



Lead and the Hunter Valley: The Facts

Lead is a heavy metal that can have serious health consequences. This is a concern for all communities, whether city or regional. The coal mining industry is equally concerned and is focused on making sure that its operations don't cause health problems for employees, contractors and local residents.

To better understand the issue, the NSW Minerals Council and some coal mining operators in the Hunter Valley sought the expertise of specialist researchers to investigate the relationship between coal mining and lead levels in the Hunter. Subsequent reviews by eminent Australian scientists have added to this understanding. These studies found that sampled lead levels are well below national standards and there is no demonstrated lead-related health risk from coal mining in the Hunter Valley.

What is lead?

Lead is a heavy metal that occurs naturally in our environment. It is also present in everyday products such as old house paint, pipes and guttering and even some toys. In the context of coal mining there are extremely low traces of lead and other elements in black coal and the soils or rock that are moved to mine the coal. Concerns that have been raised with the coal mining industry regarding lead typically relate to fears about the potential for water contamination and air pollution that may increase the risk of exposure for those living near coal mining.

Why is lead a concern?

It is now understood that exposure to lead can affect people. Elevated lead levels have been shown to affect growth and behaviour. Children younger than five years are most at risk as their bodies are still developing and are more sensitive to lead.

A better understanding of lead and its affect on people has led to stronger regulation of substances that contain lead. Historically lead has been used in paint, petrol, toys and building materials. Although restrictions on lead began early last century with lead solders removed in 1986 and lead paint being completely banned in 1997, these materials can still remain in buildings today. Use of lead in petrol was banned for new vehicles in 1986 and completely phased out in 2002. Lead flashing is still used in roofs.

What are the current Australian health standards?

There are three key health standards in Australia that determine acceptable levels of lead in a person's blood, in air and in drinking water.

The National Health and Medical Research Council (NHMRC) set a health risk guideline for blood lead levels

in all Australians to be below 10 micrograms per deciliter (one tenth of a litre).

The National Environment Protection Council (NEPC) has set an annual ambient standard for lead (as total airborne particles) of 500 nanograms per cubic metre (500 ng/m³). A nanogram is one thousand millionth of a gram. The NEPC determined that this standard "allows for adequate protection of human health and well being" and should not be exceeded.

The Australian Drinking Water Guidelines (set by the NHMRC) has determined that lead levels in drinking water should not exceed 0.01 milligrams per litre (mg/L). A milligram is one thousandth of a gram.

2008 studies of lead in the Hunter Valley

In response to community concerns about the lead levels in water tanks close to coal mining operations, the NSW mining industry acknowledged there was a need to better understand the relationship between mining and lead levels in air and drinking water.

Initially a review of existing air quality data that had been collected over many years by industry, government and universities was conducted by the Graduate School of the Environment at Macquarie University. Whether dust generated by coal mining was contaminating local water tanks was also considered. The review found that lead levels in the Hunter Valley are well below national health standards and that there is no demonstrated lead-related health risk from coal mining.

More specific results from the review include the following:

- Muswellbrook had an annual average lead concentration in air of 12 ng/m³ in a 1992 study. Since that time the lead levels in Muswellbrook have generally fallen and average values measured in 2005-7 were around 3 ng/m³
- At other sampling sites in the Hunter Valley, lead in air was measured to be 2 ng/m³ at Glenville, 5.7 ng/m³ at Singleton Showground and 3.2 ng/m³ at Rix's Creeks
- All values measured are significantly below the National Ambient Air Standard for lead of 500 ng/m³
- All values measured are significantly below the levels found in Sydney (annual average for Pyrmont was 297 ng/m³ and Richmond was 79 ng/m³) and compare with lead levels measured in pristine environments such as the Cape Grim sampling station in Northern Tasmania (annual average of 1 ng/m³).

This review concluded that "based on the studies of air quality examined, no systematic relationship between proximity to mining operations and the reported elevated tank water lead levels is apparent".

In 2008 several Hunter Valley coal mining companies commissioned a separate study by Associate Professor Barry Noller from the Centre for Mined Land Rehabilitation, University of Queensland. The village of Camberwell in the Hunter Valley and an outlying rural area of Muswellbrook were chosen for the study because of their close proximity to coal mining operations and local homes. There were 36 homes involved in the sampling study.

This research involved an extensive sampling program covering local rainwater tanks, soils, airborne particles and house dust. The key findings were:

- No tank water exceeded Australian Drinking Water Guidelines for lead
- There was no significant difference in drinking water lead levels between houses close to coal mining operations and those obtained from background sites including Newcastle town water
- Some tanks contained elevated lead levels in historical sludge, however, this was not contaminating the tank water
- Lead levels in mined overburden, coal and topsoil were low and within normal background lead levels
- Airborne particles (or Atmospheric Total Suspended Particulates) taken by High Volume Air Samplers indicated there is no significant transfer of lead from mine overburden material
- Out of all dust sampling undertaken within houses, only two window tracks were found to contain elevated lead levels (possibly from historic house dust or lead in petrol).

The relationship between lead and mining

The results of the studies show there is no demonstrated health risk from lead associated with coal mining in the Hunter Valley. Both reviews found that air and water lead levels are significantly below the relevant national standards.

A leading Australian expert in this field, Professor Brian Gulson, of Macquarie University's Graduate School of the Environment, has supported these conclusions.

In Professor Gulson's review of the Hunter Valley study he states that "there does not appear to be a lead issue".

This additional scientific knowledge will assist both industry and their local communities to better understand the relationship between lead and mining and make better informed decisions about their health and wellbeing.

All rainwater tanks should be maintained in accordance with the advice outlined in NSW Health's Rainwater Tanks brochure to ensure water is safe for drinking. The brochure can be obtained from NSW Health's local public health unit or from their website: www.health.nsw.gov.au/pubs/2007/pdf/rainwater_tanks.pdf

References and more information

- The NSW Health fact sheets on health related topics can be accessed at: www.health.nsw.gov.au/factsheets/
- The NSW Health and NSW Minerals Council fact sheet on mine dust can be accessed at: www.health.nsw.gov.au/factsheets/environmental/mine_dust.html

Disclaimer: This fact sheet is intended to provide summary information only. It does not intend to be comprehensive or to provide specific legal advice. Given the changing nature of legislation, regulations, program rules and guidelines, there is a potential for inherent inaccuracies and potential omissions in information contained in this fact sheet. All information in this fact sheet is provided "as is" with no guarantee of completeness or accuracy and without warranty of any kind, express or implied. In no event will New South Wales Minerals Council Limited, any related members, consultants or employees thereof be liable to anyone for any decision made or action taken in reliance on the information in this paper or for any consequential damages.