

LEAD Action News vol. 14 no. 2, December 2013 ISSN 1324-6012

The newsletter of The LEAD (Lead Education and Abatement Design) Group Inc.

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Editor-in-Chief: Elizabeth O'Brien, Editorial Team: Hitesh Lohani, Anne Roberts and David Ratcliffe

## Lead Safe World Project offers Solutions plus Report: Lead Poisoning in Vietnam



**Patti Peplinski, People's Choice Winner, 2013 Volcano Art Prize (VAP).**

Patti's winning entry – as part of the Prize package - has been Photoshopped by Jongmin Choi to create the [2015 Lead-Safe World Calendar](#) front cover. Invest in a lead safe world [by pre-purchasing your calendars](#) today.

Announcing - the front cover graphic for the 2015 Lead-Safe World Calendar is the Winner of the People's Choice (as voted by Facebook Likes) of the 2013 Volcano Art Prize:

**Title: Peppi the Lead Free Clown – Look Out for Lead!**

Artist: Patti Peplinski.

Lead-safety message. "I am Peppi the Lead Free Clown and I teach lead poisoning prevention through clowning. Here I am presenting lead poisoning prevention lessons at Brown Street Academy school festival in Milwaukee. "Lead dust is hard to see!" and the message was to look out for lead! I am a retired teacher from this school and when I taught there these lessons were presented annually."



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## Editorial

The LEAD Group’s Lead Safe World website continues to be developed – at [www.lead safeworld.com.au](http://www.lead safeworld.com.au) - and another Lead-Safe World Calendar has been printed and distributed this quarter.

We are continually inviting sponsors, partnerships, and companies with proven solutions to lead problems, lead-free products and lead-safe services, to join us.

This issue of LEAD Action News announces the ultimate Volcano Art Prize (VAP) winner – the People’s Choice Award for 2013, and shows some of the finalists in the art competition, who received a Picture products mug as their prize. Photographers and artists are invited to enter VAP 2014 which is now open – please spread the word globally.

Lan Nguyen has interned with us in the second half of 2013 and she has made a major contribution to this newsletter with her report on Lead Poisoning in Vietnam, plus she has reviewed some Lead News. Lead Poisoning in Vietnam is the third in our series on Lead Poisoning by Country, following: [Lead Poisoning in Indonesia](#) and Lead Poisoning in China: [Part I –](#)



[Background](#); [Part II - Lead in China](#); [Part III - Treatment and prevention of lead poisoning](#); and [References](#).

Our long-term volunteer translator, Dr Hugh Xin Xi Zhu, has contributed many many hours of Chinese translation for this issue of LEAD Action News and his input is much appreciated.

Eleven years ago, the story of The LEAD Group's aims and achievements up to 2002 was published, as the first chapter in LOCAL HEROES: Australian crusades from the environmental frontline. But until a wonderful volunteer - Gordon Lai - typed it up this year, we were unable to web-publish it. The chapter at last appears in this newsletter.

Finally, we are on the lookout for a volunteer or intern who could review the success of implementation of Strategies of the *NSW Lead Management Action Plan*, Nov 1994, by the NSW Government Lead Taskforce, and have thus web-published the typed-up strategies, as they have never been available in electronic format. Please phone 1800 626 086 if you would be willing to undertake this review, or can offer any other volunteer contribution.

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## Hunting for Graphics to Fill the 2015 Lead-Safe World Calendar



*By Elizabeth O'Brien, President, The LEAD Group Inc.*

Now that we have the front cover graphic (see above), it's time to get your entries in for the 2014 Volcano Art Prize (VAP) at <http://volcanoartprize.com/submitentry>

Entries close on Monday 25<sup>th</sup> August 2014, but don't leave it til the last minute. VAP entries can illustrate LEAD Group articles at any time of the year and they often inspire us to write articles – so please be inspired and inspiring!

Thirteen winners of 2014 VAP will appear in the 2015 Lead-Safe World Calendar, and 30 finalists will have their image (or another entrant's image) printed on a Pictureproducts ceramic or plastic mug.







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## Pictureproducts mug prizes for 2013 Volcano Art Prize (VAP)

Here are some of the happy entrants of 2013 VAP, (the ones who could be easily gathered in Sydney, Australia), with their prizes - Pictureproducts mugs printed with their entry - in hand, and their entry details.

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Artist: **Noela Whitton**

URL:

<http://volcanoartprize.com/portfolio-item/alex-with-sunflowers/>

Lead-safety message:  
My grandson Alex grew sunflowers which removed some lead from the garden soil – but we didn't let him eat the seeds or compost the plants!



Title: **Alex with Sunflowers**



Artist: **Jane Lennon**

Materials: recycled office paper pulp sculpture painted with lead-free acrylic paint

URL:

<http://volcanoartprize.com/portfolio-item/sisters/>

Lead-Safety Message:  
Create without lead



Title: **Sisters.**



Artist: **Meredith Knight**

URL:

<http://volcanoartprize.com/portfolio-item/molly-1998-to-2013-the-buddha/>

Lead-Safety Message:  
Unleaded cats live calmer, healthier and longer lives. Good grass cover protects pets from lead contaminated soil.



Title: **Molly 1998 to 2013 and the Buddha**



Artists (from left to right): **Kari McKern, Sue Gee and Meredith Knight**

URL:

<http://volcanoartprize.com/portfolio-item/selfiesixty/>

Lead-Safety Message:  
Lead raises mortality from all causes, Vitamin D has the opposite effect. Good health involves tracking these metrics.



Title (of entry by **Kari McKern**):  
**Selfie@Sixty**

Artist: **Sue Gee**

URL: <http://volcanoartprize.com/portfolio-item/lead-destroys-our-hearts-and-minds/>

Lead-Safety Message: As we age, the lead we took in earlier in life, leaves our bones, raises our blood pressure and brings on dementia. Ask your doctor to test your blood lead level – there may be ways to remove your lead before it takes its toll.



Title: **Lead destroys our hearts and minds**

URL:

<http://volcanoartprize.com/portfolio-item/incense-smoke-dangerous-to-your-health/>

Lead-safety message:  
“Incense sticks (agarbatti) could come with a health risk — new research has shown that burning these generate indoor air pollutants, including carbon monoxide and particulates like lead. Children and Pregnant women should not breathe the fumes of burning Incense. Health Canada began to investigate regulating the lead content of Incense in 2009.



Artist: **Rama Veeraghanta**



Title: **Incense Smoke Dangerous to Your Health**



Artist: **Tony Lennon**

URL:

<http://volcanoartprize.com/portfolio-item/lead-in-bones-in-lead/>

Lead-Safety Message: As the lead stored in your bones leaches into your blood as you age, so you get closer to the grave.



Title: **Lead in Bones in Lead**



Artist: **Daniel Kim**

URL: <http://volcanoartprize.com/portfolio-item/pick-yer-poison/>

Lead-safety message: "How long are we going to let them have their way? Even now, these poisonous plagues remain unresolved problems... and chances are, someone you know is already affected by it. Just because it's not in your face like doesn't mean it's not there. This is everybody's problem. Let's do something about this, together.

Some things lead and cane toads have in common:

Quickest way to be poisoned is to ingest it.

It's impossible to get rid of either in the foreseeable future.

Both were used for pest control. Both have done more harm than good.

They affect both people and wildlife; hunting is the worst offender as all parties involved suffer. Lead from bullets affect both the hunter and the hunted, most predators that eat a cane toad die from its poison.



Title: **Pick Yer Poison**

Artist: **Nigel Gorman**

URL: <http://volcanoartprize.com/portfolio-item/red-means-lead/>

Lead-Safety Message: Lead Paint deteriorating off old homes poses great health risks to families and the general community.

Nigel kindly donated his prize mug to another artist: Claire O'Brien.



Title: **Red Means Lead!!**





Artist: Claire O'Brien

Materials: oil on canvas.

URL:

<http://volcanoartprize.com/portfolio-item/fido/>

Lead-safety message: Mans best friend deserves to be lead free too. Lead level test kits available from The LEAD Group.



Title: **Fido.**

Artist: **Emily Grace**

URL: <http://volcanoartprize.com/portfolio-item/backyard-chickens/>

Lead-Safety Message: Lead in home-grown eggs from urban areas tends to be higher than in commercial eggs; as soil lead increases, the concentration of lead in eggs tends to increase. Test your soil for lead with a LEAD Group DIY-sampling lab analysis kit.

Emily also donated her prize mug to Michael Mobbs of Sustainable Projects and Design – for his lead awareness raising activities and Michael kindly agreed to promote the 2014 Lead-Safe World Calendar at his [Sustainable House in Chippendale in inner Sydney](#) – where he drinks rainwater, keeps chickens, and grows vegetables and herbs.



Title: **Backyard chickens**

## **Volcano Art Prize (VAP) 2014 People's Choice Prize is \$500!**



*By Elizabeth O'Brien, President, The LEAD Group*

Following the inaugural environmental Volcano Art Prize (VAP) competition in 2012, and the recently-concluded 2013 VAP, all those entries are in the VAP Archives at <http://volcanoartprize.com/vap-archive/> - you can now submit your artworks for the 2014 Volcano Art Prize competition. Some artists each year have been so keen to submit more than one entry, that we've changed the rules so that each artist submit an entry in the 2014 VAP, can pay \$10 for each extra entry and submit as many entries as they like.

But the big news is that, thanks to generous donations from Ian Smith and from our VAP sponsor Pictureproducts, the cash prize for the People's Choice will rise from \$100 in 2013 to **\$500 in 2014 VAP!**

For your first entry, it's only \$10 for adults in OECD countries to enter, and other adults and all earthlings under the age of 18 enter for free! You have more chances to win the cash prize if you submit more entries!

Simply create a landscape-orientation image on the theme of lead-safety, by photographing or scanning anything – an artwork or real-life - related to lead (it's in people/animals/plants/old



paint/soil/food/water/products etc) or lead-safety (while renovating/shooting/working with lead) or lead poisoning prevention (testing for lead/detoxing lead from the body).

Browse our websites – [www.lead.org.au](http://www.lead.org.au) and [www.lead safeworld.com](http://www.lead safeworld.com) – to develop your own ideas. You can also see the 2012 and 2013 Volcano Art Prize entries, for inspiration, at <http://volcanoartprize.com/vap-archive/> and 2014 VAP entries at <http://volcanoartprize.com/peoples-choice/>

Please read the Conditions of Entry at the bottom of the home page at <http://volcanoartprize.com/> especially noting:

Each digital image must be between 1 MB and 3 MB and in landscape orientation, not portrait orientation. That is, winning entries will be printed in colour on a landscape A4 page.

Submit entries online at <http://volcanoartprize.com/submitentry/> before midnight on Monday 25<sup>th</sup> August 2014.

## Lead News

Compiled by Elizabeth O'Brien, from emails received by The LEAD Group. Reviewed by Lan Nguyen and edited by Elizabeth O'Brien, LEAD Group Inc, Sydney.

From: Ted Schettler

Subject: [chescience]

### **Prevalence of dementia in England lower than expected; how to explain it?**

Date: 18 July 2013 1:18:03 PM AEST

Today, a study in Lancet reported that the prevalence of dementia in the UK in 2011 was significantly lower than would have been expected based on the estimated prevalence in 1991. The CFAS data point to substantial added value from existing healthy lifestyle messages. They suggest that lifestyle changes—eg, in diet, exercise, and smoking—might reduce the risk of dementia and promote more general health and wellbeing."

A healthy lifestyle is of course important, but what has not been mentioned in any report that I've seen is the potential role of declining lead levels in the UK population.

I have no doubt that reduced smoking, increased exercise, and improved blood pressure control are contributing to the unexpected findings reported today. We'll never know for certain, but I suspect reductions in lead levels across the entire population are also playing a role in the dementia decrease, thirty years after it was phased out of gasoline.

Ted S

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Published in final edited form as:





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- [Interaction of stress, lead burden, and age on cognition in older men: the VA Normative Aging Study](#). Peters JL, Weisskopf MG, Spiro A 3rd, Schwartz J, Sparrow D, Nie H, Hu H, Wright RO, Wright RJ. Environ Health Perspect. 2010 Apr;118(4):505-10 Published online 2009 November 6

## **Eliminating childhood lead toxicity in Australia: a call to lower the intervention level.**

MJA 199 (5) · 2 September 2013 323

In epidemiology, the weight-of-evidence approach is useful for reaching general conclusions, whereas details from selected studies are useful for understanding nuances. This is particularly important when evidence from human and experimental research is consistent across multiple studies and in populations with different characteristics, including Australia.<sup>1-3</sup> There will always be limitations and unmeasured confounders, but, ultimately, we can rely on controlled laboratory studies which show that lead is toxic, even at picomolar concentrations.<sup>1,4</sup> Recent independent and expert scientific reviews — including reviews from the World Health Organization, Germany's Human Biomonitoring Commission and US national agencies such as the Agency for Toxic Substances and Disease Registry, Centers for Disease Control and Prevention, National Toxicology Program and Environmental Protection Agency — have issued recommendations to reduce the public health risks of lead exposure.

A February 2013 report by Health [MJA 199 (5) · 2 September 2013 324] Canada confirms that effects have been associated with blood lead levels as low as 1–2 µg/dL.<sup>5</sup> These reviews indicate that the current National Health and Medical Research Council guideline for lead (10 µg/dL) is too high and should be revised downwards.

Mark P Taylor Professor of Environmental Science, Faculty of Science, Macquarie University, Sydney, NSW.

Bruce P Lanphear Professor of Children's Environmental Health, BC Children's Hospital, Simon Fraser University, Vancouver, British Columbia, Canada.

Chris Winder Professor of Occupational Health, Safety and Environmental Management, Faculty of Business, Australian Catholic University, Sydney, NSW.

doi: 10.5694/mja13.10261

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## Lead threat to children from home veggie patches

NSW Date September 7, 2013 - [Amy Corderoy](#) Health Editor, Sydney Morning Herald

A study following five Sydney families over 15 months has discovered a direct link between lead contamination in soil and contaminated lead inside the house, with family members and pets likely walking it in. The study found summer is particularly dangerous, as dry weather creates more contaminated dust that easily moves around....

A 2006 study of vegetables sampled from the Sydney Basin area found 32 per cent contained lead levels that exceeded the allowable limits for vegetables, with lettuce, parsley and leek the worst offenders.

Read more: <http://www.smh.com.au/nsw/lead-threat-to-children-from-home-veggie-patches-20130906-2tan9.html#ixzz2g56Dbtta>

### ***Is your garden putting your health at risk? Free test for soil metal contamination at Open Day 2013***

7 September 2013

Urban gardens and home vegetable patches are increasingly popular in Sydney, yet few people are aware that a simple soil check might reduce significantly any health risks associated with "eating home-grown produce.

As part of a new '[VegeSafe](#)' initiative, to keep veggies safe, a team of Environmental and Earth scientists from Macquarie University's Faculty of Science will be offering free soil metal testing at the University's annual Open Day on September 14, giving community members new insight into safe urban gardening options.

Although lead was removed from petrol in 2002, and in other household substances like paint during the 1990's, our research shows that Sydney's household soil still has a lead legacy – accumulated lead in soil and dust," says Associate Professor Damian Gore. "This is especially important information for parents and keen urban gardeners," he says.

Team leader Professor Mark Taylor, an expert in lead contamination, says "High soil lead has been shown to correlate with high blood lead exposure in children – through them being more likely to be exposed to that dirt through their play, and getting dirt in their mouths – an exposure which is then associated with developmental and neurological risks."



Quick facts:

Your garden soil in Sydney might be lead-contaminated if it is now or was once surrounding or nearby;

- A pre-1997 painted residential building or pre-2010 painted industrial building, and the paint has deteriorated or been dry-scraped, heat-gunned or dry-sanded and allowed to contaminate the yard;
- Older inner city homes or those near main busy roads - pre-2002 leaded petrol vehicle emissions emitted lead particulates to the atmosphere that accumulate in dust, soil and ceilings;
- Lead flashing or lead acid batteries, manufacturing or recycling plants, or a waste dump/landfill.

The team will also measure several other toxic elements including copper, zinc and arsenic, which may have been used in fungicides and pesticides, and will alert homeowners if found in unhealthy concentrations.

Read more: [Is your garden putting your health at risk? Free test for soil metal contamination at Open Day 2013](#)

## **Lead Poisoning Puts Workers At Risk Thanks To Outdated Regulations**

[http://www.huffingtonpost.com/2013/09/25/lead-poisoning-workers-risk-regulations\\_n\\_3986513.html](http://www.huffingtonpost.com/2013/09/25/lead-poisoning-workers-risk-regulations_n_3986513.html)

Posted: 09/25/2013 1:00 pm EDT | Updated: 09/25/2013 1:56 pm EDT

In a letter to a friend dated July 31, 1786, Benjamin Franklin wrote of [lead's "mischievous" effects](#) on workers and bemoaned how unsuspecting plumbers, painters and other professionals continued to be exposed and harmed.

Health experts echo Franklin's laments today. They say scores of working adults continue to be exposed to high levels of lead, including recent cases at indoor gun ranges, as regulations lag decades behind knowledge of the metal's health hazards and budget cuts further hamper efforts to prevent poisonings.

Howard Hu, dean of the University of Toronto Dalla Lana School of Public Health referenced the U.S. Occupational Safety and Health Administration's current safety limit of 40 to 60 micrograms per deciliter of lead in a worker's blood, depending on the situation. Scientific studies have hinted that chronic blood lead levels as low as 2 micrograms per deciliter may [raise the risk of death](#) from a heart attack or stroke.

Dr. Michael Kosnett, an occupational health expert at the University of Colorado, Denver said "There's clear evidence that levels currently tolerated in the workplace under OSHA standards constitute a risk to the health of workers."

Tony Myhre, a security guard in Everett, Wash., believes he is among many who've fallen victim to this discrepancy in what is considered an acceptable amount of poison.

In late July, during a required training at an indoor gun range, he recalled becoming "tired and woozy." A blood test revealed a lead concentration of 11 micrograms per deciliter, about 10 times





the national average for adults. However, Brian Borgelt, manager of the Tacoma, Wash. gun range, claimed no responsibility for any lead exposure, referencing the OSHA benchmark.

Since revising its definition of elevated blood lead, the CDC's Adult Blood Lead Epidemiology and Surveillance (ABLES) program has helped many states -- including Washington -- track workers like Myhre with blood lead levels as low as 10 micrograms per deciliter. While it's extremely unusual for such a level to be accompanied by symptoms, experts worry about the long-term effects. But federal funding cuts threaten to stifle ABLES efforts.

"It's gonna stink. There are plenty of populations of people for which exposure is ongoing and not being detected," said Hu. "The workers and their employers are simply ignorant of these kinds of exposures, the risks inherent in their work."

Mark Olson, an attorney representing a group of young men who allege they were lead poisoned while remodeling [Wade's Eastside Guns](#) in Bellevue, Wash., suggests there's another component to the problem beyond just ignorance: negligence. Olson alleged that Wade Gaughran, the owner of the gun shop and range, knew of the health hazards, "and sent these kids into harm's way."

Schoonover from the Washington State Department of Labor and Industries said ABLES information on Wade's Eastside Guns "really facilitated the quick and concerted action and intervention" when identifying the cases and preventing continued exposures. ABLES is key, Schoonover said, to protect people. "We need to reinstate funding."

Unfortunately, the CDC is not the only agency facing financial constraints.

Deep budget cuts have also [severed childhood lead poisoning prevention programs](#), just as expanding knowledge of adult health hazards hints at more threats to the next generation.

A couple more important news articles have come in, at

<http://www.theglobeandmail.com/report-on-business/industry-news/the-law-page/us-ruling-over-tecks-trail-bc-smelter-may-have-ripple-effect/article6459408> and <http://ridatahub.org/datastories/educational-costs-of-unhealthy-housing/1/>

From: Rick Rabin

Sent: Thursday, October 03, 2013 1:01 AM

To: Leadnet Subject: [Leadnet]

## **Safer Consumer Products Program Launch**

The list of chemicals in this California program includes lead and many cosmetology products.

Rick Rabin

For those who are interested in getting rid of toxic chemicals and green chemistry, California now has the most innovative regulations in this field in North America. Not all that we wanted, especially because the number of products affected outright will be small. However, the lists below give OHS activists and specialists useful starting places to ask questions about what can be done in their workplaces or through contracts and policies/regulations. Don't know of another set of lists that is as comprehensive, and in a regulation. Gives all kinds of legitimacy to using them to argue the 1200 or so chemicals shouldn't be in products or workplaces.

For those interested in the specifics of the regulation, workers are included and occupational health is included in the definition of public health. We also got respiratory sensitizers in the list of lists.



Thanks to the CHANGE (Californians for a Healthy and Green Economy -- [www.changecalifornia.org](http://www.changecalifornia.org)) coalition for its perseverance in getting us this far. [The Coalition includes Worksafe and some California union locals or districts (e.g., CWA)]. Also to the Green Ribbon Science Panel and others who made this possible.

If you've got questions, happy to answer them off-line if that's easier. The links in the e-mail will take you to the page for the Green Chemistry Initiative, where there's more information.

Dorothy

----- Forwarded message -----

From: Department of Toxic Substances Control (DTSC)

Date: 1 October 2013 14:27

Subject: Safer Consumer Products Program Launch

Department of Toxic Substances Control

October 1, 2013

The Department of Toxic Substances Control (DTSC) is pleased to announce the launch of California's Safer Consumer Products (SCP) program implementing new regulations taking effect today, October 1, 2013.

To kick off the SCP program, DTSC published informational lists of candidate chemicals on the new Safer Consumer Products Web site, <http://www.dtsc.ca.gov/scp/index.cfm>

The purpose of these informational lists is to inform stakeholders about chemicals that may be named as Chemicals of Concern if they are later identified by DTSC as part of a product-chemical combination that is listed as a Priority Product. Please see the "Informational Candidate Chemicals list" on the Chemical Lists page - [www.dtsc.ca.gov/SCP/ChemList.cfm](http://www.dtsc.ca.gov/SCP/ChemList.cfm) - to view the list of chemicals pulled from the Authoritative Lists.

DTSC has also posted its Toxics Information Clearinghouse (TIC) Web site. The TIC's primary goal is to serve as a decentralized system for collection, maintenance, and distribution of information on specified chemicals via a publicly accessible web-based portal. The TIC provides a portal to multiple web-based sources of chemical-specific information for hazard traits, toxicity endpoints, and other related properties.

For more information on the launch of DTSC's Safer Consumer Products program, read the press release.

Dorothy Wigmore

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You can follow Worksafe on Twitter @WorksafeCA.



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## Generous donation to LEAF (Lead Education and Abatement Fund)

One of The LEAD Group's volunteers, Systems Analyst Ian Smith, after hearing that The LEAD Group's government grant for the Global Lead Advice and Support Service was not continued after 30<sup>th</sup> June 2013, has made the most generous donation to LEAF ever received - \$25,000. We are really grateful for this donation which allowed us to print 200 VAP Catalogues (the 2014 Lead-Safe World CALENDARS) and post complimentary copies to dozens of organizations who are making a difference in the world of lead-safety. However, the major expenditure from the donation, as directed by Ian, was to pay out the mortgage on the premises The LEAD Group offices are in, so that the organisation has a chance to remain functioning and can continue to work to increase our income and influence, through the Lead Safe World Project. Thanks Ian!

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## Lead Poisoning and Contamination in Vietnam

*By Lan Nguyen, Bachelor of International Relations, University of Social Sciences and Humanities Ho Chi Minh City Vietnam; Student, Masters of Human Resource Management, University of Technology, Sydney; Intern at The LEAD Group. Late 2013*

### INTRODUCTION

Lead poisoning has been recognised as a serious health problem all over the world for decades. However, in Vietnam the community is still lacking knowledge of lead poisoning and lead contamination; and this has and will continue to result in a number of negative consequences. October 20-26<sup>th</sup> 2013 marked the Inaugural International Lead Poisoning Prevention Week of Action, and while 35 countries participated in this World Health Organisation (WHO) and United Nations Environment Programme (UNEP) initiative, Vietnam was not one of them.

(See the map of participating countries at

[https://www.google.com/fusiontables/embedviz?q=select+col1+from+1OG9aRBB5lXEDiZ2ZTr&uOd4rRbbmRu\\_rFb4a9U&viz=MAP&h=false&lat=32.9723045620657&lng=-70.58009375&t=1&z=3&l=col1&y=3&tmplt=4&hml=ONE\\_COL\\_LAT\\_LNG](https://www.google.com/fusiontables/embedviz?q=select+col1+from+1OG9aRBB5lXEDiZ2ZTr&uOd4rRbbmRu_rFb4a9U&viz=MAP&h=false&lat=32.9723045620657&lng=-70.58009375&t=1&z=3&l=col1&y=3&tmplt=4&hml=ONE_COL_LAT_LNG) and click on the red dots to read the Lead Week of Action activities in each country.)

Therefore, this report's major purpose is to raise public awareness in Vietnam, of the harmful effects of lead with some detailed cases as well as data from scientific research conducted in Vietnam.

First I report the results of a survey on childhood blood lead levels in the southern area of Vietnam; then following is a review of associated risk factors with specific examples in certain areas, covering mining and recycling activities, traditional remedies, food and consumer products as significant sources of potential lead exposure in Vietnam.





## BLOOD LEAD LEVELS IN VIETNAM

Havens' study (2012), titled "Childhood Blood Lead Levels and Associated Risk Factors in Vietnam", gives a brief summary of blood lead levels dependent on the characteristics of the children enrolled in the study, and their families (see Table 1), indicating that 'although leaded gasoline has been phased out, there are still sources of lead exposure in the environment in Vietnam more than a decade later' (p. 32), with leaded paint, traditional medicines, metal recycling and smelting included.

**Table 1 Distribution of Blood Lead Levels Relative to Major Child and Family Characteristics (n=331)**

Major Child / Family Characteristic	Mean blood lead ( $\mu\text{g}/\text{dL}^*$ )	Median blood lead ( $\mu\text{g}/\text{dL}$ ) and blood lead IQI**
Male	5.19	3.70 (1.65 – 6.52)
Female	4.63	3.60 (1.65 – 5.80)
<b>Age (months)</b>		
0-12	3.75	1.65 (1.65 – 3.60)
13-24	6.71	5.20 (3.63 – 7.60)
25-36	5.39	4.90 (1.65 – 7.40)
37+	5.70	5.50 (3.70 – 7.90)
<b>Location</b>		
Ho Chi Minh	4.41	1.65 (1.65 – 5.35)
All other locations	5.43	3.80 (1.65 – 6.70)
<b>Source of drinking water</b>		
Piped	4.54	1.65 (1.65 – 5.20)
Bottled	4.88	4.00 (1.65 – 6.20)
Rainwater	5.62	5.40 (3.28 – 7.95)
Well water	5.39	3.65 (1.65 – 6.68)
<b>Use traditional medicines</b>	5.12	3.80 (1.65 -6.20)
<b>Have peeling paint in the home</b>	4.84	3.50 (1.65 – 5.70)
<b>Attends school outside the home</b>	6.54	5.70 (4.10 – 8.15)
<b>Parents do metal recycling</b>	10.64	5.45 (4.39 – 14.55)
<b>Live near a busy intersection</b>	5.14	3.60 (1.65 – 6.35)

\*  $\mu\text{g}/\text{dL}$  means micrograms per decilitre - micrograms of lead per decilitre of blood

\*\* IQI means the inter-quartile intervals, (25th - 75th percentiles) which describe the blood lead distribution. *Source: Havens 2012*

Unfortunately, in relation to leaded paint, one of the major concerns in OECD countries, there is little in the way of statistics on its production, trade and waste in Asia as well as the Pacific, and Vietnam is no exception.

The following section: ASSOCIATED RISK FACTORS - discusses not only the details of three significant sources of lead exposure but also two other sources of increasing concern: food and consumer products.



## ASSOCIATED RISK FACTORS

### Mining activities

A study by Nguyen et al (2011) conducted at one of the largest lead-zinc mines in Northern Vietnam examines the concentrations of multiple heavy metals in some plant species as well as soil and water samples collected beside a stream, downstream from one of the mine sites. They found that ‘All the concentrations of Cu [Copper], Zn [Zinc], As [Arsenic], Cd [Cadmium] and Pb [Lead] in soil samples collected from the mine site exceeded Vietnamese standard limits for industrial soil’ (p. 1386). In particular, while the allowable Pb limit is 300 milligrams per kilogram ( $\text{mgkg}^{-1}$ ), the mean Pb concentrations for all soil sample sites ranged between 2,630  $\text{mgkg}^{-1}$  and 91,800  $\text{mgkg}^{-1}$ . Samples from one mine site (No. 7) contained a mean Pb level of 30,700  $\text{mgkg}^{-1}$  and a range of 16,900 to 77,900  $\text{mgkg}^{-1}$ , whereas samples from mine site No. 1 contained a mean of 91,800  $\text{mgkg}^{-1}$  and a range of 89,100 to 94,300  $\text{mgkg}^{-1}$  Pb. Samples collected beside the stream downstream from No. 1 mine site, at the closest sampling site to the mine site, contained a mean of 15,000  $\text{mgkg}^{-1}$  and a range from 10,300 to 19,800  $\text{mgkg}^{-1}$  Pb. The most distant downstream sampling site from mine site No. 1, contained a mean of 2,630  $\text{mgkg}^{-1}$  and a range of 2,190 to 3,540  $\text{mgkg}^{-1}$  Pb.

Findings of another study which focused on Cho Dien mine, one of the largest lead and zinc mines in Bac Kan Province, Vietnam, indicated that ‘Pb contamination in drinking water and surface water is a major concern’ (Nguyen et al 2012, p. 263) (see more detail in Table 2 and Table 3)

**Table 2 Average and range of concentrations of heavy metals in drinking water sampled around Cho Dien mine, Bac Kan Province (mg/L\*) [and Vietnamese and US standard limits, for comparison]**

Type (number)	As	Cu	Cd	Pb	Zn
Bore wells (6)	5.1 (2-8)	29 (2.0-54)	0.5 (ND-2**)	30 (ND-121)	71 (ND-155)
Creeks (14)	3.0 (ND-13)	46.5 (5-218)	0.61 (ND-2)	12.0 (ND-34)	58.4 (ND-170)
Dug wells (2)	4.5 (2-7.1)	35 (11-59)	1.5 (1-2)	13.5 (9-18)	472 (2-942)
1329/2002/BYT/QD	10	2000	3	10	3000
USA Drinking Water Standard	10	1300	5	15	

1329/2002/BYT/QD: Hygiene Standard of Drinking Water – Ministry of Public Health, Vietnam

\* mg/L means milligrams per litre, that is milligrams of lead per litre of water

\*\* (ND-2) means results ranged from ND = Not detected, up to 2 mg/L, and so on

Source: Nguyen et al 2012

The concentration of Pb in 6 of the total 14 creek samples, mostly from sites near the mining areas, were found to be higher than the permissible Vietnamese standard of 10 mg/L value, according to Nguyen et al (2012). Also, ‘the locations where Pb concentration was higher than the allowable standard were at two bore wells near mine tailings’ (p. 258). Similarly, the Pb level in surface water was above the allowable standard at some locations near the mining area and it was even higher in comparison with that measured in drinking water.



**Table 3 Average and range of concentrations of heavy metals in surface water sampled around Cho Dien mine (mg/L)**

Elements	Range	Average (n=20)	QCVN-B1 08:2008/BTNMT
As	ND-95	18.2	50
Cd	ND-18	3.3	10
Cu	3-865	146	500
Pb	2-564	107	50
Zn	10-4,170	1,040	1,500

QCVN-B1 08:2008/BTNMT: National technical regulations on quality of surface water source, class B1

Note: The classification of surface water to assess water quality and control, for purposes of water use vary; A1-Good use for water supply purposes and other purposes, such as type A2, B1 and B2; A2-For the purpose of water supply but to apply the appropriate; treatment technology; preservation of aquatic plants, or other purposes, such as type B1 and B2; B1-For irrigation purposes or other purposes required or similar water quality purposes as type B2 use; B2-Transport water and other purposes with low quality water requirements.

ND: Not detected

Source: Nguyen et al 2012

### Recycling activities

In developing countries, lead exposures are frequently associated with not only smelting and mining but also recycling efforts. According to Gottesfeld and Pokhrel (2011, as cited with the wrong spelling Gottesfeld, in Havens 2012, p. 1 & 2), 'Even with the elimination of leaded fuel, elevated pediatric blood lead levels have been found in neighboring Southeast Asian countries due to other environmental lead exposures such as lead battery recycling and electronic waste (e-waste). Some of these same exposures can be found throughout Vietnam'.

Very few studies have investigated the heavy metal content in rice samples from recycling areas in the country. According to Le et al. 2009, in an aluminium waste recycling village in Van Mon – Bac Ninh, the average content of Pb in the rice samples (0,057 ppm) was found to be lower than the FAO (Food and Agriculture Organization of the United Nations)/ World Health Organization (WHO) Guidelines which is less than 0.1 ppm. However, notably, the comparison of oral and inhalation exposure estimates, also known as hazard quotient (HQ), was higher in the polluted area. In other words, lead exposure in the neighborhood area was estimated to be generally high in comparison with other neighbourhoods some distance away, maybe more than two times higher.

These were the outcomes of a research finished in 2009 and published in 2010. However, in 2010 there are updates. 'The Joint FAO/WHO Expert Committee on Food Additives re-evaluated lead in June, 2010 and withdrew the provisional tolerable weekly intake guideline value on the grounds that it was inadequate to protect against IQ loss.' (WHO 2010) In other words, WHO is saying that there is no safe limit for lead in food as any lead will damage the developing human brain, at blood levels of 5 µg/dl and even lower.





Photo: High level of pollution in aluminum waste recycling village Van Mon (Yen Phong – Bac Ninh)

Source:

<http://vea.gov.vn/vn/truyenthong/tapchimt/nctd42009/PublishingImages/TCMT%20122011%2050.jpg>

Another example was in Dong Mai lead recycling village (Hung Yen province), where blood lead tests were performed on resident children under the ages of 10 years in 2012. Results showed that all of them were found having BLLs above the previously recommended 10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) limit. Notably, in a further test, of 24 participating children, there were 2 cases with BLLs of  $\geq 70\mu\text{g}/\text{dL}$ , 17 at 45-70  $\mu\text{g}/\text{dL}$ , 4 at 25-44  $\mu\text{g}/\text{dL}$ , and 1 at 15-19  $\mu\text{g}/\text{dL}$  (baohungyen.vn 2012).

In May 2012, the USA Centers for Disease Control and Prevention (CDC) halved the blood lead reference level from 10  $\mu\text{g}/\text{dL}$  to 5  $\mu\text{g}/\text{dL}$  for follow up for children in the United States.

*In the past, blood lead level tests below 10 micrograms per deciliter may, or may not, have been reported to parents. Identifying a child's blood lead equal to or above 5 micrograms per deciliter means more parents should learn that their child has an elevated blood lead level. (CDC 2012)*

Even though there has been increasing awareness of at-risk children, the significant issue is that lead recycling has been the major source of employment for local residents in this area. Among the cases of highest level lead poisoning, 3 year-old girl Le Phuong Ly with BLL of 73.16  $\mu\text{g}/\text{dl}$  has been growing up in the highly polluted house considered as an informal recycling site. Her parent, when being asked about their intention of stopping such manufacturing or shifting it to some distance, was still undecided (baohungyen.vn 2012).

### **Lead in traditional remedies**

The use of some Asian traditional and herbal therapies would give a daily dose of heavy metals, including arsenic, lead and mercury, when regularly taken as recommended. According to Garvey et al. (2001), lead content of these so-called 'natural' medicines, with a daily dose of lead in excess of 300 micrograms ( $\mu\text{g}$ ), may increase blood lead levels and body lead burdens (see Table 4).



**Table 4 Daily lead dose >300 µg per day in 54 different traditional Asian remedies**

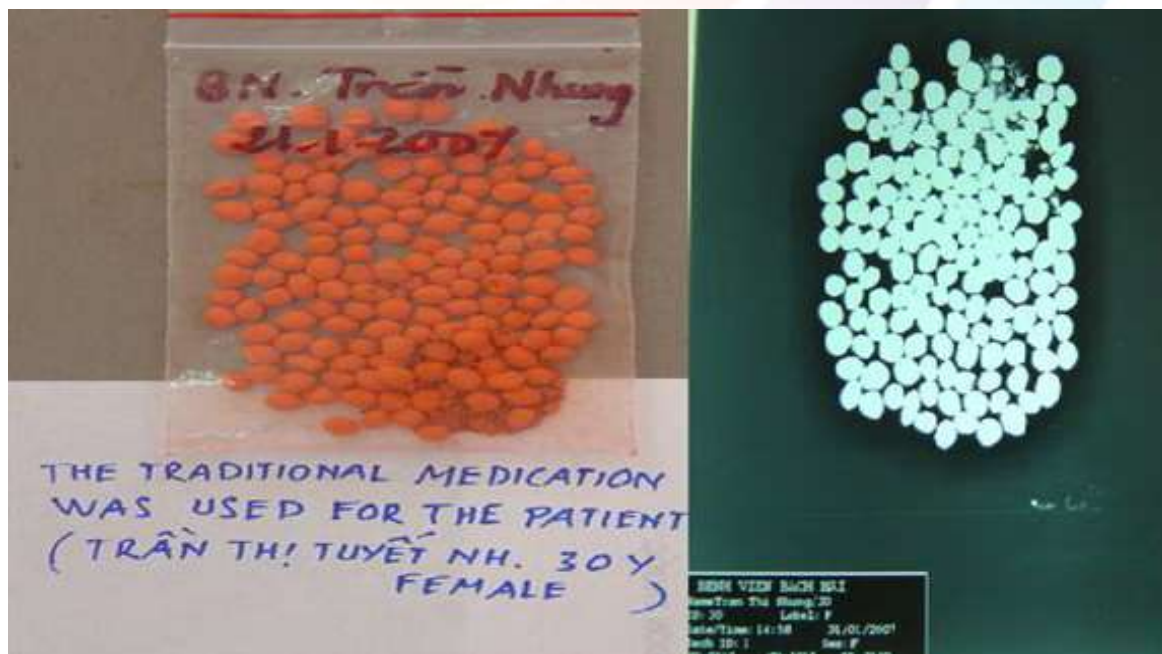
Crude Tan Pills	385.00
Crude Red Pills	630.00
Chinese Nodi Pills	450.00
Tit Tau To	1,372.00
Jien Pu Hu Chien Wan	833.00
Curing Pill	2,079.00
Tienchi Powder	19,600.00
Precious Pills for Women	514.50
Yang Chun Yu Ye Kou Fu Ye	313.60
Pilulae Corticis Eucommiae et Ossis Tigris	980.00
Eastern Magic Juice	441.00
Bo Ying Pills	416.00
Reinforce Sex Pill	5,880.00
Yinchiao Tablets	784.00
Crocodile Bile Pills for Asthma	588.00
Ohta's Isan	324.10
Hindu Magic Pill	931.00
Angelicae Natural Extraction	343.00
Tangbuisu	380.80
Prostate Gland Pill	818.30
Anmien Pien	651.70
Wuchi Pai Feng Wan	656.60
Chaun Xin Lian	632.10
Wei-Tai '999' Capsules	1,342.60
Kain Yeung Pill	407.40
Gammaoling Tablets	1,239.70
Hypertension Repression Tablets	715.40
Menopause Easy Tea	23,667.00
Vitality Tea for Men	459.90
Women's Tea Menstruation-Mind	548.80
Hypertensive Tea	999.60
Gejie Da Bu Wan	1,680.70

Notes: Total 32/54 (60%) Source: Garvey et al. 2001

According to Garvey et al (2001), the daily dose for protection of public health is 30 µg of lead per day. However, Medlin (2004) emphasised that blood lead levels as low as 10 µg/dL cause adverse health effects, and that, for children under age 6, the U.S. Food and Drug Administration (FDA) recommends the rate of less than 6.0 µg lead daily from all food sources. This, in comparison with the magnitude of the daily dose that is possible when traditional medicines contain lead in excess of 300 µg per gram, indicates a high lead poisoning potential and potential for adverse health risks for those who are using these kinds of medicines – depending of course on how many pills are ingested each day.

Pandalai and Morgan (2011) further emphasise that traditional remedies, also known as Complementary and Alternative Medicines (CAM), has been little studied regarding metal content of these products specifically from Vietnam, but 'limited data collected from other Southeast Asian countries where similar products are used and available are revealing' (p. 296).

In Vietnam, these kinds of medicines could be a risk to public health mainly because the origins of the raw materials, the name of the traders involved, and their recipes are largely unknown. There was a sharp increase in lead poisoning among children, raising alarm at the impacts of fake oriental traditional medicines on children's health late in 2011. In the last few months of that year, more than 130 cases, 94% of them children, were sent to the Poisons Information Center, Bach Mai Hospital, Hanoi (vietnamnet.vn 2011).



A sample of traditional remedies of unknown origins reported to contain lead.

Source: <http://bachmai.gov.vn/images/stories/2010/chongdoc.jpg>

According to the Chemical Institute, of 100 samples of this medicine, 98 were reported to contain lead of 2%, and more important, some of them had more than 85% lead content (vietnamnet.vn 2011). The figure of 2% lead converts to 20,000 micrograms per gram ( $\mu\text{g}/\text{gm}$ ), whereas 85% lead converts to 850,000  $\mu\text{g}/\text{gm}$ , so, clearly, a person would not have to ingest very much of these pills before their blood lead level would start to rise and the more they ingest, the sooner they would become "a case of lead poisoning". For every case who reaches the hospital however, there would be many more cases where symptoms may be less severe, or medical attention is not sought for other reasons, and people thus continue to take the medications because they're unaware of the potential impacts on their long-term health and intellectual development.

### Lead in food

Besides traditional therapies, food safety has been a matter of considerable public concern in Vietnam. In general, there are two major sources of this big worry, including influence of environmental contaminants and impacts of harmful chemicals used as food preservatives, colourants and flavour enhancers.

One increasing concern refers to potentially toxic element accumulation in fish and vegetables from environmental pollution in association with urban growth, agricultural growth and industrial development. For further understanding of the risk associated with human consumption, Marcussen et al (2007) and Le et al (2009) examined the concentration of toxic elements in eels and fish produced in wastewater-fed ponds of Hanoi and in freshwater from the central provinces respectively. It is emphasised that 'among the various pollutants, heavy metals, in particular, are widespread contaminants released into aquatic systems from numerous anthropogenic sources.



Some metals are known to be toxic even at low concentrations, including arsenic, cadmium, mercury, and lead' (Le et al 2009, p. 70). The maximum metal levels in fish were found to be far lower than the permissible values for fish consumption, suggesting that any serious health risk for public health were not clear.

Another significant aspect is concerned with the increasing use of harmful chemicals on food. This does not necessarily simply mention chemicals such as pesticides, antibiotics and hormones that are used in plant and animal farming to boost production and ensure adequate food supply. More importantly, it has been discussed that unhealthy processed foods greatly outnumber unadulterated healthy foods. According to Natural Medicine College (2013), more than 75% of supermarket shelves are stocked with packaged and processed foods today. Notably, many newspaper articles have recently described plenty of harmful chemicals used on food that are available to buy in the area. For example, a kind of industrial powder is said to be widely used instead of bones in soups at small restaurants in order to cut electricity consumption.



Health risks ignored, industrial powder has been widely used in foods

Source: <http://us.24h.com.vn/upload/3-2013/images/2013-08-05/1375665707-ham-thuc-an1.jpg>

This powder is believed to contain heavy metals and other toxic elements but as many people have not had much knowledge of that, it has been very popular among restaurant owners (Ngoc Mai 2013).

### Lead in consumer products

It is reported that the general risk of lead in consumer products is still prevalent in the region. Data collected by Murao and Ono (2012) shows that Vietnam is among various Asia Pacific countries that still use lead for their products (see Table 5).

Table 5 Existing use of leaded paint. KEY - Y: yes; N: no; NA: information not available

Country	Residential	Industrial	Toys	Jewellery	Consumer products	Others
India	Y	Y	Y	NA	NA	NA





Myanmar	Y	Y	Y	NA	Y	NA
Nepal	Y	Y	Y	Y	Y	Y
Philippines	Y	Y	Y	Y	Y	Y
Solomon Is.	N	N	N	N	Y	Y
Sri Lanka	Y	Y	NA	NA	NA	NA
Thailand	Y	Y	Y	Y	Y	NA
Vietnam	Y	Y	Y	Y	Y	NA
Iran	NA	NA	Y	NA	NA	NA
Percentage of YES	78%	78%	78%	44%	67%	33%

Source: Country presentations at the 2nd GAELP presentation by Mendoza, June 2012/Bangkok (Murao and Ono 2012)

During 2007 there were numerous recalls of name-brand toys in the United States because of lead paint contamination including products from China, Korea, India, Peru, Taiwan, and Vietnam. Lead contamination rates were further analysed, giving the results that of the tested 95 samples, 12 items were reported to have high lead content, exceeding the current US regulatory standard (Weidenhamer 2009). These findings suggest that toys and other consumer products deserve more attention from government agencies as well as manufacturers and retailers.

Another case that raised questions for government agencies in seeking to limit lead exposure was lead contaminated mugs, glasses and cups imported from China early in 2011. In more detail, Quality Management Institute’s representative emphasised, ‘Tests of samples show that most of them have high contents of heavy metals including lead in paint.’ However, at that time the lead content of such imports had not been limited in Vietnam’s existing regulations, so the only thing government agencies could do was to recommend consumers not use these products (Thanh Xuan & Vu Van Anh 2011).

## CONCLUSION

This brief review of research and e-articles on potential health risks associated with lead poisoning in Vietnam cannot present comprehensive information since very little data is available. However, it can be seen that Vietnam’s marked industrialisation without sufficient regulations is of outstanding importance. Some mentioned scholars provided further emphasis for the recommendation that, ‘while government institutions may need to be strengthened, and environmental regulations need to be in place, true on-the-ground improvement in environmental quality in Vietnam and in many other developing countries requires an increased focus on promoting public awareness of industrial environmental issues’ (Wahlberg & Nguyen 2008, p. 712).

## RECOMMENDATIONS

As mentioned above, the most significant issue related to lead poisoning in Vietnam is the lack of knowledge of lead exposure among the community. Mentioning about lead poisoning monitoring, Havens (2012) states ‘Vietnam does not appear to have any form of routine surveillance in place, even though there has been increasing awareness of at-risk children, particularly around lead recycling and craft villages. I could not find any information in English medical literature or in discussion with Vietnamese personnel such as physicians and environmental scientists regarding any form of lead assessment or prevention programs in the country. There does not appear to be any public health movement to remediate any of the current lead exposures’ (p. 2).



Hence it could be concluded that the government agencies face important roles to take the first step in raising awareness. Under this circumstance, Model National Public Health Policy on the Prevention of Lead Poisoning by Elizabeth O'Brien and Anne Roberts, The LEAD Group Inc., Australia would be an effective tool. According to The LEAD Group's Model Lead Policy, 'the first step in implementing a national policy for preventing lead poisoning in a population is to do a national blood lead level survey of all ages'. Follow up should occur for every blood lead level above 5 µg/dL. That is, the national survey should investigate all cases above 5 µg/dL and determine the likely lead sources by testing food, water, consumer product, traditional medicines, soil, dust, etc.

These investigations are fundamental for the government to develop any health policy for the prevention of lead poisoning in Vietnam. With the available data, it will be easier to apply following steps as suggested in the Model Lead Policy.

Further, in order to prepare for participating in the 2014 International Lead Poisoning Prevention Week of Action, national governments and NGOs in every country could usefully refer to the WHO/UNEP briefing for Lead Week of Action event organizers, listed at <http://www.unep.org/hazardoussubstances/LeadCadmium/PrioritiesforAction/LeadPaints/FocalAreasofWork/GAELP/tabid/106381/Default.aspx> and linked to [http://www.who.int/ipcs/assessment/public\\_health/briefing.pdf](http://www.who.int/ipcs/assessment/public_health/briefing.pdf)

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# Chinese Translation of Biosolids used as fertilizer in China and other countries

Written in English by Kobe He, Intern, The LEAD Group, Edited by Anne Roberts, at [www.lead.org.au/lanv10n1/lanv10n1-4.html](http://www.lead.org.au/lanv10n1/lanv10n1-4.html) - Translated into Chinese by Dr Hugh Xin Xi Zhu

## 在中国和其他国家使用生物固体作为肥料

由科比何用英文编写，实习生，铅集团，由安妮·罗伯茨编辑，

由修心禧朱医师翻译成中文

越来越多地使用生物固体或人类的污水作为肥料在农场带来了巨大的环境和健康风险。污水是众所周知的，因为其营养成分和低廉的价格。把污水污泥作为肥料使用，可以作为处置问题的解决方案。然而，重金属如铅有可能被发现在污水里：这种材料可以被植物吸收（吸收量随不同的植物而变化，其中的细节被发现在铅集团的事实表中“你的院子里是铅安全吗？”）能够，相应的，显著损害人体器官的功能。

未经处理的污水中含有大量不同的营养成分，并可能被用来灌溉禾谷类作物和某些蔬菜如菠菜。自从污水仅包含人类和动物的粪便以来，这已经是很长时间了。第一次工业革命发生以来许多不良材料已被纳入污水。因此，现在大部分从社区收集的污水，在它被用作一个农场肥料之前必须进行加工和处理。以下的材料在污水污泥中可能被发现：水，粪便物，卫生纸，头发，腐臭油脂和工业化学品（含有重金属如铝，铜，锌，铅，铬，镍，钼，硒，银，砷，汞等）。

土壤中重金属含量，从不同程度的液体污水污泥的使用中获得以后。（资料来源：PCARRD, 2002。亮点2001，洛斯巴尼奥斯，拉古纳。来自菲律宾有机农业信息网。）

重金属	标准限值* (ppm)	金属在土壤中水平 (ppm)，使用液体污水污泥 (t/ha)			
		0	40	80	120
砷 (As)	5.00	0.002	0.002	0.002	0.002
镉 (Cd)	5.00	0.001	0.001	0.001	0.001
铬 (Cr)	5.00	0.067	0.065	0.065	0.079
铅 (Pb)	5.00	0.869	0.845	0.852	0.907
汞 (Hg)	0.20	0.001	0.001	0.001	0.001
硒 (Se)	1.00	0.001	0.001	0.002	0.002

多年来，使用生物固体作为肥料对于西方国家的农民来说一直不寻常的，因为废物处理是非常复杂和昂贵。相比之下，中国农民用人类排泄物施肥领域超过4000年。经过数千年的耕作，中国的土壤仍然肥沃，适合耕种，水土流失尚未普遍。由于价格低廉的污水污泥作为一个可行的环境选项，使用污水污泥的变动已经出现在一些发达国家如英国和美国。





在中国，由于水和化肥价格的上涨，多达1000万的农民使用未经处理的污水灌溉和施肥农田。大多数农场经营高度依赖于本地资源，如从严重污染的河流和湖泊抽水和使用人类的污水作为肥料。

在中国干燥的地区，未经处理的废水是唯一可行的灌溉水源来保持农民的经营。从附近的河流和湖泊运水的运输费用高昂，对于农民年收入低于2000美元的是禁止的。为了减少开支，他们经常从厕所获取未经处理的人类粪便，并把它播撒在农田作为肥料。即使没有直接使用废水，还有另一个严重的问题造成土壤铅污染。中国政府没有很好的工业废物处置的界定标准；许多工厂排放的废水排入河流和湖泊经常没有任何加工处理，因为很少有可能被处以罚款和监禁。其结果是，许多毒素和重金属，如铅被释放到河流和湖泊。农民往往在那里集水灌溉，这样会导致毒素在他们的农场传播。如果从来没有清理的话，它将保留在土壤里几千年。毒素和重金属将会被农作物吸收。

（编者按：2006年的一项研究发现，33.8%的中国儿童血铅水平大于 $10 \mu\text{g/dL}$ 。见：王和张）

生物固体也被广泛使用在欧洲和美国。在部分的欧洲和其他地区生物固体已经被应用于农业土地达一个多世纪。在美国，生物固体再循环是和农垦一样古老了，甚至和风力，太阳能，水力发电一样古老。但是在美国，使用生物固体在农业灌溉中是受到联邦和州一级监管的。在管理规则的某些章节，限制金属如铅在生物固体中和生物固体应用于农田的要求已经得到维护和建立，同时加强了风险评估能力（Biosolid.com, 2002）。在最近的几十年里，许多国家都积极参与进行实地试验，以确定生物固体管理的安全性和环境保险。

### 以下的事件来自于来源观察

在1993年，一队在亚利桑那大学的研究人员发表的研究论文，发现有显着的数字的人类致病生物甚至还在处理过的污水污泥里。

污泥的病原体可以移动通过许多环境途径 -

直接接触污泥，吸入蒸发，污染地下水，污染在污泥中穴居的啮齿类动物，通过作物根部吸收。

在艾斯利普，纽约，污泥是杀死了25岁的哈里·多斌的疾病的病因，它开咖啡卡车在长岛铁路站离开污泥堆肥场1000英尺。在1991年7月多斌开始遭受健康问题。医生没有成功的治疗他的哮喘，关节炎，莱姆病，肾脏疾病和支气管炎。最终在1992年1月，当他再也无法呼吸，他们进行肺活检并发现烟曲霉，一个共同的污泥堆肥的副产品。在疾病得到正确诊断的时候，它是不可阻挡的，蔓延到他的脊椎，他的腿，最后他的心脏，导致他在1992年9月23日死亡。其他的艾斯利普居民抱怨慢性咳嗽，恶心和其他反应。

病毒，细菌，原虫，真菌和肠道蠕虫居于污水污泥中。许多病原体可引起疾病，致使人患病，致残和杀死人类，包括沙门氏菌，志贺氏菌，弯曲杆菌，大肠杆菌，肠道病毒（引起麻痹，脑膜炎，发热，呼吸系统疾病，腹泻，脑炎），贾第鞭毛虫，隐孢子虫，蛔虫，钩虫和绦虫。

斯巴达以外，密苏里州，有一个很小的农村城镇它的污水处理厂，在20世纪80年代中后期开始运作，奶农埃德

柔乐在1990年开始发现它的奶牛有问题。他们生病和死亡的，和没有兽医或大学科学家能告诉他为什么。死亡和疾病一直持续到1993年年底，农场宣告破产。



柔乐发起的科学土壤测试显示，污泥倾倒在—块地上流到他的地里，那里被发现含有大量的重金属污染物。死牛试验呈重金属阳性，铅被发现在肝脏，肾脏，骨骼和牙齿。

在林登，华盛顿，奶农琳达和雷蒙德·詹德开始失去奶牛，在污泥被播撒到毗邻农场一年后。琳达·詹德说：“我们注意到.....跛行和其他功能障碍，”。测试发现重金属在污泥处置场址的土壤里和两个邻居的井水里，那井水供几个家庭用。雷蒙詹德被诊断为重金属中毒，几个家庭成员显示出神经损伤的迹象，他们认为这些都与重金属中毒，包括铅中毒有关。16个邻近的家庭都经历了健康问题，范围从流感症状到癌症。

污水污泥在市场上通常称为“免费肥料”，和受到许多农民的欢迎。然而，问题不过夜就出现。铅是更容易产生慢性的长期的问题，而不是急性发作时，除非在非常高的数量，但长期积累的铅可以对人类和动物的健康有严重的影响。这个症状可能会在多年以后出现。在桑德尔和柔乐的例子中，他们并没有意识到正发生了什么事，直到2年后。（2010年来源观察）。

## 澳大利亚立法控制铅和其他重金属的含量，它可以通过污水污泥被添加到农业用地

根据新南威尔士州环境保护局公布的生物固体产品的使用和处置的环境准则，一个污染物的评级系统已经开发，用以协助确定供土地使用或处理的生物固体产品的适用性。每种污染物要被分级A, B, C, D或E (E级为最低级)，污染物验收浓度阈值，铅（根据干重）的A级：

150（毫克/公斤），B级：150（毫克/公斤），C级，D级420（毫克/公斤）：500（毫克/公斤）。农业用地在生物固体使用以后，最大可允许的土壤铅浓度是150（毫克/公斤土壤干重）（EPA, 2000）。

根据中国海关部门的统计局资料，最近中国农产品出口的总价值已经达到了380亿美元。

根据上海市农业委员会，中国农产品出口的总价值在2006年达到了310亿美元，占全球总出口7880亿美元的3.9%。

中国农产品出口到主要进口国家所占的比例，从2002至2007年（上海农业委员会，2009年）

年份 →	2002	2003	2004	2005	2006	2007
国家 ↓	%	%	%	%	%	%
日本	31.7	28.5	32.0	29.2	26.5	22.8
香港	11.4	10.4	11.3	9.7	8.6	8.3
南韩	11.3	12.1	9.2	10.5	9.3	9.8
美国	9.0	9.7	10.0	10.4	12.2	12.0
总数	66.7	63.7	65.5	63.2	60.1	56.7

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## 声明

这里所表达的观点不一定是澳大利亚政府的观点，和澳大利亚政府对所载的任何资料或意见不承担任何责任。

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## ***Chinese Translation of Dangers of a blood lead level above 2 µg/dL and below 10 µg/dL to adults***

### **血铅浓度高于2微克/分升和低于10微克/分升对成人的危险**

*By Robert Taylor for The LEAD Group Inc, Australia, December 2010, at [www.lead.org.au/fs/fst68.html](http://www.lead.org.au/fs/fst68.html)*

*Translated into Chinese by Dr Hugh Xin Xi Zhu*

*由罗伯特 泰勒 为前集团公司 编写*

*由修 心禧朱 医生翻译成中文*

注释: µg/dL=微克/分升, µmol/L= 微摩尔/升,

是通用单位用于铅在血液中的结果。另请参阅“血铅测试：测试谁，何时，以及如何应对的结果”。也可见于“[Blood lead testing: who to test, when, and how to respond to the result](#)”

1. “环境接触铅和慢性肾脏病进展：一个为期四年的前瞻性纵向研究” 由Chun-Chen Yu, Ja-Liang Lin and Dan-Tzu Lin-Tan发表于美国肾病协会杂志2004年，15期1016-1022页。

网址: <http://jasn.asnjournals.org/cgi/content/full/15/4/1016>

“.....经过长期随访48月，只有BLB[体内铅负荷]和BLL[血铅水平]保持肾功能进行性恶化的最重要的预测指标。

.....值得注意的是，在目前的工作中没有发现铅指标的安全界限。研究参与者的平均血铅仅为4.2微克/分升。“





2. “血铅低于0.48微摩尔/升（10微克/分升）和死亡率在美国的成人” 由Andy Menke, Paul Muntner, Vecihi Batuman, Ellen K. Silbergeld 和 Eliseo Guallar编写，2006年9月26日发表于“循环”——美国心脏协会杂志，2006年9月18日公布于网上。可以从以下网址购买：<http://circ.ahajournals.org/cgi/reprint/CIRCULATIONAHA.106.628321v1>

“方法和结果：

研究中参与者的几何平均血铅水平为0.12微摩尔/升（2.58微克/分升）。多变量调整后，风险比率（95%置信区间）为参与者的血铅在最高的三分位数（>0.17\_摩尔/升 [ >3.62\_克/分升]）与那些血铅在最低的三分位数（<0.09微摩尔/升[<1.94微克/分升]）的比值，全原因死亡率是1.25（1.04~1.51；P趋势在三分位数= 0.002）和心血管死亡率是1.55（1.08~2.24；P趋势=0.003）。血铅水平显著与心肌梗死和中风的死亡率相关，而这种相关性明显的见于血铅水平>0.10微摩尔/升（>2微克/分升）。“

*在高血铅水平的影响下，平均总胆固醇，高学研发病率，肾小球滤过率降低的发病率，和心血管疾病的历史的发病率是较高的。*

“全原因的死亡率的多变量调整的危险比率，对于最高与最低三分位数的比值是1.25（95%置信区间为1.04~1.51；P趋势在三分位数=0.002）。在专门的死因调查时，死亡率增加主要集中在心血管疾病死亡。多变量调整的危险比率对于最高和最低的三分位数的血铅水平的比值分别是心血管疾病死亡率1.55（1.08~2.24），心肌梗死死亡率1.89（1.04~3.43），和中风死亡率2.51（1.20~5.26），（每个P趋势=0.05）。这个结果在横跨亚群中是明显一致的。“

“在本研究中的数据中，血铅与心血管死亡率之间的关系可明显见于血铅含量低至0.10微摩尔/升（2微克/分升）的水平。在1999年到2002年的全国健康和营养的调查中，因为美国成年人38%铅含量在0.10微摩尔/升（2微克/分升）的水平，这些发现对于公共健康的影响是巨大的。本研究的结果呼吁将铅暴露的水平<0.48微摩尔/升（10微克/分升）纳入与成人相关心血管疾病的危险因素之中。

3. “‘安全’水平的铅毕竟可能不是那么安全” 由Melissa Healy编写，泰晤士报员工作家，2006年10月2日发表于洛杉矶时报，网址：<http://articles.latimes.com/2006/oct/02/health/he-lead2>

一项研究发表在美国心脏协会杂志“循环”追踪13,946名成人为期12年，比较铅水平和死亡原因。研究发现，那些血铅水平在3.6微克/分升和100微克/分升之间的人，比那些非常低铅水平的人[1.9微克/分升]大2.5倍的可能死于心脏病发作。89%更可能死于中风，和55%更可能死于心血管疾病。

4.

“血液中的铅：‘安全’的水平太高了？美国人平均测试得到有足够高的铅水平来增加心脏病死亡风险” 由Miranda Hitti编写，医学作家，WebMD 医学新闻，2006年9月18日，

网址：<http://www.medicinenet.com/script/main/art.asp?articlekey=64228>

“根据一项新的研究，在美国人中发现的平均血铅水平是高到足以增加心脏发作和中风的可能性。

“研究表明，事实上，只携带现在被认为“高”的血铅水平的五分之一的人们，更有可能死于心脏发作或中风。

“根据这项研究，这些发现表明“高”血铅的门槛可能不会充分考虑到铅的心脏风险。

“这项研究发表在“循环”的快速接入网络版上。”





“一个'高'血铅水平现在被定义为每分升血液含有超过10微克铅（10 $\mu$ g/dL）。

“大多数美国人 - 99% - 低于该阈值，写的研究人员，包括Andy Menke杜兰大学公共卫生学院的，公共卫生硕士，。

“但是一个增加的死于心脏病发作或中风的可能性已经开始被发现，当人们的血铅浓度大于2微克/分升，根据Menke和他的同事。”

5. “铅，镉，吸烟和增加外周动脉疾病的风险”由A Navas-Acien, E Selvin, R Sharrett, E Calderon-Aranda, E Silbergeld, E Guallar编写发表于“循环”109期，美国心脏协会，2004年6月7日，可以从网上认购“循环”在：[www.circulationaha.org](http://www.circulationaha.org) or [www.circ.ahajournals.org](http://www.circ.ahajournals.org)

“...外周动脉疾病的比比比，比较2~4的四分位数铅与最低四分位数铅的比比比分别为1.63（95%置信区间，0.51~5.15），1.92（95%置信区间，0.62~9.47）和2.88（95%置信区间，0.87~9.47）。各自的（P趋势=0.02）。”

“在一个美国成年人的代表性样本中，血铅和镉含量是与增加周围动脉疾病的发病率有紧密联系的。...观察到的增加周围动脉疾病的患病率发生在铅和镉的含量都明显低于目前环境和职业监管机构规定的安全水平。例如，只有1研究参与者有铅含量>1.93微摩尔/升（40微克/分升），职业安全与健康管理局（OSHA）的安全标准的全血铅含量，只有35人（1.6%）的铅含量>

0.48微摩尔/升（10微克/分升），疾病控制和预防中心对于血铅含量升高的儿童和孕妇的标准。”

6. “铅和镉的‘安全’水平”由Carole Bullock编写，美国心脏协会杂志新闻报道，2004年6月8日，在网址：[www.eurekalert.org/pub\\_releases/2004-06/aha-lo060304.php](http://www.eurekalert.org/pub_releases/2004-06/aha-lo060304.php)

“一般市民可以暴露于铅和镉通过香烟烟雾，在工业和燃烧源附近的周围空气，在某些食物和有时在饮用水。外周动脉疾病或PAD影响了8至12百万美国人，根据美国心脏协会统计。它是类似于冠状动脉疾病和颈动脉疾病的一种疾病。在PAD，脂肪沉淀在动脉壁上积聚，减少血液循环，主要是在腿和脚的动脉。在其早期阶段一个常见的症状是在活动期间，腿部和臀部出现抽筋和疲劳。这种抽筋在患者站立静止时消退。

“在一项2125人的研究中，那些带有最高的血铅或镉浓度的人，几乎比那些带有最低血水平的这两种金属的人，三倍更有可能发展成为周围动脉疾病。然而，这个最高含量是远在目前被认为是安全的水平之内。Eliseo Guallar说，资深作者，医学博士，公共卫生学博士，一个在约翰霍普金斯大学彭博公共卫生学院在巴尔的摩的流行病学助理教授。”

7. “血铅水平和所有原因的死亡，心血管疾病，和癌症：结果来自第三次国家康营养调的死亡率研究”由Susan E. Schober, Lisa B. Mirel, Barry I. Graubard, Debra J. Brody, Katherine M. Flegal编写，发表于“环境与健康展望在线”2006年7月6日。环境健康科学研究所，国立卫生研究院，美国卫生和人类服务部。

在网址[www.ehponline.org/members/2006/9123/9123.pdf](http://www.ehponline.org/members/2006/9123/9123.pdf)



“对于所有年龄段相结合，死亡率的相对风险为1.24 [95%可信区间, 1.05-10.48...心血管疾病为1.20 (95%可信区间, 0.93-1.55) ...癌症为1.44 (95%可信区间, 1.12-1.86)”，对于那些血铅含量5-9微克/分升。”

“我们的研究显示死亡率增加在血铅水平低至5-9微克/分升与其他的调查结果一致。提示对健康的作用与低水平的铅暴露相关。当前的，正在进行的国家健康和营养调查，从1999-2002的数据，的最新横断面分析，提示一种增加外周动脉疾病，高血压，肾功能不全的风险。在人群中平均血铅水平大约2微克/分升（Muntner等人 2005, Navas-Acien等人 2004）。其他基于人口的研究的分析支持这些结果。例如，在标准老龄化研究，血液中铅含量<10微克/分升与肾功能和认知功能障碍有联系。（Kim等人，1996; Payton等人，1994, 1998; Weisskopf等人，2004; Wright等人，2003）。第三次国家健康和营养调查的人群横断面分析表明，血铅水平与血压升高（Nash等人，2003）和肾功能下降（Muntner等人，2003）有关。”

8. “研究表明低血铅水平可导致早期死于心血管病和癌症”由Courtney Hinton编写，健康住宅联盟的实习生和马里兰大学的学生，发表在“联盟警告”，2006年8月，由健康住宅联盟出版（AFHH）

在[www.afhh.org/res/res\\_alert.htm#lowblearlydeath](http://www.afhh.org/res/res_alert.htm#lowblearlydeath)

这是上面第7项目的总结，（第三次国家健康和营养调查，NHANES 3）

“以往的调查，在1976-1980年进行的，表明死亡与血液中铅含量超过20微克/分升有较高的死亡风险。自1970年以来，血铅水平已有显著的下落，然而，第三次调查，从1988年至1994年进行的，反映了即使是低血铅水平，在5-9微克/分升之间，仍携带增加死亡的风险。

“目前国家健康和营养调查，从1999-2002年的数据，表明周围动脉疾病，高血压和肾功能不全的风险增加，与人群中平均血铅含量约2微克/分升有关。

“第三次国家健康和营养调查研究分析支持不良健康后果与血铅水平低于现在关注的水平有关的其他证据。

9. “血铅浓度会[大于8微克/分升]与老年妇女的死亡率的关系：一项前瞻性群组研究”由Nail a Khalil, John W Wilson, Evelyn O Talbott, Lisa A Morrow, Marc C Hochberg, Teresa A Hillier, Susan B Muldoon, Steven R Cummings and Jane A Cauley (2009)在<http://www.ehjournal.net/content/8/1/15>

“妇女的血铅浓度 $\geq 8$ 微克/分升（0.384微摩尔/升的），有59%增加的多变量调整的所有原因死亡率的风险（风险比 [HR]，1.59; 95%可信区间 [CI] 为1.02-2.49）（ $P = 0.041$ ），尤其是冠状动脉心脏疾病（CHD）死亡率（ $HR=3.08$ ; 95% [CI] 为（1.23-7.70）（ $P = 0.016$ ），比较女性血液中铅浓度<8微克/分升（<0.384微摩尔/升的），血铅与中风，癌症，或者非心血管死亡没有关联。”

“结论

妇女带有血铅浓度 $\geq 8$ 微克/分升（0.384微摩尔/升），会经历死亡率增加，尤其是冠心病，相比那些带有较低血铅浓度的妇女。”

10. “特发性震颤和血铅浓度之间的关系”由ED Louis, EC Jurewicz, LK Applegate, P Factor-Litvak, M Parides, L Andrews, V Slavkovich, JH Graziano, S Carroll, and A Todd,编写，

网址：<http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1241711&blobtype=pdf>



特发性震颤（ET）是一种神经性疾病，其特征是手和/或头部的动作性震颤。ET被认为是区别于与年龄有关的增强的生理性震颤。”

“在243个研究对象中，总的震颤评分和BPb [血铅]浓度呈正相关（Spearman’s  $r = 0.14$ ； $P = 0.03$ ）。”

“ET患者的血铅浓度比对照组的较高（平均值±标准差，分别为： $3.3 \pm 2.4$ 和 $2.6 \pm 1.6$ 微克/分升，中位数： $2.7$ 和 $2.3$ 微克/分升， $P=0.038$ ）。

“在这个病例对照研究中，我们发现ET患者的血铅浓度比对照组的较高。在调整了混杂变量因素后，高血铅浓度和ET的诊断之间的这种关联依然存在。该关系在散发ET中最强，也就是，那些无家族史的震颤，这表明铅作为一种毒物可能与没有遗传易感性的ET患者更有关系。”

“虽然我们的数据表明，ET和较高的血铅浓度之间有关联，我们必须谨慎对待这些数据的解释。单独的血铅浓度 $3.3$ 微克/分升就足以引起ET是不可能的。”

11. “产妇血铅水平与妊娠诱发高血压的风险。“EDEN”的群组研究“由Chadi Yazbeck, Olivier Thiebaugeorges, Thierry Moreau, Valérie Goua, Ginette Debotte, Josiane Sahuquillo, Anne Forhan, Bernard Foliguet, Guillaume Magnin, Rémy Slama, Marie-Aline Charles, Guy Huel.编写，“环境健康展望“在线2009年6月26日。<http://www.ehponline.org/members/2009/0800488/0800488.pdf>

“结果：妊娠高血压（PIH）被确诊有106例（10.9%）。年龄，胎次，体重增加，酗酒，吸烟习惯和补钙在高血压和非高血压的妇女之间是可以比较的。PIH患者的铅水平（ $2.2$ 微克/分升[ $0.11$ 微摩尔/升]

$SD1.4$ 微克/分升）显著的高于正常血压的患者的铅水平（ $1.9$ 微克/分升[ $0.09$ 微摩尔/升] $SD1.2$ 微克/分升）， $P=0.02$ ”

“讨论：我们发现妊娠高血压PIH调整后的风险，与妊娠中期孕妇血中铅浓度有关。这种风险在最高四分位数比较铅分布的最低四分位数要增加一倍.....我们发现，铅在妊娠高血压中可能有病因作用，即使在低水平的环境暴露中，表明让公共健康组织考虑降低孕妇中的“可接受的”血铅水平的上限，可能是适当的。目前这上限是 $10$ 微克/分升”。

12. “血铅水平与美国年轻成人中的重度抑郁症，恐慌症，和广泛性焦虑症”由Maryse F. Bouchard, David C. Bellinger, Jennifer Weuve, Julia Matthews-Bellinger,; Stephen E. Gilman, Robert O. Wright, Joel Schwartz and Marc G. Weisskopf编写，普通精神病学档案66卷（12号），2009年12月在：<http://archpsyc.ama-assn.org/cgi/content/abstract/66/12/1313>

“比较那些血铅水平小于 $0.7$ 微克/分升的人（在研究人群中最低的五分之一的血铅浓度），那些血铅水平超过 $2.1$ 微克/分升（最高的五分之一）的人，有 $2.3$ 倍增加的风险，满足DSM-IV标准，对于MDD[重度抑郁症]和有 $4.9$ 倍增加的风险，对于PD[恐慌症]。在排除当前吸烟者之后，风险升高至 $2.5$ 倍对于MDD和 $8.2$ 倍对于PD。”

“这些结果支持先前报道的情绪和焦虑症与较高的职业性铅暴露有关联和较不完整记载的与较低环境水平的铅暴露的老年男性有关联。目前的研究结果扩大这些观察到一般美国年轻成年人的入口。”

13. “血铅在当前可接受的水平可能会导致早产“由Mohsen Vigehe, Kazuhito Yokoyama, Zahrabigom Seyedaghamiri, Atsuko Shinohara, Takehisa Matsukawa, Momoko Chiba & Masoud





Yunesian编写，职业与环境医学，2011年3月，68期（3）卷，231-234。上网2010年8月26日  
网址：<http://oem.bmj.com/content/early/2010/08/26/oem.2009.050419.abstract>

“这项研究发现，分娩早产婴儿的母亲比较分娩足月婴儿的母亲有显著较高的血铅水平。逻辑回归分析显示增加血铅的浓度伴有增加早产的风险。还发现血铅水平与胎龄之间呈负相关关系。因此，当前的研究结果表明，升高血铅浓度，即使在“可接受的”的水平，可能是早产的风险因素。”

“目前的研究结果支持以前的发现，不良妊娠结局发生在血铅水平比目前”可接受“的水平还要低，虽然这项研究可能是第一个归咎早产于低血铅水平。（平均<5微克/分升）。”

14. “对成人铅暴露的医疗管理的建议”由Michael J. Kosnett; Richard P. Wedeen; Stephen J. Rothenberg; Karen L. Hipkins; Barbara L. Materna; Brian S. Schwartz; Howard Hu; and Alan Woolf编写，在“环境健康展望”，2007年115期（3）卷，463页。©2007 国家环境健康研究院，在线 2007年4月11日。<http://www.medscape.com/viewarticle/554718>

“去除个体的铅暴露，应被考虑来避免长期的健康风险，如果暴露控制措施经历较长时间里不能降低血铅浓度至<10微克/分升或者如果选定的医疗条件存在会增加继续暴露的风险。建议医疗监测对于所有铅作业工人，应包括季度血铅测量对于个体带有血铅浓度在10-19微克/分升之间，和半年血铅测量当持续的血铅浓度<10微克/分升。要建议孕妇避免职业的或者非职业的可导致血铅浓度>5微克/分升的铅接触。螯合剂可能在医疗处理高度暴露的成年人伴有症状性铅中毒时有辅助作用，但不推荐用于无症状个体伴有低血铅浓度。”

15. “铅的重量：在成人中衡量效果”由A. Spivey编写，环境健康展望，第115卷，第1页，2007年1月

“远未得到解决，斯比维伊的文章争辩说，铅的毒性是美国成年人健康的一个持续的问题。转移到减少铅的毒性来源，如汽车燃料已经减少了美国人口的血铅水平。然而口袋里还保留在非常高的水平，主要是通过职业暴露。此外，虽然目前的水平低于OSHA标准，新的研究表明，铅中毒发生的作用远低于这些标准。检测方法在过去的二十年有所改善；既提供铅是罪魁祸首的证据，也衡量其对健康的负面影响，特别是对心脏，肾脏和大脑。血压升高一直与血铅水平有紧密联系。铅也与高血压和肾脏损害挂钩。安吉拉认为，铅没有天然的生物学作用，所以应加以控制。”





## Chinese Translation of *AkzoNobel calls for coatings industry voluntary agreement to phase out lead*

### 阿克苏诺贝尔号召油漆行业形成自愿协议淘汰铅

[Original title: *When will paint makers agree to ban lead?* READ THIS ARTICLE IN ENGLISH BY SUBSCRIBING OR APPLYING FOR A FREE 4-WEEK TRIAL AT

<http://www.businessgreen.com/bg/analysis/2301351/when-will-paint-makers-agree-to-ban-lead> ]

21 Oct 2013, Jessica Shankleman, BusinessGreen, translated into Chinese by Dr Hugh Xin Xi Zhu, for publication by The LEAD Group (permission sought from Incisive Media, the UK-based publisher of BusinessGreen).

阿克苏 诺贝尔号召油漆行业要形成自愿协议从供应链淘汰有害化学物质



w w w . e g g p h o t o g r a p h y . c o m . a u

[原题：什么时候油漆制造商将同意禁铅？读这篇英语文章，可通过认购或申请一个免费的为期4周的试用在以下网址：<http://www.businessgreen.com/bg/analysis/2301351/when-will-paint-makers-agree-to-ban-lead> ]

2013年10月21日，由杰西卡 仙克里曼

编写，绿色商业公司，由修心禧朱翻译成中文，公布于铅集团公司网站

[www.lead safeworld.com](http://www.lead safeworld.com) 经精锐传媒，英国为基地的出版商绿色商业许可用中文发表。



铅可能会给红色，黄色和白色的油漆明亮的色调和比替代品更便宜使用，但关心的问题仍然是铅中毒对健康的风险，特别是在发展中世界。

由于联合国发起的一个星期的反对铅中毒的行动，多乐士油漆的制造商今天呼吁它的业界从他的供应链自愿禁止铅化合物。

一些公司已经开始研制的无铅替代油漆，但阿克苏诺贝尔认为它是世界上唯一的油漆公司有从它的产品中全面禁止铅。2011年，它生产出了最后的一滴含铅油漆，现在只有使用更安全的无铅替代品。

然而，该行业的其他公司至今拒绝完全淘汰铅，尽管与材料相关的证明健康风险 - 铅中毒已被指责为0.6%的全球疾病负担，而且据说导致每年600,000学习困难儿童的新发病例。本月初，国际油漆，油墨理事会（IPPIC）发表声明有效地称它正在努力遵守任何立法，但也不愿在这个问题上起带头作用。

欧盟已经步入正轨要从2015年6月起禁止所有铅化合物，在REACH化学品法规下，它被标注为“高度关注”的材料后。

但朱利安·亨特，法规事务经理阿克苏诺贝尔，认为公司应该采取更积极的措施，以达到领先于新的化学品的规则在全球生效之前。

上周，阿克苏诺贝尔写信给所有的贸易协会，作为它的一个成员，要求讨论自愿工业协议以淘汰铅的前景。此举包括写信给IPPIC和代表英国，欧洲和美国的油漆协会。

“作为油漆制造商，我们都有责任照顾那些接触到我们的产品和它们被使用的环境”，信中声明。“给定的有效替代品已经有了，我们不相信继续使用含有铅化合物油漆是符合本行业的油漆护理，产品管理或可持续发展的愿望的。因此我们认为在油漆里继续使用铅化合物是现在社会不能接受的。”

亨特告诉绿色商业，阿克苏诺贝尔公司的禁令已经每年从它的产品删除300吨铅化合物，加上一个全行业自愿禁令可能对全球健康产生重大影响。

“我们相信，如果世界上所有的公司跟着我们的例子，环境会从成百上千吨的铅保存下来，”亨特告诉绿色商业。

“我们正在说，我们想采取更积极的带头和表率。我们可以做到这一点相当快因为替代铅颜料和催干剂已经有了，你可以从供应商的货架上买到，供应商会告诉你如何调配它们，所以它不是火箭科学。所有的油漆公司有好的实验室化学家在他们的员工里，他们应该能够制定不使用的铅化合物在其中的产品。”

这种过渡的成本必然是全球禁止采用的主要障碍，因为更安全的铅基油漆替代产品往往更加昂贵。但亨特认为更清洁原料的价格会下降，如果整个行业的禁令被颁布。

阿克苏诺贝尔是世界上最大的涂料公司，但仍有待观察它是否能鼓励同业接纳它的无铅推动。自从写这封信，该公司表示它只收到一个响应 - 英国油漆协会表示将与它有关的成员协商关于这个提议。



# BOOK EXTRACT FROM: Local Heroes - Australian crusades from the environmental frontline

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Annandale, NSW Australia, 2002.

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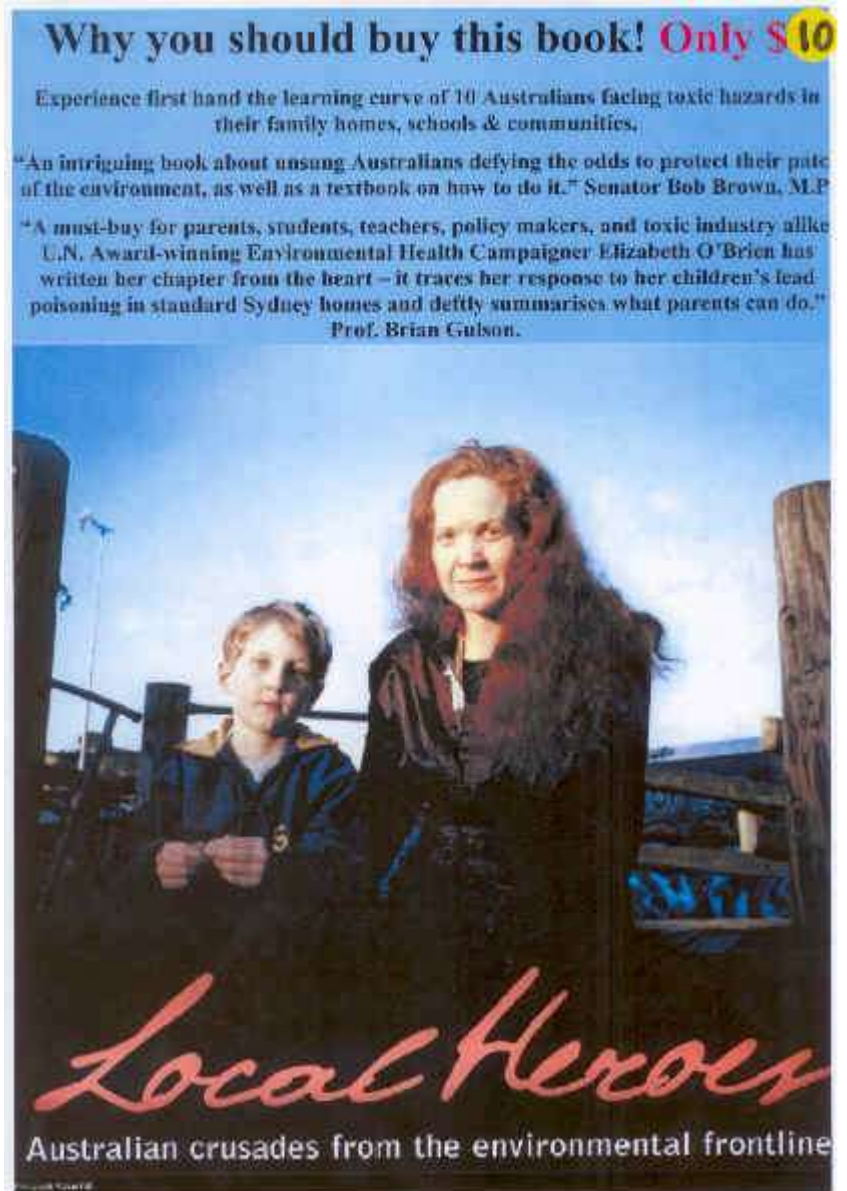
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# Chapter 1 - The LEAD Group: Responding to the Problem of Lead Contamination

*By Elizabeth O'Brien*

*'Every use of lead hurts someone, somewhere, some time.'*

- Elizabeth O'Brien, Coordinator

The LEAD Group, Sydney, May Day 1997

## Page 1

I am the parent of a lead-poisoned child. Historically, it is quite probable that, since the Industrial Revolution, the majority of young children have been lead poisoned. That is, the average blood lead level of children may well have exceeded 10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) - the definition of lead poisoning in the United States. When my youngest child was one year old and had a high level in his blood, we campaigned for the study<sup>1</sup> that found that 50% of the pre-schoolers who lived near the old Thomas Thoms plant in the inner-city suburb of Summer Hill, in Sydney, were also lead poisoned. In 1991, a group of us were so concerned about government inaction over lead contamination in inner Sydney that we formed The LEAD Group and set its aims; to eliminate childhood lead poisoning in Australia by the Year 2002, and to protect the environment from lead. This is the story of how I came to help establish The LEAD Group and of what it has been like to go from a concerned mother of a lead-affected child to a national activist and manager of a service aimed at solving lead problems.

## What's Wrong with Lead?

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The problem with lead is that in its most toxic forms - fumes and dust - it is mostly *invisible*. It contaminates every environmental medium - air, surface dust, soil, sediment, water and food; and every plant, animal and human on the planet is contaminated due to the use of lead in petrol. The average person walks around with about 10% of the lethal dose of lead in their body. By comparison, most people walk around with 1-2% of the lethal dose of DDT. Children are more likely to get lead poisoned than adults, because children put their fingers in their mouth and fingers carry minuscule particles of lead from dust or soil.

Very young children learn by putting their fingers in their mouth: it is part of healthy childhood development - and you would have to bind their hands to stop them from doing it. Young children and unborn babies are particularly susceptible to the effects of lead, as are the developing sperms and eggs in couples prior to conception. But anyone can be lead poisoned and millions of workers throughout the world are poisoned daily by the lead that is so cheap and readily available that its use can always be justified by industry. As many as 30% of the lead poisoned children in the United States today are thought to be poisoned by their parents working with lead and bringing home lead dust on their skin, hair, clothing, boots and kitbags. Even people who are not paid to work with lead and lead products get poisoned by lead, and we all buy leaded products and use, reuse, recycle, repair and dispose of them. During the mining, smelting and, to a lesser extent, secondary smelting (that is, recycling) of lead, people and the environment are poisoned and lead contaminated.<sup>2</sup>

So, which consumer products contain lead? The main lead products, for which worldwide consumption is increasing annually, are ammunition (shot and bullets) and lead acid batteries. Batteries take up 64% of world production of lead, and this figure is expected to rise to 70% with





the introduction of electric vehicles, which require three times the lead of a normal car battery. Nuclear power plants and uranium mines require tonnes of lead to function. Other leaded products, and some of the pathways for poisoning from them, include: automobile paint; industrial and marine paints, which can still contain lead today; solder used in the electronics industry and for plumbing (although the Australian Drinking Water Guidelines advise against this); lead copper alloys used in all modern plumbing; lead-stabilised PVC (and other) plastics used in many products (from mini-blinds, to stationery, to cladding for homes and in interiors of cars); cable sheathing; soldering of food cans (still 5% of the canned food market in Australia); leaded steel used in all modern car petrol tanks; many rolled or extruded products (from roof flashings to lead light); plus lead in chemicals, pigments, glass making and ceramics, and the contacts in light bulbs. When cars are 'recycled' for their metal content, the entire non-metal components go up in smoke and the resultant metal is simply reused as one product, not separated into its components.

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Zinc and copper smelting also give off emissions of lead and other heavy metals (for example, cadmium and arsenic) into the air, land and water. So, every zinc product (for example, galvanized iron) or copper product (for example, telephone cabling) you buy has contributed to someone's lead poisoning. Some toxic substances are synergistic - that is, the effect of the two metals together is greater than the sum of the effects of the two metals on their own. Mercury and lead are thought to be synergistic, so don't get or keep your mercury amalgam teeth fillings if you have ever been lead poisoned or likely to be so. We are surrounded by lead-poisoned people. The symptoms of lead poisoning are extremely common, and in most cases the cause goes unrecognized.

At the 'low' blood lead levels experienced in the general population in any industrialised, motorised society, lead contributes to reduced intelligence, learning difficulties such as attention deficit disorder (ADD), behavior problems, hearing impairment, infertility, minor birth defects, and raised blood pressure, which leads to a higher number of fatal strokes and heart attacks than the number of people killed on the roads in Australia every year.<sup>3</sup> The more lead, the worse the effects and the greater the range of symptoms. For people who work with lead or anyone who suffers a 'high' blood lead level, the results are more devastating: impotence in males, miscarriage in females, blindness, delinquency, aggressive mood swings, kidney failure, and possibly cancer. Certainly, at very high levels, lead causes coma, convulsions and death.

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Are you starting to think of who you know (or have heard about) who might be lead poisoned? Is it you? It's amazing the number of people that you talk to who have a family member who died of lead poisoning, especially when you consider that the vast majority of cases go undiagnosed. In 1993, a baby girl died in New Zealand from eating 8 square centimetres (about 1 square inch) of paint off her forty-year-old cot. The diagnosis came after the death. Every year in Australia, Aboriginal children and adolescents die of lead poisoning - they get it from sniffing leaded petrol. But the autopsy rarely attributes it to the leaded petrol - they might die of accidental causes, blood loss or self-immolation, because something went horribly wrong when they were high. Or they might have died of kidney failure or heart attack. The higher the blood lead level on admission to hospital of a petrol sniffer, the more likely the person is to leave in a box.

And then there is the environmental load. No organism on the planet needs lead in order to function. Lead is toxic to every organ in the body and to every organism on the planet. Lead is also the most studied toxic substance and the most widespread industrial contaminant. Where there



are other contaminants, there is almost always lead. Lead is a marker toxic substance. If we can do something to make the planet safe from lead, there is hope that we can do something to make it safe from other toxic substances. My argument is that lead can be a model for toxic use reduction.

### **Solutions to Lead Problems**

To make the world lead-safe for our children today will require a lot of cooperation and communication. I believe that childhood lead poisoning will be eliminated in Australia when everyone knows that lead is toxic, that it is everywhere, and that there are three components to every poisoning - the contamination of the local environment, the intake into the body, and the absorption from the gut, lungs or skin. By intervening at all three of these points in the pathway of a poisoning, we can make our children's lives safe. That is, by cleaning up our children's environment, by cleaning their hands and not adding lead to their air, and by ensuring that they consume regular, small, nutritious meals and have adequate iron, calcium, zinc, protein, vitamin C and pectin, and not too much high-fat fast food, we can prevent our own children being poisoned (or further poisoned).

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But hang on, what if the sources of lead contamination are constantly being replenished in our particular local environment and it is impossible to keep up with cleaning it up? What if a significant proportion of the cars on the road are still emitting lead from their exhausts, which settles on every surface your children touch, and adds to the weight of leaded dust in your roof void that may be slowly leaking into your living space, or that may one day be demolished and spread everywhere, or that may just collapse as ceilings sometimes do? What if the 3.5 million pre-1970 homes in Australia (which might include your neighbour's house or the local childcare centre) continue to have their old leaded paint dry-sanded or heat-gunned off intermittently?

What if the sum total of lead required for every consumer product which contains lead demands that more lead be mined in the world every year, and children live in the mining communities and around the smelters and lead recycling secondary smelters? If you had a running tap spreading water faster than you could mop it up, the solution would be to turn off the supply, wouldn't it? To replace all the lead in petrol with a safer alternative, such as is in LRP (lead replacement petrol), so that people who can't afford or don't want to buy a post-1986 car could immediately use unleaded petrol, would cost about the same as leaded petrol.<sup>4</sup> That is the same price that people are currently paying to the federal government in their leaded petrol tax. That tax (in excess of \$725 million has been collected to date<sup>5</sup>) could be used to pay for other lead-risk reduction programs. For example, just like leaded ceiling dust removal has added about \$10 million to the cost of the Sydney Aircraft Noise Insulation Project, people who live outside Sydenham in Sydney could have their ceiling dust removed by government grant, or at least a subsidy. And it could be made illegal to dry-sand or heat-gun old leaded paint. These instruments of contamination (heat guns and sanders) could be appropriately labelled with warnings about lead.

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Professional renovators could be regulated to have licences to do lead abatement work. The government could provide low-interest loans to owners to make pre-1970 buildings lead-safe, just like they currently give loans to ensure that heritage buildings and fences are painted the appropriate colours. Whole inner-city industrial suburbs could have lead-risk reduction programs in housing, paid for by the government.

Consumers could be educated (through labelling requirements, for example) about the cradle-to-grave impacts of the lead which they are purchasing in so many consumer products, so that they



could make decisions about whether they really want to be responsible for contamination of all those point-source (smelting and mining) communities and for consequent problems between concerned residents and the public relations machinery of industry. In the meantime, taxing the production of lead at the mines would ensure that, in future, it is not just the taxpayer who ends up paying for all the environmental and social costs of despoliation of the environment by mining and lead contamination from the manufacture, use or disposal of the products, but that these costs (externalities) are factored into the cost of products. That is, when you pay for a leaded product, you will be paying the true cost of the cradle-to-grave management of lead. These taxes could then be put towards preventive lead-risk reduction activities in the homes of smelter towns such as Port Pirie, Broken Hill, Boolaroo, Hobart and Port Kembla, and not just for those whose children have been poisoned.

Bureaucrats tell me, and *Choice* magazine seems to concur,<sup>6</sup> that consumers just want the cheapest product that will suit the purpose: they don't want to have to pay extra to ensure that government regulators are out there managing the product's toxic impacts or industry is paying for product stewardship. To me, it is all a matter of being informed. I know I would rather know the true cost of a car, for instance, so that I can determine its true affordability both to me and to society.

It is only when consumers start to make informed choices, and they 'consume thoughtfully' (or don't consume), that they truly use their 'consumer power'. Until then, they are being misled by the affordability of old houses, which are in truth 'toxic time-bombs', and of private transport. If one factored in the road accident deaths and injuries, the asthma attacks and respiratory deaths from particulates and the greenhouse effect, then it is clear that the car is already unaffordable.

### **The Founding of The LEAD Group**

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In 1990, uninformed and heavily pregnant, I went looking - with my husband and two children - for a bigger house to buy. The house we wanted had a view from the kitchen window of a chimney stack across the road. I listened to my body and to the 'head-stuff' that flashed through my mind. I heard a concern for the baby that was growing inside me. In our attempts to discover whether it would be safe to buy the house (it wasn't, so we didn't) my life was turned upside down. I became a parent by day and a campaigner by night. For five years since leaving primary teaching I had been attempting to be the best mother I could possibly be - reading to my children for two hours a day, from home-made books in their own style of language, illustrated with photographs of our life; networking with other mothers through breastfeeding and play groups; and founding a women's discussion group to recharge my batteries after spending all day tending to my children's every need. They were 'continuum concept' babies for whom crying was circumvented at every opportunity. It pained me when I couldn't work out what ailed them. I was connected to my children as though I was my children.

The full-on parenting of my first son was redoubled for the second son, who was born profoundly deaf, blind in one eye and with unknown sight in the other eye, with a heart murmur and suspected autism. I had been in contact with German measles at the play group when I was five months' pregnant. My new baby didn't make eye contact with me until he was seven months old. Our entire house became a playground for auditory, visual and motor stimulation, with weekly visits from an occupational therapist and a toy library. When I believed we were over the worst period-when he had gone from being developmentally delayed (being late to lift his head and to sit up), to being advanced (by walking at nine months, when he was declared not autistic), when his hearing had by a miracle developed and his speech had gone from backward to advanced with



constant speech therapy, and when we knew his other eye could see - then I was ready to have the daughter I had always wanted.

Almost precisely at the same time as my third son was born, in September 1990, I began to get passionate about lead. You see, we didn't buy the house, because the chimney stack belonged to a lead flashing manufacturing plant, and the soil in the backyard had twenty times more lead than the recommended level. And I remembered from my teaching days a blood lead survey of the children in the school at which I taught showed they all had high levels of lead. 'That's why they're all so stupid and so difficult to teach', one of the teachers told me. In my part-time campaigning I was able to get the then State Pollution Control Commission (SPCC, and now the Environment Protection Authority, or EPA) to convince the manufacturing plant to pay for further soil tests. In the meantime, we moved into an old house we figured was far enough away from the plant (less than a kilometer) to be safe. I then met the young mother who had just purchased the contaminated home, at a nursing mothers meeting. Together with a third woman who lived across the road from the plant, we co-founded The LEAD Group in time to be presented with the soil results. After the meeting at the plant, in which we were told that one house alongside the plant had fifty times the recommended level of lead in the soil, we were advised by the SPCC officer that they had no regulatory power to act on soil results, but that we should 'get the kids tested'.

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In September 1991, at the age of twelve months, my youngest (third) baby had a blood lead level of 31 µg/dL, my three-year-old son was 13 µg/dL and my five-year-old son was 14 µg/dL. The source was most probably a combination (as it nearly always is) of dust from the renovations carried out by the previous owners of our house, lead fallout from decades of leaded petrol use, and industrial sources in Sydney's inner west. The impact of these results was to provide endless motivation for me to become as much of a full-time campaigner as is possible with three small children. Having such a defenceless babe with a blood lead level three times the acceptable US level has unleashed in me infinite energy and passion for a less toxic world. No amount of money could buy such passion. The same passion is evident in my greatest lead campaign colleague, Theresa Gordon - a wonderful woman who grew up in the shadow of the Boolaroo lead smelter (see Chapter 3).

As I was later to discover through having the shed baby teeth of my children tested for lead, our eldest son was also badly affected as a toddler (we lived in an old inner-west house then, too), but my middle son was much less affected.

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Going straight from lying on the floor to getting up and walking at the age of nine months, as he did, had apparently saved him the many months of exposure at the crucial time when normal babies are crawling. For the first time I felt lucky to have an abnormal child. Since realising how insightful and cuddly he is, I feel lucky to have him full-stop. So, every night, when it is time for my eldest child, now at high school, to start doing his homework, talented and intelligent though he is, he simply doesn't have the functional learning behaviour to get on and attend to tasks. This to me is the worst aspect of 'low'-level lead poisoning - that it detracts from a child's ability to use the (still possibly high) IQ he is equipped with after it has been depleted by lead. Many people don't understand that lead doesn't make you dumb. Rather, it decreases IQ, so that a potential perfect genius becomes a frustrated smarter-than-average child, and a potential below average intelligence child becomes a socially dysfunctional one. The problems with the effects of lead are society-wide, and are not always recognizable in individuals.<sup>7</sup> The lead in children in Port Pirie, in South Australia (Australia's biggest lead smelter town), has doubled the number of children with





an IQ level below 82, which can lead to poor school performance, reading disabilities, problems with attention and fine motor skills, and anti-social behaviour.<sup>8</sup>

At the blood lead level my youngest son had, if he had not been tested, and had I therefore not been motivated to bring his blood lead level down, he would have been in the highest blood lead group in Port Pirie - that is, among the worst-affected 7% of children. It took me two years of bloody hard housekeeping and care (having to discover for myself what worked and what didn't) to get his blood lead level down to the national goal level. Many standard cleaning techniques simply make for higher blood lead levels, such as vacuuming with an ordinary vacuum cleaner rather than a special HEPA (High Efficiency Particulate Air) vacuum cleaner.

Though industry and government have presented housework as a necessary part of the solution to pollution, in my case it was dangerous. The many extra hours of housework gave me ample thinking time for campaigning. I typically did all my writing in the middle of the night while the floor towels were having the tracked-in dirt washed out of them, and I constantly had to balance my desire to just 'be' with my children, talking and reading with them, with having to clean up the always present lead dust that rains down on the little children in our cities. I was always motivated by the thought that if I campaigned hard enough, other children could have a lead-safe world and other parents would have more time to play with their babies. Whenever people ask me how my baby is now that he is ten, I tell them he is the most gorgeous little boy in the world and his personality will get him through anything. As a teacher, I know all about scripting children to perform to the best of their ability.

## **History of The LEAD Group in Action**

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Back in 1991, the new owner of the original contaminated house we almost bought put together a thirty-page submission which eventually led to a blood lead survey of Summer Hill, the results of which became one of the critical factors in the setting up of the NSW Lead Taskforce. This was a government taskforce headed by the EPA. The taskforce eventually had nine working groups under it which met from June 1993 to early 1994. At the working groups, industry, government and community representatives formulated over 200 lead recommendations for solving lead problems such as lead in children's blood, water and wastewater, petrol, air, paint, food, soil and dust, Broken Hill and education. I represented the community, as a volunteer, at over fifty of the meetings of eight of the working groups.

Just as had happened in the 1980s, when, in response to lobbying over the school blood lead survey, New South Wales led the country in introducing unleaded petrol in 1985, so the push to further reduce the amount of lead in leaded petrol, and to proactively reduce the amount of leaded petrol sold, came from New South Wales. By 1992, The LEAD Group had joined forces with Theresa Gordon from NO-LEAD (North Lakes Environmental Action Defence Group) in Newcastle and with Lynette Thorstensen, of Greenpeace, to go to Canberra and lobby the Minister for the Environment.

We won a 50-75% reduction over two years in the amount of lead coming out of car exhausts in the various states of Australia. We didn't win a phase-out date. We did win a reduction in the 'acceptable' level of lead in blood from 25 µg/dL, the previous 'level of concern', down to 10 µg/dL, which brought Australia in line with the US. In November 1993, the National Health and Medical Research Council (NH&MRC) set a national target for 1998, when all Australians should have a blood lead level less than 15 µg/dL, except if they worked with lead.<sup>9</sup> In order to achieve this target, strategies were to be out in place whereby 90% of pre-school children would have



blood lead levels below 10 µg/dL.<sup>10</sup> But why was it acceptable for 10% of pre-schoolers in Australia (approximately 100,000 children) to be lead poisoned by 1998? The target was obviously not achieved by the end of 1998 and it certainly wasn't achieved by the end of 1996 when the National Blood Lead Survey (the Donovan Survey) was published. The Donovan Survey found that 7.7% of children aged from one to four were above 10 µg/dL and 1.7% were above 15 µg/dL. So everyone ignored the fact that the specific target of zero children above 15 µg/dL had not been met, and decided that the lead problem was over because the 1998 target of less than 10% of children being above 10 µg/dL had been met two years early. The upshot of the Donovan Survey having tested far fewer children than the planned number that was necessary to do a reasonable statistical analysis, was that Donovan couldn't specify the prevalence of lead poisoning in rural areas as compared to urban areas. It turned out that the NH&MRC statement was also carefully worded so that no one was ever sure in what population the target was to be met.<sup>11</sup> Parents would of course hope that their immediate community would have fewer than 10% of children being lead poisoned (that is, above 10 µg/dL). But because the figures were reported as national averages, communities at particular risk - such as inner Sydney, which had 25% of children with higher lead levels - were ignored.

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After the NSW Lead Taskforce recommendations were flushed out (in late 1994) by further campaigning for and success in gaining a NSW Parliamentary Select Committee on Lead Pollution, New South Wales ended up with over 400 recommendations for how to clean up the most leaded state in Australia. One component of the federal government's \$4 million education campaign about lead involved funding The LEAD Group with \$150,000 to set up a national LEADLINE, a lead advisory service based on a freecall number, (1800 626 086). The number of enquiries to LEADLINE peaked at 650 in one month during its term, which ran from June 1995 to May 1996, by which time the federal government had changed from Labor to Liberal and the funding ceased. Apparently, we had solved the problem! The annual number of calls handled by the Lead Advisory Service (Australia) has increased steadily since 1995, such that in financial year (FY) 1999/2000 it was over 5500 calls.

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Thankfully, the NSW Labor government took over the freecall service and funded extra community education components to the value of \$300,000 for the first thirteen months of operation, from June 1996 to June 1997. We received \$290,000 for FY 1997/98 and \$236,000 for FY 1998/99. We hoped to receive more, so that we could achieve more, from the federal and state governments, as well as from corporate sponsorship, in FY 1999/2000. In fact, we received \$214,000 from the NSW government and \$15,000 from the federal government, and no corporate sponsorship, in FY 1999/2000. In FY 2000/2001 the Lead Advisory Service received \$109,000 in grants from the federal, NSW and South Australian governments. A proposal put to Pasminco to fund a community outreach program was unsuccessful. I am still the coordinator of The LEAD Group, though I was required to resign as president to take up the position of manager of the Lead Advisory Service (NSW). We hoped for a much more significant portion of the \$725 million lead petrol tax income from the federal government, and community outreach funding from the NSW government. In fact, so far, we have only received \$20,000 from government sources, \$2,000 from non-lead corporations and no funding from lead corporations for FY 2001-2002. So in 2002, despite the fact that the call level to the Advisory Service remains high, government and non-government funding sources have fallen drastically. Since 1993, The LEAD Group has published twenty-eight issues of our journal called *LEAD Action News*, and published numerous fact sheets. With volunteer labour and later government funding, our publications, telephone counselling service, media coverage,



and, more recently, information stalls at expos, plus workshops for parents and other community groups, have personally assisted in solving the lead problems of hundreds of thousands of Australian families. Yet in 1996, a national blood lead survey estimated that 75,000 pre-schoolers still had a blood lead level above the national goal. No one knows how many older children and adults in Australia are lead poisoned. On 1 December 1996, New South Wales made a blood lead level above 15 µg/dL a notifiable disease, so there should be some data in time. Data from a 1997 NSW state blood lead survey remains unpublished.

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Data from a blood lead survey undertaken in 1997 by the Environmental Centre in Broken Hill - a lead mining town in far west New South Wales - has highlighted the plight of the town's babies, many of whom are poisoned before they even crawl. The blood lead survey undertaken in 1998 by the Hunter Area Public Health Unit (PHU) in the area around Boolaroo - a lead smelter community near Newcastle - found that 43% of the children were poisoned, and the most recent published blood lead survey in Sydney (1996) found that 25% of the pre-schoolers within 10 kilometres of the central business district (CBD) are poisoned, as well as 9% of the pre-schoolers more than 10 kilometres from the CBD.<sup>12</sup>This last pool of Sydney children makes up by far the greater number of kids.

### **The Biggest Lead Problem is Cars**

Why are cars the biggest lead problem? Simply because 64% of the world's lead goes into lead acid batteries, and most of those batteries are for cars. But also because there is lead in petrol, and, believe it or not, there are still cars being made today which run on leaded petrol, because developing countries have still not introduced unleaded petrol. If Australia is anything to go on, there will be people complaining well into the future about the expense of switching from leaded to unleaded petrol for these now new cars. How leaded petrol was ever allowed to be sold in the first place is a rather unbelievable story that I came across in an anonymous article given to me by Greenpeace in 1992. The following story was later confirmed by an article published in *The Nation* on 20 March 2000.<sup>13</sup> Tetraethyl lead was developed in the early 1920s as an anti-knock additive by Thomas Midgley (who thus invented arguably two of the most dangerous substances ever conceived of, for he also invented chlorofluorocarbons). Within a few years of going into production, five workers were dead from lead poisoning, and thirty-five others of the production team of forty-nine were severely lead poisoned. The product was marketed by industry giants Standard Oil, General Motors and Du Pont. Some of the workers who died actually went mad and suicided - such are the dramatic effects of organic lead compounds on the brain. Of those workers, a company official said, 'These men probably went insane because they worked too hard'. Midgley accused the dead men of 'carelessness'. After 300 more cases of lead poisoning and another six deaths, the US Surgeon General questioned whether it was a public health risk to allow leaded dust to fall on the streets of cities. The lead industry giants held sway for nearly seventy years on that issue, by which time the weight of evidence was too much even for the by now much-practised tactics of 'buying' research and independent' experts, invoking the national 'economic health' to forestall regulation, and selling the concept that damage to people's health and to the environment is a necessary price of progress.

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In 1990, the Organization for Economic Cooperation and Development (OECD), comprising the world's twenty-four wealthiest nations, declared lead to be the top-priority chemical of five priority chemicals targeted for international cooperative risk-reduction activities. The November 1992 unpublished, restricted draft of the OECD's Lead Monograph declared (on page 12): 'Finally,



because the phasing out of lead gasoline has led to dramatic decreases in atmospheric lead levels, it is clearly the most important single measure for lead risk reduction.'

At around the same time, the US Agency for Toxic Substances and Disease Registry (ATSDR) published a list of the world's top twenty toxic substances. Lead was number one. And while some developed countries managed to phase out leaded petrol (for example, Japan in 1986, Canada in 1990, Austria in 1993, the United States in 1995, and New Zealand in 1996), others such as Australia have lagged behind, with a final phase-out date proposed to be 2002. However, the developing countries may soon catch up, now that the World Bank is economically behind them. According to the *New Scientist* of 27 July 1996 (page 13):

The World's biggest aid lender to developing countries now puts banishing lead from petrol as its number one priority for Third World transport investment ... There is, says the World Bank, 'no excuse for continuing to allow leaded fuels in any city.'

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In fact, a report from the United Nations Environment Programme and the OECD confirms that China's lead petrol phase-out, which began in 1997, was completed in 2000 - two years ahead of Australia.

So, now you can see why I have been passionate about getting rid of lead in petrol since 1992. But another change has taken place in my consciousness since then. It is called the Gaia Principle and it has a hold on me. I interpret the Gaia Principle to mean that something which damages any part of the planet damages me. Just like my children's crying still hurts me, so the despoliation of any country by mining wastes and the dumping of leaded waste in Third World countries, where neither workers' health nor the environment is adequately protected and children die recycling batteries, hurts all of us.

Apart from every old car and some new cars having lead in the petrol tank steel, the petrol, the wheel and seat-belt weights, the PVC interiors, the mirror backing paint, the radiator, possibly the exterior paint, and perhaps the panel beating, every car has at least 8 kilograms of lead in the battery, which needs replacing every couple of years. In 1996, Australia was exporting around one-third of all its lead acid batteries for recycling in Third World countries, in contravention of the Basel Convention which says that First World countries will not export contaminated waste to Third World countries.<sup>14</sup>

Moving on from the Gaia Principle you get to the concepts of cradle-to-grave management of lead (in recognition of the fact that there are billions of metric tonnes of mined lead already 'out there'), toxics use reduction, and finally to the concept of zero emissions mining, smelting and manufacturing processes. The only way forward is to accept where we are at and to take steps to improve the planet's health - for the sake of all of us. As you can see from the above, lead is a leader amongst toxic substances and the only one mentioned by name at the 1994 United Nations Commission on Sustainable Development (CSD) (I was there in New York lobbying). And again at the 1995 CSD meeting, specific actions for leaded petrol and other lead consumer products were the only specific chemical-risk reduction actions agreed at the meeting.

### **What You Can Do About Lead**

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To make a start, I advise that you finish reading this and then, if you have any questions, ring the wonderful staff at the Australia-wide Lead Advisory Service and together we can solve our lead problems (freecall: 1800 626 086; office tel: (02) 9716 0132).





## **Paint**

Ask your painter whether there is any lead in the pre-1970 paint they are about to remove or to prepare for repainting for you. If they answer, 'She'll be right, mate', hire another painter. If the painter happens to be your partner/friend, or they are the only painter around, move the children out of the house until you can be sure that a lead-aware clean-up has taken place (even if that means doing it yourself, though we don't recommend this if you are pregnant or within three months of possibly conceiving). The whole purpose of lead-aware paint removal is to protect humans and the rest of the environment from lead. Wear a respirator with dual filters (carbon and HEPA). For non-wood surfaces, wet paint removal techniques (wet sanding by hand, efficient vacuum extracted water abrasion, chemical stripping) are recommended, although chemical strippers and baths have been shown to leave some invisible lead behind in the wood which when sanded prior to repainting then creates lead wood dust.

## **Conception**

Both partners should have a blood lead level below 10 µg/dL fully four months before conception. Adequate zinc levels are extremely important to the health of the foetus in the months prior to conception, so have your zinc and lead levels tested from the same venous blood sample, and use zinc supplements if necessary.

## **Cars**

I would suggest that unless you make massive donations to environmental groups, or you are a campaigner, the greatest single environmental action that you will take in your life (apart from selling your mining shares) is to decide to live without buying a car. This is something you very much have to do before you decide where to live, unless you already live on a public transport route or you ride a bike. The second best environmental action you can take personally is to decide to reduce your car use. I would love to hear from anyone who has successfully done this in the city through the period of having small children. You are an environmental champion. Try to think of the car as a cigarette on wheels. If you remember that there are 300 toxic components in cigarette smoke, and more than 1,000 in petrol vehicle emissions, this will help you to remember to walk, cycle, roller-blade, ride-share and car-pool as much as possible, and to switch off your engine whenever you are parked, especially if you use leaded petrol. And as my twelve-year-old says, 'Get your car tuned - people are breathing', and 'Don't exceed the speed limit - it wastes petrol'.

## **House-buying/renting**

### **Page 17**

If buying or renting a pre-1970 house, assume it is lead contaminated, especially if someone else has just repainted it and there doesn't appear to be any problem.

## **Lead and the Future**

My vision is that through understanding the toxic effects of even just the lead component of cars, and adding that to the total deficit which private transport brings to the life of the planet, people will be persuaded to reduce their use of cars. Specifically, my vision is that in every year the number of new vehicles being registered in Sydney will be less than the number for the previous year. And for the number of vehicle kilometres travelled in that year to be less than the number on average for each vehicle in the previous year. In other words, that we see a turnaround in car use and that the city truly 'goes green'. There is a real need for people to campaign for the Roads and Traffic Authority (RTA) to not build any more roads and for the State Transit Authority



to get funding to build a decent public transport infrastructure. I envision that heaps of people will soon be wearing a sky-blue-coloured ribbon and joining the Blue Skies campaign against new motorway developments. And they will decide how much ride-sharing, use of public transport, cycling or walking is suitable for them right now, and set targets to do what they can to reduce their car use or their family's car use.

### **Page 18**

The 'three by three' cents per litre petrol tax currently being collected by the NSW government for road spending could go entirely and immediately over to public transport expenditure for the next three years minimum. Both the NSW Parliamentary Select Committee on Lead Pollution and the NSW Lead Taskforce reports<sup>15</sup> contained a recommendation that leaded petrol should be phased out in New South Wales by 1996. In the absence of a suitably early phase-out date of leaded petrol from the federal government, some refineries, such as BP and Shell, have led the way in phasing out lead petrol. The Western Australian government achieved a phase-out date of 1 January 2000.

Leaded petrol was finally phased out in Australia as at 1 January 2002 - or so we thought until we read about the exceptions allowing highly leaded Avgas to continue to be supplied to those remote Aboriginal communities with petrol sniffing problems, plus to motor car and motor bike sports and boasting associations. An article by Paul Toohey in the *Weekend Australian Magazine* of 24 - 25 November 2001 ('In your face - the town ruled by petrol sniffers') stated that six petrol sniffers had died in the past eighteen months in the South Australian town of Oukatja (population 400, including sixty sniffers), and: 'In the past two months, Avgas, or aviation fuel, has replaced super [leaded petrol] and unleaded at the town's only service station. It is unpopular with car owners because it blows out engine gaskets, but it is widely held that Avgas cannot be sniffed because it makes people violently ill. A glance at the cans of Oukatja's petrol sniffers quickly dispels this notion. With no petrol available, all the children's tins have a few centimetres of dirty blue liquid - Avgas - swilling around the bottom.' Despite this, a decision was made by the Hon. Amanda Vanstone on 23 January 2002 that Environment Australia would grant the Department of Health and Ageing the right to increase the number of remote Aboriginal communities to be supplied Avgas to thirty-three communities. Senator Vanstone's decision 'took into account recommendations from the Fuel Standards Consultative Committee. The Committee advised that Avgas was not attractive to petrol sniffers ...' The Committee does not seem to have advised that it is the lead in petrol that mostly kills sniffers.

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As of mid-2002 The LEAD Group is providing the web-based Global Lead Advice and Support Service (GLASS). With over 1,000 hits a week to our website ([www.lead.org.au](http://www.lead.org.au)) and an individualized information and referral email service accessible via a form on the website we have so far assisted people in forty-one countries covering an enormous range of lead-related issues. Attempts to gain funding for this service have so far been unsuccessful and it is currently run on voluntary labour. One of our original aims was to eliminate childhood lead poisoning by 2002. Obviously, this has not happened and so we have adjusted our aims to firstly include all age groups in the elimination of lead poisoning and extended the time to the optimistic date of 2012. Our thinking is based on the fact that behind every lead-poisoned adult is a lead-poisoned child.

Imagine a city where people take more trips on bicycles than in cars (Amsterdam is such a city), and where they don't have to wear respirators to do so. Imagine a city where your children can walk or ride their bikes home from school safely even when there is a major traffic thoroughfare between your home and the school. Imagine the centre of your city with no choking traffic fumes and no heavy particulate-laden air on still days, and no black dust in windowsills. Imagine if the



worst you had to put up with on the busiest road was the summer glare, and not the traffic dust in your eyes. Imagine major roads alongside which you would actually be content to breathe deeply, to centre yourself and say, 'This is my chosen environment and I feel healthy in it'. Imagine being able to see blue skies to the horizon every sunny day, everywhere you look.

#### **Page 195**

**Endnote 1.** M.Fett, M. Mira, J.Smith, G. Alperstein, J. Causer. T. Brokenshire. B. Gulson and S. Cannata, 'Community prevalence survey of children's blood lead levels and environmental lead contamination in inner Sydney', *Medical Journal of Australia*, vol. 157, 1992, pp. 441-5.

**Endnote 2.** In 1992 there were approximately 12,000 people working in the Australian lead industry (e.g. mining and smelting) and countless others who work with lead every day. Some of them die without ever properly recognizing lead as a danger. They die of strokes or heart attacks brought on by the rise in blood pressure that lead causes. See, for example, Joel Schwartz et al., *Costs and Benefits of Reducing Lead in Gasoline: Final Regulatory Impact Analysis Report from Office of Policy Analysis US Environmental Protection Agency*, February 1985 (especially Chapter 5, 'Health Benefits of Reducing Lead: Adult Illnesses Related to Blood Pressure')

**Endnote 3.** Julian Cribb, 'Toxic deaths overtake road toll', *The Weekend Australian*, 8 September 1993, p.3

**Endnote 4.** See 'Leaded Petrol to be Phased out by 2002', Media Release by Senator Robert Hill, Minister for Environment and Heritage, 15 March 2000, p. 1.

**Endnote 5.** Leaded Petrol Excise Figures, March 1994 to January 2000. Data available from Federal Department of Industry, Science and Resources.

**Endnote 6.** Australian Consumers Association, advertising brochure, 1997.

**Endnote 7.** There are several thousand references documenting the reduction in IQ caused by lead, but my favourite is by Professor Herbert Needleman, *Human Lead Exposure*, CRC Press, Boca Raton, Ann Arbor and London, 1992.

**Endnote 8.** See *Lead Safe: A Guide for Health Care Professionals*, NSW Lead Education Program, Lead Reference Centre, Social Change Media, 1997, p.8; Anthony J. McMichael, Peter A. Baghurst, Neil R. Wigg, Graham V. Vimpani, Evelyn F. Robertson and Russell J. Roberts, 'Port Pirie Cohort Study: Environmental exposure to lead and children's abilities at the age of four years', *New England Journal of Medicine*, vol. 319, no. 8, 1988, pp. 468-75.

**Endnote 9.** G. Alperstein, R. Taylor and G. Vimpani, *Lead Alert: A Guide for Health Professionals*, Commonwealth Environment Protection Agency, 1994.

**Endnote 10.** *Ibid.*, p.6

**Endnote 11.** The exact words read: At its meeting on 3 November 1993, NHMRC set target dates for the reduction of lead in all Australians to less than 15 µg/dL (0.72 µmol/L) by the end of 1998, with the exception of occupational exposure. Strategies in place to achieve this first target should be such as to result in blood lead levels in 90% of children between 1-4 years below 10 µg/dL (0.48 µmol/L by the end of 1998).

**Endnote 12.** M. Mira, J. Bawden-Smith, J. Causer, G. Alperstein, M. Karr, P. Snitch, G. Waller, and M. Fett, 'Blood lead concentrations of pre-school children in central and southern Sydney', *Medical Journal of Australia*, vol. 164, 1996, pp. 399-402.

**Endnote 13.** See Jamie Lincoln Kitman, 'The secret history of lead', *The Nation*, 20 March 2000. Full text available at [www.thenation.com](http://www.thenation.com) in Archives.



**Endnote 14.** See 'Lead Overload: Lead Battery Waste Trade and Recycling in the Philippines', A Greenpeace Report, August 1996, p. 1.

**Endnote 15.** NSW Lead Management Action Plan 1994, available free from the NSW Pollution Line, tel: 131 555. [NB: As of January 2014, this reference is out of print but the Strategies from it have been web-published by The LEAD Group Inc, in *LEAD Action News volume 14 number 2* (see next article).]

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## **Strategies of the *NSW Lead Management Action Plan*, Nov 1994, by the NSW Government Lead Taskforce**

### **Core Strategies of the Lead Management Action Plan**

#### **Establishment of a Lead Reference Centre**

**Strategy 1.** Establishing and resourcing a Lead Reference Centre (**Strategy** implementation: NSW Government, co-ordination by the EPA).

#### **Establish Environmental Lead Centres in Point-source Communities**

**Strategy 2.** The establishment of community Environmental Lead Centres in point-source communities where a significant lead contamination problem has been found to exist and where the management strategy has identified that abatement actions should be implemented. The functions of the Environmental Lead Centres would be:

- to develop and implement problem-specific lead management strategies
- to develop protocols and action plans to resolve local issues
- to develop, in conjunction with the proposed Lead Reference Centre, targeted education material
- to provide an interface with the local community.

These Centres would be established where environmental and health investigations have identified a specific need to manage exposure to community lead.

(**Strategy** implementation: NSW Government, co-ordination by NSW Health and the EPA; NSW Government to seek joint funding from industry).

#### **Lead In Air**

##### **Identification of Problem Areas**

**Strategy 3.** Undertaking source emission inventories. Estimates of emission rates from sites, which produce or incorporate lead products should be undertaken and updated regularly. The information should be included in the State of the Environment Report.

(**Strategy** implementation: Industry, with emission inventory design, with the co-ordination and collation of results for incorporation into the State of the Environment Report being undertaken by the EPA)

**Strategy 4.** Undertaking blood lead sampling of high-risk populations to determine if the lead exposure pathways are impacting on community health.

(**Strategy** implementation: NSW Health in association with the Commonwealth EPA and the NHMRC. Co-ordination and strategy development to be undertaken by NSW Health)





## **Control of Fugitive and Point-Source Emissions**

**Strategy 5.** Develop management strategies to address point sources with high emission rates. Issues to be incorporated into the management **Strategy** includes:

- fugitive emissions
- regular stack emissions testing for factories (testing rates should vary depending on emission rates).
- public access to monitoring data and information contained in licence conditions

(**Strategy** implementation: Industry, co-ordinated by the EPA)

**Strategy 6.** Develop management strategies to control non-point source emissions such as:

- the removal of lead based paints from public structures
- demolition of buildings

(**Strategy** implementation: Australian Institute of Environmental Health, local councils; EPA to produce guidelines)

## **Education**

**Strategy 7.** Develop specific education material for high-risk communities which can be incorporated into a broad lead education campaign.

(**Strategy** implementation: Lead Reference Centre with input from existing Environmental Lead Centres and appropriate organisations)

**Strategy 8.** Develop information sheets to distribute to exposed communities on practical risk reduction techniques for intercepting exposure pathways within the home environment.

(**Strategy** implementation: EPA, Health; co-ordinated by the Lead Reference Centre)

**Strategy 9.** Provide ready access to information and strategies to the community. This should be undertaken as part of the broad strategy to be developed by the Lead Reference Centre

(**Strategy** implementation: Lead Reference Centre, Environmental Lead Centres)

## **Review of Standards**

Objective:

To review standards and monitoring protocols to determine the adequacy of these standards to protect the community at the new NHMRC goal for population blood lead levels.

**Strategy 10.** Request that the NHMRC review the national goal for ambient air lead levels and determine, through risk assessment, if it enables the achievement of the new blood lead goals for populations where exposure to lead is high.

(**Strategy** implementation: NHMRC with assistance from state health and environment agencies; co-ordinated by the EPA and the Lead Reference Centre)

**Strategy 11.** Request that the NHMRC, in conjunction with ANZECC, establish a monitoring protocol for taking samples to determine compliance with the NHMRC goals and objectives.

(**Strategy** implementation: NHMRC with assistance from state health and environment agencies; co-ordinated by the EPA and the Lead Reference Centre)

## **Lead in Broken Hill – Incorporates Strategies for North Lake Macquarie and Port Kembla.**

### **Strategy Management**



**Strategy 12.** Establish the Broken Hill Environmental Lead Centre to co-ordinate the implementation of the short-term strategy and to provide a prominent interface with the Broken Hill community.

(**Strategy** implementation: NSW Government through NSW Health to establish the Broken Hill Environmental Lead Centre)

**Strategy 13.** Employ appropriate professional and support staff, including an office manager, scientific officers, clerk of works and technicians to implement the strategy.

(**Strategy** implementation: Relevant authorities such as NSW Health, the EPA and the local council to establish the terms of reference for the Broken Hill Environmental Lead Centre and to employ appropriate staff)

### **Blood Lead Surveillance**

**Strategy 14.** Provide trained community nursing staff to undertake blood lead monitoring.

**Strategy 15.** Establish clinic facilities within the Environmental Lead Centre.

**Strategy 16.** Offer routine testing for all pre-school children and newborn babies.

**Strategy 17.** Target all children under five years of age in Broken Hill for inclusion in the blood lead screening program

**Strategy 18.** Monitor all children with high blood lead levels

**Strategy 19.** Evaluate the effectiveness of interventions used to lower blood lead levels.

(**Strategy** implementation: All strategies will be implemented by the Broken Hill Environmental Lead Centre)

### **Management Response**

**Strategy 20.** Remediation and/or abatement of lead contamination in the home environment of children identified as having high blood lead levels. The necessary equipment required to undertake the investigation and remediation or abatement work will be provided to undertake this strategy.

**Strategy 21.** Provide emergency housing for families of children with very high blood lead levels. This housing should be provided until their home environments have been remediated or their blood lead levels have stabilised.

(**Strategy** implementation: All strategies will be implemented by the Broken Hill Environmental Lead Centre)

### **Community Liaison and Education**

**Strategy 22.** Provide a full time community education officer to develop specific education programs to service the needs of the local community. Effective programs will need to evolve with the implementation and findings of the short-term strategy.

**Strategy 23.** Liaise closely with the Lead Reference Centre to ensure the wide distribution of education material developed in Broken Hill and which is of relevance to other statewide lead issues.

(**Strategy** implementation: All strategies will be implemented by the Broken Hill Environmental Lead Centre)

### **Evaluation**



**Strategy 24.** Evaluate the remediation or intervention programs undertaken at the homes of children with high blood lead levels. Assess the effectiveness of the interim intervention remediation protocols.

(**Strategy** implementation: Broken Hill Environmental Lead Centre)

#### **Development of Comprehensive Risk Reduction Strategies North Lake Macquarie**

**Strategy 25.** Employment of a person to assess and co-ordinate all projects undertaken in the area and to assess all available data on the extent of the lead contamination.

(**Strategy** implementation.. Co-ordinated by the EPA)

As indicated necessary by the implementation of strategy (1) undertake the following:

**Strategy 26.** Review the function of the existing Environmental Health Centre and augment these functions if necessary.

(**Strategy** implementation: Undertaken by a consultative committee incorporating government, community representatives and industry representatives)

**Strategy 27.** Develop information for the community giving clear and effective advice on how to intercept exposure pathways and minimise the impact of lead.

(**Strategy** implementation: Undertaken by the Environmental Lead Centre with assistance from the Lead Reference Centre and relevant authorities)

**Strategy 28.** Develop and implement a comprehensive education strategy

(**Strategy** implementation: Undertaken by the Environmental Lead Centre with assistance from the Lead Reference Centre and relevant authorities such as Dept of School Education)

#### **Further Reduce Point-Source and Fugitive Emissions North Lake Macquarie**

**Strategy 29.** Continue and enhance the co-operative effort between industry and the regulating authorities to investigate point source and fugitive emissions and to reduce these emission rates where ever possible.

**Strategy 30.** To implement a staged and targeted reduction program based on the findings of the above investigations.

(**Strategy** implementation: to be undertaken by the company implementing a program developed in consultation with the EPA and the community)

#### **Quantification of the Lead Issue - Port Kembla**

**Strategy 31.** Development and implementation of an investigation program to determine the status of environmental contamination and the consequent effect on public health in the vicinity of the Port Kembla smelter.

(**Strategy** implementation: a multidisciplinary team incorporating NSW Health, the EPA, industry and local government. strategy development and co-ordination to be undertaken by NSW Health)

**Strategy 32.** Develop an Action Plan for the management of lead contamination issues which is based on the findings of the investigation program. The Action Plan could incorporate the establishment of an Environmental Lead Centre if appropriate and the development of an education strategy.

(**Strategy** implementation: a multidisciplinary team incorporating NSW Health, the EPA, industry and local government strategy development and co-ordination to be undertaken by NSW Health)



## **Determination of the Lead Emission Rates from the Smelter - Port Kembla**

**Strategy 33.** Establish emission rates for fugitive and point source emissions from the smelter by undertaking a comprehensive audit of the plant.

(**Strategy** implementation: Fugitive and point-source emission rates from the smelter should be established by the company. The EPA should be responsible for ensuring that this action is undertaken)

## **Lead In Children's Blood**

### **Surveillance**

Objectives:

To describe the distribution of blood lead levels in NSW children and characterise risk factors associated with elevated blood lead levels.

**Strategy 34.** Conduct a random sample blood lead survey of children living in NSW.

(**Strategy** implementation: developed and funded by CEPA, initiated and undertaken by NSW Health)

**Strategy 35.** As part of the blood lead survey include a questionnaire on potential risk factors for elevated blood lead levels.

(**Strategy** implementation: NSW Health)

**Strategy 36.** Compare the costs and the results of blood lead levels obtained through hospital based surveillance with the levels obtained by a community based survey (the gold standard).

(**Strategy** implementation: NSW Health)

### **Quality Control**

**Strategy 37.** Develop blood sampling guidelines based on Australian Standard 2636 for distribution to general practitioners, paediatricians and other health care workers who are likely to carry out blood lead testing.

(**Strategy** implementation: NSW Health).

**Strategy 38.** Develop national reporting guidelines for pathology laboratories undertaking blood lead testing. The guidelines could be included as part of the Australian Standard for blood lead analysis (AS 4090.1).

(**Strategy** implementation. Developed by NSW Health and Standards Australia)

### **Education**

**Strategy 39.** Develop and disseminate guidelines for health care workers.

(**Strategy** implementation: Liaison between the NSW Government and the Commonwealth to be undertaken by the Lead Reference Centre in conjunction with NSW Health)

**Strategy 40.** Develop lead education materials for targeted groups within the community.

(**Strategy** implementation: Lead Reference Centre)

### **Evaluation**

**Strategy 41.** Establish a blood lead surveillance system based on either:

- repeated community surveys or





- hospital based opportunistic surveys.

(**Strategy** implementation: NSW Health with co-operation from the Lead Reference Centre)

## **Lead Education**

### **Knowledge**

**Strategy** 42. Develop broad education strategies using a low level media campaign which provides information on the sources of lead contamination and ways of minimising exposure to these sources.

**Strategy** 43. Develop strategies for the wide distribution of general information to specific target groups (eg pre-1986 car users and parents of young children).

**Strategy** 44. Develop distribution strategies for general information to broad target groups (eg information on lead paint issues).

**Strategy** 45. Print lead education material in a range of community languages.

(**Strategy** implementation: All of these strategies will be developed by the Lead Reference Centre with input from relevant agencies. In specific instances (such as the development of education material on detailed health issues), it will be more appropriate for individual agencies to develop the education material. In these cases the Lead Reference Centre will be responsible for identifying the agency and the education message.)

### **Development of Broadly Targeted Community Education Material**

**Strategy** 46. Promote the use of unleaded petrol among those people who drive cars manufactured before 1986.

**Strategy** 47. Distribute pertinent lead information to pregnant women through the Blue Book System.

**Strategy** 48. Distribute lead in paint information kits through paint retail outlets and local councils.

**Strategy** 49. Distribute a general lead information kit for parents of children less than five years old through childcare and pre-school centres.

**Strategy** 50. Distribute information to child education centres on pertinent lead issues including the identification and management of lead exposure pathways.

(**Strategy** implementation: All strategies will be implemented by the Lead Reference Centre or by a more appropriate agency identified by the Lead Reference Centre)

### **Development of Training and Education Programs**

**Strategy** 51. Develop in service training modules for childcare providers.

**Strategy** 52. Develop relevant curriculum material for incorporation into TAFE training courses.

**Strategy** 53. Incorporate information on lead into the appropriate syllabuses of the relevant key learning areas of the NSW K-12 curriculum.

**Strategy** 54. Develop teaching/learning units for NSW schools where lead content is appropriate to the syllabuses.

**Strategy** 55. Incorporate relevant lead education material into courses for medical practitioners and childcarers.



(**Strategy** implementation: Lead Reference Centre in co-operation with the Board of Studies, Department of School Education, non-government systems and schools, the TAFE Commission and appropriate child care organisations)

**Strategy 56.** Training of public and community health professionals about lead issues

(**Strategy** implementation: NSW Health with the assistance of the Lead Reference Centre)

#### **Development of Specifically Targeted Community Education Material**

**Strategy 57.** Develop an information booklet for parents of children affected by high blood lead levels.

(**Strategy** implementation: Lead Reference Centre with the assistance of relevant authorities; co-ordinated by the Lead Reference Centre)

**Strategy 58.** Develop and augment education strategies for point-source communities including Broken Hill, North Lake Macquarie and Port Kembla (in some instances this will necessitate prior work to be undertaken to identify the extent and characteristics of the problem and to develop and evaluate site specific management strategies).

(**Strategy** implementation: Lead Reference Centre and the Environmental Lead Centres if required, co-ordinated by the Lead Reference Centre and the EPA)

**Strategy 59.** Develop information kits outlining exposure routes and exposure management strategies for people whose homes are affected by lead paints or lead from vehicle emissions.

(**Strategy** implementation: Environmental Lead Centres where these exist in conjunction with relevant agencies. Lead Reference Centre to incorporate information into the education **Strategy**)

**Strategy 60.** Assess the impact and suitability of the DEST Medical Practitioners Kit and identify follow –up actions if necessary.

(**Strategy** implementation: NSW Health)

**Strategy 61.** Review the lead education program in the context of the needs of the Aboriginal community

(**Strategy** implementation: the Lead Reference Centre with the assistance of an appropriate liaison committee)

#### **Development, Co-ordination and Dissemination of Education Material**

Objectives:

To develop, co-ordinate and conduct lead education strategies as well as to assist in the development of education strategies by other government and non-government bodies.

To ensure that information messages are developed consistently and, through a comprehensive distribution strategy, to ensure that the development messages reach target audiences.

**Strategy 62.** Development of relevant educational material by the Lead Reference Centre and responsible agencies

(**Strategy** implementation: Lead Reference Centre with the assistance of relevant agencies)

**Strategy 63.** Review education and training procedures for primary lead industry workers

(**Strategy** implementation: the WorkCover Authority)



**Strategy 64.** Review and assist the development of lead education material produced for local council implementation.

(**Strategy** implementation: the Australian Institute of Environmental Health)

### **Lead In Food**

#### **Regulation**

**Strategy 65.** Incorporate any amendments to the Australian Food Standards Code made by the National Food Authority into NSW legislation.

(**Strategy** implementation: NSW Health)

#### **Surveillance**

Objectives:

To increase surveillance of lead levels in imported foods.

**Strategy 66.** Review current testing procedures for imported foods as undertaken by the Australian Quarantine and Inspection Service (AQIS)

(**Strategy** implementation: ACIS, NSW Health to liaise with the Commonwealth Department of Human Services and Health)

**Strategy 67.** Survey lead levels of uncovered food at roadside stalls and market places located on high traffic density roads.

(**Strategy** implementation: Public Health Units, NSW Health to write protocol)

#### **Education**

**Strategy 68.** Develop and disseminate information about lead and food preparation and nutrition.

(**Strategy** implementation: Lead Reference Centre with the assistance of NSW Health)

**Strategy 69.** Provide information on ways to minimise lead exposure from food sources as well as cooking, storage and serving utensils.

(**Strategy** implementation.. Lead Reference Centre with the assistance of NSW Health)

### **Lead In Paint**

#### **Information and education material**

**Strategy 70.** Develop appropriate materials and guidelines on paint containing lead which is targeted at do-it-yourself renovators, building industry professionals, architects, painters and renovation contractors.

(**Strategy** implementation: Lead Reference Centre with assistance from relevant authorities)

**Strategy 71.** Provide information and advice for tenants of rented accommodation (public and private) on the dangers of leaded paint.

(**Strategy** implementation: Department of Housing with the co-operation of the Lead Reference Centre)

#### **Augmentation of administrative and regulatory control**

**Strategy 72.** Review the Standard for the Uniform Scheduling of Drugs and Poisons to reduce the permissible lead concentration of all paints except zinc based paints as defined by Australian Standards AS 2105 and AS 2204.



(**Strategy** implementation: NHMRC and NSW Health, co-ordinated by the Lead Reference Centre and the Government Paint Committee)

**Strategy 73.** Extend the existing prohibitions for the use of First Schedule paints under the Uniform Paint Standard to include industrial buildings and structures, mines and oil terminals, food and drink preparation equipment and utensils and small-scale automotive repair work.

(**Strategy** implementation: NHMRC (NSW Health to adopt into state legislation) in consultation with the Government Paint Committee and with reference to the recommendations of the Lead in Paint Working Group Report).

**Strategy 74.** Develop regulations for contractors removing lead based paints from industrial structures to be registered and develop a code of practice for such contractors.

(**Strategy** implementation: WorkCover Authority, co-ordinated by the Lead Reference Centre and the Government Paint Committee)

**Strategy 75.** Develop regulations for contractors removing lead based paints from large buildings such as factories, office blocks and warehouses, to comply with a code of practice.

(**Strategy** implementation: WorkCover Authority, co-ordinated by the Lead Reference Centre and the Government Paint Committee)

**Strategy 76.** Establish and maintain a register of tradespeople who work on residential buildings and who have completed relevant training courses on lead paint issues.

(**Strategy** implementation: Master Painters, Decorators and Signwriters Association)

**Strategy 77.** Adopt under the Commonwealth Trade Practices Act Australian Standard 1647 to control the levels of heavy metals in imported toys.

(**Strategy** implementation: Department of Consumer Affairs, Commonwealth State Consumer Products Advisory Committee)

**Strategy 78.** Review monitoring surveillance for imported toys to ensure compliance with AS1647.

(**Strategy** implementation: Department of Consumer Affairs, Commonwealth State Consumer Products Advisory Committee)

**Strategy 79.** Direct all Government departments and agencies to use Government Paint Committee (GPC) Specifications for all painting work, to use GPC approved contractors for the removal of First Schedule paints and to comply with the proposed Australian Standard code of practice for the removal of paint containing lead.

(**Strategy** implementation: all Government departments)

**Strategy 80.** Review the Waste Management Act to determine:

- the applicability of extending throughout NSW the current metropolitan requirements for the registration and licensing of hazardous waste generation and disposal
- the feasibility of establishing and operating regional hazardous waste collection and storage centres for the disposal of lead containing waste.

(**Strategy** implementation: EPA, Waste Service and local authorities)

#### **Development of standards**

**Strategy 81.** Develop a code of practice for the removal and disposal of lead based paints from industrial applications.





(**Strategy** implementation: Standards Australia, co-ordinated by the Lead Reference Centre)

**Strategy 82.** Develop a code of practice for the removal and disposal of lead based paints from industrial, commercial and residential buildings.

(**Strategy** implementation: Standards Australia, co-ordinated by the Lead Reference Centre)

**Strategy 83.** Amend Australian Standard AS 2311 (Painting of Buildings) to call up the proposed code of practice for commercial/residential/institutional applications.

(**Strategy** implementation: Standards Australia, co-ordinated by the Lead Reference Centre)

### **Development of training programs**

Objective:

To ensure that tradespeople working in areas where there is a potential to increase the risk of lead exposure to children (eg in houses and schools) undergo training in using safe lead removal techniques which minimise the generation of lead bearing dusts.

**Strategy 84.** Incorporate topics into trade courses on lead related issues which are based on the proposed Australian Standard codes of practice discussed earlier to control lead in paint.

(**Strategy** implementation: TAFE in co-operation with the Lead Reference Centre)

**Strategy 85.** Develop short courses for already qualified tradespeople on lead related issues which are based on these codes of practice. These trained tradespeople will be incorporated into the register to be maintained by the Master Painters, Decorators and Signwriters Association.

(**Strategy** implementation: TAFE in co-operation with the Lead Reference Centre)

### **Lead In Petrol**

#### **Information and education**

Objectives:

To make as many motorists as possible aware of the possibility of using unleaded petrol in pre-1986 vehicles.

To make as many motorists as possible aware of the dangers of lead in leaded petrol to children's health.

**Strategy 86.** Continue to support the Federal Government's "Take the Step" campaign.

(**Strategy** implementation: CEPA and state environment departments)

**Strategy 87.** Widely distribute the list of pre-1986 vehicles which can use unleaded petrol without engine modification.

(**Strategy** implementation: distribution strategies to be investigated by the Lead Reference Centre)

**Strategy 88.** Include information on lead in vehicle maintenance programs and on awareness programs on vehicle emissions.

(**Strategy** implementation: Lead Reference Centre)

**Strategy 89.** Obtain agreement between the EPA, NSW Health and petrol retailers on wording for a sticker to be displayed on leaded petrol bowsers.

(**Strategy** implementation: EPA, NSW Health, petrol retailers, coordinated by the Lead Reference Centre)

### **Augmentation of Administrative and Regulatory Control**



**Strategy 90.** Gain industry agreement to relabel "super" petrol as "leaded" as soon as possible.

(**Strategy** implementation: Australian Institute of Petroleum and other appropriate organisations, co-ordinated by the EPA)

**Strategy 91.** Amend the Clean Air Regulations to take account of the use of other possible fuel additives if this becomes necessary.

(**Strategy** implementation: ANZECC, co-ordinated by the EPA)

**Strategy 92.** Develop national fuel standards which include efficiency and emissions standards.

(**Strategy** implementation: coordination by ANZECC)

### **Lead In Soil And Dust**

#### **Establishment of Lead Risk Status in NSW**

**Strategy 93.** Develop and undertake a lead emissions inventory on a state-wide basis. The inventory should be updated on a regular basis (frequency determined by the emission rate). This information should be included in the State of the Environment Report.

(**Strategy** implementation.. Undertaken by the EPA with the assistance of appropriate authorities, industry and the Lead Reference Centre.)

**Strategy 94.** Develop and assess techniques for removal of lead containing dust from exterior and interior surfaces.

(**Strategy** implementation: Environmental Lead Centres, where these exist, with the Lead Reference Centre developing and modifying education material for wider usage)

**Strategy 95.** Collation of all available data to identify areas of risk from lead exposure

(**Strategy** implementation: EPA, through an emission inventory and roadside and urban lead studies)

**Strategy 96.** Correlate blood lead data with the above environmental data to determine an accurate picture of community lead hazard.

(**Strategy** implementation: NSW Health with assistance from the Environmental Lead Centres where these exist. To be co-ordinated with the information obtained from undertaking blood lead investigations (see section 3.5)

### **Education**

**Strategy 97.** Establishment of a Lead Reference Centre to develop and disseminate education materials on reducing the lead hazard and to provide a lead advisory service for the community,

(**Strategy** implementation: NSW Government)

**Strategy 98.** Development of self assessment-style exposure risk identification guides.

(**Strategy** implementation: EPA, NSW Health and the Environmental Lead Centres where these exist, co-ordinated by NSW Health and the Lead Reference Centre)

**Strategy 99.** Develop information guidelines which clearly outline risk reduction actions that can be implemented by home owners, schools, play centres and other target groups where the exposure to lead may be high.

(**Strategy** implementation: Lead Reference Centre with input from relevant agencies and Environmental Lead Centres where these exist)



**Strategy 100.** Assessing and modifying where necessary, information developed by community Environmental Lead Centres as well as from other national and international studies on risk reduction and abatement strategies.

(**Strategy** implementation: Lead Reference Centre with assistance from relevant agencies)

**Strategy 101.** Testing of domestic and industrial vacuum cleaners to determine their ability to filter fine dust particles.

(**Strategy** implementation: Environmental Lead Centres where these exist, with the Lead Reference Centre to modify and develop associated education material for wider usage)

### **Standards and Protocols**

**Strategy 102.** The continued development of soil sampling and analytical standards for lead.

(**Strategy** implementation: Standards Australia, co-ordinated by the Lead Reference Centre)

**Strategy 103.** The development of standardised dust sampling methodologies.

(**Strategy** implementation: Environmental Lead Centres where these exist, co-ordinated by the Lead Reference Centre)

**Strategy 104.** Investigate and develop where necessary, techniques which effectively reduce exposure to lead. Validate existing techniques to ensure that they are not causing secondary lead contamination.

(**Strategy** implementation: Environmental Lead Centres, co-ordinated by the Lead Reference Centre)

### **Review of Planning Controls and Mechanisms**

**Strategy 105.** Review current planning instruments and guidelines available (such as s.149 certificates, Circular C20, Unhealthy Building Land Notices) to manage contamination issues from both point and diffuse sources. The impact of these instruments on the management of sites should be assessed in terms of equity, community impacts and effectiveness.

(**Strategy** implementation: Interagency forum, co-ordinated by the Department of Planning)

**Strategy 106.** Review planning policies to enable greater control of the development of sensitive land uses in high risk lead contamination areas.

(**Strategy** implementation: Interagency forum, co-ordinated by the Department of Planning)

**Strategy 107.** Developing codes of practice and guidelines for the removal of lead based paints from non-scheduled premises. These guidelines should be distributed by local governments in conjunction with issuing development approvals, building approvals and demolition approvals.

(**Strategy** implementation: Standards Australia, co-ordinated by the Lead Reference Centre)

**Strategy 108.** Investigate waste management strategies for the disposal or re-use of urban soils and dusts contaminated with high levels of lead to prevent inappropriate use or disposal of these materials.

(**Strategy** implementation: EPA, Waste Service)

**Strategy 109.** Resolution of financial and liability issues associated with contaminated sites.

(**Strategy** implementation: ANZECC (work in progress))

### **Lead In Water And Wastewater**

#### **Data collection**



**Strategy 110.** Conduct a water sampling program which includes the following areas:

- high rise (complex plumbing systems)
- schools (long run systems)
- old urban areas

(**Strategy** implementation: Water Board and other local water authorities through the provision of research grants funded by appropriate Commonwealth and State authorities. NSW Public Works to develop a program for rural water authorities)

**Strategy 111.** Information obtained through implementation of the above should be incorporated into the education strategy where appropriate.

(**Strategy** implementation: Lead Reference Centre)

**Strategy 112.** Data collected on lead within the water and wastewater section to be included in the EPA State of the Environment report, to enable the effectiveness of reduction initiatives to be monitored.

(**Strategy** implementation: Data collection undertaken by water authorities and NSW Public Works. EPA to incorporate data into the State of the Environment Report)

### **Materials and Standards**

**Strategy 113.** Reduce the allowable level of lead in plumbing products to the minimum practical level.

(**Strategy** implementation: industry, water authorities and Standards Australia, co-ordinated by the Department of Consumer Affairs)

**Strategy 114.** Investigate the application of environmentally benign alternatives to lead plumbing products.

(**Strategy** implementation: industry)

**Strategy 115.** Mark solders as either suitable or unsuitable for use in plumbing systems.

(**Strategy** implementation: industry; co-ordinated by the Department of Consumer Affairs)

**Strategy 116.** Develop standard methods for testing the extraction of metals from products in contact with drinking water [Australian Standard AS 4020 (interim Standard)]

(**Strategy** implementation. Standards Australia)

**Strategy 117.** Amend the draft NHMRC goal of 10 ug/L of lead in drinking water to include prescribed sampling methodologies.

(**Strategy** implementation: NHMRC; co-ordinated by ANZECC)

**Strategy 118.** Continue the campaign to reduce industrial discharges containing lead into the wastewater system.

(**Strategy** implementation: Water Board and local water authorities)

### **Education**

**Strategy 119.** Develop comprehensive general and targeted education campaigns which:

- focus on key target groups (eg carers of young children, lead industry workers and do it yourself plumbers)
- focus on ways to minimise individual exposure





- focus on problems associated with first draw water and the use of hot water systems used specifically for consumption purposes.

Investigate the feasibility of distributing this material with water bills and at plumbing hardware centres.

(**Strategy** implementation: water authorities in consultation with the Lead Reference Centre)

### **Water Supply and Water Treatment**

**Strategy** 120. Develop exposure reduction strategies, especially for domestic situations, where indicated necessary by the outcome of the recommended data collection program.

(**Strategy** implementation: Undertaken by the relevant water authorities or Public Works in rural regions. Prevention strategies which focus on education should be developed by the Lead Reference Centre with input from relevant authorities)

**Strategy** 121. Where practical, introduce water treatment to reduce lead leaching rates from supply systems in high risk areas.

(**Strategy** implementation: Water Board/local water authorities/local government)

**Strategy** 122. Strictly apply the guidelines for the application of biosolids and sewage effluent to land within water supply catchments.

(**Strategy** implementation: Water Board/local water authorities)

**Strategy** 123. Investigate the efficiency of water filters to remove lead especially for schools and multileveled buildings.

(**Strategy** implementation: Manufacturers. Information coordinated and reported by the Lead Reference Centre)

**Strategy** 124. Investigate ways of reducing the cost to the consumer of lead analysis of drinking water in areas of high lead exposure.

(**Strategy** implementation: Water Board/local water authorities)

**Strategy** 125. Develop effective and economic mitigation techniques.

(**Strategy** implementation: Water Board/local water authorities)

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