Environmental Protection Notice

- On 25 October 2007, the Department of Environment and Conservation (DEC) issued an Environmental Protection Notice to the Esperance Port Authority.

- The notice required a comprehensive ambient air quality monitoring network to be established.
Environmental Protection Notice

- The major components of the network were in place by the end of January 2008 and monthly reports have been provided by the Port from February 2008.
- DEC has strengthened and expanded the air quality monitoring network and reporting requirements in the licence issued in January 2009.
The Licence Requires

- Monitoring of ambient air quality at four sites (Sites 1 to 4) using pairs of High Volume Air Samplers (HVAS) and Tapered Element Oscillating Microbalances to measure particulates;
- Analysis of filter papers from the HVAS for iron, nickel, lead and sulphur;
- Monthly analysis of material collected by deposition gauges (DG1 to DG13; & DG14 to DG19 from April’09) located in and around the Port;
- Monthly reporting to DEC
The Licence Requires

- Analysis of five rainwater tanks located in the community (adjacent to DG3, DG5, DG8, DG11 and DG12; DG14 to DG19 from April ‘09) monthly;
- An additional five rainwater tanks and associated deposition gauges, installed by 31 March 2009, were added to the monitoring program, results from these were included in the April report; and
- Monitoring of each ship loading of bulk nickel concentrate to be reported to DEC.
Deposition Gauges Results

- Over the last 12 months there has been an ongoing reduction in nickel deposition when compared to historic data.
- The next chart gives the nickel results from deposition gauge 1 (DG1), which was installed immediately adjacent to the Port entrance in 1995.
Nickel Deposits on Gauge DG1 at Esperance
(neighbourhood gauge close to the Port)

Concentration = 42

Indicates concentration below limit of reporting
HVAS Nickel Analysis Results

- Between November 2007 and April 2009 the highest nickel levels (for each highvol site) for each ship loading during this period were graphed.
- Results indicate that two of the 30 loading events during this period were above the licence target of 0.14 µg/m³ (this target applied from 6 October 2008).
- In the case of the loading of ship 2 in October 2008 two sites exceeded the target.

Nickel Concentration (µg/m³)

Ship loading event

Site 1
Site 2
Site 3
Site 4
Site 1 < LOD
Site 2 < LOD
Site 3 < LOD
Site 4 < LOD
Licence Target

< LOD - less than limit of detection
HVAS Nickel Analysis Results

- As a result of the licence target being exceeded in October 2008 the Port revised its bulk nickel ship loading protocol.
- The revised protocol was implemented on 11 December 2008. DEC’s licence requires a protocol to be in place pending short term improvements to loading facilities.
- There have been 11 bulk nickel ship loadings since the revised protocol was implemented and none of these exceeded the licence target.
Nickel levels and the annual 0.003ug/m3 guideline

- Sites 1, 3 and 4 each show numerous 24 hr results where levels less than the guideline were recorded.
- Site 2 has shown some levels below the guideline during March and April.
Nickel Levels at Site 1 High Volume Air Sampler (Esperance 2008 - 2009)

- Shiploading events
- Licence Target (0.14 μg/m³)

- Site 1 - Nickel
- Site 1 - Nickel < LOD

Individual HiVol Sampler Events Within Each Month
Nickel Levels at Site 2 High Volume Air Sampler
(Esperance 2008 - 2009)

Licence Target (0.14 µg/m³)

Shiploading events ↓

Nickel Concentration (µg/m³)

Site 2 - Nickel

Individual HiVol Sampler Events Within Each Month

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Nickel Levels at Site 3 High Volume Air Sampler
(Esperance 2008 - 2009)

- Shiploading events
- Licence Target (0.14 µg/m³)

- Site 3 - Nickel
- Nickel Target 0.14 µg/m³
- Site 3 - Nickel < LOD

Individual HiVol Sampler Events Within Each Month
Nickel Levels at Site 4 High Volume Air Sampler
(Esperance 2008 - 2009)

- Shiploading events
- Licence Target (0.14 μg/l m³)

- Site 4 - Nickel
- Site 4 - Nickel < LOD

Individual HiVol Sampler Events Within Each Month
Lead levels from highvols

- Highvol results show very low lead levels and in most cases below level of detect
- These data do not indicate recirculation of lead dust in air is an issue
Lead Levels at Site 3 High Volume Air Sampler (Esperance 2008 - 2009)

NEPM Standard (0.5 µg/m³) (Annual)

- Site 3 - Lead
- Site 3 - Lead < LOD

LOD decreased from 0.01 to 0.001 µg/m³
LOD increased from 0.001 to 0.003 µg/m³

Individual HiVol Sampler Events Within Each Month
Lead Levels at Site 6 (Lead shed exhaust) High Volume Air Sampler
(Esperance 2009)  —  NEPM Standard (0.5 µg/m³) (Annual)

![Graph showing lead concentration over time with an LOR changed to 0.003 and actual day of HiVol Sampler Events.]

- Site 6 - Lead
- Site 6 - Lead <LOD
Lead results from Dust Deposition Gauges

- All community deposition gauges show very low levels of lead dust or below the limit of detection. Five community sites (DG 3, 4, 6, 7 & 8) have shown 16 consecutive months where lead levels were below the limit of detection.

- These data do not indicate recirculation of lead dust in air is an issue.
Lead Deposition on Dust Gauge DG1 at Esperance
(neighbourhood gauge close to the Port)

- indicates concentration below limit of reporting

Lead Concentration (mg/m²/month)

Lead Deposition on Gauge DG4 at Esperance

Concentration = 42

indicates concentration below limit of reporting

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Lead Deposition on Gauge DG8 at Esperance

Concentration = 72

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DEC’s March 2009 Vegetation Survey

- Second year of a 5 year program
- Resampled the same 17 sites from 2008
- 4 new transects 3km long @ 500m interval
- 24 new sites of same species (Acacia Cyclops)
- 4 new sites at Dempster Head
- 15 deciduous trees (to assess recirculation)
- Around 160 samples
- Report being prepared
Additional High volume Samplers

- To improve data on nickel and lead levels within the community, three extra highvols will be established.
- As required under the EPN, a new site is being established by the Port at the Shire offices.
- Two additional highvols will be established west of the port in the community.
- The extra data will enable better assessment of air quality in the town against the guidelines.
- The extra data will enable better assessment of any lead recirculation via the air.
Air Monitoring results from lead shed negative pressure exhaust

- DEC Osiris monitoring pre-start very low levels of dust, highvol confirmed low lead
- Osiris and highvol during assembly of bagging machine showed ongoing low levels
- Highvol (site 6) shows consistent close to or less than limit of detection (0.003ug/m3) of lead during bagging operations
- Osiris now removed as task met
- Bagging the lead stockpile is finished and it has been exported; shed clean-up has been completed and demolition commenced.
Air Monitoring results from lead shed negative pressure exhaust

- The negative pressure unit will be run continuously during demolition activities.
- Monitoring and reporting on air quality from the exhaust will continue until demolition of the inner shed is complete.