMBIENT AIR	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Council of State Decision 481/1996 on air quality limit values (implements EU Council Directives) sets limit values on NO ₂ , SO ₂ , TSP and lead in outdoor air where people might be exposed. The annual mean concentration limit value for lead is 0.5µg/m ³ , which is stricter than limit value 2µg/m ³ in Council Directive 82/884.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To protect human health against effects caused by impurities in outdoor air.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1996
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Concentrations are measured and the results are put into an air quality databank.

Programme results	
What are the results of the monitoring programme(s) described?	The concentrations are very low, as both point and diffuse sources of lead are already well under control. The main load is of transboundary origin.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Seppo Sarkkinen Ministry of Environment P.O. Box 399 FIN-00121 Helsinki Telephone: +358 9 19911

LEAD SHOT	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Legislation on hunting (615/1993) prohibits the use of lead shots in hunting of waterfowl from August 1, 1996.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To reduce exposure to lead in the environment.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1996
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Hunters' Central Organisation Telephone: + 358 9 8777677 Facsimile: + 358 9 8777617

PRODUCT AND/OR USE REGULATION	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Council of State Decision 282/1994 restricts the use of sewage sludge in agriculture if the heavy metal content in either the soil or sludge exceeds limit values. For sludge the lead limit value is 100mg/kg dry matter (from the beginning of 1998), and for soil it is 60mg/kg dry matter.</p> <p>Ministry of Agriculture and Forestry Decision 46/1994 sets requirements for fertilizers. The lead limit value for fertilizers is 150mg/kg or 60mg/l.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The main objective is to reduce lead concentrations in fields to prevent the contamination of agricultural products.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1994
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Described in Part I

Programme results	
What are the results of the monitoring programme(s) described?	Described in Part I
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Ministry of Agriculture and Forestry PL 232 FIN-00171 Helsinki</p> <p>Telephone: + 358 9 1601 Facsimile: + 358 9 160 2190</p> <p>Ministry of Environment PL 380 FIN-00131 Helsinki</p> <p>Telephone: +1 358 9 19911 Facsimile: +1 358 9 1991 9545</p>

France

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>A study of blood lead levels in the French population was carried out in 1996 and 1997. It covered three population groups:</p> <ul style="list-style-type: none"> • the general population in three large French cities, by means of visits to health centres; • the army; • children aged one to six years, hospitalised in child surgery departments throughout the country. <p>This study showed a distinct drop in blood lead levels in the general population compared to levels observed in similar studies carried out in 1979 and 1982. In children aged one to six years, 1.5% had blood lead levels higher than 100 µg/l. In soldiers in the army, 5.5% had blood lead levels superior to 100 µg/l and 0.6% over 200 µg/l. Besides industrial sources, old housing and tap water consumption appear to be the two main risk factors, in particular for children.</p> <p><u>Ministry of Agriculture, DGAL, SDS & A, Office of Veterinary Pharmacy and Residue Control</u> NA</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Lead contamination of drinking water is monitored regularly in the context of hygiene controls. The frequency depends on the quality of the water distributed and the size of the network. Water hardness parameters are also measured regularly. 22% of the networks providing 6.5% of the population with drinking water are liable to contain high levels of lead.</p>

	<p><u>Ministry of Agriculture, DGAL, SDS & A, Office of Veterinary Pharmacy and Residue Control</u></p> <p>Since 1988, the DGAL has put in place programmes to monitor lead contamination of animal products (butcher meat, fowl meat) and by-products (milk and milk products). The programmes are annual and carried out by departmental agents of veterinary services in a strictly random manner, in order to obtain a snapshot of the level of exposure to this danger.</p> <p>Thus 600 samples of meat and offal have been collected every year at slaughterhouses since 1988. In 1998, the number of samples increased considerably (presently 3800) because of new demands by the EEC (D96/23 of 29/04/98). Since 1996, 500 samples of chicken liver have been collected yearly in fowl slaughterhouses. An average of 600 samples of milk and milk products have been collected annually since 1988 from dairies. Similarly, fish and shellfish samples are collected periodically to be examined for lead content.</p> <p>The results of the various monitoring programmes can be summarised as follows:</p> <p>In 1996, 1.33% (1.96%) of bovine (horse) muscle revealed levels higher than the norm set out in the recommendation by the French Superior Council for Public Hygiene (CSHPF); similarly, 4.1% (2.7%) of butter (cream) samples showed levels higher than the limit levels “established” by the National Centre of Veterinary and Food Studies (CNEVA) (“quality” levels which are stricter than the CSHPF levels) in 1995.</p> <p>Of all samples of butcher animal meat analysed between 1989 and 1995, only 1.44% of bovine meat exceeded the CSHPF recommendation limit, along with 0% of pork meat, 1.25% of small ruminant meat and 2.9% of horse meat;</p> <p>For milk and milk products, samples taken since 1988 have shown the following positive levels:</p> <ul style="list-style-type: none"> - 0% for milk and yoghurts; - 1.3% for cheese; <p>For 170 freshwater fish and 150 shellfish, no samples showed lead levels exceeding the level recommended by the CSHPF in 1996.</p>
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	<p>The results of the lead monitoring programmes on animal products and by-products show low levels of contamination of meat products by lead.</p> <p>Moreover, it should be mentioned that an evaluation of theoretical maximum exposure to lead through food has been carried out by the CREDOC in a study observing food consumption at the beginning of 1998.</p> <p>The main objective of this evaluation was to pinpoint the food categories which would most contribute to high exposure to lead, according the hypothesis that maximum levels of lead are attained in all food categories.</p> <p>The main sources of exposure thus obtained (taking into account the levels of consumption and contamination) are, by decreasing order of importance:</p> <ul style="list-style-type: none"> • wine; • vegetables; • fish; • shellfish. <p>For more information, please contact Mme A. Collerie de Bonely at the CREDOC (Research Centre for the Study and Observation of Living Conditions) on (33) 01.40.77.85.39 (tel) or 01.40.77.85.09 (fax), 142 rue du Chevaleret, 75013 Paris.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Occasional programmes of verification and correction of hardness parameters have made it possible to reduce levels of contamination observed in drinking water. The actions described in Part II will be subject to evaluation at a later date.</p> <p><u>Ministry of Agriculture, DGAL, SDS & A, Office of Veterinary Pharmacy and Residue Control</u></p> <p>There are no regulations in France limiting lead in food products, but only recommendations by the French Superior Council for Public Hygiene. These recommendations were also used by the DGAL in 1996 in a Guideline for veterinary inspectors assigned to the enforcement of public health measures.</p>

Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>See Part II.</p> <p><u>Ministry of Agriculture, DGAL, SDS & A, Office of Veterinary Pharmacy and Residue Control</u></p> <p>At the international level, within the framework of the Codex Alimentarius, it has been decided to reduce the norm for lead in wine from 200 to 20 ppb and in fish from 500 to 200 ppb, based on the results of French monitoring programmes and on data available from professionals. Similarly, the norm for shellfish could be reduced from 1000 to 300 ppb. However, for vegetables the norm cannot be reduced.</p>

France

Part II: Description of Distinct Activities

DRINKING WATER	
Implementation of the new European Directive on drinking water quality	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Identification of measures needed to comply with the new MAC value on lead in drinking water in the new European Directive (to be adopted at the end of 1998).
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To comply with the new MAC value (10 µg/l) at the consumer's tap in 2013.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	March 1998 (start of work) Unknown
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Lead monitoring at the consumer's tap (to be implemented two years after publication of the new directive)
Programme results	
What are the results of the monitoring programme(s) described?	Not yet available
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	Jean L Godet Ministère de la Santé 8 Avenue Sègur 75350 Paris 07 Telephone: + 33 (01) 40 56 56 30 Fascimile: + 33 (01) 40 56 50 56 E-mail: dgs_vs4@pante.gov.fr

DRINKING WATER	
Re-mineralisation of soft water intended for human consumption	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	New Ministry of Health recommendations on soft drinking water in contact with metallic pipes (lead, copper, iron) in rural areas.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To reduce lead concernation at the consumer's tap either by treatment of water (re-mineralisation) or by repleacing lead pipes in the house.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1998 (April) 2003
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Yearly questionnaire filled out by sanitary authority in charge of monitoring drinking water quality.

Programme results	
What are the results of the monitoring programme(s) described?	Not yet available.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Jean L. Godet Ministère de la Santé 8 Avenue Sègur 75350 Paris 07</p> <p>Telephone: + 33 (01) 40 56 56 30 Fascimile: + 33 (01) 40 56 50 56 E-mail: dgs_vs4@pante.gov.fr</p>

DRINKING WATER	
Prohibition of lead pipes and solder with lead in the installation of distribution of drinking water	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Regulation: <ul style="list-style-type: none"> • Prohibition of lead pipes (April 1995) in new installation; • Prohibition of solder with lead (August 1997) in new installation.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To reduce lead concentration in water at the consumer's tap.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	April 1995 (lead pipes) and August 1997 (solder) NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Promotion of new material for solder in contact with drinking water free of lead (tin-copper).
Further information	
Who can be contacted for more information?	<p>Jean L. Godet Ministère de la Santé 8 Ave. Sègur 75350 Paris 07</p> <p>Telephone: + 33 (01) 40 56 56 30 Fascimile: + 33 (01) 40 56 50 56 E-mail: dgs_vs4@pante.gov.fr</p>

HISTORIC USE IN BUILDINGS	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Lead-based paint in homes is the most important remaining source of high lead exposure for children in France. The activity implemented has been, from 1992, a targeted screening of children selected on the basis of individual risk assessment to identify those who meet certain criteria which may include place of residence or answers to personal risk-related questions.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The goals of this activity are to prevent children being exposed to lead and to reduce the harmful effects of elevated BLL after elevations have occurred.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1992
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Childhood blood lead monitoring system containing information on elevated and non-elevated BLL results.

Programme results	
What are the results of the monitoring programme(s) described?	From 1992, we have the results for over 14,000 children and 13,381 BLL have been monitored.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Jocelyn Boudot Ministère de la Santé 8 Ave Sègur 75350 Paris 07 Telephone: + 33 (01) 40 56 42 40 Facsimile: + 33 (01) 40 56 50 56

Germany

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Blood lead levels are measured in the frame of the environmental specimen bank. The environmental specimen bank programme of the Federal Republic of Germany is a permanent institution of the Federation under the general responsibility of the Federal Ministry of Environment, Nature Conservation and Nuclear Safety and the administrative co-ordination of the Federal Environmental Agency.</p> <p>Since 1981, blood and other human organ specimens are collected twice per year from a group of about 100 students in defined peripheral conditions.</p> <p>The subjects have to complete standard questionnaires about family and health status, occupational exposure, nutrition, smoking and drinking habits, and the use of medicine.</p> <p>Every step in the procedure, from sampling to transport, preparation, chemical analysis and long-term storage, is carried out according to obligatory Standard Operating Procedures.</p> <p>Whole blood samples are analysed for lead without pre-treatment by electrothermal AAS; the limit of detection is approx. 2.0 µg/l.</p> <p>Since the mid 1980s a downward time trend in blood lead levels is observed; the mean (± s.d.) lead concentration in 1984 was 82.3 (± 33.8) µg/l and in 1997, 25.1 (± 15.5) µg/l.</p> <p>Data are also available in tables or graphics. For more information, please contact: Umweltbundesamt, Mrs. Schröter-Kermani, FG II 1.5, D-14191 Berlin, Postfach 330022.</p> <p>(German Environmental Survey (Geres) of human beings, animals and environment for heavy metals and other hazardous compounds. Reports are available in German language. For more information, please contact: Umweltbundesamt, Mr. Krause, FG V 4.3, D-14191 Berlin, Postfach 330022.)</p>

Environmental monitoring programmes

Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.

Biota

The environmental specimen bank of the Federal Republic of Germany implies collection of specimens from representative areas of Germany.

Until now, nine representative types of ecosystems from terrestrial, limnetic and marine regions are examined. From marine ecosystems, bladder wrack (*Fucus vesiculosus*), common mussel (*Mytilus edilus*), eel pout (*Zoarces viviparus*) and eggs of herring gull (*Larus argentatus*) are collected.

From limnetic ecosystems, zebra mussel (*Dreissena polymorpha*) and bream (*Abramis brama*) are collected. From terrestrial ecosystems, needles of pine (*Pinus sylvestris*) and spruce (*Picea abies*), leaves of poplar (*Populus nigra*) and beech (*Fagus sylvatica*), earthworm (*Lumbricus terrestris/ Apporectodea longa*), liver of roe deer (*Capreolus capreolus*) and eggs of pigeons (*Columba livia f. domestica*) are collected. In principle, sampling takes place once a year at the same time of the season.

The Federal Environmental Specimen Bank is operating according to well-defined Standard Operating Procedures for sampling, sample transport, sample processing, sample characterization and storage.

For the period 1985-96, no significant changes in lead levels in bladder wrack or common mussel could be observed. Downward time trends in lead levels in the period 1985-97 could be observed in the case of spruce needles and poplar leaves.

(German Environmental Survey (Geres) of human beings, animals and environment for heavy metals and other hazardous compounds. Reports are available in German language. For more information, please contact: Umweltbundesamt, Mr. Krause, FG V 4.3, D-14191 Berlin, Postfach 330022.)

	<p><u>Soil</u></p> <p>650 Permanent Soil Monitoring Sites (<i>Bodendauerbeobachtungsflächen</i>) in the Federal States; choice of sampling points representative of landscape, soil type, land cover, population density etc.; data obtained: pedological data, total lead content of different layers of the soil, plant-available lead content in soil, lead content in atmospheric deposition, fertilisers and plants.</p> <p>Forest Soil Inventory (<i>Bodenzustandserhebung im Wald</i>) with sampling points on an 8x8 km grid (1800 sampling points), sampling between 1987 and 1993. Data obtained: pedological data, total lead content in organic layers</p> <p>Collection of publications containing soil investigation data. Data obtained: total lead content in soil, lead content in atmospheric deposition, fertilisers, sewage sludge and other materials</p> <p>Sewage Sludge Ordinance: Soils earmarked for application of sludge has to be analysed before application. Implementation by the Federal States.</p> <p>Background values: Background values indicate the natural basic levels and the additional ubiquitous anthropogenic load. Background values are available from each of the 16 Federal States.</p> <p>For more information, please contact Mr. Junker, Section II 3.3 in the Umweltbundesamt (German Federal Environmental Agency).</p> <p><u>Air</u></p> <p>Guideline 82/884/EWG of the Council of the EU concerning lead concentration in the air stipulates a limit value of 2 µg/m³ (annual mean average value).</p> <p>The WHO Air Quality Guidelines for Europe (second edition, 1998) mention a limit value for lead concentration in the air of 0.5 µg/m³.</p> <p>The Federal Law for Emission Protection prescribes air quality monitoring of several urban and industrial areas in the Federal Republic. The Bundesländer are responsible for measurements and data gathering. The data have to be reported regularly to the EEA (European Environmental Agency) and to the Federal Ministry for Environment.</p> <p>For more information, please contact Ms. Dauert, Section II 4.3 in the Umweltbundesamt (German Federal Environmental Agency).</p>
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Drinking Water

Monitoring of lead levels in drinking water is required by legal regulations. The sampling frequency depends on the capacity of the drinking water plant as well as on the preceding results. Monitoring does not include the domestic water supply (behind the water meter).

The limit value is 40 µg/l. Values in excess were not reported during the last years.

A different situation exists inside households in regard to tap water. It is estimated that about 10% of German households have lead or partially lead drinking water installations.

Results of a repeated survey (title "Environment and Health Measurement and Analysis of Environmental Exposure Factors in the Federal Republic of Germany" - Environment Survey, and Umwelt-Survey respectively [*Krause et al. 1985/1986, 1990/1991, 1992/1992*]) demonstrate the following figures.

Drinking water monitoring was based on representative test subjects (population aged 25-69 years). The lead concentration in drinking water as well as the estimated lead intake via drinking water are representative for the total German population.

For more information, please contact Mr. HÖring, Section V 2.10 in the Umweltbundesamt (German Federal Environmental Agency).

Biota

Based upon data from the Federal Environmental Specimen Bank, no observed levels exceed levels of concern.

Level of concern	
	<p><u>Soil</u></p> <p>In the draft of the national <i>Soil Protection and Contaminated Sites Ordinance</i> the proposed standards for lead are as follows:</p> <p>Precautionary value: 40-100 mg/kg total content depending on soil type.</p> <p>Threshold value: depending on land cover</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Playgrounds (200 mg/kg total content) Housing areas (400 mg/kg total content) Parks and leisure grounds (1000 mg/kg total content) Industrial areas (2000 mg/kg total content) Grassland (1000 mg/kg total content) Arable land (500 µg/kg plant-available content)</p> </div> <p>Admissible lead input to the soil from all paths: 400 g/ha/year</p> <p>In general, lead levels in soil do not exceed levels of concern. But the maximum levels in densely populated areas and around industrial pollution sources can easily exceed the above mentioned threshold values. If the suspicion of danger is confirmed, there are several possibilities of action, from restriction of land utilisation to decontamination measures.</p>

	<p>Lead levels in soil (total content)</p> <p><i>Programme mean [mg/kg] - maximum [mg/kg] - number of sampling points</i></p> <p>Permanent soil monitoring sites Agricultural land in Bavaria (50-100*-225) Federal Monitoring Network Old Federal States (60-300-45) Data from literature Large cities (130-7000-11,000 [17 cities]) Flood areas (130-800-400 [6 rivers]) Site of a former PCP production plant (300-700 [1 site]) Military contaminated site (140-2300-50 [1 site]) Motorways (distance < 1 m) (600-900 [4 motorways]) Motorways (distance 10 m) (70-100 [4 motorways]) Motorways (distance 50-100 m) (50-60 [4 motorways]) Landfill (400-1400 [1 site]) Former mining areas (1000-14,000-600 [15 sites])</p> <p><i>Median [mg/kg]-90th percentile [mg/kg]</i></p> <p>Background values for agricultural land Rural areas (30-80[> 5000]) Conurbations (20-150 [3000]) Density of population not specified (30-110 [> 5000])</p> <p>*First value below maximum</p> <p>The soil is the environmental medium where lead releases accumulate. Therefore, short-term decreases in lead levels in soil cannot be expected. But it has been determined by monitoring that the lead input to the soil has decreased over the last 20 years. The soil input from sewage sludge has decreased by two-thirds since 1977, and that from atmospheric deposition by 75% since 1986 (compare with table in Annex 1).</p>
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<u>Air</u>				
<p>Since 1972, lead concentrations in the air have been decreasing continuously as a result of the Federal Law concerning lead limitation in fuels and due to national regulations on emission control measures in the industrial sector (TA Luft). In rural areas, lead concentrations during the last two decades have decreased by one or two orders of magnitude down to values around 11 ng/m³. The situation is similar for urban regions, with lead concentrations around 70 ng/m³. Maximum values in industrial areas are around 300 ng/m³. Therefore, the EU guideline (limit of 2000 ng/m³) is fulfilled. Exceeding the WHO values may possibly occur rarely in industrial sectors.</p>				
<u>Drinking water</u>				
Daily intake of drinking water lead				
	n	median	arithmetic mean	CI
[µg/d]	4009	0.6	5.36	3.53-7.20
<p>Method for drinking water samples: "spontaneous" (as used for the household) and stagnation (the first portion of tap water in the morning). Reference: UBA, WaBoLu, Umwelt-Survey 1990/92, Bundesrepublik Deutschland. Frequency (%) of values in excess: (Lead concentration in drinking water/tap water > 40 µg/L).</p>				
[Survey (1985/86) - Survey (1990/91) - Survey (1991/92 "Neue Länder" of Germany)]				
spontaneous sample	1.3		0.1	5.9
stagnation sample	1.8		0.8	7.7
<p>Reference: UBA, WaBoLu, Umwelt-Survey 1990/92, Bundesrepublik Deutschland. The survey for 1998/99 is in preparation.</p>				

Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	Since exceeding environmental quality standards occurs only in very few cases, no general co-ordinated activities are planned. However, due to the further reduction of the use of leaded petrol and the continuous application of the best available technologies for stationary sources, it can be expected that the environmental level of lead will be reduced further, in particular in the “Neue Länder” of Germany. Specific actions might be necessary at “hot spots” to comply with the Soil Protection and Contaminated Sites Ordinance.

Annex 1: Changes in lead input to soil 1977-96

Subject	1977	1980	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Unit	No. of samples
Dust deposition in cities of Bavaria		470		350		300	240		210	170	140	97	84	69	64	64	42	g/ha/year	30 monitoring sites
Bulk deposition in Bavaria							70	60	55	50	40	30	17	20	21	20		g/ha/year	133 monitoring sites
Sewage sludge, old Federal States	290		190						158						100			mg/kg ds	>1000

ds = dry substance

Germany

Part II: Description of Distinct Activities

PRODUCT AND/OR USE REGULATION	
Draft Decree concerning the avoidance and recycling of packaging waste	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Limit values for heavy metals in packaging materials; marking of hazardous compounds shall be obligatory and recycling quotes shall be fulfilled.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Packaging materials shall be reused at a rate of 45%, with a view to reducing their release to the environment.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1998 No end foreseen.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Yes, see above.

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	BAT – exchange of information at EU, OSPAR and UN-ECE level. Exchange of technology programmes.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

EMISSIONS FROM MAJOR SOURCES	
17. BImSchV (Federal Ordinance on Emission Protection) concerning waste incineration	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Limitation of lead emissions from waste combustion plants in accordance with BAT.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The limit value for lead shall be met by new <i>and</i> old plants. Old plants need advanced measures for emission control.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1990 12/1996
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Not specifically.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Emissions are controlled three times per year (air). Lead concentrations in solid waste, for deposition (TA Si) or use (LAGA Merkblatt), are limited and monitored permanently.

Programme results	
What are the results of the monitoring programme(s) described?	Lead emissions by waste combustion have decreased steadily since the 1990s. Their share of total lead emissions from point sources is around 0.3% (1.2 t/a of total 384 t/a in 1995).
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Further measures on national activities for waste combustion are not elaborated. A revision of EU guidelines concerning the incineration of waste is on the way.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	BAT - exchange of information at EU, OSPAR, UN-ECE level. Exchange of technology programmes.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Mr. B. Johnke Umweltbundesamt FG III 4.3 D-14191 Berlin Postfach 330022

RECYCLING	
Ordinance for batteries (implemented by March 1998 in adoption of EU regulation 91/157 EWG)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Batteries with more than 0.4% lead by weight and lead-acid batteries are regulated. Obligations for producers: take-back systems free of charge; recycling; monitoring of success analysis control. Security deposit (15 DM) for car batteries in case of non-return of a used battery.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Reduction of uncontrolled littering of lead batteries in the environment or introduction into the public waste fraction.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1988 Still in force
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Yes, return rates for lead-acid batteries shall be maximised. A deposit fund of 15 DM is an attractive level to bring back used batteries. According to the waste management law (passed in 1996), lead-acid batteries shall be recycled.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Producers are obliged to report on the success of the return system (amount of batteries sold and returned per year, qualitative and quantitative results of recycling and removing, including the paid process - § 10 battery ordinance).

Programme results	
What are the results of the monitoring programme(s) described?	Until now, no results are available on the return system described. The results of the voluntary return system are approx. 100% return rate for industrial applications; return rate of batteries in cars: 70-95%.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	BAT - exchange of information at EU, OSPAR, UN-ECE level. Exchange of technology programmes.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Voluntary agreement concerning the return of lead-acid batteries. Reduction of use of lead and lead compounds in production, improvement of the purification of wastewater containing lead.

Further information	
Who can be contacted for more information?	<p>Mrs. Böttcher Tiedemann Umweltbundesamt FG III 3.2 D-14191 Berlin Postfach 330022</p> <p>Telephone: +49-30-8903-3020 Fascimile: +49-30-8903-3336</p> <p>Dr. Rainer Korthauer Fachverband Batterien im ZVEJ Stresemann str. 19 D-60596 Frankfurt</p> <p>Telephone: +49-69-6302-256 Fascimile: +49-69-6302-279</p>

EMISSIONS FROM MAJOR SOURCES/WATER POINT SOURCES	
TA Luft (technical description for air pollution control) describing technologies and setting limit values for important industrial sectors; b) water cleaning act § 7, Annex 41 concerning glass industry as a typical and main sector for lead discharge into water: limit values (further Annexes deal with other important sectors)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Application of “best available techniques” by all significant industrial activities obligatory. Nationwide emission limit values are fixed for emissions into the air and discharges into water.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The limit value for lead shall be met by new <i>and</i> old plants. Old plants needed advanced measures for the emission control.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	In the 1970s. Still in force.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Not specifically.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Control by local authorities.

Programme results	
What are the results of the monitoring programme(s) described?	BAT application is ensured.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	BAT - exchange of information at EU, OSPAR, UN-ECE level. Exchange of technology programmes.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Reduction of use of lead and lead compounds in production; improvement of the purification of wastewater containing lead.
Further information	
Who can be contacted for more information?	

WATER POINT SOURCES	
Charge on discharging of wastewater containing lead	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Increase of wastewater charge on lead from 50 DM per 500g lead discharged to a water body, to 60 DM per 500g (1993), to 70 DM as of 1 January.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The 1876 Federal Wastewater Charge Act was amended in 1994. The goal is to increase the costs for discharging noxious substances (of which lead is one) to a water body and therefore to increase the economic incentive to the polluter to purify his wastewater with the best available technology.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1980 with 12 DM per 500g, to now 70 DM per 500g. Open.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Not specifically.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Control by local water authorities.

Programme results	
What are the results of the monitoring programme(s) described?	Calculation of the wastewater charge debt to be paid by the discharger. Investment of the earned charges as an incentive to wastewater load reducing activities that are initiated by the wastewater producer.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	BAT - exchange of information at EU, OSPAR, UN-ECE level. Exchange of technology programmes.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Reduction of use of lead and lead compounds in production; improvement of the purification of wastewater containing lead.
Further information	
Who can be contacted for more information?	

LEAD IN GASOLINE	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Since February 1988, lead-containing standard (“normal”) gasoline is prohibited. Due to an extra fee on lead-containing gasoline (only super available), lead-free gasoline is cheaper nation-wide (stimulation effect).
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Lead shall be phased out in gasoline during the 1990s.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1988. Still in force.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Control by local authorities.

Programme results	
What are the results of the monitoring programme(s) described?	The goal (completely lead-free gasoline) is almost reached (96% lead-free in 1996).
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	BAT - exchange of information at EU, OSPAR, UN-ECE level. Exchange of technology programmes.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

Hungary

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Since 1996, the monitoring of lead-exposed workers in Hungary is regulated by Decree No. 27/1996. (VIII.28.) NM. The monitoring scheme is the same as before, but the limit values were decreased, and even lower values were set for pregnant women. The current ZP limit value is 150 $\mu\text{mol/mol}$ hem (100 for 18-45 year old women); the limit value for blood lead is 2.4 $\mu\text{mol/L}$ (1.5 for 18- to 45-year-old women).</p> <p>If blood level value is above the limit value (increased exposure), the worker is removed from further lead exposure.</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Lead is regularly measured in samples from suspended dust, according to Hungarian standard MSZ 21454/6-1986, in every county capital, and from fall-out dust at about 600 measuring points in 90-100 settlements by the National Emission Measuring Network. The sampling points for suspended dust are placed located where there is dense traffic. Thus, samples reflect lead emissions from transport.</p> <p>A soil conservation and monitoring system was introduced in 1992 at 1200 observation sites designated in environmentally sensitive areas. Soil quality is tested for temporal change after one, three and six years. The results of lead measurements show that less than 1% of the samples contain lead above the limit value (100 mg/kg soil), and 80% of contain less than 25 mg lead/kg of soil.</p>

Lead in drinking water is controlled occasionally. Although these data do not cover the whole public water supply, the lead content of drinking water at the customer's tap, based on sampling of running water, is usually below detection limit value (only 5% was at or above 4 µg/L).

There are legal provisions concerning the lead content of food in Hungary since the 1960s. The current legislative Decree 8/1985. (X.21.) EüM sets limits for 42 groups of food. Lowering of the limit values is in progress. Hungary participates in both the FAO/WHO Food and Animal Feed Contamination Monitoring Programme and the programme of GEMS/Food since 1976.

The monitoring programme for food covers the whole country. The total number of samples is about 2000. The samples are taken from food processing facilities and from the distribution chain. The analysis is carried out by the atomic absorption method, as set by a national standard. Data are evaluated and published yearly. Based on the data of the National Institute for Food Research and the regional laboratories of the Ministry of Agriculture, typical values for lead in food (domestic and imported) in 1996-97 were determined as follows:

Meat	138µg/kg	Vegetables	32µg/kg
Fish	71µg/kg	Vegetable products	58µg/kg
Milk, milk products	29µg/kg	Fruit	31µg/kg
Cereals	58µg/kg	Fruit products	53µg/kg
Drink	17µg/kg	Sugar	75µg/kg

Lead content of Hungarian food products was measured as a part of the WHO/CET project in 1990-91 (nearly 3700 data). In 1992-94, further measurements were carried out in different cereals. The comparison of results shows a decrease in concentration (e.g. lead concentration in bran in 1990 was: median 350, max. 1570 µg/kg; in 1994 it was: median 36, range 20-464 µg/kg).

Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>The lead content of food within the monitoring programme exceeds the limit in less than 1% of samples. Some 5-8% of samples taken for regulatory control (e.g. contaminated land, technological disorder etc.) exceeds the limit value. No significant difference between domestic and imported products was found.</p> <p>There has been a steady decrease in lead content in human, environmental and food samples. Only a small percentage of samples exceed national and international limit values. These beneficial changes are, to a considerable extent, due to the introduction of the use of unleaded gasoline since 1992, to a low concentration of lead in leaded gasoline and, in the case of food, to the nearly complete phase-out of the use of lead for sealing cans.</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>Reduction of exposure from environmental sources, mainly traffic sources (restriction of traffic, prohibition of selling leaded fuel), prevention of lead entering the food chain, and establishment of protective forests are proposed. Measures for decreasing household use of lead in households (replacement of lead-stabilized PVC pipes, lead paints, pottery) and minimizing disposal of lead-containing waste disposal are also recommended.</p>

Hungary

Part II: Description of Distinct Activities

RESEARCH/EDUCATION	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<ol style="list-style-type: none"> 1. Survey on lead in the environment, in biological samples and in humans by means of identifying and collecting available information. 2. Sociological survey based on responses of persons in government, local authorities, health care and NGOs to a questionnaire and interviews. 3. Development of a risk communication model by involving target groups such as workers, drivers, pregnant women, mothers, and information mediators like pediatricians, public nurses, teachers, NGOs.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objective of the project was to develop and implement a model initiative of environmental health relevance. The specific goal was to enhance awareness and to provide training to various societal groups, so that they would be able to better recognize the hazard, assess it properly and protect themselves against the harmful effects. The project was designed so that, if successful, it could serve as a model for addressing other environmental hazards in Hungary and other countries of Central and Eastern Europe.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Fall of 1993 Spring of 1996
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA
Programme results	
What are the results of the monitoring programme(s) described?	Publication of a special monograph, <i>From science to action: the lead hazard in Hungary - A fact report</i> , edited by Z. Füzesi, B.S. Lery and C. Levenstein, in May 1996.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Establishment of a multisectoral working group aiming at elaboration, co-ordination and operation of an overall activity plan for lead risk reduction. The possible donor organizations are the Fact Foundation, the National Health Insurance Authority and US EPA.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	The monograph on the project was published in both Hungarian and English, in order to facilitate its use by the CEE countries.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Dr. Zsuzsanna Füzesi Fact Foundation H-7601 Pécs, POB 239 Telephone: + 36 72 510829 Fascimile: + 36 72 510828 E-mail: fact@mail.matav.hu

LEAD IN GASOLINE	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<ol style="list-style-type: none"> 1. On 1 January 1985, the Hungarian oil industry began production of gasoline with a lead content of less than 0.4 g/L, according to the initiative of the Hungarian Government in 1984. 2. National Standard No. MSZ 19950-85 set the above limit value as compulsory in Hungary effective from 1 July 1986. 3. According to National Standard No. MSZ 19950-91 XI. with effect from 1 January 1992, gasoline can be produced as "leaded petrol", containing lead less than 0.15 g/L, by the Hungarian oil industry. The limit value for "non-leaded petrol" is 0.013 g/L. 4. According to the voluntary initiative by the Hungarian Oil Company (MOL Rt), production of leaded gasoline ceased effective 1 January 1999.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The programme is aimed at reducing exposure of man and the environment to lead emitted by vehicles.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1985 1999
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	In the fall of 1996, the management of the Hungarian Oil Company (MOL Rt) made a decision to produce gasoline without any lead additives as of 1 January 1999. This decision has had a great influence, since nearly 90% of fuel sold in Hungary is produced by MOL Rt.
Further information	
Who can be contacted for more information?	Zoltán Szabó Department of Development Hungarian Oil Company H-2440 Százhalombatta, Gyártelep Telephone: + 36 23 353258

RECYCLING	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<ol style="list-style-type: none"> 1. Lead batteries are subject to a product charge in Hungary since 1995. The underlying legislation is Act LIII. of 1995 on product charges. The charges are accumulated in the Central Fund for Environment, which is devoted to financing different programmes in the field of environment. One of the separate programmes is the battery programme. 2. Applicants have to develop a national collection network for lead batteries. The fund is available after the conditions concerning limit quantity for collected batteries have been met. Until a reprocessing capacity has been built up, the batteries are exported to countries with available capacity. 3. Establishment of capacity for reprocessing of batteries.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objective of the project is to support financially the recycling of batteries, thereby minimizing waste and decreasing the volume of production.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>1996</p> <p>1999</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	The programme is aimed at promoting the collection and recycling of batteries.

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The quantity of waste batteries collected by applicants to the fund was monitored.
Programme results	
What are the results of the monitoring programme(s) described?	In 1996 and 1997, respectively, 20,000 and 23,000 tonnes of batteries were collected. This provided a basis for the amount of funding.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	After establishing a national collection network and reprocessing capacity, the recycling of batteries will result in decreased production and volume of waste.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Ágnes Pintye Ministry for Environment and Regional Policy H-1394 Budapest, POB. 351</p> <p>Telephone: + 36 1 4573575 Fascimile: + 36 1 2012491</p>

HUMAN HEALTH AND ENVIRONMENTAL MONITORING	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Outlined in the programme for long-term development of health policy (Priorities of Public Health to 2000), as published in Government Decision 1030/1994 (IV.29.) Korm.</p> <p>Monitoring of lead in the air; regular measurement of lead in dust, soil, water and other environmental samples. Biological monitoring of lead exposure of children.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objective of the programme is to find adequate ways of reducing exposure to lead of man and the environment. The specific target is that no blood sample from children would exceed the limit of 15 µg/dL by the year 2000.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>1995</p> <p>2000</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Regular monitoring of lead concentrations in the air, soil and blood samples of preschool and school children living in areas where there is dense traffic.

Programme results	
What are the results of the monitoring programme(s) described?	In 1997, the lead concentration in the soil was fairly low: less than 25 mg/kg in 80% of samples. The lead concentration in air during the winter of 1996-97, as measured in 23 settlements, was as follows: mean concentration was 0.07-10 µg/m ³ ; the frequency of exceeding the limit values was 40-100% in four settlements, while in the others this frequency was 0-33%.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	The main findings of the programme will serve as a basis for further measures concerning exposure to lead.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Dénes Pápay, MD, Ph.D. "József Fodor" National Centre for Public Health H-1097 Budapest, Gyáli u. 2-6</p> <p>Telephone: +36 1 2154821 Fascimile: +36 1 2154821</p>

Ireland

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>There is extensive monitoring of the occupational environment by state (and private industrially funded) occupational hygienists. Occupational blood lead levels are routinely measured in approximately 30 companies where risk assessments have shown significant exposures above 40µg/dL of blood. Lead glass manufacture, lead ore mining, lead battery manufacture, lead roofing, lead soldering in the electronics industry, plastic manufacturing, and exposure to lead on military firing ranges are areas where the most monitoring takes place.</p> <p>One-off surveys are done in new industries where pregnant workers may be exposed to lead solder flux or lead pigment in plastics. Surveys have also been done pre-exposure in army recruits and in industries where lead is used.</p> <p>In the last five years, approximately ten workers have shown blood lead levels over 70µg/dL. About 2000-2500 samples are taken from workers annually and analysed in the state laboratory, Abbotstown, County Dublin.</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Air quality monitoring is performed for lead at eight collecting sites in Dublin City and published annually by the EPA (e.g. EPA: Air Quality Monitoring; Annual Report 1996).</p> <p>The method of sampling lead in the air involves the use of a low volume sampler. This is used for the efficient collection of suspended particulate matter in air up to an aerodynamic diameter of about 10µm on a membrane filter. Each collecting/sampling station consists of a pump which draws a regulated amount of air through a membrane filter, with a porosity of less than 1µm, which is located in a calming chamber and exposed to the external air. The filters are replaced weekly. The lead content of the retained particulates is determined by acid dissolution, followed by flame absorption spectrometry.</p> <p>The highest annual mean concentrations at traffic stations were less than 0.25µg/m³ (one-eighth of the limit value of 2µg/m³).</p>

	<p>The European Communities (Quality of Water Intended for Human Consumption) Regulations, 1988 set the maximum admissible concentration (MAC) for lead in drinking water at 50 µg/l in running water. Atomic absorption is the method of analysis used.</p> <p>Lead levels in drinking water are monitored by sanitary authorities and reported on by the Environmental Protection Agency on a yearly basis. Details of the number of analyses and exceedances of the MAC for the years 1994-96 are as follows:</p> <table border="1"> <thead> <tr> <th></th> <th>1994</th> <th>1995</th> <th>1996</th> </tr> </thead> <tbody> <tr> <td>No. of analyses</td> <td>1648</td> <td>1607</td> <td>1571</td> </tr> <tr> <td>No. of exceedances</td> <td>21</td> <td>22</td> <td>12</td> </tr> </tbody> </table>		1994	1995	1996	No. of analyses	1648	1607	1571	No. of exceedances	21	22	12
	1994	1995	1996										
No. of analyses	1648	1607	1571										
No. of exceedances	21	22	12										
Level of concern													
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Occupational levels in general have decreased over many years in industries where routine monitoring has been established. However, there is still a need to expand the number of smaller industrial units where monitoring is routinely done. Whilst the number of workers exceeding the upper limit of 70µg/100dL is very small, it has not been significantly reduced in the past three to four years, possibly due to the large economic growth and industrial demand over the same time period. The fact that the numbers exceeding the limit value have not vastly increased is a good trend.</p> <p>Very few lead in water measurements have exceeded recommended limits.</p> <p>Environmental air levels appear to have decreased due to over two-thirds of vehicles now using unleaded fuel. As at April 1998, unleaded petrol sales as a percentage of total sales of petrol in Ireland were 83%. The corresponding figure in April 1993 was only 36%, which clearly illustrates a progressive phase-out of the usage of leaded petrol.</p>												
Future actions to reduce exposure													
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>Continued monitoring of occupational and environmental levels will continue to ensure that the current trend of reduced lead exposures continues.</p> <p>Leaded petrol will be phased out, and levels permissible in unleaded petrol will be reduced, in the year 2000.</p>												

Ireland

Part II: Description of Distinct Activities

LEAD IN GASOLINE	
Regulations to implement EU Directives on lead content of petrol, reduction of levels permissible in unleaded petrol in 2000, and phase-out of leaded petrol in 2000	
Continued inspection and monitoring of lead used at work, monitoring of environmental levels of lead	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	National legislation - the European Communities (Lead Content in Petrol) Regulations 1986 (SI No. 374 of 1986) - transposed Council Directive of 20 March 1985 No. 85/210/EEC, which relates to the lead content of petrol. Contamination by lead compounds must not exceed 0.013 grams per litre.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Elimination of leaded petrol (UN-ECE) by 2000. The specific objective of phasing out the use of leaded petrol is to eliminate the health threat it poses, particularly to children and the unborn, by eradicating this toxic pollution and thereby gain a significant environmental advance. Lead in unleaded petrol to be reduced from maximal permitted level now of 0.013 g/l (below EU max. permissible level of 0.015g/l) to 0.005g/l by 2000. Statutory Instrument 374 of 1986
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began: 1986 End: 2000

Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Not specifically.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Continued monitoring of air, water and employee (human blood) lead levels.
Programme results	
What are the results of the monitoring programme(s) described?	Encouraging so far; see EPA annual reports.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Consideration is being given to reducing maximal occupational exposure level from 70µg/dL to 60µg/dL and setting a maximal exposure level for pregnant workers. At present, only a guideline figure of 25µg/dL is used.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	No specific measures, but continued co-operation with health and safety inspectors from Eastern Europe, e.g. Poland, Hungary, Cyprus.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	See above reference to reducing blood levels to 60µg/dL max. and pregnant worker exposure level to 25µg/dL. Numerous surveys on women of reproductivity age in the electronics industry.

Further information	
Who can be contacted for more information?	Thomas Donnelly Health and Safety Authority 10 Hogan Place Dublin 2 Telephone: + 353 1 614 7091 Fascimile: +353 1 614 7020 E-mail: tomd@has.ie

Actions in relation to lead batteries may be relevant. In particular, the Waste Management (Hazardous Waste) Regulations, 1998, which prohibit the marketing of batteries which contain more than 0.4% of lead weight.

Grants were allocated from the ERDF for capital expenditure on waste recycling facilities, including a project for the safe recovery of waste batteries. All funding under the waste recycling grants scheme has been allocated.

Italy

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Biological monitoring programmes to measure blood lead levels (B-Pb) in the general population, including children and pregnant women, are described in Part II (Main Elements) below.</p> <p>Biological monitoring of lead exposure in workers has been carried out according to Legislative Decree No. 277 of 15 August 1991 (in accomplishment of EEC Directives 80/1107, 82/605, 83/477, 86/188, and 88/642) by public laboratories within universities and scientific institutions (departments of occupational and environmental health, departments of hygiene), regional health services, and environmental agencies (departments of prevention, multizonal regional centers for prevention, regional agencies for environmental protection), and, since enactment of Legislative Decree No. 626 of 19 September 1994 (in accomplishment of EEC Directives 89/391, 89/654, 89/655, 89/656, 90/269, 90/394, and 90/679), by private laboratories. In particular, Council Directive No. 82/605/EEC was on the protection of workers from risks related to exposure to metallic lead and its ionic compounds at work (first individual Directive within the meaning of Article 8 of Directive No. 80/1107/EEC). In the last decades, owing to technological and environmental improvements, occupational exposure to lead has dropped as well.</p> <p>In industrial sectors where lead is largely utilised (batteries and ceramics), mean B-Pb is 25-35µg/dL. In the ceramics sector, it is in this range and 10-15% of subjects have over 40µg/dL. In the battery industry, mean B-Pb is below 30µg/dL and less than 3% of workers have over 50µg/dL. At present, the risk of increased lead absorption is higher for workers employed in specific activities (lead recovery, repair of radiators, bronze and copper foundries) and in small factories where environmental or preventive measures are inefficient. Action level and limit (Legislative Decree No. 277/91) are now 35 and 70µg/dL, respectively (Apostoli P., <i>Ann. Ist. Super. Sanità</i> 34(1): 121-29, 1998). Further results obtained by public laboratories from selected industrial areas (in the Piemonte, Lombardia, Emilia Romagna and Toscana regions) where occupational exposure to lead occurs are reported in a monographic issue of the <i>Annali dell'Istituto Superiore di Sanità</i> (Menditto A., Chiodo F., Patriarca M., and Morisi G., Editors, "Evoluzione dell'esposizione al piombo negli ambienti di vita e di lavoro in Italia. Indagini effettuate nel periodo 1978-1996," <i>Ann. Ist. Super. Sanità</i> 34(1), 1998).</p>

Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Regional programmes for the determination of lead in air are carried out according to Decree of Ministers Council Presidency of 28 March 1983. Laboratories within the Regional Agencies for Environmental Protection, or the Multizonal Regional Centers for Prevention, are involved in air monitoring activities.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Blood lead levels in the general population (adults) do not exceed international standards (see Part II, Main Elements, below), but are higher than levels found for adults (non-Hispanic) in the US and in Northern European countries. As for children, the limit of 100 µg/l recommended by the Centers for Disease Control and Prevention in Atlanta (USA) is exceeded by 4.6% and 1.6% of male and female children, respectively.</p> <p>Results of biological monitoring of lead exposure in workers from a selected number of industrial areas in the regions of Piemonte, Lombardia, Emilia Romagna, and Toscana, where occupational exposure to lead occurs, are reported in <i>Ann. Ist. Super. Sanità</i> 34(1), 1998, and may be summarized as follows.</p> <p>In 1992 in ceramic tile plants (Scandiano, Region of Emilia Romagna) less than 0.5% of B-Pb in males and 0% in females exceeded the 60µg/dL, limit value, according to Legislative Decree 277/91. The percentages of B-Pb between 40 and 60µg/dL were 11.1% and 3.2% in males and females, respectively (Candela S. et al., <i>Ann. Ist. Super. Sanità</i> 34(1): 137-144, 1998).</p> <p>In the period 1993-95, in 383 factories (ceramics, glass, typography and chemicals) located in the Florence, Prato, Pistoia, Lucca and Pisa areas (region of Toscana), 1.7% of B-Pb in males and 0.7% in females, was higher than 60µg/dL. High levels of exposure were found in glass factories where the <i>decorazione a scavo</i> technique was used (Li Donni V. et al., <i>Ann. Ist. Super. Sanità</i> 34(1):131-136, 1998).</p>

	<p>In 1993-95, in factories (crystal, ceramics, chemicals, metallurgy, and mechanics, iron and steel, printing and painting) located in the areas of Siena and Livorno (region of Toscana), out of all workers in all sectors, only in crystal did any have a B-Pb higher than 60µg/dL (Sciarra G. et al., <i>Ann. Ist. Super. Sanità</i> 34(1): 145-156, 1998).</p> <p>In all studies concerning occupational exposure, including those carried out in the regions of Piemonte and Lombardia, a lowering trend in B-Pb has been observed in the last decades.</p> <p>Blood lead levels in the general population decreased between 1979 and 1996, following the reduction of tetraethyl lead content in gasoline starting from 1982. Risk reduction measures were implemented on enactment of Presidential Decree No. 485 of 10 March 1982, issued in accomplishment of EEC Directive 78/611, and of Ministerial Decree No. 214 of 25 May 1988, in accomplishment of EEC Directive 85/210.</p>
<p>Future actions to reduce exposure</p>	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>State benefits are awarded (Law by Decree No. 669 of 31 December 1996, Law No. 30 of 28 February 1997, Law by Decree No. 324 of 25 September 1997) for the replacement of old vehicles, equipped with conventional exhaust systems, by new ones with catalytic converters that run on “green” gasoline.</p> <p>Dr Antonio Menditto, Dr Marina Patriarca Laboratorio di Biochimica Clinica Istituto Superiore di Sanità Viale Regina Elena 299 I-00161 Rome</p> <p>Telephone: +39-6-4990-2559 Facsimile: +39-6-4938-7168 E-mail: a.mendit@iss.it // m.patria@iss.it</p>

Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>As regards Item “f” of Annex 1 to the Ministerial Declaration (“Restrict the use of lead shot in wetlands....”) the situation is as follows:</p> <ul style="list-style-type: none"> a) The problem of the presence of lead shot in Italy is quite marginal due to the limited extent of wet zones. It should be remembered that most of them are located in protected areas such as parks or wildlife reserves, where shooting is prohibited. b) ANPAM (<i>Association of National Producers of Guns and Ammunition</i>) and the Italian Sports Shooting Federation have carried out extensive studies and research on the presence of lead in the soil of shooting ranges, obtaining very encouraging results regarding the non-mobility of lead. c) Always in the context of shooting activities, plans are being perfected for the recovery and recycling of lead from shooting ranges.
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	

Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	<p>Dr Vito Genco ANPAM (Associazione Nazionale Produttori Armi e Munizioni) Viale dell'Astronomia, 30 00144 Rome</p> <p>Telephone: + 39/06/322-0016 Facsimile: + 39/06/322-0018 E-mail: vgenco@tin.it</p>

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>According to three-year research programme PR-27/IS, "The Venice Lagoon: Health risk scenarios associated with highly toxic chemical microcontaminants," which started February 1, 1998, human milk obtained from local mothers over the 1998-2000 period will be examined. Several toxic microcontaminants, including lead, will be determined. Risk associated with exposure to these microcontaminants will be estimated; possible risk management measures will be defined. Blood analysis on a number of local donors will be performed in a complementary investigation.</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Within the framework of the above mentioned programme, marine sediments, water, suspended particulate matter, and edible fish and shellfish from the lagoon area will be assayed to quantify levels of many priority microcontaminants, including lead. Results, which are expected by the year 2000, will be compared to those already available from the same area.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>On the basis of available data, there is no evidence that lead levels in environmental matrices exceed domestic limit values.</p>

Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	Dr. Alessandro di Domenico Istituto Superiore di Sanità Laboratorio di Tossicologia Comparata ed Ecotossicologia Viale Regina Elena, 299 00161 Rome Telephone: +39/06/4990-2826 or 4990-2077

Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>According to the three-year research programme PR-22/IS "Hygienic and health aspects of atmospheric pollution in urban areas," sub-programme "Evaluation of levels of human exposure to highly toxic microcontaminants in urban areas," priority toxic microcontaminants, including lead, will be monitored in the air of a pilot urban setting (Rome) to define methodological approaches and establish risk priorities. The programme started on February 1, 1998, and will end in the year 2000.</p> <p>Air samples will be assayed as to particulate matter and condensable components. Data will be obtained from canonical outdoor sampling stations and from indoor spaces, at ground level and at certain altitudes, to derive indicative risk scenarios. Atmospheric pollution gradient will be studied in the altitude range < 1 km a.s.l.</p> <p>Undisturbed urban soil samples will be collected from city parks, within the top one-metre layer, to examine contaminant distribution as a function of time. Appropriate sites will be selected in the city of Rome. A remote site in the wilderness will provide a baseline reference.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Blood lead levels in the general population (adults) do not exceed international standards (see Part II, Main Elements, below), but are higher than levels found in adults (non-Hispanic) in the US and in Northern European countries. As for children, the limit of 100µg/dL recommended by the Centers for Disease Control and Prevention in Atlanta is exceeded by 4.6% and 1.6% of male and female children respectively.</p> <p>Results of biological monitoring of lead exposure in workers from a selected number of industrial areas in the regions of Piemonte, Lombardia, Emilia Romagna and Toscana, where occupational exposure to lead occurs, are reported in <i>Ann Ist. Super. Sant.</i> 34(1), 1998, and may be summarized as follows:</p> <p>In 1992, in ceramic tile plants (Scandiano, region of Emilia Romagna) less than 0.5% of B-Pb in males and 0% in females exceeded 60µg/dL, the limit value according to Legislative Decree 277/91. B-Pb was between 40 and 60µg/dL in 11.1% of males and 3.2% of females (Candela S. et al., <i>Ann Ist. Super. Sant.</i> 34(1), 1998, 137-44).</p> <p>In the period 1993-95, in 383 factories (ceramics, glass, typography, chemicals) located in the</p>

	<p>areas of Florence, Prato, Pistoia, Lucca and Pisa (region of Toscana) 1.7% of B-Pb in males and 0.7% in females was higher than 60µg/dL. High levels of exposure were found in glass factories, where the <i>decorazione e scavo</i> technique was used (Li Donni V. et al., <i>Ann Ist. Super. Sant.</i> 34(1), 1998, 131-36.</p> <p>In 1993-95 in factories (crystal, ceramics, chemicals, metallurgy and mechanics, iron and steel, printing and painting) located in the areas of Siena and Livorno (region of Toscana), none of the workers in any sector except crystal had a B-Pb higher than 60µg/dL (Sciarra G. et al., <i>Ann Ist. Super. Sant.</i> 34(1), 1998, 145-56, 1998).</p> <p>In all studies concerning occupational exposure, including those carried out in the regions of Piemonte and Lombardia, a lowering trend for B-Pb has been observed in the last decades.</p> <p>Blood levels in the general population fell between 1979 and 1996, following the reduction of tetraethyl lead content in gasoline starting in 1982. Risk reduction measures implemented upon enactment of Presidential Decree No. 485 of 10 March 1982, issued in accomplishment of EEC Directive 78/611, and Ministerial Decree No. 214 of 25 May 1988, in accomplishment of EEC Directive 85/210.94.</p>
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Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	<p>State benefits are awarded (Law by Decree No. 669 of 31 December 1996, Law No. 30 of 28 February 1997, Law by Decree No. 324 of 25 September 1997) for the replacement of old vehicles equipped with conventional exhaust systems with new ones using catalytic converters which, therefore, run on green gasoline.</p> <p>Dr. Alessandro di Domenico Istituto Superiore di Sanità Laboratorio di Tossicologia Comparata ed Ecotossicologia Viale Regina Elena, 299 00161 Rome</p> <p>Telephone: +39/06/4990-2826 or 4990-2077 Facsimile: +39/06/4938-7139 E-mail: addeke@iss.it</p>

Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Hair can be considered as a biomarker of environmental exposure. In an investigation promoted by the Istituto Superiore di Sanità (ISS) in 1992-94 to establish the normal levels of minor and trace elements in about 400 healthy subjects aged 6-15 years living in the urban area of Rome, mean lead concentrations in male and female subjects were found to be 6.8 ± 5.9 and 7.4 ± 5.8 $\mu\text{g/g}$, respectively. These values are comparable to those obtained in similar investigations in other countries (Japan, UK, USA).</p> <p>Lead was also measured in the hair of individuals involved in goldsmithing activities in Italy, especially in the three major areas of production (Arezzo, Valenza, and Vicenza). The study was part of a research project undertaken by the National Research Council, jointly with the Ministry of Industry and the National Craftsmen Federation, in support of goldsmithing activities in the period 1995-98. In the study, 95 subjects (73 exposed individuals and 22 controls) were selected among workers and employees of 17 manufacturers in the three provinces. Mean lead concentrations were found to be 0.855 ± 0.628 and 0.779 ± 0.617 $\mu\text{g/g}$ for exposed and control subjects, respectively; the difference between means is not statistically significant.</p> <p>In the framework of a research project undertaken by the European Union and co-ordinated by Spain for the period 1997-2000, Pt-group metals released by automotive catalytic converters are being monitored in environmental matrices as well as in biological fluids. As a pilot study, part of the activities preliminarily set up by the ISS have been directed to the parallel quantification of lead in the urine of over 300 youngsters aged 6-12 years from a number of urban and suburban schools of Rome. The average value obtained for the first 100 subjects is 1.45 ± 1.10 $\mu\text{g/l}$. When compared with previous data for the same geographic area, this indicates a decrease of lead concentration clearly due to the expanding use of unleaded gasoline. This trend parallels the progressive increase in concentration of Pt-group metals as caused by the large-scale adoption of catalytic converters.</p> <p>As prescribed by EC Directives 23/96 and 24/96 of April 29, 1996, lead is constantly monitored in living animals and their products. As regards the harmonization of methodologies adopted in Member States, this activity is part of the mandate assigned to the ISS as one of the four Community Reference Laboratories for Residues appointed by the European Union in the early 1990s. This results in the constant improvement of the analytical proficiency of the National Reference Laboratories in the Member States. In Italy, the lead concentrations determined in bovine meat in the context of the annual residue plans exceeds in only a few cases the threshold value, provisionally set at $1\mu\text{g/g}$.</p>

Level of concern	
Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?	
Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	<p>Dr. Sergio Caroli Istituto Superiore di Sanità Laboratorio di Tossicologia Applicata Viale Regina Elena, 299 00161 Rome</p> <p>Telephone: +39/06/4990-2052 or 4990-2366 Facsimile: +39/06/4990-2366 or 4938-7068 E-mail: caroli@net.iss.it</p>

Italy

Part II: Description of Distinct Activities

HUMAN HEALTH MONITORING Biological monitoring of lead exposure for the general population in Italy according to EEC Directive 77/312 and Presidential Decree No. 496 of 8 June 1982	
Main elements	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	<p>Biological monitoring programmes to measure blood lead levels (B-Pb) in subjects in the general population, including children and pregnant women, were carried out between 1979 and 1981 in accomplishment of EEC Directive 77/312, and between 1985 and 1996 according to the related Presidential Decree No. 496 of 8 June 1982. Campaigns were co-ordinated by the Laboratory of Clinical Biochemistry (ISS) and organised as multicentric activities with the participation of peripheral laboratories. Therefore, from the first campaign (1979) stringent quality control procedures were implemented, including adoption of the same internal quality control samples and regular participation in external quality assessment exercises by all peripheral laboratories. In addition, 10% of the samples collected and examined during the campaign by each laboratory were also examined by a reference laboratory at ISS and the degree of accordance evaluated. Results obtained between 1992 and 1996 have been described and compared with those obtained previously (<i>Ann. Ist. Super. Sanità</i> 34(1), 1998). For each contribution, an English summary is included. In the last campaign, biological monitoring of lead exposure was carried out in seven Italian regions (Piemonte, Liguria, Veneto, Emilia Romagna, Toscana, Umbria, Lazio) by university departments (departments of occupational and environmental health, departments of hygiene), regional health services and environmental agencies (departments of prevention, multizonal regional centers for prevention, regional agencies for environmental protection). A total of 7749 subjects (4346 females and 3403 males) were examined, of which 1170 (559 females and 611 males) were under 15 years of age.</p> <p>Laboratories involved in biological monitoring of both environmental and occupational exposure to lead participate in an external quality assessment scheme for the determination of lead in blood organised by the Laboratory of Clinical Biochemistry (ISS). The scheme is open to selected laboratories from developing countries, and to collaborative activities with other schemes operating in Europe in the field of occupational, environmental and preventive medicine.</p>

Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Evaluate the level of exposure to lead of the general population in Italy.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	The project began in 1979 and the last campaign ended in 1996. Further monitoring activities are being planned.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Biological monitoring of the general population in Italy has been carried out since 1979 (first survey) and B-Pb ranged between 150 and 200 µg/dL in various Italian regions. Comparison of results obtained in 1992-96 with the results of the first survey shows a reduction of B-Pb greater than 60%. In the last survey (1992-96), the median, 90th percentile and 98th percentile B-Pb in male adults were 86, 158 and 242 µg/dL respectively; in female adults they were 54, 103 and 160 µg/dL. The reference levels for the general population set out by Directive 77/312/EEC are 20, 30 and 35 µg/dL. This time-dependent decrease in B-Pb parallels the stepwise decrease in lead levels in gasoline which took place between 1981 and 1999 (from 0.6 to 0.15 g/l).

Programme results	
What are the results of the monitoring programme(s) described?	<p>The median values of the observed blood lead levels were, for adults, 86 µg/dL in males and 53.5 µg/dL in females; and, for children, 50 µg/dL in males and 53 µg/dL in females. Our investigation confirms the positive correlation between blood lead levels and alcohol consumption, and between blood lead levels and cigarette smoking in both sexes and in all age groups. The association of blood lead levels with alcohol seems to be stronger than that with cigarette smoking. The comparison with the results of previous investigations shows a reduction between of 43% and 48% in blood lead levels in both adults and children of the general population during the 1985-96 period.</p> <p>Blood lead levels in the general population (adults) do not exceed international standards but are higher than those found for adults (non-Hispanic) in US and in Northern European countries. As for children, the limit of 100 µg/dL recommended by the Centers for Disease Control and Prevention in Atlanta (USA) is exceeded by 4.6% and 1.6% of male and female children, respectively (Menditto A. et al., <i>Ann. Ist. Super. Sanità</i> 34(1):27-39, 1998).</p>
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Dr Antonio Menditto, Dr Marina Patriarca Laboratorio di Biochimica Clinica Istituto Superiore di Sanità Viale Regina Elena 299 I-00161 Rome</p> <p>Telephone: +39-06-4990-2559 Facsimile: +39-06-4938-7168 E-mail: a.mendit@iss.it; m.patria@iss.it</p>

LEAD IN GASOLINE	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Unleaded gasoline came on the market in Italy in 1986, pursuant to EEC Directive 85/210. This Directive was implemented in Italy with Ministerial Decree No. 214 of 28 May 1998.</p> <p>The Italian gasoline demand in 1986 was about 12,000 ktonnes and lead content was 0.4 g/litre. The Italian Government also legislated a future reduction of lead in leaded gasoline from 0.4 to 0.3 g/litre in 1988, and from 0.3 to 0.15 g/litre in 1991.</p> <p>In 1997, the market for gasoline in Italy reached about 17,500 ktonnes of which 8500 ktonnes was leaded.</p> <p>Italy has promoted the use of unleaded gasoline by applying a different excise duty favouring it.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>The specific objective of this activity is to eliminate leaded gasoline from the market.</p> <p>Currently about 55% of gasoline on the market is unleaded and the remaining 45% is leaded. Consumption of leaded gasoline will decrease rapidly in the future and disappear by 2003-04.</p>
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>1986</p> <p>Expected 2003-04</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	<p>Elimination of lead from gasoline has been obtained through extensive modification of the refining industry.</p> <p>The programme resulting from the introduction of low-lead and unleaded gasoline was completed between 1986 and 1995, with significant investments to modify the structure of refineries.</p> <p>The reforming capacity has been reduced, and a new capability to carry out catalytic cracking, isomerization alkylation, and MTBE production has been reached.</p> <p>By July 1998, Italian refineries will be able to produce all gasolines without lead and comply with the new limits of 1% vol and 40% vol. Maximum, respectively, for benzene and aromatics content. Leaded gasoline will be produced by adding 0.15 g/litre of lead to unleaded.</p>

Further information	
Who can be contacted for more information?	Ing. Franco Del Manso Unione Petrolifera Via Giorgione, 129 00147 Rome Telephone: +39/06/5960-2939 Facsimile: + 39/06/5960-2925 E-mail: delmanso@unionepetrolifera.it

DRINKING WATER	
Criteria to evaluate the characteristics of natural mineral waters	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Ministerial Decree No. 542 of 12 November 1992.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Recognition and qualification of natural mineral waters for commercial purposes. The regulation addresses a large number of chemical and physico-chemical parameters, including several toxic pollutants. For lead, a limit value is set at 0.05 mg/litre.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing since enactment of Ministerial Decree.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Regulatory compliance is required for qualification and commercial use of natural mineral waters.
Further information	
Who can be contacted for more information?	<p>Dr. Alessandro di Domenico Istituto Superiore di Sanità Laboratorio di Tossicologia Comparata ed Ecotossicologia Viale Regina Elena, 299 00161 Rome</p> <p>Telephone: +39/06/4990-2826 or 4990-2077 Facsimile: +39/06/4938-7139 E-mail: addeke@iss.it</p>

AMBIENT AIR	
Technical directions concerning air pollutants in urban areas and the definition of related status and levels of attention and alarm	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Ministerial Decree of 15 April 1994.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Attention and alarm limit values are set for several common air pollutants, in view of proper risk management measures. Lead is recognized as a priority pollutant for which, however, no limit values are set; instead, the Decree emphasizes the need to carry out pilot <i>ad hoc</i> monitoring campaigns.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing since enactment of Ministerial Decree.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Ing. Rita Caroselli Ministero dell' Ambiente Servizio I.A.R. Via della Ferratella in Laterano, 33 00184 Rome</p> <p>Telephone: +39/06/7036-2427 or 7036-2415 Facsimile: +39/06/7725-7016</p>

PRODUCT AND/OR USE REGULATION	
Classification and regulations concerning packaging and labelling of dangerous preparations	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Ministerial Decree of 28 January 1992.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Classification and regulation of the packaging and labelling of dangerous preparations.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing since enactment of Ministerial Decree.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Regulatory compliance is required for proper commercialization of a very large number of preparations containing at least one dangerous substance.
Further information	
Who can be contacted for more information?	<p>Dr. Alessandro di Domenico Istituto Superiore di Sanità Laboratorio di Tossicologia Comparata ed Ecotossicologia Viale Regina Elena, 299 00161 Rome</p> <p>Telephone: + 39/06/4990-2826 or 4990-2077 Facsimile: + 39/06/4938-7139 E-mail: addeke@iss.it</p>

The Venice Lagoon: Health Risk Scenarios Associated with Highly Toxic Chemical Microcontaminants (Refer to Part I: Human Health Monitoring Programmes, Environmental Monitoring Programmes, Level of Concern, and Future Actions to Reduce Exposure)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Dr. Alessandro di Domenico Istituto Superiore di Sanità Laboratorio di Tossicologia Comparata ed Ecotossicologia Viale Regina Elena, 299 00161 Rome</p> <p>Telephone: +39/06/4990-2826 or 4990-2077 Facsimile: +39/06/4938-7139 E-mail: addeke@iss.it</p>

<p align="center">Hygienic and Health Aspects of Atmospheric Pollution in Urban Areas; Evaluation of Levels of Human Exposure to Highly Toxic Microcontaminants in Urban Areas</p> <p align="center">(Refer to Part I: Human Health Monitoring Programmes, Environmental Monitoring Programmes, Level of Concern, and Future Actions to Reduce Exposure)</p>	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	

Further information	
Who can be contacted for more information?	<p>Dr. Alessandro di Domenico Istituto Superiore di Sanità Laboratorio di Tossicologia Comparata ed Ecotossicologia Viale Regina Elena, 299 00161 Rome</p> <p>Telephone: +39/06/4990-2826 or 4990-2077 Facsimile: +39/06/4938-7139</p>

Other regulations:Exposure from food packaging:

Decree No. 338 of the Ministry of Health, of July 22, 1998, and pertinent preceding regulations. The Decree is the accomplishment of EEC Directive No. 97/48.

Lead in paint:

Decree of the Ministry of Health, of July 29, 1994, in accomplishment of EEC Directives No. 89/667, 91/173, 91/338 and 91/339.

Recycling:

Decree of the Ministry of the Environment, of May 16, 1990, by which a Consortium to recycle lead batteries and wastes is established.

Water Point Sources:

Legislative Decree No. 152 of the President of the Italian Republic, of May 11, 1999, in accomplishment of EEC Directives No. 91/271 and 91/676.

Japan

Part I: Levels of Exposure

Human health monitoring programmes																			
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>																			
Environmental monitoring programmes																			
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Monitoring (air)</p> <p>One day (24 hours) per month sampling with high volume sampler at 23 national monitoring sites.</p> <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: left; width: 25%;">Period</th> <th style="text-align: center; width: 45%;">Concentration of lead (annual means, 23 sites)</th> <th style="text-align: left; width: 30%;">Unit</th> </tr> </thead> <tbody> <tr> <td>4,1992~3,1993</td> <td style="text-align: center;">0.01~0.09</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>4,1993~3,1994</td> <td style="text-align: center;">0.01~0.14</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>4,1994~3,1995</td> <td style="text-align: center;">0.01~0.11</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>4,1995~3,1996</td> <td style="text-align: center;">0.01~0.10</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> <tr> <td>4,1996~3,1997</td> <td style="text-align: center;">0.01~0.11</td> <td>$\mu\text{g}/\text{m}^3$</td> </tr> </tbody> </table>	Period	Concentration of lead (annual means, 23 sites)	Unit	4,1992~3,1993	0.01~0.09	$\mu\text{g}/\text{m}^3$	4,1993~3,1994	0.01~0.14	$\mu\text{g}/\text{m}^3$	4,1994~3,1995	0.01~0.11	$\mu\text{g}/\text{m}^3$	4,1995~3,1996	0.01~0.10	$\mu\text{g}/\text{m}^3$	4,1996~3,1997	0.01~0.11	$\mu\text{g}/\text{m}^3$
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4,1996~3,1997	0.01~0.11	$\mu\text{g}/\text{m}^3$																	

	<p>Monitoring (water) For lead, there are Environmental Quality Standards concerning public water areas and ground water. We are monitoring concentration of lead as item of EQS.</p> <p>Monitoring (drinking water) For lead, there is a Water Quality Standard for Drinking Water. Based on the Water Works Law, every water supply system must monitor concentrations of lead as an item of WQS regularly.</p>
Level of concern	
Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?	<p>The current levels have been reduced sufficiently as compared with WHO air quality guidelines ($0.5\mu\text{g}/\text{m}^3$)</p> <p>As for water quality, we decided on lead as an item of EQS in 1971. Ten years after our decision, the ratio of exceedence of EQS on lead became almost zero.</p> <p>Recently, it has been very low (e.g. 1993: 0.35% , 1994: 0.62%, 1995: 0.62%, 1996: 0.42%)</p>
Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	In 1992, the long-term target for lead was set at 0.01 mg/l in order to reduce exposure through drinking water.

Japan

Part II: Description of Distinct Activities

ENVIRONMENTAL MONITORING (Ambient air)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Monitoring programme - one day (24 hours) per month sampling with high-volume sampler at 23 national monitoring sites.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objectives are to monitor the level of lead in ambient air.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1966 1997
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Hiroshi Ono 1-2-2 Kasumigaseki, Chiyodaku Tokyo 100-8975</p> <p>Telephone: + 81 3 5521 8294 Facsimile: + 81 3 3580 7173 E-mail: hiroshi_ono@eanet.go.up</p>

EMISSIONS FROM MAJOR SOURCES	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Emission regulation (air pollution control law). Emission standards 10-30mg/m ³ .
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objectives are to reduce the emission of lead from stationary sources. These objectives have been well achieved.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1971 Continues
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Hiroshi Ono Environment Agency 1-2-2 Kasumigaseki, Chiyodaku Tokyo 100-8975</p> <p>Telephone: + 81 3 5521 8294 Facsimile: + 81 3 3580 7173 E-mail: hiroshi_ono@eanet.go.up</p>

RESEARCH/EDUCATION	
Studies on the effect of lead poisoning in waterfowl	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Research on the effect of shot and development of alternatives.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objectives are to direct concrete measures on reduction of the lead risk to waterfowl.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1994 Continues
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Activities have included the comparative testing of steel shot and experimental soft steel shot for various barrels, assessment of the properties of bismuth shot, development and performance testing of the common choke tube for steel shot. The hunting association is voluntarily regulating hunting in some lakes.

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Hiroshi Ono Environment Agency 1-2-2 Kasumigaseki, Chiyodaku Tokyo 100-8975</p> <p>Telephone: + 81 3 5521 8294 Facsimile: + 81 3 3580 7173 E-mail: hiroshi_ono@eanet.go.up</p>

Voluntary Initiative by Industries	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<ol style="list-style-type: none"> 1. Restrictions on the use of lead and lead compounds. 2. Restrictions on migrated lead content. 3. Protection of workers and the environment from exposure.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objectives are the risk management of lead and lead compounds.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1996 Continues
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	The Action Plan of the Japanese Chemical Industries Association and 13 related associations relating to the OECD Risk Management Programme's work on lead and lead compounds.
Further information	
Who can be contacted for more information?	<p>Hironobu Okumura MITI 1-3-1 Kasumigaseki, Chiyodaku Tokyo 100-8975</p> <p>Telephone: + 81 3 3501 0080 Facsimile: + 81 3 3580 6347 E-mail: OHAA2302@mita.go.jp</p>

Republic of Korea

Part I: Levels of Exposure

Human health monitoring programmes																																						
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p><u>Occupational exposure</u></p> <p>Population surveyed: approx. 3500-4000 workers in lead-related workplaces; for example, workers in the battery industry, primary and secondary smelting industry, litharge (PbO) manufacturing industry, etc.</p> <ul style="list-style-type: none"> • Methods used: regular monitoring of lead levels in blood, together with ZPP (zinc protoporphyrin) levels, at least twice a year • Lead in blood: AA graphite standard addition method (Hitachi 8100) • ZPP in blood: portable hematoflurometer (AVIV Co.) • date conducted and data obtained: <table style="width: 100%; margin-top: 10px;"> <thead> <tr> <th rowspan="2" style="text-align: left; vertical-align: bottom;"><u>Year</u></th> <th colspan="2" style="text-align: center; border-bottom: 1px solid black;">Lead conc. (µg/dL)</th> <th colspan="2" style="text-align: center; border-bottom: 1px solid black;">ZPP conc. (µg/dL)</th> </tr> <tr> <th style="text-align: center; border-bottom: 1px solid black;"><u>No. of people</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>average</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>No. of people</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>average</u></th> </tr> </thead> <tbody> <tr> <td>1993</td> <td style="text-align: center;">1161</td> <td style="text-align: center;">28.9</td> <td style="text-align: center;">7978</td> <td style="text-align: center;">50.2</td> </tr> <tr> <td>1994</td> <td style="text-align: center;">3442</td> <td style="text-align: center;">30.5</td> <td style="text-align: center;">6698</td> <td style="text-align: center;">60.2</td> </tr> <tr> <td>1995</td> <td style="text-align: center;">3744</td> <td style="text-align: center;">28.5</td> <td style="text-align: center;">6848</td> <td style="text-align: center;">56.6</td> </tr> <tr> <td>1996</td> <td style="text-align: center;">3550</td> <td style="text-align: center;">28.8</td> <td style="text-align: center;">6183</td> <td style="text-align: center;">56.8</td> </tr> <tr> <td>1997</td> <td style="text-align: center;">4301</td> <td style="text-align: center;">26.7</td> <td style="text-align: center;">6194</td> <td style="text-align: center;">53.6</td> </tr> </tbody> </table> <p style="margin-top: 10px;"><u>General population</u></p> <p>Population surveyed: the survey has involved a total of 9803 members of the general population who had lived at least three years around the industrial complex areas.</p> <ul style="list-style-type: none"> • Methods used: regular monitoring of lead levels in blood and urine samples using AAS. • The survey, conducted in 1980-1996, shows that the lead concentration in blood is in the range of 34-343 ppb and, in urine samples, in the range of 6.9-41.7 ppb. 				<u>Year</u>	Lead conc. (µg/dL)		ZPP conc. (µg/dL)		<u>No. of people</u>	<u>average</u>	<u>No. of people</u>	<u>average</u>	1993	1161	28.9	7978	50.2	1994	3442	30.5	6698	60.2	1995	3744	28.5	6848	56.6	1996	3550	28.8	6183	56.8	1997	4301	26.7	6194	53.6
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Environmental monitoring programmes

Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.

Food

Monitoring of the trace amounts of some metal elements, including lead, has been conducted by the Korea Food and Drug Administration (KFDA)

- Methods used: samples collected from food distributed in commerce and analysed using AA graphite and ICP (Inductively Coupled Plasma) Emission Spectroscopy.
- Date conducted and data obtained:
 - During the period 1992-1996, a total of 1834 samples from agricultural products (cereals, legumes, potatoes, fruits, vegetables).

Year

Reference documents where the specific data can be found

Feb.-Dec 1992	Report of National Institute of Health, Vol. 29, No. 2, pp 365-77
Feb.-Dec 1993	Report of National Institute of Health, Vol. 30, No. 2, pp 366-77
Feb.-Dec 1994	Report of National Institute of Health, Vol. 31, No. 2, pp 437-49
Feb.-Dec 1995	Report of National Institute of Health, Vol. 32, No. 2, pp 456-69
Feb.-Dec 1996	Annual report of KFDA, Vol. 1, No. 1, pp 58-70.

- Also in 1997, a total of 800 samples from freshwater fish (crucian carp, carp, Israeli carp, catfish, mandarin fish, common minnow, eels, loaches) were analysed. The lead levels were in the range of 0.01-1.25mg/kg; and
- in 1998, a total of 800 samples from canned food, fish, crustaceans, molluscs, cereals, legumes, spices, etc.

	<p><u>Drinking water</u> Monitoring for hazardous substances, including lead, has been conducted regularly and compared to national standards. Sampling and analysis are carried out every month using absorptiometric analysis, AAS, ICP emission spectroscopy, etc.</p> <p><u>Soil</u> Lead levels are regularly monitored once a year at 3000 places nationwide using absorptiometric analysis, AAS, ICP emission spectroscopy, etc.</p> <p><u>Workplace</u> The owner of a workplace dealing with lead, including in the battery industry, primary and secondary smelting industry, and litharge manufacturing industry, is required to measure the level twice a year. Samples from workplaces are analysed using personal air samplers (Gilian Co.).</p> <p><u>Air</u> Monitoring is conducted every month at 35 places in 12 large cities in this country.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p><u>Food</u> Levels of lead in agricultural products and fish are found to be lower, in general, than some of the national standards for lead in food, and are probably close to the natural level of lead.</p>

<u>Food</u>	<u>Criteria</u>
fish & shellfish	not more than 2.0 mg/kg
soft drinks	not more than 0.3 mg/kg
sugar	not more than 0.5-2.0 mg/kg
ginseng products*	not more than 0.3 mg/kg
*e.g. ginseng drinks, canned or bottled ginseng products	
<u>Drinking water</u>	
Maximum allowed lead level in drinking water is 0.05mg/L, and the result up to now shows that the levels are below the standards.	
<u>Soil</u>	
Monitoring results in 1997 showed that seven out of 3000 sites nationwide had been found to exceed the level of concern (100 mg/kg on arable land and 400 mg/kg in an industrial complex area). Those seven were mainly mining and waste dumping areas.	
<u>Workplace</u>	
The Threshold Limit Value (TLV) for lead concentration at the workplace and in human blood is 0.05 mg/m ³ and 40 µg/dL, respectively. The 1997 survey result showed that around 3.9% of a total of 2378 workplaces exceeded the TLV.	
<u>Air</u>	
The WHO-recommended one-year-average level is 0.5-1.0 µg/m ³ and the national standards three-month-average level 1.5 µg/m ³ . The result obtained so far has shown that the level of concentration is below both the WHO recommendation and the national standards.	

Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p><u>Food</u> Continued use of the present monitoring scheme.</p> <p><u>Drinking water</u> Continued use of the present monitoring scheme</p> <p><u>Soil</u> Further investigation of the level and degree of contamination at some locations found to exceed the level of apprehension, and then actions to remove the contaminant by installing necessary infrastructure.</p> <p><u>Workplace</u> Continued use of the present monitoring scheme.</p> <p><u>Air</u> From 1 January 1999, the industries operating furnaces and other heat treatment facilities for iron works will be required to keep the level of lead release to below 10 mg/m³ and the rest of industries below 5 mg/m³. This requirement is a change from the present regulation of 20 mg/m³ for the former and 5 mg/m³ for the rest.</p>

Republic of Korea

Part II: Description of Distinct Activities

OCCUPATIONAL EXPOSURE Occupational health programme	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Monitoring of blood lead levels among 1000 workers in three lead battery companies has been conducted with the following sampling periods:</p> <ul style="list-style-type: none"> • every month for those workers whose blood lead levels exceed 40 µg/dL; • every two months for those whose blood lead levels are 30-40 µg/dL; • every three months for all other workers. <p>Monitoring of the lead level at workplaces is conducted every six months.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>The objectives of this programme are to:</p> <ul style="list-style-type: none"> • discover acute poisoning cases among workers whose lead level exceeds 60 µg/dL; • provide adequate recommendations to those whose lead levels are 40-59 µg/dL, such as changing jobs or provision of respiratory protective equipment; • reduce and avoid undue accumulation of lead in the workers' bodies; • maintain the lead level at workplaces below 0.05 µg/dL.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>1993</p> <p>Not specified yet</p>

Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	Industrial Health and Work Environment Division Ministry of Labour 1 Jooang-dong, Kwacheon 427-760 Government Complex Telephone: + 82 2 507 0206 Facsimile: + 82 2 503 4491

ENVIRONMENTAL MONITORING	
Lead in food	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Conduct monitoring to find out lead content in food.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objective of this programme is to consider whether to set new criteria based on the results obtained.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1985 Will be continued
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	If lead contents are considered to present a hazard to human health, risk management process are undertaken including public hearings, legal notification.

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Nak-Kyung Kim Chief scientist Heavy Metals Division Korea Food and Drug Administration (KFDA) 5 Nokbun-dong Eunpyung-ku Seoul 122-020</p> <p>Telephone: + 82 2 380 1670 Facsimile: + 82 2 382 4892 E-mail: drnkkim@unitel.co.kr</p>

EXPOSURE OF CHILDREN	
Regulating lead in paint, lacquer, etc.	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Prescribe the lead content in paint and lacquer which are often used in toys and utensils, and find out whether they meet the standards during safety inspection.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Target items are toys, go-carts, baby carriages, etc. Maximum allowed lead content is 90 mg/kg, and products which do not meet the standards are not allowed to be distributed or sold.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1981 Will be continued
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Safety Planning Division Agency for Technology and Standards MOCIE 2 Jooang-dong, Kwacheon 427-010 Telephone: + 82 2 509 7408 Facsimile: + 82 2 507 6876

LEAD IN GASOLINE Regulating lead content of automobile fuel	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The lead content of automobile petrol must be equal to or below 0.013g/L (effective from 1 January 1993), and any petrol manufacturer that does not meet the requirement is liable for a maximum one-year imprisonment or will be fined a maximum of 5 million Korean won.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The Minister of Environment can limit the manufacture, sale or use of petrol when the release of materials hazardous to the environment or human health is obvious
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1 January 1993 Will be continued
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Examination of automobile petrol is conducted four times a year.

Programme results	
What are the results of the monitoring programme(s) described?	No petrol product has exceeded the limit since its implementation.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Air Quality Policy Division Ministry of Environment 1 Jooang-dong Kwacheon 427-760 Government Complex Telephone: + 82 2 504 9247 Facsimile: + 82 2 504 9208

WATER POINT SOURCES	
Regulations to control water quality in inland water and sea water	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Release standards for lead: <ul style="list-style-type: none"> • The requirement in an area defined as clean is to keep the level at or below 0.2 mg/L and, in other areas such as industrial complex sites, it is 1 mg/L; • For underground water, lead content of water for household and agricultural use must be at or below 0.1 mg/L and that of water for industrial use 0.2 mg/L.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In the area found to exceed the prescribed lead level, water quality improvement plans such as installing necessary environmental infrastructures will be carried out.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1992 Will be continued
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	<p>Random monitoring of wastewater from an industrial facility is conducted, and the owner of the facility is required to pay a release charge if the wastewater is found to exceed the standards prescribed.</p> <p>Underground water for household use is monitored once a year, that for industrial use once every two years, and that for agricultural use once every three years. The supplier of the underground water is required to install an appropriate pollution prevention infrastructure if the supply water is found to exceed the standards.</p>
Programme results	
What are the results of the monitoring programme(s) described?	Monitoring data obtained in 1992-1997 in four major rivers in this country shows no significant lead contamination.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	Water Quality Policy Division Ministry of Environment 1 Jooang-dong, Kwacheon 427-760 Government Complex Telephone: + 82 2 504 9252 Facsimile: + 82 2 504 9209

WATER POINT SOURCES	
Regulations regarding lead-containing wastes	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	If the filtrate from a waste contains a minimum of 3 mg/L of lead, the waste becomes a designated waste subject to strict restriction during the entire process of disposal. Vehicles for transportation and collection must be specifically designated. Storage facilities and containers must be designed to avoid any possible infiltration of water such as rainwater.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Landfill is often used to dispose of lead-containing wastes after solidification with cement, synthetic polymers or similar methods in order to avoid any possible contamination of the surrounding environment.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1 August 1983 Will be continued
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	Waste Policy Division Ministry of Environment 1 Jooang-dong Kwacheon 427-760 Government Complex Telephone: + 82 2 504 9259 Facsimile: + 82 2 504 9210

Mexico

Part I: Levels of Exposure

<p>Describe the population(s) surveyed, methods used, dates conducted, and data obtained. related to programmes or activities to measure blood lead levels (or other biomarkers of exposure).</p>	<ul style="list-style-type: none"> • Higher milk intake during pregnancy is associated with lower maternal and umbilical cord lead levels in postpartum women <p>Population: This study evaluated the effect of milk consumption in 1849 mother-and-child pairs participating in the lead surveillance programme in Mexico City.</p> <p>Results: Maternal blood lead was inversely related to the consumption of milk and orange juice. Women who reported the consumption of more than seven glasses of milk per week had a blood lead level of 8.7 µg/dL; in comparison, those who reported consuming less than seven glasses per week had a blood lead level of 11.1 µg/dL.</p> <p>Hernandez-Avila M, et al. Higher milk intake during pregnancy is associated with lower maternal and umbilical cord lead levels in postpartum women. Res 1997; 764(2): 116-121.</p> <ul style="list-style-type: none"> • Lead levels in umbilical cord levels in Mexico City hospitals (1992-94) <p>Population: 2520 women who attended their childbirth in nine hospitals of the health sector in Mexico City from SSA, IMSS, and ISSSTE.</p> <p>Method: Questionnaire applied directed to the women and cord blood samples analyzed by spectrophotometry.</p> <p>Results: Use of ceramic pottery with lead resulted in the most important variability.</p> <p>Jimenez Corona A., et al. Lead levels in umbilical cord blood in hospitals of Mexico City (1992-1994). Gac Med Mex 1996 Jul; 132 (4); 447-50.</p> <ul style="list-style-type: none"> • High blood lead levels in ceramic folk art workers in Michoacan, Mexico <p>Population: Individuals of all ages from three rural communities in central Michoacan.</p>
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Method: Evaluated the blood lead level and related to individuals' work with ceramics in their homes. Used a questionnaire; venous blood samples were obtained from the workers.

Results: Blood lead levels exceeded the maximum level permitted, but levels were lower than those found in 1970s.

Fernandez G O, et al. High blood lead levels in ceramic folk art workers in Michoacan, Mexico. Arch Environ Health 1997 Jan; 52 (1): 51-55.

- Calcium intake and blood lead in women of reproductive age

Population: 198 women of 15-48 years of age living in Mexico City.

Method: To evaluate the relation between calcium intake and blood lead levels, the calcium intake was calculated from the frequency of consumption of 11 foods which provide nearly 95% of the intake of calcium in Mexico and blood samples were analyzed.

Results: A statistically significant decreasing trend was observed between the risk of having blood lead levels exceeding 10 µg/dL and the increase in calcium intake.

Lacasana-Navarro, et al. Calcium intake and blood lead in women in reproductive age. Rev. Invest. Clin. 1996 Nov; 48 (6): 425-30.

- Prevalence and determinants of lead intoxication in Mexican children of low socio-economic status

Population: Children between one and five years of age living in a marginal area to the north of Mexico City.

Method: Evaluation of sources of exposure to this metal in the same area and evaluation of the blood levels.

Results: 67.5% of the children studied had blood lead levels • 10 µg/dL. In addition, the study found that the probability of higher blood lead levels corresponds to children whose mothers use lead-glazed pottery dishes and to children who habitually bite coloured pencils.

	<p>Lopez-Carrillo L, et al. Prevalence and determination of lead intoxication in Mexican children of low socio-economic status. <i>Environ Health Perspect</i> 1996 Nov; 104 (11): 1208-11.</p> <ul style="list-style-type: none"> • Dietary and environmental determination of blood and bone lead levels in lactating postpartum women living in Mexico City <p>Population: 98 postpartum women living in Mexico City.</p> <p>Method: A cross-sectional investigation of the interrelationships between environmental, dietary and lifestyle histories, blood lead levels, and bone lead levels.</p> <p>Results: The findings of this cross-sectional study suggest that patella bone is a significant contributor to blood lead during lactation, and that consumption of high calcium content foods may protect against the accumulation of lead in bone.</p> <p>Hernandez-Avila M, et al. Dietary and environmental determinants of blood and bone lead levels in lactating postpartum women living in Mexico City. <i>Environ Health Perspect</i> 1996 Oct; 104 (10): 1076-82.</p> <ul style="list-style-type: none"> • Blood lead levels in pregnant women of high and low socio-economic status in Mexico City <p>Population: 513 pregnant women in Mexico City: 311 from public hospital prenatal clinics, representing primarily women of low socio-economic status, and 202 from private hospitals, primarily women of high socio-economic status.</p> <p>Method: Examination of factors affecting of blood lead levels.</p> <p>Results: Avoiding use of lead-glazed ceramics, consuming diet rich in calcium, and, if needed, taking calcium supplements would be expected to result in substantial lowering of blood lead level, especially in pregnant women of low socio-economic status.</p> <p>Farias P, et al. Blood lead levels in pregnant women of high and low socio-economic status in Mexico City. <i>Environ Health Perspect</i> 1996 Oct; 104 (10): 1070-74.</p>
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- Maternal influences on cord blood lead levels

Population: Women of low to middle socio-economic status who lived in the Valley of Mexico from 12 weeks of pregnancy to delivery.

Method: Measurement of maternal venous blood during pregnancy and at delivery, and umbilical cord. Use of multiple regression analyses to model cord blood lead and a logit analysis to model the maternal-cord blood lead relationship.

Results: Cord blood lead levels were higher than those in maternal blood lead at delivery in 33% of cases, and were predominant in the case of mothers over 30 and those drinking milk less than once per day.

Rothenberg S J, et al. Maternal influences on cord blood lead levels. *J Expo Anal.*

- Risk factors for high blood lead levels in Mexico City schoolchildren.

Population: 1583 schoolchildren from (a) two areas in Mexico City (Tlalnepantla and Xalostoc) with high concentration of lead in air, and (b) three areas (Pedregal, Iztapalapa and Centro) with less impressive air lead levels.

Method: A bivariate analysis and a multilogistic analysis were conducted to identify associations and to identify the model that most accurately explains the variability of the sample.

Results: High blood lead concentrations were found in children who lived in Xalostoc and Tlalnepantla, and the lowest concentration was found in children from Iztapalapa. The strongest association was with area of residence, followed by educational level of parents cooking meals in glazed pottery, and chewing or sucking of yellow or other coloured pencils.

Olaiz G, et al. Risk factors for high levels of lead in blood of schoolchildren in Mexico City. *Arch Environ Health* 1996 Mar; 51(2): 122-26.

	<ul style="list-style-type: none">• Environmental urban lead exposure and blood lead levels in Mexico City children Population: 200 children younger than five years of age who lived in one of two areas of Mexico City. Method: Analysis of environmental samples of floor, window and street dust, paint, soil, water and glazed ceramic were obtained from the participants' households, as well as blood samples and dirt from the hands of the children. Results: The major sources of lead exposure in Mexico City could be controlled by adequate public health programmes to reinforce the use of unleaded fuel and to encourage production and use of unleaded cookware instead of lead-glazed ceramics. Romieu I, et al. Environmental urban lead exposure and blood lead levels in children of Mexico City. Environ Health Perspect 1995 Nov; 103(11): 1036-40.• Sources of lead exposure in Mexico City Evidence of the presence of lead in different environmental media and its impact on blood lead levels of the Mexican population. Results: The major sources and pathways of lead exposure among the Mexican population are gasoline emission, lead-glazed ceramics, leaded paint, and lead in canned food and beverages. Romieu I, et al. Sources of lead exposure in Mexico City. Environ Health Perspect 1994 Apr; 102 (4): 384-89.• Environmental exposure factors and blood lead concentration in Mexico City children Population: 113 infants, aged three to seven, who attended paediatric consultation at the American British Cowdray Hospital from May 1991 to October 1992. Method: Analysis of blood lead. Results: The main predictor of blood lead levels is use of glazed pottery for cooking rice Jimenez C, et al. Environmental exposure factors and the concentration of blood lead in Mexico City children. Salud Public Mex 1993 Nov; 35 (6): 599-606.
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Describe your country's programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water, methods used, sampling design, dates conducted, and data obtained.	Programme to Improve Air Quality in the Metropolitan Area in the Mexican Valley (PROAIRE), which is a monitoring network for O ₃ , SO ₂ , NO ₂ , CO, total suspended particles, respirable fraction particles and lead.
Based upon the data presented above, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?	In 1990, lead levels in air were 1.26 µg/m ³ (average). In 1995, they had decreased to 0.22 µg/m ³ . Yes.
What actions or changes are proposed to further reduce these exposures?	

Mexico

Part II: Description of Distinct Activities

Mexico has distinct risk management activities concerning: lead in gasoline, exposure of children, food packaging, ceramic ware and crystal ware, air emissions from major point sources, and recycling.

LEAD IN GASOLINE	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation	<ul style="list-style-type: none"> • In 1990, unleaded gasoline is introduced on the market. • In 1991, the automotive industry introduces catalytic converters on new model cars. • In 1994, Mexico issues a standard (Norma 086) establishing values in gasoline with lead of 0.06-0.08 kg/m³.
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets.	<ul style="list-style-type: none"> • In the 1993-94 period, leaded gasoline is 50% replaced with unleaded gasoline; also in this period, lead content in leaded gasoline is reduced by 92%. • By 1995, lead in gasoline values were 0.03 kg/m³: i.e. below standard 086. • By January 1998, there is no leaded gasoline on the Mexican market.
What year did the project begin and what year did it end (or is it expected to end)?	1980-98
Is the activity aimed at promoting and maximizing the use of economically viable collection and recycling programmes? If so, please describe.	None
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Establishment of the Programme to Improve Air Quality in the Metropolitan Area in the Mexican Valley (PROAIRE), which is a monitoring network for O ₃ , SO ₂ , NO ₂ , CO, total suspended particles, respirable fraction particles and lead.
What are the results of these monitoring programmes?	In 1990, lead levels in air were 1.26 µg/m ³ (average), decreasing in 1995 to 0.22 µg/m ³ .
Summarize any future risk management	The gasoline lead programme is fully completed.

activities you may be considering, including supporting rationale.	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	None
Describe any industry programme initiated in relation to this activity.	None
Further information	José Castro National Institute of Ecology Telephone: + 52 (5) 624-34-17 E-mail: jdcastro@ine.gob.mx

LEAD IN GLAZED POTTERY	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	In 1991, an agreement is established between the government and NGOs to implement a programme to reduce lead in products. In 1994, two standards are published, one to set lead limits in pottery and the other to establish a three-year period in which lead in pottery is to be avoided.
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets.	In 1997, an alternative technology is implemented to eliminate use of lead in pottery. By 1998, export products do not contain lead and small producers have begun to stop using lead.
What year did the project begin and what year did it end (or is it expected to end)?	In 1991, undefined, continuous follow-up to reach all small producers
Is the activity aimed at promoting and maximizing the use of economically viable collection and recycling programmes? If so, please describe.	No
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	A norm has been established for detection of lead in pottery through spectrophotometry analysis. A seal in every piece indicates that the product does not contain lead.
What are the results of these monitoring programmes?	Detection of ceramic pieces and their retirement from the market.
Summarize any future risk management activities you may be considering, including supporting rationale.	The Ministry of Health (Secretaría de Salud) is in charge of supervising lead content in publicly marketed products.
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Technology transfer with other countries in Latin America.

Describe any industry programme initiated in relation to this activity.	Pilot promotion of high temperature furnace that burns gas in artisan communities Educational programmes for artisans.
Further information	José Castro National Institute of Ecology Telephone: +52 (5) 624-34-17 E-mail: jdcastro@ine.gob.mx

The Netherlands

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Yes</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Yes</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Levels of exposure to lead have been reduced as a result of the reduction of emissions, but still exceed levels of concern (maximum permissible concentration air = 0.5 g/m³, water = 11g/l).</p>

Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	<ul style="list-style-type: none">- Agreements with point sources on the further reduction of lead emissions.- See Part II of the questionnaire.

The Netherlands

Part II: Description of Distinct Activities

Activity: Phase-down of Lead in Gasoline	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>No new information on regulations since 1992.</p> <p>Maximum permitted lead concentration in leaded gasoline: 0.15 g/l gasoline.</p> <p>Maximum permitted lead concentration in unleaded gasoline: 0.013 g/l gasoline.</p> <p>In practice, the lead content in unleaded gasoline is lower. The above mentioned concentration is an EU figure, based on the transition period from leaded to unleaded gasoline.</p> <p>The emission of lead from road traffic in the Netherlands has been reduced by almost 100% now. Leaded gasoline is practically no longer sold.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Not relevant, see above.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Not relevant, see above.

Further information	
Who can be contacted for more information?	<p>Mr. H. Baarbé Ministry of Housing, Spatial Planning and the Environment Directorate Geluid en Verkeer PO Box 30945 2500 GX The Hague</p> <p>Telephone: +31 70 339 4371 Facsimile: +31 70 339 1281 E-mail: Baarbe@dgv.dgm.minvrom.nl</p>

Activity: Toys (Dutch Commodity Act)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Directive 88/379/EEC has been implemented by the Dutch Commodity Act, in which maximum bioavailability of lead in toys of 0.7 g/l a day is permitted.
Further information	
Who can be contacted for more information?	<p>Mr. G. Houben Ministry of Health, Welfare and Sport PO Box 5406 2280 HK Rijswijk</p> <p>Telephone: +31 70 340 6705 Facsimile: +31 70 340 5087</p>

Activity: Directive 94/62/EC on Packaging and Packaging Waste	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	(see text Directive 94/62/EC)
Further information	
Who can be contacted for more information?	<p>Dr. C. Clement Ministry of Housing, Spatial Planning and Environment PO Box 30945 2500 GX The Hague</p> <p>Telephone: +31 70 339 4697 Facsimile: +31 70 339 1284</p>

Activity: Paint	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	No new information since 1992.
Further information	
Who can be contacted for more information?	<p>Mr. C.J. Manniën Ministry of Housing, Spatial Planning and the Environment Directory of Industry and Products PO Box 30945 2500 GX The Hague</p> <p>Telephone: +31 70 339 4338 Facsimile: +31 70 339 1293</p>

Activity: Ceramic and Crystal Ware	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	No new information since 1992.
Further information	
Who can be contacted for more information?	Mr. G. Houben Ministry of Health, Welfare and Sport PO Box 5406 2280 HK Rijswijk Telephone: +31 70 340 6705 Facsimile: +31 70 340 5087

Activity: Fishing Lead	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	No new information since 1992.
Further information	
Who can be contacted for more information?	Mr. F. Dorgelo Ministry of Housing, Spatial Planning and the Environment PO Box 30945 2500 GX The Hague Telephone: +31 70 339 4908 Facsimile: +31 70 339 1297

Activity: Drinking Water	
Further information	
Who can be contacted for more information?	Mr. D. Vonk/Mrs. Foqué Ministry of Housing, Spatial Planning and the Environment PO Box 30945 2500 GX The Hague Telephone: +31 70 339 4287/4954 Facsimile: +31 70 339 1288

Activity: Exposure at the Workplace	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	No new information since 1992.
Further information	
Who can be contacted for more information?	<p>Mr. A. Vijlbrief Ministry of Social Affairs and Employment PO Box 90801 2509 LV The Hague</p> <p>Telephone: +31 70 333 5306 Facsimile: +31 70 333 4026</p>

Activity: Emission to Air	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	No new information since 1992.
Further information	
Who can be contacted for more information?	<p>Mr. H.W. Holtring Ministry of Housing, Spatial Planning and the Environment PO Box 30945 2500 GX The Hague</p> <p>Telephone: +31 70 339 4419 Facsimile: +31 70 339 1311</p>

Activity: Building Materials	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	At the moment the Dutch government is discussing with the construction and metal industries the possibilities for product innovation. Apart from the above mentioned action, there is no new information since 1992.
Further information	
Who can be contacted for more information?	Mr. F. Dorgelo Ministry of Housing, Spatial Planning and the Environment PO Box 30945 2500 GX The Hague Telephone: +31 70 339 4908 Facsimile: +31 70 339 1297

New Zealand

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>There is no programme to systematically measure blood lead levels in the general population, or in specific sub-groups such as young children. There are, however, ad hoc investigations associated with symptoms or signs of lead exposure, or exposure settings of concern.</p> <p>Workers are tested for lead levels from time to time both by employers and OSH. The industries involved include painters, vehicle radiator repair, shooting range workers, battery manufacturers, fishing sinker makers, miscellaneous. Data on the results is not available in one place, and dates are also not available. The testing is random and occasional. In the past, high levels have been observed in all the above groups.</p> <p>All paint manufacturers have voluntarily reduced lead levels to the lowest possible. The issue in NZ is the renovation of old buildings which have been painted with lead based paint in the past.</p> <p>None planned for workplace exposure to lead, other than ongoing workplace monitoring as part of managing hazards.</p> <p>Education of painters on correct methods for removal of lead based paint. Training of painters in correct methods.</p>

Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>There are programmes which monitor lead levels in drinking water supplies throughout the country. The outcome of this work is set out in Part II.</p> <p>There are no current programmes to monitor lead in air on a regular ongoing basis from a national perspective, as this was discontinued following the removal of lead from petrol. A decline in ambient air levels had been apparent following the removal of lead from petrol and no further national, systematic monitoring of compliance with the ambient air standard for lead was considered necessary. Monitoring of particular point sources still occurs regionally.</p> <p>In relation to food, lead is monitored in a wide range of foods in the periodic survey (the total diet survey). The last year for which fully analysed data is available is 1990/1991. Using model diets for various population groups, the percentage of the provisional tolerable daily intakes of 3.6 micrograms per kilogram (body weight) contributed by the diet was calculated. The proportions for the various age/sex categories were respectively as follows: Young male, 13%; Male (adult), 10%; Female (adult), 10%; Child, 21%; and Young child, 25%.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Air levels have been shown to be generally below the international standards following the removal of lead from petrol. Blood levels in the general population are not monitored sufficiently to enable a conclusion to be reached on compliance with international standards or guidelines.</p> <p>There is anecdotal evidence to show that levels in painters are falling because of improved working methods. Levels are also falling in radiator repair staff due to improved work methods and a move to lead free radiators.</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>The responding agency is not aware of any specific actions or changes planned to reduce environmental or human lead concentrations in New Zealand in the immediate future.</p>

New Zealand

Part II: Description of Distinct Activities

Phase-out of lead in paint	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	NA
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	All paint manufacturers have voluntarily reduced lead levels to the lowest possible. The issue in NZ is the renovation of old buildings which have been painted with lead based paint in the past.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	None planned for workplace exposure to lead, other than ongoing workplace monitoring as part of managing hazards.
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	None planned.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Education of painters on correct methods for removal of lead based paint. Training of painters in correct painting methods.

Further information	
Who can be contacted for more information?	Lyall Mortimer (on workplace issues concerning lead) PO Box 3705 Wellington Telephone: +64-4 9154458 Facsimile: +64-4 9154370

Phase-down of lead in gasoline	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	New Zealand phased out the use of lead in petrol on a nationwide basis by regulation (the Petroleum Products Specifications Regulations 1995).
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Objective was the removal of lead as an additive in gasoline in general use. This has been completed.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Begin: January 1996 End: September 1996
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Activity complete.
Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Informal discussions are held from time to time with representatives of government in various Asian countries with which New Zealand has contact.

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Essentially the whole programme was carried out by industry, since the fuel was supplied by the private sector in accordance with government regulation. Industry was required to make available an appropriate lead substitute for use in motor vehicles requiring such an additive
Further information	
Who can be contacted for more information?	<p>Maxine Francis Ministry of Commerce PO Box 1473 Wellington</p> <p>Telephone: +64-4 472 0030 Facsimile: +64-4 473 7010 E-mail: maxine.francis@moc.govt.nz</p>

Eliminating exposure of children to lead resulting from products intended for use by children	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Existing legislation relating to unsafe toys is continuing to be administered. The standards for elements (including lead) in crayons and children's water colour paints were reviewed and modified in the Toxic Substances Amendment Regulations 1999. The approach taken to the maximum levels for the elements was altered to apply the amount of extractable element in the product (as in EN71-3:1994 E, Safety of Toys, Migration of Certain Elements). This will enhance the consistency between New Zealand and international standards.</p> <p>The Toxic Substances Regulations 1983 also contain requirements relating to maximum levels of lead in paint, and in painted articles such as children's toys, cots and furniture. Administration of these requirements is an ongoing activity.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The intention was to minimise the risk to the population, particularly young children. More specific objectives (such as blood lead ranges for the population) have not been established.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>Begin: 1983</p> <p>End: Ongoing</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Children’s toys (particularly crayons and water colour paints) are checked on entry to New Zealand before they are put on the market. In relation to other risk goods, education on regulatory requirement, general investigation measures and health promotion activities are intended to minimise risk.
Programme results	
What are the results of the monitoring programme(s) described?	Periodic surveys and investigation activities have identified non-complying goods from time to time. Occasionally non-complying goods are identified following the investigation of suspected or actual cases of lead poisoning.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	No additional programmes planned at present.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	Activities carried out in this area are communicated to other countries in various WHO meetings as opportunities occur.

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	No specific programmes known, but legislative requirements have been drawn to the attention of importers and manufacturers, so they can enhance their efforts towards maintaining compliance.
Further information	
Who can be contacted for more information?	<p>Natalia Foronda Ministry of Health PO Box 5013 Wellington</p> <p>Telephone: +64-4 496 2265 Facsimile: +64-4 496 2340 E-mail: natalia.foronda@moh.govt.nz</p>

Reducing lead levels in drinking water through appropriate measures	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>The Ministry of Health carries out a systematic surveillance programme covering all public drinking water supplies serving more than 100 persons. 268 of the 1940 public water supplies tested had lead levels at the time of monitoring greater than 50% of the maximum acceptable values (MAV) for lead of 0.01mg/L. As this is a first flush sample, these results are somewhat of a worst case, not reflecting the water likely to be consumed by the population served. 155 supplies had at least one of these samples which exceeded the MAV for lead.</p> <p>Policy development is underway which should lead to the putting in place of regulations requiring compliance with the drinking water standards.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To ensure that all the public drinking water supplies in New Zealand are operated in such a way that they can demonstrate that they comply with the New Zealand drinking water standards (including the value for lead).
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>Begin: 1984</p> <p>End: Ongoing</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Public drinking water supplies which have been found to have lead levels in excess of 50% of the MAV, as described above, are required to carry out regular monitoring to keep the situation under regular review. Periodic national surveys are also carried out.
Programme results	
What are the results of the monitoring programme(s) described?	Slightly over 10% of the public drinking water supplies have been shown to provide water that may contain up to 50% of the maximum permitted level, $\frac{3}{4}$ of which from time to time have been shown to exceed the standard when tested in a first flush test (which is somewhat of a worse case).
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Nothing additional to that described is planned at present.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	No specific efforts have been taken, but the approach taken is described and made known whenever the opportunity to do this is available.

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Industry are, in some cases, involved in the fulfillment of the programme, as they may be contracted to provide the water and have the responsibility for ensuring and maintaining compliance.
Further information	
Who can be contacted for more information?	<p>Paul Prendergast Ministry of Health PO Box 5013 Wellington</p> <p>Telephone: +64-4 496 2073 Facsimile: +64-4 496 2340 E-mail: paul.prendergast@moh.govt.nz</p>

Eliminating exposure to lead from food packaging (e.g. cans)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Domestic food manufacturers no longer use cans with lead-soldered seams. Imported, high acid canned foods (e.g. tomato products) are monitored and product in lead-soldered cans is tested for lead residues.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To minimise dietary lead intake.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Begin: 1980 End: Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	<p>Research and evaluation of new products that may be used by industry, for example high lustre metallic glazes.</p> <p>Monitoring of domestic products.</p> <p>Monitoring the entry of imported risk products.</p>
Programme results	
What are the results of the monitoring programme(s) described?	New products have been found not to allow excessive leaching of lead. There has been a high level of compliance found in recent work relating to domestic and imported goods.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	One possibility for additional work might be surveillance of crystal ware, which is not currently carried out.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	No specific efforts have been taken.

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Jim Wilson Ministry of Health PO Box 5013 Wellington Telephone: +64-4 496 2360 Facsimile: +64-4 496 2340 E-mail: jim.wilson@moh.govt.nz

Norway

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Lead in at five stations, whole country weekly sampling since 1980, bulk, samples, ICP-MS data $\mu\text{g Pb/l}$ and $\mu\text{g lead/m}^2$.</p> <p>Lead in mosses, approximately 460 sampling plots, whole country, five-yearly intervals, conducted 1977, 1985, 1990, 1995, ICP-MS (results presented as concentration isoline maps pm lead in moss)</p> <p>Lead in air, Ny-Alesurd, Spitsbergen, weekly samples - ICP-MS</p> <p>Lead in air, urban areas, measuring campaigns</p> <p>Lead in lake water, whole country, 1995</p>

	<p><u>Air</u> Atmospheric deposition of lead is measured at 500 sites in Norway every five years by means of moss analysis. The deposition levels in 1995 were about 60% of those in 1990. Long-range atmospheric transport is the main source of lead deposition in Norway.</p> <p><u>Biota</u> Lead concentrations at national sites (humus layer) were measured in 1977, 1985 and 1995, and compared with levels in the underlying minerals soil. The levels in topsoil are strongly affected by long-range transport from other countries. In spite of a strongly reduced atmospheric deposition over the last 20 years, there is only a slight decrease in the topsoil lead (Steinnes et al., 1989, 1997).</p> <p><u>Food</u> The Norwegian Food Control Authority is collecting data for lead in all major food categories. The aim is to be able to make estimations of the intake of lead from food in Norway. All samples are collected to represent the food on the market, and sampling is performed by electrothermic AAS. The results so far are at the lower range of what has been reported from European countries.</p> <p><u>Drinking water</u> A continuous sampling and analysis of drinking water is performed by the local Food Control Units, but the data are not collected and processed. The concentrations of lead in drinking water in Norway are generally low and far below the maximum limits set by the EU.</p>
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Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Concentrations of lead in precipitation, air and mosses have decreased since 1980, due to reduced emissions (long-range transported air pollutants and local emissions). Reduced emissions due to reduced use of leaded petrol.</p> <p>Lead in primary teeth decreased significantly from the 1970s to 1990s. Lead in teeth and atmospheric deposition of lead have been positively correlated.</p> <p>The current levels of lead in foodstuffs are generally well below the limits proposed by the Nordic Council of Ministers in 1994 (<i>Nord</i> 1994:509). There is a lack of old data. Analysis of time trends is therefore not possible.</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	

Norway

Part II: Description of Distinct Activities

ENVIRONMENTAL MONITORING	
Monitoring programme (long-range transported air pollutants) - precipitation, mosses, air	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Monitoring activities supposed to continue.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Objective of monitoring: describe load of atmospheric pollutants in Norway caused by long-range transport. Geographical differences. Time trends.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Monitoring precipitation 1980.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Norwegian Pollution Control Authority

PRODUCT AND/OR USE REGULATION	
Regulation of content of heavy metals in packaging according to EU Directive	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The total content of lead, cadmium, mercury and hexavalent chromium in packaging shall not exceed: 600 ppm after 30 June 1998 250 ppm after 30 June 1999 100 ppm after 30 June 2001
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The goal is (mainly) to reduce emissions of heavy metals from management operations of packaging waste. Targets (listed in air) are fulfilled so far.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	The sorting and clearing equipment used for collected glass is improved to meet requirement concerning lead concentration in glass cullets used for production of new glass packaging.
Further information	
Who can be contacted for more information?	

RESEARCH/EDUCATION	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>1. Estimations of the intake of lead will be made. The results will be used to plan a monitoring programme if necessary.</p> <p>2. There is ongoing work within the EU regarding maximum limits for lead in foodstuffs. The result of this work will probably be implemented in Norwegian legislation.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The aim of this activity is to assess the risk of lead exposure from food. Measures to reduce the risk will be taken if necessary.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	End 1999 (?)
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>Gunnar S. Eriksen Norwegian Food Control Authority PO Box 8187 DEP N 0034 Oslo</p> <p>Telephone: + 47 22 24 66 56 Facsimile: + 47 22 24 66 99 E-mail: gunnar.eriksen@snt.dep.telemax.no</p>

Sweden

Part I: Levels of Exposure

Human health monitoring programmes																	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>The Ordinance (AFS 1992:17) on Lead regulates the handling of lead. Medical examinations and periodical medical checks are stipulated for personnel working with lead as follows:</p> <p>For men and for women over 50</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><i>Blood lead content</i> <i>µmol/l</i></th> <th style="text-align: left;"><i>Action</i></th> </tr> </thead> <tbody> <tr> <td>below 1.0</td> <td>No recurrent checks stipulated</td> </tr> <tr> <td>1.0-1.5</td> <td>Six-monthly checks of blood lead content</td> </tr> <tr> <td>1.5-2.0</td> <td>Three-monthly checks of blood lead content</td> </tr> <tr> <td>Above 2.0</td> <td>Investigation/action (as stipulated per Section 35)</td> </tr> <tr> <td></td> <td>Suspension if three consecutive tests show concentration exceeding 2.0</td> </tr> <tr> <td></td> <td>Suspension if three consecutive tests show concentration exceeding 2.0</td> </tr> <tr> <td></td> <td>Return to lead work when the concentration is less than 2.0</td> </tr> </tbody> </table>	<i>Blood lead content</i> <i>µmol/l</i>	<i>Action</i>	below 1.0	No recurrent checks stipulated	1.0-1.5	Six-monthly checks of blood lead content	1.5-2.0	Three-monthly checks of blood lead content	Above 2.0	Investigation/action (as stipulated per Section 35)		Suspension if three consecutive tests show concentration exceeding 2.0		Suspension if three consecutive tests show concentration exceeding 2.0		Return to lead work when the concentration is less than 2.0
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Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Due to the almost total phase-out of leaded petrol, the lead levels in air are normally below $0.1 \mu\text{g}/\text{m}^3$. This means that measuring lead levels in air has lost much of its interest.</p> <p>Every five years, samples of moss are collected to determine atmospheric heavy metal deposition. The last report dates from 1995-96. The northern parts of Sweden had lead concentrations below $5 \mu\text{g}/\text{g}$, except around a major smelter where the concentration was $10\text{-}20 \mu\text{g}/\text{g}$. The concentration in the southern part was normally between $5\text{-}10 \mu\text{g}/\text{g}$. In the Nordic countries, the regional deposition pattern of almost all metals shows a decreasing gradient from relatively high values in the southern parts to lower values towards the north. Compared with previous similar studies, a significant decrease in the deposition of most elements has been found during the last 10-20 years.</p> <p>Within the domestic animal control programme, 250-300 analyses of animal tissues are conducted annually. Pig kidneys are regularly sampled, other tissues are not. Samples are delivered to the National Food Administration from slaughterhouses from the whole country regularly throughout the year. The analysis is performed by atomic absorption spectrophotometry (graphite furnace) after dry ashing. Samples of wheat and rye flour, bought in three different cities in the country, are analysed for lead annually in a total number of 10-15 samples.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>No detailed statistics on levels in lead-exposed workers are available after 1990.</p> <p>Maximum permitted levels in food are rarely exceeded. Levels in food have decreased due the reduced use of leaded petrol and lead-soldered tin cans.</p> <p>The blood lead content in children in the study mentioned above (Skjerving, et al) is very low in an international perspective. Even the highest observed values are far below the level of $100 \text{ g}/\text{l}$, considered to be the lowest level harmful to the central nervous system.</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>NA</p>

Sweden

Part II: Description of Distinct Activities

RECYCLING	
Phase-out of lead in accumulators/batteries	
Main elements	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	<p>A main element in promoting recycling of batteries has been the charge for car batteries, which was introduced in 1991 to support the companies that receive, store and transport batteries for recycling. This charge has recently been extended to include all other lead batteries.</p> <p>A revision of Directive 91/157/EEC on batteries is going on within the EU.</p>
Objectives	
<p>What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).</p>	<p>In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all use of lead in accumulators should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/98:145), a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals including lead.</p> <p>There has been no reduction in the use of lead batteries since 1990, as no commercially available alternatives that are better for the environment have been developed. Recycling of the batteries is, however, close to 100%.</p>
Duration	
<p>What year did the project begin and what year did it end (or is it expected to end)?</p>	<p>The work to phase out lead from society, including lead in batteries, began in 1990 and is supposed to end by 10-15 years from now. Recycling of car batteries started in 1989 and will continue as long as these are used in cars.</p>

Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	See above.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Reports to the government of up-to-date results have been made in 1994 and 1997.
Programme results	
What are the results of the monitoring programme(s) described?	See above.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	In the new Environment Bill, the government stresses that the car industry and the authorities need to develop environmentally friendly alternatives, reduce the amount of lead in batteries and/or prolong the life of batteries in order to fulfill the phase-out goal.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Sigrid Olsson Environmental Protection Agency S-106 48 Stockholm</p> <p>Telephone: + 46 8 698 10 00 Facsimile: + 46 8 20 29 25 E-mail: sigrid.olsson@environ.se</p>

PRODUCT AND/OR USE REGULATION	
Phase-out of lead for all other uses that have been highlighted in reporting from the National Chemicals Inspectorate to the Swedish government (cables, soldering, light bulbs, cathode ray tubes, chimney tops, radiation protection, brass)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The main elements until now have concerned provision of information about the governmental phase-out goal and public reporting on the progress of the phase-out.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all uses of lead should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/98:145) a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals, including lead.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990, supposed to end within 10-15 years.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Generally the new Environment Bill stresses the importance of recycling and minimisation of the use of lead.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Reports to the government of up-to-date results have been made in 1994 and 1997.

Programme results	
<p>What are the results of the monitoring programme(s) described?</p>	<p>Cables: There are no commercial alternatives or all types of lead-sheathed sea cables. The producers work hard to develop alternatives. The Swedish users have taken policy decisions to phase out lead in cables.</p> <p>Soldering: The amount of lead used for soldering electronic equipment is virtually the same as in 1992. The industry is developing alternatives that can be fully evaluated in a few years time.</p> <p>Light bulbs: Large producers have pronounced a goal to phase out lead in glass and soldering before the turn of the century.</p> <p>Cathode ray tubes: Flat panel displays are developed to replace cathode ray tubes in today's TV sets and computer displays. Lead-free displays are commercially available for computers, but not for TV sets.</p> <p>Chimney tops: A change in building recommendations is expected to reduce the use of lead.</p> <p>Radiation protection: There are no alternatives for this use today.</p> <p>Brass: Brass produced in Sweden normally contains about 2% lead and is used for e.g. water taps. The industry aims at a 50% reduction of the content.</p>
Future risk management activities	
<p>Summarise any future risk management activities you may be considering, including supporting rationale.</p>	<p>The National Chemicals Inspectorate and the Environmental Protection Agency will follow the phase-out efforts in each area of use.</p>
Information sharing with non-OECD countries	
<p>Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.</p>	<p>NA</p>

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Jerker Forssell KemI Box 1384, S-171 27 Solna Telephone: + 46 8 730 69 31 Facsimile: + 46 8 735 76 98 E-mail: jerkerf@kemi.se

CERAMIC WARE AND CRYSTAL WARE	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	A limit value for the leaching of lead from materials intended to come into contact with food exists in accordance with EU legislation.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all uses of lead should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/98:145), a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals, including lead.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990, supposed to end within 10-15 years from now.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	See above.

Programme results	
What are the results of the monitoring programme(s) described?	In a survey made by the National Food Administration in 1996, ceramic ware from small aircraft enterprises in some cases exceeded the limit value for lead leaching. The results were presented in the Administration's newsletter, together with risk reducing recommendations for the ceramic producers as well as the distributors of glazing. Measures were taken to stop further selling of ceramic ware exceeding the limit value.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	National Food Administration Box 622 S-751 Uppsala Telephone: + 46 18 17 55 00 Facsimile: + 46 18 10 58 48 E-mail: livsmedelsverket@slv.se

CERAMIC WARE AND CRYSTAL WARE Phase-out of lead in crystal glass	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The Swedish glass industry has the aim of phasing out lead completely. The industry voluntarily agreed not to use lead in the manufacturing of semi-crystal after 1991.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Alternative compositions for full lead crystal are now being tested. The Swedish glass industry will work for an amendment of the EU directive on crystal glass, so that the quality label should be determined by physical properties instead of chemical composition.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990, the end depends on the EU regulation on crystal glass.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Generally, the new Environment Bill stresses the importance of recycling and minimisation of the use of lead.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	See above.

Programme results	
What are the results of the monitoring programme(s) described?	The total use of lead in crystal glass was reduced from 1500 tonnes in 1988 to less than 900 tonnes in 1996. Emissions to air and water from production sites were reduced by more than 90% in the same period.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	See above.
Further information	
Who can be contacted for more information?	<p>Jerker Forssell National Chemicals Inspectorate Box 1384, S-171 27 Solna</p> <p>Telephone: + 46 8 730 69 31 Facsimile: + 46 8 735 76 98 E-mail: Jerker@kemi.se</p>

LEAD SHOT AND SINKERS Phase-out of lead weights in fishing	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The main elements until now have been to reach voluntary agreements with the interest organisations, and to carry out public reporting on the progress of the phase-out. An information campaign aimed at anglers was conducted by the National Chemicals Inspectorate and the Swedish Anglers' Association in 1993. A study of dissolution of lead weights lost when fishing was launched by the National Chemicals Inspectorate in 1994.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all use of lead weights should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/98:145), a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals, including lead. Commercial fishing has decreased, and so has the number of fishing tools that are lost at sea. According to a report made by the Nordic Council of Ministers, there are acceptable alternatives to all kinds of lead weights. However, the Swedish Fishermen's Federation questions that assessment. The knowledge of the reduction goal seems to be scant among fishermen. The use of lead in sinkers for angling is probably the same as when the general policy for phase-out was laid down. There is a lack of competitive alternatives on the market.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990, supposed to end within 10-15 years from now.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Generally, the new Environment Bill stresses the importance of recycling and minimisation of the use of lead.

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The National Chemicals Inspectorate keeps in contact with the interest organisations (e.g. the Swedish Fishermen's Federation, the Swedish Anglers' Association) to follow their phase-out efforts. Reports to the government on up-to-date results were made in 1994 and 1997.
Programme results	
What are the results of the monitoring programme(s) described?	See above.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	<p>The Swedish Angler's Association, the Swedish Fishing Waters' Proprietors Federation and the National Chemicals Inspectorate will together run an information campaign in 1999, with the aim of minimising the use of certain sinkers for salmon fishing during spring and autumn in fast-flowing water. This kind of fishing is considered to represent the major losses of lead weights in angling.</p> <p>The National Chemicals Inspectorate has initiated a contact with the Swedish Fishermen's Organisation to discuss the need for information activities in order to motivate a phase-out among fisherman. The fisherman have been requested to present a phase-out plan to KemI during the year 2000.</p>
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	Jerker Forssell National Chemicals Inspectorate KemI Box 1384, S-171 27 Solna Telephone: + 46 8 730 69 31 Facsimile: + 46 8 735 76 98 E-mail: Jerker@kemi.se

EXPOSURE FROM FOOD PACKAGING	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The large wholesale dealers have stopped the importation of lead soldered tin as a consequence of their own health and environmental policies.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all use of lead weights should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/98:145), a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals, including lead. Since large wholesale dealers have required suppliers to provide lead-free tins, lead soldered tins hardly ever appear on the Swedish food market any longer. Minor quantities, imported by smaller enterprises, may be found occasionally.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990 and can be considered as ended.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA
Programme results	
What are the results of the monitoring programme(s) described?	See above.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	See above.

Further information	
Who can be contacted for more information?	National Food Administration Box 622 S-751 26 Uppsala Telephone: + 46 18 17 55 00 Facsimile: + 46 18 10 58 48 E-mail: livsmedelsverket@slv.se

LEAD IN GASOLINE	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	A voluntary phase-out of lead in petrol had already started in 1994. Since March 1994, there is a legal halt of sale of leaded petrol to consumers.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objective was a total phase-out of lead in petrol, which has also been met. The only permitted use today is for certain aircraft and military vehicles and for drag racing. The military, however, uses lead-free petrol.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	See above.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	No further risk management is considered necessary, as the amount of lead used is small and there are no obvious substitutes in the case of certain aircraft.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	The UN, with support of the World Bank, has promoted activities for the phase-out of leaded petrol (e.g. in Slovakia, Bulgaria and Vienna/Austria) in which Sweden has participated.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Taina Backstrom Environment Protection Agency 106 48 Stockholm Telephone: + 46 8 698 11 59 Facsimile: + 46 8 20 29 25 E-mail: taina.backstrom@environ.se

PRODUCT AND/OR USE REGULATION	
Phase-out of leaded keels	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The main elements until now have been to provide information about the governmental phase-out goal and to carry out public reporting about the progress of the phase-out.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all use of lead weight balances should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/98:145), a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals, including lead.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990, supposed to end within 10-15 years from now.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Generally, the new Environment Bill stresses the importance of recycling and minimisation of the use of lead.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The National Chemicals Inspectorate keeps in contact with the interest organisations to follow their phase-out efforts. Reports to the government of up-to-date results were made in 1994 and 1997.

Programme results	
What are the results of the monitoring programme(s) described?	See above.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	<p>Producers of boats with keels have been requested by the National Chemicals Inspectorate to work towards alternatives to leaded keels through international activities. The producers should make a phase-out plan, together with the boating interest organisations, and submit the plan to the National Chemicals Inspectorate during the year 2000.</p> <p>Producers of boats and boat accessories should be made aware of the goals of the phase-out of lead in society. The National Chemicals Inspectorate plans to initiate information activities together with the boating organisations.</p>
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Jerker Forssell National Chemicals Inspectorate Box 1384, S-171 27 Solna</p> <p>Telephone: + 46 8 730 69 31 Facsimile: + 46 8 735 76 98 E-mail: jerkerf@kemi.se</p>

LEAD SHOT	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>The main elements until now have been to reach voluntary agreements with the interest organisations, monitor the sale of ammunition, and carry out public reporting on progress.</p> <p>A ban of the use of lead shot in hunting of ducks and geese was introduced in July 1998, extending the former ban on use within so-called Ramsar areas (wetlands of international importance).</p> <p>In the new Environment Bill (1997/1998:145), the government has proposed a total ban on lead shot in hunting from the year 2000 and in short shooting from 2004. The proposal was to be treated by the Parliament in winter 1998/spring 1999.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>The Government Bill (1990/91:90) prescribed a voluntary changeover to alternative shot by the beginning of the year 2000 and stated that a ban should be considered if the phase-out had not been achieved by then. The follow-up in 1997 showed that the amount of lead shot sold had been reduced by only 10% and that the sale of alternative lead shot was still low.</p> <p>Despite the fact that the Swedish Hunters' Organisation supports a phase-out, individual hunters are quite reluctant. The main reasons for the hunters not to change to alternative shot seem to be the lower price of lead shot, combined with a fear of weapon damage or accidents due to different properties of the alternatives.</p> <p>The main obstacle in the case of sport shooting is the international (UIT) rules at the Olympic games and other events, where use of alternative shot is not permitted.</p>
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990, expected to end in the year 2004.

Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	The Environment Protection Agency and the National Chemicals Inspectorate have suggested that action plans for minimising the spreading of lead to the environment should be made by those running the training grounds and shooting ranges. The plans should be submitted to the local authorities no later than the year 2000.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	See above.
Programme results	
What are the results of the monitoring programme(s) described?	See above.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	See above.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA

Further information	
Who can be contacted for more information?	<p>Jerker Forssell National Chemicals Inspectorate Box 1384, S-171 27 Solna</p> <p>Telephone: + 46 8 730 69 31 Facsimile: + 46 8 735 76 98 E-mail: jerkerf@kemi.se</p> <p>Christer Peterson Environmental Protection Agency S-106 48 Stockholm</p> <p>Telephone: + 46 8 698 13 64 Facsimile: + 46 8 20 29 25 E-mail: christer.pettersson@environ.se</p>

PRODUCT AND/OR USE REGULATION	
Phase-out of lead in other ammunition than lead shot	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The main elements until now have been to reach voluntary agreements with the interest organisations, monitor the sale of ammunition, and make public reporting about the progress.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all use of lead in ammunition should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/1998:145), a phase-out target of ten years has been set for ammunition other than lead shot.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Begun in 1990, expected to end within ten years from now.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	The Environmental Protection Agency and the National Chemicals Inspectorate have suggested that action plans for minimising the spreading of lead to the environment should be made by those running training grounds and shooting ranges. The plans should be submitted to the local authorities no later than the year 2000.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The National Chemicals Inspectorate keeps in contact with the interest organisations - e.g. the Swedish Hunters Organisation, the Sport Shooting Association, the weapon and ammunition industry, the military - to follow their phase-out efforts. Reports to the government of up-to-date results were made in 1994 and 1997.

Programme results	
What are the results of the monitoring programme(s) described?	It has not been possible to get any exact figures on the use of ammunition. The military will reduce its use of leaded ammunition by about 90% in the coming ten years.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	

Further information	
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LEAD IN PAINT	
Phase-out of lead in paint, lacquers and rust preventives	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>The Swedish Paint and Printing Ink Makers Association (SVEFF, Sveriges Färgfabrikanters Föreing) already presented a phase-out plan in 1990. The plan was revised in 1993 and is running to the end of 1998.</p> <p>Since July 1996, the sale of chemicals (e.g. paint) with lead content of more than 0.5% is not permitted to consumers. It is also not permitted to use lead carbonate (white lead) or lead sulphate as ingredients in paints. Dispensation may be granted for the use in restoration of art or historic buildings. The mentioned restrictions are both in accordance with EU regulations 76/69/EEC on limitations on marketing and use of dangerous substances and preparations.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>According to the general policy for lead laid down in the Government Bill (1990/91:90), all use of lead in paint, lacquers and rust protectives should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/98:155), a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals, including lead.</p> <p>SVEFF continues its work to fulfill previous undertakings. The use of lead <i>oxide</i> as a rust-proofing agent had decreased by 60% in 1995, compared to 1988. It is now also declining in the dominant areas of use, e.g. bridges, military construction. A conflict between environmental interests and the historical interest of preserving the original painting sometimes exists in restoration of older constructions. In 1995, the use of lead <i>chromate</i> as well as lead <i>siccatives</i> had decreased by 80-85% compared to 1988.</p>
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	See above.

Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	See above.
Programme results	
What are the results of the monitoring programme(s) described?	See above.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	<p>SVEFF will be reporting on the outcome of its phase-out plan in 1999. The National Chemicals Inspectorate will reconcile results with approved goals, in consultation with paint manufacturers, and then determine whether there is any need for a new phase-out plan.</p> <p>The risk for significant exposure arising from the historic use of lead-containing materials in the buildings is not considered a problem in Sweden.</p>
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	The paint industry has made several efforts to reduce use of lead in paints by substitution and by providing information to the users.
Further information	
Who can be contacted for more information?	<p>SVEFF/Swedish Paint and Printing Ink Makers Association S-106 13 Stockholm</p> <p>Telephone: + 46 8 698 81 20 Facsimile: + 46 8 698 81 29 E-mail: sveff.info@ktf.se</p> <p>Jerker Forssell National Chemicals Inspectorate Box 1384, S-171 27 Solna</p> <p>Telephone: 46 8 730 69 31 Facsimile: 46 8 735 76 98 E-mail: jerkerf@kemi.se</p>

EXPOSURE OF CHILDREN	
Exposure to lead from products intended for use by children (e.g. toys, cribs, crayons)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Lead migration from toys is regulated in a European standards, derived from an EU directive on toys. EC-labelled toys are supposed to fulfil the standard.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	NA
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	NA
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	The National Chemicals Inspectorate is presently considering an inspection activity, in co-operation with the Swedish Consumer Agency, aimed at toy chemicals, e.g. in crayons, paint and tin soldiers.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	<p>Wanja Geisendorf Swedish Consumer Agency S-118 87 Stockholm</p> <p>Telephone: + 46 8 429 05 00 Facsimile: + 46 8 429 89 00</p>

PRODUCT AND/OR USE REGULATION	
Phase-out of lead in PVC	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The main elements until now have been to investigate possible risk reducing measures, reach voluntary agreements with the industry actors, and carry out public reporting about the progress of the phase-out.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all use of lead in plastics was supposed to be phased out in the long term, primarily through voluntary measures.</p> <p>In the new Environment Bill (1997/98:145), the government has proposed a voluntary phase-out of all uses of lead in PVC products before the year 2003.</p> <p>The use of lead as stabilizer is now limited to certain tubes and cables. It is presumed that the phase-out will continue, and that use by the year 2000 will be only 10% of that in 1994 in the majority of the applications.</p>
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990, supposed to end the year 2003.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	See above.
Programme results	
What are the results of the monitoring programme(s) described?	See above.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	The National Chemicals Inspectorate will follow the manufacturers' phase-out efforts.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	There is an ongoing Nordic project with the aim to produce PVC tubes without lead.
Further information	
Who can be contacted for more information?	The National Chemicals Inspectorate Box 1384 S-171 27 Solna Telephone: + 46 8 730 57 00 Facsimile: + 46 8 735 76 98 E-mail: kemi@kemi.se

PRODUCT AND/OR USE REGULATION	
Phase-out of lead in weight balances for car wheels	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The main elements until now have been to inform about the governmental phase-out goal and to make public reporting about the progress of the phase-out.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all use of lead weight balances should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1990/91:90), all use of lead weight balances should be phased out in the long term, primarily through voluntary measures. In the new Environment Bill (1997/98.145), a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals, including lead.</p> <p>The few alternative weight balances that exist on the market are sold in small quantities and for a much higher price. Rims that need less balancing are being developed, which the car industry considers to be the best solution in the long run.</p>
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Began in 1990, supposed to end within 10-15 years from now.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Generally the new Environment Bill stresses the importance of recycling and minimisation of the use of lead.

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	See above.
Programme results	
What are the results of the monitoring programme(s) described?	See above.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	The car industry, together with other industries, have been requested by the National Chemicals Inspectorate to work internationally on spurring the development of more environmentally friendly alternatives to lead weight balances on car wheels. The progress and plans for a phase-out should be reported to the National Chemicals Inspectorate during the year 2000.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Jerker Forssell KemI Box 1384, S-171 27 Solna Telephone: + 46 8 730 69 31 Facsimile: + 46 8 735 76 98 E-mail: jerkerf@kemi.se

DRINKING WATER	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Limit values for lead concentration in drinking water, as well as the leaching properties of materials in contact with the water, are set by the National Food Administration (see the 1993 Lead Monograph).
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	In accordance with the general policy for lead laid down in the Government Bill (1990/91:90), all uses of lead were supposed to be phased out in the long term, primarily through voluntary measures. In the new Environment Bill of 1998, a phase-out within a period of 10-15 years has been set as a target for the use of certain hazardous chemicals, including lead. No special activities have been conducted since 1992.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	NA
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	NA

Programme results	
What are the results of the monitoring programme(s) described?	Since there are hardly any lead pipes in Sweden, lead in drinking water is considered to be a minor problem.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	National Food Administration Box 622 S-751 26 Uppsala Telephone: + 46 18 17 55 00 Facsimile: + 46 18 10 58 48 E-mail: livsmedelsverket@slv.se

Switzerland

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>See the OECD Lead Monograph.</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>See the OECD Lead Monograph.</p> <p><u>Soil</u> National Soil Monitoring Network (NABO)</p> <p><u>Air</u> National Air Pollutant Observation Network (NABEL)</p> <p><u>Water</u> River Monitoring and Survey Programme (NADUF) Lead total and suspended matter in the river Rhine (Tableaux numériques des analyses physico-chimique des eaux du Rhin et des matières en suspension, Commission Internationale pour la Protection du Rhin, 1995).</p>

Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p><u>Soil</u> Yes, guide values on soil pollutants exceed the levels given in the corresponding ordinance in several areas.</p> <p>Measures: Emission limits (e.g. lead-free gasoline, reduction of lead in shot).</p>
Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	

Switzerland

Part II: Description of Distinct Activities

RECYCLING	
Revision of the Regulation on Batteries and Accumulators	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Ordinance.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead based paint).	Obligation for the consumer to return all used batteries. Obligation for manufacturers and traders to accept all used batteries.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Revision of existing legislation. 2nd half of 1998.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Yes, see above.

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	

Further information	
Who can be contacted for more information?	Christoph Rentsch BUWAL CH-3003 Bern Telephone: + 41 31 322 93 64 Facsimile: + 41 31 324 79 78 E-mail: christoph.rentsch@buwal.admin.ch

New Ordinance on Lead's Impact on Soil	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Introduction of values for testing and remediation of soil pollutants, e.g. lead to protect man, animals and plants against polluted soils.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Protection of man, animals and plants against harmful or detrimental effects of polluted soils.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Autumn 1998 End
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	National and cantonal monitoring of soil.

Programme results	
What are the results of the monitoring programme(s) described?	Test reports.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Minimisation of contamination of soils with lead.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Jürg Zihler BUWAL CH-3003 Bern

LEAD SHOT	
Prohibition of lead shot for hunting in wetlands and in shallow waters (legislation)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Agreement on the conservation of African-Eurasian migratory waterbirds, paragraph 4.1.4. Convention of migratory species of wild animals, Bonn convention/ordinance on hunting and the protection of mammals and birds, paragraph 2.1.h.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Prevent lead intoxication of waterfowl.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	April 1998
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Rolf Anderegg BUWAL CH-3003 Bern

ENVIRONMENTAL MONITORING Heavy metals (lead) in roe deer (<i>Capreolus capreolus</i>)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Monitoring programme.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1984 1998
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Dr. Peter Dollinger Federal Veterinary Office CH-3003 Bern

Turkey

Part II: Description of Distinct Activities

DETERMINING LEAD CONCENTRATION IN BIOLOGICAL MATERIALS, SOIL, WATER AND AIR	
Main elements	
Describe the main elements of the activity, including monitoring legislation, regulations, policies and/or implementation.	<p>Based on current lead levels in the environment:</p> <ul style="list-style-type: none"> • In accordance with the Regulation on Production, Packaging and Purchasing of Natural Spring Water, Mineral Water, Potable Water and Recreational Water: <ul style="list-style-type: none"> In natural spring water: 0.01 mg/l In mineral water: 0.01 mg/l In potable water: 0.01 mg/l • In accordance with the Regulation on Protection of Air Quality: <ul style="list-style-type: none"> Long-term limit values for lead and lead compounds In suspended particulate matter: 2 µg/m³ In deposited dust: 500 µg/m²/day
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Activities related to determining the concentration of lead in biological materials, soil, water and air are being achieved with respect to protecting environmental and public health.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	The activities began in 1984 under the Ministry of Health, before the Department of Environmental Health Research of the Refik Saydam Centre of Hygiene.

Aimed at recycling?	
<p>Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.</p>	
Programme evaluation	
<p>What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions to lead risk reduction?</p>	<p>Based on lead levels in high risk and sensitive populations resulting from lead exposure:</p> <ul style="list-style-type: none"> • Concerning the routine measurement activities for lead performed routinely at the Department of Environmental Health: <ul style="list-style-type: none"> – Determination of the lead level in blood and urine has been performed routinely at the Laboratory for Occupational Health Control and Research since 1980. – Routine measurement activities for lead in the atmosphere have been carried out in regard to background levels at the Laboratory for Air Pollution Control and Research since 1993, but not yet in urban areas. – Routine measurement activities for lead in water at the Laboratory for Water Quality Control and Research have been carried out since 1984. – Routine measurement activities for lead in soil at the Laboratory for Soil Pollution Control and Research have been carried out since 1992. • A research project on Determination of Accumulation of Heavy Metals Caused by Emissions from Traffic, especially in the soil of playing areas such as parks or school gardens located near main highways, has been ongoing since 1995. <ul style="list-style-type: none"> – Children aged 0-12 are a vulnerable group at high risk and need special consideration. It is reported that children playing in areas near heavy traffic and industry are exposed to approximately 50-200 mg dust and soil by intake through the respiratory system. – According to the concentration levels reported for heavy metals in surface dust, those for lead and cadmium should be less than 1000 ppm and 100 ppm, respectively, to prevent contamination by heavy metals at sampling points. – It is intended to determine the magnitude of the accumulation of heavy metals, especially lead, resulting from traffic emissions. – Duration: 2 years.

	<p>Parameters determined: lead, zinc, nickel and cadmium.</p> <p>The analytical parts of the project started in October 1995 and concluded in October 1997, as planned in the time schedule. Evaluation of the project studies will be achieved in the near future.</p> <ul style="list-style-type: none"> • The project proposal on “determination of the deposition and accumulation of pollutants emitted from exhausts of motor vehicles to air, soil and biological material with respect to public health” was prepared and submitted to the related international institutions in order to obtain co-operation in the studies.
Programme results	
What are the results of the monitoring programme(s) described?	It needs to be improved.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	<p>In accordance with Article 10 of the Plan of Action of the Workshop on Urban Air Pollution in ECO Countries organized by the Department of Environmental Research on December 22-23, 1997:</p> <p>“To follow up and take necessary action to increase awareness of public health problems by organizing meetings, workshops, conference, etc., among ECO Member States with possible assistance of international organizations and other national institutions.”</p>
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	The Declaration on Environment for the Automotive Industry signed on December 31, 1993, between the Ministry of Environment and the Automotive Industry Association is a promising indication of progress in reducing emissions from motor vehicles.

Further information	
Who can be contacted for more information?	A. Banu Bayar (Chem. Dipl. Engineer) Director for the Department of Environmental Research Ministry of Health Refik Saydam Centre of Hygiene Saglik Bakanligi Refik Saydam Hifzissihha Merkezi Baskanligi Cemal Gursel Caddesi No 18 Ankara

United Kingdom

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p><u>Population studies</u></p> <p>The then Department of the Environment (DOE - now the Department of the Environment, Transport and the Regions: DETR), in conjunction with the Department of Health (DH), commissioned a survey of blood lead as part of the 1995 Health Survey of England (HSoE); 6857 samples were analysed, from adults and some children over 11 (5% of the sample). A parallel study of blood lead in 584 younger children (aged 31 months), born in 1992 in Bristol and part of the Avon Longitudinal Study of Pregnancy and Childhood (ALSPAC), has also been carried out. Blood lead analyses were performed using microsampling flame atomic absorption spectrometry, with a protocol for controlling accuracy which allowed comparison with an earlier blood lead survey (DOE, 1986). All details of the 1995 studies are available in: <i>Recent UK Blood Lead Surveys</i> (1998), published by the Institute of Environment and Health, Leicester, UK LE1 9HN (ISBN 1 899110 13 5).</p> <p>A further study, on around 2000 young people aged 4 to 18, is currently being undertaken as part of the National Diet and Nutrition Survey (NDNS).</p>

	<p><u>Exposure of workers to lead</u></p> <p>The UK's Control of Lead at Work Regulations 1998 introduced tighter controls to protect the health of workers exposed to lead. The Regulations apply to workers who are liable to be exposed to lead in a form in which it can be inhaled, ingested or absorbed through the skin. Workers whose exposure to lead is liable to be "significant"-a term defined in the Regulations-are placed under medical surveillance by an appropriate doctor. This surveillance includes periodic medical assessments carried out at least once each year, and measuring the concentration of lead in the workers' blood, or urine where there is exposure to the organic form of lead, i.e. lead alkyls. The frequency of measuring blood lead concentrations depends on the extent and nature of the exposure to lead and varies from at least once every three months to at least once a year. Workers who are exposed to lead alkyls have the concentration of lead in their urine measured at least once every six weeks and their blood leads measured at least once a year. Each April, doctors responsible for the medical surveillance of lead workers send to the Health and Safety Executive (HSE) a statistical return based on the previous 12 months which shows: the number of workers under medical surveillance; their gender; the lead sector in which they are employed; the distribution of their blood lead measurements; and the numbers who are suspended from work because their blood lead levels have reached the suspension level set by the Regulations. The Health and Safety Commission publishes summaries of this statistical information in its annual publication "Health and Safety Statistics". The latest published figures show that, in 1996/97, the total number of workers under medical surveillance was some 15,700, of whom 94% were male.</p> <p><u>Contaminated land</u></p> <p>The major sources of lead pollution in soil are exhaust emissions from petrol vehicles, mining and smelting activities, former use of lead arsenate pesticides, and the application of sewage sludge to agricultural land. Because of low solubility and resistance to microbial degradation, lead accumulates in the surface horizons in soil. Soil lead concentrations in remote or recently settled areas lie in the range 10-30 mg/kg, but elsewhere, even in rural areas, low-level contamination will have raised lead contamination to the 30-100 mg/kg range. Urban soil concentrations are typically much higher, reflecting greater exhaust emissions.</p>
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Environmental monitoring programmes

Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.

Water

Water companies in England and Wales are required to monitor for lead at consumers' taps at the frequencies specified in the Water Supply (Water Quality) Regulations 1989. The standard frequency is four samples a year taken at randomly selected taps in each water supply zone. If a sample exceeds the standard, then the increased sampling frequency of either 12 or 24 samples per year is adopted, depending on the size of the zone. A reduced sampling frequency of one sample per zone per year is permissible if the company can demonstrate that the concentration of lead in all compliance samples taken in the preceding three years has been less than 25 micrograms per litre ($\mu\text{g/l}$). Samples are taken as first draw daytime samples (i.e. without flushing) from randomly selected properties. Thus, by definition these may or may not have lead pipework. The new EC Directive on drinking water quality, which has just been agreed, requires that the number of samples taken should be distributed equally in time and location and be representative of the quality of the water consumed throughout the year. The new standards will apply to samples of drinking water obtained by an adequate sampling method at the tap, and taken so as to be representative of a weekly average value ingested by the consumer.

The protocol for monitoring for lead under the new Directive has yet to be agreed, but the Commission is likely to propose a system of harmonised monitoring which will take into account the above conditions. This is likely to take the form of random daytime sampling from randomly selected domestic properties across a supply zone, a protocol similar to that applied under the current Regulations. Some water companies carry out special surveys for lead in drinking water in addition to the routine monitoring. Water companies also sample for lead on specific requests from consumers who may be concerned that they have lead pipework. Exception reporting (i.e. any failures to meet the standard) for the regulatory monitoring is assessed monthly by the Drinking Water Inspectorate. All regulatory data, including lead, are assessed annually for inclusion in the Chief Inspector's Annual Report. Regulatory data for lead, plus data from any special surveys, are further assessed in more detail and reported on separately.

	<p><u>Contaminated land</u></p> <p>Land contaminated with lead or other substances is identified through the process of risk assessment. DETR published tentative “trigger concentrations” for lead and other substances in its ICRCL Guidance Note 59/83, Guidance on the assessment and redevelopment of contaminated land (July 1987). The threshold concentration for lead, the level below which land may be considered to be uncontaminated, is 500 mg/kg for domestic gardens and allotments, and 2000 mg/kg for parks, playing fields and open space. DETR, through its Land and Soil Research Programme, is planning to replace the ICRCL “trigger concentrations” with guideline values produced by the CLEA (Contaminated Land Exposure Assessment) computer model.</p> <p><u>Food</u></p> <p>Lead levels in food are routinely monitored by the Ministry of Agriculture, Fisheries and Food (MAFF) and have shown a substantial decrease in the last few years.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p><u>Population studies</u></p> <p>The completed (1995) surveys showed that blood lead levels have fallen considerably (by 3-5 times) throughout all age groups in the population compared with measurements made 10-15 years ago. The majority of people in the UK now have very low blood levels averaging approximately 3 micrograms per decilitre (µg/dL). Although 3% of the HSoE subjects and 5% of the ALSPAC toddlers had a blood lead level greater than 10 µg/dL, none of the children surveyed had blood lead levels above 27 µg/dL and only 0.17% of adults were above 25 µg/dL.</p> <p>These reductions in blood lead follow on from the UK’s long-standing policy to reduce the exposure of man and the environment from all sources of lead, wherever practicable. This approach has led to action being taken to reduce exposure to lead from sources such as food, vehicular emissions and paint.</p>

	<p><u>Water</u></p> <p>The Regulations set a standard for lead in water of 50 µg/l at the point of supply. This is more restrictive than the standard of 50 µg/l in the original EC Directive relating to the quality of water intended for human consumption, which applies to a sample taken from running water or after flushing. New Regulations will be enacted to meet the requirements of the new EC Directive which will reduce this standard to 25 µg/l by the year 2003 and to 10 µg/l by 2013. 592 of the 29,237 (or 2.0%) of the regulatory monitoring samples taken for lead during 1997 failed to meet the current standard of 50 µg/l. This compares to 1736 of the 58,635 samples (or 3.0%) taken in 1991. The Regulations place a responsibility on water companies to take action to reduce lead concentrations at consumers' taps. Where there is a risk that the lead standard would be exceeded after the time of supply, the companies are required at present to treat the water to reduce plumbosolvency, except where:</p> <ul style="list-style-type: none">(a) the treatment is unlikely to achieve a significant reduction in the concentrations of lead; or(b) the prescribed risk relates to water supplied to an insignificant part of the water supply zone; or(c) treatment is not reasonably practical. <p>Advice on the implementation of these responsibilities is given in Chapter 8 of <i>Guidance on Safeguarding the Quality of Public Water Supplies</i>. In 1991, most water companies in England and Wales gave legally binding undertakings to investigate and, where necessary, install and/or optimize treatment to reduce plumbosolvency. By the end of 1992, 12 companies, including those which had installed treatment to reduce plumbosolvency prior to 1989, were able to demonstrate that there was either no risk of the standard for lead being exceeded in their water supply zones; that the risk related to an insignificant part of the zone; or that the optimisation of treatment had</p>
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	<p>not eliminated the risk and that further treatment was not reasonably practicable. The remaining companies evaluated a number of treatment options and, in most cases, pH adjustment and/or treatment with an orthophosphate was shown to be the most effective. Most of these undertakings were completed prior to 31 December 1995, the exception being North West Water, which had an ongoing programme into 1998. The effectiveness of the additional treatment will gradually increase with time, as protective layers build up on the inside of lead pipes. Treatment, however, is unlikely to have a significant impact in those areas where the condition of the lead piping has significantly deteriorated and the problem is due to particulate lead rather than dissolved lead. The only practical options in such cases are to consider replacing the lead piping or to persuade the consumers to adopt a number of simple short-term precautions to reduce the level of lead in the water supplied at the tap. Leaflets have been produced giving this advice.</p> <p>It is estimated that there are some 7,200,000 lead service pipes in England and Wales, or some 35% of all connections. Since 1992, a total of 595,032 lead communication pipes have been replaced by the water companies.</p>
<p>Future actions to reduce exposure</p>	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p><u>General population</u></p> <p>The Environment Leaders' Meeting of the Eight in Miami in May 1997 declared that further action should be taken to reduce blood lead levels in children in the eight countries to below 10 (as recommended by US CDC, WHO). This has been adopted by the UK Government as the new action level for blood leads. Action to achieve the Miami target is being led by DETR, within the UK's long-standing policy to reduce the exposure of man and the environment from all sources of lead, wherever practicable. Lead has been banned or restricted in a number of applications. The use of lead paints was banned in 1992 (UK Statutory Instrument 1992/31), and this has contributed to falling levels of lead in dust since that time. Lead content is also restricted in toys, petrol, food (with a lower level for baby foods) and ceramic ware in line with European Directives.</p>

	<p><u>Water</u></p> <p>Under the new Directive, Member States have to ensure that all appropriate measures are taken to reduce the concentration of lead in drinking water as much as possible during the interim period needed to achieve compliance with the 10 µg/l standard. Thus, water companies will be required to introduce treatment to reduce plumbosolvency if the lead concentration at a significant number of properties in a water supply zone exceeds 10 µg/l and a significant number of properties are supplied through lead pipes, unless it can be shown that additional treatment will have little or no effect. The priority will be to install treatment to meet the 25 µg/l standard, but companies will be expected to also install treatment as soon as possible for zones where 25 µg/l is currently being met but 10 µg/l is not met. In many cases replacement or lining of the lead pipework will be the only options. Water companies are being asked to install treatment by the end of 2002 in order to achieve compliance with a standard of 25 µg/l, and likewise to develop suitable lead pipe replacement strategies to meet either the proposed 25 µg/l by 2003 or the ultimate 10 µg/l standard by 31 December 2013.</p> <p><u>Contaminated land</u></p> <p>The Government's policy on contaminated land is that action has to be taken where there are unacceptable risks to human health or the environment in the context of the existing or intended use of the land.</p> <p>Change of use of land. Contamination and the possibility of contamination are a material planning consideration. When determining a planning application for land which might be contaminated, the local planning authority has to consider whether the proposal takes proper account of contamination. Conditions might be imposed that require the developer to carry out remedial measures.</p> <p>Existing use of land. A number of different kinds of pollution, including land contamination, may be statutory nuisances under Part III of the Environmental Protection Act 1990. Where a local authority is satisfied that a statutory nuisance exists, it has to serve a notice on the person responsible for the nuisance (or where he cannot be found, on the owner or occupier of the land),</p>
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	<p>requiring him to abate or prohibit or restrict the nuisance. It is intended that a new regime to control contaminated land-contained in Part IIA of the Environmental Protection Act 1990, as inserted by section 57 of the Environment Act 1995-will come into force in July 1999. Contaminated land will then cease to be a statutory nuisance. Under the new regime local, authorities will inspect their areas in order to identify contaminated land and will require the person who “caused or knowingly permitted” the contamination to take action to deal with it.</p> <p><u>Air</u></p> <p>On 5 May 1998, the Expert Panel on Air Quality Standards (EPAQS) recommended a new Air Quality Standard for lead in the United Kingdom of 0.25 $\mu\text{g}/\text{m}^3$ measured as an annual average. This new standard will be considered in the current review of the National Air Quality Strategy, which at present includes the WHO’s recommendation for a lead standard of 0.5 $\mu\text{g}/\text{m}^3$ measured as an annual average.</p> <p><u>Petrol and other sources</u></p> <p>The Government is proposing to ban the general marketing of leaded petrol from 1st January 2000, in line with EU Directive requirements. Lead fishing weights are banned and there has been a voluntary phase-out of the use of lead shot in wetlands over the last two years. It has been proposed that this continue until September 1998, against a background of considering legislative options with the aim that legislation should be put in place by the year 2000.</p>
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United Kingdom

Part II: Description of Distinct Activities

DRINKING WATER	
Statutory regulations are used in England and Wales	
Main Elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The Regulations specify the level of monitoring to be undertaken and the standards to be achieved. Compliance is monitored by the Drinking Water Inspectorate.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To meet the current regulatory standards, which are based on the EC Drinking Water Directives. Water companies give legally binding undertakings to carry out suitable remedial action by a given date to facilitate compliance with the regulatory requirements.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing since 1989.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No.

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The Drinking Water Inspectorate (DWI) carry out detailed assessments of the monitoring data provided by the water companies and also monitor progress with undertakings.
Programme results	
What are the results of the monitoring programme(s) described?	The results are reported annually in the Chief Inspector's Report and in specific reports on lead in drinking water.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Compliance with the new EC Directive standards.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	See above.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	

Further information	
Who can be contacted for more information?	<p>Mike Roberts Department of Environment, Transport and the Regions Chemicals and Biotechnology Division 3/E7 Ashdown House 123 Victoria Street London SW1E 6DE</p> <p>Telephone: + 44 1718905268 Facsimile: + 44 171 890 5229 E-mail: mike.roberts@detrbiotech.demon.co.uk</p>

OCCUPATIONAL EXPOSURE	
To evaluate the effectiveness of the UK's new Control of Lead at Work Regulations 1998	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	The UK will i) monitor the blood lead levels of workers collated under the new Regulations during the three years 1998/99 to 2000/01; (ii) evaluate the effectiveness of the Regulations during 2001/02 in helping to prevent or adequately control exposure to lead in the workplace, and in reducing the blood lead levels of workers; (iii) propose for consultation a further tightening of workplace controls to come into force by April 2003.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To reduce the blood lead levels of workers to as low as is reasonably practicable for the various sectors of the lead industry to achieve.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	1998 Ongoing, but provisional end date is April 2003.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	No.

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	The annual collection and collation of workers' blood lead levels, plus a study or exercise (yet to be designed) to gauge the overall effectiveness of the new workplace Regulations.
Programme results	
What are the results of the monitoring programme(s) described?	Not yet available.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Any future activities or initiatives will be decided when the effectiveness of the new Regulations has been evaluated.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	None.
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	None known, but the various sectors of the UK's lead industry are actively engaged in complying with the more stringent control measures introduced by the new Regulations. Compliance will be more of a challenge for some sectors than others, e.g. it will be particularly challenging to lead-acid battery manufacturers and those engaged in the demolition and scrap recovery industries.

Further information	
Who can be contacted for more information?	<p>Mike Reeves Health and Safety Executive 6 SW Rose Court 2 Southwark Bridge London SE1 9HS UK</p> <p>Telephone: +44 171 717 6259 Facsimile: +44 171 717 6190 E-mail: mike.reeves@hse.gov.uk</p>

United States

Part I: Levels of Exposure

Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p><u>General population</u></p> <p>The second phase of the National Health and Nutrition Examination Survey (NHANES III, Phase 2) was carried out between 1991 and 1994. The purpose of this survey is to measure blood lead levels in the general population. NHANES is an ongoing series of national examinations of the health and nutritional status of the civilian non-institutionalized population. (NHANES IV will begin in the spring of 1999 and will include blood lead measurements, providing continued surveillance of lead levels in a representative sample of the US population.)</p> <p><u>Children</u></p> <p>CDC sponsors a grant programme for state and local health departments for screening, especially of children who are determined to be at risk for lead exposure because they have risk factors, such as poverty or residence in older, deteriorating housing.</p> <p><u>General</u></p> <p>The CDC NCEH Laboratory provides a Blood Lead Laboratory Reference System as a voluntary assistance programme to help lead measurement laboratories achieve and maintain accuracy in this critical analytical technique.</p>

	<p><u>1993 Lower Rio Grande Valley Environmental Scoping Study</u> Purpose: Sampling of nine residences and 18 subjects (adults) in the Lower Rio Grande Valley of Texas. Methods: Blood sampling done according to CDC protocol. Analysis of blood lead by graphite furnace atomic absorption spectroscopy; analysis done by CDC. Dates obtained: 18 March to April (spring phase) and again from 21 July to 3 August (summer phase) 1993. Results obtained reflected blood lead level normal or low; no seasonal differences were noted.</p> <p><u>Bone lead (and blood lead) study (a small pilot study)</u> Populations surveyed: Adolescents and young adults (age 16-22) in general population (Boston, Massachusetts). Methods used: For venous blood lead - graphite furnace atomic absorption spectrophotometry (GF-AAS). For tibia lead - K-X-ray fluorescence (K-XRF) with one hour measurement period Dates conducted: 1995 Data obtained: Blood lead levels were low. All measurements were below 4.5 µg/dL, with about 60% of the measurements below the detection limit of 1 µg/dL. Tibia lead levels were also low: average levels were not different from 0.</p> <p><u>The effect of a dust lead control programme combined with health education on blood lead in toddlers: a randomized study</u> <u>GG Rhoads, AS Ettinger, KD Goldman, CP Weisel, TJ Buckley, PJ Lioy</u> <u>Dates conducted: 1993-95</u> In the Children's Lead Exposure and Reduction Study (CLEARS) 115 children in Jersey City, New Jersey under three years old who were at risk of excessive lead exposure were randomly divided into two groups. During the course of a one-year intervention, the Lead Group (LG) was offered bi-weekly assistance with home dust control and a series of educational sessions about lead. The Accident Group (AG) was offered targeted education and home safety items related to prevention of unintentional injuries. The AG subjects received only routine information about lead and served as a control group.</p>
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	<p>A final blood lead was obtained from 46 LG and 53 AG children. The LG families received an average of 3.4 (range 1-6) one hour organized educational sessions and 16.6 (range 0-42) cleaning visits. Baseline blood leads were (mean \pm S.E.) 12.3 ± 0.8 and 11.6 ± 0.8 $\mu\text{g/dL}$ in the lead and accident groups, respectively. After intervention, blood lead fell by 2.1 ± 0.8 $\mu\text{g/dL}$ (17% fall) in the LG and increased by 0.1 ± 1.0 in the AG ($p < .05$, one-sided). The mean difference between groups in final blood lead was most striking in the summer months (4.0 $\mu\text{g/dL}$). The reduction of blood lead in the LG group was greater for the 34 children whose houses were cleaned > 9 times (-2.7 $\mu\text{g/dL}$) than for the 12 cleaned on fewer occasions ($+0.5$ $\mu\text{g/dL}$). These results confirm the importance of dust lead control and education as a practical strategy for children at risk of lead exposure.</p>
Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>The US has developed regulations requiring monitoring of movement of lead in the subsurface environment from land disposal facilities.</p> <p>The National Primary Drinking Water Regulations for Lead and Copper became effective on December 7, 1992. Under the regulations, water systems that serve 25 or more of the same individuals at least six months of the year must monitor periodically for lead levels at the tap. Depending on system size, water systems must collect samples from 5 to 100 taps in homes most likely to have high levels of lead at the tap, such as those served by lead service lines and/or containing lead pipes or copper pipes with lead solder installed after 1982. If more than 10% of the taps sampled exceed 15 parts per billion (ppb) lead, the water system is considered to have exceeded the lead action level.</p> <p>Based on the results of lead monitoring through September 30, 1995, 69.1 million people were provided drinking water by water systems that exceeded the action level of 15 ppb at least once. Of that number, 42.8 million people were provided water by systems where sampling results showed lead levels between 15 and 30 ppb, and 26.3 million people received water from systems where sampling results showed lead levels over 30 ppb, which EPA views as a significant exceedence. About 2.1 million people receive water from water systems where sampling results showed lead levels greater than 130 ppb. (Source: EPA, <i>Environmental Indicators of Water Quality in the United States</i>, EPA 841-R-96-002, June 1996.)</p>

	<p>The US monitors lead in food in a couple of different ways. The heavy metals monitoring programme in food evaluates a variety of heavy metals, including lead in food sources. The total diet programme analyzes food for nutritional qualities, pesticides and contaminants, including lead, to find exposures in diets common to different sub-populations of the US.</p> <p>A small-scale monitoring programme of 48 children ages 2 to 4 years living in lead contaminated homes in an urban New Jersey area was conducted in 1997 to determine dietary intake of lead, including contributions to diet from contaminated floors and hands. Experimental dietary collection procedures were developed utilizing duplicate diet, child handled food, and technician handled food samples to measure potential contamination of foods during the act of eating. Drinking water, blood, floor wipes, hand wipes, and questionnaire data were also collected and analyzed using state-of-the-art measurement techniques with ICP/MS. Data is currently being analyzed and is not available at this time.</p> <p>Three field studies are being conducted under the National Human Exposure Assessment Survey and will be completed in FY98. The data are expected to be available in FY00. These studies will measure exposures in three study regions using data on pollutant concentrations in environmental and biological media and estimates of the frequency and durations of exposure-related human activities. These studies will: 1) measure pollutant concentrations in air, water, soil, dust, food, blood, urine and hair and on surfaces and human skin using various sampling and analytical techniques; 2) determine direct exposure using personal exposure monitors; and 3) estimate human activity patterns using a series of questionnaires and diaries. Respondents will be selected randomly using a stratified probability sample, so that inferences can be made about the exposures of the populations from which the samples are drawn. These data will be to used to estimate human exposures among the sampled populations and to test a series of hypotheses related to these exposures.</p>
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Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p><u>Human blood lead levels</u></p> <p>Although blood lead levels in the general population of the US are declining, NHANES III, Phase 2 also shows that blood lead levels among children aged 1-5 years were more likely to be elevated among those who were poor, non-Hispanic black, living in large metropolitan areas, or living in older housing. Some 890,000 young children are estimated to have blood lead levels of at least 10 µg/dL. The blood lead level of concern for children in the US is 10 µg/dL.</p> <p>From NHANES II, conducted during 1976-80, to Phase 1 of NHANES III (conducted during October 1988-September 1991) the geometric mean (GM) BLL for persons aged 1-74 years declined from 12.8 µg/dL to 2.9µg/dL. These declines were associated with removal of lead from paint, gasoline and food cans, and removal from materials used in plumbing. A further decline to 2.3 µg/dL was observed in Phase 2 of NHANES III.</p> <p><u>Drinking water</u></p> <p>Levels of lead in drinking water from approximately 25-30% of community and non-transient non-community water systems exceed levels of concern. Based on anecdotal data available, EPA believes the steps taken by these water systems to optimize corrosion control and to remove lead from source water, where high concentrations of lead in source water have been found, have reduced exposure to lead in drinking water. The results of follow-up monitoring have not yet been assessed nationally, however.</p> <p>Preliminary concentration data for food samples indicate the activities of the child associated with eating in environments contaminated with lead can significantly increase dietary intake.</p>

Future actions to reduce exposure	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>In 1997, the US recommended a systematic approach to screening of children who are at risk for lead exposure, in order to further reduce exposure levels among those shown to be at risk by the most recent population survey. The US grant programme is increasingly focused on improving the efforts of health departments in states and locales to locate and screen children who are at risk.</p> <p>Regulations under development:</p> <ul style="list-style-type: none"> • Identification of hazardous levels of lead in paint, soil and dust <ul style="list-style-type: none"> - will identify hazardous levels of lead in paint and soil. • Management and Disposal Standards for Lead-Based Paint Debris <ul style="list-style-type: none"> - will decrease the costs of lead-based paint debris disposal, thus increasing the amount of abatements in residences with lead-based paint. • Lead-based Paint Activities, Training and Certification for Public and Commercial Buildings <ul style="list-style-type: none"> - will develop standards for certification and training of workers and work practice standards for those engaged in lead-based paint activities. • Renovation and Remodeling Activities <ul style="list-style-type: none"> - will consider what type of regulatory action is needed, if any, for training and certification of renovators and remodelers who work with lead-based paint. • Continuing Technical Evaluation • Continued expansion of lead laboratory accreditation programme • Distribution of soil lead around housing study • Phase II of the National Survey of Lead-Based Paint in Housing • Seasonal rhythms of blood lead levels study. • Effect of abatement and repair and maintenance activities on blood lead levels

	<ul style="list-style-type: none"> • Effect of renovation and remodeling on worker exposures and children’s blood lead levels. • Effects of in-home educational intervention on blood lead levels. <p><u>Drinking water</u></p> <p>Water systems that exceeded the lead action level during initial monitoring should have optimal corrosion control treatment in place in the 1997-99 time frame. Those systems that continue to exceed the lead action level after optimizing corrosion control are required to replace the portion of the lead service lines that they own and to offer to replace the privately-owned portion(s) of lead service lines. Water systems have up to 15 years to complete this lead service line replacement, replacing at least 7% of the lead service lines per year.</p> <p>The US also expects the revised Lead Ban provisions of the Safe Drinking Water Act Amendments of 1996, which take effect on August 6, 1998, to reduce the potential for lead contamination of drinking water to occur as a result of the installation or repair of building plumbing systems.</p>
Human health monitoring programmes	
<p>Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]</p>	<p>Yes, the US Department of Health and Human Services, National Center for Health Statistics, Centers for Disease Control conduct a survey of blood lead levels in adults and children.</p>

Environmental monitoring programmes	
<p>Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.</p>	<p>Yes, State and local government environmental agencies monitor for ambient lead levels in air and report the data to the US Environmental Protection Agency's Aerometric Information Retrieval System (AIRS). This is all performed in accordance with the US Code of Federal Regulations, Title 40, Chapter 1, Subchapter C, Part 58, "Ambient Air Quality Surveillance." The cited regulation addresses specific aspects of ambient air quality surveillance such as quality assurance requirements, monitoring methodology, network design, probe/monitoring path siting criteria, operating schedule, and data reporting requirements. Appendices to this regulation address several of these topics in substantial detail. In 1997, a total of 381 monitoring sites reported ambient lead concentration data to AIRS.</p>
Level of concern	
<p>Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	<p>Nature and Sources: EPA's regulatory efforts to reduce the content of lead in gasoline, the contribution from the transportation sector, has declined. Today, metals processing is the major source of lead emissions to the atmosphere. The highest ambient air concentrations of lead are found in the vicinity of ferrous and non-ferrous smelters, battery manufacturers, and other stationary sources of lead emissions.</p> <p>Primary and Secondary Standards: The primary and secondary NAAQS for lead is a quarterly average concentration not to exceed $1.5\mu\text{g}/\text{m}^3$.</p> <p>United States Ten-Year Trends: The statistic used to track ambient lead air quality is the maximum quarterly mean concentration of each year. A total of 195 ambient lead monitors met the trends data completeness criteria. Point-source oriented monitoring data were excluded from all ambient trends analyses so as not to mask the underlying urban trends. Between 1988 and 1997, maximum quarterly average lead concentrations decreased 67% at population-oriented monitors. Between 1996 and 1997, national average lead concentrations (approaching the minimum detectable level) remained unchanged.</p> <p>Emissions Trends: Total lead emissions decreased 44% between 1988 and 1997 nationwide in the</p>

	US. The large ambient and emissions reductions are a waning result of the phase-out of leaded gasoline. On-road vehicles accounted for 82% of the 10-year emissions decline. Between 1996 and 1997, lead emissions estimates increased by 1%. The slight rise was due to an increase in the amount of lead recovered as scrap. Industrial processes were the major source of lead emissions in 1997, accounting for 74% of the total. The transportation sector (on-road and non-road sources) now accounts for only 13% of total 1997 lead emissions; on-road vehicles account for only one half of a percent.
Future actions to reduce exposure	
What actions or changes are proposed to further reduce these exposure levels?	Further regulatory actions will focus on process controls at the few remaining industrial facilities which cause monitored ambient levels to exceed the national standard.
Human health monitoring programmes	
Are there programmes or activities within your country to measure blood lead levels (or other biomarkers of exposure) in specific populations, such as children or workers, or in the general population? If so, describe the population(s) surveyed, methods used, dates conducted, and data obtained. [Note: these data may be available from health agencies and/or occupational health authorities.]	<ul style="list-style-type: none"> • Surveillance and monitoring programmes, including collection and testing of product samples from the marketplace and from importation. • ASTM standards monitoring, including subcommittee E06.23, Lead Hazards, and Subcommittee F15.22, Toy Safety, and review of proposed standards, proposed revisions to existing standards for test methods, specifications and guides.
Environmental monitoring programmes	
Are there programmes to monitor lead levels in environmental media, such as air or soil, or in food or drinking water? If so, describe these programmes, methods used, sampling design, dates conducted, and data obtained.	
Level of concern	
Based upon these data, do current levels of lead in humans or environmental media exceed levels of concern such as established national or sub-national (e.g. state/provincial) standards or goals, or	

<p>international standards or guidelines recognised in your country? Have these levels changed as a result of actions taken to reduce exposures or releases of lead?</p>	
<p>Future actions to reduce exposure</p>	
<p>What actions or changes are proposed to further reduce these exposure levels?</p>	<p>An information document on the lead hazard evaluation process for consumer products is being developed to supplement the Commission’s general guidance policy on lead in consumer products. The Federal Interagency Lead Task Force Subcommittee will examine possible hazards from lead in vinyl molding and glazed ceramic tiles. Continuation of surveillance and monitoring of consumer products in the marketplace, especially of children’s products.</p>

United States

Part II: Description of Distinct Activities

HISTORIC USE IN BUILDINGS Establishment of strategies, including public information programmes, to abate significant exposures from the historic use of lead-containing materials in buildings	
Main elements	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	<p>The goals of the USEPA National Lead Programme are to create a national lead abatement infrastructure of trained and certified workers, educate consumers to take actions based on informed choices and stimulate public response to prevent lead poisoning, develop regulations to implement a lead abatement infrastructure, and develop technical studies and programmes to improve understanding of exposure and exposure reduction methods.</p> <p>The Toxic Substances Control Act was amended in 1992 by Title X, which focuses specifically on reducing hazards of existing lead-based paint.</p> <p>Regulations developed under Title X after 1992 include:</p> <ul style="list-style-type: none"> • Lead-Based Paint Activities, Training and Certification Regulations for Target Housing and Child-Occupied Facilities and Promulgation of a Model State Plan. <ul style="list-style-type: none"> - establishes work practice standards and standards for certification and training of workers; - establishes a Model State Plan for States to create state certification and training of workers. • Disclosure of Lead Hazards During Real Estate Transactions <ul style="list-style-type: none"> - requires landlords and sellers to disclose known lead information and give informational pamphlet to renters and buyers. In addition, sellers must allow buyers a ten-day lead inspection opportunity.

	<ul style="list-style-type: none">• Comprehensive guide on lead poisoning prevention for parents.• Community Assistance/Environmental Justice Grants – Grants designed to create jobs and train workers in lead abatement.• Public Education and Outreach Grants - Grant programme designed to aid high risk communities in lead poisoning prevention.• Public Service Announcements for Lead Hazard Awareness. <p>Completed Technical Support:</p> <ul style="list-style-type: none">• Analysis of factors associated with lead-based paint exposure and blood lead levels.• Evaluation of lead-based paint detection methodology.• Assessment of lead-based paint abatement and hazard control technologies.• Establishment of a National Lead Laboratory Accreditation Programme. <p>Ongoing technical support:</p> <ul style="list-style-type: none">• Continued expansion of lead laboratory accreditation programme.• Distribution of lead-contaminated soil around housing study.• Phase II of the National Survey of Lead-Based Paint in Housing.• Seasonal rhythms of blood lead levels study.• Effect of abatement and repair and maintenance activities on blood lead levels.• Effect of renovation and remodeling on worker exposures and children’s blood lead levels.• Effects of in-home educational intervention on blood lead levels.• Renovation and remodeling study.• Risk assessment of health-based standards for identification of hazardous levels of lead in paint, dust and soil.
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Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	<p>The goal of the US Lead Programme is to control exposures in order to eliminate childhood lead poisoning.</p> <p>The National Health and Nutrition Examination Survey (NHANES) monitors blood lead levels of a large representative sample of the US population. Preliminary data from Phase 2 of the third NHANES, covering the years 1991-94, show that blood lead levels have declined in recent years.</p>
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>1992</p> <p>Ongoing</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	Proposed Disposal Standards for lead-based paint debris encourages recycling or reclamation of lead and component debris that has been stripped of lead-based paint.
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	<ul style="list-style-type: none"> • Collection of NHANES data - human health and environmental testing. • Analysis of NHANES data to evaluate if the programme components are reaching the targeted population. • Evaluation of Disclosure of Lead Hazards in Real Estate Transactions. • Evaluation of a Lead Hazard Reduction Grant Programme in Low-Income Privately Owned Homes.
Programme results	
What are the results of the monitoring programme(s) described?	Blood lead levels of children in the US have been decreasing rapidly. Certain sub-populations, such as low income inner city children, have not experienced the same degree of blood lead level declines.

Future risk management activities	
<p>Summarise any future risk management activities you may be considering, including supporting rationale.</p>	<ul style="list-style-type: none"> • Identification of hazardous levels of lead in paint, soil and dust - will identify hazardous levels of lead in paint and soil. • Management and Disposal Standards for Lead-Based Paint Debris - will decrease the costs of lead-based paint debris disposal, thus increasing the amount of abatements in residences with lead-based paint. • Lead-Based Paint Activities, Training and Certification for Public and Commercial Buildings - will develop standards for certification and training of workers and work practice standards for those engaged in lead-based paint activities. • Renovation and Remodeling Activities - will consider what type of regulatory action is needed, if any, for training and certification of renovators • Development of a system for approving lead-based paint testing and abatement products • Utilization of new NHANES data to target outreach communities.
Information sharing with non-OECD countries	
<p>Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.</p>	
Related industry programmes	
<p>Describe any industry programme initiated in relation to this activity.</p>	

Further information	
Who can be contacted for more information?	John Melone MC 7404 401 M St., SW Washington, D.C. 20460 Telephone: + 1 (202) 260 1866 E-mail: Melone.john@epa.gov

LEAD SHOT	
Restriction of use of lead shot in wetlands and promotion of the use of alternatives to lead sinkers in shallow waters	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Use of lead shot while hunting waterfowl is prohibited.</p> <p>The US has proposed a ban on the manufacture of lead fishing sinkers one inch or less in any diameter.</p> <p>The US is developing education and outreach to anglers and hunters on the hazards to human health and wildlife from the use and manufacture of lead sinkers and shot.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	Reduction of the use of lead fishing sinkers and shot.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>1989</p> <p>Ongoing</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	Ongoing education and outreach efforts to anglers and hunters.
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	<p>John Melone MC 7404 401 M St., SW Washington, D.C. 20460</p> <p>Telephone: + 1 (202) 260 1866 Facsimile: + 1 (202) 260 0018 E-mail: Melone.john@epa.gov</p>

DRINKING WATER	
Reduce levels in drinking water through appropriate measures (e.g. water treatment, use of materials in the distribution system which do not release lead into the water)	
Main elements	
<p>Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.</p>	<p>National regulations promulgated under the authority of the Safe Drinking Water Act (National Primary Drinking Water Regulations for Lead and Copper (Lead and Copper Rule (LCR)) require public water systems to maintain optimal corrosion control in order to minimize levels of lead in drinking water at the tap. The regulations require water systems to monitor for lead at the tap periodically. The regulations also require water systems to take other actions if the lead action level is exceeded. These actions include: monitoring source water and treating it, if appropriate; lead service line replacement; and public education.</p> <p>Amended Lead Ban Provisions of the Safe Drinking Water Act. Section 1417(a)(1) of the Safe Drinking Water Act (SDWA) requires that after June 19, 1986, only "lead free" pipe, solder or flux may be used in the installation or repair of (1) Public Water Systems, or (2) any plumbing in a residential or non-residential facility providing water for human consumption, which is connected to a Public Water System. Under section 1417(d), "lead free" as defined in the SDWA means that solders and flux may not contain more than 0.2% lead, and pipes, pipe fittings and well pumps may not contain more than 8.0% lead. Section 1417 was amended August 6, 1996, to include the following:</p> <ul style="list-style-type: none"> - The definition of "lead free" was expanded for plumbing fittings and fixtures intended to dispense water for human consumption to mean those fittings and fixtures that are in compliance with a voluntary standard established pursuant to the Act. - Prohibition of any person introducing into commerce any pipe, or any pipe or plumbing fitting or fixture, that is not lead free, except for a pipe that is used in manufacturing or industrial processing; - Prohibition of any person engaged in the business of selling plumbing supplies, except manufacturers, to sell solder or flux that is not lead free; or of any person to introduce into commerce any solder or flux that is not lead free unless the solder or flux bears a prominent label stating that it is illegal to use the solder or flux in the installation or repair of any plumbing providing water for human consumption.

Objectives	
<p>What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).</p>	<p>The goal of the activity is to reduce the levels of lead at the tap to as close to zero as possible. The States are primarily responsible for implementing the regulations, and EPA currently has limited data reflecting current implementation status. The following summarizes what the implementation status should be. EPA believes some systems are behind schedule, however.</p> <p>Systems serving more than 50,000 people should have completed two rounds of initial monitoring, optimized corrosion control treatment, installed any necessary source water treatment, and completed two rounds of follow-up monitoring. States should be in the process of setting optimal water quality control parameters for these systems and determining the need for lead service line replacement. Smaller-size systems should have completed initial monitoring. Those not exceeding the lead action level should now be monitoring for lead at the tap at least once every three years. For those exceeding the lead action level, the schedule depends on when the exceedence occurred.</p>
Duration	
<p>What year did the project begin and what year did it end (or is it expected to end)?</p>	<p>1992 Ongoing</p>
Aimed at recycling?	
<p>Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.</p>	
Programme evaluation	
<p>What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?</p>	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	Industry has tested a number of their products against NSF Standard 61, section 9.
Further information	
Who can be contacted for more information?	<p>Connie Bosma US Environmental Protection Agency Office of Ground Water and Drinking Water Implementation and Assistance Division (4606) 401 M Street, SW Washington, D.C. 20460</p> <p>Telephone: + 1 (202) 260 5529 Facsimile: + 1 (202) 260 4656 E-mail: bosma.connie@epamail.epa.gov</p>

OCCUPATIONAL EXPOSURE	
Reduction in levels of lead in occupational settings	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Lead Exposure in Construction; Interim Final Rule 1993 - This regulation reduces the Permissible Exposure Limit for construction workers and establishes blood lead limits. Monitoring for airborne and blood lead levels of workers is also required by this regulation.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The objective is to provide necessary protection to workers who deal with lead at their worksite.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	The Lead Industry Association and the Battery Council International will be providing data on blood lead levels in lead-acid battery workers as a voluntary activity.
Further information	
Who can be contacted for more information?	<p>Robert Manware US Department of Labor Occupational Safety and Health Administration 200 Constitution Ave., NW Washington, D.C. 20216</p> <p>Telephone: + 1 (202) 219 7166 (extension 153) Facsimile: + 1 (202) 219 7125 E-mail: Bob.Manware@osha-no.osha.gov</p>

EXPOSURE FROM FOOD PACKAGING	
Elimination of exposure to lead from food packaging (e.g. for cans, by phasing down lead solder use in existing canning lines, not using lead solder in new canning lines, or where these are not practical, using functional barriers to prevent lead migration; for wine bottle capsules, substituting other materials)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>In 1995, the US issued a regulation prohibiting the use of lead solder in the manufacture of cans for packaging food.</p> <p>In 1996, the US issued a regulation prohibiting the use of tin-coated lead foil capsules (i.e. coverings for the cork and neck area) on wine bottles.</p> <p>Work has been undertaken with the candy manufacturing industry to halt use of lead print on candy wrappers.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The goal is to reduce exposure to lead to the extent feasible.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	
Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	The US has been working with candy manufacturers to use non-lead based inks on candy wrappers.
Further information	
Who can be contacted for more information?	<p>Mike Kashtock Center for Food Safety and Applied Nutrition (HFS-306) Food and Drug Administration 200 C St., SW Washington, D.C. 20204</p> <p>Telephone: + 1 (202) 205 4681</p>

CERAMIC WARE AND CRYSTAL WARE	
Restriction of exposure to lead from leaching of lead from ceramic ware and crystal ware used for food and beverages (e.g. through effective production and process controls)	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	In 1995, the US issued a compliance policy guide which establishes new limits for leaching of lead from lead-glazed ceramic ware.
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	The goal of this activity is to reduce the amount of lead exposure from leaching of lead-glazed ceramic ware.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Mike Kashtock Center for Food Safety and Applied Nutrition (HFS-306) Food and Drug Administration 200 C St., SW Washington, D.C. 20204 Telephone: + 1 (202) 205 4681

Programmes which have phased out the use of lead such as in gasoline and paint in the US, were established before 1992, and are not reported in this questionnaire	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	See above.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	See above.
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	

Programme results	
What are the results of the monitoring programme(s) described?	
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	

LEAD IN GASOLINE	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	<p>Beginning in 1973, legislation was enacted to 1) phase-down lead in leaded gasoline and 2) provide for transition to the use of unleaded gasoline/eventual prohibition of commercial supply, transport, sale or use of leaded gasoline.</p> <p>In 1978, the United States Environmental Protection Agency (EPA) promulgated a health-based national ambient air quality standard for lead at a level of 1.5 micrograms of lead per cubic metre of air, averaged over a calendar quarter.</p> <p>Legislation providing for the establishment of national, state and local ambient air lead monitoring networks was enacted in 1979.</p>
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	During the 1970s, the transportation sector (particularly on-road vehicle emissions) was clearly the predominate source of lead emissions. The objective of lead reduction/removal from gasoline was to affect a substantial decrease in ambient air lead concentrations, and hence lead exposure resulting from relatively high concentrations found in ambient air.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	<p>Phase-out of lead in gasoline began with legislation in 1973.</p> <p>Leaded gasoline was completely prohibited by January 1, 1996.</p>
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA

Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	See Part I discussion on ambient monitoring.
Programme results	
What are the results of the monitoring programme(s) described?	See Part I discussion of results.
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	NA
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	NA
Related industry programmes	
Describe any industry programme initiated in relation to this activity.	NA
Further information	
Who can be contacted for more information?	Mark Schmidt USEPA (MD-14) Research Triangle Park North Carolina 27711 Telephone: +1 (919) 541 2416 Facsimile: +1 (919) 541 1903 E-mail: schmidt.mark@epa.gov

EXPOSURE OF CHILDREN	
Main elements	
Describe the main elements of the activity, including monitoring, legislation, regulations, policies and/or implementation.	Eliminate exposure of children to lead resulting from products intended for use by children (e.g. toys, cribs, crayons).
Objectives	
What are the specific objectives, goals and/or targets of this activity? Describe the status of the activity with respect to meeting the objectives, goals and/or targets (e.g. prohibition on the selling of lead-based paint).	To identify lead products of concern and reduce or eliminate exposure from lead products intended for use by children.
Duration	
What year did the project begin and what year did it end (or is it expected to end)?	Ongoing
Aimed at recycling?	
Is the activity aimed at promoting and maximising the use of economically viable collection and recycling programmes? If so, please describe.	NA
Programme evaluation	
What measures are in place to monitor and evaluate progress in meeting specific objectives and goals, as well as the efficacy of specific actions related to lead risk reduction?	Surveillance and monitoring programmes are in place to evaluate products containing lead. The US also works with manufacturers on voluntary standards.

Programme results	
What are the results of the monitoring programme(s) described?	<p>Starting in 1992 to the present, children's products have been monitored for lead-containing paint. In 1994, crayons with lead in them were detected and recalled.</p> <p>In 1996, vinyl mini-blinds were found to contain lead. The US worked with manufacturers to eliminate lead from the vinyl formula.</p> <p>In 1997, vinyl toys were evaluated from lead and cadmium levels. No hazardous exposures were found. Also some toys, children's jewelry, figurines and game pieces were found to contain lead. Letters of advice were sent or recalls were issued.</p>
Future risk management activities	
Summarise any future risk management activities you may be considering, including supporting rationale.	<p>An information document on lead hazard evaluation process for consumer products is being developed to supplement the US Consumer Product Safety Commission's general guidance policy on lead in consumer products.</p> <p>The Federal Interagency Lead Task Force Subcommittee will examine possible hazards from lead in vinyl molding and glazed ceramic tiles.</p> <p>Continuation of surveillance and monitoring of consumer products in the marketplace, especially of children's products.</p>
Information sharing with non-OECD countries	
Describe any efforts to share information concerning the exposure and methods for reducing such exposure with non-OECD countries.	

Related industry programmes	
Describe any industry programme initiated in relation to this activity.	
Further information	
Who can be contacted for more information?	Dr. Marilyn Wind, Director, Health Effects Division Address: US Consumer Product Safety Commission East West Towers, 4330 East West Highway Bethesda, Maryland 20814 Telephone: + 1 (301) 504-0477 ext. 1205