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The Lead Education and Abatement Design Group
Working to eliminate lead poisoning globally and to protect the
environment from lead in all its uses: past, current and new uses
ABN 25 819 463 114

President's Annual Report FY2015

By Elizabeth O'Brien, LEAD Group Committee President

What does The LEAD Group have to be proud of this year?

- Two tiny grants (from \$4850 from NRMA and \$500 from Marrickville Council) and a 7% increase lead test kit sales over last FY
- Influence via lots of web hits, information distributed and advice given and a change to Australia's NHMRC blood lead action level (See attached Analysis of LEAD Group Websites Traffic in the FY)
- Professor Taylor's media events and journal publications

The last financial year has been a milestone year for The LEAD Group (TLG) because on 19 May, 2015, Australia's National Health and Medical Research Council (NHMRC) released their **Statement and Information Paper: Evidence on the Effects of Lead on Human Health**. According to an e-mail sent by the NHMRC on that day: "The NHMRC Statement advises that a blood lead level greater than 5 micrograms per decilitre suggests that a person has been, or continues to be, exposed to lead at a level that is above what is considered the average 'background' exposure in Australia. If a person has a blood lead level greater than 5 micrograms per decilitre, it is recommended that the source of exposure should be investigated and reduced, particularly if the person is a child or pregnant woman. Identifying and controlling the source of lead exposure will reduce the risk of harm to the individual and to the community."

The LEAD Group strongly objects to the phrase: "exposed to lead at a level that is above what is considered the average 'background' exposure in Australia". The term "Average" is a statistical term and should never be applied to an "opinion" or "what is considered". It is dangerous to accept this opinion as to what is the

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average blood lead level in Australia, when in fact, the actual average blood lead level in Australia is likely to be much lower than 5 micrograms per decilitre (5 µg/dL). It has been observed in every other country which undertakes blood lead surveys of their population that the average blood lead level in all age groups, drops markedly following the elimination of leaded petrol. Leaded Petrol was phased out in Australia as of 1 January, 2002.

Whilst the NHMRC does at least acknowledge (at <https://www.nhmrc.gov.au/media/releases/2015/nhmrc-releases-statement-and-information-paper-impacts-lead-human-health>) that:

“The average blood lead level among Australians is now estimated to be less than 5 micrograms per decilitre. This level is likely to decrease further over time as the presence of lead in the environment continues to reduce”

It is not at all clear as to how the NHMRC is proposing that lead in the environment will reduce. The Australian Federal Government and State & Territory Jurisdictions have long struggled with the concept that when you turn off the flow of lead into the environment (eg. by phasing out leaded petrol or banning the addition of lead to new paint) you also have to clean up and manage the existing lead in the environment in order to reduce lead exposure.

The Australian Government needs to be far more proactive in creating strategies (policies, legislation, etc.) to assist individuals to identify sources of lead and manage their lead exposure, especially targeting lead poisoning prevention.

The **NHMRC Statement and Information Paper: Evidence on the Effects of Lead on Human Health** at <https://www.nhmrc.gov.au/guidelines-publications/eh58> states:

“If a person has a blood lead level greater than 5 micrograms per decilitre, it is recommended that the source of exposure should be investigated and reduced, particularly if the person is a child or pregnant woman. Identifying and controlling the source of lead exposure will reduce the risk of harm to the individual and to the community.”

The LEAD Group has been calling for a national blood lead survey of all ages in Australia to be done for over 20 years yet no such survey has ever been carried out. Only one national blood lead study, on children aged 12-48 months has ever been published in Australia (in 1996) and the average then was above 5 micrograms per decilitre. However, with the elimination of leaded petrol in Australia on 1st January 2002, the average blood lead level for both genders and across all age groups, should have fallen well below 5 micrograms per decilitre today.

The danger of not doing a national blood lead survey of all ages, is that doctors will believe the opinion of the NHMRC that blood lead levels up to 5 micrograms per decilitre are “average” and therefore not worthy of taking action to identify lead sources and abate the sources or abolish the lead pathway or remove lead from the body (if the lead exposure happened much earlier and is not affected by current abatement of lead sources). The NHMRC simply MUST tell medical professionals that 5 micrograms per decilitre has been chosen as the action level for economic reasons and not because it is the average level.

The LEAD Group calls on the NHMRC to undertake a GP education campaign re: lead poisoning emphasising that the only non-actionable level of lead in blood is one that is below the limit of detection of the lab, as well as emphasising the need for more data on actual blood lead levels (preferably a study) and notification by labs and collation by government of ALL blood lead results for statistical analysis.

The LEAD Group recommends to the NHMRC and Australian Health Professionals, that the new NHMRC level of 5 µg/dL be renamed *the **priority action blood lead level***.

In The LEAD Group’s **Info Pack 56 – Changing ideas about what is a safe blood lead level**, at <http://www.leadsafeworld.com/safe-blood-lead-level/> you will read that our Technical Advisers recommend that Australia follow the Canadian proposal to lower the blood lead goal to one-tenth of the 1993 Australian and 1991 US level of 10 micrograms per decilitre, ie 1 microgram per decilitre (1 µg/dL).

However, some Australian Labs have a limit of detection for blood lead analysis of 2 µg/dL, and thus the above recommendation: a better target blood lead level is to be below the limit of detection (or below 1 µg/dL if the limit of detection is lower than 1 µg/dL).

Put another way, The LEAD Group recommends any blood lead result which does not have a less than sign (<) is a blood lead level requiring action, or **action blood lead level** and that any blood lead result above 5 µg/dL is the **priority action blood lead level**.

The LEAD Group further calls on the Australian Government (probably the Federal Department of the Environment) and all State Environment & Consumer Protection agencies, to ban the addition of lead to all consumer products where it can be readily replaced by safer alternatives, and make more stringent (revised downwards) all standards, guidelines, licence limits and regulatory (eg. occupational & rental) triggers for lead levels in food, air, soil, dust and paint on surfaces, sediment, building cavity dust, agricultural additives (fertilizer, soil additives, etc.), water (waste water, recreational waters, drinking water, stock water, etc.), tobacco products, etc.

For instance, the Australian "occupational trigger level" for lead in paint is long overdue for revision downwards from the current 1%, so The LEAD Group now recommends lead-safe methods be used to work on paint with a lead content greater than approximately 0.1%.

During FY2015 The LEAD Group did not gain any Australian Federal government funding which provided for one full time waged staff member, myself and two part time waged staff members to run the Global Lead Advice and Support Service (GLASS) in FY2013. Grant-writing efforts in FY2014 have resulted in \$4850 being received from NRMA Community grants in mid-July 2014 and \$500 was received from the Pratt Foundation in December 2014.

My plan that we would apply for 1 grant per week did not come to fruition as grant writing is a very specialised and time consuming process. The other plan to email an invitation to become a Lead Safe World major sponsor to one company per week also fell away. But on the upside, Professor Taylor has been a world-class media star raising awareness of lead poisoning and lead contamination in Australia and beyond.

Professor Mark Taylor – LEAD Group Media Star

According to <http://web.science.mq.edu.au/directory/listing/person.htm?id=mataylor> "Mark Taylor is a Professor of Environmental Science at Macquarie University. His research program investigates environmental pollution and risks to human health from aerosols, dusts, sediments, soil and water. He works in range of locations across Australia, including Broken Hill, Darwin, Mount Isa, Port Pirie and Townsville."

Professor Mark Taylor is also a Committee Member and Member of the Technical Advisory Board of The LEAD Group [<http://www.lead.org.au/lk.html>]. He's The LEAD Group's media star and we've put together a list below of just a fraction of the media hits he's garnered and his journal publications in the 2015 Financial Year or thereabouts.

Publications extracted from Mark Taylor's Macquarie University webpage

[HTTP://WEB.SCIENCE.MQ.EDU.AU/DIRECTORY/LISTING/PERSON.HTM?ID=MATAYLOR](http://web.science.mq.edu.au/directory/listing/person.htm?id=mataylor)

RECENT JOURNAL PUBLICATIONS

2015

- Hart, B.T., Taylor, M., Iles, M. Kyle, G. and Sinclair, G. 2015. Resolving long-term issues related to surface water management and monitoring associated with the Ranger Uranium Mine, Northern Territory, Australia. Australasian Journal of Environmental Management. DOI:

10.1080/14486563.2015.1028487.

<http://www.tandfonline.com/doi/abs/10.1080/14486563.2015.1028487?journalCode=tjem20>

- Harvey, P.J., Taylor, M.P., Handley, H. (accepted 9th March 2015). Identification of the sources of metal (lead) contamination in drinking waters using lead isotopic compositions. *Environmental Science and Pollution Research*. <http://link.springer.com/article/10.1007%2Fs11356-015-4349-2#page-1>
- Harvey, P.J., Taylor, M.P., Handley, H. (accepted March 20th 2015). Environmental contamination of soils from lead joints used in large water supply pipelines. *Water, Air & Soil Pollution*.
- Kristensen, L.J., Taylor, M.P., Morrison, A.L. 2015. Lead and zinc dust depositions from ore trains characterised using lead isotopic compositions. *Environmental Science: Processes & Impacts*, 17, 631-637. <http://www.ncbi.nlm.nih.gov/pubmed/25627173>
- Taylor, M.P. 2015. Atmospherically deposited trace metals from bulk mineral concentrate port operations. *Science of the Total Environment*. 515–516, 143–152. <http://www.ncbi.nlm.nih.gov/pubmed/25706750>
- Taylor, M.P., Mackay, A.K., Munksgaard, N.C., and Hudson-Edwards, K.A. 2015. Comments on manuscript - Zheng, J., Huynh, T., Gasparon, M., Ng, J. and Noller, B., 2013. Human health risk assessment of lead from mining activities at semi-arid locations in the context of total lead exposure. *Environmental Science and Pollution Research*, 20, 8404-8416; *Environmental Science and Pollution Research*. DOI: 10.1007/s11356-015-4100-z. <http://www.ncbi.nlm.nih.gov/pubmed/24122159>
- Taylor, M.P., Zahran, S., Kristensen, L.J., Rouillon, M. 2015. Evaluating the efficacy of playground washing to reduce environmental metal exposures. *Environmental Pollution*, 202, 112–119. <http://www.ncbi.nlm.nih.gov/pubmed/25818090>

2014

- Csavina, J., Taylor, M.P., Félix, O., Rine, K.P., Sáez, A.E., Betterton, E.A. 2014. Size-resolved aerosol contaminants associated with copper and lead smelting emissions: Implications for emissions management and human health. *Science of the Total Environment*, 493, 750-756.
- Gore, D.B., Taylor, M.P., Pritchard, R.G., Fryirs, K.A. 2014. On-site teaching with XRF and XRD: training the next generation of industry and research professionals. *Powder Diffraction*, 29(S1), S8-S14. <http://dx.doi.org/10.1017/S0885715614000876>.
- Kristensen, L.J., Taylor, M.P., Odigie, K., Hibdon, S.A., Flegal, A.R. 2014. Lead isotopic compositions of ash sourced from Australian bushfires. *Environmental Pollution*, 190, 159-165. <http://www.ncbi.nlm.nih.gov/pubmed/24763391>
- Laidlaw, M.A.S., Zahran, S., Pingatore, N., Clague, J., Devlin, G., Taylor, M.P. 2014. Identifying and fingerprinting temporal lead sources in domestic homes. *Environmental Pollution*, 184, 238–246. <http://www.sciencedirect.com/science/article/pii/S0269749113004661>
- Laidlaw, M.A.S., Zahran, S., Pingatore, N., Clague, J., Devlin, G., Taylor, M.P. 2014. Reply to comments on “Identification of lead sources in residential environments: Sydney Australia” by Laidlaw et al. (2014). *Environmental Pollution*, 192, 216–219. <http://www.sciencedirect.com/science/article/pii/S0269749114000438>

- Oulton, L.J., Taylor, M.P., Hose, G.C., Brown, C. 2014. Sublethal toxicity of untreated and treated stormwater Zn concentrations on the foraging behaviour of *Paratya australiensis* (Decapoda: Atyidae). *Ecotoxicology*. 23, 1022-1029. <http://www.ncbi.nlm.nih.gov/pubmed/24825724>
- Taylor, M.P., Davies, P.J., Kristensen, L.J., Csavina, J., 2014. Licenced to pollute but not to poison: the ineffectiveness of regulatory authorities at protecting public health from atmospheric arsenic, lead and other contaminants resulting from mining and smelting operations. *Aeolian Research*, 14, 35–52. <http://www.sciencedirect.com/science/article/pii/S1875963714000226>
- Taylor, M.P. and Isley, C. 2014. Measuring, monitoring and reporting but not intervening: Air Quality in Australian Mining and Smelting Areas. *Air Quality and Climate Change Journal*, 48 (2), 35-42. http://www.researchonline.mq.edu.au/vital/access/manager/Repository/mq:36792;jsessionid=3BABCA0E9F6071D61B94F92B289D0729?f0=sm_subject%3A%22Particulate+Matter%22
- Taylor, M.P., Mould, S., Kristensen, L.J., Rouillon, M. 2014. Environmental arsenic, cadmium and lead dust emissions from metal mine operations: implications for environmental management, monitoring and human health. *Environmental Research*, 135, 296-303. <http://www.ncbi.nlm.nih.gov/pubmed/25462679>
- Taylor, M.P., Winder, C., Lanphear, B.P. 2014. Australia's leading public health body delays action on the revision of the public health goal for blood lead exposures. *Environment International*, 70, 113–117. <http://www.ncbi.nlm.nih.gov/pubmed/24927499>

Selected Media Coverage

- ABC News, 1st September 2014 - "Growing veggies safely in your backyard: avoiding the 'legacy of our industrial activities'" <http://www.abc.net.au/news/2014-08-29/growing-safe-veggies-in-your-sydney-backyard/5705016> (accessed 1.09.2014)
- Green Lifestyle, 1st September 2014 - "Lead foot gardens" <http://www.greenlifestylemag.com.au/features/20175/lead-foot-gardens> (accessed 1.09.2014)

Annotated list of assorted Mark Taylor media hits and publications

https://webcentral.mq.edu.au/public/download/?id=123034&foreign_id=36412

Undated

Australian and international guidelines for urban soil in residential areas: Guidelines for arsenic (As), cadmium (Cd), hexavalent chromium (CrVI), copper (Cu), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), and zinc (Zn) in Australia, California, Canada, Norway, United States [one Powerpoint slide] - for Vegesafe Program, Macquarie University

By Professor Mark Taylor

<https://theconversation.com/australias-dirty-secret-whos-breathing-toxic-air-23237>

April 16, 2014

[Australia's dirty secret: who's breathing toxic air?](#)

[Donna Green](#), *UNSW Australia*; [Jayajit Chakraborty](#), *University of South Florida*, and [Mark Patrick Taylor](#)

Australians living in poorer communities, with lower employment and education levels, as well as communities with a high proportion of Indigenous people, are significantly more likely to be exposed to high levels of toxic air pollution... Port Pirie in South Australia is a good example of such a community.

<http://search.informit.com.au/documentSummary;dn=459442988919303;res=IELENG>

May 2014

Measuring, monitoring and reporting but not intervening: Air quality in Australian mining and smelting areas [Hunter Valley (New South Wales), Mount Isa (Queensland) and Port Pirie (South Australia)]

Professor Mark Taylor and Cynthia Isley, of Macquarie University, are drawing attention to the health issues and lack of adherence to governmental policies relating to mining activities.

Mining and smelting in the Hunter Valley (New South Wales), Mount Isa (Queensland), and Port Pirie (South Australia) are required to conform to Australia's National Environment Protection Measure Ambient Air Quality criteria.

Industrial emissions of lead and sulphur dioxide as airborne particulate matter pose real health risks due to high toxicity levels.

Doing all the required measuring of air quality in Australian mining and smelting ventures will not ensure that nearby townships have support of health-tracking responses.

Air quality criteria are not being adhered to. While there is a 1992 Intergovernmental Agreement to monitor adverse health outcomes, there is a lack of follow-through action.

Air quality standards must be enforced. Measuring, monitoring and reporting on the quality of the air only will not address the possible high cost of unattended health risks to individuals and whole communities.

<https://theconversation.com/reducing-the-harms-of-toxic-air-in-mining-and-smelting-communities-25999>

May 1, 2014

Reducing the harms of toxic air in mining and smelting communities

[Mark Patrick Taylor](#); [Janae Csavina](#), *University of Arizona*; [Louise Kristensen](#), and [Peter Davies](#)

Children in the mining towns of Mount Isa in Queensland and Port Pirie in South Australia are exposed to harmful levels of pollutants that increase their risk of learning and developmental disorders, and a number of serious illnesses.

Along with lead, these toxic substances are emitted at much higher levels than anywhere else in Australia.

To [achieve the objectives](#) of the relevant state [environment protection legislation](#) and not compromise ecological sustainability and the health of the local communities, we need more frequent sampling, higher standards and shorter averaging periods for air quality.

http://ac.els-cdn.com/S0160412014002037/1-s2.0-S0160412014002037-main.pdf?_tid=ca6904b0-9ba4-11e4-9826-00000aacb35f&acdnat=1421209460_9dd823c08bba1410eaca0d478d049c15

September 2014

Tribute to Prof. Christopher Winder

By Professors Mark Taylor and Bruce Lanphear

<https://theconversation.com/toxic-playgrounds-broken-hill-kids-exposed-to-poisonous-dust-32325>

October 16, 2014

[Toxic playgrounds: Broken Hill kids exposed to poisonous dust](#)

[Mark Patrick Taylor](#); [Louise Kristensen](#); [Marek Rouillon](#), and [Simon Mould](#)

In the shadows of Broken Hill's rich mining history lies a legacy of contamination and regulatory failure that will likely outlive any benefits locals derive from mining. One in five children aged under...

<http://www.sciencedirect.com/science/article/pii/S0160412014001482>

September 2014

Australia's leading public health body delays action on the revision of the public health goal for blood lead exposures [re: NHMRC not taking action]

<http://www.theherald.com.au/story/2713274/boolaroo-clean-up-a-failure/>

21 November 2014

Boolaroo clean-up a failure ONLINE 25/11/21 Boolaroo clean-up a failure PART OF: Toxic Truth: A Newcastle Herald Investigation [re: Boolaroo Smelter remediation follow-up]

by Professor Mark Taylor



"On the face of it, it appears that the community surrounding the old Pasmaenco site has been short-changed for the benefit of the remaining Pasmaenco creditors": Mark Patrick Taylor at Boolaroo. Picture: Dean Osland

Boolaroo, (in the Lake Macquarie district), has suffered the insult of emissions of lead, cadmium and arsenic. The residents have been left out of the 'fair treatment' contract of Australian business practice.

Despite the fact that the Lead Abatement Strategy (2007) was developed to manage clearing of contaminated top soil, Boolaroo residents have lived with the disturbing reality of high blood-lead readings in the children of the area.

Professor Mark Taylor. Called for "the bar to be raised" so that the clean-up can meet recognised national standards.

www.abc.net.au/lateline/content/2014/s4133987.htm

Nov 21, 2014

[Lateline - 21/11/2014: University study finds high levels of lead, heavy metals in NSW towns](#)

MARK TAYLOR, PROF ENVIRONMENTAL SCIENTIST, MACQUARIE UNIVERSITY: Lead, arsenic and cadmium, these are elements they don't go away. And unless you clean up, unless you remove them, the problem will remain.

<http://www.abc.net.au/news/2014-12-05/high-toxin-levels-in-townsville-playgrounds-alarms-researchers/5946730>

Dec 4, 2014

[High toxin levels in Townsville playgrounds alarms researchers - ABC](#)

Dr **Mark Taylor** said the results showed traces of the toxic elements all exceeded state and national benchmarks for health. "The largest and most common exceedance would lead, followed probably by nickel," he said.

<http://www.abc.net.au/catalyst/stories/4174798.htm>

Feb 10, 2015

[Catalyst: Lead Astray - ABC TV Science](#)

But in a yet-to-be-published Australian study Professor **Mark Taylor** has found a similar correlation between peak lead emissions and peak violence, and not just in big cities.

<http://www.ncbi.nlm.nih.gov/pubmed/25706750>

Online 23 February 2015

Atmospherically deposited trace metals from bulk mineral concentrate port operation [re: public locations and children's playgrounds in the inner city of Townsville, northern Queensland]

By Mark Patrick Taylor

Environmental dust metal and metalloid hazards (arsenic, cadmium, lead and nickel) are an on-going issue of concern for the residents of the inner city of Townsville, Northern Queensland.

Analysis of controlled measurements showed a reading 26 times above the German Federal Emission Control Act 2002 annual benchmark.

Reassessment is critical to ensure human health protection.

<http://www.abc.net.au/news/2015-02-27/researcher-defends-study-into-toxic-dust-levels-in/6268468>

Feb 26, 2015

[Researcher defends study into toxic dust in Townsville CBD as research published](#)

Researcher **Mark Taylor** has defended his study which attributed toxins, found at Townsville CBD playgrounds, to the port.

www.abc.net.au/gardening/stories/s4197011.htm

Mar 14, 2015

[Gardening Australia - Fact Sheet: Safe Soil - ABC](#)

So Costa's invited Professor **Mark Taylor** from Macquarie University over to help. "Mark, Alex has got some concerns about the soil: Vegesafe practises can help to safeguard against contaminated soil".

www.abc.net.au/gardening/stories/s4197409.htm

Mar 14, 2015

[Gardening Australia - Transcript - Episode 02 - ABC](#)

PROFESSOR MARK TAYLOR: We come and we sample peoples' yards for the metals in the soils or people send us their soils and we analyse them with what's called an 'XRF'. It gives us results within about a minute, so a fantastic screening tool. It tells us about the metal concentrations in your soils," says Mark

<http://www.abc.net.au/news/2015-04-17/new-research-suggests-ageing-pipes-are-leaking-lead-into-water-/6402408>

Apr 17, 2015

[New research suggests ageing pipes are leaking lead into water supply in north-east Tasmania](#)

Researcher **Mark Taylor** said the studies found that, contrary to previous official arguments, ageing infrastructure was contaminating the water supplies. Since 2012 residents have been warned not to drink the water because of lead and e-coli concerns.

<http://www.abc.net.au/news/2015-04-22/residents-in-pioneer-expected-to-take-lead-issues-to-taswater/6410898>

Apr 21, 2015

[Residents in lead-contaminated Tasmanian town of Pioneer expected to demand TasWater to take action](#)

More than 50 people attended a meeting in the town last night where researchers from Macquarie University, **Mark Taylor** and Paul Harvey, presented a report linking elevated lead levels to ageing pipes. Resident Tim Slade said he was alarmed that the highest reading in the town was 22 times above the health standard of 10 micrograms a litre.

<http://www.abc.net.au/news/2015-04-23/north-east-tasmania-water-may-have-been-contaminated-for-years/6417126>

Apr 23, 2015

[Water authority concedes north-east Tasmania's water may have been contaminated for years - ABC](#)

Prof **Mark Taylor** with rusty pipes Photo: Professor **Mark Taylor** with corroding pipes believed to be the source of the contamination. The water is so poor in five Tasmanian towns including Pioneer and Winnaleah that it is unfit to drink, with "do not consume" notices in place.

www.abc.net.au/7.30/content/2015/s4222652.htm

Apr 23, 2015

[These are the Australian towns where the tap water's toxic](#)

MARK TAYLOR, ENVIRONMENTAL SCIENTIST, MACQUARIE UNI.: It's appalling, it's Third World and I think if you asked anybody in a city to do this over this time period, they would be up in arms about it.. Making a comment in response ABC reporter MICHAEL ATKIN said: "Residents just 12 kilometres away in Pioneer are facing the same problem: their water is unsafe to drink".

<https://theconversation.com/the-verdicts-in-we-must-better-protect-kids-from-toxic-lead-exposure-41969>

May 19, 2015

The verdict's in: we

must better protect kids from toxic lead exposure

Mark Patrick Taylor and **Bruce Lanphear**, *Simon Fraser University*: Soil, dust and air-based exposure to lead can interfere with a child's developing nervous systems and cause behavioral and developmental problems.

www.abc.net.au/pm/content/2015/s4257757.htm?source=rss

Jun 18, 2015

PM - Water tanks brought in to address lead contamination in Tasmanian town's drinking water

Professor **Mark Taylor** from Macquarie University did the original study and he says TasWater still hasn't addressed the issue that the lead is potentially leaching from the plumbing inside people's houses.

<http://www.abc.net.au/news/2015-09-16/nsw-govt-announces-two-reviews-into-williamtown27s-toxic-raaf-/6780756>

Sep 15, 2015

Two separate inquiries to be held into toxic contamination at Williamtown's RAAF base

Mr Speakman said the second review, by Macquarie University's Professor **Mark Taylor**, would be much broader. Professor Taylor has been asked to look at whether the EPA has improved its handling of leaks and spills since a critical auditor-general's report last year.

Oct 6, 2015

<http://www.abc.net.au/am/content/2015/s4325619.htm>

AM - Lead, arsenic, cadmium: exposure linked to students' low grades in study

MARK TAYLOR: What we wanted to know is: do those known toxic exposures, do they play out when we look at children's scores in schools?

www.abc.net.au/pm/content/2015/s4326181.htm?site=newengland

Oct 6, 2015

PM - Scientist calls for tighter emissions regulations

The report's author is environmental scientist at Macquarie University, Professor **Mark Taylor**. He says emissions in mining towns need to be cut.

<https://theconversation.com/australian-children-exposed-to-toxic-mining-metals-do-worse-at-school-48343>

October 6, 2015

Australian children exposed to toxic mining metals do worse at school

Mark Patrick Taylor; Chenyin Dong; Louise Kristensen, and Sammy Zahran,

Colorado State University

Children in mining and smelting towns who are exposed high levels of lead, arsenic and cadmium are more than twice as likely to have developmental disorders than the national average.

<http://www.abc.net.au/news/2014-10-16/contaminated-playgrounds-a-danger-to-broken-hill-kids-research/5817244>

Oct 15, 2014

Broken Hill children affected by contaminated playgrounds, researchers say

Macquarie University environmental science professor **Mark Taylor** said the substances could affect children's heart and kidney health.