Occupational Health, Safety & Environmental Services

BASELINE DUST MONITORING

At

KUNDIP

For

TECTONIC RESOURCES NL

Report No: **001/05/HYG**
Survey Dates: **10 – 14 Jan 05**
Report Date: **9 Feb 05**
Consultant: **Venessa Thelan – BappSc (Env Hlth), Grad Cert (Ind Hyg) MASTI, AAIOH, ASIA**

WestSafe
A.B.N. 40234719957
75 Exchequer Avenue
Greenfields WA 6210
Mob: 0407 103 893 PH: 08 9535 1014

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1. Introduction

WestSafe was requested by Kim Bennett, Environmental Consultant for Tectonic Resources NL, to conduct baseline dust monitoring within the proposed Kundip project area, Ravensthorpe Western Australia. The Kundip project area is located approximately 17 km southeast of Ravensthorpe on the Ravensthorpe - Hopetoun Road. Historic mining of gold and copper has been conducted in this area since 1900 and WestSafe understands that Tectonic Resources intends to undertake mining of gold and copper ores from the Kundip project area, following approval being granted.

WestSafe established and ran a short dust monitoring program as per (Australian Standard 3640-2004) during the period 10 – 14 January 2005.[(A)] The program incorporated fifty (50) dust collection sites across the Kundip project area with subsequent analysis for inhalable dust and specified heavy metals.

2. Limitations

All work conducted by WestSafe is done so in a conscientious and professional manner. The nature of the task and the likely disproportion between any damage or loss which might arise from the work and any report prepared as a result and the cost of our services is such that WestSafe cannot guarantee that all possibilities associated with the dust monitoring program have been identified. Thus while work is carried out to the best of our ability it is exclusive of any loss or damages which may arise from services provided to Tectonic Resources NL.

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3. Aim

The aim of this survey was to establish baseline dust levels across the Kundip project area prior to any significant disturbance by Tectonic Resources NL. Additional heavy metal analysis was deemed necessary to account for known entities and the possibility of contamination from a nearby Tailings stockpile, located approximately 7km north – north/west of Kundip, also on the Ravensthorpe - Hopetoun Road.

4. General Information

The historic Kundip mining centre is contained within the mining tenements held by Tectonic Resources NL. Mining of the ore bodies within the Kundip project area is an integral component of the Phillips River Gold Project proposed by Tectonic Resources NL.

Baseline sampling refers to sampling conducted at the prospective site of a mine prior to mining. It is useful in providing data on pre-existing dust conditions but, due to seasonal and annual variability in dust levels, should ideally be conducted over a number of years. In practice, this is rarely possible and any data collected can only reflect the dust load and chemical levels present during the specified sampling period.

5. Method

Dust sample collection was conducted using the method described in Australian Standard (AS) 3640-2004 – *Workplace Atmospheres – Method for sampling and gravimetric determination of inhalable dust,* as agreed with Tectonic Resources NL.[(A)] This method is primarily designed for personal sampling however it is also commonly used to obtain static samples at fixed locations.

SKC Universal XR Programmable Sampling Pumps were used with IOM filter head and sampling trains. Filters were pre-weighed and stored individually in petri dishes following collection. Weighing and analysis of samples was conducted by Analytical Reference Laboratories in Perth, Western Australia.

Pumps were fitted inside portable metal cases with 1m extension poles and suitable tubing to ensure filters were set a minimum of 1.2m above the ground. The pumps were calibrated prior to placement at approximately 6am each morning. Flow rates were set at 2.0L/min +\- 0.2 L/min and samples would have been rejected if they had fluctuated outside these parameters. Collection occurred at approximately 4pm each afternoon following a second calibration check on each pump, and filters were individually packed and labeled thereafter.

There is no standard method for determining the spatial arrangement of monitoring equipment or the optimal number of samplers that should be employed. Cost, access to potential sampling sites and the availability of power can often limit the options. WestSafe intended that a GPS would be available for use throughout the week to enable five solid lines of samples running N/W – S/E, covering the majority of the Kundip lease. This did not eventuate and every effort was made to achieve this aim manually. However, being unfamiliar with the site layout combined with limited access across all areas resulted in a slightly skewed arrangement with much of the sampling occurring close to past workings/waste dumps. A GPS was provided by Tectonic Resources NL on Friday 14th of November and each sample collection site was revisited for identification, plots are shown at Appendix I.

6. Results

Results are shown in Table 1 below, which provides sample ID numbers and GPS locations referenced to Appendix I. A brief description of the collection point is also provided however this is not intended as a means of identifying that location and WestSafe recommends that only the GPS coordinates be used for this purpose. The decision to analyse for nickel, copper and arsenic was based on a chemical analysis of sediment from the uncontained Elverdton Tailings Stockpile located approximately 7 km north - northwest of the Kundip project area. Tectonic Resources NL provided this analysis in a document titled '*Assessment of sediment in retention trench (Elverdton May 2003)',* which is attached as Annex A.

Analytical Reference Laboratories conducted the laboratory analysis and reports are provided at Appendix II. Analysis results have been incorporated into Table 1 for ease for reference. No measurable amount of copper, arsenic or nickel was found in any of the samples. The minimum measurable amount of dust collected during this survey was 0.1mg/m^3 with a maximum of 0.9mg/m^3, less than 10% of the national exposure standard.(B) The variance between results across location and collection date is attributable to changes in wind speed and possibly, to soil composition and physical condition in the immediate vicinity of the sample collection point.

7. Discussion

Weather information collected for the sampling period is attached at Appendix III and shows prominent south westerly winds throughout the sampling period at three local weather stations for both of the daily recording times of 9am and 3pm.(E) Unfortunately this wind pattern did not assist in determining the spread of any dusts separated from the Elverdton Tailings Stockpile north - northwest of Kundip. The only collection day where a measurable quantity of dust was collected across all ten samples was Thursday 13th January, which was also the day with the highest wind speeds, ranging from 37kph at Hopetoun to 39kph at Cheadenup to 31kph at Ravensthorpe. Dust levels on this day ranged from 0.1 to 0.4mg/m^3 and were variable over the area surveyed.

These results indicate that dust collection in even higher winds may exceed the exposure standard, and if the direction was north – northwest, there is a remote possibility that contamination from the Elverdton Tailings stockpile may be identified. However this cannot be confirmed without having sampled under those conditions.

8. Exposure Standards

National exposure standards for inhalable dust and the heavy metals listed in Table 1 are provided in WorkSafe Australia Standard - *Exposure Standards for Atmospheric Contaminants in the Occupational Environment*, and are detailed below.(B)

Airborne Particulates – Inhalable Dust: The behaviour, deposition and fate of any individual particle after entry to the human respiratory system and the response that it elicits depends on the nature and size of the particle. Only the larger particles in any total quantity of dust present in a workers breathing zone will be deposited in the nose, pharynx and larynx. Smaller particles which may reach the gas exchange regions are known as the respirable fraction. The analytical method outlined in AS 3640 is a gravimetric analysis, providing a total dust result and as such takes into account both the inhalable and respirable fractions.

Sampling for respirable dust was not warranted on this occasion as the method is used for occupational exposures where a specific hazard has been identified. There may be a requirement to conduct sampling for respirable dusts in the future once the mine becomes operational.

For dusts not otherwise classified (i.e. not wood dusts or silica), the recommended exposure standard is 10mg/m^3. Where dust is known to contain a specific contaminant then the exposure standard applicable to the specific contaminant is used.

Copper: Copper dusts and mists (as Cu) - TWA exposure standard 1mg/m^3.

Arsenic: Arsenic as As - TWA exposure standard 0.05mg/m^3.

Nickel: Nickel sulphide roasting (fume & dust as Ni) - TWA exposure standard 1mg/ m^3.

Table 1 – Sampling Results for KUNDIP Mine Site – 10 – 14th January 2005

Sample ID	Date Collected	GPS Location	Physical Description of Location	Total Sampling Time (mins)	Ave Flow Rate L/min	RESULTS			
						Inhalable Dust mg/m^3	Nickel (Ni) mg/m^3	Copper (Cu) mg/m^3	Arsenic (Ar) mg/m^3
I5545	10 January 2005	0240455 6271539	Opposite Northern Road Boundary Marker (Tyre)	517	2.150	<0.1	<0.001	<0.001	<0.001
I5546		0240558 6271170	Small Tree on left on main northern road (approx 360m south of I5545)	214	2.125	<0.1	<0.001	<0.001	<0.001
I5547		0240707 6270820	On left of bend in road near main Kaolin Pit (approx 360m south of I5547)	512	2.035	<0.1	<0.001	<0.001	<0.001
I5548		0240633 6270663	Opposite Two Boys Pit at Tectonic Resources NL Survey Station	511	2.035	<0.1	<0.001	<0.001	<0.001
I5539		0240620 6270496	Southern End of Two Boys Pit – Lone Tree near barrel dump	420	2	<0.1	<0.001	<0.001	<0.001
I5540		0240554 6270661	West Side of two Boys Pit - Tectonic Resources NL survey station pole	490	2.105	0.1	<0.001	<0.001	<0.001
I5541		0240993 6270340	Track through Harbour View where Bush gets very close to sides of track(additional 50m east)	499	2.075	<0.1	<0.001	<0.001	<0.001
I5542		0240878 6269310	At Ore Vacuum Truck , S/E corner near tree	495	1.920	<0.1	<0.001	<0.001	<0.001
I5543		0240696 6268768	Southern Boundary – (corner of north-south track)	479	2.040	<0.1	<0.001	<0.001	<0.001
I5544		0240667 6269140	Road running N/W – S/E from southern boundary to 'Old Truck' road – approx 50m from top	501	2	<0.1	<0.001	<0.001	<0.001
I5642	11th January 2005	0240505 6271130	North of Large M74/180 Dump	662	2.107	<0.1	<0.001	<0.001	<0.001
I5644		0240633 6270850	100m west of Top track north of M74/180 dump	658	2.055	<0.1	<0.001	<0.001	<0.001
I5646		0240579 6270783	Centre of Pits M74/180 – approx 150m south of I5644	596	2	<0.1	<0.001	<0.001	<0.001
I5650		0240499 6270629	At crossroads near main structures	648	2.072	<0.1	<0.001	<0.001	<0.001
I5649		0240593 6270479	At southern end of Two Boys Pit, west side on mound	648	2.055	<0.1	<0.001	<0.001	<0.001
I5647		0240367 6270044	At old 'sterilisation' track on left of road to Flag	648	2.055	<0.1	<0.001	<0.001	<0.001
I5651		0240774 6270298	Road heading east across Harbour View – approximately 300m west of I5541 –	617	2	<0.1	<0.001	<0.001	<0.001
I5635		0240596 6269707	Recent Track from Harbour View to Flag	501	2	0.1	<0.001	<0.001	<0.001
I5648		0240701 6269206	At Yellow Rock Pile on Road to Ore Vacuum Truck	642	2.072	<0.1	<0.001	<0.001	<0.001
I5657		0240557 6268753	Half way between I5544 and White Survey pole on Southern Boundary track	642	2.055	<0.1	<0.001	<0.001	<0.001
I5625	12th January 2005	0240374 6271198	100m further west from I5642	527	2	<0.1	<0.001	<0.001	<0.001
I5645		0240570 6270957	N/W corner of M74/180 (as seen on map)	631	2	<0.1	<0.001	<0.001	<0.001
I5631		0240504 6270842	N/W corner of Kaolin Pit Dump	496	2	0.2	<0.001	<0.001	<0.001
I5638		0240404 6270633	Northern side of Western Gem Pit	627	2.090	<0.1	<0.001	<0.001	<0.001
I5624		0240382 6270526	Southern Side of Western Gem Pit	623	2.070	0.3	<0.001	<0.001	<0.001
I5627		0240226 6270259	Junction of Road to Flag and Two Boys Pit	621	2.010	<0.1	<0.001	<0.001	<0.001
I5643		0240239 6269794	Junction of Road to Flag and Road through Harbour View	619	2.125	0.2	<0.001	<0.001	<0.001
I5655		0240598 6269132	At East side of existing works at Flag	618	2.125	0.1	<0.001	<0.001	<0.001
I5654		0240329 6269132	On E/W track from Flag to Hopetoun Road	615	1.970	0.1	<0.001	<0.001	<0.001
I5652		0240309 6268739	A Marker Point on Southern Boundary	614	2.070	0.1	<0.001	<0.001	<0.001

Sample ID	Date Collected	GPS Location	Physical Description of Location	Total Sampling Time (mins)	Ave Flow Rate L/min	RESULTS			
						Inhalable Dust mg/m^3	Nickel (Ni) mg/m^3	Copper (Cu) mg/m^3	Arsenic (Ar) mg/m^3
I5640	13th January 2005	0240224 6270723	S/W Corner of P74/153	261	2	0.3	<0.001	<0.001	<0.001
I5637		0240387 6270924	West Side of large dam near Kaolin Pit – (left side of pit)	418	2.055	0.4	<0.001	<0.001	<0.001
I5634		0240111 6270378	South side of road to Western Gem Pit – approx 10m towards old works	406	2.070	0.8	<0.001	<0.001	<0.001
I5656		0240047 6270168	On Road to Two Boys Pit at Bend in road	404	2.055	0.4	<0.001	<0.001	<0.001
I5629		0240118 6269958	100m west of road to Flag – approx half way between Main road in and Harbour View Turn off	402	1.970	0.3	<0.001	<0.001	<0.001
I5626		0240099 6269766	At old tree stump just west of N/E – S/W road through Mayday opposite old workings	402	2.125	0.2	<0.001	<0.001	<0.001
I5653		0239994 6269419	Approx 200m south of I5623	402	2.025	0.1	<0.001	<0.001	<0.001
I5639		0240471 6269278	N/W side of existing works at Flag	399	2.125	0.4	<0.001	<0.001	<0.001
I5618		0240187 6269405	On Road past Mayday (from Flag to Hopetoun Road)	396	2.055	0.2	<0.001	<0.001	<0.001
I5630		0240208 6269138	At junction of tracks adjacent to southern boundary and between Flag and Hopetoun Road	401	2	0.2	<0.001	<0.001	<0.001
I5622	14th January 2005	0239299 6270503	Near the eastern branch of the Steere river (off to the left of the main road in)	408	2.090	<0.1	<0.001	<0.001	<0.001
I5633		0239756 6270231	On Main Road In – at Rise before Bend (just before junction in road)	406	2.132	0.2	<0.001	<0.001	<0.001
I5636		0240114 6270723	Off track – approx 20m west of Gem Pit and Kaolin Dump	374	2.055	<0.1	<0.001	<0.001	<0.001
I5632		0240094 6270505	Off Track from Gem Pit (west)	369	2.090	<0.1	<0.001	<0.001	<0.001
I5613		0240037 6269889	Off track to Flag – approx 100m south of I5629	360	2.070	<0.1	<0.001	<0.001	<0.001
I5616		0240015 6269817	West Side of Mayday	344	2.090	<0.1	<0.001	<0.001	<0.001
I5628		0239950 6269789	S/W Side of Mayday	345	2.107	<0.1	<0.001	<0.001	<0.001
I5621		0239869 6269523	S/W of Mayday oat rear of Cleared area behind old workings	339	2.055	0.1	<0.001	<0.001	<0.001
I5620		0239836 6269271	At junction to Boundary	334	2.090	0.9	<0.001	<0.001	<0.001
I5641		0239892 6268684	Along Southern Boundary	345	2.040	0.5	<0.001	<0.001	<0.001

9. Associated Health Hazards

Whilst results obtained during this survey do not indicated a measurable presence of heavy metals or significant dust levels, it is essential that the health effects of these potential hazards are recognised, given the likely increase in levels during future mining activities. The following information is provided in brief to highlight some of the known health hazards associated with inhalation of heavy metals and dust.

Inhalation of dusts and fumes of metallic copper may cause irritation of the upper respiratory tract, congestion of nasal mucous membranes, ulceration and perforation of the nasal septum, and pharyngeal congestion. Acute arsenical poisoning due to inhalation is exceedingly rare in the workplace however when it does occur it produces respiratory tract symptoms (cough, chest pain and dyspnoea), giddiness, headache, and extreme general weakness, followed by gastrointestinal symptoms including epigastric pain, vomiting and diarrhoea.[C]

Chronic signs of toxicity in workers exposed to arsenic compounds are related chiefly to the skin, mucous membranes, gastrointestinal and nervous systems, and less commonly to disorders of the circulatory system and liver. Lung cancer is the primary cause of concern with chronic inhalation of arsenic in the workplace. Deaths due to respiratory cancer have been observed among workers exposed to inorganic arsenic in gold mining, and in the smelting of nonferrous metals, especially copper.[C]

10 Recommendations & Conclusion

There is nothing in the results to indicate any reason for concern in relation to existing dust levels within the Kundip project area, although it must be acknowledged that the results obtained from this particular sampling program are only indicative of the dust levels that were present during that time. In general, mining activities contribute significantly to increased dust movement, and given the known presence of gold and copper in the Kundip soils it is possible that heavy metal presence in that dust will also increase.

In order to gain a more thorough appreciation of existing and potential dust levels it may be of benefit to conduct additional sampling. WestSafe recommends using a type of Continuous particle monitor which can produce a continuous record of ambient dust levels. This is a significant advance over the standard high volume sampler in that it allows examination of short-term dust episodes. It can be utilised as a powerful management tool if matched to records of mining activity and continuous wind data. Two examples of continuous monitors are: TEOM™ and Beta gauges, further information on which can be found at References F, G and H.

Venessa Thelan
Director WestSafe

REFERENCES

A. Australian Standard 3640-2004 – Workplace Atmospheres – Method for sampling and gravimetric determination of inhalable dust

B. Worksafe Australia Standard – Exposure Standards for Atmospheric Contaminants in the Occupational Environment – NOHSC:3008 (1995) Guidance Note & NOHSC:1003(1995) National Exposure Standards

C. Agency for Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for Copper (Update); Toxicological Profile for Arsenic; Toxicological Profile for Nickel*. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA.

D. California Environmental Protection Agency (CalEPA). *Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels.* Draft for Public Comment. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1997. US Environmental Protection Agency on line at *http://www.epa.gov/ttn/atw/hlthef/nickel.html#ref6* 1997.

E. Bureau of Meterology (Australian Government) – Daily Weather Observations on line at *http://www.bom.gov.au/climate/dwo/*

F. *Dust Control,* Environment Australia, 1998 - Best Practice Environmental Management in Mining, Chap 6, on line at http://www.deh.gov.au/industry/industry-performance/minerals/booklets/dust/#61

G. Pacwill Environmental FH621-10 Beta Attenuation Monitor, on line at *http://www.pacwill.ca/betagauge.html*

Assessment of sediment in retention trench (Elverdton May 2003)

Particle sizing of 03A60_001

DRY SIEVE

Lab No 03A60_001
Sample *Sediment in trench*

Sieve (mm)	% retained	% passing
1.0	29.7	93.4
0.6	15.2	87.8
0.3	11.5	76.5
0.15	5.9	34.7
0.106	2.1	21.1
0.075	2.7	8.9
	4.2	5.8

Lab No 03A60_002
Sample *Wind blown dump*

Sieve (mm)	% retained	% passing
1.0	0.3	99.7
0.6	1.2	98.5
0.3	13.1	85.4
0.15	42.3	43.1
0.106	16.7	26.4
0.075	15.2	11.2
	7.7	3.5

Lab No 03A60_003
Sample *Matrix mine face*

Sieve (mm)	% retained	% passing
1.0	29.7	70.3
0.6	16.2	54.1
0.3	11.5	42.6
0.15	5.9	36.7
0.106	2.1	34.6
0.075	2.7	31.8
	4.2	27.6

Lab No 03A60_004
Sample *Upper Catchment*

Sieve (mm)	% retained	% passing
1.0	0.3	99.7
0.6	4.8	95.1
0.3	6.7	88.4
0.15	12.8	75.7
0.106	9.1	66.5
0.075	10.5	56.0
	17.3	38.7

Particle size distribution of each sample was measured by dry sieving through a set of standard wire mesh screens. The presence of easily disrupted aggregates in each sample was noted, particularly Lab Nos 03A60_003 and 03A60_004.

Particle sizing of 03A60_001-004

WET SIEVE

Lab No 03A60_001
Sample *Sediment in trench*

Sieve (mm)	% retained	% passing
1.0	5.8	95.0
0.6	5.1	89.9
0.3	16.7	73.1
0.15	38.6	37.5
0.106	13.9	23.7
0.075	11.2	12.5
	5.7	6.8

03A60_002
Wind blown dump

Sieve (mm)	% retained	% passing
1.0	0.3	99.7
0.6	1.2	98.4
0.3	13.5	84.9
0.15	40.9	44.0
0.106	16.5	27.5
0.075	14.9	12.5
	7.0	5.5

Lab No 03A60_003
Sample *Matrix mine face*

Sieve (mm)	% retained	% passing
1.0	0.3	99.7
0.6	0.4	99.3
0.3	1.0	98.3
0.15	2.0	96.3
0.106	1.2	95.1
0.075	1.8	93.5
	2.2	91.3

Lab No 03A60_004
Sample *Upper Catchment*

Sieve (mm)	% retained	% passing
1.0	<0.1	100.0
0.6	<0.1	100.0
0.3	0.5	99.5
0.15	5.7	93.8
0.106	5.2	88.6
0.075	10.1	78.5
	14.6	63.9

Samples were dispersed in $Calgon/NaOH$, wet sieved through a 0.075 mm sieve and the >0.075 size fraction dried by dry sieving. AS 1289.3.6.1-1995 : Methods of testing soils for engineering purposes - Soil classification tests - Determination of the particle size distribution of a soil - Standard method of analysis by sieving

CHEMICAL ANALYSES

LAB NO	SAMPLE	pH (H2O)	SO4_S (H2O) %	S (comb) %	S (comb) mg/kg	S (ICP-s) %wt	Cu (ICP-s) %wt	Cu (ICP-s) mg/kg
60_001	Sediment trench	4.9	0.1	0.1	1000	0.1	0.0048	480
60_002	Wind blown dump	5.1	<0.1	0.1	1000	0.1	0.0078	780
60_003	Matrix mine face	5.1	0.4	0.7	7000	0.8	0.124	1240
60_004	Upper Catchment	4.9	0.2	0.2	2000	0.2	0.126	1260

Background Dust Monitoring Map

Kundip Project Area

January 2005

GPS Locations of Samples.

LABORATORY REPORT

ARL Lab No: 1696
DATE: 2 February 2005

CLIENT: West Safe Pty Ltd
75 Exchequer Avenue
GREENFIELDS WA 6210

ATTENTION: Ms Vanessa Thelan

DESCRIPTION: Fifty filter samples for analysis of Inhalable Dust, Nickel, Arsenic and Copper. All samples analysed as received.

DATE RECEIVED: 17 January 2005

METHOD: ARL 099 – Analysis of Inhalable Dust
ARL 103 – Analysis of Metal and Metalloid in Workplace Atmospheres

RESULTS:

		mg/m^3 Inhalable Dust	**mg/m^3 Nickel**	**mg/m^3 Arsenic**	**mg/m^3 Copper**
I5545	10/01/2005	<0.1	<0.001	<0.001	<0.001
I5546	10/01/2005	<0.1	<0.001	<0.001	<0.001
I5547	10/01/2005	<0.1	<0.001	<0.001	<0.001
I5548	10/01/2005	<0.1	<0.001	<0.001	<0.001
I5539	10/01/2005	<0.1	<0.001	<0.001	<0.001
I5540	10/01/2005	0.1	<0.001	<0.001	<0.001
I5541	10/01/2005	<0.1	<0.001	<0.001	<0.001
I5542	10/01/2005	<0.1	<0.001	<0.001	<0.001
I5543	10/01/2005	<0.1	<0.001	<0.001	<0.001
I5544	10/01/2005	<0.1	<0.001	<0.001	<0.001

RESULTS:

		mg/m^3 Inhalable Dust	mg/m^3 Nickel	mg/m^3 Arsenic	mg/m^3 Copper
I5642	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5644	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5646	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5650	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5649	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5647	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5651	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5635	11/01/2005	0.1	<0.001	<0.001	<0.001
I5648	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5657	11/01/2005	<0.1	<0.001	<0.001	<0.001
I5625	12/01/2005	<0.1	<0.001	<0.001	<0.001
I5645	12/01/2005	<0.1	<0.001	<0.001	<0.001
I5631	12/01/2005	0.2	<0.001	<0.001	<0.001
I5638	12/01/2005	<0.1	<0.001	<0.001	<0.001
I5624	12/01/2005	0.3	<0.001	<0.001	<0.001
I5627	12/01/2005	<0.1	<0.001	<0.001	<0.001
I5643	12/01/2005	0.2	<0.001	<0.001	<0.001
I5655	12/01/2005	0.1	<0.001	<0.001	<0.001
I5654	12/01/2005	0.1	<0.001	<0.001	<0.001
I5632	12/01/2005	0.1	<0.001	<0.001	<0.001

West Safe Pty Ltd
Attn: Vanessa Thelan
ARL Lab No: 1696
2 February 2005

RESULTS:

		mg/m^3 Inhalable Dust	mg/m^3 Nickel	mg/m^3 Arsenic	mg/m^3 Copper
I5640	13/01/2005	0.3	<0.001	<0.001	<0.001
I5637	13/01/2005	0.4	<0.001	<0.001	<0.001
I5634	13/01/2005	0.2	<0.001	<0.001	<0.001
I5656	13/01/2005	0.4	<0.001	<0.001	<0.001
I5629	13/01/2005	0.3	<0.001	<0.001	<0.001
I5626	13/01/2005	0.2	<0.001	<0.001	<0.001
I5653	13/01/2005	0.1	<0.001	<0.001	<0.001
I5639	13/01/2005	0.4	<0.001	<0.001	<0.001
I5618	13/01/2005	0.2	<0.001	<0.001	<0.001
I5630	13/01/2005	0.2	<0.001	<0.001	<0.001
I5622	14/01/2005	<0.1	<0.001	<0.001	<0.001
I5633	14/01/2005	0.2	<0.001	<0.001	<0.001
I5636	14/01/2005	<0.1	<0.001	<0.001	<0.001
I5632	14/01/2005	<0.1	<0.001	<0.001	<0.001
I5613	14/01/2005	<0.1	<0.001	<0.001	<0.001
I5616	14/01/2005	<0.1	<0.001	<0.001	<0.001
I5628	14/01/2005	<0.1	<0.001	<0.001	<0.001
I5621	14/01/2005	0.1	<0.001	<0.001	0.001
I5620	14/01/2005	0.9	<0.001	<0.001	<0.001
I5641	14/01/2005	0.5	<0.001	<0.001	<0.001

mg/m^3 values calculated using supplied run times.

Daniel Haworth
Environmental Officer

METEROLOGICAL DATA FOR SAMPLING PERIOD

Hopetoun, Western Australia - January 2005 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
10	Mo	18.7	24.4	0			SW	56	03:57	22.0	56		SW	28	1015.0	22.3	61		S	26	1013.1
11	Tu	13.2	24.4	0			WSW	43	08:17	22.4	51		WSW	30	1018.0	21.6	57		S	19	1017.4
12	We	11.6	29.2	0			SE	35	13:39	24.3	47		NNE	7	1016.2	24.9	42		SSE	22	1011.9
13	Th	15.3	23.4	0.2			SW	57	12:07	17.7	92		SW	33	1015.8	19.5	53		SSW	37	1018.1
14	Fr	15.6	22.0	0			SSW	41	00:15	18.8	46		S	20	1023.8	19.4	43		S	24	1022.1

Cheadanup (Munglinup District), Western Australia - January 2005 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
10	Mo	17.6	26.4	0			SW	52	03:58	20.3	60		SW	28	1014.6	24.3	36		SSW	19	1012.4
11	Tu	10.5	27.3	0			WSW	43	08:24	21.5	46		WSW	26	1017.9	25.6	30		S	20	1017.0
12	We	10.8	35.7	0			W	43	13:44	24.6	18		NNW	11	1016.8	35.1	9		WNW	19	1011.8
13	Th	12.9	22.5	0			SSW	59	13:29	20.9	65		SSW	31	1015.0	19.9	47		SSW	39	1017.2
14	Fr	11.7	22.0	0.2			S	43	14:42	16.6	52		SSE	17	1023.1	20.5	39		S	26	1021.1

Ravensthorpe, Western Australia - January 2005 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
10	Mo	16.9	28.3	1.0						20.2	58	6	SW	4	1015.1	24.5	45	0	S	9	1012.3
11	Tu	12.3	27.9	0						21.9	44	0	SW	19	1018.0						
12	We	10.3	35.0	0						24.9	26	4		Calm	1016.4	33.9	15	0	SW	9	1011.7
13	Th	13.5	21.5	0						21.0	65	8	SW	28	1014.9	20.5	49	8	SW	31	1016.9
14	Fr	14.0	21.4	0						16.9	50	8	S	4	1023.4	18.7	43	0	S	9	1021.4

Data provided by Bureau of Meteorology