



Lead issue update

Government welcomes Parliamentary inquiry report

The report of the Parliamentary inquiry into the cause and extent of the lead pollution in Esperance area was released on 6 September 2007. The report can be accessed through the Parliament of Western Australia website on www.parliament.wa.gov.au/index.htm.

The report was tabled in Parliament and the State Government is reviewing the findings of the Parliamentary committee and is taking all of the recommendations in this report into consideration.

The Minister for Planning and Infrastructure Hon Alannah MacTiernan has agreed to implement two recommendations immediately.

Firstly, that the Esperance Port Authority would undertake professional cleaning in the homes of families with children who registered blood lead levels of five micrograms and above, following the second round of blood testing.

And secondly, the State Government will undertake to publish online the Esperance Port Authority dust monitoring results.

Environment Minister David Templeman has endorsed the committee's recommendation

that funding be increased for inspections by the Department of Environment and Conservation (DEC). In May this year the Minister announced that fees for the State's 860 licensed premises would be increased on average by 50 per cent over two years.

This fee hike will yield an additional \$4 million per annum, phased in over two years, for DEC, enabling it to increase the number of environmental officers and carry out more regular crucial checks to ensure environmental compliance by industry across the board.

And licence fees for port operations in particular will be further increased to reflect the increasing demands on regulators as a consequence of the resource boom.

This increase will fund additional environmental officers focussed on the regulation of ports State-wide.

Issue No.3
Sept 2007

Inside

.....
Latest blood test results
.....

.....
What's been done already?
.....

.....
Transport route sampling
.....

.....
Marine sediment analysis program
.....

.....
Rainwater tanks re-tested
.....

.....
Improved community consultation
.....

.....
Nickel monitoring continues
.....

.....
Esperance position
.....

.....
Independent audit
.....

.....
Esperance parks cleaned up
.....

.....
Cleaning DVD
.....

A letter to residents from Professor Michael Moore, Director of the National Research Centre for Environmental Toxicology at the University of Queensland is also reprinted at the back of this newsletter.

Professor Moore, an expert on nickel, met Esperance residents in August to discuss their concerns. His contact details are on the letterhead enclosed if anyone has further queries.

Community to help drive risk assessment

Esperance community input is being sought for a health and ecological risk assessment of the town.

The Department of Environment and Conservation (DEC) has appointed environmental consultants Golder Associates to carry out the assessment.

Golder plans to work closely with community members to ensure the assessment takes into account the concerns of people living and working in Esperance.

The risk assessment consists of three phases, with the initial phase of gap analysis and planning for further investigations already underway.

Golder has begun collating existing health and ecological data to build a picture about risks and to identify any information gaps from the sampling already completed by DEC and DOH. The gap analysis, which is

expected to take two to three months, will be used to determine whether further sampling and clean-up is required.

The consultants recently met with key stakeholders in Esperance, including community representatives, to work out how best to engage the broader community throughout the assessment

Phase 2 is likely to involve further health and ecological investigations in Esperance, while Phase 3 is planned to recommend to the State Government strategies to manage ecological and public health risks in the Esperance area.

Community members seeking more information about the assessment are invited to call Paul McLeod at Golder Associates on 9213 7600.

Latest blood test results

The Department of Health (DOH) has now tested 2919 Esperance residents for their lead blood levels, with 33 showing levels above 10 micrograms per decilitre.

Significantly, the scheduled three-month re-testing of children has been completed and found a reduction in blood lead levels for 94.5% of those tested.

Table 1 (right) sets out the results, which were forecast by medical officers, toxicologists, and Professor Alison L Jones from the University of Newcastle. Two cases which did not result in anticipated reductions were followed up by a DOH medical officer.

Re-testing will again be undertaken in October 2007, at which time it is anticipated even further reductions will be noted.

Table 2 below summarises the blood test results across the community.

Table 1: Follow-up Blood Lead Levels (BLL) for children [†] in the Esperance community	
Results as at 3 September 2007	
All children (tested March-June)	
Number tested	390
Number eligible for re-testing (> 5µg/dL)	83
Follow-up children (tested July)	
Number re-tested	55
Percentage of eligible children re-tested	66%
Average BLL of first test (µg/dL)	7.1
Average BLL of second test (µg/dL)	4.3
Number with lower BLL	52
Percentage with lower BLL	94.5%

[†] Children aged less 5yrs with initial BLL > 5µg/dL

Table 2: Cumulative lead blood levels for Esperance community members[†] from 19 March to 28 August 2007

Age group (years)	0 to < 5 (years)	5 to < 10 (years)	10 to < 20 (years)	20 to < 40 (years)	> 40 (years)	TOTAL
Number of tests	404	259	319	565	1372	2919
Average lead level (µg/dl)	3.0	2.4	1.8	1.9	3.0	2.6
Number with lead level in range 5 - 9 µg/dl	76	21	5	24	203	329
Number with lead level ≥ 10 µg/dl ** (values)	7* (11,12x3, 13,20,22)	0	0	4 (10,15, 16,18)	22 (10x5,11x7, 12x4,13x3, 14,16,21)	33

[†] Community members only (individuals identified with occupational exposure to lead from the port are not included in the table). Repeat tests not included.

* Children aged 0 to < 5 years (83 children) with a blood lead level of 5 µg/dl or greater will be followed up until levels have dropped on two consecutive occasions

** World Health Organisation (WHO) guidelines recommend blood lead levels < 10 µg/dl

Improved community consultation

The Government and the Esperance Port Authority have moved to improve consultation between the Port Authority and the local community.

A new Port Consultative Committee (PCC) is being established and will replace the Port Development Consultative Committee. The new group aims:

- To act as a conduit between the Port Authority and the broader Esperance community.
- To facilitate communication flow of issues, results of environmental monitoring and proposals for new products intended for handling through the Port of Esperance.
- To provide advice to the Port Authority on issues of concern to the community and stakeholders.
- To provide a forum where government agencies and potential port users can inform the Esperance community of issues relevant to the Port Authority and the community.
- To inform the community on public health and safety and to monitor the environmental impact on the community.

In establishing the PCC the following points have been recognised:

- The Port Authority is in close proximity to the residents of Esperance.
- The operations and materials handled by the Port Authority have the potential to and have impacted on the public health of the Esperance community and the environment.
- The Port Authority seeks an open and transparent relationship with the Esperance community on issues which have the potential to impact on their health and the environment.
- The significant benefits that the Port Authority brings to the community.

The PCC will discuss methods of dissemination of information from the Esperance Port Authority to the community and provide advice accordingly.

The Committee will also provide advice to the Port Authority on any proposal which is the subject of a community consultation process.

The PCC will be chaired by a Director of the Esperance Port Authority Board and include members from the:

- Shire of Esperance;
- Locals for Esperance Development (LED);
- Local Environmental Action Forum (LEAF);
- Western Australian Farmers Federation;
- Esperance Chamber of Commerce and Industry;
- Esperance Regional Tourism Authority;
- Foreshore Action Group;
- Esperance Rate Payers Association; and
- Department of Environment and Conservation

Nickel monitoring continues

DEC is continuing to monitor nickel ship loading and rail transport in Esperance.

The Pollution Response Unit monitored ship loading in early July and mid-August and found dust emissions at the ship loading area were significantly lower than during the May shipment. Odours were not detected in residential areas surrounding the port.

Officers noted that more attention had been given to ensuring moisture content was correct in an effort to reduce airborne dust. The PRU was expected to monitor the September nickel shipment.

Inspections of train kibbles transporting nickel into Esperance in June found some kibbles were damaged and some overloaded, preventing the covers from sealing properly.

DEC issued an Environmental Field Notice to a mining company and requested both nickel exporters ensure damaged kibbles were not being used and that covers were appropriately fitted. DEC has also requested work practices be improved to prevent overloading of kibbles.

There has been a positive response by the mining companies who have advised they would be removing damaged kibbles from service and putting in place an audit process to ensure kibbles were regularly inspected.

Recent inspections of several trainloads of kibbles have found them to be in good condition and with well fitting covers.



What's been done already?

Efforts to address the lead pollution in Esperance have been widespread and the State Government has spent more than \$5 million to date in the clean-up of the town. Key activities are summarised here:

Health tests

- 2919 blood samples have been tested for lead levels and 98 urinary samples tested for nickel.
- Isotope testing was carried out on blood lead samples to determine the source of lead in those samples.
- Re-testing of any person with elevated blood lead levels is in place and will stay in place until blood lead levels are within accepted levels.
- Repeat testing of all children especially those aged five and under with blood lead levels above 5 micrograms per decilitre is continuing.
- Dr Alison Jones has been brought in to provide advice to parents of young children and community members about lead toxicology.
- Professor Michael Moore has been brought to Esperance to speak with community residents and port workers about nickel toxicology.

Rainwater tank testing

- 423 rainwater tanks have been cleaned.
- 271 water filters have been distributed.
- Established an ongoing re-testing program of rainwater tanks that have been cleaned to establish if lead and nickel levels in those tanks are and remain below guideline levels after rainfall.

Environmental testing

- 39 water samples have been taken.
- 126 soil samples have been taken.

- 176 swab samples have been taken from homes, schools and public buildings.
- 22 rainwater tanks along the transport route from Esperance to Norseman have been sampled.
- 24 soil samples along the transport route have been taken.

Clean-up operations

- Children's playground equipment and barbecues in the Esperance townsite have been cleaned and sand and soft fall in children's playgrounds have been replaced.
- Cleaned homes of those children under five years of age with blood lead levels above 10 micrograms per decilitre.
- Provided HEPA vacuum cleaners free of charge.
- Produced and distributed a DVD on effective cleaning of heavy metal residues from homes.
- Consultants Golder Associates have been contracted to carry out an independent assessment of the monitoring carried out to date and to provide advice to Government, the Port Authority and to the community on gaps in testing and recommendations for further work.
- DOH has inspected and sampled ceiling voids in Esperance homes to check for lead contamination.

Consultation

- Two open days have been held so members of the public could speak to officers of government agencies, the Port Authority, and consultants.
- An Esperance Response Coordinator has been appointed to coordinate the Government response

to the lead and nickel contamination in Esperance and respond to community concerns.

- The Esperance Community Reference Group (ECRG) has been set up with representation from the community, the Shire, the Port Authority and its Board and the Shire Council.
- Provided dust monitoring results from the Esperance Port Authority to the ECRG.
- Engaged Coakes Consulting to obtain feedback from Esperance residents on issues of concern.

Port operations and related activities

- Improved dust monitoring at the port.
- Improved the transport of nickel concentrates to the port by order to repair or replace faulty kibbles and ensure these are effectively covered.
- Meetings with nickel exporters have been held to consider how best to raise standards of handling and loading nickel concentrates at the port.
- Nickel exporters have been required to review the use of xanthate in the production of nickel sulphide concentrate, resulting in a considerable reduction in its use and therefore in offensive odours to residents.
- Engaged consultants to consider engineering options and costs of replacing the current conveyor and ship loading system for nickel sulphide concentrates.
- Engaged the Chamber of Minerals and Energy to act in a coordinating role with mining companies using the port.
- Conducted an upstream tour of nickel mining operations for members of the Esperance community.
- Made interim improvements to the port's current conveyor and ship loading infrastructure.
- Initiated an independent survey of sediment samples in and around the port to determine the extent of contamination.
- Engaged independent environmental auditors to monitor the Port Authority's performance.
- Required all new materials which are proposed to be exported through the port to have a health and environmental risk assessment approved by appropriate government agencies.

Other developments

- The State Government has provided a grant of \$500,000 to the Esperance community to promote the town as a good place in which to live, work and visit.
- Applied rigorous risk assessment to the proposal from Magellan metals to remove stockpiled lead from the port of Esperance.

Transport route sampling

Testing of rainwater tanks along the rail transport corridor between the Magellan mine site near Leonora and Esperance has been completed and with one minor exception, results have all been well within health guideline levels.

DOH gratefully acknowledges the assistance of the relevant local government officers who undertook the sampling.

DEC has also carried out preliminary screening along the transport route. The results are currently being finalised and once completed, the information will be provided to Golder Associates as part of its comprehensive assessment of what further testing might need to be done.

Marine sediment analysis program

A marine sediment analysis program for the Esperance harbour is underway.

DEC requested the Esperance Port Authority undertake a comprehensive sampling program to determine the levels of nickel and lead in sediments in the harbour area.

The program proposed by the Port Authority was agreed to and sampling has now been completed. The samples are currently being analysed and DEC will be provided with a draft report of initial sample results in November.

The Port Authority will post the sampling results on its website once they are received.

Rainwater tanks re-tested

Re-testing of a selected number of rainwater tanks to validate the decontamination and pump-out process has now been completed and results are expected shortly.

The sampled tanks were selected on the basis of being amongst the earliest cleaned, and some of the highest exceedences recorded. Results will be posted on the DOH website at the earliest opportunity.

Following discussions between the DOH and the Esperance Shire, the sampling program of rainwater tanks by the Shire has been suspended until results of re-testing have been received.





Lead issue update

Esperance position

DEC is committed to locating an experienced industry regulation environmental officer in Esperance. However after advertising the position in May this year, there were no suitable applicants and so an appointment is still to be made.

DEC will be readvertising the position, target employment markets further afield and investigating additional strategies to ensure Esperance continues to be well supported.

Until DEC locates a suitably qualified and experienced person in Esperance to take on the industry regulation role, Perth-based environmental regulation and Pollution Response Unit officers will continue to be sent to Esperance to carry out monitoring, observe nickel ship loading and other regulatory activities.

Independent audit

DEC has identified a person with 30 years experience in environmental regulation to carry out an independent audit of the Department's inspection processes in Esperance.

The independent consultant has recently left the Department of Environment and Climate Change in New South Wales.

DEC is waiting to receive his tender submission for approval and he is expected to be able to arrive in WA by the end of September.

Esperance parks cleaned up

More than 20 parks and children's playgrounds have been cleaned by the Shire of Esperance.

All have been pressure cleaned and those listed below with an asterisk have also had sand replaced.

- Adventureland Park (Esplanade, port end) *
- Arthur Street (cnr Jacaranda/Arthur Street)
- Brockman Street Park (Brockman Street)
- Butler Street Park (off Mathew Street)
- Dixon Park (Catherine Street) *
- Eagle Court Park (Eagle Court) *
- Grace Darling Park (cnr James/Esplanade) *
- GSG (Brazier Street, opposite Shire Depot)
- Hockey Place Park (Hockey Place)
- Ingleton Place Park (Ingleton Place)
- Kalinda Park (east of Mitchell Street)
- Lalor Street Park (cnr Easton/Southern Way)
- Layton Street Park (Layton Street)
- Lions Park (cnr Mitchell/Goldfields Road) *
- Milner Street Park (Milner Street)
- Museum Park (Dempster Street)
- Olympian Way Park (Olympian Way) *
- St Germaine Park (cnr Burton/St Germaine Avenue) *
- Summy Park (end of Daw Drive) *
- Treasure Road Park (Treasure Road)
- Victoria Street Park (cnr Victoria/Queen Street)
- Wildcherry Park (Wildcherry Avenue) *

Cleaning DVD

Following requests from the community for additional information on how to remove lead dust from homes, a number of 14-minute DVDs and VHS videos are now available.

Free copies can be obtained from the Esperance Shire building and library, Esperance Hospital, day care centres, video stores, Coates Hire (where the HEPA vacuum cleaners remain available free of charge). Once you have obtained the required information, returning the copy for others would be appreciated.

Mr Michael Jackson, who is coordinating the Government's response to lead and nickel contamination in Esperance, can be contacted on 9071 0626. Further information is also available on the DOH website at www.health.wa.gov.au and DEC's website at www.dec.wa.gov.au



National Research Centre for Environmental Toxicology

DIRECTOR
Professor Michael R. Moore BSc, PhD, DSc, MACM

The University of Queensland
39 Kessels Road
Coopers Plains Qld 4108 Australia
P.O. Box 594 Archerfield Qld 4108
Telephone +61 7 3274 9009
Facsimile +61 7 3274 9003
Email m.moore@uq.edu.au
Internet www.entox.uq.edu.au

NICKEL

Report from Esperance, July/August 2007.

Professor Michael R. Moore, EnTox

Over a fairly hectic week of meetings I, as an outsider, had the opportunity and privilege to meet with all sections of the community in Esperance, port operators and subsequently nickel exporters and government officers in Perth. Through speaking to all those people especially those who live in Esperance I gained a clear insight into the issues associated with the initial identification of lead exposure and subsequent realisation that there was potential for nickel exposure. The level of nickel exposure has been modest on the basis of urinary nickel measurements and consequentially very unlikely to be associated with nickel toxicity.

One of the primary anxieties relate to dermal sensitisation by nickel. In my discussions with both the people who live in Esperance and their general practitioners there was no indication that nickel sensitivity was a specific issue.

There have been suggestions that epidemiological investigations should be pursued. This is probably unwise. The population size involved (around 14,000) is so small that such an investigation would lack the power to provide reliable information one way or another on impacts of nickel. Overall, it should be remembered that although exposure has taken place the body does clear nickel rapidly and the urine measurements show only modest elevations. Nickel does not bioaccumulate in animals or humans.

HEALTH EFFECTS

The general population can be exposed to nickel via inhalation, oral, and skin exposure. Based on occupational exposure studies, reports of allergic contact dermatitis and animal exposure studies, the primary targets of toxicity appear to be the respiratory tract following inhalation exposure, the immune system following inhalation, oral, or dermal exposure. The toxicity of the different nickel compounds is related to its solubility, with soluble nickel sulfate being the most toxic and insoluble nickel oxide being the least toxic.

SKIN - Contact Dermatitis.

The most commonly reported adverse health effect associated with nickel exposure is contact dermatitis. After an individual becomes sensitized to nickel, dermal contact with a small amount of nickel can result in dermatitis.

Lungs - Respiratory Effects.

Adverse respiratory effects have been reported in humans and animals exposed to nickel compounds at concentrations much higher than typically found in the environment. Lung inflammation is the predominant effect. Exposure to nickel sulfate or nickel subsulfide also



produces damage to the nasal olfactory epithelium. In the absence of exposure to other carcinogenic agents, nickel sulfate does not appear to be carcinogenic following inhalation exposure.

Cancer

The carcinogenicity of nickel has been well documented in occupationally-exposed individuals. Significant increases in the risk of mortality from lung or nasal cancers were observed in several cohorts of nickel refinery workers. Studies of workers in other nickel industries, which typically involve exposure to lower concentrations of nickel, have not found significant increases in cancer risks. The strongest evidence of carcinogenicity is for nickel sulfides.

Soluble nickel does not appear to be carcinogenic in the absence of exposure to other carcinogenic agents. There is no evidence that exposure to low levels of nickel is carcinogenic in humans.

Absorption - Inhalation Exposure

Following inhalation exposure, about 20–35% of nickel deposited in the lungs of humans is absorbed into the bloodstream. Absorption from the respiratory tract is dependent on the solubility of the nickel compound, with higher urinary nickel levels observed in workers exposed to soluble nickel compounds (nickel chloride, nickel sulfate) than in those exposed to less-soluble nickel compounds (nickel oxide, nickel subsulfide).

Absorption - Oral Exposure

A human study using a stable nickel isotope estimated that 29–40% of the ingested label was absorbed. The bioavailability of nickel was elevated in fasted subjects given nickel sulfate in drinking water, but not when nickel was given with food. The bioavailability of nickel increased when nickel was administered in an acidic soft drink, but decreased when nickel was given with whole milk, coffee, tea, or orange juice.

I hope that this helps with the understanding of some of the various issue with regard to Nickel

A handwritten signature in blue ink, appearing to read "Michael R. Moore". The signature is stylized with a large loop at the end.

Michael R. Moore, August 2007