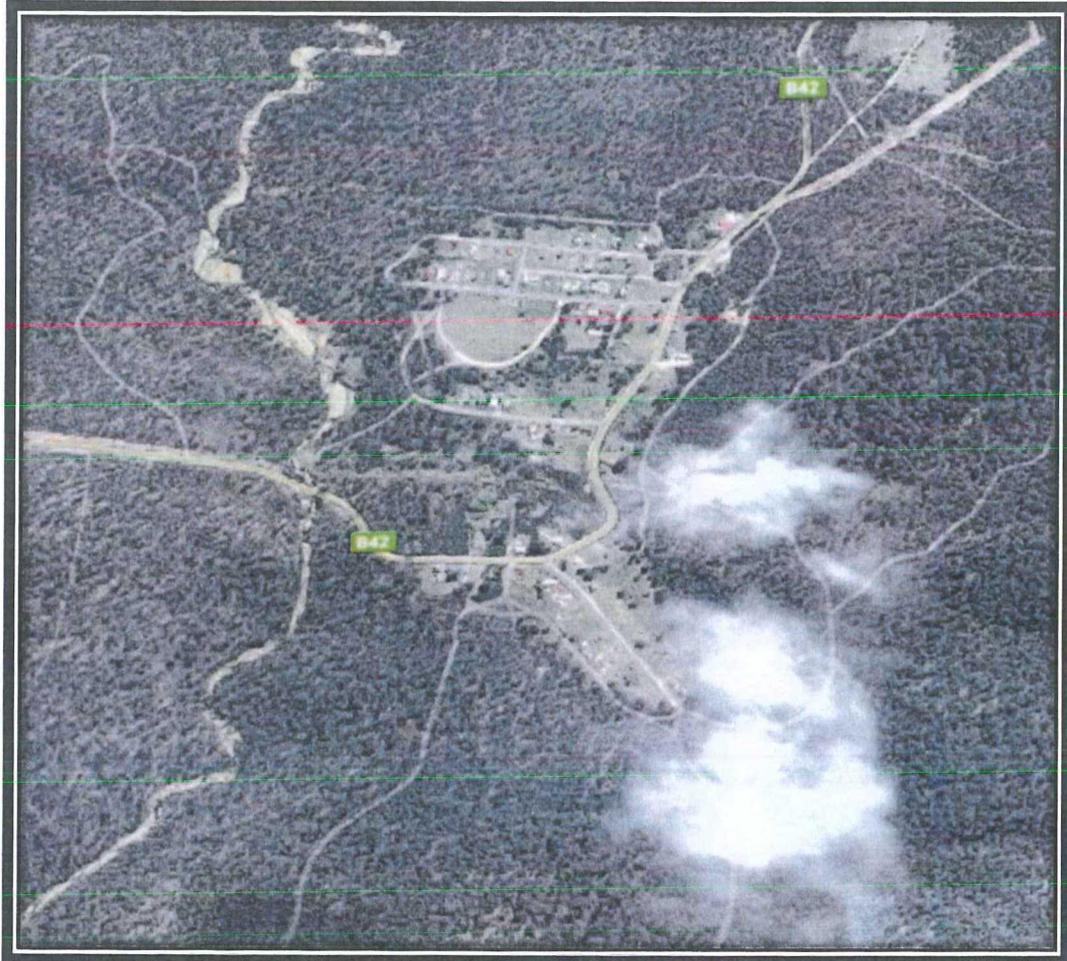


Storey's Creek Site – Asbestos Concentration Levels Methodology



Site Inspection and Assessment Conducted on the 16th April 2017

By Peter Stucki



Office: Unit 2 #4 Lampton Ave Moonah 7009
Postal Address: As Above
Mobile: 0439 338 360
Email: admin@aegisasbestos.com.au

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Introduction

In February 2017, Mineral Resources Tasmania contacted Aegis AC P/L to undertake a site inspection of the Forestry Tasmania, Storey's Creek site. This site, previously a small community, is known to have contamination of hazardous materials, particularly asbestos containing materials. However, the concentration levels of asbestos containing material and the grade of the asbestos containing material – friable and non-friable, at the Storey's Creek site is unknown.

The aim of the site inspection and report is to provide a realistic assessment of the extent of the surface contamination and options for remediation of the site.

The site inspection, survey and assessment of the Storey's Creek site was carried out by Aegis AC Pty Ltd Licensed Asbestos Assessor, Peter Stucki. Peter has 25 years' experience in the asbestos removal industry. His involvement with asbestos extends to major commercial construction and building sites in Tasmania and the mainland.

The site inspection involved Peter and a 2nd Aegis employee surveying the location over 7 days.

Scope of Works & Methodology

The site inspection covered a land area defined by Forestry Tasmania have regard to an aerial photograph of the original site, refer Appendices #1. This photograph shows the current land tenure compared with the as a small community. The site investigation and assessment included the overall footprint of the buildings, related infrastructure, and surrounding areas at the site.

Attention focused on areas where buildings and other structure once stood. The site was divided up into approximately a 25m x 25m grid. To aid in the "gridding" of the site Aegis AC P/L used laser measuring devices, stringlines, wooden pegs and line marking spray paint. The surface of each of the 25m x 25m squares was visually inspected for identifiable asbestos contamination.

Prior to commencing the site inspection, it was considered appropriate to grade the surface contamination to assist with future remediation options. The levels of grading are;

- Level 1 – no asbestos debris observed
- Level 2 – light contamination being assessed as less than 5 pieces of asbestos debris
- Level 3 – medium contamination being assessed as between 5 and 20 pieces of asbestos debris
- Level 4 – heavy contamination being assessed as greater than 20 pieces of asbestos debris

The grids are referenced via a numerical code, with the aerial photograph marked accordingly. Each grid was colour coded during the site inspection as a visual aid to the levels of contamination.

On completion of the site investigation and assessment, Aegis AC P/L is to provide Mineral Resources Tasmania's management with options to consider regarding remediation strategies for the areas contaminated with asbestos.

These options may include, but not limited to;

- The physical act of picking up the asbestos debris in the more heavily contaminated areas and in areas that is more likely to be regularly walked by members of the public.
- The covering of asbestos debris by importing soil from other areas
- The excavating of the top layer of soil from the more heavily contaminated areas to be transported off site as asbestos waste.

Observations

During the site inspection and evaluation on the extent of asbestos debris contamination at Storey's Creek, the following was determined;

- Most of the asbestos containing materials found at Storey's Creek, >95%, would be classed as non-friable.
- The non-friable asbestos containing material observed at Storey's Creek was predominately in the form of asbestos cement sheet debris
- This debris ranged in size from 1cm^2 up to 50cm^2
- Other non-friable asbestos containing material observed at Storey's Creek included;
 - asbestos piping. Lengths of asbestos piping was observed above ground. Other lengths remained connected to buried pipes.
 - asbestos floor tiles. Samples of this material had previous been sent to a laboratory for testing and found to contain asbestos.
- Friable asbestos was identified on the ground surface. This included the following locations;
 - pipe lagging between P.9 and P.10, refer Appendices #2
 - millboard found near the two concrete slabs that are the source of all the broken vinyl floor tiles. The millboard debris was bagged and removed from site by Aegis AC Pty Ltd.

Recommendations

Aegis AC Pty Ltd has determined four levels of grading, indicating surface contamination on the site, refer Appendices #2.

- Level 1 – no asbestos debris observed
- Level 2 – light contamination being assessed as less than 5 pieces of asbestos debris
- Level 3 – medium contamination being assessed as between 5 and 20 pieces of asbestos debris
- Level 4 – heavy contamination being assessed as greater than 20 pieces of asbestos debris

Appendices #2 identifies the approximate location and spread of the four levels of grading.

Level 1

It is estimated around 50% of the land can be graded as L/1 and therefore not containing asbestos contamination on the surface.

Level 2

It is estimated around 10% of the land can be graded as L/2. It is recommended that the visible asbestos debris be picked up and bagged. Bagged waste would be disposed of at a controlled waste facility. This is a practical solution to remove contamination.

Level 3

It is estimated around 5% of the land can be graded as L/3. A similar approach to removing asbestos debris in the L/2 areas would be recommended.

Level 4

It is estimated around 35% of the land can be graded as L/4 category. In a number of the L4, 25m x 25m locations the amount of asbestos debris on the surface is in the hundreds of pieces.

The L4 areas require priority attention. There are three options for remediation of the L/4 Storey's Creek site. These are;

- Option 1
The physical act of picking up and bagging of the asbestos debris. This is the most practical and cheapest solution to removing contamination. Utilising a team of asbestos removalist, working systematically over 25m x 25m gridding the worst affected areas of the site could be cleaned up in approximately 4 weeks. Asbestos removalist would manually collect visible asbestos debris and then rake over the surface to expose any sub surface material. This removal method does not include cleaning up the tip site.
- Option 2
Covering the worst affected areas by digging up and importing soil to cover the L4 contaminated area. The volume of soil required to achieve this would be significant. The soil cover would need to be a minimum 100mm in depth.

- Option 3
Removing the existing asbestos debris and surface soil. This would be achieved via excavation the top layer of soil. The contaminated soil would be loaded into lined skip bins and transported to an approved controlled waste facility. Pieces of asbestos debris sticking up from the soil as observed in the site inspection would indicate that there may be a lot more buried asbestos containing material. This option represents best practices and would be a long-term solution. However, it would be the costliest of the 3 options.

The friable pipe lagging located adjacent to P.9 and P.10 should be immediately removed by a A-Class Licenced asbestos removalist. This contamination is regarded as the highest risk at the site.

It is unrealistic to think all the pieces of asbestos debris would be located and removed from site. However, the manual process of collecting and bagging would remove the vast majority of asbestos containing material on the surface.

Once manual collecting and bagging of asbestos debris has been completed an Occupational Hygienist should visually inspect the site and provide a Visual Clearance Certificate. The Visual Clearance Certificate is likely to include a disclaimer stating;

- the size of the area
- the extent of vegetation overgrowth and
- future weathering from rain and wind may expose additional asbestos debris

The site should be reinspected annually as harsh weather conditions may cause more debris to become exposed to the surface. This exposed asbestos debris should be collected, bagged and removed from site.

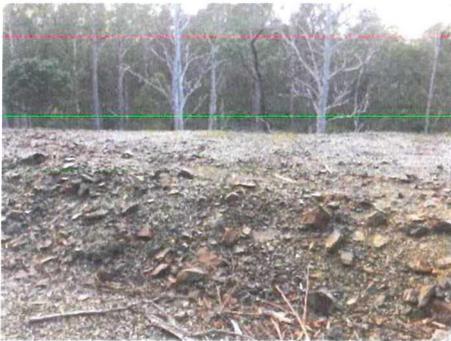
The Tip Site

The tip site, between the bunding and the tip face, covers an area of approximately 90m x 15m.

Upon close inspection, the following was noted;

- hundreds of small pieces of asbestos cement sheet debris are mixed in amongst the soil and pebbles. This level of contamination indicates a L/4 grading.
- the likelihood of asbestos debris having been pushed down into the tip.

Unfortunately, it was not possible to gain access to the banks of the tip face and gully as it was deemed unsafe and covered with vegetation overgrown. However, the flat section, at the top of the tip face, could be remediated. The same method of remediation as mentioned for L/2 contamination would be undertaken.



PIC OF BUNDING AROUND TOP OF TIP FACE



PIC OF FLAT AREA BETWEEN BUNDING AND TIP FACE



PIC OF PART OF TIP FACE



PIC OF L/4 CONTAMINATED AREA BETWEEN BUNDING AND TIP FACE. APPROX 90m X 15m

Air Monitoring Results

Air monitoring was carried out by I.P.M Safety in four different site locations on the 12th April 2017. All samples returned a result of less than the lower limit of detection of 0.01 fibres per ml, refer Appendices #4



Storys Creek township - asbestos

APPENDICES

	L/1 = NO ASBESTOS DETECTED
	L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES
	L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES
	L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES

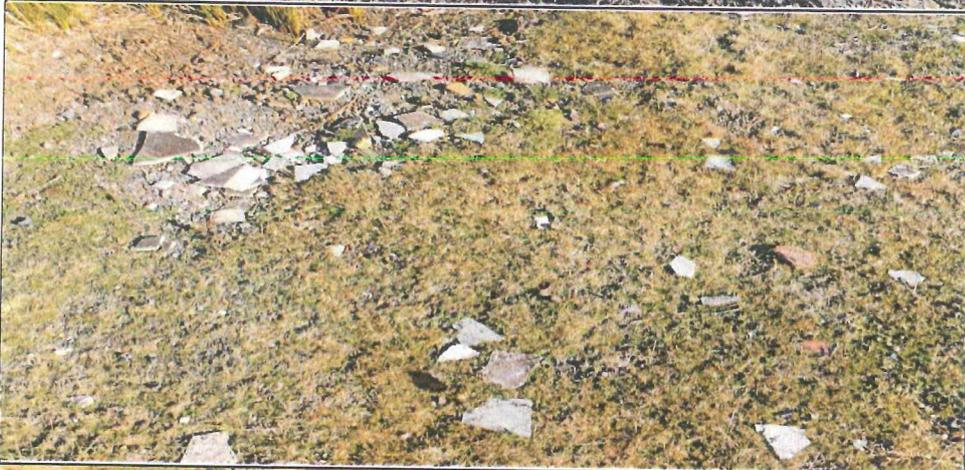
P.1		L/1 = NO ASBESTOS DETECTED	
P.2		L/1 = NO ASBESTOS DETECTED	
P.3		L/1 = NO ASBESTOS DETECTED	
P.4		L/1 = NO ASBESTOS DETECTED	
P.5		L/1 = NO ASBESTOS DETECTED	
P.6		L/1 = NO ASBESTOS DETECTED	
P.7		L/1 = NO ASBESTOS DETECTED	
P.8		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.9		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	PIPE LAGGING BETWEEN P.9 & P.10
P.10		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	AROUND CONCRETE SLAB - 12m IN FROM P.10
P.11		L/1 = NO ASBESTOS DETECTED	
P.12		L/1 = NO ASBESTOS DETECTED	
P.13		L/1 = NO ASBESTOS DETECTED	
P.14		L/1 = NO ASBESTOS DETECTED	
P.15		L/1 = NO ASBESTOS DETECTED	
P.16		L/1 = NO ASBESTOS DETECTED	
P.17		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	AROUND CONCRETE SLAB - 15m IN FROM P.17
P.18		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.19		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	LARGE ASBESTOS PIPES EXPOSED. PIPES CONTINUE BELOW GROUND AND ARE EXPOSED AGAIN 20m IN FROM P.19
P.20		L/1 = NO ASBESTOS DETECTED	
P.21		L/1 = NO ASBESTOS DETECTED	
P.22		L/1 = NO ASBESTOS DETECTED	
P.23		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	BETWEEN P.23 AND THE ROAD
P.24		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	BETWEEN P.24 AND THE ROAD
P.25		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	BETWEEN P.25 AND THE ROAD
P.26		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	BETWEEN P.26 AND THE ROAD
P.27		L/1 = NO ASBESTOS DETECTED	
P.28		L/1 = NO ASBESTOS DETECTED	
P.29		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	BETWEEN P.29 AND THE DRAIN
P.30		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	BETWEEN P.30 AND THE DRAIN
P.31		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	BETWEEN P.31 AND THE DRAIN
P.32		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	BETWEEN P.32 AND THE DRAIN
P.33		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	BETWEEN P.33 AND THE DRAIN
P.34		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	BETWEEN P.34 AND THE DRAIN
P.35		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	BETWEEN P.35 AND THE DRAIN
P.36		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	BETWEEN P.36 AND THE DRAIN
P.37		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	BETWEEN P.37 AND THE ROAD
P.38		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	BETWEEN P.38 AND THE ROAD
P.39		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	BETWEEN P.39 AND THE ROAD
P.40		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	BEHIND P.40 - AROUND CAR WRECKS
P.41		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	BEHIND P.41 - AROUND CAR WRECKS
P.42		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.43		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.44		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.45		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.46		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.47		L/1 = NO ASBESTOS DETECTED	OVERGROWN AROUND P.47
P.48		L/1 = NO ASBESTOS DETECTED	OVERGROWN AROUND P.48
P.49		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	CLEARING IN FRONT OF P.49
P.50		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.51		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.52		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.53		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.54		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	IN BRACKEN
P.55		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	IN BRACKEN
P.56		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	IN BRACKEN
P.57		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	IN BRACKEN
P.58		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.59		L/1 = NO ASBESTOS DETECTED	
P.60		L/1 = NO ASBESTOS DETECTED	
P.61		L/1 = NO ASBESTOS DETECTED	
P.62		L/1 = NO ASBESTOS DETECTED	
P.63		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	VINYL TILE DEBRIS - IN FROM P.63
P.64		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	VINYL TILE DEBRIS - IN FROM P.64
P.65		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	VINYL TILE DEBRIS - IN FROM P.65

P.66		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	VINYL TILE DEBRIS - IN FROM P.66
P.67		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	VINYL TILE DEBRIS - IN FROM P.67
P.68		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.69		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.70		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.71		L/1 = NO ASBESTOS DETECTED	
P.72		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	
P.73		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	LARGE ASBESTOS PIPES
P.74		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	LARGE ASBESTOS PIPES
P.75		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.76		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.77		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.78		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.79		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	
P.80		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	
P.81		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	
P.82		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	
P.83		L/1 = NO ASBESTOS DETECTED	
P.84		L/1 = NO ASBESTOS DETECTED	
P.85		L/1 = NO ASBESTOS DETECTED	
P.86		L/1 = NO ASBESTOS DETECTED	
P.87		L/3 = MEDIUM CONTAMINATION - ASSESSED AT BETWEEN 5 TO 20 PIECES	
P.88		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.89		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.90		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.91		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.92		L/1 = NO ASBESTOS DETECTED	
P.93		L/1 = NO ASBESTOS DETECTED	
P.94		L/1 = NO ASBESTOS DETECTED	
P.95		L/1 = NO ASBESTOS DETECTED	
P.96		L/1 = NO ASBESTOS DETECTED	
P.97		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.98		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	
P.99		L/1 = NO ASBESTOS DETECTED	
P.100		L/4 = HEAVY CONTAMINATION - ASSESSED AT GREATER THAN 20 PIECES	AROUND CONCRETE SLAB - 10m IN FROM P.100 DRUM ALSO CONTAINS DEBRIS
P.101		L/2 = LIGHT CONTAMINATION - ASSESSED AT LESS THAN 5 PIECES	2 X LARGE PIECES OF ASBESTOS SHEET - 20m IN FROM P.101
P.102		L/1 = NO ASBESTOS DETECTED	
P.103		L/1 = NO ASBESTOS DETECTED	

STOREY'S CREEK SURVEY



PIC 1



PIC 2



PIC 3



PIC 4



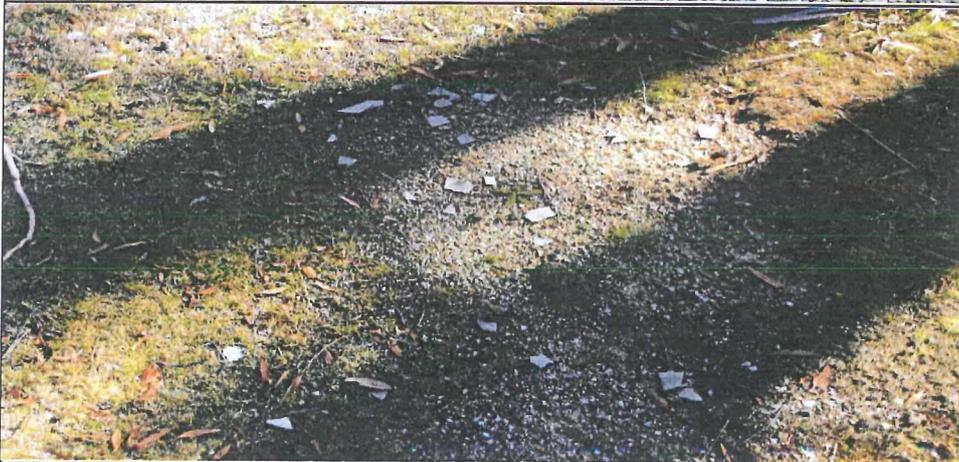
PIC 5



PIC 6



PIC 7



PIC 8



PIC 9



PIC 10



PIC 11



PIC 12



PIC 13



PIC 14



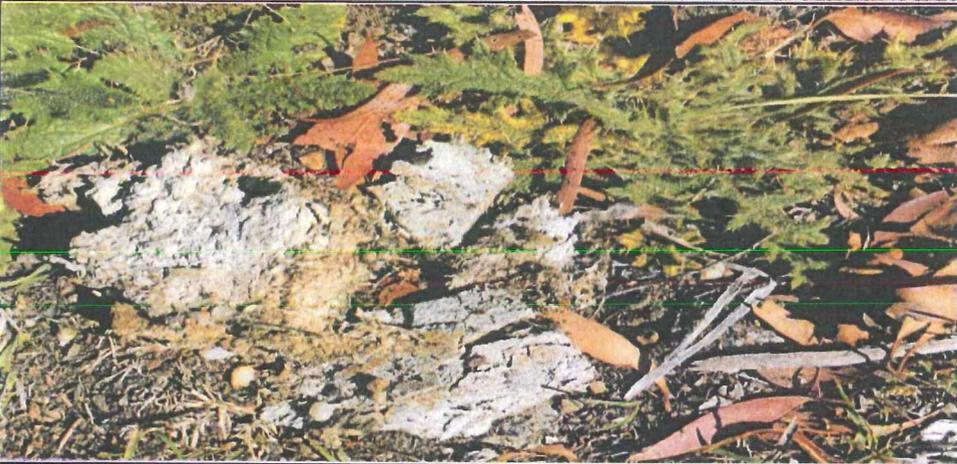
PIC 15



PIC 16



PIC 17



PIC OF MILLBOARD DEBRIS FOUND AMONGST TILE DEBRIS, NEAR THE TWO SLABS. WAS BAGGED AND REMOVED FROM SITE BY AEGIS AC PTY LTD



PIC OF DRUM CONTAINING ASBESTOS SHEET DEBRIS



PIC OF PEG WITH YELLOW PAINTED, TOP INDICATING AREA OF WHERE PHOTO WAS TAKEN - 17 PEGS IN TOTAL



**PIC OF PEG WITH WHITE
PAINTED TOP, PLACED
AROUND THE PERIMETERS
OF THE SURVEY AREA.
APPROX 25m APART. 103
PEGs IN TOTAL**



Accreditation for compliance with ISO/IEC 17025. Accreditation No. 18898. The results of the tests included in this document are traceable to Australian/National Standards.



Airborne Asbestos Fibre Monitoring Report

Client: Aegis Asbestos Pty. Ltd.

Report Number: A1071-001

Client Address: Unit 2/4 Lampton Ave, Derwent Park, TAS 7009

Purchase Order: -

Work Address: Storys Creek, Rossarden TAS 7213

Test Status: Control Monitoring

Method: Filter examined in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC:3003 (2005)], and in-house method L24 Asbestos Fibre Counting Procedure.

Sample Date	Sample Location	Sample Number	Sample Period	Sample Duration (minutes)	Sample Volume (litres)	Fibres /100 Fields	Results ¹ (fibres/mL)
11/4/17	Hall entrance	IPM1314	10:00-14:40	280	420	3	<0.01
11/4/17	Front of residence	IPM1315	10:00-14:45	285	427.5	1	<0.01
11/4/17	Stockpile in trees	IPM1316	10:00-14:46	286	429	0	<0.01
11/4/17	Fence off mining machinery	IPM1317	10:00-14:42	282	423	0	<0.01
08/02/2017	Lot Blank SKC IPM-D 16907-7EO-057					0	-

**Safe Work Australia Code of Practice *How to Safely Remove Asbestos*, December 2011
Table 1: Air Monitoring Action Levels**

Comments: Control Monitoring was conducted outdoors at Storys Creek, during the mapping of scattered asbestos containing material located across the site. Detailed locations shown on attached figure.

The respirable fibre levels recorded in the area(s) listed above was less than the lower limit of detection of 0.01 fibres per ml. The concentration of airborne respirable fibre is within Safe Work Australia's Action Level and is consistent with typical background respirable fibre levels.

Accredited Asbestos Counter:

Geoff Howard
Name

Signature

Date: 12/04/2017

Occupational Hygiene Consultant:

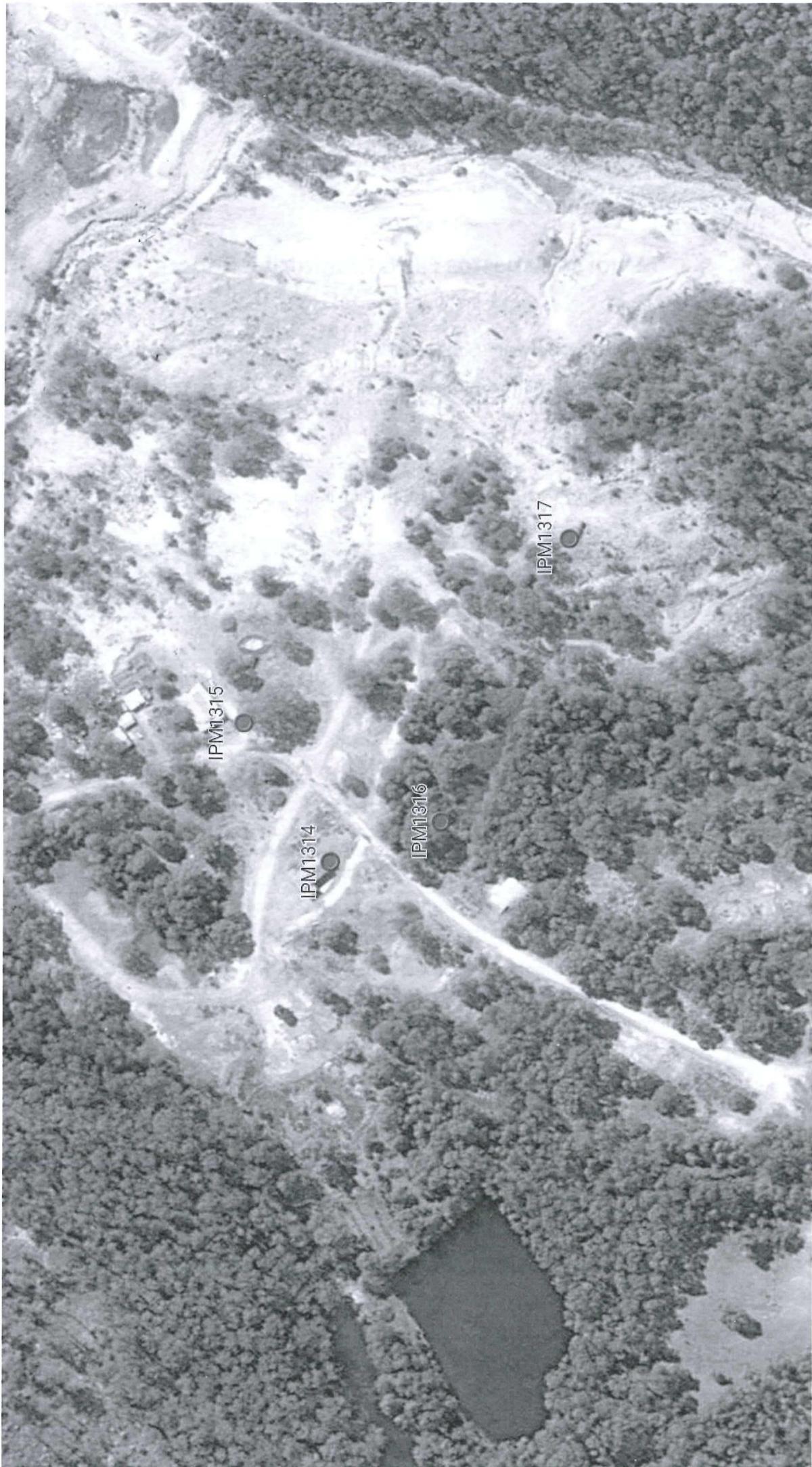
James Pene
Name

Signature

Date: 12/04/2017

Copies to: Peter Stucki: peter@aegisasbestos.com.au; Administration: admin@aegisasbestos.com.au

¹ Measurement of uncertainty is ± 0.01 Fibres per mL, based on Appendix K, Table 5 and 6 of the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC:3003 (2005)].



IPM1315

IPM1314

IPM1316

IPM1317