

## 2.8 LEAD IN SOIL AND DUST

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### 2.8.1 SUMMARY OF WORKING GROUP FINDINGS

#### Issues:

- Significant areas of public and private land may contain soil lead levels which are above current guidelines for lead levels in soil. There are no current guidelines for lead levels in dust.
- Lead emission rates will continue to fall as lead is phased out of petrol. However, pre-existing soil lead contamination will not readily dissipate and will remain a long term exposure pathway.
- Lead will continue to accumulate in the inner city while newly constructed expressways enable more cars to travel into the city. This trend will continue until the proportion of cars requiring leaded petrol is greatly reduced.
- The development of lead management strategies, sampling protocols and abatement techniques is in its infancy in Australia. Solutions are not yet available for some of the issues associated with lead in soil and dust. In some instances work has begun on resolving these issues, but additional work is needed, particularly on the development of management protocols which provide practical, effective action and advice to home owners and communities.
- There is a possibility that some commonly recommended remediation or cleaning methods, such as vacuuming, may actually be elevating children's blood lead levels. Consequently techniques for removing lead bearing dusts in and around domestic dwellings should be researched and validated.



- The removal of lead based paints from homes, buildings and public structures along with the demolition of structures containing lead products leads to the generation of lead bearing dusts which contribute to the lead loading of surrounding residential areas. Control measures need to be developed and implemented to minimise this source of lead contamination.
- Soils and dust act as reservoirs for deposited lead emissions from cars, factories, paint removal and so on. Much of this lead has arisen from legal activities at the time of deposition.
- Neighbouring buildings with deteriorating lead based paints may also be a lead source. The problem can be aggravated in high density urban areas where lead based paints may be removed from large surface areas and concentrated in small backyards and courtyards.
- Lead in house dust is one of the best predictors of childhood lead poisoning but is also one of the least understood and is associated with a significant divergence of opinion on sampling protocols.
- Bioavailability of the lead is an important parameter in determining risk. Although there are methods available to predict bioavailability, there is no general agreement on the suitability of these methods. Consequently a standard method to determine the bioavailability of lead ingested by children, is not available.
- Lead loading measurements (micrograms of lead per square metre) more directly measures lead available for a child to ingest (and consequently more accurately predicts children's blood lead levels) than dust lead concentrations (micrograms of lead per gram of dust).
- The task of reducing lead emission rates and reducing the concentration of lead in soils and dusts will become increasingly critical as lead level guidelines continue to be reviewed and reduced.
- Current legislation has been developed to deal with point sources from significant industrial activity. While it does this effectively, in many cases it is inappropriate and cumbersome when applied to non-industrial premises such as residential properties.

**Control measures:**

- The Working Group has focused on the ingestion of lead (in any form) by children less than seven years of age. Consequently, the Lead in Soil and Dust Action Plan (see section 3.10 of this volume) focuses on strategies which will have some impact on the reduction of lead risk faced by children.



A wider range of prevention strategies would be necessary if the full impacts of lead contamination (eg. environmental impact) were to be assessed.

- Because of the inter-relationship between lead exposure pathways, lead reduction strategies which are implemented to reduce airborne lead emissions (eg. a reduction in the lead content of leaded petrol and paint will reduce the rate of contamination accumulation in soils and dusts and will prevent contamination of additional sites occurring).
- Health risk assessment should be used to identify priority lead management actions. Risk assessment will also identify those intervention actions which do not significantly reduce risk but which dilute resources unnecessarily (eg. removing soil with high lead levels from industrial estates where there is no significant lead exposure to children).
- An Australian Standard for the Analysis of Soils and Biota is currently being developed for the determination of lead in soils. Standardised procedures for sampling, sample preparation and analysis for the determination of lead in dust should also be developed.
- There is a general lack of services and resources for parents of children with elevated blood lead levels. Services should be provided to assist local communities to manage lead contamination problems in high risk areas.
- Information should be distributed to assist parents to identify if their child is in a high lead risk category and hence if a blood lead test is recommended.
- Site specific protocols and management strategies should be developed wherever possible.
- The issuance of s.149 certificates under the Environmental Planning and Assessment Act should be reviewed. The review should consider the possible role of s.149 certificates in a range of lead contamination and general contamination scenarios as well as the administration of these certificates and equity between issues and between sites
- Planning authorities should consider development and implementation of planning instruments which avoid placing high risk populations in areas of high lead exposure risk (for example avoiding placing preschools and playgrounds in close proximity to smelters and roadways). Where such placement is unavoidable, information on risk minimising practices should be made available.
- Owners of rental property should be no less responsible for lead contamination than owner-residents. Tenants should be considered as a



group with special needs in the development of policy and education programs.

- The effective management of lead in soil and dust issues is dependent on the following measures, many of which have been considered in more detail by other Working Groups, in particular:
  - the continued reduction in the lead content of lead sources such as petrol, paint and factory emissions
  - the increased penetration of unleaded petrol into the petrol market
  - development of codes of practice for the removal of lead based paints
  - identification of at-risk populations
  - the development and implementation of a well structured education strategy to increase community understanding on soil and dust issues and to provide information to allow effective decision making which will reduce the exposure of children to lead
  - the development of effective guidelines to assist the community to manage lead soil and dust problems
  - the review of planning instruments to enhance the management of contaminated sites and to control landuse on affected areas.

## 2.8.2. TASKFORCE DISCUSSION OF ISSUES AND FINDINGS

### 1. The Identification of At-Risk Populations

It is important to make the distinction between contaminated lands which pose an immediate health risk from contaminated lands that do not pose a health risk (i.e. because there are no exposure pathways).

The identification of at-risk populations should rely largely on:

- development of a lead emission inventory (discussed in section 2.1 *Lead in Air*)



- blood lead sampling to identify high risk populations (discussed in section 2.1 *Lead in Air* and section 2.3 *Lead in Children's Blood*)
- self assessment by the community, with the assistance of a risk assessment guide, in cases where the emission inventory is not practical (such as issues relating to lead in paint).

## 2. Development of Guidelines and Educational Material to Manage Lead

The development of effective lead management strategies will need to incorporate:

- development of guidelines and education materials which advise on ways to intercept lead exposure pathways and which raise general awareness of lead issues within the community and particularly within high risk communities.
- development of specific soil lead action guidelines for different lead contamination scenarios (eg. communities near major roadways, industrial sites, mining regions and where leaded paints may be the cause of the lead contamination).

The establishment of generic action levels for lead concentration in soil and dust should generally be avoided as each site should be assessed on its specific characteristics.

Guidelines should be feasible, affordable and effective in reducing or eliminating lead exposure pathways and in measurably reducing the impacts of lead on health. They should not create other associated health or environmental problems and must be acceptable to the community.

The proposed Environmental Lead Centres will be the principal body investigating strategies to intercept exposure pathways. These Centres will need to ensure that strategies developed can be modified to be relevant to cover a range of lead contamination issues. Work undertaken by the Environmental Lead Centres should include the development of standardised methods for the collection and analysis of soil and dust samples. In some situations standards will be developed by Standards Australia. Where appropriate, these standards should be adopted.

Educational material should provide information on issues such as when to take blood lead samples, how to undertake site investigations, sample analysis, lead paint removal and lead waste disposal.



3. Review of Planning Instruments and Enhancement of Planning Control

The lack of co-ordination between regulating authorities and between the public and private sector has resulted in the ad hoc implementation of policy and sub-optimal control of the lead problem. There are many mechanisms in existence in NSW which could be used to more effectively minimise the impact of contaminated sites on the community and to more effectively and efficiently manage those sites. The Lead in Soil and Dust Action Plan calls for the review of all planning instruments to improve management and control over such sites.

The Lead in Soil and Dust Action Plan proposes that a forum be established by an appropriate department, such as the Department of Planning, to investigate landuse planning and management issues. This forum should investigate the following, and develop guidelines where appropriate:

- the application of s149 certificates by councils to manage contamination issues
- the effectiveness of the Department of Planning's C20 circular in identifying soil contamination issues
- the stages at which contamination issues enter the planning process, and
- the development of sensitive landuses in high risk areas (eg. preschools on major roads).

In undertaking this review every effort should be made to maximise the use of existing regulatory, financial and educational mechanisms to resolve planning control issues associated with lead.

4. Barriers to Reducing Exposure to Lead in Soil and Dust

Potential barriers to developing and implementing effective strategies to reduce exposure to lead include:

- the complexity of lead in soil and dust issues
- the intersectoral nature of proposed actions which requires the co-operation and co-ordination of a number of authorities as well as close liaison between the public and private sectors
- the difficulty of effectively controlling emissions from non-scheduled

premises

- the difficulty of enforcing codes of practice
- the difficulty of co-ordinating planning controls and regulatory processes to allow for the comprehensive management of complex lead contamination issues
- existing legislation focuses on the land owner and not the polluter to manage contamination issues
- no single polluter or management authority is responsible for some forms of lead pollution (such as fallout from vehicle emissions)
- the failure to incorporate the environmental costs into transport strategy decisions
- the lack of available data needed to identify high lead exposure risk areas
- the potential for environmental damage to occur if the impact of remediation strategies on the environment is not considered.