This document was created in response to a Freedom of Information request made to CSIRO.

FOI Number: FOI2013/3

Date: 4 March 2013

Request: Any information relating to the use, or presence of asbestos (in any form) at the Tidbinbilla Deep Space Tracking Station (now known as the Canberra Deep space Communication Complex) now located at 421 Discovery Drive, Paddys River ACT.

Documents: 1-33

For more information, please refer to CSIRO’s FOI disclosure log at www.csiro.au/FOILog
British Aerospace Australia Limited

Environmental Audit: Canberra Deep Space Communication Complex

Final Report
Volume 1 of 2
August 1992

Ove Arup & Partners Consulting Engineers
British Aerospace Australia Limited

Report on the investigations for the environmental audit of Canberra Deep Space Communication Complex

Final Report, August 1992

Volume 1 of 2: Report
# CONTENTS VOLUME 1

STANDARD ABBREVIATIONS USED IN THIS REPORT

NOTES ON INFORMATION IN THE REPORT

EXECUTIVE SUMMARY

1. INTRODUCTION
   1.1 Project description
   1.2 Project background
   1.3 Project philosophy
   1.4 Report structure
   1.5 Disclaimer

2. DESCRIPTION OF THE FACILITY
   2.1 Site facilities and layout
   2.2 Antennas
   2.3 Powerhouse
   2.4 Hazardous materials storage
   2.5 Water supply
   2.6 Wastewater treatment

3. REVIEW OF ENVIRONMENTAL ISSUES AND APPLICABLE LEGISLATION
   3.1 Introduction
   3.2 US Federal Jurisdiction
   3.3 Australian Commonwealth Legislation
   3.4 Australian Capital Territory Legislation
   3.5 Environmental risk assessment
   3.6 Priority for investigation

4. AUDIT OF MANAGEMENT STRUCTURE FOR ENVIRONMENTAL MATTERS
   4.1 Existing structure
   4.2 Recommended changes to management structure
   4.3 Other management-related recommendations

5. AUDIT OF MANAGEMENT OF THE PHYSICAL ENVIRONMENT
   5.1 Introduction
   5.2 Reduction of bushfire hazard
   5.3 Protection and enhancement of desirable ecological attributes
   5.4 Control of soil erosion
   5.5 Control of noxious weeds and other undesirable plant species
   5.6 Protection of other sites of interest
   5.7 Agricultural viability of the grazing operation
   5.8 Environmental requirements for future development
   5.9 Findings and recommendations
6. AUDIT OF UNDERGROUND STORAGE TANKS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>General</td>
<td>21</td>
</tr>
<tr>
<td>6.2</td>
<td>Description of fuel and oil facilities</td>
<td>21</td>
</tr>
<tr>
<td>6.3</td>
<td>Relevant site history</td>
<td>22</td>
</tr>
<tr>
<td>6.4</td>
<td>Legal requirements</td>
<td>22</td>
</tr>
<tr>
<td>6.5</td>
<td>Soil gas survey</td>
<td>24</td>
</tr>
<tr>
<td>6.6</td>
<td>Results of testing programme</td>
<td>24</td>
</tr>
<tr>
<td>6.7</td>
<td>Recommended underground storage tank management programme</td>
<td>28</td>
</tr>
<tr>
<td>6.8</td>
<td>Additional details and costing</td>
<td>30</td>
</tr>
<tr>
<td>6.9</td>
<td>Summary of underground storage tank management plan</td>
<td>32</td>
</tr>
</tbody>
</table>

7. AUDIT OF HAZARDOUS MATERIALS MANAGEMENT

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Applicable legislation</td>
<td>33</td>
</tr>
<tr>
<td>7.2</td>
<td>Dangerous goods management at the CDSCC</td>
<td>34</td>
</tr>
<tr>
<td>7.3</td>
<td>Summary and recommendations</td>
<td>38</td>
</tr>
</tbody>
</table>

8. AUDIT OF FORMER BURN PIT AREA

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>Background</td>
<td>40</td>
</tr>
<tr>
<td>8.2</td>
<td>Test results</td>
<td>40</td>
</tr>
<tr>
<td>8.3</td>
<td>Recommended actions</td>
<td>42</td>
</tr>
</tbody>
</table>

9. REVIEW OF WATER SUPPLY

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1</td>
<td>Present position</td>
<td>43</td>
</tr>
<tr>
<td>9.2</td>
<td>Legal requirements</td>
<td>43</td>
</tr>
<tr>
<td>9.3</td>
<td>Drinking water</td>
<td>44</td>
</tr>
<tr>
<td>9.4</td>
<td>Non-potable water</td>
<td>44</td>
</tr>
</tbody>
</table>

10. AUDIT OF SEWAGE TREATMENT SYSTEM

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1</td>
<td>History and present position</td>
<td>45</td>
</tr>
<tr>
<td>10.2</td>
<td>Legal requirements</td>
<td>45</td>
</tr>
<tr>
<td>10.3</td>
<td>Results of sewerage testing programme</td>
<td>45</td>
</tr>
</tbody>
</table>

11. AUDIT OF STORMWATER MANAGEMENT

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1</td>
<td>Present position</td>
<td>50</td>
</tr>
<tr>
<td>11.2</td>
<td>Legal requirements</td>
<td>50</td>
</tr>
<tr>
<td>11.3</td>
<td>Stormwater testing programme</td>
<td>51</td>
</tr>
<tr>
<td>11.4</td>
<td>Recommended actions</td>
<td>51</td>
</tr>
</tbody>
</table>
12. REVIEW OF ASBESTOS MANAGEMENT
   12.1 Present position
   12.2 Recommended remedial actions

13. REVIEW OF AIR EMISSIONS
   13.1 Present position
   13.2 Legal requirements
   13.3 Results of observations

14. SUMMARY OF RECOMMENDATIONS
   14.1 Recommended actions
   14.2 Staffing
   14.3 Summary of costs

15. CONCLUSION

REFERENCES

ACKNOWLEDGMENTS

FIGURES
1. Locality plan
2. General environment
3. Site plan
4. Points of interest for environmental audit
5. UST groupings and sampling locations
6. Location of hazardous materials storage areas
7. Layout of hazardous materials storage area ST6
PHOTOGRAPHS

1. 70m antenna DSS43: General view looking SE
2. Western wall of Powerhouse
3. Eastern wall of Powerhouse with Transformer Yard
4. General view of Storage Yard looking southwest
5. Drum storage in southern part of Storage Yard
6. Flammable materials store and waste oil tank
7. General view of water supply bores, stormwater pond and sewage treatment plant, looking southwest
8. Drinking water supply chlorinator building and storage tank
9. Stormwater treatment pond outlet and reclaimed oil tanks, looking northwest
10. Bulk diesel underground storage tanks, looking south
11. 'A Ready' diesel and fuel underground tanks, and diesel bowser, looking northwest
12. Petrol dispensing area, looking west
13. Hydraulic oil underground storage and pumps
14. Augering for soil samples at 'B Ready' underground diesel storage tanks
15. Onsite testing of soil samples for fuel oil contamination
16. Placarding at drinking water supply chlorinator building
17. Detail of stormwater pond showing lifted liner
18. Smoke emission at generator startup
19. Smoke haze 5 seconds after generator startup
20. Smoke haze as full load applied to generator
21. Smoke haze under full generator load
22. Excavating in former burn pit area
23. Soil sampling in former burn pit area
24. Sampling of northern drinking water bore

CONTENTS VOLUME 2

APPENDICES

A. PROJECT BRIEF
B. DETAILS OF U.S. FEDERAL LEGISLATION
C. DETAILS OF COMMONWEALTH LEGISLATION
D. DETAILS OF ACT LEGISLATION
E. REPORT ON FUEL STORAGES BY GEO & HYDRO CONSULTANTS LTD
F. FIRST REPORT BY GOLDER ASSOCIATES
G. SECOND REPORT BY GOLDER ASSOCIATES
H. ASBESTOS SURVEY BY ENVIROSCIENCES PTY LIMITED

This report was prepared by Martin Taylor, Senior Environmental Engineer, and reviewed by Ron McLean, Associate Director, Ove Arup & Partners.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>Australian Capital Territory</td>
</tr>
<tr>
<td>ACTEWE</td>
<td>ACT Electricity and Water (service utility)</td>
</tr>
<tr>
<td>ACTPA</td>
<td>Australian Capital Territory Planning Authority</td>
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<tr>
<td>ACTPEHS</td>
<td>ACT Public and Environmental Health Service</td>
</tr>
<tr>
<td>ANZECC</td>
<td>Australian and New Zealand Environment and Conservation Council</td>
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<tr>
<td>BAA</td>
<td>British Aerospace Australia</td>
</tr>
<tr>
<td>BTEX</td>
<td>benzene, toluene, ethyl benzene, xylene</td>
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<tr>
<td>CAA</td>
<td>Clean Air Act (US)</td>
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<tr>
<td>CDSCC</td>
<td>Canberra Deep Space Communication Complex</td>
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<tr>
<td>CERCLA</td>
<td>Comprehensive Emergency Response, Compensation and Liability Act (US)</td>
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<tr>
<td>CWA</td>
<td>Clean Waters Act (US)</td>
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<tr>
<td>DGA</td>
<td>ACT Dangerous Goods Act</td>
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<tr>
<td>DITAC</td>
<td>Department of Industry Technology and Commerce</td>
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<tr>
<td>DSCC</td>
<td>Deep Space Communication Complex</td>
</tr>
<tr>
<td>DSS</td>
<td>prefix for antenna numbering</td>
</tr>
<tr>
<td>E</td>
<td>eucalyptus</td>
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<tr>
<td>EIS</td>
<td>environmental impact statement</td>
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<tr>
<td>EPAV</td>
<td>Environment Protection Authority of Victoria</td>
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<tr>
<td>FIFRA</td>
<td>Federal Insecticide, Fungicide, and Rodenticide Act (US)</td>
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<tr>
<td>HSWA</td>
<td>Hazardous and Solid Waste Amendments to RCRA (US)</td>
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<tr>
<td>Hz</td>
<td>hertz</td>
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<tr>
<td>JPL</td>
<td>Jet Propulsion Laboratory</td>
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<tr>
<td>kVA</td>
<td>kilovolt amperes</td>
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<tr>
<td>kW</td>
<td>kilowatts</td>
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<tr>
<td>l</td>
<td>litre</td>
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<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>mg/l</td>
<td>milligram per litre</td>
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<tr>
<td>MW</td>
<td>megawatts</td>
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<tr>
<td>NAAQS</td>
<td>National Ambient Air Quality Standards (US)</td>
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<td>NASA</td>
<td>National Aeronautics and Space Administration</td>
</tr>
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<td>NATA</td>
<td>National Association of Testing Authorities</td>
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<td>NCP</td>
<td>National Contingency Plan (US)</td>
</tr>
<tr>
<td>NCPA</td>
<td>National Capital Planning Authority</td>
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<td>NESHAP</td>
<td>National Emission Standards for Hazardous Air Pollutants (US)</td>
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<tr>
<td>NHMRC</td>
<td>National Health and Medical Research Council (Australia)</td>
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<td>NPDES</td>
<td>National Pollutant Discharge Elimination System (US)</td>
</tr>
<tr>
<td>OC</td>
<td>organochlorine (pesticide)</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Health and Safety Act (US &amp; ACT)</td>
</tr>
<tr>
<td>PCB</td>
<td>polychlorinated biphenyl</td>
</tr>
<tr>
<td>PER</td>
<td>Public Environment Report</td>
</tr>
<tr>
<td>PLUZ</td>
<td>Predominant Land Use Zones</td>
</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation and Recovery Act (US)</td>
</tr>
<tr>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act (US)</td>
</tr>
<tr>
<td>SDWA</td>
<td>Safe Drinking Water Act (US)</td>
</tr>
<tr>
<td>ST</td>
<td>prefix for building numbering</td>
</tr>
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<td>SWDA</td>
<td>Solid Waste Disposal Act (US)</td>
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<tr>
<td>TSCA</td>
<td>Toxic Substance Control Act (US)</td>
</tr>
<tr>
<td>ug/l</td>
<td>microgram per litre</td>
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<tr>
<td>US</td>
<td>United States</td>
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<tr>
<td>USEPA</td>
<td>United States Environment Protection Agency</td>
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<tr>
<td>UST</td>
<td>Underground storage tank</td>
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<tr>
<td>VHC</td>
<td>volatile halogenated compound</td>
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</tbody>
</table>
NOTES ON INFORMATION IN THE REPORT

Superscript numbers, without brackets, in the report (e.g. landsfarming^4) are used to designate footnotes. These footnotes are sequential through the report and are found at the foot of the page where they occur. The only exception is the notes for Table 8.1 which appear on the following page because of the table size.

Superscript numbers, with brackets, (e.g. legislation^11) designate references which are listed at the end of the report.

Estimated costs presented in this report are in Australian dollars and are based on local Canberra prices at May 1992. At 18 May 1992, A$1,000 was trading at US$758.
EXECUTIVE SUMMARY

Task
Ove Arup & Partners was commissioned by British Aerospace Australia Limited to carry out an audit of environmental management at the Canberra Deep Space Communication Complex. The Complex is located 25km southwest of Canberra city centre, Australian Capital Territory, Australia. In accordance with the Brief supplied by British Aerospace, and the Proposal submitted by Ove Arup & Partners, the Audit covers compliance with the intent of environmental regulations and environmental management practice in United States Federal, Australian Commonwealth, and Australian Capital Territory (equivalent to state and local) jurisdictions.

Report contents
The sections of the report are in four main groupings to follow the basic structure of the Audit. Firstly there is the identification of environmental issues, ranking these issues in terms of their relative potential impact on the local environment, analysing the legislation which applies to the Complex for the issues identified, and consideration of the management structure for dealing with the issues. Secondly there are a number of sections, each dealing with a single environmental issue, with recommendations for any suggested improvements. Thirdly there is a summary of the recommendations and cost estimates. Lastly details of the applicable legislation, and reports from specialist subconsultants are included as a separate volume.

Level of compliance
Overall a reasonable level of environmental awareness and operational management was found given the generally low potential environmental risk posed by the location and operation of the Complex.

The following recommended actions on the range of environmental issues considered in this audit are prioritised on the basis of what 'needs to be done' where the present situation does not meet local environmental regulations or is causing environmental impact, what 'should be done' where there is a relatively high risk of causing environmental impact but the system already complies with existing intent, and what 'could be done' to reduce already low risks of environmental impact or to bring the existing controls into line with the intent of US Federal regulations where these are substantially more stringent than local requirements.

Recommended action: legislation
Recommendations are made to rectify relatively minor non-compliance with local practice and legislation. Some recommended actions exceed current requirements for the Australian Capital Territory. However, they are in line with expected trends and provide the opportunity to move into line with US Federal practice. At the same time it is necessary to be aware of the practical limitations in fully complying with all US Federal requirements when the legal and social infrastructure is not congruous. It is not considered appropriate, given the scale of the environmental risk, for the Complex to be a trendsetter significantly in advance of local practice.

Recommended action: environmental management structure
It is considered that the existing environmental management structure could be slightly modified to place responsibility for the environmental performance of the Complex directly with the operating contractor. This would include, for example, transferring the existing water pollution licence to the Contractor's name. It should be noted that this is basically a formalisation of how the site operates at present.

Existing contracts and insurances should be reviewed to ensure that the responsibilities of all parties are clearly defined and that adequate insurance cover exists.
The Department of Industry Technology and Commerce have confirmed that they will continue to maintain control of the remainder of Lot 76. The Department could participate in, and perhaps initiate a higher profile for, rural land management for the whole catchment. The main issues identified at present are noxious weeds and soil erosion. The indicative cost of remedial work has been estimated as $59,000.

**Recommended action: underground storage tanks**

The areas around underground storage tanks and associated pipework, and locations of known hydrocarbon spillages, were tested for contamination. An estimated total of 800 cubic metres of contaminated soils were delineated at three separate locations. Groundwater contamination was present, of undetermined extent, at two of the locations but off-site migration of contaminants was not detected.

It is recommended that a Management Plan should be developed specifically for the underground storage tanks. The Plan should cover all tanks, and be developed in discussion with the Department of Dangerous Goods. As a precursor to the plan, there needs to be a rationalisation of the types and quantities of fuels to be stored on the site.

Soil and groundwater remediation detailed in the previous paragraph should be carried out for the three areas of contamination identified. Land farming is the recommended soil remediation method.

A leak detection system should be installed, and an inventory management system developed. Maintenance and modifications should be carried out on leaking pipework etc., to reduce the chances of further spillages and to prevent loss of any leaks into the surrounding soils. Civil works in terms of pipe trenches and bunded concrete pads should be carried out. A system of monitoring wells and soil gas leak detection systems is recommended.

At this time, immediate removal of the single-walled USTs and their replacement with double walled tanks is not considered to be justified. An approved programme of tank tightness testing should be initiated, in preference to immediately removing the tanks from service. Advice should be sought from a corrosion expert on the necessity of additional corrosion protection such as retrofitting cathodic protection to the tanks and pipework.

The preliminary cost estimate of implementing these recommendations is $190,000, but this will vary depending on the number of tanks to be retained, the costs of modifying pipework and the selected option for soil remediation.

**Recommended action: hazardous materials**

To improve the management of hazardous materials on the site, both immediate and longer term actions are recommended. Soil around the present hazardous materials storage area was tested for contamination. Around the perimeter of the area, only small areas of oil contamination at the surface were identified. On the basis of these results it is recommended that these contaminated soils should be included in the remediation programme as recommended for the UST areas.

The quantities of hazardous materials stored need to be rationalised. In particular, damaged drums or redundant stocks should be identified and disposed of in accordance with ACT legislation. Documentation systems and information flows should be developed in line with US "Right-to-know" regulations.

It is recommended that improved hazardous materials storage be developed in accordance with requirements of the ACT Department of Dangerous Goods, by construction of a new building on a sealed, bunded pad, at a location sufficiently remote from the fuel storage and handling areas.

The waste hydraulic oil and waste solvents from DSS43 need to be tested for restricted substances and an appropriate disposal strategy developed. The collection system at DSS43 needs to be improved to prevent further spillages at the Antenna and the waste oil tank.

The estimated cost of this work is $150,000.
Recommended action: former burn pit area

Soil testing was carried out in the former fire pit area upslope of the northern water extraction point. Two burn pits were identified during the sampling programme but their extent, and the possible location of a third pit, could not be confirmed. A wide range of contaminants were identified, with some metals and hydrocarbon levels exceeding the Level B, Environmental Soil Quality Guidelines, recommended by ANZECC and NHMRC.

Level B indicates that further investigation is warranted as part of control strategy development. The need for cleanup action will depend on the actual levels of contamination present, together with site specific factors such as proposed long-term land use. It is recommended that investigations should be initiated into the need for removal of this material, and options for remediation.

It is recommended that this investigation work could be effectively combined with a wider hydrogeological study of the site, at an estimated cost of $35,000. Costs for remediation of the area are dependent on a number of factors including the extent of contamination identified by the testing programme and the practicable options for dealing with this contamination. Costs could vary between $10,000 and $60,000.

Recommended action: water supply

The raw drinking water supply from the northern groundwater bore (immediately north of the Facility Support Services building) was tested as specified under the US Safe Drinking Water Act. It was found that the water satisfied all parameters. On this basis there is no identified need to remove the northern groundwater source from service. However, given its proximity to potential sources of contamination, it is recommended that the northern bore be used as a backup to the southern bore which is more remote from potential sources of contamination. If it is found necessary to use this bore on a regular basis, monitoring for iron, trihalomethanes and other volatile halogenated hydrocarbons (VHHS) should be included in the regular monitoring programme.

The present programme of drinking water testing for a small number of parameters should be continued. Testing for chloromethanes on a regular basis should be added to the programme at an estimated cost of $3,000 per year.

The capacity of the present supply to meet projected demands should be evaluated as part of the geotechnical investigation of the site discussed above at an additional estimated cost of $4,000.

Recommended action: sewage treatment

A programme of testing was carried out in the former treatment lagoons to form the basis of a recommendation for future land use in the area. The water in the lagoons is suitable for disposal on site to dewater the ponds. It is recommended that the area then be returned to natural ground level and revegetated for grazing, at an estimated cost of $10,000.

Testing also was carried out on the effluent and sludge from the new aerated treatment plant to determine their suitability for irrigation and land disposal respectively. It is considered that effluent is suitable for irrigation on grazing or landscaped areas with a minimum of restriction. It is recommended that the effluent, and dry weather flow from the stormwater pond, could be combined and irrigated over an appropriate area. On-site disposal of excess sludge is not recommended because of the difficulty in ensuring adequate sterilisation. The present system of disposal by licensed contractor should be continued. The estimated cost for implementing these recommendations is $25,000. There should be a programme of education and monitoring to eliminate the entry of unsuitable materials into the sewage system.
Recommended action: stormwater

The following action items are recommended based on observation and test results. The rubble drain at the Powerhouse transformer area should be cleaned to remove accumulated fines. Consideration should be given to raising the kerbing to ensure trapping of oil spills. The oil trap should be pumped out the next time other oil/water mixtures are removed from the site, and a programme of regular checks initiated.

A grit and oil arrester could be provided for the vehicle washdown area. The stormwater pollution control pond should be repaired to provide the full design volume. This may require replacing the floor lining with concrete to prevent lifting during prolonged wet weather. There needs to be a programme of education and monitoring to eliminate the deliberate depositing of unsuitable materials in the stormwater system particularly during dry weather. The flood capacity of Larrys Creek should be checked and if necessary increased to reduce the risk of surcharges in peak flood events.

The cost of known works is estimated to be $60,000 with the major component being repair of the stormwater pond.

Recommended action: asbestos

An asbestos management survey was carried out by a company experienced in this specialised field. Three main areas were identified where friable asbestos lagging has been used as insulation. It is considered that this lagging needs to be removed as soon as possible. Other asbestos-containing materials were of a non-friable nature; it is recommended that these materials should be removed prior to any demolition or refurbishment of those areas or, failing this, within 10 years.

A preliminary estimate of the cost of removing the friable asbestos is $140,000, including provision of a suitable alternative air inlet. It makes no allowance for 'business interruption'.

Recommended action: air emissions

No action is recommended on the issue of air emissions from an environmental management viewpoint.

Resources required for implementation

Carrying out the above recommendations is expected to require the equivalent of full-time commitment by one staff member, probably for approximately six months until all systems are up and running, at an estimated cost of $50,000. After that time, it would reduce to a part-time responsibility.

The preliminary total cost if all the recommendations are implemented immediately is between $736,000 and $786,000 in 1992 Australian dollars (equivalent to US$558,000 to US$596,000) for the primary work. Administration, training, consultancy fees and associated costs would be additional to this amount. All component costs need revision on the basis of detailed specifications as final requirements are clarified.
1. **INTRODUCTION**

1.1 **Project description**

Ove Arup & Partners was commissioned by British Aerospace Australia Limited to carry out an audit of compliance with environmental legislation for the Canberra Deep Space Communication Complex (CDSCC), Australia.

The environmental audit process applied for this project consisted of the following steps:

- identify the environmental issues to be audited;
- review the legislation or policies which apply to these issues;
- collect data on the impact of the operation on the environment;
- assess the extent of compliance with the legislation and policies; and,
- recommend overall strategies and detailed actions for improving the level of compliance and reducing the overall level of environmental effect.

The majority of the fieldwork for this audit was carried out in two stages, 10 - 23 November 1991 and 17 - 28 February 1992. Ove Arup & Partners was the principal environmental consultant and project manager, and dealt with the details of all issues not specifically covered by specialist sub-consultants. Goldar Associates Pty Ltd examined hazardous materials management and fuel storage and handling, and provided advice on US Federal legislation requirements. Soil and groundwater testing for oil contamination was provided by Geo & Hydro Consultants Ltd. Mr. David Hogg assessed the management of the physical environment, and provided detailed advice on implications of local regulations. Envirosciences Pty Ltd carried out an asbestos materials survey. Mallesons Stephen Jaques, solicitors and attorneys at law, reviewed the draft final report from an Australian legal perspective; any recommendations arising from their review have been incorporated into this Final Report.

1.2 **Project background**

Located at Tidbinbilla in the Australian Capital Territory, as shown in Figure 1, Canberra DSCC is one of three similar facilities located at approximately 120 degrees longitude separation to one another around the world. The other Complexes are at Goldstone in California, and Madrid, Spain. Together with the control centre at Jet Propulsion Laboratory, Pasadena in California, the Complexes form the Deep Space Network. Their purpose is to maintain continuous communication with a number of spacecraft, particularly those such as Magellan and Galileo which are on missions outside earth orbit. There are four antennas in the Complex, the largest being the 70m diameter DSS43.

Canberra DSCC is managed by the Australian Space Office, Department of Industry Technology and Commerce (DITAC) on behalf of the National Aeronautics and Space Administration (NASA). Canberra DSCC is operated by British Aerospace Australia Ltd under contract to the Australian Space Office. Technical and operational requirements are set by Jet Propulsion Laboratories (JPL) who operate the full Deep Space Network for NASA.

The site has been developed since 1963. Because of its remoteness by road from Canberra, and the critical nature of many of the missions carried out by the Complex, the site is self-contained, with its own water supply and sewage treatment facilities, canteen, vehicle servicing and fuel supplies, and the ability to generate its own electricity. This last facility is used only about 6% of the time because of the higher cost of operation compared with commercial supplies. However, for security of operation under worst case conditions, about 60 days' diesel fuel supplies are held on site in underground storage tanks. Significant quantities of hydraulic oil are in use, as well as smaller quantities of chemicals such as solvents. These chemicals have the potential to cause adverse ecological and other impacts if released to the environment.
NASA and JPL have stated an overall commitment to protect the environment and human health and safety, and to operate all their facilities in compliance with (a) the intent of environmental legislation of the host country and (b) the intent of US Federal Legislation. As part of this commitment, JPL has carried out an environmental audit at both Goldstone and Madrid DSCCs, and is proceeding with the necessary remedial work identified by these audits.

British Aerospace Australia commissioned Ove Arup & Partners to carry out a similar environmental compliance audit at Canberra DSCC in accordance with the Brief in Appendix A. It was specified that the audit should assess compliance with the intent of legislation in the jurisdictions of US Federal, Australian Commonwealth, and Australian Capital Territory (the equivalent of State and Local Government combined).

1.3 Project philosophy

The aim of the study was to audit the facility’s compliance with the intent of environmental legislation in three jurisdictions, namely Australian Commonwealth, Australian Capital Territory, and United States Federal where no local regulations are in place.

This was achieved by the following:

- reviewing environmental issues to be addressed;
- at the same time, reviewing legislation, both general and detailed, for the three jurisdictions;
- carrying out inspections and monitoring;
- compiling and assessing the fieldwork results with respect to legislation;
- recommending actions to achieve compliance at three levels of priority, namely
  - needs to be done as the present situation does not meet the intent of existing local regulations or is causing environmental impact. Terms such as ‘minimum required technology’ and ‘necessary environmental practice’ apply to these actions;
  - should be done as there is a high risk of causing significant environmental impact or the present situation is unlikely to comply with the intent if the local regulations are tightened. Equivalent terms are ‘best practicable technology’ and ‘prudent environmental practice’; and,
  - could be done as the present situation does not comply with US Federal regulations where these are more stringent than local regulations or there is a low risk of causing significant environmental impact but improvements can be made at relatively low cost. Terms such as ‘best available technology’ and ‘best environmental practice’ apply to this level of recommended action.

- providing preliminary cost estimates for the recommended actions.
1.4 Report structure

This report is in two volumes. Volume 1 is the body of the report and contains the following sections:

- 1 and 2, introductory sections giving the background to the Audit and a general description of the facility;
- 3 on the applicable environmental legislation;
- 4 to 13, each dealing with one major environmental issue, with recommendations for improved environmental management; and,
- 14 and 15, concluding sections with a summary and costing for the recommended remedial environmental work.

Volume 2 holds all of the Appendices.

1.5 Disclaimer

This report describes the field investigation for the Environmental Audit at Canberra Deep Space Communication Complex and the interpretation of data obtained from this work. It has been compiled for the use of British Aerospace Australia only, and its conclusions are only valid for the purpose for which it was requested. It is valid only when it is in original form and any person other than British Aerospace Australia who relies on it without written permission from Ove Arup & Partners does so at his own risk.

While every care has been taken in the compilation of this report, to the extent that its conclusions are based on the analysis of data made available by British Aerospace Australia or by a third party, no responsibility is accepted for consequences arising from errors or omissions in that data which Ove Arup & Partners could not ascertain by reasonable enquiry in the ordinary course of its investigation.
2. DESCRIPTION OF THE FACILITY

2.1 Site facilities and layout

The Canberra Deep Space Communication Complex is located within a hilly farming and forestry area at Tidbinbilla, some 25km south west of Canberra city centre as shown in Figure 1. Figure 2 shows the main features of the area immediately surrounding the Complex. The Complex consists of four antennas, an operations facility, backup power supply and supporting administration and maintenance centres. The locations of the main structures are shown in Figure 3 and Photograph 1.

The facilities of interest for the audit are described in more detail below in Sections 2.2 to 2.6 with their locations shown in Figures 3 and 4.

2.2 Antennas

The largest antenna, the 70m diameter DSS43, is shown in the centre of Photograph 1. This facility has the ability to transmit as well as receive data. It is of interest in the audit for several reasons as follows:

- it is hydraulically driven, and has a reservoir of 30,000l of hydraulic oil under pressure, some 10m above ground level. The environmental consequences of a failure of this reservoir would be severe, and a 40,000l capacity oil trap has been installed on the stormwater drainage line;
- the low power transmitter is cooled using an ethylene glycol system;
- the solvent M50 (discussed in more detail under Hazardous Materials Management in Section 7) is used in cleaning throughout the antenna, and uncontrolled small leaks and spillages of hydraulic oil occur within the structure. A system of collectors and pipes take this material to ground level where it is regularly drained off for disposal; and,
- the three transformers which were originally installed on this antenna were PCB-filled. They were removed in 1987 and replaced with transformers containing no PCBs.

The other smaller antennas, DSS42 and DSS45 to the north and DSS46 to the south, contain only small quantities of hydraulic and lubricating oils. They present no major environmental problems other than the use of M50 solvent for cleaning.

2.3 Powerhouse

The requirement for a totally reliable electrical power supply has resulted in construction of an on-site 5MW power station which operates on diesel fuel. This operates when the commercial supply fails (an infrequent occurrence), and when the Complex is carrying out critical missions where the low probability of failure of commercial power is unacceptable. The Powerhouse operates some 6% of the year on average. Two views of the Powerhouse are shown in Photograph 2 (west face) and Photograph 3 (east face and Transformer Yard).

The Powerhouse also contains a converter to change the frequency of the commercial power supply from 50HZ to 60HZ to suit the United States' equipment used in the Complex.

The use of diesel fuel has required development of significant fuel storage in underground tanks. This is discussed in more detail in Section 6 Audit of underground storage tanks.

Two of the transformers attached to the Powerhouse were found, in 1986, to contain PCB-contaminated oil. This was removed and replaced with clean oil. This is discussed further in Section 7 Audit of hazardous materials management.
2.4 Hazardous materials storage

Environmentally hazardous materials are stored in a number of locations but are concentrated around the facility support area. Hazardous materials are those which can be harmful to human health in particular, and to flora and fauna in general.

The drum storage compound is shown in Photographs 4 and 5. Photograph 4 is a general view of the yard from the northeast in front of the Powerhouse. Photograph 5 is a view of some of the drums through the western side of the fence. This contains 75 full 205l drums, a small number of 205l drums either containing waste oil or empty, and 10 unlabelled drums.

Adjacent to the fuel bowser is a flammable goods store, containing a range of materials, mostly in small containers. In the same building, but separated by a full-height brick wall, is a grease store. The layout of this area is shown in Photograph 6. Also shown is the 2000l tank for the storage of waste oil from the Powerhouse.

Within the vehicle maintenance area, and in lockers on the western wall of the Powerhouse building (Photograph 2), are stored oils and greases, solvents, and kerosene and additives for the steam cleaner.

Near antenna DSS43, opposite the antenna maintenance building, is the second major concentration of hazardous materials storage. In this area are the hydraulic oil storage (2 x 40,000l underground tank) and pumping facility, the 6000l tank for waste antenna oil, and the distilled water storage and pumping facility for cooling the 400kW transmitter.

The gardener's workshop contains small quantities of pesticides, mainly 'Roundup' for weed control. The gardener follows a policy of minimum chemicals use, preferring natural control methods where possible.

The cleaner stores and uses only small quantities of normal household products. Supplies of these are brought to site on a daily basis as needed.

2.5 Water supply

Drinking water is extracted from two bores, located as shown on Figure 4, and pumped to storage. The northern bore is shown in Photograph 7 and is the light grey feature in the centre. This water is not given any treatment other than chlorination prior to being reticulated around the Complex from the storage shown in Photograph 8.

Water for garden maintenance and firefighting comes from two sources. The first is two bores near the northern drinking water bore as shown on Figure 4, and in Photograph 7. The second is Paddys River, from where it is pumped to tanks on the hill to the west of the Complex. Additional pressure is provided for firefighting at a separate pump house equipped with both electric and diesel pumps.

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1'Roundup' is a tradename registered by Monsanto Australia Ltd.
2.6 Wastewater treatment

Sewage from the site is collected to a newly commissioned treatment plant (location 11 on Figure 4). This consists of comminution on the inlet, extended aeration, sludge settling and flow equalisation, filtration and ultraviolet disinfection, prior to discharge to Larrys Creek. As for most such plants there has been a period for stabilising the plant, but commissioning tests indicate that a discharge quality in compliance with the licence under the ACT Water Pollution Act is achievable. The septic tank replaced by this new system has been emptied and cleaned and will serve as an emergency storage should there be a prolonged failure of the aerated treatment system.

All stormwater from around the site is piped to an oil interceptor (location 10 on Figure 4 and shown in Photograph 9), which has the capacity to retain about 20,000l of spilled oil. The catalyst for installation of this facility was an accidental spillage of some 13,000l of diesel fuel during a transfer operation, which then flowed to Larrys Creek via the stormwater system (pers. comm. J Kirkpatrick, Facilities Section Leader, Canberra DSUCC). This interceptor is in addition to a 40,000l triple plate oil interceptor beside DSS43 (location 5 on Figure 4) which was installed to hold the full capacity of the hydraulic oil reservoir for the 70m antenna should a catastrophic failure occur. There is also a small interceptor on the line which drains the Powerhouse transformer area. This would collect any oil which leaks or is spilled in this area, although the collection system may not perform adequately in the event of a catastrophic failure. Further comments on this are made in Section 11 Audit of stormwater management.
3. REVIEW OF ENVIRONMENTAL ISSUES AND APPLICABLE LEGISLATION

3.1 Introduction

Environmental legislation and guidelines form the framework within which the overall potential for impact can be judged for an operating facility. In support of the (US) national goal of the preservation of the environment and the protection of human health and safety, NASA and JPL have adopted a position that their operating installations shall maintain a high level of compliance with environmental legislation. Their facilities are expected to comply with the intent of both Australian and US Federal legislation (ref. Appendix A - Project Brief).

In Sections 3.2 to 3.4, the environmental regulations are listed for each jurisdiction, namely US Federal, Australian Commonwealth and Australian Capital Territory, this latter being the equivalent of a joint state and local government. An assessment of the legislation considered appropriate for application to Canberra DSCC is provided below. More complete details on the provisions of each regulation are contained in Appendices B, C and D to this report.

Also provided in Section 3.5 is an environmental risk assessment in which the potential avenues for impact are ranked to give an indication of the relative priority for management action.

3.2 US Federal Jurisdiction

Following briefings by Complex management and a series of site inspections in the two weeks from 11 November 1991, a listing was made of the US legislation which is considered to be applicable to the environmental issues identified for the site. The listing is as follows, with a detailed analysis of each regulation being provided in Appendix B: Details of US Federal Legislation:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Legislation title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental approvals</td>
<td>Usually state-based</td>
</tr>
<tr>
<td>Worker safety</td>
<td>OSHA - Occupational Safety and Health Act</td>
</tr>
<tr>
<td>Emergency planning and right to know</td>
<td>OSHA CERCLA/SARA (Title III reporting) &amp; NCP (40CFR Part 300 Subpart C)</td>
</tr>
<tr>
<td>Solid &amp; hazardous waste management &amp; underground storage tanks (USTs)</td>
<td>CWA - Clean Waters Act</td>
</tr>
<tr>
<td>Polychlorinated biphenyl (PCB) management</td>
<td>RCRA (as amended) and 40CFR Parts 240-281</td>
</tr>
<tr>
<td></td>
<td>TSCA and 40CFR Part 700-766</td>
</tr>
</tbody>
</table>
3.3 Australian Commonwealth Legislation

Those Commonwealth environmental Acts considered applicable to CDSCC are listed below, with further detail provided in Appendix C: Details of Commonwealth Legislation:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Legislation title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pesticide usage</td>
<td>FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act)</td>
</tr>
<tr>
<td>Due diligence</td>
<td>CERCLA, SARA, RCRA</td>
</tr>
<tr>
<td>Hazardous substance release and emergency response</td>
<td>CERCLA (as amended) and the NCP</td>
</tr>
<tr>
<td>Water supply</td>
<td>National Contingency Plan</td>
</tr>
<tr>
<td>Wastewater</td>
<td>SDWA (Safe Drinking Water Act)</td>
</tr>
<tr>
<td>Asbestos management</td>
<td>CWA, NPDES permitting (National Pollutant Discharge Elimination System), RCRA</td>
</tr>
<tr>
<td>Air emissions</td>
<td>CAA (Clean Air Act), OSHA, NESHAP (National Emission Standards for Hazardous Air Pollutants)</td>
</tr>
<tr>
<td></td>
<td>CAA - NAAQS (National Ambient Air Quality Standards), NESHAP, OSHA, SARA</td>
</tr>
</tbody>
</table>

- Environment Protection (Impact of Proposals) Act 1974, Aboriginal and Torres Strait Islander Heritage Protection Act 1984
- Industrial Chemicals (Notification and Assessment) Act 1989
- Hazardous Wastes (Regulation of Exports and Imports) Act 1989
- Ozone Protection Act 1989
3.4 **Australian Capital Territory Legislation**

A number of Acts and Regulations under the jurisdiction of the Australian Capital Territory Government are applicable to environmental management at CDSCC. These are listed below, with detail provided in Appendix D: Details of Australian Capital Territory legislation:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Legislation title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental approvals and general</td>
<td>Land (Planning and Environment) Act 1991</td>
</tr>
<tr>
<td>environmental management</td>
<td>National Capital Plan 1990</td>
</tr>
<tr>
<td></td>
<td>Draft Territory Plan 1991</td>
</tr>
<tr>
<td></td>
<td>Noxious Weeds Act 1921</td>
</tr>
<tr>
<td></td>
<td>Soil Conservation Act 1960</td>
</tr>
<tr>
<td></td>
<td>Careless Use of Fire Act 1956</td>
</tr>
<tr>
<td>Hazardous materials management &amp; underground</td>
<td>Dangerous Goods Act 1975</td>
</tr>
<tr>
<td>storage tanks (USTs)</td>
<td></td>
</tr>
<tr>
<td>Hazardous waste</td>
<td>Dangerous Goods Act 1975</td>
</tr>
<tr>
<td>Spill and emergency planning</td>
<td>Water Pollution Act 1984</td>
</tr>
<tr>
<td></td>
<td>Dangerous Goods Act 1975</td>
</tr>
<tr>
<td>Water supply</td>
<td>Building and Services Act 1924</td>
</tr>
<tr>
<td></td>
<td>Public Health Act 1928</td>
</tr>
<tr>
<td></td>
<td>Electricity and Water Act 1988</td>
</tr>
<tr>
<td>Wastewater</td>
<td>Water Pollution Act 1984</td>
</tr>
<tr>
<td>Air emissions</td>
<td>Air Pollution Act 1984</td>
</tr>
<tr>
<td>Solid waste</td>
<td>Building and Services Act 1924</td>
</tr>
</tbody>
</table>
3.5 Environmental risk assessment

Risk is defined as the likelihood of a specified undesired event occurring within a specified period or in specified circumstances. In this Audit the undesired event is an adverse effect on the natural environment or public health from a release of hazardous materials into the environment, and the specified period is the life of the facility. Risk therefore combines consideration of both consequences and probabilities.

Table 3.1 below presents an analysis of the comparative risks to the environment of the various hazards on the Complex. It should be noted that numbers are not used, as the terms represent relative, rather than absolute, values. Similarly the final resultant ranking of issues, and the use of terms such as "high", do not imply a particular level of potential impact on the external environment. Rather, they were used as a means of setting priorities for this Audit and for future environmental management of the site.

<table>
<thead>
<tr>
<th>Possible hazard</th>
<th>Consequences</th>
<th>Present probability</th>
<th>Risk</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor land management</td>
<td>moderate</td>
<td>low</td>
<td>moderate</td>
<td>9</td>
</tr>
<tr>
<td>Fuel loss from line or pump</td>
<td>high</td>
<td>occurring</td>
<td>high</td>
<td>1</td>
</tr>
<tr>
<td>UST leak</td>
<td>high</td>
<td>moderate</td>
<td>significant</td>
<td>4</td>
</tr>
<tr>
<td>Hydraulic oil loss</td>
<td>moderate</td>
<td>occurring</td>
<td>high</td>
<td>3</td>
</tr>
<tr>
<td>Waste oil spillage</td>
<td>moderate</td>
<td>occurring</td>
<td>high</td>
<td>2</td>
</tr>
<tr>
<td>Hazardous material loss</td>
<td>moderate</td>
<td>high</td>
<td>significant</td>
<td>5</td>
</tr>
<tr>
<td>Unsafe drinking water</td>
<td>high</td>
<td>low</td>
<td>moderate</td>
<td>6</td>
</tr>
<tr>
<td>Sewage treatment failure</td>
<td>low</td>
<td>moderate</td>
<td>low</td>
<td>10</td>
</tr>
<tr>
<td>Stormwater treatment failure</td>
<td>moderate</td>
<td>low</td>
<td>moderate</td>
<td>8</td>
</tr>
<tr>
<td>PCB release</td>
<td>moderate</td>
<td>very low</td>
<td>low</td>
<td>11</td>
</tr>
<tr>
<td>Asbestos release</td>
<td>high</td>
<td>low</td>
<td>moderate</td>
<td>7</td>
</tr>
<tr>
<td>Air pollutant release</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 3.1: Environmental risk analysis

In Table 3.1 the hazards are in the order of topics in the remainder of this report, with some subdivision to reflect the potential mechanisms for release to the environment. The "Consequence" column has a rating based on both the environmental toxicity of the hazardous material and on the quantity of the material on the site. Therefore fuel spillages are given a high rating because of the quantities present and their throughput at the site, even though longer term toxicity is not severe. On the other hand, materials with severe long term consequences such as the chlorinated solvents are given a moderate consequence rating because of the relatively small quantities which could be released.

*Risk* is the product of consequence times probability and varies from high, where impacts have occurred or are continuing, down to low where an impact on the environment is not anticipated.
3.6 Priority for investigation

The environmental risks identified by the Audit are ranked in Table 3.1 above. It should be noted at this stage that the ranking corresponds in most cases to the level of attention given to the particular issue by Complex management now and in the immediate past. Some of the low rankings are a result of major efforts in the past. A brief assessment of the results is as follows, with more detailed comments contained in the relevant sections in the remainder of the report.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Losses from fuel lines and pumps have resulted in major incidents on the site in the past, and minor leaks are continuing; there is a potential for losses to groundwater bypassing the stormwater treatment pond;</td>
</tr>
<tr>
<td>2</td>
<td>Waste oil contains chlorinated hydrocarbon solvents; spillages have occurred at collection and transfer points;</td>
</tr>
<tr>
<td>3</td>
<td>Hydraulic oil is transferred and used at high pressure; a major leak occurred in the past and minor leaks and spillages are evident; controls are in place to cater for possible incidents;</td>
</tr>
<tr>
<td>4</td>
<td>Underground storage tanks are a less likely source of leaks than the associated pipework, however consequences can be severe; groundwater contamination could bypass existing control systems;</td>
</tr>
<tr>
<td>5</td>
<td>The present system for hazardous materials storage results in a relatively high probability of losses; the quantities of materials stored are relatively low; limiting the overall risk;</td>
</tr>
<tr>
<td>6</td>
<td>The provision of unsafe drinking water would result in high public (and staff) health consequences; present levels of control are generally adequate resulting in moderate level of overall risk;</td>
</tr>
<tr>
<td>7</td>
<td>The comments for unsafe drinking water also apply to release of asbestos;</td>
</tr>
<tr>
<td>8</td>
<td>Although the probability of a failure in the stormwater treatment system is judged to be low, despite the lifting of the liner, the potential consequences make the overall risk level moderate;</td>
</tr>
<tr>
<td>9</td>
<td>The present good level of control on use of the land immediately outside the complex needs to be reinforced to maintain environmental values;</td>
</tr>
<tr>
<td>10</td>
<td>When stable operations are achieved in the new sewage treatment plant, the overall level of environmental risk will be reduced to a low level;</td>
</tr>
<tr>
<td>11</td>
<td>All inventories of materials containing PCBs were removed from the site some years ago, and only testing of unknown oils in the storage yard is required to ensure that no PCBs remain on the site; and,</td>
</tr>
<tr>
<td>12</td>
<td>With the low usage of on-site power generation, the potential for adverse effects on air quality is low.</td>
</tr>
</tbody>
</table>
4. AUDIT OF MANAGEMENT STRUCTURE FOR ENVIRONMENTAL MATTERS

4.1 Existing structure

The management structure within the Complex for dealing with environmental issues was observed to be a relatively loose structure, with the main responsibilities falling to the Facilities Section Leader. This was due to the historic responsibility of that position for operation of the main potential sources of environmental hazard, such as the sewage treatment system, fuel supply, etc. The Supervising Engineer with responsibility for Maintenance also had some control over environmental issues such as the use of solvents, and control of hydraulic oil losses. The structure is shown diagrammatically in Table 4.1 below.

With increasing awareness of environmental issues over recent years, work has been carried out in a number of areas, such as removal of PCBs, asbestos management and upgrading the sewage treatment system. This was carried out without an overall goal having been set.

```
+----------------+            +----------------+            +----------------+  
| DITAC           |            | NASA            |            | JPL              |
+----------------+            +----------------+            +----------------+  
| British        |            | British         |            | British          |
| Aerospace      |            | Aerospace       |            | Aerospace        |
+----------------+            +----------------+            +----------------+  
| On Site Manager|            | On Site Manager |            | On Site Manager  |
+----------------+            +----------------+            +----------------+  
| Facilities     |            | Facilities      |            | Facilities       |
| Section Leader |            | Section Leader  |            | Section Leader   |
| Supervising    |            | Supervising     |            | Supervising      |
| Engineer       |            | Engineer        |            | Engineer         |
| Maintenance    |            | Maintenance     |            | Maintenance      |
```

*Table 4.1 Present structure for environmental management*

This basic structure is considered to be adequate for achieving and maintaining a suitable level of environmental management. Possible refinements and shifts of responsibility and authority are recommended below.
4.2 **Recommended changes to management structure**

The following refinements of the structure for environmental management are recommended:

- the operator of the site could be made contractually responsible for the environmental performance of the Complex.
- all licences and approvals under ACT legislation should be issued to the operator rather than, for example, being issued to DITAC as it is the operator who has the principal responsibility for the day-to-day operation of the facilities concerned;
- the terms of the operator’s contract should include clear statements on the environmental goals, and measures for determining compliance.
- a clear structure should be developed for determining environmental management priorities which fully takes into account the physical, cultural and legislative circumstances applicable to the Canberra DSCC, and the environmental consequences of non-compliance. In particular, the contract should clearly state lines of responsibility.
- within the operational structure, there should be a senior officer designated as ‘Manager - Environment’, having responsibility for day-to-day environmental management and reporting to the On-Site Manager. Since the major potential environmental hazards are already the responsibility of the Facilities Section Leader, and the majority of experience is within that section, it is recommended that this position be designated as having responsibility for environmental management. There may need to be minor adjustments in some areas of present overlap, mainly with the Supervising Engineer Maintenance.
- documentation for appropriate practices should be developed for each environmental issue. These could be compiled as an “Environmental Management Manual” or similar document. The environmental management manual should classify occurrences, incidents or system breakdowns into various categories depending on their environmental and legal consequences, and state the level of reporting that is required. It is further suggested that the manual be checked by a solicitor to ensure that it provides for incidents to be reported to the appropriate level of management, and that any written reports are prepared so as to attract, as far as possible, legal professional privilege, so that sensitive material is not discoverable in court proceedings and used against the operator’s interests.
- some training may be required, but it is expected that the major requirement will be for an overall information package to ensure that all staff are aware of the environmental responsibilities of the Complex and their role within the structure.
- there should be a proper and adequate reporting system to the management board of the operating contractor and the board must be informed of compliance issues. A system of quarterly reporting at board level (plus reporting as required to cover unexpected circumstances such as a major pollution incident) would usually be the minimum acceptable standard. There should also be a mechanism for informing DITAC of the results of the monitoring process and any actions arising therefrom.
4.3 Other Management - Related Recommendations

4.3.1 Insurance

A review of the insurance covers of DITAC and the operator should be carried out to ascertain exactly what is and is not covered. Policies are increasingly likely to exclude loss or damage from environmental risks, and virtually all third party policies exclude liability for gradual pollution. Special pollution policies generally described as "environmental impairment liability cover" have now been developed to cover sudden and accidental, as well as gradual pollution.

4.3.2 Register

There should be a centralised register of environmental licences and all other records that must be maintained in accordance with requirements under the Occupational Health and Safety Act.

4.3.3 Review of Contracts

It is also recommended that there be a review of contracts, both between DITAC and the operator, and between the operator and its subcontractors, to determine how responsibility for environmental incidents is "allocated" under these contracts.

In many cases it is not possible to transfer or avoid statutory liabilities by transferring those responsibilities under contract. However, a review of the contracts could be worthwhile in that:

(a) the contracts may be definitive in allocating liability if the law is unclear or if no strict obligation is imposed on the operator;

(b) even if a statutory liability is incurred by the operator, it may be possible to recover some or all of the costs arising from that liability from the subcontractor; and

(c) it serves as a mechanism for assessing the environmental standards of the subcontractor, in the sense that the higher the standards, the less likelihood there is of problems arising.

If the operator contracts with independent contractors, a standard form contract containing appropriate warranties and indemnities for environmental issues should be developed.

If contractual responsibility for the performance of the Complex is transferred to the operator then the issues raised in points (a) and (b) above could, in the present circumstances, operate to the operator's disadvantage, depending on the terms of the actual contract and any existing insurances.

It is recommended that the allocation of environmental responsibility for that portion of block 76 which is not directly used by the Complex be clarified with DITAC (see also clause 14.1.2 of this report). If the Complex does not use this portion, then the contract between DITAC and the operator should clearly state that the operator is not the occupier of this portion (within the meaning of the various environmental laws) and that the department carries the responsibility for environmental management and risk of this portion.
FOI 2013/3

PAGES 15 TO 52 OF VOLUME 1

IRRELEVANT

PURSUANT TO SECTION 22
12. REVIEW OF ASBESTOS MANAGEMENT

12.1 Present position
Asbestos is generally regarded as a worker health issue, and as such does not strictly fall within the ambit of this environmental audit. This is reinforced by legislation in most jurisdictions which places asbestos control under Occupational Health and Safety Regulations rather than a Clean Air Act. However, the topic was included in this Environmental Audit because of public access to some areas, and the ability to cover the topic at relatively low cost and with no disruption of the main Audit programme.

In common with much of the Canberra area, asbestos was used extensively on the site for various insulation tasks. Some remedial work to remove materials containing asbestos fibres has been undertaken in the past, but the overall result is not well documented.

12.2 Recommended remedial actions
The asbestos survey was carried out by a company experienced in this specialised field. The full report is attached as Appendix H in Volume 2. The main conclusions and recommendations are discussed below.

The areas of highest concern identified in the asbestos survey were those where asbestos lagging has been used as insulation. These were as follows:

- Powerhouse diesel exhaust lagging and pipe penetrations;
- the Operations Building boilers and pipework in the plant rooms; and,
- steam cleaning pipes on Antenna DSS43.

This lagging is a friable form of asbestos which can become airborne readily if disturbed. In most cases this lagging is encased in metal or canvas, but in some areas the encasement has been damaged, leaving the asbestos lagging exposed.

It is recommended that all unbound (loose or friable) asbestos, whether clad or unclad, should be removed by a licensed asbestos-removal contractor at the earliest practicable opportunity.

The asbestos millboard located around the air-conditioning heater banks is also of concern as any dislodgment of the millboard could cause asbestos to enter the air-conditioning system. The material was observed to be in very good condition, however it is recommended that it should be removed as soon as possible.

The majority of the other asbestos products identified were of a less friable nature, such as asbestos-cement sheeting, woven asbestos, vinyl tiles, gaskets and gland packing. It has become accepted practice to retain such materials provided only that:

- they remain in good condition, are free from damage, and surface coatings such as paint finishes are renewed regularly; and,
- if it is necessary to modify, cut, drill or otherwise penetrate the material for the purposes of refurbishment or similar activity, then the material should be removed by a licensed contractor prior to any refurbishment being carried out.

The asbestos material must be removed in accordance with all local regulations and requirements of the National Health and Medical Research Council, Worksafe Australia and local authorities for the disposal of any removed material. The estimated costs for the remedial work are $75,000 for removal of asbestos, $30,000 for relagging, $10,000 for temporary air-conditioning duct work, and $25,000 for design of the programme, monitoring and supervision, giving a total of $140,000.

It should also be noted that synthetic mineral fibres are subject to occupational health and safety codes and requirements, as provided in the 'National Standard and National Code of Practice for the Safe Use of Synthetic Mineral Fibres' published by Worksafe Australia.
All removals of asbestos should be recorded and the survey information in Appendix H progressively annotated to give an up-to-date log book on the progress of the work.

In respect of the Priority 3 (bound asbestos) items listed in Appendix H, it is recommended that the following timings and practices apply to their removal:

- the recommended maximum period for removal and replacement of the materials is 10 years (i.e. before 2002). This is not a statutory requirement under current legislation.
- any proposal to refurbish or modify an element which contains bound asbestos should provide for the safe removal and disposal of the asbestos, and its replacement with an acceptable alternative. Even simple and straightforward work such as fixing or drilling through a.c. material should be prohibited - in all circumstances the only treatment should be removal and disposal.
- material which is retained should be maintained in a sound painted or sealed condition.
- the requirement to programme for removal should be structured around the planned upgrading, modification and maintenance of the complex, subject to the upper limit time frame recommended above.
- any opportunity to replace the material at an earlier time than the recommended upper limit should be taken.
FOI 2013/3

PAGES 55 TO 59 OF VOLUME 1

IRRELEVANT

PURSUANT TO SECTION 22
14.1.9 Asbestos

An asbestos management survey was carried out as an adjunct to the Audit as detailed in Section 12 of this report. On the basis of the survey it is recommended that:

- where friable asbestos lagging has been used as insulation (namely Powerhouse diesel exhaust lagging and pipe penetrations, the Operations Building boilers and pipework in the plant rooms, and steam cleaning pipes on Antenna DSS43), it needs to be removed as soon as possible;
- the asbestos millboard located around the air-conditioning heater banks should be removed as soon as possible; and,
- the other asbestos products identified should be removed prior to any demolition or refurbishment in those areas.

The asbestos must be removed in accordance with all local regulations and requirements of the National Health and Medical Research Council, Worksafe Australia and local authorities for the disposal of any removed material.

14.1.10 Air emissions

No action is recommended on this issue from an environmental management viewpoint, provided that the present rate of on-site power generation (approximately 6% of any year) is not increased.

14.2 Staffing

Carrying out the above recommendations is expected to require full-time commitment by one staff member, probably for approximately six months until all systems are up and running. After that time, it would reduce to a part-time responsibility.

The duties of the position would include:

- supervision of remediation work recommended above;
- training personnel concerning proper procedures for handling, disposal and management of environmentally hazardous materials;
- optimising waste minimisation and recycling;
- evaluating off-site disposal areas and minimising reliance on off-site disposal;
- developing procedures for tracking waste shipments of Dangerous Goods;
- developing procedures for the inspection of Dangerous Goods accumulation areas and hazardous materials storage; and,
- developing emergency planning and occupational health planning for Dangerous Goods and hazardous materials storage and management.

14.3 Summary of costs

The estimated costs for the above remediation programmes are summarised in Table 14.1 below. Total cost of implementing all recommendations is estimated as between $736,000 and $786,000 (1992 Australian dollars).

It is emphasised that these costs are preliminary estimates only and need to be revised on the basis of a more detailed specification of remediation requirements and techniques.
<table>
<thead>
<tr>
<th>Major item</th>
<th>Part</th>
<th>Estimated cost(^\text{a})</th>
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<tr>
<td>Management structure</td>
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</tr>
<tr>
<td>Management of physical environment</td>
<td>Control of soil erosion</td>
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</tr>
<tr>
<td></td>
<td>Control of noxious weeds</td>
<td>$20,000</td>
</tr>
<tr>
<td></td>
<td>(then $4,000/yr)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protect sites of interest by fencing</td>
<td>$4,000</td>
</tr>
<tr>
<td>Underground storage tanks</td>
<td>Management Plan</td>
<td>Included in 'Staffing' below</td>
</tr>
<tr>
<td></td>
<td>Soil remediation by landfarming</td>
<td>$73,000</td>
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<tr>
<td></td>
<td>Groundwater pump and treat</td>
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<td>Leak detection system</td>
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<td>Civil works and overfill protection</td>
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<td>Tank tightness testing</td>
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<td>Hazardous materials</td>
<td>Soil remediation</td>
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<td></td>
<td>Disposal of redundant materials</td>
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<tr>
<td></td>
<td>Documentation system</td>
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<td></td>
<td>Hazmat store</td>
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<td></td>
<td>Improvement to waste oil collection</td>
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<td>Testing of groundwater bore yield</td>
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<td>Sewage treatment</td>
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<td>Rehabilitation of old lagoons</td>
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<td>Stormwater</td>
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Table 14.1: Preliminary cost estimates for implementing Audit recommendations

\(^{a}\) Costs assume that all work is documented by a consultant (allowance of 10\%) and that all site work is undertaken by contractors.
15. CONCLUSION

Overall a reasonable level of environmental awareness and operational management was found and audited given the generally low potential environmental risk posed by the location and operation of the Canberra Deep Space Communication Complex.

Recommendations have been made to rectify relatively minor non-compliance with local practice and legislation. Some actions have been included which exceed current requirements for the Australian Capital Territory where there is an opportunity to move into line with US Federal practice. At the same time it is necessary to be aware of the practical limitations in fully complying with all US Federal requirements when the legal and social infrastructure are not congruous. It is not considered appropriate, given the scale of the environmental risk, for the Complex to be a trendsetter significantly in advance of local practice.
REFERENCES


(2) GILBERT ASSOCIATES, Madrid Deep Space Communications Complex, Remedial Actions Pertaining to Environmental Issues, Volume 1, May 1991.

(3) NATIONAL CAPITAL DEVELOPMENT COMMISSION, Sites of significance in the ACT. Volume 7, Paddys River and Tennent Areas. Technical Paper 56.


(9) WORMALDS PTY LTD, Report on alternatives to Halons, 1988

BIBLIOGRAPHY


ACKNOWLEDGMENTS

Study team
Ove Arup & Partners
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Golder Associates
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P Waddel

Geo & Hydro Consultants
A Morton
D Hogg

ACT Electricity & Water Laboratory

Envirosciences

Mallesons Stephen Jaques

CDSCC staff

We wish to record our appreciation of the assistance and patience shown to the study team by the staff of the Complex, particularly during the fieldwork phases. Special mention is made of the detailed information provided by Mr Jim Kirkpatrick and all staff in the Facilities Services Section regarding the environmental history of the site and present operating details. This information allowed a cost-effective targeted fieldwork programme to be assembled.
FOI 2013/3

ATTACHMENT ‘FIGURES’ TO VOLUME 1

IRRELEVANT
PURSUANT TO SECTION 22
British Aerospace Australia Limited

Report on the investigations for the environmental audit of Canberra Deep Space Communication Complex

Final Report, August 1992

Volume 2 of 2 : Appendices
CONTENTS VOLUME 2

APPENDICES

A  PROJECT BRIEF
B  DETAILS OF U.S. FEDERAL LEGISLATION
C  DETAILS OF COMMONWEALTH LEGISLATION
D  DETAILS OF ACT LEGISLATION
E  REPORT ON FUEL STORAGES BY GEO & HYDRO CONSULTANTS LTD
F  FIRST REPORT BY GOLDER ASSOCIATES
G  SECOND REPORT BY GOLDER ASSOCIATES
H  ASBESTOS SURVEY BY ENVIROSCIENCES PTY LIMITED
APPENDIX A

STATEMENT OF WORKS
STATEMENT OF WORKS

ENGINEERING SERVICES REQUIRED

FOR

ENVIRONMENTAL COMPLIANCE AUDIT

AT

CANBERRA DEEP SPACE COMMUNICATION COMPLEX

JUNE 1991

BRITISH AEROSPACE AUSTRALIA
PO Box 638
Fyshwick
ACT 2609
CDSCC ENVIRONMENTAL STUDY

SECTION 1

A. SCOPE OF WORK

1. In general the Contractor shall perform an environmental compliance audit at the Canberra Deep Space Communication Complex. The study shall assess the extent of non-compliance with both Australian and US Federal regulations/procedures including but not limited to
   a. Hazardous material management
   b. Solid material waste management
   c. Ground water and waste water management
   d. Underground storage tank integrity
   e. Asbestos
   f. Gaseous discharge.

2. Only Australian regulations are binding on the Canberra Complex but as part of the world wide DSN/NASA Tracking Network it has been decided that US Federal regulations shall also be applied to the Canberra Complex. To enable this requirement to be fulfilled it will be necessary for the Contractor to engage a US sub-contractor to assist with the environmental audit.

3. The environmental audit will be performed in conjunction with designated Complex personnel. The following is a list of potential environmental sample options and the Contractor should ascertain that state of the art laboratory testing techniques are available locally. Appropriate samples should be taken as part of the audit and the contractor will select certified laboratories for sample analysis and provide the necessary liaison with these laboratories.
   a. Soil samples - Soil samples shall be collected from areas of known or suspected contamination. They may be grab, surface samples or "undisturbed" samples extracted from
selected depths from borings drilled into the earth (hollow stem auger technique.)

b. Wastewater samples - These samples shall be collected from wastewater treatment plant vessels, inlets, or outfalls. The purpose of these samples is varied, but includes determining whether effluent discharged from the treatment plant is adversely impacting the environment, influent to the plant is treatable, and treatment processes are effective in reducing contaminants. Either grab samples may be collected, or a continuous sampler may be used to collect composite or discrete samples over a designated period of time.

c. Groundwater samples - These samples shall be collected from monitoring wells installed in borings. Wells shall be installed in areas where known or suspected contamination of the subsurface has occurred and contamination of groundwater is possible. Utilize USEPA established methodology for construction of wells and extraction of groundwater for analysis.

d. Surface water samples - These samples shall be collected from streams, ponds, and other surface water bodies to investigate whether contamination has occurred. Samples of both the water column and sediment layers are generally collected.

e. Waste samples - These are samples of wastes from drums, tanks, waste piles, basins or other areas where an unidentified waste may be located. The purpose for sampling is to determine the nature of the waste so that it may be properly and safely handled, containerized and evaluated regarding its potential for reuse, recycling, reclamation, or disposal. Such samples also includes testing of the underground storage tanks for leaks.

4. The environmental study will be performed in conjunction with the Canberra Complex personnel. This participation will provide for a planned future environmental compliance activity.
SECTION II

A. DETAIL REQUIREMENTS

The Contractor shall perform the services and furnish related materials to accomplish the tasks as outlined below.

1. Attend discussions with Canberra Complex personnel to accomplish the following.
   a. Review Project scope
   b. Review project schedule
   c. Review the extent that Complex personnel will assist with the audit
   d. Identify and review applicable Australian and US Federal laws and regulations that apply to the Complex
   e. Review facility profiles and site plans
   f. Review scope of participation of US sub-contractor

2. a. It is the intent of this project to provide the Canberra Deep Space Communication Complex with a comprehensive final audit report, listing deficiencies, method of improvement and preliminary cost estimates to correct deficiencies. Recommended improvements shall be supported by sketches, showing in detail, corrective action.
   b. The Contractor shall submit a preliminary report of the findings to the Canberra Complex for review.

3. a. As part of the initial discussions with Complex personnel the contractor shall provide an environmental study plan for review. The plan should include but not be limited to the following:
   a. Additional information required from the Canberra Complex prior to the start of the study.
   b. Type of on-site support required at the Complex during the study.
c. Format for conducting the site study.
d. Schedule for study and on-site time.
b. The study and report shall address the following environmental areas:
   1. Hazardous waste
   2. Solid (Non-hazardous waste)
   3. Pesticides
   4. Wastewater
   5. Underground Tanks
   6. Asbestos
   7. Gaseous discharge
   8. Spill Response
   9. Training
   10. Recordkeeping
   11. Methodology for Future Environmental Studies
   12. Administrative Planning and Programs

c. Collect Preliminary Data
   1. The Contractor shall collect pertinent information on the complex and its operations which may be subject to regulations and thus subject to audit.
   2. The Contractor shall prepare a proposed schedule and audit plan for the Complex which shall be submitted to the Complex for approval.
   3. Perform on-site audit and collect field data.
   a. Wastewater and Storm Water
      Tasks for consideration involve investigations to analyze the existing information and records relating to wastewater, storm water, and industrial water facilities and discharges to and/or from these facilities; analyze flow patterns and regulatory, safety, and maintenance; and prepare design criteria (identify compliance requirements) and cost order of magnitude estimates for compliance improvements as determined by the study to be necessary to achieve compliance.
b. **Hazard Waste and Solid Waste Management**

Hazardous waste is regulated at the USEPA level under the Resource Conservation and Recovery Act (RCRA) and should be considered during study. These regulations address the management of hazardous wastes (and not hazardous materials) by generators, transporters, and owners and operators of treatment, storage, and disposal facilities.

If the Canberra complex stores hazardous materials and generates hazardous waste and if the complex stores hazardous waste, the Contractor shall determine compliance status of operations of storage facilities, recommend corrective actions and prepare an order of magnitude cost estimate for improvements to achieve compliance.

c. **Pesticide Substances**

Determine whether use of pesticide substances at the site is in compliance with appropriate regulations.

d. **Underground Leak Detection Plan**

The Contractor shall provide guidance for developing an underground tank program. This guidance at a minimum shall address testing of the systems for leaks, tank inventory monitoring, tank systems retrofit, tank replacement and concepts for remediation of leaks. In addition, underground tank systems and management practices will be evaluated based on accepted environmental principals. An order of magnitude cost estimate will be prepared for bringing the tank systems up to an acceptable standard.

e. **Asbestos Survey and Abatement**

Visually identify the locations and physical conditions of asbestos-containing materials at the complexes.

Provide a quantitative means for establishing priorities to be used in deciding possible
corrective action. Establish a basis for creating an on-going Abatement program.

The asbestos surveys shall provide a method for analyzing materials of construction in order to identify potential exposures to workers from asbestos-containing materials.
SECTION III

PRESENTATION OF STUDY FINDINGS

The report to be generated shall list all noted areas of non-compliance and recommended action items which can be taken to achieve compliance. Order of magnitude cost estimates to achieve compliance is to be provided for each item of non-compliance.

Guidelines for such cost estimates shall be as follows:
1. Agree on scope of problem
2. Determine whether confirmation studies are required
3. Establish steps in compliance program
4. Develop current order of magnitude estimates

It is anticipated that the environmental compliance audit will take from 6-8 months to complete.
August 2, 1991

Refer to: 401-035/IJJ:yjb

Mr. Richard Jacobson
Deputy Director
Tidbinbilla Space Tracking Station
P. O. Box 350
Kingston, A.C.T. 2604
AUSTRALIA

SUBJECT: ENVIRONMENTAL COMPLIANCE AND RESTORATION, CANBERRA DSCC, CoF FY’90

Dear Richard:

The purpose of this letter is to relate the recommendations and results of recent telecons held with us and between you and Len Kushner. The telecons concerned the above subject and follow-on Statement of Work dated June 1991 as prepared by British Aerospace Australia.

Our comments and recommendations are based on the experiences we had during the implementation of the Madrid Environmental Program and the completed Goldstone Environmental Program. The current TDA Five Year CoF Environmental Plan for Madrid and Canberra reflects those CoF projects that have been implemented at Goldstone. Two of these projects are presently in-work at Canberra including Oil Spill Confinement and Control (FY ’91) and Upgrade Sewage Treatment (FY ’88). Follow-on planned CDSCC environmental projects are Upgrade or Replacement of Underground Storage Tanks (FY ’94) and Upgrade Hazardous Materials and Waste Storage Areas (FY ’94).

Two of your concerns for the subject task are the level of environmental compliance and the method of testing the various samples. Our reply is that it is understood that compliance with the applicable Australian regulations is binding. In the event that Australian regulations do not cover a situation that is covered by U.S. Federal regulations, then the "intent" of the U.S. regulations should be considered. The "intent" would not require that the exact methodology and level of detail be followed as prescribed in the U.S. regulations. Laboratory testing of samples should be conducted within the existing capabilities of Australian testing laboratories. [Considering that asbestos has been deleted from the scope of work] and the

NOT SO (SEE APPDX H)
Mr. Richard Jacobson

August 2, 1991

The upgrade of sewage treatment is in work, we do not think that laboratory sample testing would go much beyond water and petroleum product testing. We do not believe, in any case, that contaminated material should be sent to the United States for testing.

Pesticides were almost nonexistent at Goldstone. Spill response was contracted to an off-site contractor. Training and record keeping is a U.S. requirement and is an on-going activity at Goldstone; however, this can be accomplished at CDSCC by responding to the "intent" of the U.S. regulations.

We anticipate that the required actions resulting from the subject task will fall within the scope of work described in the two CoF FY '94 environmental projects mentioned above.

If you have any further concerns, please do not hesitate to contact Len Kushner who is the TDA Safety and Environmental Protection Engineer. He will assist you in any way that he can.

Sincerely,

Jack

I. J. Justice, Manager
TDA Resources, Safety and Environmental Programs

cc: E. Abrahamy
    M. Dinn (CDSCC)
    J. E. Fernandez
    L. Kushner
    G. Morris
    P. Westmoreland
FOI 2013/3

APPENDIX A OF VOLUME 2

IRRELEVANT
Pursuant to Section 22
APPENDIX B

REVIEW OF US FEDERAL ENVIRONMENTAL LEGISLATION APPLICABLE TO CANBERRA DSCC
B.1 LISTING OF US FEDERAL ENVIRONMENTAL LEGISLATION

Based on the knowledge and experience of Golder Associates (particularly Mr Michael Schlender), and after briefings by Complex management and a series of site inspections, a listing has been made of the US legislation which is applicable to the environmental issues identified for the site. The listing is as follows for each area of interest:

- Environmental approvals
  None specific (should be good engineering practice)

- Worker Safety
  OSHA - Occupational Safety and Health Act

- Emergency Planning and Right to Know
  OSHA
  CERCLA/SARA (Title III reporting) & NCP (40CFR Part 300 Subpart C).
  CWA - Clean Waters Act

- Solid & Hazardous Waste Management & Underground Storage Tanks (USTs)
  OSHA
  RCRA - Resource Conservation and Recovery
  Act as amended by HSWA - Hazardous and Solid Waste Amendments.
  Solid Waste Reg's. (40CFR Parts 240-259)

- Hazardous Substance Release and Emergency Response
  CERCLA (as amended) and the NCP - National Contingency Plan

- Hazardous Waste & Solid Waste Management
  RCRA (as amended) and 40CFR Pts 240-281

- Polychlorinated Biphenyl (PCB) Management
  TSCA and 40CFR Pts 700-766

- Pesticide Usage
  FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act

- Water supply
  SDWA - Safe Drinking Water Act

- Wastewater
  CWA
  NPDES permitting - National Pollutant Discharge Elimination System

- Asbestos management
  CAA - Clean Air Act
  OSHA
  NESHAP - National Emission Standards for Hazardous Air Pollutants

- Air Emissions
  CAA (National Ambient Air Quality Standards - NAAQS)
  NESHAP
  OSHA
  SARA

A detailed analysis of each piece of legislation is contained in the following sheets.

B.1
FOI 2013/3

PAGES B.2 TO B.10 OF VOLUME 2

IRRELEVANT
PURSUANT TO SECTION 22
| Jurisdiction | United States Federal | No 42 USC § 7401, 40 CFR part 61, No 29 USC § 651 et seq., 29 CFR part 1910 |

**Qualitative requirements**

CAA promulgates primary and secondary standards for air quality, including particulates, hydrocarbons, sulfur oxides, nitrogen oxides, carbon monoxide, ozone, and lead.

1990 Amendments to CAA include standards for air toxics.

CAA defines hazardous air pollutants as those for which no air quality standard is applicable, but which may or contribute to air pollution that may result in an increase in mortality or serious irreversible illness. Asbestos is covered in this definition under NESHAPS.

OSHA requirements concerning asbestos administered by Worksafe Australia:

Removal of Asbestos Containing Materials (ACMs) not required under any federal legislation and ACMs are not considered a hazardous waste under Federal CERCLA or RCRA Acts.

**Quantitative standards**

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<thead>
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<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
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</thead>
</table>

Consequences (in the United States)

USEPA CAA requirements apply for air toxics/asbestos as ACT Air Pollution Act of 1984 may or may not cover these pollutants.

United States OSHA has adopted a Permissible Airbourne Exposure Level (PEL) of 0.2 fibers per cc of air (over 8 hours). Standard of 0.1 f/cc triggers air monitoring, employee training, and medical surveillance for the work setting.

Civil and criminal penalties under CAA for non-compliance. Civil penalties of up to $25,000 per day of violation, criminal provisions include one year imprisonment. A fine of $10,000 for knowingly making false statements regarding representations or certification, or tampering with a air monitoring devise or method.

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<td>MS 2 Dec 91</td>
<td>MT 21/4/92</td>
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</table>

Table B.9: US Federal legislation - asbestos management
## Qualitative requirements

CAA promulgates primary and secondary standards for air quality, including particulates, hydrocarbons, sulfur oxides, nitrogen oxides, carbon monoxide, ozone, and lead.

1990 Amendments to CAA include standards for air toxics.

Establishes National Ambient Air Quality Standards (NAAQS) and sets forth permit requirements for emission sources, and regulations for Prevention of Significant Deterioration (PSD) of air quality over designated areas or regions.

CAA defines hazardous air pollutants as those for which no air quality standard is applicable, but which may contribute to air pollution that may result in an increase in mortality or serious irreversible illness.

NESHAPS includes asbestos, benzene, beryllium, coke oven (emissions), mercury, vinyl chloride, and radionuclides as hazardous chemicals and regulates source emissions under CAA. OSHA regulations and standards cover asbestos management/abatement (see below).

SARA requires reporting of chemical releases (including air) above applicable threshold levels.

## Quantitative standards

<table>
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<th>Frequency etc</th>
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Table B.10: US Federal legislation - air emissions
APPENDIX C

REVIEW OF COMMONWEALTH OF AUSTRALIA ENVIRONMENTAL LEGISLATION APPLICABLE TO CANBERRA DSCC
COMMONWEALTH ENVIRONMENTAL ACTS CONSIDERED APPLICABLE

Environment Protection (Impact of Proposals) Act 1974  
Aboriginal and Torres Strait Islander Heritage Protection Act 1984  
Hazardous Wastes (Regulation of Exports and Imports) Act 1989  
Industrial Chemicals (Notification and Assessment) Act 1989  
Ozone Protection Act 1989  

COMMONWEALTH ENVIRONMENTAL ACTS CONSIDERED NOT APPLICABLE

Resource Assessment Commission Act 1989  
National Parks and Wildlife Conservation Act 1975  
Australian Heritage Commission Act 1975  
Environment Protection (Sea Dumping) Act 1981  

Historic Shipwrecks Act 1976  
Protection of Moveable Cultural Heritage Act 1986  

SPECIAL NOTE TO TABLES C2, C3, C4 AND C5.

Under "Consequences", the person liable is the person who actually commits the offence. If that person is a director, servant or agent of a corporation who was acting within their authority, the corporation is also liable unless it can raise the defences of reasonable precaution and due diligence.
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Commonwealth of Australia</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation</td>
<td>Environment Protection (Impact of Proposals) Act</td>
<td>Date 1974</td>
</tr>
</tbody>
</table>

**Qualitative requirements**

Provides for protection of the environment by controlling the impact of development proposals.

Applies to proposals in which there is some involvement by the Commonwealth Government.

The Act is limited to matters which affect the environment to a significant extent.

Environment Protection (Impact of Proposals) Regulations deal only with the legal procedures which apply to commissions under the Act.

Administrative Procedures under the Environment Protection (Impact of Proposals) Act 1974 contain the procedures to be followed under EIA.

Memoranda of Understanding are developed between Commonwealth and States and Territories on the interaction between the two jurisdictions.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consequences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- failure to attend Commission, take oath etc $1000 or 6 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- failure to refer or follow procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- failure to abide by conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality control</th>
<th>Compiled</th>
<th>Entered</th>
<th>Checked</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MT 7Nov91</td>
<td>MT 7Nov91</td>
<td>MT 21Apr92</td>
</tr>
</tbody>
</table>

Table C.1: Commonwealth legislation - Environmental Protection (Impact of Proposals) Act
### Jurisdiction
Commonwealth of Australia

### Regulation
Aboriginal and Torres Strait Islander Heritage Protection Act, and Regulations

### Date
1984

### Qualitative requirements
- Protects archaeological, sacred and historic sites, objects and skeletal remains which are of particular significance to Aborigines and which are under threat of injury or desecration;
- The Commonwealth may make declarations to protect areas or objects from injury or desecration;
- Regulates the discovery and disposal of aboriginal remains.

### Quantitative standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
</table>

### Consequences
- contravening provision of a declaration in relation to an area - person $10,000 and/or 5 years; corporation $50,000
- as above for objects - person $5,000 and/or 2 years; corporation $25,000
- not notifying remains $500
- corporation responsible for acts of servants and agents

### Quality control
- Compiled: MT 7Nov1991
- Entered: MT 7Nov1991
- Checked: MT 21Apr92

Table C.2: Commonwealth Legislation - Aboriginal and Torres Strait Islander Heritage Protection Act
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Commonwealth of Australia</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation</td>
<td>Hazardous Wastes (Regulation of Exports and Imports) Act</td>
<td>Date 1989</td>
</tr>
</tbody>
</table>

**Qualitative requirements**

- Provides a system for the control of import and export of hazardous waste (by permit)
- Ensures wastes are disposed of in an environmentally acceptable manner here and overseas
- Hazardous waste is as defined in the Basel Convention (Schedule attached)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
</table>

**Consequences**

- Importing or exporting without a permit, not in accordance with a permit, not in accordance with an order - penalty 5 years
- Directors, servants or agents of a corporation is liable

<table>
<thead>
<tr>
<th>Quality control</th>
<th>Compiled</th>
<th>Entered</th>
<th>Checked</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MT 7NOV91</td>
<td>MT 7NOV91</td>
<td>MT 21Apr92</td>
</tr>
</tbody>
</table>

Table C.3: Commonwealth legislation - Hazardous Wastes (Regulation of Exports and Imports) Act
SCHEDULE.

ANNEXES I TO IV TO THE BASEL CONVENTION

Annex I

CATEGORIES OF WASTES TO BE CONTROLLED

Waste Streams

Y1 Clinical wastes from medical care in hospitals, medical centers and clinics
Y2 Wastes from the production and preparation of pharmaceutical products
Y3 Waste pharmaceuticals, drugs and medicines
Y4 Wastes from the production, formulation and use of biocides and phytosanitaries
Y5 Wastes from the manufacture, formulation and use of wood preserving chemicals
Y6 Wastes from the production, formulation and use of organic solvents
Y7 Wastes from heat treatment and tempering operations containing cyanides
Y8 Waste mineral oils unfit for their originally intended use
Y9 Waste oils/water, hydrocarbons/water mixtures, emulsions
Y10 Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)
Y11 Waste tarry residues arising from refining, distillation and any pyrolytic treatment
Y12 Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnishes
Y13 Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives
Y14 Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known
Y15 Wastes of an explosive nature not subject to other legislation
Y16 Wastes from production, formulation and use of photographic chemicals and processing materials
Y17 Wastes resulting from surface treatment of metals and plastics
Y18 Residues arising from industrial waste disposal operations

Wastes having as constituents:

Y19 Metal carbonyls
Y20 Beryllium; beryllium compounds
Y21 Hexavalent chromium compounds
Y22 Copper compounds
Y23 Zinc compounds
Y24 Arsenic; arsenic compounds
Y25 Selenium; selenium compounds
Y26 Cadmium; cadmium compounds
Y27 Antimony; antimony compounds
Y28 Tellurium; tellurium compounds
Y29 Mercury; mercury compounds
Y30 Thallium; thallium compounds
Y31 Lead; lead compounds
SCHEDULE—continued

Y32 Inorganic fluorine compounds excluding calcium fluoride
Y33 Inorganic cyanides
Y34 Acidic solutions or acids in solid form
Y35 Basic solutions or bases in solid form
Y36 Asbestos (dust and fibres)
Y37 Organic phosphorus compounds
Y38 Organic cyanides
Y39 Phenols; phenol compounds including chlorophenols
Y40 Ethers
Y41 Halogenated organic solvents
Y42 Organic solvents excluding halogenated solvents
Y43 Any congener of polychlorinated dibenzo-furan
Y44 Any congener of polychlorinated dibenzo-p-dioxin
Y45 Organohalogen compounds other than substances referred to in this Annex (eg Y39, Y41, Y42, Y43, Y44).

Annex II

CATEGORIES OF WASTES REQUIRING SPECIAL CONSIDERATION

Y46 Wastes collected from households
Y47 Residues arising from the incineration of household wastes

Annex III

LIST OF HAZARDOUS CHARACTERISTICS

<table>
<thead>
<tr>
<th>UN Class Code</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 H1</td>
<td>Explosive</td>
</tr>
<tr>
<td></td>
<td>An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or wastes) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings.</td>
</tr>
<tr>
<td>3 H3</td>
<td>Flammable liquids</td>
</tr>
<tr>
<td></td>
<td>The word &quot;flammable&quot; has the same meaning as &quot;inflammable&quot;. Flammable liquids are liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc., but not including substances or wastes otherwise classified on account of their dangerous characteristics) which give off a flammable vapour at temperatures of not more than 60.5°C, closed-cup test, or not more than 65.6°C, open-cup test. (Since the results of open-cup tests and of closed-cup tests are not strictly comparable and even individual results by the same test are often variable, regulations varying from the above figures to make allowance for such differences would be within the spirit of this definition.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4.1</td>
<td>Flammable solids</td>
</tr>
<tr>
<td>Substances, or waste solids, other than those classed as explosives, which under conditions encountered in transport are readily combustible, or may cause or contribute to fire through friction.</td>
<td></td>
</tr>
<tr>
<td>H4.2</td>
<td>Substances or wastes liable to spontaneous combustion</td>
</tr>
<tr>
<td>Substances or wastes which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up on contact with air, and being then liable to catch fire.</td>
<td></td>
</tr>
<tr>
<td>H4.3</td>
<td>Substances or wastes which, in contact with water emit flammable gases</td>
</tr>
<tr>
<td>Substances or wastes which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.</td>
<td></td>
</tr>
<tr>
<td>H5.1</td>
<td>Oxidizing</td>
</tr>
<tr>
<td>Substances or wastes which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion of other materials.</td>
<td></td>
</tr>
<tr>
<td>H5.2</td>
<td>Organic Peroxides</td>
</tr>
<tr>
<td>Organic substances or wastes which contain the bivalent-O-O-structure are thermally unstable substances which may undergo exothermic self-accelerating decomposition.</td>
<td></td>
</tr>
<tr>
<td>H6.1</td>
<td>Poisonous (Acute)</td>
</tr>
<tr>
<td>Substances or wastes liable either to cause death or serious injury or to harm human health if swallowed or inhaled or by skin contact.</td>
<td></td>
</tr>
<tr>
<td>H6.2</td>
<td>Infectious substances</td>
</tr>
<tr>
<td>Substances or wastes containing viable micro-organisms or their toxins which are known or suspected to cause disease in animals or humans.</td>
<td></td>
</tr>
<tr>
<td>H8</td>
<td>Corrosives</td>
</tr>
<tr>
<td>Substances or wastes which, by chemical action, will cause severe damage when in contact with living tissue, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport; they may also cause other hazards.</td>
<td></td>
</tr>
<tr>
<td>H10</td>
<td>Liberation of toxic gases in contact with air or water</td>
</tr>
<tr>
<td>Substances or wastes which, by interaction with air or water, are liable to give off toxic gases in dangerous quantities.</td>
<td></td>
</tr>
<tr>
<td>H11</td>
<td>Toxic (Delayed or chronic)</td>
</tr>
<tr>
<td>Substances or wastes which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity.</td>
<td></td>
</tr>
<tr>
<td>H12</td>
<td>Ecotoxic</td>
</tr>
<tr>
<td>Substances or wastes which if released present or may present immediate or delayed adverse impacts to the environment by means of bioaccumulation and/or toxic effects upon biotic systems.</td>
<td></td>
</tr>
<tr>
<td>H13</td>
<td>Capable, by any means, after disposal, of yielding another material, e.g., leachate, which possesses any of the characteristics listed above.</td>
</tr>
</tbody>
</table>

Tests
The potential hazards posed by certain types of wastes are not yet fully documented; tests to define quantitatively these hazards do not exist. Further research is necessary in order to develop means to characterize potential hazards posed to man and/or the environment by these wastes. Standardized tests have been derived with respect to pure...
SCHEDULE—continued

4.1 H4.1 Flammable solids
Solids, or waste solids, other than those classed as explosives, which under conditions encountered in transport are readily combustible, or may cause or contribute to fire through friction.

4.2 H4.2 Substances or wastes liable to spontaneous combustion
Substances or wastes which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up on contact with air, and being then liable to catch fire.

4.3 H4.3 Substances or wastes which, in contact with water emit flammable gases
Substances or wastes which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

5.1 H5.1 Oxidizing
Substances or wastes which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion of other materials.

5.2 H5.2 Organic Peroxides
Organic substances or wastes which contain the bivalent-O-O-structure are thermally unstable substances which may undergo exothermic self-accelerating decomposition.

6.1 H6.1 Poisonous (Acute)
Substances or wastes liable either to cause death or serious injury or to harm human health if swallowed or inhaled or by skin contact.

6.2 H6.2 Infectious substances
Substances or wastes containing viable micro organisms or their toxins which are known or suspected to cause disease in animals or humans.

8 H8 Corrosives
Substances or wastes which, by chemical action, will cause severe damage when in contact with living tissue, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport; they may also cause other hazards.

9 H10 Liberation of toxic gases in contact with air or water
Substances or wastes which, by interaction with air or water, are liable to give off toxic gases in dangerous quantities.

9 H11 Toxic (Delayed or chronic)
Substances or wastes which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity.

9 H12 Ecotoxic
Substances or wastes which if released present or may present immediate or delayed adverse impacts to the environment by means of bioaccumulation and/or toxic effects upon biotic systems.

9 H13 Capable, by any means, after disposal, of yielding another material, e.g., leachate, which possesses any of the characteristics listed above.

Tests
The potential hazards posed by certain types of wastes are not yet fully documented; tests to define quantitatively these hazards do not exist. Further research is necessary in order to develop means to characterise potential hazards posed to man and/or the environment by these wastes. Standardized tests have been derived with respect to pure
### Qualitative requirements

Establishes a national system for the notification and assessment of industrial chemicals (administered by Worksafe Australia) to aid in protecting people and the environment.

Provides for the Director of Chemicals Notification and Assessment to keep an inventory of chemical substances.

Makes it an offence to import or manufacture a priority existing chemical or a new chemical unless one holds an assessment certificate for that chemical.

An assessment certificate indicates that the risk of adverse health, safety and environmental effects (if any) of importation, manufacture, use, storage, handling or disposal has been assessed.

### Quantitative standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
</table>

### Consequences

- Importing and manufacturing a new chemical without permit - $30,000
- Importing and manufacturing a priority existing chemical without a permit - $12,000
- Failure to comply with a notice regarding a priority existing chemical - $30,000
- Failure to provide secondary notifications - $12,000
- Providing misleading information - $3,000

### Quality control

- Compiled: MT 7NOV91
- Entered: MT 7NOV91
- Checked: MT 21Apr92

Table C.4 - Commonwealth legislation - Industrial Chemicals (Notification and Assessment) Act
### Qualitative requirements

- Gives effect to Australia's obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer (Scheduled Substances attached)

- Gives effect to Australia's obligations under the Vienna Convention for the Protection of the Ozone Layer

- Controls the manufacture, import and export of ODS and products which contain them, including extruded polystyrene produced using CFCs

- Prohibits the manufacture and import of CFCs from 31 December 1989 (some exemptions including calibration of scientific equipment, defence purposes, to satisfy legal requirements)

### Quantitative standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
</table>

### Consequences

- unlicensed manufacture, import or export of CFCs or halons - person $50,000; corporation $250,000

- manufacturing or importing a product containing scheduled substance - person $5,000; corporation $25,000

- importing for or exporting to a non-Protocol country - Person $10,000; Corporation $50,000

- failure to report as required - person $10,000, corporation $50,000

- a corporation is responsible for actions of its directors, servants or agents

### Quality control

- Compiled: MT 9Nov91
- Entered: MT 9Nov91
- Checked: MT 21Apr92

Table C.5: Commonwealth legislation - Ozone Protection Act
### SCHEDULE I
**SCHEDULED SUBSTANCES**

#### PART I
**CFCs**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Column 2 Ozone depleting potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trichlorofluoromethane (CFC-11)</td>
<td>1.0</td>
</tr>
<tr>
<td>Dichlorodifluoromethane (CFC-12)</td>
<td>1.0</td>
</tr>
<tr>
<td>Trichlorotrifluoroethane (CFC-113)</td>
<td>0.8</td>
</tr>
<tr>
<td>Dichlorotetrafluoroethane (CFC-114)</td>
<td>1.0</td>
</tr>
<tr>
<td>(Mono) chloropentafluoroethane (CFC-115)</td>
<td>0.6</td>
</tr>
</tbody>
</table>

#### PART II
**Halons**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Column 2 Ozone depleting potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromochlorodifluoromethane (Halon-1211)</td>
<td>3.0</td>
</tr>
<tr>
<td>Bromotrifluoromethane (Halon-1301)</td>
<td>10.0</td>
</tr>
<tr>
<td>Dibromotetrafluoroethane (Halon-2402)</td>
<td>6.0</td>
</tr>
</tbody>
</table>
APPENDIX D

REVIEW OF AUSTRALIAN CAPITAL TERRITORY ENVIRONMENTAL LEGISLATION APPLICABLE TO CANBERRA DSCC
D.1 GENERAL

The following pieces of ACT legislation are considered applicable to the activities at Canberra Deep Space Communication Complex, and are reviewed in the following Tables:

- Land (Planning and Environment) Act  
- Water Pollution Act  
- Air Pollution Act  
- Noise Control Act  
- Public Health Act  
- Noxious Weeds Act  
- Soil Conservation Act  
- Careless Use of Fire Act  
- Electricity and Water Act  
- Canberra Water Supply and Sewerage Act  
- National Capital Plan  
- Draft Territory Plan  
- Ozone Protection Act  
- Dangerous Goods Act

Table D.1  
Table D.2  
Table D.3  
Table D.4  
Table D.5  
Table D.6  
Table D.7  
Table D.8  
Table D.9  
Table D.10  
Table D.11  
Table D.12  
Table D.13  
Table D.14

SPECIAL NOTE TO TABLES D2, D3 AND D13

Under "Consequences", the person liable is the person who actually commits the offence. If that person is a director servant or agent of a corporation who was acting within their authority, the corporation is also liable unless it can raise the defences of reasonable precaution and due diligence.
### Qualitative requirements

Establishes procedures for the preparation of the Territory Plan.

Establishes procedures for the environmental assessment of new proposals within the ACT and environmental inquiries.

Provides for the protection of Heritages Places including Aboriginal places.

Provides for the administration of leases within the ACT.

### Quantitative standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Consequences

<table>
<thead>
<tr>
<th>Quality control</th>
<th>Compiled</th>
<th>Entered</th>
<th>Checked</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DH</td>
<td>PT</td>
<td>MT 21/4/92</td>
</tr>
</tbody>
</table>

Table D.1: ACT legislation - Land (Planning and Environment) Act
**Qualitative requirements**

Provides for licences to discharge water (including treated sewage effluent, stormwater, runoff from construction sites).
Provides for power of inspectors to enter premises, inspect apparatus, collect samples, conduct tests, take photographs etc.
Sets penalties for discharging waste or contravening conditions of licence - penalty is related to class of water affected.
Regulations classify waters and establish requirements for discharge of wastes into classified waters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larrys Creek - Class C water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biochemical oxygen demand</td>
<td>mg/l</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Total organic carbon</td>
<td>mg/l</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Non-filterable residue</td>
<td>mg/l</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Faecal coliform</td>
<td>no/100ml</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Settleable matter</td>
<td>-</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>Grease, oil, solid matter, unnatural discolouration</td>
<td>-</td>
<td>None visible</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>-</td>
<td>6.5 - 8.5</td>
<td></td>
</tr>
<tr>
<td>Phosphorus compounds (P)</td>
<td>mg/l</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Temperature change in receiving water</td>
<td>Degrees</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Celsius</td>
<td>10</td>
<td>(Flow less than 5 percentile low flow)</td>
</tr>
<tr>
<td>Total filtrable residue</td>
<td>mg/l</td>
<td>600</td>
<td>(1000 if drawn directly from groundwater sources)</td>
</tr>
<tr>
<td>Ammonia</td>
<td></td>
<td></td>
<td>Determined by formula (see attached)</td>
</tr>
<tr>
<td>Restricted substances</td>
<td></td>
<td></td>
<td>See attached Schedule 2</td>
</tr>
</tbody>
</table>

**Consequences**

Offences punishable by fines (body corporate and individual person). Maximum fines depend on class of water affected.

**Quality control**

<table>
<thead>
<tr>
<th></th>
<th>Compiled</th>
<th>Entered</th>
<th>Checked</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DH</td>
<td>PT</td>
<td>MT 21/4/92</td>
</tr>
</tbody>
</table>
Jurisdiction | Australian Capital Territory | No
---|---|---
Regulation | Air Pollution Act | Date 1984

**Qualitative requirements**

Limits pollution from fuel-burning equipment and industrial plant.

Prohibits lighting of fires in open air subject to certain exemptions.

Provides for power of inspectors to enter premises, conduct tests, inspect records, take samples and photographs etc.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid/oxides of nitrogen</td>
<td>g/m³ as nitrogen dioxide</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>g/m³ as carbon monoxide</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Soot</td>
<td>Bacharach scale</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Consequences**

Offences include failure to prevent pollution, carry out preventive measures, keep records, provide access holes for sampling and operate and maintain control equipment - punishable by fines.

Fines of up to $10,000 for individuals and $50,000 for corporations can be imposed.

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<tr>
<th>Quality control</th>
<th>Compiled DH</th>
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</thead>
</table>

Table D.3: ACT legislation - Air Pollution Act
AUSTRALIAN CAPITAL TERRITORY

Regulations 1984  No. 24

Air Pollution Regulations

TABLE OF PROVISIONS

PART I—PRELIMINARY

1. Regulation
2. Citation
3. Interpretation

PART II—STANDARDS FOR EXISTING EQUIPMENT

3. Application of Part
4. Standards of concentration
5. Exceptions

PART III—STANDARDS FOR FUTURE EQUIPMENT

6. Application of Part
7. General standards of concentration
8. Exceptions
9. Specific standards of concentration

PART IV—TESTING PROCEDURES

10. Procedure for solid particles
11. Procedure for smoke and soot
12. Measurement and correction of gas volume to normal conditions
13. Manner of testing for other than solid particles

PART V—SAMPLING

Division 1—Sampling of solid particles

14. Samples of emissions of solid particles
15. Circular chimneys
16. Rectangular chimneys

Division 2—Sampling of other than solid particles

17. Samples of emissions of other than solid particles

Division 3—General

18. Sampling position
19. Working platform
20. Obligations of occupier

PART VI—FUels

21. Fuels

SCHEDULE

(Reg. 24/83) — Cat. No. 84-1482.8 — Recommended retail price $2.00
AUSTRALIAN CAPITAL TERRITORY

Regulations 1984  No. 24

Air Pollution Regulations

THOMAS UREN, the Minister of State for Territories and Local Government, hereby make the following Regulations under the Air Pollution Ordinance 1984.


TOM UREN
Minister of State for Territories and Local Government

PART 1—PRELIMINARY

Citation

1. These Regulations may be cited as the Air Pollution Regulations.

Interpretation

2. (1) In these Regulations, unless the contrary intention appears—
   "equipment" means fuel-burning equipment or industrial plant;
   "obscuration" means the ratio of visible light attenuated by pollutants suspended in the effluent stream to incident visible light, expressed as a percentage;
   "prescribed date" means the date of commencement of these Regulations;
   "process" includes the carrying on of any trade or industry;
   "Ringelmann chart" means—
      (a) a Ringelmann chart that conforms to British Standards publication BS2742C, as referred to in British Standard BS2742:1969; or
      (b) a miniature smoke chart that conforms to British Standards publication BS2742M, as referred to in British Standard BS2742:1969;
   "type A socket" means a socket having a clear internal diameter of not less than 168 millimetres and a length of not less than 90 millimetres;
   "type B socket" means a socket having a clear internal diameter of not less than 33 millimetres and a length of not more than 50 millimetres.
(3) A reference in these Regulations to a normal volume, in relation to gas, shall be read as a reference to volume corrected to 0° Celsius and to an absolute pressure of 101.3250 x 10^5 pascal.

(3) A reference in these Regulations to the Bacharach filter paper method shall be read as a reference to a kit having code number 21-7000 and comprising the Bacharach True-Spot Smoke Tester model RCD-B, the Oil Burner Smoke Scale and filter paper, as supplied by the Bacharach Industrial Instrument Company, Pittsburgh, Pennsylvania, U.S.A.

(4) A reference in these Regulations consisting of the words “Australian Standard” followed by letters and figures shall be read as a reference to the standard published under those letters and figures by, or on behalf of, the body incorporated by Royal Charter under the name Standards Association of Australia, being that standard as existing at the date of commencement of these Regulations.

(5) A reference in these Regulations consisting of the words “British Standard” followed by letters and figures shall be read as a reference to the standard published under those letters and figures by the Executive Board of the body incorporated by Royal Charter under the name British Standards Institution, being that standard as existing at the date of commencement of these Regulations.

(6) A reference in these Regulations consisting of the words “American Standard” followed by letters and figures shall be read as a reference to the standard published under those letters and figures by the American Society for Testing and Materials, being that standard as existing at the date of commencement of these Regulations.

(7) A reference in these Regulations to prescribed obscuration measuring equipment shall be read as a reference to equipment used to measure obscuration, being equipment—

(a) comprising—

(i) a device which projects light and a receiver which is a photocell detector, mounted on a chimney;

(ii) transformers, amplifiers, voltage stabilization equipment and calibration adjustment equipment;

(iii) an indicating meter which is calibrated in percentage obscuration and complies with Australian Standard AS1042-1973:

(iv) a recorder which produces a permanent record of the obscuration measured and complies with Australian Standard AS1024-1971;

(v) a visible, external alarm device;

(vi) an audible, external alarm device; and

(vii) an alarm actuating device which is either a component part of the obscuration measuring equipment or mounted independently of this equipment;

(b) having a response time of not greater than 10 seconds, where the response time refers to the time taken, after there has been a change in the level of obscuration in the chimney, for 95% of the corresponding final value of obscuration to be displayed on the indicating meter and recorder.

PART II—STANDARDS FOR EXISTING EQUIPMENT

Application of Part

3. (1) This Part applies in relation to air pollution from the carrying on of any process, or the use of any equipment, that is being carried on, or is in use, at the prescribed date.

(2) For the purpose of these Regulations, where, on or before the prescribed date, a contract has been entered into for the purchase of equipment, that equipment shall be deemed to be in use at the prescribed date.

Standards of concentration

4. For the purposes of the Ordinance, the following standards of concentration of pollutants are prescribed:

(a) in the case of a process or equipment that emits solid particles, other than a process or equipment referred to in paragraph (b), the total mass of solid particles in each normal cubic metre of residual gases shall not exceed 0.5 gram;

(b) in the case of a process or equipment that consists of a boiler or incinerator that emits solid particles, the total mass of solid particles in each normal cubic metre of residual gases, when adjusted to a basis of 12% carbon dioxide, shall not exceed 0.5 gram;

(c) in the case of equipment that emits smoke, the concentration of smoke shall not exceed—

(i) in the case of black smoke, a concentration equal to the concentration that appears as Shade 2 on the Ringelmann chart; or

(ii) in the case of white smoke, 20% obscuration as measured by prescribed obscuration measuring equipment; and

(d) in the case of equipment that uses liquid or gaseous fuel and emits soot, the concentration of soot shall not exceed a concentration equal to the concentration that appears as a blackening index of Shade 3 when tested by the Bacharach filter paper method.

Exceptions

5. (1) Notwithstanding regulation 4, the concentration of smoke emitted from equipment—

(a) may exceed the concentration specified in sub-paragraph 4(e)(i) for a period that does not exceed 20 minutes in any one period of 24 hours where the excessive emission is due solely to the lighting up of a boiler.
or incinerator from cold if the concentration does not exceed a concentration equal to the concentration that appears as Shade 3 on the Ringelmann chart; and

(b) may exceed the concentration specified in sub-paragraph (1) (a) for a period that does not exceed 10 minutes in any one period of 8 hours where the excessive emission is due solely to the blowing of tubes of a boiler,

if in any case reasonable steps are taken to prevent or minimize the emission.

(2) Notwithstanding paragraph 4 (d), the concentration of soot—

(a) may exceed the concentration specified in paragraph 4 (d) for a period that does not exceed 20 minutes in any one period of 24 hours where the excessive emission is due solely to the lighting up of the equipment from cold if the concentration does not exceed a concentration equal to the concentration that appears as a blackening index of Shade 5 when tested by the Bacharach filter paper method; and

(b) may exceed the concentration specified in paragraph (2) (a) for a period that does not exceed 5 minutes in any one period of 8 hours where the excessive emission is due solely to the blowing of tubes of a boiler,

if in any case reasonable steps are taken to prevent or minimize the emission.

PART III—STANDARDS FOR FUTURE EQUIPMENT

Application of Part

4. (1) This Part applies in relation to air pollution from the carrying on of any process instituted, or the use of any equipment constructed or installed, after the prescribed date.

(2) After the expiration of a period of 6 months after the prescribed date, this Part applies in relation to the carrying on of any process, or the use of any equipment, that was being carried on or that was being used, as the case may be, on the prescribed date, and the provisions of Part II shall, at the expiration of that period, cease to have effect in relation to that process or equipment.

General standards of concentration

7. For the purposes of the Ordinance, the following standards of concentration of pollutants are prescribed:

(a) in the case of a process or equipment that emits solid particles, the total mass of solid particles in each normal cubic metre of residual gases shall not exceed—

(i) in the case of emissions from a furnace for heating metals, other than a cold blast foundry cupola — 0.1 gram; and

(ii) in the case of emissions from any other process or equipment, other than a process or equipment referred to in paragraph (b) — 0.25 gram.

(b) in the case of a boiler or incinerator that emits solid particles, the total mass of solid particles in each normal cubic metre of residual gases, when adjusted to a basis of 12% carbon dioxide, shall not exceed—

(i) in the case of a boiler burning solid fuel — 0.25 gram;

(ii) in the case of an incinerator having a rated capacity of 300 kilograms per hour or less — 0.3 gram; and

(iii) in the case of an incinerator having a rated capacity of more than 300 kilograms per hour — 0.25 gram.

(c) in the case of equipment that emits smoke, the concentration of smoke shall not exceed—

(i) in the case of black smoke, a concentration equal to the concentration that appears as Shade 1 on the Ringelmann chart; or

(ii) in the case of white smoke, 20% obscuration, as measured by prescribed obscuration measuring equipment; and

(d) in the case of equipment that uses liquid or gaseous fuel and emits soot, the concentration of soot shall not exceed a concentration equal to the concentration that appears as a blackening index of Shade 3 when tested by the Bacharach filter paper method.

Exceptions

8. (1) Notwithstanding regulation 7, the concentration of smoke emitted from equipment—

(a) may exceed the concentration specified in sub-paragraph 7 (1) (i) for a period that does not exceed 20 minutes in any one period of 24 hours where the excessive emission is due solely to the lighting up of a boiler or incinerator from cold if the concentration does not exceed a concentration equal to the concentration that appears as Shade 3 on the Ringelmann chart; and

(b) may exceed the concentration specified in paragraph 4 (d) for a period that does not exceed 10 minutes in any one period of 8 hours where the excessive emission is due solely to the blowing of tubes of a boiler,

if in any case reasonable steps are taken to prevent or minimize the emission.

(2) Notwithstanding paragraph 4 (d), the concentration of soot—

(a) may exceed the concentration specified in paragraph 7 (1) (a) for a period that does not exceed 20 minutes in any one period of 24 hours where the excessive emission is due solely to the lighting up of a boiler or incinerator from cold if the concentration does not exceed a concentration equal to the concentration that appears as a blackening index of Shade 5 when tested by the Bacharach filter paper method; and

(b) may exceed the concentration specified in paragraph 7 (1) (b) for a period that does not exceed 5 minutes in any one period of 8 hours
where the excessive emission is due solely to the blowing of tubes of a boiler, if in any case reasonable steps are taken to prevent or minimize the emission.

Specific standards of concentration
9. The amount of pollutant, or of the total of the pollutants, specified in an item in column 2 of the following table, emitted from the source specified in column 3 of that item, shall not exceed the concentration, expressed in amounts per normal cubic metre of residual gases, specified in column 4 of that item opposite that source:

<table>
<thead>
<tr>
<th>Item number</th>
<th>Substance</th>
<th>Source</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sulfur dioxide and sulfur trioxide</td>
<td>Any process</td>
<td>0.1 g/m³ as sulfur trioxide</td>
</tr>
<tr>
<td>2</td>
<td>Nitric acid</td>
<td>Any process manufacturing nitric acid</td>
<td>2.0 g/m³ as nitrogen dioxide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any process manufacturing sulfuric acid</td>
<td>1.0 g/m³ as nitrogen dioxide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any process other than—</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(i) a gas-fired power station</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii) a process manufacturing nitric acid or sulfuric acid or of its final products</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Oxides of nitrogen</td>
<td>Any process manufacturing sulfuric acid</td>
<td>2.0 g/m³ as nitrogen dioxide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any process manufacturing sulfuric acid</td>
<td>1.0 g/m³ as nitrogen dioxide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Any process other than—</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(i) a gas-fired power station</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii) a process manufacturing nitric acid or sulfuric acid or of its final products</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Carbon monoxide</td>
<td>Any process</td>
<td>0.35 g/m³ as carbon dioxide</td>
</tr>
<tr>
<td>5</td>
<td>Fluorine and its compounds</td>
<td>Any process manufacturing aluminium from electrolysis</td>
<td>0.062 g/m³ as hydrogen fluoride</td>
</tr>
<tr>
<td>6</td>
<td>Chlorine and its compounds</td>
<td>Any process</td>
<td>0.05 g/m³ as hydrogen chloride</td>
</tr>
<tr>
<td>7</td>
<td>Hydrogen sulphide</td>
<td>Any process</td>
<td>0.2 g/m³ as hydrogen sulphide</td>
</tr>
<tr>
<td>8</td>
<td>Ammonia and its compounds</td>
<td>Any process</td>
<td>5 mg/m³ as ammonia</td>
</tr>
<tr>
<td>9</td>
<td>Arsenic and its compounds</td>
<td>Any process</td>
<td>10 mg/m³ as arsine</td>
</tr>
<tr>
<td>10</td>
<td>Cadmium and its compounds</td>
<td>Any process</td>
<td>5 mg/m³ as cadmium</td>
</tr>
<tr>
<td>11</td>
<td>Lead and its compounds</td>
<td>Any process</td>
<td>5 mg/m³ as lead</td>
</tr>
<tr>
<td>12</td>
<td>Mercury and its compounds</td>
<td>Any process</td>
<td>5 mg/m³ as mercury</td>
</tr>
</tbody>
</table>

**PART IV—TESTING PROCEDURES**

Procedure for solid particles
10. (1) The determination of the concentration of solid particles in each normal cubic metre of residual gases shall be carried out in accordance with British Standard BS3405:1971 or American Standard ASTM D2328-71.

(2) The number of sampling points in each sampling plane shall be—
(a) in the case of a duct area of less than 0.2 square metre—not less than 4;
(b) in the case of a duct area of not less than 0.2 square metre and not more than 0.2 square metres—not less than 8; and
(c) in the case of a duct area of more than 0.2 square metres—1 point for each 0.25 square metre of the cross section of the sampling plane.

(3) The sampling points shall be at the centre of equal areas over the cross-section of the sampling plane.

Procedure for smoke and soot
11. (1) The determination of the concentration of smoke in pollutants shall be carried out in accordance with British Standard BS2742:1969.

(2) The determination of the concentration of soot in pollutants shall be carried out in accordance with American Standard ASTM D2158-65.

Measurement and correction of gas volume to normal conditions
12. (1) This regulation applies to the measurement, and correction to normal conditions, of gas volumes in the determination of the concentration of pollutants other than solid particles, smoke or soot, being pollutants in respect of which no measurement or correction procedure is specified in the Schedule.

(2) The volume of sample gases taken for the purpose of this regulation shall be measured by passing all the gases drawn through the sampling train into a positive displacement dry meter that complies with the provisions of this regulation.

(3) A meter referred to in sub-regulation (2) shall—
(a) be accurate to within 1%;
(b) have a resolution of 10 milliliters;
(c) have a volume per revolution of 1 litre; and
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Australian Capital Territory</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation</td>
<td>Noise Control Act</td>
<td>Date 1988</td>
</tr>
</tbody>
</table>

**Qualitative requirements**

Limits permissible noise levels from plant, equipment, activities etc.

Empowers inspectors to issue a Noise Direction Notice to the Occupier of the premises.

Establishes conditions for hearing conservation in the workplace.

**Quantitative standards**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of noise to which person is exposed in employment</td>
<td>decibels</td>
<td>115</td>
<td></td>
</tr>
<tr>
<td>Noise dose (defined in Act)</td>
<td>-</td>
<td>0.33</td>
<td></td>
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</tbody>
</table>

**Consequences**

Noise emissions unlikely to be of concern with respect to CDSCC.

**Quality control**

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</table>

Table D.4: ACT legislation - Noise Control Act
Jurisdiction: Australian Capital Territory

Regulation: Public Health Act

Qualitative requirements:

Provides for the disposal of garbage and refuse.

Specifies requirements for installation of septic tanks.

Quantitative standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
</tr>
</thead>
</table>

Consequences:

Requires permission of Medical Officer of Health to dispose of refuse.

Quality control

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Table D.5: ACT legislation - Public Health Act

Footnote:

The disposal of garbage and refuse in the ACT is primarily regulated by the Garbage Regulations made under the Building and Services Act 1924. The regulations make provision for occupiers of non-residential premises to make arrangements with either the relevant Minister or a private contractor for the removal of garbage from the premises.

The Garbage Regulations also regulate grease traps and imposes penalties for leaving garbage about the premises.
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Australian Capital Territory</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation</td>
<td>Noxious Weeds Act</td>
<td>Date 1921</td>
</tr>
</tbody>
</table>

**Qualitative requirements**

Provides for Minister to declare plants to be noxious weeds.

Requires land owners to destroy or eradicate, or otherwise deal with noxious weeds growing on their land. Owners include the occupier, lessee, manager or agent.

Empowers Minister or authorised person to enter land and destroy noxious weeds and recover costs from owner.

**Quantitative standards**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
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**Consequences**

- failure to comply - $40 minimum
- recovery from owner of costs of removal of noxious weeds

**Quality control**

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Table D.6: ACT legislation - Noxious Weeds Act
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<thead>
<tr>
<th>Jurisdiction</th>
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<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation</td>
<td>Soil Conservation Act</td>
<td>Date 1960</td>
</tr>
</tbody>
</table>

**Qualitative requirements**

Empowers Minister to direct landholders, including occupiers or lessees, to take action to prevent soil erosion.

Prohibits removal of vegetation along streams without approval.

**Quantitative standards**

<table>
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<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
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**Consequences**

Relevant to possible future stabilisation works along Larrys Creek.

The penalty for non-compliance is $400.

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Table D.7: ACT legislation - Soil Conservation Act
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<th>Jurisdiction</th>
<th>Australian Capital Territory</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>Regulation</td>
<td>Careless Use of Fire Act</td>
<td>Date 1936</td>
</tr>
</tbody>
</table>

**Qualitative requirements**

Requires landowners to take reasonable measures to prevent and inhibit the outbreak and spread of fire.

Prohibits or regulates the lighting of fires out of doors including for burning-off purposes.

**Quantitative standards**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
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**Consequences**

Land under control of CDSCC should be kept in an appropriate condition to inhibit spread of fire.

The penalty for non-compliance is $1,000 and/or three months imprisonment.

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Table D.8: ACT legislation - Careless Use of Fire Act
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<tbody>
<tr>
<td>Regulation</td>
<td>Electricity and Water Act</td>
<td>Date 1988</td>
</tr>
</tbody>
</table>

**Qualitative requirements**

Establishes ACT Electricity and Water Authority and defines its powers.

Includes the power of the Authority to participate in the setting and enforcement of standards relating to water extraction and treatment and disposal of sewage.

**Quantitative standards**

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<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
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**Consequences**

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Table D.9: ACT legislation - Electricity and Water Act
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<tr>
<th>Jurisdiction</th>
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<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation</td>
<td>Canberra Sewerage and Water Supply Regulations</td>
<td>Date 1988</td>
</tr>
</tbody>
</table>

**Qualitative requirements**

In force under the Building and Services Act 1924. Relates to matters of a building nature rather than to environmental aspects of sewerage and water supply.

**Quantitative standards**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
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**Consequences**

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Table D.10: ACT legislation - Canberra Water Supply and Sewerage Act
Qualitative requirements

Note: This requirement relates mainly to future development rather than to the current operation of the CDSCC.

'It is in the interests of the National Capital that any further development of the Tidbinbilla Deep Space Communications site is sympathetic to the rural landscape character of the surrounds' (Section 9.4.1.).

Appendix E includes water quality objectives adopted from ACT Water Policy Plan (NCDC 1989).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Limits</th>
<th>Frequency etc</th>
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Consequences

A Special Requirement of the Plan is: 'Development is to conform to a Development Control Plan agreed by the Authority.'

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Table D.11: ACT legislation - National Capital Plan
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**Qualitative requirements**

*Note:* These requirements relate to future development rather than to the current operation of the Complex.

As at 1st August 1992 the Draft Plan does not yet have any legal effect.

Delineates Predominant Land Use Zones (PLUZ) within the ACT and establishes policies for each PLUZ.

CDSCC is within a Rural PLUZ but is subject to special requirements under the National Capital Plan.

A general condition applying to rural land is that any development which would visually intrude on the landscape or is not compatible with continuing rural use of the land will not be permitted.

**Quantitative standards**

The Plan lays down requirements for environmental assessment, identifying proposals which are subject to mandatory preliminary assessment. These include 'all proposals involving a communications tower, radio mast or satellite dish higher than 15m above the ground and/or a building of 65 square metres or more of floor area'.

**Consequences**

Any major new developments at CDSCC will be subject to preliminary environmental assessment under the Territory Plan. Depending on the outcome of this, there may be a requirement for preparation and public review of a public environmental report or environmental impact statement in accordance with the ACT Land (Planning and Environment) Act 1991 and/or the Commonwealth Environment Protection (Impact of Proposals) Act 1974. These requirements should be recognised in the planning and programming of any future development.

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Table D.12: ACT legislation - Draft Territory Plan
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<td>Regulation</td>
<td>Ozone Protection Act</td>
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**Qualitative requirements**

Controls the disposal, transportation, storage and discharge of ozone depleting substances into the atmosphere, and provides for licences relating to servicing of equipment containing such substances.

## Quantitative standards

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Consequences: Penalty for most offences $5,000 or imprisonment for 6 months

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**Qualitative requirements**

Establishes controls for the storage, manufacture, transport, sale and use of dangerous goods.

Requires adequate precautions to be taken against fires, explosions, leakages and spillages and for notification of these incidences.

Requires records to be created and information to be provided to the Chief Inspector of Dangerous Goods.

Requires dangerous goods to be properly labelled and packaged.

**Quantitative standards**

**Consequences**

Keeping or conveying dangerous goods without a licence - $10,000 ($2,000 for individuals)

Negligent or careless use storage or conveyance of dangerous goods - $2,000 and/or 12 months imprisonment.

Penalty for breaching the regulation or a licence $2,000.

Persons liable include the owner of the dangerous goods and the occupier of the place where the goods are kept (subject to defence that goods kept without their knowledge), and the employer of any person who contravenes the Act (subject to due diligence defence).

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Table D.14: ACT legislation - Dangerous Goods Act
FOI 2013/3

APPENDIX D OF VOLUME 2

IRRELEVANT
PURSUANT TO SECTION 22
FOI 2013/3

APPENDIX E OF VOLUME 2

IRRELEVANT
PURSUANT TO SECTION 22
FOI 2013/3

APPENDIX F OF VOLUME 2

IRRELEVANT

PURSUANT TO SECTION 22
APPENDIX H

ASBESTOS SURVEY BY ENVIROSCIENCES PTY LTD
ASBESTOS SURVEY OF
CANBERRA DEEP SPACE
COMMUNICATION COMPLEX
TIDBINBILLA ACT
# TABLE OF CONTENTS

1.0 [INTRODUCTION] 1

2.0 HEALTH EFFECTS OF ASBESTOS MATERIALS 1
2.1 CROCIDOLITE 2
2.2 AMOSITE 2
2.3 CHRYSOTILE 2
2.4 EFFECTS OF SMOKING 3
2.5 AIRBORNE ASBESTOS CONCENTRATION AND HEALTH EFFECTS 3

3.0 NATURE OF SURVEY 3

4.0 RESULTS OF SURVEY 3
4.1 POWER HOUSE 3
4.2 MAIN OPERATIONS BUILDING (001) 6
4.3 ANTENNA DSS43 (ST2) 13
4.4 ANTENNA DSS46 16
4.5 DSS46 OPERATIONS ROOM AND ANTENNA SUPPORT BUILDING (026) 16
4.6 CAFETERIA (005) 17
4.7 TOURIST CENTRE (005) 17
4.8 OFFICES WEST OF CAFETERIA 18
4.9 SECURITY GUARD OFFICE 18
4.10 SAFETY OFFICE AND WORKSHOP 18
4.11 STORE ROOM (007) 18
4.12 PETROL PUMP SHELTER ROOM (017) 18
4.13 STORAGE COMPOUND (ST6) 18
4.14 FIRETANK PUMP HOUSE (032) 18
4.15 WATER TANK (ST20) 18
4.16 ANTENNA SUPPORT SERVICES BUILDING (033) 19
4.17 PUMP HOUSE (013) 19
4.18 CARAVAN STORE (012) 19
4.19 FLAMMABLE GOODS STORE (005) 19
4.20 ANTENNA STORE / PANEL STORE (030) 19
4.21 CHLORINATOR / PUMP HOUSE (016) 19
4.22 FACILITIES STORE 20
4.23 HIGH POWER TRANSMITTER BUILDING (015) 20
4.24 COMPLEX MAINTENANCE FACILITIES BUILDING (024) 20
4.25 FACILITIES SUPPORT SERVICE BUILDING (027) 20
4.26 ANTENNA SUPPORT BUILDING (003) 20
4.27 ANTENNA DSS45 (ST17) 21
4.28 ANTENNA DSS42 (ST5) 21
4.29 COLLIMATION TOWER (ST4) AND BUILDING (004) 21
4.30 PUMP HOUSE (010) 22
4.31 WATER TANKS 22
<table>
<thead>
<tr>
<th>Section</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0 ANALYTICAL RESULTS</td>
<td>22</td>
</tr>
<tr>
<td>6.0 PRIORITY ASSESSMENT</td>
<td>26</td>
</tr>
<tr>
<td>7.0 CONCLUSIONS AND RECOMMENDATIONS</td>
<td>29</td>
</tr>
<tr>
<td>8.0 COMMENTS</td>
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</tr>
</tbody>
</table>

PHOTOGRAPHS 1 TO 23
1.0 INTRODUCTION

The Canberra Deep Space Communication Complex is located at Tidbinbilla approximately forty kilometres southwest of Canberra.

The complex has four deep space antennae together with associated backup equipment and buildings.

The complex is used to track spacecraft, send commands to spacecraft, acquire data from the spacecraft and communicate with the spacecraft.

Ove Arup and Partners were commissioned to carry out an environmental audit of the complex and, as part of that audit, identify all asbestos based products within the complex. Envirosciences Pty Limited were commissioned to carry out an asbestos survey of the complex.

This report presents the findings of the survey of all buildings and structures associated with the complex, carried out to determine the extent of asbestos within the complex.

2.0 HEALTH EFFECTS OF ASBESTOS MATERIALS

The health effects of asbestos materials are well documented. They are directly attributable to the inhalation of asbestos fibres. These fibres, because of their nature, may penetrate deep into the respiratory system. If asbestos fibres are not available to be inhaled, no health risk exists. Similarly, if high fibre concentrations are present, the risk to health is great.

The primary health effect of asbestos materials is asbestosis, a pneumoconiosis produced by the inhalation of asbestos fibres. The disease and its progression to mesothelioma, a specific form of lung cancer, has been widely studied.

Both clinical and epidemiological data have conclusively shown that asbestos is associated with asbestosis and respiratory cancer in man. Animal studies support these findings, and suggest that pathological response to asbestos is due more to the physical characteristics of the fibres than to chemical composition.
Asbestos exposure is associated with the development of tumours of the lung lining - the plural and peritoneal tissues. Conclusive evidence of the link between mesothelioma and asbestos exposure was not available until 1960 when Wagner et al reported 33 cases of mesothelioma in a crocidolite mining area of South Africa.

The health effects of the various individual asbestos types have been extensively studied. The results of these studies may be summarised as follows:

2.1 CROCIDOLITE

In industrial applications, crocidolite was used extensively in the production of gas mask canisters during World War 2, and mortality of these workers has been extensively studied by Jones et al (1976), who examined a cohort of 1,088 workers exposed between 1940 and 1945. Workers were traced and monitored until 1979. A total of 29 mesothelioma cases were detected and a linear relationship was discovered between employment duration and the risk of mesothelioma.

Crocidolite is considered the most toxic of the asbestiform minerals.

2.2 AMOSITE

Mortality patterns among workers producing amosite between 1941 and 1945 have been studied by Selikoff (1972). A group of 820 men were observed over a 35 year period during which 528 deaths occurred. By death certificate information, 15 (2.8%) were due to asbestosis and one due to mesothelioma. A further review of surgical information disclosed an extra 13 additional cases of mesothelioma, and 15 additional cases of asbestosis not listed on the death certificates.

2.3 CHRYSOTILE

Studies of chrysotile workers have demonstrated a low lung cancer risk even in highest exposure groups. Later studies (Nicholson et al, 1979) have reported a large excess of death from lung cancer and asbestosis in a study of 544 Quebec miners followed between 1961 and 1977. A total of 28 lung cancers were observed versus 11 expected (SMR = 252). Only one mesothelioma was observed.

Chrysotile is considered to be less toxic than crocidolite.
2.4 EFFECTS OF SMOKING

Smoking and asbestos exposure are more than additive in their combined ability to increase the risk of lung cancer. Hammond et al (1979) studied 8,220 asbestos insulation workers with known smoking status. The mortality experience of these workers was compared with that experienced among smokers and non-smokers of the American Cancer Society’s prospective cancer prevention study and found to be excessive. The results were indicative of an excess mortality for smokers compared with non-smokers.

2.5 AIRBORNE ASBESTOS CONCENTRATION AND HEALTH EFFECTS

Available epidemiological data support a linear, no threshold dose response relationship between asbestos exposure and the risk of lung cancer. No threshold has been demonstrated for non-malignant respiratory diseases associated with asbestos exposure, and any asbestos exposure carries with it some increased risk of asbestos-related disease. Accordingly, asbestos exposure of individuals should be reduced to the lowest possible level.

3.0 NATURE OF SURVEY

The survey was undertaken by way of a visual inspection of all construction materials. Samples of materials suspected of containing asbestos were taken for analysis. These samples were analysed using polarised light microscopy and selected fibres were further analysed using dispersion staining. All analysis of samples were undertaken in Envirosiences Pty Limited NATA registered laboratory in Sydney.

A photographic record was also gathered. All sampling was taken place in the presence of Mr Ron McLean of Ove Arup & Partners.

4.0 RESULTS OF SURVEY

4.1 POWER HOUSE - REF NO. 002

The power house houses diesel generators and electrical transformers which supply power to the complex. Located at the northern end of the power house is a mechanical workshop and offices.
4.1.1 Mechanical Workshop Supervisors Office (Room 71)
The floor of this office is covered with vinyl tiles which contain chrysotile asbestos - approximately 20 m².

4.1.2 Mechanical Workshop Tea Room (Room 75)
The floor of this tea room is covered with vinyl tiles which contain chrysotile asbestos - approximately 10 m².

4.1.3 Store Room (Room 74A)
No asbestos sighted.

4.1.4 Machine Shop
The north wall of the machine shop is made from asbestos cement sheet which contains chrysotile asbestos - approximately 28 m². (*Photograph 1*)

4.1.5 Room 71
This room has an asbestos cement sheet wall containing chrysotile asbestos.

4.1.6 Store Room Outside Room 71A Door
This store room has asbestos cement sheet walls, on the south and east sides, which contains chrysotile asbestos - approximately 50 m².

4.1.7 Garage Area
The garage area at the northern end of the Power House has asbestos cement sheeting on the west and south walls which contain chrysotile asbestos.

4.1.8 MG Room (Room 78A)
There are two electrical cables which run down the wall and then underground in an easterly direction towards DSS43 antenna. These cables are wrapped in an insulation rope which could not be sampled as the cable could not be isolated but this insulation is suspected of containing chrysotile asbestos. (*Photograph 2*)

4.1.9 Room 80
Constructed of timber and brick walls. No asbestos sighted.
4.1.10 Electrical Room (Room 81)
The room is constructed of brick and timber walls and timber ceiling. The vinyl tiles on
the floor were tested and found to contain no asbestos fibres.

4.1.11 Electrical Switch Room (Room 83)
The vinyl tiles on the floor of this room were tested and found to contain no asbestos
fibres.

4.1.12 "A" Diesel Generator Room (Room 82)
There are four diesel generators located in this room. Each of these generators has an
exhaust duct which runs from the generator to the exterior of the building through the
western wall (Photograph 3). These ducts are lagged with chrysotile asbestos wrapped in
chrysotile asbestos rope which is, in turn metal clad. In some areas this metal cladding is
incomplete or damaged leaving asbestos exposed. The exhaust ducts are each
approximately 4 m long and 0.45 m in diameter (Photograph 4).

There are also two 100 mm diameter pipes that run from each of the two centre diesel
generators through the western wall. The wall penetrations of these four pipes are
insulated with chrysotile asbestos (Photograph 5).

Gaskets associated with the generators may contain asbestos but access for sampling was
not possible.

4.1.13 "B" Diesel Generator Room (Room 86)
This room contains four older Catapillar diesel generators, a new Shinko generator and
electrical switching mechanisms.

The diesel exhausts are synthetic mineral fibre and metal clad. Gaskets associated with
the generators may contain asbestos but access for sampling was not possible.

4.1.14 Fire Doors
Fire doors tested in the Power House were found to contain no asbestos.

4.1.15 Power House Exteriors
The power house exterior has a metal skillion roof and chiefly brick and timber walls. The
eaves are made from asbestos cement sheet which contains chrysotile and amosite asbestos.
East Side

On the east side of the power house is an electrical compound housing transformers and electrical cupboards. The weatherproof sealing material was sampled from these cupboards and was found to contain no asbestos (Photograph 6).

At the northern end of the electrical compound is an electrical cable running down from an electrical box into the ground. This cable is wrapped in an insulation rope which could not be sampled, as the cable could not be isolated, but the insulation is suspected of containing chrysotile asbestos (Photograph 7 & 8).

West Side

On the west side of the power house are pumps and pipework associated with the diesel generators. The gland packing and gaskets associated with these pumps and pipes were not able to be sampled but may contain asbestos.

The penetrations from the diesel generator room "A" are asbestos and there is also asbestos cement sheeting around the penetrations where the diesel exhausts exits the wall. There is no insulation of the exhausts on the outside of the building (Photograph 9).

4.2 MAIN OPERATIONS BUILDING (001)

4.2.1 Plant Room (Room 55)

This plant room has brick walls and an asbestos cement sheet ceiling containing chrysotile asbestos - approximately 500 m².

In the northwest corner of the plant room is a boiler which is entirely covered with lagging which contains amosite asbestos. The boiler is approximately 1.5 metres diameter and 2.5 meters long (Photograph 10). In some places this asbestos lagging is damaged (Photograph 11).

There are air-conditioning plants within the plant room which are insulated with synthetic mineral fibre. All pipework associated with the air-conditioning plant and the boiler are lagged with synthetic mineral fibre or polystyrene.

4.2.2 Electrical Room (Room 56)

No asbestos sighted.
4.2.3 Transformer Room (Room 57)
No asbestos sighted.

4.2.4 Operations Room Plenum (Room 54)
The vinyl tiles in this room were tested and were found to contain no asbestos fibres. No asbestos sighted.

4.2.5 Telecom Room (Room 80)
The vinyl tiles in this room were tested and were found to contain no asbestos fibre. No asbestos sighted.

4.2.6 Room 29
No asbestos sighted

4.2.7 Corridor to Room 29
Cold water pipes on the ceiling are lagged with synthetic mineral fibre and metal clad.

The air-conditioning plant 4, located at the end of the corridor, is lined with synthetic mineral fibre. No asbestos sighted.

4.2.8 Cleaners Cupboard (Room 43)
No asbestos sighted.

4.2.9 Front Entrance Lobby (Ground Floor)
There are synthetic mineral fibre lagged pipes and air-conditioning ducting in the ceiling space. No asbestos sighted.

4.2.10 Records Room (Room 39)
The vinyl tiles in this room were tested and found to contain no asbestos. No asbestos sighted.

4.2.11 Records Room (Room 42)
No asbestos sighted.

4.2.12 Electrical Switch Room
No asbestos sighted.
4.2.13 Air-Conditioning Room (Room 35)
The majority of pipework within this room is lagged with polystyrene and metal. Where the chilled water pipe enters the air-conditioning plant the penetration pipe are lagged with chrysotile asbestos. This lagging is in bad condition (Photograph 12).

4.2.14 UPS Room (Room 36)
No asbestos sighted.

4.2.15 Exit Passage (Door 34A)
In this area are water pipes insulated with synthetic mineral fibre and metal cladding.

4.2.16 Operations Room Plenum
No asbestos sighted.

4.2.17 Air-Conditioning Plant Room (Room 32)
This plant room has brick walls. The asbestos cement sheet ceiling, over the air-conditioning plant, contains chrysotile asbestos - approximately 130 m².

Located at the eastern side of the plant room is a boiler which is lagged with amosite asbestos - approximately 1.5 m diameter, and 2 m long (Photograph 13).

There is approximately 180 m of 150 mm and 200 mm diameter pipework that runs from the boiler and hot water pumps to the air-conditioning plant. These pipes are lagged with amosite asbestos and in some areas are damaged and in bad condition (Photograph 14, 15 & 16).

There is some gasket material on the work bench of the plant room. This gasket material contains chrysotile asbestos. This indicates that gaskets associated with the boiler, pumps and pipes will contain asbestos. Pump gland packing may also contain asbestos.

4.2.18 Video Room (Room 38)
No asbestos sighted.

4.2.19 Ground Floor Corridor
The ceiling space of the ground floor corridor contains pipes and air-conditioning ducts lagged with synthetic mineral fibre. No asbestos sighted.
4.2.20 Operations Centre (Room 51)
The operations centre has metal ceiling tiles and synthetic mineral fibre blanket attached to the underside of the metal roof. Synthetic mineral fibre lagged air-conditioning ducts are located in the ceiling space.

There is some fibrous cement sheeting in the Northwest corner, either side of door 52, but this was found to contain no asbestos fibre. No asbestos sighted.

4.2.21 Room 52
New office. No asbestos sighted.

4.2.22 Office (Room 48)
No asbestos sighted.

4.2.23 Office (Room 47)
See "air-conditioning heater banks" Section 4.2.57.

4.2.24 Office (Room 46)
No asbestos sighted.

4.2.25 Mens Toilet (Room 45)
Asbestos cement sheeting above the door contains chrysotile asbestos - approximately 3 m².

4.2.26 Electronic Room (Room 49)
No asbestos sighted.

4.2.27 Briefing Room (Room 4)
No asbestos sighted.

4.2.28 Office (Room 3)
No asbestos sighted.

4.2.29 Office (Room 2)
No asbestos sighted.
4.2.30 Office (Room 26)
No asbestos sighted.

4.2.31 Office (Room 28)
No asbestos sighted.

4.2.32 Office (Room 27)
No asbestos sighted.

4.2.33 Office (Room 25)
No asbestos sighted.

4.2.34 Office (Room 24)
No asbestos sighted.

4.2.35 Office (Room 23)
No asbestos sighted.

4.2.36 Mens Toilet (Room 22)
No asbestos sighted.

4.2.37 Ladies Toilet (Room 21)
No asbestos sighted.

4.2.38 Ladies Rest Room (Room 20)
No asbestos sighted.

4.2.39 Cleaners Room (Room 19)
No asbestos sighted.

4.2.40 Kitchen (Room 18)
No asbestos sighted.

4.2.41 Office (Room 17A)
No asbestos sighted.
4.2.42 Office (Room 17)
No asbestos sighted.

4.2.43 Office (Room 16)
No asbestos sighted.

4.2.44 Office (Room 15)
No asbestos sighted.

4.2.45 Office (Room 58)
No asbestos sighted.

4.2.46 Office (Room 59)
No asbestos sighted.

4.2.47 Store (Room 14)
No asbestos sighted. Vinyl tiles were tested and found to contain no asbestos.

4.2.48 Tape Storage (Room 13)
No asbestos sighted.

4.2.49 Workshop (Room 12)
The supply air chamber is lined with synthetic mineral fibre. No asbestos sighted.

4.2.50 Office (Room 11)
No asbestos sighted.

4.2.51 Instrument Room (Room 9A)
No asbestos sighted.

4.2.52 Office (Room 9)
No asbestos sighted.

4.2.53 Room 10
No asbestos sighted.
4.2.54 Signal Processing Centre (Room 8)
No asbestos sighted.

4.2.55 Air-Conditioning Plant Room (Room 7)
This air-conditioning plant is relatively new. The heater bank millboard was tested and found to contain no asbestos. No asbestos sighted.

4.2.56 Frequency Timing Standard Room
No asbestos sighted.

4.2.57 Air-Conditioning Heater Banks
Air-conditioning heater banks are located at various locations within the air-conditioning ducting, throughout the building.

The heater bank in the ceiling space of room 47 was tested. There is an asbestos millboard material insulating the electrical components of the heater bank. This millboard contains chrysotile and amosite asbestos (Photograph 17).

Access to the inside of the air-conditioning duct was not able to be gained but it is highly likely that this same asbestos millboard lines the inside of the duct, usually approximately 1 m downstream and 0.5 m upstream of the heater bank.

There is a new air-conditioning plant room (Room 7) in which a new heater bank is located. The millboard associated with this heater bank does not contain asbestos.

All of the original type of heater banks should be assumed to contain the asbestos millboard.

4.2.58 Fire Doors
A number of fire doors were tested. Some fire doors have been replaced and these doors have a label on the side indicating they are free from asbestos. Other doors tested were found to contain chrysotile asbestos. All doors without the asbestos free label should be treated as containing asbestos.
4.2.59 Exterior of Main Operations Building
The exterior of the main operations building is constructed of a metal skillion roof with brick and timber walls.

The eaves are constructed from asbestos cement sheeting containing chrysotile asbestos.

On the southern side of the building, to the east of the main entrance door, is a UPS battery cupboard. This cupboard has asbestos cement sheets on each end which contain chrysotile asbestos - approximately 4 m².

On the northern wall is a square of fibrous cement sheet covering a hole. This sheet contains no asbestos.

4.3 ANTENNA DSS43 (ST2) (Photograph 18)

4.3.1 Ground Floor Entrance (Room 102)
The wall lining was tested and found to contain no asbestos.

There are two sheets of fibrous cement against the western wall which does not contain asbestos. No asbestos sighted.

4.3.2 Electrical Switch Room (Room 105)
No asbestos sighted.

4.3.3 Air-Conditioning Plant Room (Room 101)
The expansion joint material for the air-conditioning ducting in this room contains chrysotile asbestos. These joints are painted (Photograph 19).

There is also an expansion joint from unit VC1 to the exterior which contains chrysotile asbestos. This joint is not painted. There is a heater bank in the air-conditioning ducting. Access for sampling was not possible but ducting may contain asbestos millboard, usually 1 m downstream and 0.5 m upstream of the heater bank (Photograph 20).

Pumps and valves may have asbestos gaskets and asbestos gland packing. Access for sampling was not possible. All air-conditioning ducting is insulated with synthetic mineral fibre covered with canvas. Chilled water pipes are insulated with rubber.
4.3.4 Stairwell 202
The stairwell has a vinyl tile floor covering. These vinyl tiles contain chrysotile asbestos.

4.3.5 Room 202 (First Level)
There are vinyl tiles on the floor of this room which contain chrysotile asbestos approximately 30 m².

There is an asbestos cement sheet manhole cover in the ceiling of the mens toilet - approximately 0.5 m².

4.3.6 Store Room (Room 201)
There is woven asbestos insulation around the monorail beam above the door to room 202 - approximately 150 mm x 15 mm.

4.3.7 Room 304 (Alidade Level)
The air-conditioning ducting in the ceiling space is insulated with synthetic mineral fibre. No asbestos sighted.

4.3.8 Control Room (Room 304 Alidade Level)
Synthetic mineral fibre insulated air-conditioning ducts and wall in the ceiling space. No asbestos sighted.

4.3.9 Room 303 (Alidade Level)
No asbestos sighted.

4.3.10 Bilge Area (Below Alidade Level)
In this area is an asbestos lagged metal clad steam pipe. The lagging contains chrysotile asbestos. The pipe lagging is 100 mm diameter and is approximately 35 m in length and continues to the outside of the antenna. (see 'Steam Cleaning Pipes' section 4.3.18.).

4.3.11 High Pressure Pump Room (Room 305 Alidade Level)
Gaskets and gland packing may contain asbestos.

4.3.12 Air-Conditioning Room (Alidade Roof Level)
Air-conditioning units have woven chrysotile asbestos expansion joints.
4.3.13 M.E. Tower (Alidade Roof Level)
The interior and exterior of the tower is insulated with synthetic mineral fibre.

4.3.14 Lower Elevation Gear Box Platform
A steam generating machine is located on this level and asbestos lagged pipes run both up and down from this level (see "Steam Cleaning Pipes" section 4.3.18).

4.3.15 Upper Elevation Gear Box Level
One of the asbestos lagged steam pipes terminate at this level. The other continues up. (See "Steam Cleaning Pipes" section 4.3.18)

4.3.16 Elevation Bearing Platform
The asbestos lagged steam pipe continues up through this level on the east side of the antenna (See "Steam Cleaning Pipes" section 4.3.18).

The M.E. room is insulated with synthetic mineral fibre.

4.3.17 Tipping Structure
The asbestos lagged steam pipe terminates at this level (See "Steam Cleaning Pipes" section 4.3.18).

4.3.18 Steam Cleaning Pipes
There is a steam generating machine located on the lower elevation gear box level.

There are two steam pipes that are lagged with chrysotile asbestos and metal clad which run up the antenna structure. One of these pipes terminate at the Upper Elevation Gear Box Level and the other terminates at the Tipping Structure.

These are also two pipes that run down from the lower elevation gear box level down past the alidade roof level and alidade level and then down the stairway structure to ground level. There is also an offtake to the Bilge area below the alidade level (Section 4.3.10). These pipes are all metal clad, chrysotile asbestos lagged pipes.

The steam generator and pipework is all now redundant. In some places the metal cladding is incomplete and asbestos lagging is exposed. (Photograph 21).
4.3.19 Tunnel From DSS43 Antenna To Operations Building (ST14)
The electrical penetrations were tested and found to contain no asbestos. No asbestos sighted.

4.4 ANTENA DSS46 (ST18)

4.4.1 Base
No asbestos sighted.

4.4.2 X-Skid Level
No asbestos sighted.

4.4.3 Y-Skid Level
No asbestos sighted.

4.4.4 Wheel House
The interior of the air-conditioning duct is insulated with synthetic mineral fibre clad with aluminium foil. No asbestos sighted.

4.4.5 Cone
The cone insulation was tested and was found to contain no asbestos. No asbestos sighted.

4.5 DSS46 OPERATIONS ROOM AND ANTENNA SUPPORT BUILDING (O26)

4.5.1 Office (Room 205)
No asbestos sighted.

4.5.2 Lunch Room and Kitchen (Room 207)
In the ceiling space is synthetic mineral fibre insulation below a metal skillion roof.
Vinyl tiles were tested in this room and were found to contain no asbestos.

4.5.3 Operations Room (Room 206)
No asbestos sighted.
4.5.4 Exterior
The eaves of this building are made from asbestos cement sheeting.

4.6 CAFETERIA (005)

4.6.1 Dinning Room
The dining room and serving area is constructed from metal and timber panel walls and a timber ceiling with synthetic mineral fibre insulation in the ceiling space. No asbestos sighted.

4.6.2 Kitchen
The air extraction hoods over the dish washer and the stoves are made from asbestos cement sheeting which contains chrysotile and amosite asbestos - approximately 14 m².

The ceiling space is insulated with synthetic mineral fibre.

4.6.3 Back Room Pantry
The ceiling of this area is constructed from asbestos cement sheeting - approximately 20 m².

4.6.4 Building Exterior
There are six asbestos cement panels on the west wall of the dining room - approximately 5 m².

There is a small piece of asbestos cement sheeting on the wall next to the transformer. There are asbestos cement panels above the entrance door, north and south of the entrance door. There are three of these panels - approximately 3 m².

4.7 TOURIST CENTRE (005)

4.7.1 Interior
There was no access to the ceiling space of the tourist centre. No asbestos sighted.

4.7.2 Exterior
The tourist centre has asbestos cement eaves. There is also asbestos cement sheet on the wall on either side of the main entrance.
4.7.3 Tourist Centre Gift Shop
No asbestos sighted.

4.8 OFFICES WEST OF CAFETERIA

4.8.1 Office (Room 173)
No asbestos sighted.

4.8.2 Office (Room 172)
No asbestos sighted.

4.9 SECURITY GUARD OFFICE
This is a brick building with metal skillion roof. No asbestos sighted.

4.10 SAFETY OFFICE AND WORKSHOP
This office has brick walls and metal roof. No asbestos sighted.

4.11 STORE ROOM (007)
No asbestos sighted.

4.12 PETROL PUMP SHELTER (ROOM 017)
No asbestos sighted.

4.13 STORAGE COMPOUND (ST6)
No asbestos sighted.

4.14 FIRETANK PUMP HOUSE (032)
No asbestos sighted.

4.15 WATER TANK (ST20)
No asbestos sighted.
4.16 ANTENNA SUPPORT SERVICES BUILDING (033)

This is a brick building with a metal roof. There is synthetic mineral fibre insulation in the ceiling space.

The exterior has fibrous cement sheeting outside door 224. This was tested and was found to contain no asbestos. No asbestos sighted.

4.17 PUMP HOUSE (013)

The pump house has asbestos cement eaves.

4.18 CARAVAN STORE (012)

This is a mobile demountable van. No asbestos sighted.

4.19 FLAMMABLE GOODS STORE (008)

This is a brick building with metal roof. No asbestos sighted.

4.20 ANTENNA STORE / PANEL STORE (030)

This building has metal walls and roof. There is a fire hose cover, located on the exterior of the north wall, which has a fibrous cement roof. This was tested and found to contain no asbestos. No asbestos sighted.

4.21 CHLORINATOR / PUMP HOUSE (016)

4.21.1 Water Supply Pump Room (Room 120)
No asbestos sighted.

4.21.2 Chlorine Room (Room 119)
No asbestos sighted.
4.22 FACILITIES STORE

4.22.1 Store (Room 146)
No asbestos sighted.

4.22.2 Store (Room 147)
No asbestos sighted.

4.22.3 Store (Room 148)
No asbestos sighted.

4.23 HIGH POWER TRANSMITTER BUILDING (015)

No asbestos sighted.

4.24 COMPLEX MAINTENANCE FACILITIES BUILDING (024)

This building has synthetic mineral fibre in the ceiling space. The vinyl tiles on the floor were tested and contain no asbestos.

4.25 FACILITIES SUPPORT SERVICE BUILDING (027)

This building has synthetic mineral fibre in the ceiling space. No asbestos sighted.

4.26 ANTENNA SUPPORT BUILDING (003)

This is a brick veneer building with metal roof. The eaves are made from asbestos cement sheet.

4.26.1 Office (Room 104)
No asbestos sighted.

4.26.2 Workshop (Room 105)
No asbestos sighted.

4.26.3 Mens Toilet (Room 97)
No asbestos sighted.
4.26.4 Workshop (Room 100)
No asbestos sighted.

4.26.5 Computer Room (Room 101)
No asbestos sighted.

4.26.6 Workshop (Room 102)
No asbestos sighted.

4.26.7 Workshop (Room 103)
No asbestos sighted.

4.26.8 Workshop (Room 104)
No asbestos sighted.

4.26.9 Workshop (Room 105)
No asbestos sighted.

4.26.10 Workshop (Room 106)
No asbestos sighted.

4.27 ANTENNA DSS45 (ST17) (PHOTOGRAPH 22)

This antenna was only recently installed. No asbestos was sighted.

4.28 ANTENNA DSS42 (ST5)

No asbestos sighted.

4.29 COLLIMATION TOWER (ST4) AND BUILDING (004)

The collimation tower and building is situated approximately 5 km northwest of Tidbinbilla Tracking Station near Black Hill.

The tower is constructed from metal and the associated building is brick with a metal roof. The inside has masonite lined walls with a timber ceiling.
There is a transformer on the northern wall. Cables run from the transformer into the ground. These cables are covered with insulation material which may be asbestos. It was not possible to sample this insulation as the cables could not be isolated.

4.30 PUMP HOUSE (010)

The pump house is located approximately one kilometre west of the tracking station. It is a brick building with a metal roof.

There is an electrical box in the southern wall which contains an electrical backing board. This board contains chrysotile asbestos.

The pumps, located at the creek, are housed in a concrete cylinder with a metal cover. Gland packing and gaskets associated with the pumps may contain asbestos but were unable to be sampled.

4.31 WATER TANKS

There are two concrete water tanks located approximately 0.5 km west of the tracking station. Both tanks have a metal cover on top.

Between the two tanks is a number of pieces of broken asbestos cement sheeting which contains chrysotile asbestos. (Photograph 23).

5.0 ANALYTICAL RESULTS

<table>
<thead>
<tr>
<th>SAMPLE NO.</th>
<th>SURVEY REFERENCE</th>
<th>LOCATION</th>
<th>ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1214/1</td>
<td>4.31</td>
<td>S40- Water Tanks A/C sheet near tanks.</td>
<td>Sample consisted of fragments of a fibro plaster cement-like sheet material containing chrysotile asbestos and organic fibres.</td>
</tr>
<tr>
<td>1214/2</td>
<td>4.2.1</td>
<td>S23 Main OPS Building Room 55 - Plant Room Ceiling</td>
<td>Sample consisted of fragments of a hard fibro plaster-like sheet material containing chrysotile asbestos.</td>
</tr>
</tbody>
</table>

One Atoll & Partners
Asbestos Survey Kinnon E544
<table>
<thead>
<tr>
<th>SAMPLE NO.</th>
<th>SURVEY REFERENCE</th>
<th>LOCATION</th>
<th>ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1214/3</td>
<td>4.2.10</td>
<td>S26 - Vinyl Tile OPS Building</td>
<td>NAD’</td>
</tr>
<tr>
<td>1214/4</td>
<td>4.2.4</td>
<td>S25A - Fire Plug Pillow Insulation</td>
<td>NAD’</td>
</tr>
<tr>
<td>1214/5</td>
<td>4.2.1</td>
<td>S22A - Room 55 Plant Boiler Lagging</td>
<td>Sample consisted of soft white plaster-like material mixed with amosite asbestos.</td>
</tr>
<tr>
<td>1214/6</td>
<td>4.2.1</td>
<td>S22 OPS Building Door 56</td>
<td>Sample consisted of a soft white powdery plaster-like material, mixed with amosite asbestos.</td>
</tr>
<tr>
<td>1214/7</td>
<td>4.2.13</td>
<td>S27 Room 35 Air-conditioning Room Penetration</td>
<td>Sample consisted of a compressed fibrous mass of chrysotile asbestos and SMF like fibres.</td>
</tr>
<tr>
<td>1214/8</td>
<td>4.5.2</td>
<td>S21 PSS46 Room 207 Vinyl Tile</td>
<td>NAD’</td>
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<tr>
<td>1223/9</td>
<td>4.4.4</td>
<td>S19 DSS46 Air-conditioning duct installation</td>
<td>NAD’</td>
</tr>
<tr>
<td>1223/10</td>
<td>4.4.5</td>
<td>S20 - Cone insulation</td>
<td>NAD’</td>
</tr>
<tr>
<td>1223/11</td>
<td>4.2.14</td>
<td>S28 - Fire Door 31A OPS Building</td>
<td>NAD’</td>
</tr>
<tr>
<td>1223/12</td>
<td>4.2.59</td>
<td>S36 OPS Building A/C sheet North exterior wall</td>
<td>NAD’</td>
</tr>
<tr>
<td>1223/13</td>
<td>4.2.55</td>
<td>S94 OPS Building Air-conditioning Plant Room 7 Heater Bank</td>
<td>NAD’</td>
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<tr>
<td>1223/14</td>
<td>4.2.52</td>
<td>S33 Main OPS Building Room 9 - vinyl tile</td>
<td>NAD’</td>
</tr>
<tr>
<td>1223/15</td>
<td>4.2.59</td>
<td>S35 OPS Building exterior UPS battery cupboard A/C sheet</td>
<td>Sample consisted of a fragment of fibro-plaster-like material containing chrysotile asbestos and organic fibres.</td>
</tr>
<tr>
<td>1223/16</td>
<td>4.2.20</td>
<td>S31 OPS Building panel either side of door 52</td>
<td>NAD’</td>
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<tr>
<td>1223/17</td>
<td>4.6.4</td>
<td>S38 - Cafeteria ext Elect Backing Board</td>
<td>NAD’</td>
</tr>
<tr>
<td>SAMPLE NO.</td>
<td>SURVEY REFERENCE</td>
<td>LOCATION</td>
<td>ANALYSIS</td>
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<tr>
<td>------------</td>
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</tr>
<tr>
<td>1223/18</td>
<td>4.2.47</td>
<td>S32 OPS Building corridor outside Door 59</td>
<td>NAD'</td>
</tr>
<tr>
<td>1223/19</td>
<td>4.6.2</td>
<td>S37 Cafeteria Kitchen - A/C sheet</td>
<td>The sample consisted of soft white plaster-like material containing chrysotile and amosite asbestos.</td>
</tr>
<tr>
<td>1223/20</td>
<td>4.2.1</td>
<td>S25 - OPS Building Fire Door 31</td>
<td>The sample consisted of ash-coloured soft plaster-like material mixed with chrysotile and amosite asbestos.</td>
</tr>
<tr>
<td>1223/21</td>
<td>4.2.1</td>
<td>S25 - OPS Building Fire Door 31</td>
<td>The sample consisted of ash-coloured soft plaster-like material mixed with chrysotile and amosite asbestos.</td>
</tr>
<tr>
<td>1223/22</td>
<td>4.3.10</td>
<td>S15 DSS43 Steampipe insulation</td>
<td>The sample consisted of ash-white soft powdery plaster-like material mixed with chrysotile asbestos.</td>
</tr>
<tr>
<td>1223/23</td>
<td>4.3.3</td>
<td>S13 Expansion joint material for air-conditioning duct</td>
<td>Sample consisted of a small fibrous masses of chrysotile asbestos.</td>
</tr>
<tr>
<td>1223/24</td>
<td>4.3.1</td>
<td>S11 Antenna DSS46 Room 102 Wall Lining</td>
<td>NAD'</td>
</tr>
<tr>
<td>1223/25</td>
<td>4.1.12</td>
<td>S7 Power House diesel exhaust rope lagging</td>
<td>The sample consisted of a mass of soft white plaster-like material mixed with chrysotile asbestos.</td>
</tr>
<tr>
<td>1223/26</td>
<td>4.1.15</td>
<td>S5 Power House eaves</td>
<td>Sample consisted of fragments of a hard fibre cement sheet containing chrysotile and amosite asbestos.</td>
</tr>
<tr>
<td>1223/27</td>
<td>4.1.11</td>
<td>S4 Power House Elect S/W room 83 vinyl tile</td>
<td>NAD'</td>
</tr>
<tr>
<td>1223/28</td>
<td>4.1.10</td>
<td>S3 Power House Room 81 vinyl tile</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/29</td>
<td>4.1.4</td>
<td>S2 Power House machine shop A/C Sheet</td>
<td>Sample consisted of fragments of fibro-plaster-cement material containing organic fibres and chrysotile asbestos.</td>
</tr>
<tr>
<td>1245/30</td>
<td>4.1.1</td>
<td>S1 Power House Room 71 vinyl tile</td>
<td>Sample consisted of a hard tile containing chrysotile asbestos.</td>
</tr>
<tr>
<td>1245/31</td>
<td>4.3.14</td>
<td>S18 - Lower elevation gear box platform insulation on cooling coil pipes</td>
<td>NAD'</td>
</tr>
<tr>
<td>SAMPLE NO.</td>
<td>SURVEY REFERENCE</td>
<td>LOCATION</td>
<td>ANALYSIS</td>
</tr>
<tr>
<td>------------</td>
<td>------------------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>1245/32</td>
<td>4.3.19</td>
<td>S18A Tunnel elect penetration in wall</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/33</td>
<td>4.3.1</td>
<td>S12 DSS43 Room 102 sheeting</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/34</td>
<td>4.3.4</td>
<td>S14 · Stairwell 202 DSS43 · vinyl tile Floor</td>
<td>Sample consisted of fragments of a hard tile containing chrysotile asbestos.</td>
</tr>
<tr>
<td>1245/35</td>
<td>4.3.6</td>
<td>S14A DSS43 · Gaskets</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/36</td>
<td>4.2.5</td>
<td>S24 · OPS Building vinyl floor tile Records Room</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/37</td>
<td>4.2.17</td>
<td>S30 · Plant room 32 · gasket material</td>
<td>Sample consisted of small fragment of a gasket material containing chrysotile asbestos.</td>
</tr>
<tr>
<td>1245/38</td>
<td>4.2.17</td>
<td>S29 · Main OPS Building plant room 32 · hot water pipe insulation</td>
<td>Sample consisted of a soft white powdery plaster-like material mixed with amosite asbestos.</td>
</tr>
<tr>
<td>1245/39</td>
<td>5.4.1</td>
<td>S15A ME Tower insulation</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/40</td>
<td>4.14</td>
<td>S44 · Expansion goint on air-cond unit on slab</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/41</td>
<td>4.24</td>
<td>S49 · CMF Building floor</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/42</td>
<td>4.23</td>
<td>S48 South of high power transmitter building · lining</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/43</td>
<td>4.20</td>
<td>S46 · Panel Store · Fire hose enclosure Nth side</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/44</td>
<td>4.22</td>
<td>S47 · Facilities Store on racks</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/45</td>
<td>4.14</td>
<td>S43 · Fire Tank Pump House · top of hydrant NE corner</td>
<td>NAD'</td>
</tr>
<tr>
<td>1245/46</td>
<td>4.3.14</td>
<td>S17 DSS43 hydraulic hose tray insulation</td>
<td>NAD'</td>
</tr>
</tbody>
</table>
# ANALYTICAL RESULTS - ASBESTOS

<table>
<thead>
<tr>
<th>SAMPLE NO.</th>
<th>SURVEY REFERENCE</th>
<th>LOCATION</th>
<th>ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1245/47</td>
<td>4.16</td>
<td>S45 - Antenna support structures building - sheeting outside door 224</td>
<td>NAD’</td>
</tr>
<tr>
<td>1245/48</td>
<td>4.10</td>
<td>S41 - Outside safety office</td>
<td>NAD’</td>
</tr>
<tr>
<td>1245/49</td>
<td>4.10</td>
<td>S42 - Outside safety office</td>
<td>NAD’</td>
</tr>
<tr>
<td>1245/50</td>
<td>4.2.20</td>
<td>S31A - Main OPS Building air-cond heater banks</td>
<td>Sample consisted of pieces of soft white plaster-like material mixed with amosite and chrysotile asbestos.</td>
</tr>
<tr>
<td>1245/51</td>
<td>4.30</td>
<td>S39 - Pump House elec backing board outside wall</td>
<td>Sample consisted of small fragments of blackish land material containing chrysotile asbestos.</td>
</tr>
<tr>
<td>1245/52</td>
<td>4.1.12</td>
<td>S9 - Power House Room 82 Bottom Penetration</td>
<td>Sample consisted of a fibrous mass of organic fibres mixed with chrysotile asbestos.</td>
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<tr>
<td>1245/54</td>
<td>4.1.15</td>
<td>S10 - Power House Room 82 Top Penetration</td>
<td>NAD’</td>
</tr>
<tr>
<td>1245/55</td>
<td>4.1.12</td>
<td>S6 - Power House Room 82 Diesel exhaust lagging</td>
<td>Sample consisted of a fibrous mass of chrysotile asbestos mixed with organic fibres.</td>
</tr>
</tbody>
</table>

NAD’ = No Asbestos Detected.

## 6.0 PRIORITY ASSESSMENT

The following table generally summarizes the extent of asbestos based materials and indicates the priority of hazard.

**PRIORITY 1** - Immediate action should be taken. Hazard exists.

**PRIORITY 2** - Hazard exists if material is disturbed. Should be removed. As soon as possible.

**PRIORITY 3** - No immediate hazard exists but should be programmed for removal.

**PRIORITY 4** - Low risk but should be removed prior to refurbishment, demolition or maintenance work.
<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>AREA</th>
<th>NATURE</th>
<th>PRIORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1</td>
<td>Power House - Room 71</td>
<td>Vinyl Tiles</td>
<td>4</td>
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<tr>
<td>4.1.2</td>
<td>Power House - Room 75</td>
<td>Vinyl Tiles</td>
<td>4</td>
</tr>
<tr>
<td>4.1.4</td>
<td>Power House - Machine Shop</td>
<td>Asbestos Cement Walls</td>
<td>3</td>
</tr>
<tr>
<td>4.1.5</td>
<td>Power House - Room 71</td>
<td>Asbestos Cement Walls</td>
<td>3</td>
</tr>
<tr>
<td>4.1.6</td>
<td>Power House - Storeroom</td>
<td>Asbestos Cement Walls</td>
<td>3</td>
</tr>
<tr>
<td>4.1.7</td>
<td>Power House - Garage Area</td>
<td>Asbestos Cement Walls</td>
<td>3</td>
</tr>
<tr>
<td>4.1.8</td>
<td>Power House - M.G. Room</td>
<td>Electrical Cable Insulation</td>
<td>4</td>
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<tr>
<td>4.1.12</td>
<td>Power House - Diesel Generator Room A</td>
<td>Diesel Exhaust Duct Lagging</td>
<td>2</td>
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<tr>
<td>4.1.12</td>
<td>Power House - Diesel Generator Room A</td>
<td>Pipe Wall Penetrations</td>
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<td>4.1.12</td>
<td>Power House - Diesel Generator Room A</td>
<td>Gaskets</td>
<td>4</td>
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<td>4.1.12</td>
<td>Power House - Diesel Generator Room B</td>
<td>Gaskets</td>
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<td>4.1.15</td>
<td>Power House Exterior</td>
<td>Asbestos Cement Sheet Eaves</td>
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<td>Power House Exterior</td>
<td>Electrical Cable Insulation</td>
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<td>4.1.15</td>
<td>Power House Exterior</td>
<td>Pump Gland Packing &amp; Gaskets</td>
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<td>4.1.15</td>
<td>Power House Exterior</td>
<td>Pipe Penetrations</td>
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<td>4.2.1</td>
<td>Main OPS Building Plant Room 55</td>
<td>Lagged Boiler</td>
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<tr>
<td>4.2.13</td>
<td>Main OPS Building Air-conditioning Room 35</td>
<td>Lagged Pipe and Penetration</td>
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<td>4.2.17</td>
<td>Main OPS Building Air-conditioning Plant Room 32</td>
<td>Asbestos Cement Ceiling</td>
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<td>Main OPS Building Air-conditioning Plant Room 32</td>
<td>Gaskets on Work Bench</td>
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<td>4.2.17</td>
<td>Main OPS Building Air-conditioning Plant Room 32</td>
<td>Gland Packing and Gaskets Associated with Pumps Boilers and Pipework</td>
<td>4</td>
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<tr>
<td>Section</td>
<td>Location</td>
<td>Hazard</td>
<td>Level</td>
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<td>4.2.25</td>
<td>Main OPS Building Mens Toilet Room 45</td>
<td>Asbestos Cement Sheeting Above Door</td>
<td>3</td>
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<tr>
<td>4.2.57</td>
<td>Main OPS Building Air-Conditioning Heater Banks</td>
<td>Asbestos Millboard</td>
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<td>4.2.58</td>
<td>Main OPS Building Fire Doors</td>
<td>Asbestos Cored Fire Doors</td>
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<td>4.2.59</td>
<td>Main OPS Building Exterior</td>
<td>Asbestos Cement Eaves</td>
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<td>4.3.3</td>
<td>Antenna DSS43 Air-Conditioning Plant Room 101</td>
<td>Expansion Joint</td>
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<td>Antenna DSS43 Air-Conditioning Plant Room 101</td>
<td>Asbestos Millboard</td>
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<td>Antenna DSS43 Air-Conditioning Plant Room 101</td>
<td>Pump &amp; Pipe Gaskets and Gland Packing</td>
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<td>Antenna DSS43 Stairwell and Room 202</td>
<td>Vinyl Tiles</td>
<td>4</td>
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<td>4.3.6</td>
<td>Antenna DSS43 Storeroom</td>
<td>Woven Asbestos Insulation</td>
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<td>4.3.10</td>
<td>Antenna DSS43 Bilge Area</td>
<td>Steam Pipe Lagging</td>
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<td>Antenna DSS43 High Pressure Pump Room 305</td>
<td>Gaskets and Gland Packing</td>
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<td>Antenna DSS43 Air-Conditioning Room (Alidade Level)</td>
<td>Expansion Joints</td>
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<td>4.3.18</td>
<td>Antenna DSS43 Steam Cleaning Pipes</td>
<td>Asbestos Lagged Pipes</td>
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<td>4.6.2</td>
<td>Cafeteria - Kitchen</td>
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<td>4.6.3</td>
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<td>4.6.4</td>
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<td>4.7.2</td>
<td>Tourist Centre - Exterior</td>
<td>Asbestos Cement Eaves and Wall Cladding</td>
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<td>4.17</td>
<td>Pump House</td>
<td>Asbestos Cement Eaves</td>
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</tr>
<tr>
<td>4.26</td>
<td>Antenna Support Building (003)</td>
<td>Asbestos Cement Eaves</td>
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</tr>
<tr>
<td>4.29</td>
<td>Collimation Tower Building (004)</td>
<td>Cable Insulation</td>
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</tr>
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<td>4.30</td>
<td>Pump House (010)</td>
<td>Electrical Backing Board</td>
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</tr>
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<td>4.31</td>
<td>Water Tanks</td>
<td>Broken Asbestos Cement Sheet</td>
<td>2</td>
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</table>
7.0 CONCLUSIONS AND RECOMMENDATIONS

The areas of the Canberra Deep Space Communications Complex which are of the most concern are those where asbestos lagging has been used as insulation. These areas can be summarised as being the Power House diesel exhaust lagging and pipe penetrations, the Main Operations Building boilers and pipework, mainly located in the plant rooms, and the steam cleaning pipes on Antenna DSS43. This lagging is a friable form of asbestos which, if disturbed can be airborne readily. In the majority of areas this lagging is encased in metal or canvas but in some areas the encasement has been damaged, leaving the asbestos lagging exposed.

The asbestos millboard located around the air-conditioning heater banks is also of concern as any dislodgment of the millboard would cause asbestos to enter the air-conditioning system. Observations found this to be in very good condition.

The majority of the other asbestos products identified are of a less friable nature, such as asbestos-cement sheeting, woven asbestos, vinyl tiles, gaskets and gland packing.

It is our general recommendation that all asbestos containing materials ultimately should be removed prior to demolition or refurbishment in those areas. The asbestos should be performed in accordance with regulations and requirements of the New South Wales Construction and Safety Act and in particular Regulation 84A-J 1988; the "Code for the Safe Removal of Asbestos Based Thermal/Acoustic Materials" adopted by the Australian National Health and Medical Research Council; and the "Code of Practice for the Safe Removal of Asbestos" document of the National Occupational Health and Safety Commission as well as the regulations of the Metropolitan Waste Management Authority (WMA) and State Pollution Control Commission (SPCC).

8.0 COMMENTS

Every possible effort was made to identify and quantify asbestos based materials in the areas covered by this survey. Discussions, inspections and our experience lead us to believe the likelihood of asbestos products existing, other than those noted in this report, is unlikely.
PHOTOGRAPHS
Photograph 1 - Asbestos Cement Sheet Wall
Power House Machine Shop

Photograph 2 - Insulated Cable in M.G. Room
Power House

Ow Aspe & Partners
Asbestos Survey KUtos E544
Photograph 3 - Power House
Diesel Generators

Photograph 4 - Diesel Exhaust Duct with
Incomplete Metal Cladding

Ove Arup & Partners
Asbestos Survey KM:00 E544
Photograph 5 - Power House Diesel Generator
Pipe Penetration

Photograph 6 - Power House Exterior Electrical
Cupboard Sealant
Photograph 9 - Power House Asbestos Pipe Penetration
From Diesel Generating Room "A" to Exterior

Photograph 10 - Main Operations Building
Plant Room 55 Asbestos Lagged Boiler
Photograph 11 - Main Operations Building Plant Room 55
Exposed Asbestos on Lagged Boiler

Photograph 12 - Main Operations Room Air-conditioning Room 35
Asbestos Penetration

One Amp & Partners
Asbestos Survey KMMos E544
Photograph 13 - Main Operations Building Air-conditioning Plant Room 32
Asbestos Logged Boiler

Photograph 14 - Main Operations Building Air-conditioning Plant Room 32
Asbestos Logged Pipes
Photograph 15 - Main Operations Building Air-conditioning Plant Room 32
Asbestos Lagged Boiler

Photograph 16 - Main Operations Building Air-conditioning Plant Room 32
Exposed Asbestos on Lagged Pipes
Photograph 17 - Main Operations Building Typical Asbestos Millboard Lined Air-conditioning Heater Bank

Photograph 18 - Antenna DSS43
Photograph 19 - Antenna DSS43 Air-conditioning Plant Room 101
Air-conditioning Expansion Joint

Photograph 20 - Antenna DSS43 Air-conditioning Plant Room 101
Heater Bank
Photograph 21 - Antenna DSS43
Asbestos Lagged Steam Pipes

Photograph 22 - Antenna DSS45
Photograph 23 - Broken Asbestos Cement Sheets Between Water Tanks
REGISTER OF ASBESTOS
MATERIALS REPORT
CANBERRA DEEP SPACE
COMMUNICATIONS COMPLEX
TIDBINBILLA ACT 2620

Prepared for:
RAYTHEON AUSTRALIA PTY LTD,
Canberra Deep Space Communications Complex
Po Box 1035
Tuggeranong, ACT 2901

Report Date: 4 June 2008
Project Ref: ENVICANB00135AA

Fieldwork by:                   Fieldwork by:                   Written/Submitted by:                   Reviewed/Approved by:

Frank Poole
WHS Property Consultant
Class A Asbestos Assessor
Licence# 2006548

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Class B Asbestos Assessor
Licence# 2007142

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Senior Project Manager (WHS)
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Hazardous Materials Team Leader
Class A Asbestos Assessor
Licence#
4 June 2008

RAYTHEON AUSTRALIA PTY LTD,
Canberra Deep Space Communications Complex
P.O. Box 1035
Tuggeranong, ACT 2901

Attention: Garry Smee

Dear Garry

RE: Report - Asbestos Materials Report and Register for Canberra Deep Space Communications Complex (CDSCC)

Coffey Environments Pty Ltd is pleased to present its Register of Asbestos Material Report and Asbestos Management Plan, following a hazardous (asbestos) materials survey of CDSCC located at Tidbinbilla ACT hereafter referred to as `the site`.

Please advise me when you wish to discuss these documents. Upon agreement, final document will be issued.

Please note that all activities and services provided by Coffey Environments Pty Ltd are subject to the Methodologies and Statement of Limitations contained within this report.

Please do not hesitate to contact the Project Coordinator should you wish to discuss any aspect of the report.

For and on behalf of Coffey Environments Pty Ltd

Frank Poole
WHS Property Consultant
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CONTENTS

LIST OF ATTACHMENTS  
EXECUTIVE SUMMARY  

1 INTRODUCTION  
1.1 Background  
1.2 Scope  

2 METHODOLOGY  
2.1 Asbestos Fibre Identification  

3 RESULTS  
3.1 Asbestos Materials Register  
3.2 No Access Areas  

4 GLOSSARY  

5 RECOMMENDATIONS  
5.1 Asbestos Materials Identified  
5.1.1 Friable & Bonded Asbestos  
5.1.2 Control Measures  

6 STATEMENT OF LIMITATIONS  

7 BIBLIOGRAPHY
LIST OF ATTACHMENTS

Appendices

Appendix A: Photographs
Appendix B: Legislative Requirements and Additional Information
Appendix C: Certificate(s) of Analysis
EXECUTIVE SUMMARY

Coffey Environments Pty Ltd conducted a hazardous (asbestos) materials survey of the CDSCC located at Tidbinbilla ACT during the months of February and March 2008. The survey was undertaken to facilitate the identification and location of asbestos containing materials (ACM) to enable management of the ACM and the formation of an Asbestos Management Plan in accordance with the ACT Dangerous Substance (General) Regulation 2004. The survey was conducted by Mr Robert Munday, a Class B Asbestos Assessor, supervised by Mr Frank Poole, a Class A Asbestos Assessor.

From the site survey and laboratory analysis results a register of Asbestos containing materials has been produced in accordance with the requirements of the National Occupational Health and Safety Commission Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)], the ACT Dangerous Substance (General) Regulation 2004 and other relevant legislation.

Legislation and guidance requires that the register be used by property owners, employers, controllers of the premises and other interested parties, such as contractors, as part of an overall hazardous materials management plan designed to control the risks of exposure to hazardous materials.

This contract was completed by Coffey Environments on the basis of a defined program of work and terms and conditions agreed with the Client. We confirm that in preparing this report we have exercised all reasonable skill and care bearing in mind the project objectives, the agreed scope of works and prevailing site conditions.

ACM classified as having an elevated risk (Action A1 & A2) were identified or suspected during the survey, as summarised below. Full details of the all levels of risks for ACM assessments can be located within the register of this report (Section 3: Results).

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Hazardous Material</th>
<th>Location</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>001 – Operations Building</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Metal encased asbestos lagging to boiler</td>
<td>Internal: Plantroom, Room 55 – Boiler plant in northwest corner of the room</td>
<td>Encapsulate or remove</td>
</tr>
<tr>
<td>A1</td>
<td>Metal encased asbestos lagging to boiler</td>
<td>Internal: Plantroom, Room 32 – Boiler plant on east side of the room</td>
<td>Encapsulate or remove</td>
</tr>
<tr>
<td>A1</td>
<td>Asbestos lagging to penetrations</td>
<td>Internal: Plantroom, Room 32 – pipes running from Boiler plant and hot water pumps to AC plant</td>
<td>Encapsulate or remove</td>
</tr>
<tr>
<td>A1</td>
<td>Millboard insulation to inline heater banks</td>
<td>Internal: Room 47, AC ductwork - ceiling space</td>
<td>Recommended to be removed</td>
</tr>
<tr>
<td>A1</td>
<td>Millboard insulation to inline heater banks</td>
<td>Internal: various locations within AC ductwork located in the ceiling spaces</td>
<td>Recommended to be removed</td>
</tr>
<tr>
<td>A2</td>
<td>Asbestos lagging to pipework</td>
<td>Internal: Diesel Generator room, Room 82 – diesel generator pipes running from central generators (x2) to west wall</td>
<td>Material not in good repair and should be removed.</td>
</tr>
<tr>
<td>002 – Power House</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>Metal clad asbestos lagging and woven insulation</td>
<td>Internal: Diesel Generator room, Room 82 – generator exhaust flues from generators (x4) to west wall</td>
<td>Material is not in good repair and should be removed.</td>
</tr>
<tr>
<td>A2</td>
<td>Asbestos insulation in wall</td>
<td>Internal: Diesel Generator room, Room</td>
<td>Material is not in good</td>
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## EXECUTIVE SUMMARY

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<th>Comments</th>
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<tr>
<td></td>
<td>penetration</td>
<td>82 - generator pipes running from central generators (x2) to west wall.</td>
<td>repair and should be removed.</td>
</tr>
<tr>
<td>A2</td>
<td>Woven insulation to cable from electrical box</td>
<td>External: Electrical compound, north end - cables runs from box into the ground</td>
<td>Material is not in good repair and should be removed.</td>
</tr>
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</table>

### ST2 70m Antenna – DSS43

<table>
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<th>Action</th>
<th>Description of Hazardous Material</th>
<th>Location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Millboard insulation to inline heater banks</td>
<td>Internal: Ground Floor, Plant Room 101 - AC ductwork</td>
<td>Material is not in good repair and should be removed.</td>
</tr>
</tbody>
</table>
1 INTRODUCTION

Coffey Environments Pty Ltd was commissioned by Raytheon Australia Pty Ltd to conduct an hazardous (asbestos) materials survey (‘The Survey’) of the CDSCC located at Tidbinbilla, ACT during the months of February and March 2008 to satisfy the provisions of the ACT Dangerous Substance (General) Regulation 2004.

Frank Poole and Robert Munday of Coffey Environments (Canberra) carried out the inspection and Raytheon Australia Pty Ltd provided information regarding the site and its history. Other information was obtained from vendor manuals, standards, guidelines, regulations and other material available in the public domain.

The assessment was conducted on the basis of the condition of the materials at the time of inspection and the future anticipated activities at the site.

The scope of this investigation did not allow intrusive sampling techniques to be undertaken and therefore this report may only be used as a partial reference document for the purposes of demolition.

No inspection can be guaranteed to locate all asbestos/hazardous materials in a specific location and therefore this assessment cannot be regarded as absolute. Future demolition and or renovation to site structures may expose situations, which were concealed or otherwise impractical to access during this assessment.

1.1 Background

The site has not been previously assessed by Coffey Environments.

A survey has been conducted in the past by Envirosiences Pty Ltd with the resulting Asbestos Survey report made available for the current site inspection. This was in order to re-assess the condition of the existing Asbestos containing material (ACM) and locate and risk assess new situations not identified in the previous survey/s.

The previous noted ACM situations have been collated into Section 3 - Register Of Asbestos Containing Materials - of this report accompanied by the current condition audit on the material or removal of such (where applicable). The Asbestos Materials Register will state *ENVI where previous samples have been referred to (i.e. Referenced from Envirosiences Pty Ltd report - Ove Arup & Partners – Asbestos Survey KMs E544). The current Hazardous Materials Register will also include new situations (denoted with either EB or an EP sample number) detected during the current inspection.

The purpose of the survey was to comply with current regulations and to identify hazards within the building to enable hazardous materials to be managed.

1.2 Scope

The scope of work required Coffey Environments to:

- Mobilise a technician/consultant to and from the site.
- Liaise with personnel and collect data on the history, use and function of the site.
- Conduct a standard sampling hazardous (asbestos) materials survey of the site, to locate asbestos containing materials (ACM's).
Asbestos Materials Report
Canberra Deep Space Communications Complex (CDSCC)

- Collect samples of suspect asbestos material (where accessible) and submit samples for laboratory analysis. Note: Only 'typical' suspected occurrences are to be collected and sampled (e.g. one in every same fire door / gasket will be analysed.
- Document the details of materials identified including photographs of any samples taken
- Record, collate and report the findings.
- Deliver one bound and one electronic report to the client.
2 METHODOLOGY

Hazardous (asbestos) material surveys are undertaken considering a risk management approach, in accordance with best practice and recent Territory Government Legislation. An Occupational Health and Safety and Environmental risk assessment was conducted based on the condition of building materials identified during the survey and prioritised through Action Classifications, listed below.

The assessment involved the investigation for the presence of asbestos (AS) containing materials. Information was collected from the owners/occupiers/tenants of the site on relevant issues pertaining to the site. Based on all the available data and the status of the site at the time of inspection, where items suspected of containing asbestos were identified, visual and/or analytical characterisation (where required) was performed and reported in this Asbestos Materials Register.

Only ‘typical’ suspected asbestos material occurrences are inspected and sampled. Sampling is undertaken on a representative basis, for example, the inspection of one fire door of the same type within the same building is undertaken (i.e. not every ‘matching’ fire door is examined), unless specifically instructed.

Standard sampling hazardous (asbestos) material surveys are restricted to areas that are reasonably accessible during the survey, with respect to the following:

a) without contravention of relevant statutory requirements or codes of practice;
b) without demolition or damage to finishes and structure; and 
c) excluding plant and equipment that was ‘in service’ and operational.

Where the Surveyor encounters access restrictions during the survey, these situations are documented and reported.

No assessment can be regarded as absolute. Future demolition or refurbishment of structures may reveal materials concealed during the assessment, therefore not accessible at the time of the Survey.

As detailed above, an assessment of the resultant risks has been prioritised through the use of Action Classifications (Section 4 - Glossary).

2.1 Asbestos Fibre Identification

Samples taken from suspected asbestos containing materials are representative of the material sampled, individually identified, transported, analysed and reported in accordance with the National Occupational Health and Safety Commission (NOHSC) Guidelines, relevant Statutory Regulations, Codes of Practice and Coffey Environments Work Instructions. Laboratories undertaking analysis are appropriately NATA certified for the analysis conducted.

The presence of asbestos in a bulk sample is determined by Polarised Light Microscopy (PLM) with dispersion staining techniques.
3 RESULTS

3.1 Asbestos Materials Register

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<td>Canberra Deep Space Communications Complex (CDSCC) – Tidbinbilla ACT</td>
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</tbody>
</table>

DESCRIPTION

The survey was conducted of the CSIRO owned property located 40 kms southwest of the Canberra city centre within the ACT environs. The site consists of a complex of buildings, structures and infrastructure interconnected by a network of roads and walkways.

Within the project scope the inspection included approximately 22 buildings or other structures and services. These ranged from Operations buildings, staff and visitor facilities and amenities, Pump houses, Workshops and Antennae (up to 70m in height).

The complex is utilised on a regular basis for the purpose of tracking spacecraft and communicating data in relation to and about these spacecraft.

Buildings and structures vary in age and use ranging from the Operations Building (001) first constructed in 1964 and extended in 1980 through to the Heavy vehicle Workshop built in 2000.

For Action Classification, Material Descriptors and Register Terminology Coding please refer to Section 4-GLOSSARY

This Register is to be read in conjunction with the whole report. Additional information is attached (Appendix B)
## REGISTER OF ASBESTOS CONTAINING MATERIALS

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<th>Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Expose Potential Activity</th>
<th>Exposure Potential Measurement</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²)</th>
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<td>001 – Operations Building</td>
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<td>Asbestos containing Materials</td>
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</tr>
<tr>
<td>*ENVI</td>
<td>CH, AM</td>
<td>-</td>
<td>Millboard insulation to inline heater banks</td>
<td>Internal: Room 47 AC ductwork - ceiling space</td>
<td>Y 2 3 2 3 3 2 2 2 19</td>
<td>A1</td>
<td>N/A</td>
<td>All original type of AC duct heater banks should be presumed to contain asbestos</td>
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<tr>
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<td>Millboard insulation to inline heater banks</td>
<td>Internal: various locations within AC ductwork - ceiling space</td>
<td>Y 2 3 2 3 3 2 2 2 19</td>
<td>A1</td>
<td>N/A</td>
<td>As above</td>
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<tr>
<td>*ENVI</td>
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<td>-</td>
<td>Metal encased asbestos lagging to boiler</td>
<td>Internal: Plantroom, Room 55 – Boiler plant in northwest corner of the room</td>
<td>Y 2 3 3 3 3 2 2 2 19</td>
<td>A1</td>
<td>N/A</td>
<td>Encapsulate or remove</td>
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<td>*ENVI</td>
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<td>Internal: Plantroom, Room 32 – Boiler plant on east side of the room</td>
<td>Y 2 3 3 3 3 2 2 2 19</td>
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<td>AM</td>
<td>-</td>
<td>Asbestos lagging to penetrations</td>
<td>Internal: Plantroom, Room 32 – pipes running from Boiler plant and hot water pumps to AC plant</td>
<td>Y 2 3 3 3 3 2 2 2 19</td>
<td>A1</td>
<td>N/A</td>
<td>Material not in good repair and should be removed.</td>
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<td>*ENVI</td>
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<td>-</td>
<td>Asbestos lagging to pipework</td>
<td>Internal: Diesel Generator room, Room 82 – diesel generator pipes running from central generators (x2) to west wall</td>
<td>Y 1 2 3 3 3 1 2 1 12 15</td>
<td>A2</td>
<td>N/A</td>
<td>Material not in good repair and should be removed.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Gaskets and gland packing</td>
<td>Internal: Plantroom, Room 32 - boiler, pumps and pipes</td>
<td>Y 1 2 1 0 0 1 0 2 7</td>
<td>A3</td>
<td>N/A</td>
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<td>Product Type</td>
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<td>Surface Treatment</td>
<td>Occupant Activity</td>
<td>Likelihood of Disturbance</td>
<td>Maintenance Potential Exposure</td>
<td>Risk Score</td>
<td>Action</td>
<td>Quantity (m², m³)</td>
<td>Comments</td>
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<tr>
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<td>CH</td>
<td>-</td>
<td>Gasket material (spare)</td>
<td>Internal: Plantroom, Room 32 – spare gaskets on workbench</td>
<td>Y</td>
<td>1</td>
<td>2</td>
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<td>0</td>
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<td>0</td>
<td>2</td>
<td>7</td>
<td>A3</td>
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</tr>
<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Insulation core – Firedoors (not labelled)</td>
<td>Internal: variously throughout</td>
<td>Y</td>
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<td>7</td>
<td>A3</td>
<td>N/A</td>
<td>Various doors were previously sampled – doors not labelled as AF (Asbestos free) contain asbestos</td>
</tr>
<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet ceiling lining</td>
<td>Internal: Plantroom, Room 55</td>
<td>N</td>
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</tr>
<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet ceiling lining</td>
<td>Internal: AC Plantroom, Room 32 – ceiling over AC plant</td>
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<tr>
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<td>CH</td>
<td>1</td>
<td>Asbestos cement sheet infill panel above door</td>
<td>Internal: Level 1, male toilets (Room 45)</td>
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<td>4</td>
<td>A4</td>
<td>N/A</td>
<td>Cupboard is located to the east of the main entrance</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet wall panels</td>
<td>External: UPS battery cupboard at the south side of the building</td>
<td>N</td>
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<tr>
<td>EB 592</td>
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<td>2</td>
<td>Asbestos cement sheet eaves lining</td>
<td>External: perimeter of Logistics (Administration) building</td>
<td>N</td>
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<tr>
<td>EB 634</td>
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<td>-</td>
<td>Asbestos cement sheet eaves lining</td>
<td>External: perimeter of front (older) section of building</td>
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<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (cream)</td>
<td>Internal: Level 1 – ‘Front End’ area</td>
<td>N</td>
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<td>A4</td>
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<td>Patchwork layout</td>
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<td>Visual Observation</td>
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<td>-</td>
<td>Vinyl floor tiles (light grey)</td>
<td>Internal: Level 1 – ‘Front End’ area</td>
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</tr>
<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (dark grey)</td>
<td>Internal: Level 1 – ‘Front End’ area</td>
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<td>Asbestos Type</td>
<td>Product Type</td>
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<td>Exposure Potential</td>
<td>Maintenance Activity</td>
<td>Risk Score</td>
<td>Action</td>
<td>Quantity (m²)</td>
<td>Comments</td>
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<tr>
<td>Visual Observation</td>
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<td>Vinyl floor tiles (light olive)</td>
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<td>Vinyl floor tiles (brown marble)</td>
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<td>-</td>
<td>Vinyl floor tiles (dark green)</td>
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<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (light green)</td>
<td>Internal: Level 1 – ‘Front End’ area</td>
<td>N</td>
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<td>-</td>
<td>Vinyl floor tiles (light green with white fleck)</td>
<td>Internal: Level 1 – ‘Front End’ area</td>
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<td>Visual Observation</td>
<td>*Suspect ACM</td>
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<td>Vinyl floor tiles (grey with white fleck)</td>
<td>Internal: Level 1 – ‘Front End’ area</td>
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<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (light grey with white fleck)</td>
<td>Internal: Rooms 137 &amp; 139</td>
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<td>Patchwork layout of vinyl floor tiles</td>
</tr>
<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (dark grey with white fleck)</td>
<td>Internal: Rooms 137 &amp; 139</td>
<td>N</td>
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<td>As above</td>
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<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (beige)</td>
<td>Internal: Rooms 137 &amp; 139</td>
<td>N</td>
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<td>A4</td>
<td>N/A</td>
<td>As above</td>
</tr>
<tr>
<td>Visual Observation</td>
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<td>-</td>
<td>Vinyl floor tiles (marbled)</td>
<td>Internal: Rooms 137 &amp; 139</td>
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<td>A4</td>
<td>N/A</td>
<td>As above</td>
</tr>
<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (grey)</td>
<td>Internal: Rooms 137 &amp; 139</td>
<td>N</td>
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</table>

Coffey Environments
ENVICANB00135AA-R.01 4June08
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results</th>
<th>Photo ID</th>
<th>Description</th>
<th>Location</th>
<th>Frail</th>
<th>Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Maintenance</th>
<th>Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²/m²)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (brown)</td>
<td>Internal: Room 142</td>
<td>N</td>
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<td>A4</td>
<td>N/A</td>
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<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (dark grey)</td>
<td>Internal: Level 1, Room 106</td>
<td>N</td>
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<td>4</td>
<td>A4</td>
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<tr>
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<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (light grey)</td>
<td>Internal: Level 1, Room 106</td>
<td>N</td>
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<td>A4</td>
<td>N/A</td>
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<tr>
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<td>-</td>
<td>Vinyl floor tiles (light brown)</td>
<td>Internal: Level 1, Room 106</td>
<td>N</td>
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<td>A4</td>
<td>N/A</td>
<td>Patchwork layout of vinyl floor tiles</td>
</tr>
<tr>
<td>Visual Observation</td>
<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (cream)</td>
<td>Internal: Level 1, Room 106</td>
<td>N</td>
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</tr>
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<td>*Suspect ACM</td>
<td>-</td>
<td>Vinyl floor tiles (green)</td>
<td>Internal: Level 1, Room 106</td>
<td>N</td>
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<tr>
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<td>*Suspect ACM</td>
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<td>Vinyl floor tiles (brown)</td>
<td>Internal: Level 1, Room 106</td>
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<td>4</td>
<td>A4</td>
<td>N/A</td>
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</tbody>
</table>

*Please Note:* Various sampling has previously been undertaken on the Vinyl floor tiles located throughout this building. The results returned both positive and negative findings for asbestos however due to the very low concentration of asbestos fibres and the non-homogenous matrix of vinyl floor tiles, false negative results may be obtained and as such the accuracy of all results cannot be guaranteed. Due to the complex patchwork of floor tiles all tiles are suspected to contain asbestos until otherwise confirmed.

**No Asbestos Detected (NAD)**

*ENVI NAD - Insulation core – Firedoors (labelled) Internal: variously throughout 0 0 0 0 Nil N/A Various doors were sampled during the previous inspections—doors labelled as AF (Asbestos free) do not contain asbestos

*ENVI NAD - Fibre cement sheet infill panel External: northern wall – cover plate to hole in wall 0 0 0 0 Nil N/A
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results</th>
<th>Photo ID</th>
<th>Description</th>
<th>Location</th>
<th>Friable</th>
<th>Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Exposure Potential</th>
<th>Maintenance Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²/m³)</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>*ENVI</td>
<td>NAD</td>
<td>-</td>
<td>Vinyl floor tiles</td>
<td>Internal: Telecom room, Room 30</td>
<td>0</td>
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<td>N/A</td>
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<td>*ENVI</td>
<td>NAD</td>
<td>-</td>
<td>Vinyl floor tiles</td>
<td>Internal: Records room, Room 39</td>
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<td>NAD</td>
<td>-</td>
<td>Vinyl floor tiles</td>
<td>Internal: Store room, Room 14</td>
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<td>NAD</td>
<td>-</td>
<td>Insulation within electrical penetration</td>
<td>Internal: Tunnel from DSS43 to Operations Building</td>
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<td>Nil</td>
<td>N/A</td>
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<td>*ENVI</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet infill panels</td>
<td>Internal: Operations Centre, Room 51- either side of door 52</td>
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<td>*ENVI</td>
<td>NAD</td>
<td>-</td>
<td>Vinyl floor tiles</td>
<td>Internal: Operations room plenum, Room 54</td>
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<td>*ENVI</td>
<td>NAD (SMF)</td>
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<td>Insulation to inline heaters</td>
<td>Internal: AC Plantroom, Room 7 - new AC plant ductwork</td>
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<td>Fibre cement sheet fascia panels (painted)</td>
<td>External: CSG Docs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Nil</td>
<td>N/A</td>
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<tr>
<td>EB 591</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet fascia panels (painted)</td>
<td>External: Loading dock – above RAD</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
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<tr>
<td>EB 593</td>
<td>NAD</td>
<td>-</td>
<td>Vinyl floor tiles (grey)</td>
<td>Internal: Room 013 - PA6X room</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
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<tr>
<td>EB 594</td>
<td>NAD</td>
<td>-</td>
<td>Vinyl floor tiles (grey)</td>
<td>Internal: Passage - at entry to OPS Room</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>EB 595</td>
<td>NAD</td>
<td>-</td>
<td>Insulation to inline heater</td>
<td>Internal: Level 1 – Plantroom 001-114</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>N/A</td>
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<td>EB 596</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet eaves lining</td>
<td>External: Perimeter of Timing Room – north extension</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Nil</td>
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<td>North wall of room</td>
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<td>EB 597</td>
<td>NAD</td>
<td>-</td>
<td>Insulation core - Firedoor</td>
<td>Internal: Level 1 – Rooms 101 &amp; 102</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>N/A</td>
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<td>Sample No.</td>
<td>Results</td>
<td>Photo ID</td>
<td>Description</td>
<td>Location</td>
<td>Flammable</td>
<td>Asbestos Type</td>
<td>Product Type</td>
<td>Extent of Damage</td>
<td>Surface Treatment</td>
<td>Occupant Activity</td>
<td>Likelihood of Disturbance</td>
<td>Exposure Potential</td>
<td>Maintenance Activity</td>
<td>Risk Score</td>
<td>Action</td>
<td>Quantity (m²/m³)</td>
<td>Comments</td>
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<td>002 - Power House</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Metal clad asbestos lagging and woven insulation</td>
<td>Internal: Diesel Generator room, Room 82 - generator exhaust flues running from generators (x4) to west wall</td>
<td>Y</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>15</td>
<td>A2</td>
<td>N/A</td>
<td>Material not in good repair and should be removed.</td>
</tr>
<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos insulation in wall penetration</td>
<td>Internal: Diesel Generator room, Room 82 - diesel generator pipes running from central generators (x2) to west wall</td>
<td>Y</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>15</td>
<td>A2</td>
<td>N/A</td>
<td>Material not in good repair and should be removed.</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>3</td>
<td>Woven insulation to cable from electrical box</td>
<td>External: Electrical compound, north end - cables runs from box into the ground</td>
<td>N</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>16</td>
<td>A2</td>
<td>N/A</td>
<td>Material not in good repair and should be removed.</td>
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<tr>
<td>*ENVI</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Gaskets and packing to diesel generators and pipework</td>
<td>External: west side of building</td>
<td>N</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>A4</td>
<td>N/A</td>
</tr>
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<td>*ENVI</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Gaskets to diesel generators and pipework</td>
<td>Internal: &quot;A&quot; Diesel Generator room, Room 82 - diesel generators</td>
<td>N</td>
<td>3</td>
<td>1</td>
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<td>0</td>
<td>1</td>
<td>0</td>
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<td>A4</td>
<td>N/A</td>
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<td>*ENVI</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Gaskets to diesel generators exhausts</td>
<td>Internal: &quot;B&quot; Diesel Generator room, Room 86 - diesel generators</td>
<td>N</td>
<td>3</td>
<td>1</td>
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<td>N/A</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Vinyl floor tiles</td>
<td>Internal: Mechanical Workshop Supervisors office, Room 71</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet wall lining</td>
<td>Internal: Mechanical Workshop Supervisors office, Room 71</td>
<td>N</td>
<td>1</td>
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<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Vinyl floor tiles</td>
<td>Internal: Mechanical Workshop Tea room, Room 75</td>
<td>N</td>
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<td>Sample No.</td>
<td>Results</td>
<td>Photo ID</td>
<td>Description</td>
<td>Location</td>
<td>Firable</td>
<td>Asbestos Type</td>
<td>Product Type</td>
<td>Extent of Damage</td>
<td>Surface Treatment</td>
<td>Occupant Activity</td>
<td>Likelihood of Disturbance</td>
<td>Maintenance Activity</td>
<td>Exposure Potential</td>
<td>Activity</td>
<td>Risk Score</td>
<td>Action</td>
<td>Quantity (m²,m³)</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet wall lining</td>
<td>Internal: Machine Shop – north wall</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet wall lining</td>
<td>Internal: Storeroom outside Room 71A door – south and east walls</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>A4</td>
<td>N/A</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet wall lining</td>
<td>External: Garage area to the north end of the building – south and west walls</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td>4</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Woven insulation to cables</td>
<td>Internal: MG room, Room 78A – cables run down wall then underground in easterly direction to DSS43 antenna</td>
<td>N</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>A3</td>
<td>N/A</td>
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<tr>
<td>*ENVI</td>
<td>CH, AM</td>
<td>-</td>
<td>Asbestos cement sheet eaves lining</td>
<td>External: ‘A’ Station &amp; ‘B’ Station perimeters</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td>4</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td>EB 600</td>
<td>CH, AM</td>
<td>4</td>
<td>Asbestos cement sheet infill panels (x4)</td>
<td>Ext/int: ‘A’ Station – west wall (sandwiched between metal covers)</td>
<td>N</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>A4</td>
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<tr>
<td>Refer to EB 600</td>
<td>CH, AM</td>
<td>-</td>
<td>Asbestos cement sheet infill panels (x4)</td>
<td>Ext/int: ‘B’ Station – west wall around exhaust pipes (sandwiched between metal covers)</td>
<td>N</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td>6</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td>EB 601</td>
<td>CH</td>
<td>5</td>
<td>Manifold gaskets</td>
<td>Internal: ‘A’ Station, Room 002 -113 – emergency generator motors</td>
<td>Y</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>1</td>
<td>5</td>
<td>A4</td>
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<tr>
<td>EB 603</td>
<td>CH</td>
<td>6</td>
<td>Resinous electrical backing board</td>
<td>Internal: ‘A’ Station, Room 002 -113 – adjacent to the firedoors</td>
<td>N</td>
<td>1</td>
<td>1</td>
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<td>4</td>
<td>A4</td>
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<tr>
<td>Refer to EB 603</td>
<td>CH</td>
<td>-</td>
<td>Resinous electrical backing board</td>
<td>Internal: ‘A’ Station Switch Room 002 -112 – adjacent to the firedoors</td>
<td>N</td>
<td>1</td>
<td>1</td>
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<td>A4</td>
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<tr>
<td>Refer to EB 603</td>
<td>CH</td>
<td>-</td>
<td>Resinous electrical arc shields</td>
<td>Internal: ‘A’ Station Switch Room 002 - 112 – electrical control boards</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>1</td>
<td>4</td>
<td>A4</td>
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<td>Sample No.</td>
<td>Results</td>
<td>Photo ID</td>
<td>Description</td>
<td>Location</td>
<td>Location Description</td>
<td>Asbestos Type</td>
<td>Product Type</td>
<td>Extent of Damage</td>
<td>Surface Treatment</td>
<td>Occupant Activity</td>
<td>Likelihood of Disturbance</td>
<td>Maintenance Activity</td>
<td>Risk Score</td>
<td>Action</td>
<td>Quantity (m, m², m³)</td>
<td>Comments</td>
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<tr>
<td>Refer to EB 603</td>
<td>CH</td>
<td>-</td>
<td>Resinous electrical backing board</td>
<td>Internal: ‘B’ Station Switch Room 002 - 117 - adjacent to the firedoors</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
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<tr>
<td>Refer to EB 603</td>
<td>CH</td>
<td>-</td>
<td>Resinous electrical arc shields</td>
<td>Internal: ‘B’ Station Switch Room 002 - 117 - electrical control boards</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td>EB 604</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet eaves lining</td>
<td>External: perimeter of building – lower eaves</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td></td>
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<td>EB 605</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet infill panels</td>
<td>Internal: Rooms 002 -110 &amp; 002.104 – panels above west side louvre windows</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
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<td>EB 608</td>
<td>CH</td>
<td>7</td>
<td>Asbestos cement sheet cabinet lining</td>
<td>External: east side of building – Crittendon Transformer Load Banks</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td>EB 616</td>
<td>CH, AM</td>
<td>-</td>
<td>Asbestos cement sheet eaves lining</td>
<td>External: perimeter of office and workshop</td>
<td>N 2 1 1 0 0 0 0 1 5</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td>EB 617</td>
<td>CH, AM</td>
<td>-</td>
<td>Asbestos cement sheet infill panel</td>
<td>Ext/Int: Unisex toilet 002-107</td>
<td>N 2 1 1 0 0 0 0 1 5</td>
<td>A4</td>
<td>N/A</td>
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<td>EB 633</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet eaves lining</td>
<td>External: Emergency Generator building – upper eaves</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>8</td>
<td>Fibrous insulation to switchgear</td>
<td>Internal: ‘A’ Station Main Control Room 002 -114 – electrical control boards</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Fibrous insulation to switchgear</td>
<td>Internal: ‘B’ Station Room 002 -117 – electrical control boards</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual Observation *Suspect ACM</td>
<td>-</td>
<td></td>
<td>Asbestos cement sheet infill panels</td>
<td>External: 'B' Station – panels above windows</td>
<td>N 3 1 1 0 0 0 0 0 5</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No access to sample due to height restrictions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual Observation *Suspect ACM</td>
<td>-</td>
<td></td>
<td>Vinyl floor tiles (beige)</td>
<td>Internal: throughout</td>
<td>N 1 1 1 0 1 0 0 0 4</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Refer to comment for the Main OPs building</td>
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<tr>
<td>Sample No.</td>
<td>Results</td>
<td>Photo ID</td>
<td>Description</td>
<td>Location</td>
<td>Friable</td>
<td>Asbestos Type</td>
<td>Product Type</td>
<td>Extent of Damage</td>
<td>Surface Treatment</td>
<td>Occasional Activity</td>
<td>Likelihood of Disturbance</td>
<td>Exposure Potential</td>
<td>Maintenance Activity</td>
<td>Risk Score</td>
<td>Action</td>
<td>Quantity (m², m³)</td>
<td>Comments</td>
</tr>
<tr>
<td>-----------</td>
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<td>----------</td>
</tr>
<tr>
<td>Visual Observation</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Woven insulation to cables</td>
<td>Internal: ‘B’ Station – cables in trays in floor</td>
<td>N</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>A3</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Visual Observation</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Woven insulation rope to cables</td>
<td>Internal: ‘B’ Station – cables in trays adjacent to east switch panel cabinet</td>
<td>N</td>
<td>3</td>
<td>2</td>
<td>1</td>
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<td>0</td>
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<td>8</td>
<td>A3</td>
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<td></td>
</tr>
<tr>
<td>Visual Observation</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Woven insulation rope to cables</td>
<td>Internal: Electrical Transformer compound – south side of building</td>
<td>N</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>A3</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

**No Asbestos Detected (NAD)**

| EB 599 | NAD | - | Spray applied insulation to roof trusses | Internal: ‘A’ Station, at ceiling height | 0 | 0 | 0 | N/A |
| EB 602 (SMFI) | NAD | - | Insulation beneath metal covers | Internal: ‘A’ Station, Room 002 -113 – exhaust pipework | 0 | 0 | 0 | N/A |
| EB 615 | NAD | - | Fibre cement sheet infill panels | External: East end and north side – above and below windows | 0 | 0 | 0 | N/A | North wall of room |
| *ENVI | NAD | - | Insulation core - firedoors | Internal: Doors throughout | 0 | 0 | 0 | N/A |
| *ENVI | NAD | - | Weatherproof sealant to cabinets | External: Transformer yard – ‘HF Mowry’ electrical cabinets | 0 | 0 | 0 | N/A |
| *ENVI | NAD | - | Vinyl floor tiles | Internal: Electrical room & Electrical Switch room, Rooms 81 & 83 | 0 | 0 | 0 | N/A |

**003 – Antenna Support Building – DSS42**

**Asbestos containing Materials**

<p>| EB 598 | CH | - | Asbestos cement sheet eaves lining | External: DSS42, perimeter of building | N | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | A4 | N/A |</p>
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results</th>
<th>Photo ID</th>
<th>Description</th>
<th>Location</th>
<th>Friable</th>
<th>Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Maintenance Activity</th>
<th>Exposure Potential</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST2 70m Antenna – DSS43</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All original type of AC duct heater banks should be presumed to contain asbestos</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>Suspect ACM</td>
<td>9</td>
<td>Millboard insulation to inline heater banks</td>
<td>Internal: Ground Floor, Plant Room 101 - AC ductwork</td>
<td>N</td>
<td>Y</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>19</td>
<td>N/A</td>
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<td></td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Gaskets and packing</td>
<td>Internal: Ground Floor, Plant Room 101 – pumps and glands</td>
<td>N</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>A3</td>
<td>N/A</td>
<td>No access to sample</td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>CH</td>
<td>10</td>
<td>Sealant to AC ducting</td>
<td>Internal: Ground Floor, Plant Room 101 – flange joints</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>A4</td>
<td>N/A</td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>CH</td>
<td>-</td>
<td>Vinyl floor tiles</td>
<td>Internal: Stairwell to Level 1 and Room 202</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>A4</td>
<td>N/A</td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet manhole cover</td>
<td>Internal: Room 202 – male toilet</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>A4</td>
<td>N/A</td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>CH</td>
<td>-</td>
<td>Woven insulation to monorail beam</td>
<td>Internal: Storeroom Room 201 – above door to Room 202</td>
<td>N</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>A3</td>
<td>N/A</td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>CH</td>
<td>-</td>
<td>Metal clad asbestos lagging to pipe</td>
<td>Internal: Bilge area (below Adilade Level) 201 – steam pipe</td>
<td>N</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>A3</td>
<td>Off take pipes from the steam generating machine main pipes – Refer below</td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>CH</td>
<td>-</td>
<td>Metal clad asbestos lagging to pipes (x2)</td>
<td>Internal: Lower Elevation Gear Box Platform – steam pipes from steam generating machine</td>
<td>N</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>A3</td>
<td>Refer to comment below</td>
</tr>
<tr>
<td>&quot;ENVI&quot;</td>
<td>CH</td>
<td>-</td>
<td>Metal clad asbestos lagging to pipes (x2)</td>
<td>Internal: Upper Elevation Gear Box Platform – steam pipes</td>
<td>N</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>A3</td>
<td>Refer to comment below</td>
</tr>
</tbody>
</table>
### Asbestos Materials Report
Canberra Deep Space Communications Complex (CDSCC)

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results</th>
<th>Photo ID</th>
<th>Description</th>
<th>Location</th>
<th>Friable Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Exposure Potential</th>
<th>Maintenance Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²/m³)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Metal clad asbestos lagging to pipe (x1)</td>
<td>Internal: Elevation Bearing Platform – steam pipe</td>
<td>N 1 2 2 2 1 1 1 1 1 11</td>
<td>A3</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*ENVI</td>
<td>CH</td>
<td>-</td>
<td>Metal clad asbestos lagging to pipe (x1)</td>
<td>Internal: Tipping Structure – steam pipe terminates at this level.</td>
<td>N 1 2 2 2 1 1 1 1 1 11</td>
<td>A3</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*ENVI</td>
<td>Suspect ACM</td>
<td>11</td>
<td>Gaskets and gland packing</td>
<td>Internal: Adilade Level, High Pressure Room 305</td>
<td>N 3 2 1 1 0 1 1 2 11</td>
<td>A3</td>
<td>N/A</td>
<td>Spare gaskets in box</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*ENVI</td>
<td>CH</td>
<td>10</td>
<td>Sealant to AC ducting</td>
<td>Internal: Adilade Level, Air conditioning Plant Room – flange joints</td>
<td>N 1 1 1 0 0 0 0 1 4</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Please Note:* There is a steam generating machine located on the Lower Elevation Gear Box Level from which 2 pipes run up to Upper Elevation Gear Box Platform at which point one pipe terminates at this level and the other continues up through the Elevation Bearing Platform on the east side of the antenna. The pipe terminates at the Tipping Structure. 2 lagged steam pipes run down the structure from the Lower Elevation Gear Box Level past the Adilade Level down the stairways to the ground level. All pipes are clad in metal however some cladding is incomplete and the lagging is exposed.

### No Asbestos Detected (NAD)

<table>
<thead>
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<th>Product Type</th>
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<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Exposure Potential</th>
<th>Maintenance Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²/m³)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ENVI</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet wall linings</td>
<td>Internal: Ground Floor – Room 102</td>
<td>0 0</td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
<td>Also noted 2 ‘spare’ sheets - west wall</td>
<td></td>
<td></td>
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<tr>
<td>EB 637</td>
<td>NAD</td>
<td>-</td>
<td>Waterproof membrane</td>
<td>Internal: Adilade Level – floor</td>
<td>0 0</td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
<td></td>
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### 004 - Collimation Tower Support

#### Asbestos containing Materials

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<th>Results</th>
<th>Photo ID</th>
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<th>Location</th>
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<th>Product Type</th>
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<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Exposure Potential</th>
<th>Maintenance Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²/m³)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ENVI</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Woven insulation to cables</td>
<td>External: Transformer enclosure – run form north wall transformer into ground</td>
<td>Y 3 2 1 1 0 0 0 1 8</td>
<td>A3</td>
<td>N/A</td>
<td>No access to sample - high voltage hazard</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>*ENVI</td>
<td>Suspect ACM</td>
<td>-</td>
<td>Flange gaskets</td>
<td>External: Transformer enclosure - pipework</td>
<td>Y 3 2 1 1 0 0 0 1 8</td>
<td>A3</td>
<td>N/A</td>
<td>As above</td>
<td></td>
<td></td>
<td></td>
<td></td>
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## Asbestos Materials Report
Canberra Deep Space Communications Complex (CDSCC)

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<th>Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Exposure Potential</th>
<th>Maintenance Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m², m³)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>005 - Cafeteria /Visitor Centre</td>
<td></td>
<td></td>
<td>Asbestos containing Materials</td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td>EB 626 CH, AM 12 Asbestos cement sheet eaves lining</td>
<td>External: east side of original kitchen</td>
<td>N</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>A4</td>
<td>N/A</td>
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<tr>
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<td></td>
<td></td>
<td>EB 630 CH - Asbestos cement sheet infill panels</td>
<td>External: Visitors Centre – adjacent to rear door</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
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<td>4</td>
<td>A4</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>EB 631 CH - Asbestos cement sheet eaves/ceiling lining</td>
<td>External: Visitors Centre – rear awning</td>
<td>N</td>
<td>1</td>
<td>1</td>
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<td>4</td>
<td>A4</td>
<td>N/A</td>
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<td></td>
<td></td>
<td>EB 632 CH - Asbestos cement sheet eaves lining</td>
<td>External: Visitors Centre – rear (over Daikin AC system)</td>
<td>N</td>
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<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>A4</td>
<td>N/A</td>
<td>Small section newer piece</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>EB 636 CH, AM - Asbestos cement sheet eaves lining</td>
<td>External: perimeter of old section of the building</td>
<td>N</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>A4</td>
<td>N/A</td>
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<td></td>
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<tr>
<td></td>
<td>Refer to EB 636</td>
<td>CH, AM - Asbestos cement sheet eaves lining</td>
<td>External: above access doors to Room 005-125</td>
<td></td>
<td>N</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>A4</td>
<td>N/A</td>
<td>Appear to be part of the original building eaves</td>
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<tr>
<td></td>
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<td>EB 638 CH, AM - Asbestos cement sheet ceiling lining</td>
<td>Internal: Room 005-124, rear of kitchen</td>
<td>N</td>
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<td>1</td>
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<td>5</td>
<td>A4</td>
<td>N/A</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>ENVI</td>
<td>CH, AM - Asbestos cement sheet infill panel</td>
<td>External: Cafeteria - on wall near transformer</td>
<td></td>
<td>N</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENVI</td>
<td>CH, AM - Asbestos cement sheet infill panels</td>
<td>External: Cafeteria entrance above door and north and south of door</td>
<td></td>
<td>N</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENVI</td>
<td>CH, AM - Asbestos cement sheet infill panels</td>
<td>External: Visitors Centre – either side of the main entrance</td>
<td></td>
<td>N</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>A4</td>
<td>N/A</td>
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Asbestos Materials Report  
Canberra Deep Space Communications Complex (CDSCC)

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results</th>
<th>Photo ID</th>
<th>Description</th>
<th>Location</th>
<th>Fiable</th>
<th>Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Exposure Potential</th>
<th>Maintenance Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m², m³)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Asbestos Detected (NAD)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>EB 627</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet infill panel</td>
<td>External: Between Rooms 005-138 &amp; 005-144 – above brickwork under the Pergola</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
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<tr>
<td>EB 628</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet fascia and gable panels</td>
<td>External: perimeter of Visitors centre (new section)</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
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<td>N/A</td>
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<tr>
<td>EB 629</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet eaves lining</td>
<td>External: perimeter of Visitors centre (new section) – upper &amp; lower eaves</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
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<tr>
<td>EB 635</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet wall linings</td>
<td>External: Services courtyard – small area between Tourist centre and toilet block</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Previously recorded ACM removed as at 2008 inspection**

| ENVI | CH-AM | -       | Formed-asbestos-cement eastings                                      | Internal: Kitchen - air extraction hoods over dishwasher and stoves          | 0      | 0             |              |                  |                   |                  | 0                       | Nil               | Not sighted during the 2008 inspection – presumed removed |
| ENVI | CH     | -       | Asbestos-cement-sheet infill-panels                                  | External: west side wall of dining room                                       | 0      | 0             |              |                  |                   |                  | 0                       | Nil               | As above            |            |        |                |                          |

**006 - Safety Technicians Workshop/Cleaners store**
No asbestos containing materials identified in accessible areas at the time of the inspection – Metal, brick, timber (door) and concrete construction

**007 - Garage / Storeroom**
No asbestos containing materials identified in accessible areas at the time of the inspection – Metal and concrete structure

**009 - Check Point/Guardhouse Office**
No asbestos containing materials identified in accessible areas at the time of the inspection – Constructed 1990
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results</th>
<th>Photo ID</th>
<th>Description</th>
<th>Location</th>
<th>Fiable</th>
<th>Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Exposure Potential</th>
<th>Maintenance Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td></td>
<td></td>
<td></td>
<td><strong>010 - River Pump Control Building</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>No asbestos containing materials identified in accessible areas at the time of the inspection – Metal, brick and concrete construction</td>
</tr>
<tr>
<td>013</td>
<td></td>
<td></td>
<td></td>
<td><strong>013 - Pump House</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Asbestos containing Materials</td>
</tr>
<tr>
<td>ENVI CH</td>
<td></td>
<td>-</td>
<td>Resinous backing board</td>
<td>External: south wall of building – metal</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td>Small section newer piece</td>
</tr>
<tr>
<td>ENVI Suspect ACM</td>
<td></td>
<td>-</td>
<td>Gaskets and gland packing</td>
<td>Concrete cylinder located at creek:</td>
<td>N</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td>A3</td>
<td>N/A</td>
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<tr>
<td>EB 624 CH</td>
<td></td>
<td>-</td>
<td>Asbestos cement sheet eaves lining</td>
<td>External: perimeter of building</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td>Small section newer piece</td>
</tr>
<tr>
<td>015</td>
<td></td>
<td></td>
<td></td>
<td><strong>015 High Power Transmitter Building</strong></td>
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<td></td>
<td>No asbestos containing materials identified in accessible areas at the time of the inspection – Metal, brick and concrete construction</td>
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<tr>
<td>016</td>
<td></td>
<td></td>
<td></td>
<td><strong>016 Chlorinator/Pump House</strong></td>
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<td></td>
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<td>No asbestos containing materials identified in accessible areas at the time of the inspection – Metal, brick, timber (door) and concrete construction</td>
</tr>
<tr>
<td>024</td>
<td></td>
<td></td>
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<td><strong>024 Complex Maintenance Facility</strong></td>
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<td>No Asbestos Detected (NAD)</td>
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<tr>
<td>EB 622 NAD</td>
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<td>-</td>
<td>Fibre cement sheet wall lining</td>
<td>Internal: male and female toilets</td>
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<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Nil</td>
<td>N/A</td>
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<tr>
<td>EB 623 NAD</td>
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<td>-</td>
<td>Fibre cement sheet eaves lining</td>
<td>External: south side - main entry</td>
<td>0</td>
<td>0</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVI NAD</td>
<td></td>
<td>-</td>
<td>Vinyl floor tiles (brown)</td>
<td>Internal: Room 101</td>
<td>0</td>
<td>0</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
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</tbody>
</table>
## Asbestos Materials Report
Canberra Deep Space Communications Complex (CDSCC)

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Results</th>
<th>Photo ID</th>
<th>Description</th>
<th>Location</th>
<th>Fibre</th>
<th>Asbestos Type</th>
<th>Product Type</th>
<th>Extent of Damage</th>
<th>Surface Treatment</th>
<th>Occupant Activity</th>
<th>Likelihood of Disturbance</th>
<th>Exposure Potential</th>
<th>Maintenance Activity</th>
<th>Risk Score</th>
<th>Action</th>
<th>Quantity (m²)</th>
<th>Comments</th>
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<tbody>
<tr>
<td>026</td>
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<td><strong>Asbestos containing Materials</strong></td>
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<td></td>
</tr>
<tr>
<td>ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet eaves lining</td>
<td>External: perimeter of building</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>A4</td>
<td>N/A</td>
<td></td>
<td>Includes porch ceiling</td>
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<tr>
<td>ENVI</td>
<td>CH</td>
<td>-</td>
<td>Asbestos cement sheet ceiling lining</td>
<td>Internal: cleaners store</td>
<td>N</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>A4</td>
<td>N/A</td>
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<tr>
<td><strong>No Asbestos Detected (NAD)</strong></td>
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<tr>
<td>EB 625</td>
<td>NAD</td>
<td>-</td>
<td>Sound proof membrane</td>
<td>Internal: Room 106 – dampener pad beneath sink</td>
<td>0</td>
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<td></td>
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<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVI</td>
<td>NAD</td>
<td>-</td>
<td>Vinyl floor tiles</td>
<td>Internal: Kitchen &amp; lunchroom (Room 207)</td>
<td>0</td>
<td>0</td>
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<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
<td></td>
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<tr>
<td>027</td>
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<td><strong>No Asbestos Detected (NAD)</strong></td>
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</tr>
<tr>
<td>EB 606</td>
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<td>-</td>
<td>Fibre cement sheet wall lining</td>
<td>Internal: Room 114</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
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<td>N/A</td>
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<tr>
<td>EB 607</td>
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<td>-</td>
<td>Fibre cement sheet wall lining</td>
<td>Internal: Throughout building</td>
<td>0</td>
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<tr>
<td>EB 618</td>
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<td>-</td>
<td>Fibre cement sheet wall lining</td>
<td>Internal: Kitchen and cleaners store</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
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<tr>
<td>EB 619</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet infill panels</td>
<td>External: east and south sides of the building</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EB 620</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet wall cladding</td>
<td>External: Gardener’s office</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nil</td>
<td>N/A</td>
<td></td>
<td></td>
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<td>Sample No.</td>
<td>Results</td>
<td>Photo ID</td>
<td>Description</td>
<td>Location</td>
<td>Frangible</td>
<td>Asbestos Type</td>
<td>Product Type</td>
<td>Surface Treatment</td>
<td>Occupant Activity</td>
<td>Likelihood of Disturbance</td>
<td>Exposure Potential</td>
<td>Maintenance Activity</td>
<td>Risk Score</td>
<td>Action</td>
<td>Quantity (m.³, m²)</td>
<td>Comments</td>
<td></td>
</tr>
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<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>EB 621</td>
<td>NAD</td>
<td>-</td>
<td>Fibre cement sheet ceiling lining</td>
<td>External: High voltage enclosure</td>
<td>0</td>
<td>0</td>
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<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Nid</td>
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</tr>
</tbody>
</table>

**033 Antenna Support Services Building (DSS46)**

No asbestos containing materials identified in accessible areas at the time of the inspection – Constructed 1989

*No Asbestos Detected (NAD)*

| ENVII     | NAD     | -       | Fibre cement sheeting                            | External: adjacent door 224                        | 0         | 0             |              |                  |                      |                        | 0                    | Nid                  | N/A       |        |                   |                                                                 |

**042 Grts S Band Antenna Shelter**

No asbestos containing materials identified in accessible areas at the time of the inspection – Constructed 1993

**043 Grts Ku Band Antenna Shelter**

No asbestos containing materials identified in accessible areas at the time of the inspection – Constructed 1993

**044 Carport (Outside Visitors Centre)**

No asbestos containing materials identified in accessible areas at the time of the inspection – Metal and concrete structure

**049 Training Room**

No asbestos containing materials identified in accessible areas at the time of the inspection – Constructed 1997

**052 Heavy Vehicle Workshop**

No asbestos containing materials identified in accessible areas at the time of the inspection – Constructed 2000

**ST18 - 26m Antenna DSS46**

| *ENVII    | NAD     | -       | Insulation material                              | Internal: Cone                                     | 0         | 0             |              |                  |                      |                        | 0                    | Nid                  | N/A       |        |                   |                                                                 |

No asbestos containing materials identified during the previous surveys – No access to this area during the 2008 inspection – unit was in operation
3.2 No Access Areas

The following areas were not accessible on the day of the inspection:

- Confined space (e.g. Building 001 - beneath the AC Plantroom); and
- All High Voltage plant and equipment
4 GLOSSARY

Coffey Environments adopt the following material and location assessment algorithms in order to assess the risks associated with individual asbestos containing materials located;

**Friable**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friable</td>
<td>Y</td>
<td>Asbestos cement debris, or material which when dry may become crumbled, pulverised or reduced to powder by hand pressure.</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>Bonded i.e. non-friable material</td>
</tr>
</tbody>
</table>

**Materials Assessment**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Scores</th>
<th>Examples of Score Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos Type</td>
<td>0</td>
<td>No asbestos</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Chrysotile only</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Amphibole asbestos (excluding crocidolite)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Crocidolite</td>
</tr>
<tr>
<td>Product Type</td>
<td>0</td>
<td>No asbestos detected</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Bonded asbestos in good condition</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Friable asbestos in good condition or cement in poor condition</td>
</tr>
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<td></td>
<td>3</td>
<td>Friable asbestos in poor condition</td>
</tr>
<tr>
<td>Extent of Damage</td>
<td>0</td>
<td>No visible damage</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Minor scratches or mark, broken edges</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Significant breakage, many small areas of damage to friable material</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>High damage, visible debris</td>
</tr>
<tr>
<td>Surface Treatment</td>
<td>0</td>
<td>Bonded Asbestos including encapsulated asbestos cement</td>
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<tr>
<td></td>
<td>1</td>
<td>Enclosed laggings, sprays and boards or bare cement</td>
</tr>
<tr>
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<td>2</td>
<td>Bare board or encapsulated lagging/spray or cement debris</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Unsealed lagging/spray</td>
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</table>
## Location Assessment

<table>
<thead>
<tr>
<th>Variables</th>
<th>Scores</th>
<th>Examples of Score Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Occupant Activity</strong></td>
<td>0</td>
<td>Rare disturbance, e.g. little used store room</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Low disturbance, e.g. Office type activity</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Periodic disturbance, e.g. industrial or vehicular activity which may contact ACMs</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>High levels of disturbance e.g. fire door with AIB sheet in constant use</td>
</tr>
<tr>
<td><strong>Likelihood of Disturbance</strong></td>
<td>0</td>
<td>Usually inaccessible or unlikely to be disturbed</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Minimal likelihood for disturbance</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Likely disturbance</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Frequent disturbance</td>
</tr>
<tr>
<td><strong>Human Exposure Potential</strong></td>
<td>0</td>
<td>Infrequent</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Daily</td>
</tr>
<tr>
<td><strong>Maintenance Activity</strong></td>
<td>0</td>
<td>Minor disturbance (e.g. possibility of contact when gaining access)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Low Disturbance (e.g. changing light bulbs in AIB ceiling).</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Medium disturbance (e.g. lifting one or two ceiling tiles to access a valve)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>High level of disturbance (e.g. moving a number of AIB ceiling tiles to replace a valve or for re-cabling)</td>
</tr>
</tbody>
</table>
Risk Score

The asbestos containing material risk score is a quantitative assessment determined by the sum of the scores based on the Materials and Location Assessments; i.e. Risk score = Material Score + Location Score (out of as possible 24).

Should no asbestos be detected then the register will indicate a risk score of 0.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scores</th>
<th>Examples of Score Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Score</td>
<td>0 - 6</td>
<td>Very Low Risk - Action Score A4</td>
</tr>
<tr>
<td></td>
<td>7 - 12</td>
<td>Low Risk – Action Score A3</td>
</tr>
<tr>
<td></td>
<td>13 - 18</td>
<td>Medium Risk – Action Score A2</td>
</tr>
<tr>
<td></td>
<td>19 - 24</td>
<td>High Risk – Action Score A1</td>
</tr>
</tbody>
</table>

Following the assessment for asbestos containing materials an action score is assigned as follows:

**Action**

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td><strong>Restrict access and remove</strong></td>
</tr>
<tr>
<td></td>
<td>As a guide, the material conforms to one, or more, of the following:</td>
</tr>
<tr>
<td></td>
<td>Friable or poorly bonded to substrate, located in accessible areas</td>
</tr>
<tr>
<td></td>
<td>Severely water damaged, or unstable</td>
</tr>
<tr>
<td></td>
<td>Further damage or deterioration likely</td>
</tr>
<tr>
<td></td>
<td>Friable asbestos material located in air conditioning ducting</td>
</tr>
<tr>
<td></td>
<td>Asbestos debris and stored asbestos in reasonably accessible areas</td>
</tr>
<tr>
<td>A2</td>
<td><strong>Enclose, encapsulate or seal – Reinspect Periodically</strong></td>
</tr>
<tr>
<td></td>
<td>As a guide, the material conforms to one, or more, of the following:</td>
</tr>
<tr>
<td></td>
<td>Damaged material</td>
</tr>
<tr>
<td></td>
<td>In reasonably accessible area</td>
</tr>
<tr>
<td></td>
<td>Friable material or poorly bonded to substrate, with bonding achievable</td>
</tr>
<tr>
<td></td>
<td>Possibility of disturbance through contact</td>
</tr>
<tr>
<td></td>
<td>Possibility of deterioration caused by weathering</td>
</tr>
<tr>
<td>A3</td>
<td><strong>Remove during refurbishment or maintenance – Reinspect Periodically</strong></td>
</tr>
<tr>
<td></td>
<td>As a guide, the material conforms to one, or more, of the following:</td>
</tr>
<tr>
<td></td>
<td>Asbestos debris or stored material in rarely accessed areas</td>
</tr>
<tr>
<td></td>
<td>Further disturbance or damage unlikely other than during maintenance or service</td>
</tr>
<tr>
<td></td>
<td>Readily visible for further assessment</td>
</tr>
<tr>
<td></td>
<td>Asbestos friction materials, gaskets and brake linings</td>
</tr>
<tr>
<td>A4</td>
<td>Action 4</td>
</tr>
<tr>
<td>----</td>
<td>---------</td>
</tr>
<tr>
<td><strong>No remedial action – Reinspect Periodically</strong></td>
<td></td>
</tr>
<tr>
<td>As a guide, the material conforms to one, or more, of the following:</td>
<td></td>
</tr>
<tr>
<td>Firmly bonded to substrate and readily visible for inspection</td>
<td></td>
</tr>
<tr>
<td>Inaccessible and fully contained</td>
<td></td>
</tr>
<tr>
<td>Stable and damage unlikely</td>
<td></td>
</tr>
</tbody>
</table>

**Acronyms**

<table>
<thead>
<tr>
<th>NOHSC</th>
<th>National Occupational Health and Safety Commission</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATA</td>
<td>National Association of Testing Authorities, Australia</td>
</tr>
<tr>
<td>A/C</td>
<td>Air Conditioning</td>
</tr>
<tr>
<td>F/C</td>
<td>Fibre Cement</td>
</tr>
<tr>
<td>PLM</td>
<td>Polarised Light Microscopy</td>
</tr>
<tr>
<td>SEM</td>
<td>Scanning Electron Microscopy</td>
</tr>
<tr>
<td>EDAX</td>
<td>Energy Dispersive X-ray Analysis</td>
</tr>
<tr>
<td>ACM</td>
<td>Asbestos containing material</td>
</tr>
<tr>
<td>CH</td>
<td>Chrysotile Asbestos</td>
</tr>
<tr>
<td>CR</td>
<td>Crocidolite Asbestos</td>
</tr>
<tr>
<td>AM</td>
<td>Amosite Asbestos</td>
</tr>
<tr>
<td>NAD</td>
<td>No Asbestos Detected</td>
</tr>
<tr>
<td><strong>ENVI</strong></td>
<td>Samples referenced from Envirosiences Pty Ltd report - Ove Arup &amp; Partners – Asbestos Survey KM:os E544</td>
</tr>
</tbody>
</table>
5 RECOMMENDATIONS

5.1 Asbestos Materials Identified

The recommendations, conclusions or stability of asbestos materials contained in this report shall not abrogate a person of their responsibility to work in accordance with Statutory Requirements, Codes of Practice, Guidelines, Material Safety Data Sheets, Work Instructions or reasonable work practices.

5.1.1 Friable & Bonded Asbestos

Asbestos containing materials (ACM) are referred to as either friable or bonded. Friable asbestos is in the form of a powder, or can be crumbled, pulverized or reduced to powder by hand pressure when dry. **Friable asbestos** includes materials such as sprayed and thermal insulation, pipe lagging and millboard, and can release fibres with only minimal disturbance.

**Bonded asbestos** products are ones in which the asbestos fibres are bound within the matrix of the material. Bonded asbestos is difficult to damage or cause the release of fibres by hand and includes materials such as asbestos cement sheeting (fibre cement or fibro), vinyl floor tiles and zelemite electrical switchboards. However, bonded asbestos containing materials that have been subjected to weathering, physical damage, water damage, fire or other conditions may contain exposed fibres which could be released upon disturbance.

5.1.2 Control Measures

**Asbestos**

Friable ACM exhibits the greatest risk to human health as fibres are released upon minimal disturbance. As such removal and replacement would be the preferred option if such materials were found in accessible areas or air conditioning systems.

Alternatively removal and replacement may not be the preferred option for bonded ACM in a good and stable condition as the risk associated with removal could be high (as in the case of only partial demolition of structures on site).

The selection of the most appropriate control measure should be determined from risk assessments and detailed knowledge of the workplace and activities. The following general principles may be applied:

If the ACM is friable, in a poor/unstable condition and accessible with risk to health from exposure, immediate access restrictions should be applied and removal is required as soon as practicable using a licensed removalist.

If the ACM is friable and accessible but in a stable condition, removal is preferred. However, if removal is not immediately practicable, short-term control measures (i.e. restrict access, sealing, enclosure etc) may be employed until removal can be facilitated.

If the ACM is bonded and in a poor/unstable condition; minimising disturbance and removal or encapsulation may be appropriate controls.

For bonded ACM's in a good and stable condition, ongoing maintenance and periodic inspection would be appropriate controls.
Asbestos Materials Report
Canberra Deep Space Communications Complex (CDSCC)

Any remaining identified ACM’s or presumptions should be appropriately labelled, where possible, and regularly inspected to ensure they are not deteriorating resulting in a potential risk to health.

Prior to any demolition, partial demolition, renovation or refurbishment, asbestos containing materials likely to be disturbed by those works should be removed in accordance with the NOHSC Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC:2002 (2005)].

Further assessment of risk through airborne fibre monitoring can assist with decisions on the most appropriate, and urgency of, control measures.

Other control measures such as training and communication strategies, control of contractors and administrative procedures must be considered as part of the overall Asbestos Management Plan.
6 STATEMENT OF LIMITATIONS

Coffey Environments has conducted work concerning the environmental status of the property which is the subject of this report, and has prepared this report on the basis of that assessment.

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed, within the time and budgetary requirements of the client, and in reliance on certain data and information made available to Coffey Environments. The analyses, evaluations, opinions and conclusions presented in this report are based on those instructions, requirements, data or information, and they could change if such instructions etc. are in fact inaccurate or incomplete.

Investigations have been based on inspections conducted in accordance with relevant guidelines and standards, and normal industry practice, having regard to the client instructions, and interpretations of conditions are based on the data from those inspections and, where relevant and conducted, testing. To the best of our knowledge, they represent a reasonable interpretation of the condition of the site as able to be inspected. However there can be no guarantee that conditions at specific points not able to be inspected do not vary from the interpreted conditions based on the available observations/data.

In order to determine actual environmental conditions at specific intermediate points away from those observed/tested to date, those specific points would need to be inspected/tested.

It is also noted that sub-surface conditions can change with time, and the report is based on data that was gathered at the time of the report. Coffey Environments will not update the report and has not taken into account events occurring after the time its assessment was conducted.

This inspection and report does not include the following areas:

- Beneath building;
- Roof of building; and
- Removal of fittings e.g. kitchen or bathroom cupboards

Internal building materials should be assumed to contain asbestos and lead-based paint, and any fluorescent lights inside the buildings should be assumed to contain PCB capacitors until otherwise assessed.

Subsurface drains and pipes may be constructed of asbestos cement but this could not be assessed. Any subsurface pipes, particularly those constructed of fibro-cement or concrete, should be assumed to contain asbestos until otherwise assessed.

This report has been provided by Coffey Environments for the sole use of the client and only for the purpose for which it was prepared. Any representation contained in the report is made only for the client.

Asbestos Compliance Survey

Assessments that are effectively Compliance Surveys are non-destructive and as such are not intended for use or referral for the purpose of demolition, refurbishment, renovations or structural alterations. In the event of future demolition, refurbishment, renovation or structural alterations further investigation, which may entail destructive testing, shall be required.
No inspection can be guaranteed to locate all asbestos in a specific location. The assessment cannot be regarded as absolute, without extensive invasion of structures. Future demolition and or renovation to site structures may expose situations, which were concealed or otherwise impractical to access during this assessment.

Coffey Environments assessors take samples at any situations known, or suspected, to contain Asbestos. Where the analysis determines that No Asbestos is Detected (NAD) the samples are listed in the report to provide information for future assessments.

Where no samples are taken the situation is considered "asbestos free". This assessment is based on the knowledge and experience of Coffey Environments Assessors, or on research conducted by Coffey Environments.

Representative sampling is defined as one like sample per consistent material type, situation or item. In these instances only one test sample will be collected for analytical confirmation and the results expressed as consistent and typical of the building.

Due to the very low concentration of asbestos fibres and the non-homogenous matrix of vinyl floor tiles, false negative results may be obtained. Therefore the accuracy of all results cannot be guaranteed.

Notably, with some asbestos containing bulk material it can be very difficult, or impossible to detect the presence of asbestos using the polarised light microscopy analytical method, even after ashing or disintegration of samples. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or attributed to the fact that, very fine fibres have been distributed individually throughout the materials.

The analysis of many asbestos products used as a component of insulation materials, may be compromised in instances where the material has been heat affected, as heat may alter the morphology of the fibrous material.

The Client must not rely on an inspection or report as indicating that a site or a building is "asbestos free". All that the report can be relied upon to show is that no asbestos was found (or that only such asbestos was found as was reported to be found) in the course of the inspection. The findings of the report must be considered together with the specific scope and limitations of the type of inspection undertaken.

Coffey Environments Pty Ltd
7 BIBLIOGRAPHY


Health and Safety Laboratory UK - Methods for the Determination of Hazardous Substances (MDHS) 100 Surveying, sampling and assessment of asbestos-containing materials 2001


ACT Legislation

Dangerous Substances Act 2004

Dangerous Substances (General) Regulation 2007,
Appendix A
Photographs

Asbestos Materials Report
Canberra Deep Space Communications Complex (CDSCC)
Photograph 1: Building 001: Male toilets - asbestos infill panel above.

Photograph 2: Building 001: Asbestos eaves lining to the admin section of the building.

Photograph 3: Building 002: Transformer compound - Woven insulation to cable from electrical box.

Photograph 4: Building 002: 'A' Station - west wall infill panels in the metal casing.

Photograph 5: Building 002: 'A' Station - emergency generator motors, asbestos manifold gaskets.

Photograph 6: Building 002: 'A' Station - emergency generator room, asbestos electrical mounting board.

Photograph 8: Building 002: "A' Station Main Control – asbestos electrical control board switching gear.

Photograph 9: ST2 70m Antenna: 'Ground Floor, Plant Room 101 – asbestos lining to inline heater.

Photograph 10: ST2 70m Antenna: 'Ground Floor, Plant Room 101 – asbestos sealant to AC duct flanges.

Photograph 11: ST2 70m Antenna: 'Adilade Level, High Pressure Room 305 – asbestos gaskets in box.

Photograph 12: Building 005: asbestos eaves to the east side of original kitchen.
Appendix B
Legislative Requirements

Asbestos Materials Report
Canberra Deep Space Communications Complex (CDSCC)
**LEGISLATIVE REQUIREMENTS — ASBESTOS**

This document has been produced for information only and is under regular review due to frequent changes in legislation and guidance. It contains information relating to the column headings only and not, for instance, in relation to asbestos removal. It is the duty of employers, premise owners and controllers of premises etc to ensure they are familiar with the latest applicable state legislation and guidance.

<table>
<thead>
<tr>
<th>STATE Primary Asbestos Legislation</th>
<th>Asbestos Survey Requirements</th>
<th>Asbestos Resurvey Requirements</th>
<th>Reporting Requirements</th>
<th>Labelling/Signage Requirements</th>
<th>Other Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMONWEALTH Occupational Health and Safety (Commonwealth Employment) Act 1991 Occupational health and Safety (Safety Standards) Regulations 1994 Occupational Health and Safety Act 2000</td>
<td>All asbestos surveys are to be conducted in accordance Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)] and in accordance with the relevant State or Territory Legislation.</td>
<td>Re-inspections are required at a maximum of 1 year depending on risk. All asbestos re-surveys are to be conducted in accordance Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)].</td>
<td>Asbestos register to contain details of the type, location and condition asbestos materials plus any action taken to control ACM plus relevant details. All reporting requirements are to be conducted in accordance Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)].</td>
<td>All identified asbestos in a building or other structure should be labelled so that it is clearly visible to persons using the area, until it is finally removed. All labelling/signage requirements are to be conducted in accordance Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018(2005)].</td>
<td></td>
</tr>
</tbody>
</table>
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<thead>
<tr>
<th>STATE</th>
<th>Asbestos Survey Requirements</th>
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<th>Reporting Requirements</th>
<th>Labelling/Signage Requirements</th>
<th>Other Requirements</th>
</tr>
</thead>
</table>
| NEW SOUTH WALES | Controller of work premises responsibility  
Occupational Health and Safety Act 2000  
Occupational Health and safety Regulation 2001 | Not specified in OHS Regulation. Under National Asbestos Code of Practice [NOHSC: 2002 (1988)] the register shall be regularly updated. Re-inspections between 1 and 3 years depending on risk. | Asbestos register to contain details of the type, location and condition asbestos materials plus any action taken to control ACM plus relevant details. | Not specified in OHS Regulation. Under National Asbestos Code of Practice [NOHSC: 2002 (1988)]. All identified asbestos in a building or other structure should be labelled so that it is clearly visible to persons using the area, until it is finally removed. | Regulation states that controller of premises must ensure that risk assessment and controls to be in accordance with NOHSC:2002(1988). Current policy reflects observance of the most recent publication in relation to working with asbestos i.e. (NOHSC:2018(2005))] |
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<table>
<thead>
<tr>
<th>State</th>
<th>Primary Asbestos Legislation</th>
<th>Asbestos Survey Requirements</th>
<th>Asbestos Resurvey Requirements</th>
<th>Reporting Requirements</th>
<th>Labelling/Signage Requirements</th>
<th>Other Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>VICTORIA</td>
<td>Occupational Health &amp; Safety Act 2004 Occupational Health and Safety (Asbestos) Regulations 2003</td>
<td>Occupier’s responsibility to determine whether asbestos is present and if so identify the type, location, friability and condition of ACM. Also to conduct risk assessment on the basis of the above plus likely disturbances.</td>
<td>Undertake review and revision of risk assessment when condition of asbestos changes, remedial work has been carried out or the assessment is no longer valid. Maximum review timeframe is 5 years.</td>
<td>Reports must include the type, location, friability &amp; condition of asbestos, Identification of inaccessible areas and risk assessment including dates.</td>
<td>The regulations require that the presence and location of asbestos is clearly identified, and that where practicable, the identification is by labelling.</td>
<td></td>
</tr>
<tr>
<td>TASMANIA</td>
<td>Workplace Health &amp; Safety Act 1995. Workplace Health and Safety Regulations 1998</td>
<td>Reasonable steps to be taken to identify the presence of any asbestos. Then carry out a risk assessment on potential exposure to airborne asbestos fibres.</td>
<td>Regularly inspect any asbestos identified to ensure that it does not deteriorate or constitute a health risk, and record the date and findings of each inspection in the register.</td>
<td>Maintain a register in relation to asbestos identified and findings of each inspection in the register and make the register available.</td>
<td>In any area building, structure or mine containing asbestos &amp; regular maintenance or repair work is likely; provide and fix signs or labels to alert those persons of the location of the asbestos and any precautions that should be taken.</td>
<td></td>
</tr>
</tbody>
</table>
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<thead>
<tr>
<th>STATE</th>
<th>Primary Asbestos Legislation</th>
<th>Asbestos Survey Requirements</th>
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<th>Labelling/Signage Requirements</th>
<th>Other Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUSTRALIAN CAPITAL TERRITORY</td>
<td>Occupational Health and Safety Act 1989</td>
<td>Not legislated specifically. However compliance with employers duty under 1989 Act to ensure people are not exposed to risk is measured against relevant codes of practice i.e.: NOHSC:2018(2005); Identify ACM and create a register.</td>
<td>None stipulated in legislation. Annual review of register and management plan under NOHSC:2018(2005). A visual inspection of ACM should be undertaken as part of any review</td>
<td>None stipulated in legislation. Under NOHSC:2018(2005): Maintain a register on the premises which includes date of assessment, location &amp; types of asbestos, analysis, risk assessments, control measures, and details of competent person who undertook the assessment. Details of presumptions made and likely asbestos in inaccessible areas to be included</td>
<td>None stipulated in legislation. Under NOHSC:2018(2005): Warning signs &amp; labels to be used in conjunction with the workplace register to warn people of the presence of ACM. Competent person to determine number and position of labels. Areas containing ACM to be signposted.</td>
<td>Regulatory regime for management of asbestos is currently under review by the ACT Taskforce.</td>
</tr>
</tbody>
</table>

Coffey Environments
ENVICANB00135AA-R.01 4June08
LEGISLATIVE REQUIREMENTS — ASBESTOS

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</tr>
</thead>
<tbody>
<tr>
<td>QUEENSLAND Workplace Health &amp; Safety Act 1995 Workplace Health &amp; Safety Regs 1997 From 01.01.2008 or immediately if not previously compliant</td>
<td>Building Owner Responsibility. All workplaces built before 1990 require register of ‘Asbestos Materials’ before 31 Oct 2004 or before being dismantled, demolished, sold or leased.</td>
<td>Annual Reinspection for Asbestos Materials * Or earlier if the nature or location of the works in the vicinity of the asbestos materials changes.</td>
<td>Report must state the location, type and form of asbestos materials. Also whether the asbestos material is friable or poorly bonded or in an unstable condition. Plus any potential health risks to occupants of the building because of the presence of asbestos materials.</td>
<td>All buildings with asbestos materials must have a notice in a prominent place in the building stating there is an asbestos register and where it can be viewed.</td>
<td>* Asbestos Materials defined as installed thermal or acoustic insulation containing asbestos, in the ‘97 Regs.</td>
</tr>
</tbody>
</table>

Develop & implement an asbestos management plan.
**LEGISLATIVE REQUIREMENTS — ASBESTOS**

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<th>Other Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>WESTERN AUSTRALIA WA Occupational Safety and Health Act 1984 WA occupational Health and Safety Regulations 1996</td>
<td>Employer, main contractor, self-employed person or person having control of the workplace to ensure that presence and location of asbestos at the workplace is identified. The process of identification and assessment of risks arising from asbestos hazards are to be conducted in accordance with the Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)].</td>
<td>Annual review of register and management plan under NOHSC: 2018(2005). A visual inspection of ACM should be undertaken as part of any review</td>
<td>Under NOHSC:2018(2005): Maintain a register on the premises which includes date of assessment, location &amp; types of asbestos, analysis, risk assessments, control measures, and details of competent person who undertook the assessment. Details of presumptions made and likely asbestos in inaccessible areas to be included</td>
<td>Under NOHSC:2018(2005): Warning signs &amp; labels to be used in conjunction with the workplace register to warn people of the presence of ACM. Competent person to determine number and position of labels. Areas containing ACM to be signposted.</td>
<td>Health (Asbestos) Regulations 1992</td>
</tr>
</tbody>
</table>
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<th>Asbestos Resurvey Requirements</th>
<th>Reporting Requirements</th>
<th>Labelling/Signage Requirements</th>
<th>Other Requirements</th>
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<tr>
<td>NORTHERN TERRITORY</td>
<td>Work Health Act &amp; Regulations (Adopted NOHSC Codes of Practice)</td>
<td>Employer, main contractor, self-employed person or person having control of the workplace to ensure that presence and location of asbestos at the workplace is identified. The process of identification and assessment of risks arising from asbestos hazards are to be conducted in accordance with the Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)].</td>
<td>Annual review of register and management plan under NOHSC: 2018(2005). A visual inspection of ACM should be undertaken as part of any review</td>
<td>Under NOHSC:2018(2005): Maintain a register on the premises which includes date of assessment, location &amp; types of asbestos, analysis, risk assessments, control measures, and details of competent person who undertook the assessment. Details of presumptions made and likely asbestos in inaccessible areas to be included</td>
<td>Under NOHSC:2018(2005): Warning signs &amp; labels to be used in conjunction with the workplace register to warn people of the presence of ACM. Competent person to determine number and position of labels. Areas containing ACM to be signposted.</td>
<td>NOHSC:2018(2005) adopted by NT as an Approved Code of Practice (also NOHSC 2002 and 3003)</td>
</tr>
</tbody>
</table>

Coffey Environments
ENVI/ICAN800135AA-R.01 4 June 08
Appendix C
Certificate(s) of Analysis

Asbestos Materials Report
Canberra Deep Space Communications Complex (CDSCC)
Analytical Report

Job No: 081533
Client: Coffey Environments
Address: 2/54 Northbourne Avenue
Canberra
ACT 2069

Contact: Frank Poole
E-mail: Frank_poole@coffe.com
Fax: 02 6260 7157
Client Reference: ENVICANB00135AA
Date Sampled: Unknown
Date Received: 12/03/2008
Date Reported: 17/03/2008
Sampled By: R Munday
Location: Canberras Deep Space Communication Centre

Test Method: Qualitative identification of asbestos types in bulk samples by polarised light microscopy, including dispersion staining technique using MPL Laboratories Method WILAB 1. Accreditation does not cover the identification of Synthetic Mineral Fibres.

Approved Identifier
Emma Rowe

Approved Signatory
Monika Burger

This document is issued in accordance with NATA's accreditation requirements. AN: 2220

Document may not be reproduced except in full.

Date Printed 17/03/2008
Page 1 of 5
## Analytical Report

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<thead>
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Date Printed: 17/03/2008
## Analytical Report

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Page 3 of 5
Date Printed: 17/03/2008
## Analytical Report

**Job No:** 081533

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<th>Dimensions</th>
<th>Result</th>
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<td>Fibre Cement</td>
<td>70x30x3mm</td>
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<td>081533-042</td>
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<td>Fibre Cement</td>
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<td>Chrys, Amos</td>
</tr>
</tbody>
</table>
Analytical Report

Job No.: 081533

Report Comments

Key to results on previous pages:
NAD = No Asbestos Detected
Chrys = Chrysotile Asbestos Detected
Amos = Amosite Asbestos Detected
Croc = Crocidolite Asbestos Detected
SMF = Fibres Consistent with Synthetic Mineral Fibres
UMF = Unknown Mineral Fibres Detected

FIM = Fibrous Insulation Material
EMB = Electrical Mounting Board

Result Comments
+  No asbestos detected by polarised light microscopy including dispersion staining. Further confirmation by another independent analytical technique is advised due to the nature of the sample.
CSIRO NOTIFIABLE INCIDENT INVESTIGATION REPORT

INCIDENT DETAILS
Division: CASS
Date of Incident: 28 September 2011
Investigated by: John Phillips / Garry Smee

Site: Canberra Deep Space Communication Complex
Incident title: Caterpillar D399 Diesel Engine – ACM Water Pump Gasket
Date of Investigation: 2 November 2011

BRIEF SUMMARY OF INCIDENT:
A diesel engine water pump gasket replaced during maintenance was later suspected and confirmed as asbestos containing material (ACM). Both the replaced and new replacement gaskets were tested by the ACT Government analytical Laboratory and confirmed as ACM.

EVENTS LEADING UP TO THE INCIDENT:
While performing routine maintenance on a Caterpillar D399 750KW diesel generating set, the cooling water pump gasket was replaced. The gasket was later tested and confirmed as containing asbestos.

THE INCIDENT:
[DELETION], was mechanically abrading an old gasket off the water pump inlet fitted to a CDSSC B-Station 750KW Diesel Generator powered by a Caterpillar D399 diesel engine.

After completing the task, he suspected the gasket may be asbestos containing material (ACM) and reported this to the site HSE Officer and provided a remnant sample of the old gasket material and a sample ex-stock replacement gasket for ACM testing. He advised that he was wearing a disposable dust mask at the time.

The site HSE Officer sent the samples to the ACT Health Protection Laboratory for testing. They provided a written report that indicated the presence of asbestos.

IMMEDIATE ACTIONS:
Notified maintenance to stop any repair work on diesel engines until further notice; all concurrent Caterpillar spare gaskets held by CDSSC Logistics were quarantined and later disposed of.

JPL, GDSSC and MDSSC (sister facilities in Goldstone, USA and Madrid, Spain) were advised of the ACM. MDSSC has undertaken selected sampling and laboratory analysis of other Caterpillar D399 gaskets and have confirmed the presence of ACM.

INVESTIGATION:
It was found that many old gaskets held in stores could potentially contain asbestos. Gaskets were either old or not adequately labelled. Recent engine rebuilds had sourced gaskets directly from CAT (advisedly) and those issued in the last 20 years would not contain asbestos. All gaskets on existing engines will be treated as if containing asbestos but the likelihood is low.

Many staff onsite had worked on the engines over a long period of time, and a number of staff have worked in the Logistics area where the gaskets were stored. At the request of the site HSE Officer a list of potentially effected staff was created.

[DELETION], was provided written confirmation of his exposure as per Commonwealth Occupational Health and Safety (Safety Standards) Regulations 1994 (the Regulations).

Other CSIRO Officers who potentially had worked on the Caterpillar D399 diesel engines have been notified by letter per the regulations. Other officers potentially exposed have been listed in the SAP incident report, although this is not an exhaustive list of all CSIRO Officers who may have been exposed to ACM at CDSSC.

Note this notifiable incident investigation report only relates to potential or actual exposure to ACM in the Caterpillar D399 diesel engine water pump gasket.
RECOMMENDATIONS

SHORT TERM:
- Display asbestos awareness signage on entry to powerhouse. Completed early 2011 as part of a separate project.
- Remove remainder unidentified or suspect ACM gaskets from CDSCC Logistic stores.
- Notify maintenance staff working on engines of possibility of asbestos gaskets.
- Create list of current CSIRO Officers at CDSCC who may have been exposed to Caterpillar D399 diesel engine for inclusion to the SAP incident notification.
- Audit remainder of stores on site for asbestos containing materials.
- Further training and awareness is required for technicians working on engines in the powerhouse, and especially on precautions to take in dealing with gasket removal.

LONG TERM:
- Update HSE-RMP for powerhouse and Caterpillar D399 diesel engines (there is other known ACM in the powerhouse and potentially unknown and unidentified ACM).
- Modify CSIRO asbestos management procedure to accommodate the removal of low risk non friable asbestos materials.

RISK OUTCOMES
The risk to staff from asbestos exposure will be reduced as a result of this incident through the removal of old gaskets and precautions to be taken on future engine work.

LEARNING OUTCOMES
Individuals must consult with supervisors and other relevant staff on accepted safe work practices where risk is present.

Senior Investigating Officer:  
John Phillips

Signature:  
Date:

Divisional Chief/Site Manager:

Signature:  
Date:

Comments:
Garry Smee
Raytheon Australia PTY Ltd
PO Box 1035
Tuggeranong ACT 2901

Dear Sir/Madam,

The submitted sample has been analysed microscopically and is reported as follows:

**Laboratory Number:**  F03/0117  
**Sample Description:**  DSS43 Brake Pad  
**Sample Location:**  Canb Deep Space Communication Complex  
**Submission Date:**  6/11/03

**Results**

No fibres detected  
No asbestos was found in the sample

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)

[Signature]

Analyst
Garry Smee  
Raytheon Australia P/L  
PO Box 1035  
Tuggeranong ACT 2901  

Dear Sir/Madam,

The submitted samples have been analysed microscopically and are reported as follows:

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<th>Laboratory Number:</th>
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<tbody>
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<td>Submission Date:</td>
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</tr>
<tr>
<td>Sample Description:</td>
<td>3 x Floor tile samples</td>
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<tr>
<td>Sample Location:</td>
<td>Canberra Deep Space Communication Comple</td>
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<table>
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<tr>
<th>Sample Description</th>
<th>Identified Fibre</th>
<th>Asbestos Present or Absent</th>
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</thead>
<tbody>
<tr>
<td>Power Hse Control Rm Outside Toilet</td>
<td>No fibres detected</td>
<td>No asbestos was found in the sample</td>
</tr>
<tr>
<td>Logistics behind office area</td>
<td>No fibres detected</td>
<td>No asbestos was found in the sample</td>
</tr>
<tr>
<td>Logistics sq tile near main compactus</td>
<td>No fibres detected</td>
<td>No asbestos was found in the sample</td>
</tr>
</tbody>
</table>

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)

Analyst ____________________________

5/12/03
Garry Smee  
Raytheon Australia P/L  
PO Box 1035  
Tuggeranong ACT 2901

Dear Sir/Madam,

The submitted samples have been analysed microscopically and are reported as follows:

**Laboratory Number:** E04/0016  
**Submission Date:** 4/02/04

**Sample Description:** 3 samples  
**Sample Location:** Canb Deep Space Communication Complex

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Identified Fibre</th>
<th>Asbestos Present or Absent</th>
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</thead>
<tbody>
<tr>
<td>DSS43 Mezzanine Supervisors Office 3/1/0</td>
<td>No fibres detected</td>
<td>No asbestos was found in the sample</td>
</tr>
<tr>
<td>DSS43 Mezzanine Lobby adj cable tray</td>
<td>Cellulose</td>
<td>No asbestos was found in the sample</td>
</tr>
<tr>
<td>CO2 Pwr Hse Eave Eastside O/S Maximo dr</td>
<td>Chrysotile - white asbestos</td>
<td>The sample contains asbestos</td>
</tr>
</tbody>
</table>

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)

Analyst ____________________________
Garry Smee  
Raytheon Australia P/L  
PO Box 1035  
Tuggeranong ACT 2901

Dear Sir/Madam,

The submitted sample has been analysed microscopically by method Env A.4.4 Asbestos Identification (Polarized Light Microscopy Dispersion Staining). Result is reported as follows:

Laboratory Number: E04/0026  
Sample Description: White fibrous material  
Sample Location: DSS43 Pedestal ANU 1 Flex Joint, CDSCC  
Submission Date: 19/02/04

Results

Chrysotile - white asbestos  
The sample contains asbestos

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)

Analyst ___________________________

Locked Bag 5 Weston Creek ACT 2611 Phone (02) 6205 8700 Fax (02) 6205 8703
Occupational Hygiene
Environmental Monitoring

Gary Smee
Raytheon Australia
Brindabella Business Park
Lvl 2,4 Brindabella Cct Canberra Airport
ACT 2609
T: (02) 6201 7915
F: (02) 6201 7986

28 April 2004

QUOTE FOR ASBESTOS FIBRE MONITORING DURING REMOVAL OF DUCTING MATERIAL AT THE CANBERRA DEEP SPACE COMMUNICATION COMPLEX

We take pleasure in offering a quote for the following services:

- Air monitoring for asbestos during removal works as described over three days
- Clearance sampling following removal;
- Sampling and analysis undertaken in accordance with [NOHSC:3003 (1988)] Guidance Note On The Membrane Filter Method For Estimating Airborne Asbestos Dust

We will be available to undertake monitoring on May 28, June 1 or 2 and June 4 as discussed.

FEE (per day; does not include GST)

Sampling + analysis $350
Inspection + Clearance Report $100

Total $1150

Hoping this meets with your approval.

Regards,

Tom McDonald
for Robson Laboratories Pty Ltd

Raytheon Australia
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<tr>
<td><strong>RESULT</strong></td>
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Airborne Fibre Monitoring Results at:-
Tidbinbilla

As per the National Occupational Health & Safety Commission's "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust". NOHSC, Syd. 1998 and Robson Laboratories Method No. 1

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<td>2000</td>
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Work in progress: Background samples prior to removal of asbestos duct flange joints to DSS43 Pedestal AHU.

Note: The results are below the Minimum Practical Detection Limit of 0.01 F/mL.
RECEPTION OK

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CONNECTION TEL 02 62395069
CONNECTION ID
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USAGE TIME 00'33
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RESULT OK
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Tidbinbilla


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<tr>
<td>On</td>
<td>Off</td>
<td>mL/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2145-7</td>
<td>DSS43 Ped adj Auto Refill/ent door</td>
<td>1117</td>
<td>1630</td>
<td>2000</td>
</tr>
<tr>
<td>2145-8</td>
<td>DSS43 Ped adj door to 105</td>
<td>1119</td>
<td>1630</td>
<td>2000</td>
</tr>
<tr>
<td>2145-9</td>
<td>DSS43 Ped adj Auto Refill unit north</td>
<td>1117</td>
<td>1630</td>
<td>2000</td>
</tr>
<tr>
<td>2145-10</td>
<td>blank</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Work in progress:** removal of asbestos duct flange joints to DSS43 Pedestal AHU.

**Note:** The results are below the Minimum Practical Detection Limit of 0.01 F/mL.
<table>
<thead>
<tr>
<th>TX/RX NO.</th>
<th>0724</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONNECTION TEL</td>
<td>02 62395669</td>
</tr>
<tr>
<td>CONNECTION ID</td>
<td></td>
</tr>
<tr>
<td>START TIME</td>
<td>03/06 13:09</td>
</tr>
<tr>
<td>USAGE TIME</td>
<td>00'32</td>
</tr>
<tr>
<td>PAGES</td>
<td>1</td>
</tr>
<tr>
<td>RESULT</td>
<td>OK</td>
</tr>
</tbody>
</table>
Airborne Fibre Monitoring Results at:-  
Tidbinbilla  
as per the National Occupational Health & Safety Commissions "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust", NOHSC, Syd. 1988 and Robson Laboratories Method No. 1

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Flow Av. mL/min</th>
<th>Fields</th>
<th>Fibres</th>
<th>F/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2145</td>
<td>On</td>
<td>0827</td>
<td>1437</td>
<td>2000</td>
<td>100</td>
</tr>
<tr>
<td>2145</td>
<td>Off</td>
<td>0824</td>
<td>1437</td>
<td>2000</td>
<td>100</td>
</tr>
<tr>
<td>2145</td>
<td>Blank</td>
<td>0821</td>
<td>1436</td>
<td>2000</td>
<td>100</td>
</tr>
</tbody>
</table>

*Work in progress: Clearance after removal of asbestos duct flange joints to DSS43 Pedestal AHU.*

*Note: The results are below the Minimum Practical Detection Limit of 0.01 F/mL.*
CLEARANCE CERTIFICATE

DATE: 3 June 2004

LOCATION: Canberra Deep Space Communication Complex
DSS43 Pedestal (asbestos materials)

CONTRACT: 2145

Certification:

The asbestos flexible duct jointing material has been removed in accordance with Industry Standards, and the requirements of Worksafe Australia: Asbestos Code of Practice and Guidance Notes, 1988.

It should be noted that this clearance certificate relates only to the exact areas specified above. These areas were visually inspected on 31 May and 2 June 2004 by Anne Robson of Robson Laboratories Pty Ltd and have satisfied the above requirements. Clearance air monitoring results, samples 2145 – 11 & 12 undertaken during and at the completion of asbestos removal were all below the Minimum Practical Detection Limit of 0.01 fibres per mL and therefore satisfactory. These areas may be safely reoccupied.

Authorised by:

Director
Airborne Fibre Monitoring Results at: Can. Deep Space Comm. Complex Tidbinbilla

as per the National Occupational Health & Safety Commissions "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust", NOHSC, Syd. 1988 and Robson Laboratories Method No. 1

<table>
<thead>
<tr>
<th>Sampling Date</th>
<th>Removal Contractor</th>
<th>Contract Reference</th>
<th>Sample Location</th>
<th>On</th>
<th>Off</th>
<th>Flow Av.</th>
<th>Fields</th>
<th>Fibres</th>
<th>F/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.05.04</td>
<td>n/a</td>
<td>2145</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2145-1</td>
<td>DSS43 Pedestal AHU1 rear</td>
<td>0910</td>
<td>1530</td>
<td>2000</td>
<td>100</td>
<td>3.5</td>
<td>&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2145-2</td>
<td>DSS43 Pedestal AHU front</td>
<td>0912</td>
<td>1529</td>
<td>2000</td>
<td>100</td>
<td>0</td>
<td>&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2145-3</td>
<td>DSS43 Pedestal transmitter rm 105</td>
<td>0914</td>
<td>1526</td>
<td>2000</td>
<td>100</td>
<td>0</td>
<td>&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2145-4</td>
<td>DSS43 Pedestal inside AHU 1 duct</td>
<td>0916</td>
<td>1527</td>
<td>2000</td>
<td>100</td>
<td>0</td>
<td>&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2145-5</td>
<td>blank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Work in progress:** Background samples prior to removal of asbestos duct flange joints to DSS43 Pedestal AHU.

**Note:** The results are below the Minimum Practical Detection Limit of 0.01 F/mL.
Airborne Fibre Monitoring Results at:- Can. Deep Space Comm. Complex
Tidbinbilla

as per the National Occupational Health & Safety Commissions "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust", NOHSC, Syd. 1988 and Robson Laboratories Method No. 1

<table>
<thead>
<tr>
<th>Sampling Date</th>
<th>Removal Contractor</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.05.04</td>
<td>Time</td>
<td>Flow Av.</td>
</tr>
<tr>
<td></td>
<td>On</td>
<td>Off</td>
</tr>
<tr>
<td>2145</td>
<td>1117</td>
<td>1630</td>
</tr>
<tr>
<td>2145-7</td>
<td>DSS43 Ped adj Auto Refill/ent door</td>
<td>1117</td>
</tr>
<tr>
<td>2145-8</td>
<td>DSS43 Ped adj door to 105</td>
<td>1119</td>
</tr>
<tr>
<td>2145-9</td>
<td>DSS43 Ped adj Auto Refill unit north</td>
<td>1117</td>
</tr>
<tr>
<td>2145-10</td>
<td>blank</td>
<td></td>
</tr>
</tbody>
</table>

Work in progress: removal of asbestos duct flange joints to DSS43 Pedestal AHU.

Note: The results are below the Minimum Practical Detection Limit of 0.01 F/mL.
Occupational Hygiene
Monitoring hazardous dust

**Airborne Fibre Monitoring Results at:**

**Can. Deep Space Comm. Complex**

**Tidbinbilla**

as per the National Occupational Health & Safety Commissions "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust", NOHSC, Syd. 1988 and Robson Laboratories Method No. 1

<table>
<thead>
<tr>
<th>Sampling Date</th>
<th>Removal Contractor</th>
<th>Time</th>
<th>Flow Av.</th>
<th>Fields</th>
<th>Fibres</th>
<th>F/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>02.06.04</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2145</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Time On</th>
<th>Time Off</th>
<th>Flow Av.</th>
<th>Fields</th>
<th>Fibres</th>
<th>F/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2145-11</td>
<td>0827</td>
<td>1437</td>
<td>2000</td>
<td>100</td>
<td>0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>2145-12</td>
<td>0824</td>
<td>1437</td>
<td>2000</td>
<td>100</td>
<td>0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>2145-13</td>
<td>0821</td>
<td>1436</td>
<td>2000</td>
<td>100</td>
<td>0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>2145-14</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Work in progress:** Clearance after removal of asbestos duct flange joints to DSS43 Pedestal AHU.

**Note:** The results are below the Minimum Practical Detection Limit of 0.01 F/mL.
Dear Sir/Madam,

The submitted sample has been analysed microscopically by method Env A.4.4 Asbestos Identification (Polarized Light Microscopy Dispersion Staining). Result is reported as follows:

Laboratory Number: E04/0095  
Sample Description: 100mm Communication Cable Conduit  
Sample Location: CDSCC  
Submission Date: 19/08/04

Results

Amosite - brown asbestos  
Chrysotile - white asbestos  
The sample contains asbestos

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)
Garry Smee  
Raytheon Australia P/L  
PO Box 1035  
Tuggeranong ACT 2901

Dear Sir/Madam,

The submitted sample has been analysed microscopically by method Env A.4.4 Asbestos Identification (Polarized Light Microscopy Dispersion Staining). Result is reported as follows:

<table>
<thead>
<tr>
<th>Laboratory Number:</th>
<th>E05/0114</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Description:</td>
<td>Pipe lagging</td>
</tr>
<tr>
<td>Sample Location (reported by client):</td>
<td>Canb Deep Space Communication Complex</td>
</tr>
<tr>
<td>Submission Date:</td>
<td>26/05/05</td>
</tr>
</tbody>
</table>

**Results**

Cellulose  
No Asbestos was found in the sample

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)  
ACT Government Analytical Laboratory can not verify sample location details.

Analyst [Signature]
Dear Sir/Madam,

The submitted samples have been analysed microscopically by method Env A.4.4 Asbestos Identification (Polarized Light Microscopy Dispersion Staining). Method is based on Australian Standard 4964-2004.

Results are reported as follows:

<table>
<thead>
<tr>
<th>Laboratory Number:</th>
<th>E05/0258</th>
<th>Submission Date:</th>
<th>11/10/05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Location:</td>
<td>Tidbinbilla Tracking Station</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Sample preparation</th>
<th>Sample Result</th>
<th>Method used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe lagging</td>
<td>Extracted fibre bundles, acid washed</td>
<td>Chrysotile asbestos detected including dispersion staining.</td>
<td></td>
</tr>
</tbody>
</table>

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or ACT Planning and Land Agency Regulatory Reform Unit (6207 8370).

Analyst
APPLICATION TO DISPOSE OF ASBESTOS

Asbestos can only be disposed of at the Mugga Lane Waste Management Facility. At least two working days notice must be given in writing to Thiess Services to ensure that space is available.

Mugga Lane Waste Management Facility is only for disposal strictly by appointment and only between the hours of 7.30 am to 12.30 pm, Monday to Friday. Weather and site conditions may cause arrangements to be cancelled at short notice.

All asbestos waste must be packaged in accordance with the attached instructions, based upon ACTPLA and ACT Workcover requirements.

The transporter is responsible for lifting and placing all packages into the designated disposal area.

Enquiries may be directed to Thiess Services on (02) 6232 7111.

Please complete and return this form by facsimile to Thiess Services on (02) 6232 7733.

Name and Contact Details of Applicant

Name (Company or Individual): Barry Smith, Raytheon Australia Pty Ltd
Address: PO Box 1035, Fyshwick, ACT 2609
Phone number: 6201 7115 Mobile:
Fax number: 6201 7116

ACT Builders Licence number: Class:

(PLEASE ATTACH COPY OF LICENCE WITH ENDORSEMENT TO REMOVE ASBESTOS)

If other than a Licensed Builder, please indicate the nature of the material being disposed of:

Name of Transporter: Raytheon Australia Pty Ltd
Phone Number: 6201 7115 Mobile:
Vehicle Registration: MAC 957 Type of Asbestos: TRIANGLE
Packaging details: DOUBLE SEALED & SECURED
Site from which the asbestos is being moved: Block: Section: Penrith River District

Payment Details and Certification

Method of payment: Credit Card □ EFTPOS □ Account □ Account No: CASH
Planned date of delivery: 21/10/2000

I certify that the asbestos waste will be packaged and transported in accordance with the attached instructions, as per ACTPLA and ACT Workcover requirements

Name of Licence holder/Company:
Signature of licence holder:
Date: 21/10/2000
Indemnity

The licence holder shall indemnify and keep indemnified Thiess Services from and against any claim, demand, action, suit or proceeding that may be made or brought by any person against Thiess Services or the employees or agents of Thiess Services or any of them in respect of personal injury to or death of any person whatsoever or loss of or damage to any property or any other loss or damage whatsoever arising out of or as a consequence of an unlawful act or a negligent act or omission by the licence holder in the execution of the work undertaken in this application by the licence holder, or its employees, agents or sub-consultants and also from any costs and expenses that may be incurred with any such claim, demand, action, suit or proceeding.

Signature of Licence Holder/Company: ____________________________

Date: 20/10/2005

For Office Use Only

Signature of Thiess Services Project Manager: ____________________________

Application  Approved □  Rejected □

Date: __/___/20__  Appointment Time: ____________________________

Sir: Madam

Please advise estimate of cost to dispose of 1 x 3m length of 50mm APE (approx 1/2m baled) & 1 x 20L bag of wood to R Smith on 6201 7945.
Garry Smee  
Raytheon Australia P/L  
PO Box 1035  
Tuggeranong ACT 2901  

Dear Sir/Madam,

The submitted samples have been analysed microscopically by method Env A.4.4 Asbestos Identification which is based on AS4964. Results are reported as follows:

<table>
<thead>
<tr>
<th>Laboratory Number:</th>
<th>E07/0049</th>
<th>Submission Date:</th>
<th>15/03/07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Location:</td>
<td>Canberra Deep Space Communication Comple</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample description - 002 Power House Load Bank Lining**

- **Approximate Sample Size or weight**: 2g
- **Sample preparation**: Extracted fibre bundles
- **Chrysotile asbestos** detected by polarized light microscopy with dispersion staining.

Identifier  
H Kivela

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)

Signatory  
I Fox
Raytheon
Building 2A Dairy Road, Fyshwick

Friday 18 July 2008

Re: Analysis of vinyl sheeting samples

Dear Paul,

Robson Environmental Pty Ltd forwarded the supplied sheeting samples to Amdel Ltd for NATA (National Association of Testing Authorities) accredited analysis. The result is presented below (refer also to attached laboratory report).

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Description</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>4138 – A1</td>
<td>Stores cut tiles – supplied sample</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138 – A2</td>
<td>Middle spc40 op/ftis – supplied sample</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138 – A3</td>
<td>Spc40 between racks k168 k135 – supplied sample</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138 – A4</td>
<td>Spc40 between racks k168 k135 – supplied sample</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138 – A5</td>
<td>Spc40 drms server rack – supplied sample</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138 – A6</td>
<td>Stores – supplied sample</td>
<td>No asbestos detected</td>
</tr>
<tr>
<td>4138 – A7</td>
<td>Stores – supplied sample</td>
<td>No asbestos detected</td>
</tr>
<tr>
<td>4138 – A8</td>
<td>Stores floor – supplied sample</td>
<td>No asbestos detected</td>
</tr>
<tr>
<td>4138 – A9</td>
<td>Powerhouse A floor tile – supplied sample</td>
<td>Chrysotile</td>
</tr>
</tbody>
</table>

Samples 4138 – A1, A2, A3, A4, A5 & A9 contain asbestos.

Yours sincerely

Neill Ross
Robson Environmental Pty Ltd
### Material Analysis

**ASBESTOS IDENTIFICATION REPORT**

**CLIENT:** Robson Laboratories Pty. Ltd.  
**ADDRESS:** 9 Lyell St, Fyshwick ACT, 2009  
**JOB NO.:** 4138  
**CLIENT:** Ray Thoon, Tilkibrilla Tracking  
**JOB LOCATION:** Samples delivered  
**DATE:** 18 July 2008  
**REPORT NO.:** 6AA0549X  
**PAGE NO.:** 1 of 1

**RESULTS:**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample size</th>
<th>Description</th>
<th>Asbestos detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>4138-A1</td>
<td>(a) 45x25x3</td>
<td>Brown flooring</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138-A2</td>
<td>(a) 90x25x3</td>
<td>Brown flooring</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138-A3</td>
<td>(b) 50x30x3</td>
<td>Brown flooring</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138-A4</td>
<td>(b) 30x15x3</td>
<td>Brown flooring</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138-A5</td>
<td>(a) 40x20x3</td>
<td>Brown flooring</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4138-A6</td>
<td>(a) 170x30x2</td>
<td>Pale green flooring</td>
<td>No **</td>
</tr>
<tr>
<td>4138-A7</td>
<td>(a) 45x35x3</td>
<td>Pale brown streak flooring</td>
<td>No **</td>
</tr>
<tr>
<td>4138-A8</td>
<td>(a) 120x40x3</td>
<td>Gray flooring</td>
<td>No **</td>
</tr>
<tr>
<td>4138-A9</td>
<td>(b) 45x30x3</td>
<td>Brown flooring</td>
<td>Chrysotile</td>
</tr>
</tbody>
</table>

---

**APPROVED IDENTIFIER:** Naclye Hallifoff  
**APPROVED SIGNATORY:** Michael Till

The approximate observations (in mm) stated above refer to the size of:
(a) a single piece  
(b) largest of several particles  
(c) largest of many particles  
(d) volume in ml of unconsolidated particles  
(e) weight in grams of unconsolidated particles

* Detected by polarized light microscopy.  
** No asbestos was detected by polarized light microscopy, but identification may not be possible due to scratching. Confirmation by another analytical technique is advised.  
* Synthetic mineral fibre was detected by polarized light microscopy.

**NOTE:** Chrysotile is a fibrous silicate mineral commonly known as white asbestos; actinolite is a fibrous silicate commonly known as blue asbestos.  
SMF is commonly known as glass fibre.  
This report relates only to the samples submitted for testing.  
Amedel Ltd accepts no responsibilities for the representivity of the sample(s) submitted.

**SCOPE OF ACCREDITATION:** Class 7.82.31: Qualitative identification of asbestos types in bulk samples by polarized light microscopy, including dispersion testing.

This document is issued in accordance with NATA's accreditation requirements  
Accredited for compliance with ISO/IEC 17025.  
NATA accreditation number: 1528  
This document may not be reproduced except in whole.
ASBESTOS-FORMING MINERAL IDENTIFICATION REPORT

CLIENT: Robson Laboratories Pty. Ltd.  
DATE: 18 July 2008  
ADDRESS: 9 Lyell St, Fyshwick ACT, 2609  
REPORT NO: 8AA0546XX  
JOB NO: 4130  
CLIENT: Ray Theen, Topinbilla Tracking  
JOB LOCATION: Samples delivered  
PAGE NO: 1 of 1

RESULTS:

PROCEDURE
The samples were analysed by X-ray diffraction, which detects crystalline substances and minerals (including asbestos-forming minerals). Non-crystalline substances (eg glass, most organic compounds) are not detectable by this technique.

RESULTS
This report contains estimated percentages of asbestos-forming minerals based on X-ray diffraction analysis. These estimates have large and variable errors which depend on the nature of the sample (particularly its degree of heterogeneity and the nature of the matrix). They should be considered as approximations at best and no guarantees are given as to their accuracy.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
<th>Chrysotile Est. %</th>
<th>Other minerals detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>4130-A1</td>
<td>3mm thick brown flooring</td>
<td>5</td>
<td>Calcite, rutile</td>
</tr>
<tr>
<td>4130-A2</td>
<td>3mm thick brown flooring</td>
<td>5</td>
<td>Calcite, rutile</td>
</tr>
<tr>
<td>4130-A3</td>
<td>3mm thick brown flooring</td>
<td>5</td>
<td>Calcite, rutile</td>
</tr>
<tr>
<td>4130-A4</td>
<td>3mm thick brown flooring</td>
<td>6</td>
<td>Calcite, rutile</td>
</tr>
<tr>
<td>4130-A5</td>
<td>3mm thick brown flooring</td>
<td>5</td>
<td>Calcite, rutile</td>
</tr>
<tr>
<td>4130-A6</td>
<td>3mm thick pale green flooring</td>
<td>---</td>
<td>Calcite, rutile</td>
</tr>
<tr>
<td>4130-A7</td>
<td>3mm thick pale brown-streaked flooring</td>
<td>---</td>
<td>Kaolinite, calcite, rutile</td>
</tr>
<tr>
<td>4130-A8</td>
<td>3mm thick grey flooring</td>
<td>---</td>
<td>Calcite, rutile</td>
</tr>
<tr>
<td>4130-A9</td>
<td>3mm thick brown flooring</td>
<td>5</td>
<td>Calcite, rutile</td>
</tr>
</tbody>
</table>

TESTING OFFICER: Nadeya Haliboff

Note: Chrysotile is a fibrous chrysotile mineral commonly known as white asbestos. A dash (---) in the Chrysotile column implies not detected. The other minerals listed are fibres or pigments. They may include calcite (calcium carbonate), dolomite (calcium magnesium carbonate) and goethite (brown iron oxide). The results contained in this report relate only to the sample(s) submitted for testing. Amdel Ltd accepts no responsibilities for the representation of the sample(s) submitted.
Garry Smee  
OHS&E Officer  
Raytheon Australia Pty Ltd  
PO Box 1035  
Tuggeranong, ACT 2901

18 May 2007

Re: Inspection of asbestos materials, Canberra Deep Space Communications Complex, Tidbinbilla ACT.

Robson Laboratories Pty Ltd visually inspected and sampled suspected Asbestos Containing Materials (ACM) at Canberra Deep Space Communications Complex, Tidbinbilla on the 10 May 2007. One (1) sample was forwarded to EnviroProtect Pty Ltd for NATA (National Association of Testing Authorities) accredited analysis. The results are presented below (refer also to attached laboratory report).

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Description</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3599 - 1</td>
<td>Westinghouse 2400v circuit breaker – arc shield packing</td>
<td>Chrysotile asbestos detected</td>
</tr>
</tbody>
</table>

Client: Raytheon
Observations and Recommendations

After visually inspected and sampling suspected Asbestos Containing Materials (ACM) at Canberra Deep Space Communications Complex, Tidbinbilla ACT, Robson Laboratories Pty Ltd makes the following observations and recommendations:

- The wall sheeting to the load bank at the powerhouse contains asbestos. The edges of the wall sheeting are exposed in the areas where it has been cut to fit door handles and locks. These areas should be spray painted to encapsulate and protect the asbestos fibre. Apart from the above mentioned areas, the asbestos wall sheeting is in good condition and may remain in situ as long as it is well maintained. Provided these materials do not deteriorate, they would not be anticipated to release significant fibre under normal building usage.

- Westinghouse 2400v circuit breaker -- arc shield packing was sampled and contains asbestos.

- Various circuit breaker arc shields were visually assessed as containing asbestos.

- Where practicable, all asbestos material remaining in situ should be clearly labeled.

- Maintenance personnel should be instructed not to cut, drill or sand identified asbestos materials.

If you have any further questions please do not hesitate to contact me.

Yours sincerely

[Signature]

Nathan Campbell
Technical Officer
Robson Laboratories Pty Ltd
**CERTIFICATE OF ANALYSIS**

**EP JOB NO:** EP 17 799  
**DATE:** 15th May 2007  
**CLIENT:** Robson Laboratories Pty Ltd  
**ATTENTION:** Nathan Campbell  
**ADDRESS:** PO Box 112  
Fyshwick ACT 2609  
**SAMPLE LOCATION:** Canberra Deep Space Communications Complex - Tidbinbilla  
**SAMPLED BY:** Client  
**DATE RECEIVED:** 14th May 2007

**TEST METHOD:** Qualitative identification of asbestos types in bulk samples by polarised light microscopy, including dispersion staining using EnviroProtect Inhouse Method EPA.

<table>
<thead>
<tr>
<th>Lab. NO</th>
<th>Sample Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 799 – 1</td>
<td>Sample 3599 – 1: Westinghouse 2400V Circuit Breaker – Arc Shield Packing, Packing</td>
<td>CHRYSTAL ASBESTOS DETECTED</td>
</tr>
</tbody>
</table>

Sample Analysed on an as received basis.

Approved Identifier  
William Backendorf  
15th May 2007

Approved Signatory  
William Backendorf  
15th May 2007
Dear Sir/Madam,

The submitted samples have been analysed microscopically by method Env A.4.4 Asbestos Identification which is based on AS4964.

Results are reported as follows:

**Laboratory Number:** E07/0185  
**Submission Date:** 22/08/07  
**Sample Location:** CDSCC 421 Discovery Dr Paddy's Rivr Dist

<table>
<thead>
<tr>
<th>Sample description</th>
<th>Cement Sheeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate Sample Size or weight</td>
<td>7g</td>
</tr>
<tr>
<td>Sample preparation - Extracted fibre bundles</td>
<td></td>
</tr>
</tbody>
</table>

**Amosite and Chrysotile asbestos** detected by polarized light microscopy with dispersion staining.

**Identifier**  
H Kivela S Chatterje

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)

NATA Signatory  
I Fox
**TO**

Gary Smee

**Subject/Project**

3735 – Asbestos Clearance Certificate

**FROM**

Nathan Campbell

Phone (Office) 02 6239 5656

Phone (Mobile) 0428 518 116

Fax 02 6239 5669

Email nathan@robsonlabs.com.au

**Date** 23 August 2007

Dear Gary,

Please find attached the asbestos clearance certificate for the removal of the range hood sheeting.

Regards,

[Signature]

Nathan Campbell
Robson Laboratories Pty Ltd
CLEARANCE CERTIFICATE

ADDRESS
Canberra Deep Space Communication Complex
Tidbinbilla ACT

LOCATION
Building 005 – 136 Canteen Kitchen

JOB NUMBER
3735

DATE
22.08.07

Description of work: Removal of asbestos sheeting to range hood above dishwasher

Certification:

It should be noted that this clearance certificate relates only to the exact areas specified in this document. This area was inspected on 22 August 2007 by Nathan Campbell of Robson Laboratories and no visible asbestos material or debris was located. The asbestos removal has been completed, to an acceptable industry standard. The removed asbestos material was wrapped, labelled and stored for disposal to an acceptable standard. No claim is made relating to the presence or otherwise of asbestos containing material in any other areas not specified in this document.

This area may now be reoccupied.

Authorized by:

[Signature]

Nathan Campbell
Robson Laboratories Pty Ltd
Garry Smee  
Raytheon  
PO Box 1035  
Tuggeranong ACT 2901  

27 August 2007  

Re: Analysis of sheeting materials for asbestos content – Building 005 – 136, Canberra Deep Space Communications Complex, Tidbinbilla ACT.

Dear Garry,

Robson Laboratories Pty Ltd visually inspected and sampled sheeting materials at Building 005 – 136, Canberra Deep Space Communications Complex, Tidbinbilla ACT on the 22 August 2007. The samples were forwarded to Amdel Ltd for NATA (National Association of Testing Authorities) accredited analysis. The results are presented below (refer also to attached laboratory report).

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Description</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3735 – 1</td>
<td>Building 005 - 136 – back storeroom – façade sheeting</td>
<td>No asbestos detected</td>
</tr>
<tr>
<td>3735 – 2</td>
<td>Building 005 - 136 – dry store – ceiling sheeting</td>
<td>Chrysotile asbestos detected</td>
</tr>
</tbody>
</table>

Sample 3735 – 2 contains asbestos.

Yours sincerely

Nathan Campbell  
Technical Officer  
Robson Laboratories Pty Ltd
ASBESTOS IDENTIFICATION REPORT

CLIENT: Robson Laboratories Pty. Ltd.  DATE: 27 August 2007
ADDRESS: 9 Loyly St, Fyshwick ACT, 2609
JOB NO: 3735  REPORT NO: 7AA0115A
PAGE NO: 1 of 1

CLIENT: Raytheon
JOB LOCATION: Canberra Deep Space Communications Complex, Tidbinbilla ACT

RESULTS:

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample size</th>
<th>Description</th>
<th>Asbestos detected*</th>
</tr>
</thead>
<tbody>
<tr>
<td>3735-1</td>
<td>(5) 10x10x3</td>
<td>Pale grey fibrous sheeting</td>
<td>No</td>
</tr>
<tr>
<td>3735-2</td>
<td>(g) 15x10x2</td>
<td>White fibrous sheeting, painted off-white</td>
<td>Chrysotile</td>
</tr>
</tbody>
</table>

* Detected by polarised light microscopy. ** No asbestos was detected by polarised light microscopy, but identification may not be possible due to differing ratios. Confirmation by another analytical technique is advised. *Synthetic mineral fibres was detected by polarised light microscopy.

Note: Chrysotile is a fibrous silicate mineral commonly known as white asbestos, amosite is a fibrous silicate commonly known as brown or grey asbestos and crocidolite is a fibrous silicate commonly known as blue asbestos. EWF is commonly known as glass fibre.

The results contained in this report relate only to the sample(s) submitted for testing. Amdel Ltd accepts no responsibilities for the representivity of the sample(s) submitted.

SCOPE OF ACCREDITATION: Class 7.62.31: Qualitative identification of asbestos types in bulk samples by polarised light microscopy, including dispersion staining.

This document is issued in accordance with NATA's accreditation requirements

NATA accreditation number: 17028.

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Approved by: [Signature]

NATA
Figure 1 – 005-124 Canteen Dry Goods Store Communications Access Panel
005 CANTEEN CARPORT SIDE EAVES
Dear Garry Smee,

The submitted samples have been analysed as received, using Method A.4.4 Asbestos Identification by PML-DS which complies with AS4964. Results are reported as follows:

<table>
<thead>
<tr>
<th>Laboratory Number</th>
<th>E08/0092</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Location</td>
<td>CDSCC</td>
</tr>
<tr>
<td>Sample Number</td>
<td>1</td>
</tr>
<tr>
<td>Sample description</td>
<td>Loose insulation</td>
</tr>
<tr>
<td>Approximate Sample Size or weight</td>
<td>10g</td>
</tr>
<tr>
<td>Sample preparation</td>
<td>Extracted fibre bundles</td>
</tr>
</tbody>
</table>

No asbestos detected by polarized light microscopy with dispersion staining.

Identifier: H kivela

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718) or BEPCON (6207 9370)

NATA Signatory: I Fox

Signature: [Signature]

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NATA Accreditation Laboratory Number 14606
Raytheon
Tidbinbilla Tracking Station,
Canberra, ACT.

Wednesday 13 August 2008

Re: Analysis of material from Tidbinbilla Tracking Station – Power House

Dear John,

Robson Environmental Pty Ltd forwarded the sample taken from the Power House to Amdel Ltd for NATA (National Association of Testing Authorities) accredited analysis. The result is presented below (refer also to attached laboratory report).

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Description</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>4173 – A1</td>
<td>White fibrous sheeting</td>
<td>Chrysotile Asbestos Detected</td>
</tr>
</tbody>
</table>

Yours sincerely

Leo Menssen
Robson Environmental Pty Ltd
Material Analysis

Amdel Ltd
ABN 30 008 127 802
Unit 2, 35 Comack Road, Wingfield SA, 5013
PO Box 552, Port Adelaide BC, SA 5015
Phone: (08) 8440 7145  Facsimile: (08) 8440 7197

ASBESTOS IDENTIFICATION REPORT

CLIENT: Robson Laboratories Pty. Ltd.
ADDRESS: 9 Lyell St, Fyshwick ACT, 2609
JOB NO: 4173
CLIENT: Raytheon Tracking Station
JOB LOCATION: Tidbinbilla Tracking Station – Power House

RESULTS:

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample size</th>
<th>Description</th>
<th>Asbestos detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>4173-A1</td>
<td>(2) 3x2x1</td>
<td>White fibrous sheeting</td>
<td>Chrysotile</td>
</tr>
</tbody>
</table>

The approximate dimensions (in mm) stated above refer to the size of
(a) a single piece (b) largest of several particles (c) largest of many
particles (d) volume in ml of unconsolidated particles (e) weight in grams of unconsolidated particles
* Detected by polarized light microscopy. ** No asbestos was detected by polarized light microscopy, but identification may not be possible
due to adhering fibres. Confirmation by another analytical technique is advised. *** Synthetic mineral fibre was detected by polarized light microscopy.

Note: Chrysotile is a fibrous silicate mineral commonly known as white asbestos. Asbestos is a fibrous silicate commonly known as brown or
grey asbestos and crocidolite is a fibrous silicate commonly known as blue asbestos. Sulf is commonly known as glass fibre.
The results contained in this report relate only to the sample(s) submitted for testing. Amdel Ltd accepts no responsibility for the
representativeness of the sample(s) submitted.

SCOPE OF ACCREDITATION: Class 7.8.2.31: Qualitative identification of asbestos types in bulk samples by polarized light microscopy,
including fibre counting.

APPROVED IDENTIFIER: Nolive Hallough

APPROVED SIGNATORY: Michael Till

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NATA accreditation number: 1526
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Asbestos Identification Report

Dear Garry Smee,

The submitted samples have been analysed as received, using Method A.4.4 Asbestos Identification by PLM-DS which complies with AS4964.

Results are reported as follows:

Laboratory Number: E09/0297  Submission Date: 2/07/09
Sample Location: CDSCC Sub-floor Complex Control Centre

Sample Number - 1
Sample Description - Complex Control Centre 001-134
Approximate Sample Size or Weight - 35g
Sample Observation - Sweepings, dust, various fibres
Sample Preparation - Ashed
No asbestos detected by polarized light microscopy with dispersion staining.

Identifier: H Kivela

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718)
NATA Signatory: Ian Fox

Signature: Ian Fox

Page 1 of 1
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NATA Accreditation Laboratory Number 14606

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Garry Smee  
Raytheon Australia P/L  
PO Box 1035  
Tuggeranong ACT 2901  

Asbestos Identification Report

Dear Garry Smee,

The submitted samples have been analysed as received, using Method A.4.4 Asbestos Identification by PLM-DS which complies with AS4864.

Results are reported as follows:
Laboratory Number: E09/0333  
Submission Date: 4/08/09  
Sample Location: Operation Control Room

| Sample Number | 1 |
| Sample description | Opps ctrl rm subfloor sample |
| Approximate Sample Size or weight | 1g |
| Sample Observation | mix of fibres and dust |
| Sample preparation | Ashed |

No asbestos detected by polarized light microscopy with dispersion staining.
Sample Number - 2
Sample description - Opps ctrl rm subflor vacuum cleaner
Approximate Sample Size or weight - 40g
Sample Observation - mix of fibres and dust
Sample preparation - Ashed
No asbestos detected by polarized light microscopy with dispersion staining.

Identifier - I Fox

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718)
NATA Signatory - I Fox

Signature: ____________________________
Ian Fox

Page 2 of 2
E09/0333
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NATA Accreditation Laboratory Number 14606
Garry Smee
CSIRO
PO Box 1035
Tuggeranong ACT 2901

Asbestos Identification Report

Dear Garry Smee

The submitted samples have been analysed as received, using Method A.4.4 Asbestos Identification by PLM-DS which complies with AS4964.

Results are reported as follows:

<table>
<thead>
<tr>
<th>Laboratory Number</th>
<th>Submission Date</th>
<th>Sample Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>E10/0306</td>
<td>12/05/10</td>
<td>Canberra Deep Space Communication Comple</td>
</tr>
</tbody>
</table>

Sample Number - 1
Sample description - Lull Highlander 844C-42: Park Brake
Approximate Sample Size or weight: <1g
Sample Observation: Black matrix, shiny white fibres.
Sample preparation: Ground

No asbestos detected by polarized light microscopy with dispersion staining.

Date Tested: 12/05/10

Identifier  SChatterjee/HKivela

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (02) 6205 8718
NATA Signatory  I Fox

Signature: [Signature]

Page 1 of 1

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NATA Accreditation Laboratory Number 14606
Garry Smee  
CSIRO  
PO Box 1035  
Tuggeranong ACT 2901

Asbestos Identification Report

Dear Garry Smee

The submitted samples have been analysed as received, using Method A.4.4 Asbestos Identification by PLM-DS which complies with AS4964.

Results are reported as follows:

<table>
<thead>
<tr>
<th>Laboratory Number</th>
<th>Submission Date</th>
<th>Sample Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>E11/0120</td>
<td>2/03/11</td>
<td>Canberra Deep Space Communication Comple</td>
</tr>
</tbody>
</table>

| Sample Number | 1 |
| Sample description | 002 Power House, Southern end eave |
| Approximate Sample Size or weight | 9g |
| Sample Observation | White matrix, white ropey fibres |
| Sample preparation | Extracted fibre bundles |

No asbestos detected by polarized light microscopy with dispersion staining.

Date Tested: 2/03/11
Sample Number - 2
Sample description - 024 CMF Internal eave (old part bldg)
Approximate Sample Size or weight - 3g
Sample Observation - White matrix, white ropey fibres
Sample preparation - Extracted fibre bundles

No asbestos detected by polarized light microscopy with dispersion staining.

Date Tested: 2/03/11

Identifier - H Kivela

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718)
NATA Signatory - I Fox

Signature: [Signature]

Page 2 of 2
E11/0120
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NATA Accreditation Laboratory Number 14806
Asbestos Identification Report

Dear Garry Smee

The submitted samples have been analysed as received, using Method A.4.4 Asbestos Identification by PLM-DS which complies with AS4964.

Results are reported as follows:

<table>
<thead>
<tr>
<th>Laboratory Number:</th>
<th>E11/0371</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission Date:</td>
<td>10/08/11</td>
</tr>
<tr>
<td>Sample Location:</td>
<td>Canberra Deep Space Communication Complex</td>
</tr>
</tbody>
</table>

Sample Number - 1
Sample description - 033 Panel shed spill kit - small mat.

Approximate Sample Size or weight - 15g
Sample Observation - Vermiculite-like material, no vis fibres
Sample preparation - Crushed

No asbestos detected by polarized light microscopy with dispersion staining.

Date Tested: 11/08/11
Sample Number - 2
Sample description - 033 Panel shed spill kit - large mat.
Approximate Sample Size or weight 30g
Sample Observation Vermiculite-like material, no vis fibres
Sample preparation Crushed
No asbestos detected by polarized light microscopy with dispersion staining.
Date Tested: 11/08/11

Sample Number - 3
Sample description - Logistics store room spill kit - mixed
Approximate Sample Size or weight 25g
Sample Observation Vermiculite-like material, no vis fibres
Sample preparation Crushed
No asbestos detected by polarized light microscopy with dispersion staining.
Date Tested: 11/08/11

Identifier H Kivela

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718)
NATA Signatory I Fox

Signature:  

Ian Fox

Page 2 of 2

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NATA Accreditation Laboratory Number 14666
Garry Smee
CSIRO CDSCC
PO Box 1035
Tuggeranong ACT 2901

Asbestos Identification Report

Dear Garry Smee,

The submitted samples have been analysed as received, using Method A.4.4 Asbestos Identification by PLM-DS which complies with AS4964.

Results are reported as follows:

<table>
<thead>
<tr>
<th>Laboratory Number</th>
<th>E11/0467</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission Date</td>
<td>30/09/11</td>
</tr>
<tr>
<td>Sample Location</td>
<td>Canberra Deep Space Communication Comp.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample description</td>
<td>Old water pump gasket, caterpillar D399</td>
</tr>
</tbody>
</table>

Approximate Sample Size or weight: 1g
Sample Observation: Black matrix ropey white fibres
Sample preparation: Extracted fibre bundles

Chrysotile asbestos detected by polarized light microscopy with dispersion staining.

Date Tested: 4/10/11
Sample Number: 2
Sample description: New water pump gasket, caterpillar D399
Approximate Sample Size or weight: 10g
Sample Observation: Yellow matrix ropey white fibres
Sample preparation: Extracted fibre bundles
Chrysotile asbestos detected by polarized light microscopy with dispersion staining.
Date Tested: 4/10/11

Identifier: I Fox

For further information regarding analysis or problems associated with asbestos please contact either the ACT Government Analytical Laboratory (6205 8718)
NATA Signatory: I Fox

Signature: I Fox

Page 2 of 2
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NATA Accreditation Laboratory Number 14606

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Garry Smees  
Frank Corjo  
CSIRO - NASA Tracking Station  
DFO TNT Depot Hume  
ACT 2620  

13 November 2012  

Re: Analysis of sample taken at Canberra Deep Space Communications Complex – 09 November 2012

Dear Garry,

Neill Ross, Licensed Asbestos Assessor (ACTPLA) of Robson Environmental visited the above location and took a sample of suspect material and returned it to the laboratory for analysis. The sample was analysed for its fibrous content and the results of this analysis are given below (see Appendix 1 for photographs & Appendix 2 for laboratory report). Some sampling was undertaken previously and these were re-inspected on 09 November 2012.

Neill Ross also provided information regarding Material Assessment i.e. risk assessment. The assessment was conducted on the basis of the condition of the materials at the time of inspection.

Results

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Description</th>
<th>Condition</th>
<th>Fibrous Content</th>
<th>Action Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>4138 - A1</td>
<td>Store - Vinyl floor tile and black adhesive</td>
<td>poor</td>
<td>Chrysotile asbestos</td>
<td>A3</td>
</tr>
<tr>
<td>N0516</td>
<td>Store - Vinyl floor tile underlay</td>
<td>-</td>
<td>No asbestos detected</td>
<td>-</td>
</tr>
</tbody>
</table>
Material Assessment

Material Assessment is the assessment of the condition of asbestos containing materials (ACM) and their ability to release fibres. This assessment helps to judge the potential for fibre release of ACM and to prioritise the need for action as part of a plan for managing asbestos in buildings. Material Assessment is based upon a simple additive algorithm. The tool is used to numerically assess the potential for fibre release. The tool is not designed to calculate absolute differences in potency or fibre release/hazard potential between ACM. However, it enables ACM to be ranked in a simple numerical order. That is, it is a qualitative assessment rather than quantitative.

The main factors influencing fibre release are given a score that are added together to obtain a material assessment rating i.e. Action Rating. The four main parameters that determine the amount of fibre released from an ACM when subject to disturbance are:

- product type;
- extent of damage or deterioration;
- surface treatment; and
- asbestos type.

Non-asbestos materials are not scored. Risk Scores are reinterpreted as Action Ratings, which provide succinct guidance to building owners/managers/dutyholders for the proper management of asbestos materials in buildings.

<table>
<thead>
<tr>
<th>Action Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 Action 1</td>
</tr>
<tr>
<td>A2 Action 2</td>
</tr>
<tr>
<td>A3 Action 3</td>
</tr>
<tr>
<td>A4 Action 4</td>
</tr>
<tr>
<td>A5 Action 5</td>
</tr>
</tbody>
</table>
Conclusions & Recommendations:

The vinyl floor tiles with black adhesive contain chrysotile (white) asbestos and if they are to be disturbed, must be removed by a licensed asbestos removalist.

It is recommended that the vinyl floor tiles and black adhesive be removed due to the damaged state of many of the floor tiles. The high traffic use of the area may also cause further damage with possible asbestos fibre release.

If the material requires removal, it is necessary that the asbestos containing material is removed by a Licensed Asbestos Removalist as per the National Code of Practice: How to Safely Remove Asbestos.

Air monitoring is recommended (not mandatory, but good occupational hygiene practice) during the removal or remediation work and following the work. An independent Asbestos Assessor should then undertake a Clearance Inspection, which involves a visual inspection of the asbestos work area followed by atmospheric monitoring. Once it has been established that the removal/remediation work has been completed satisfactorily, a Clearance Certificate and copy of the air monitoring certificate should be issued to provide assurance that the area is safe for normal reoccupation. This must be done by a NATA accredited laboratory.

Material Assessment Restrictions and Caveats

The samples taken from suspected asbestos containing materials are representative of the materials sampled, individually identified, transported, analysed and reported in accordance with the National Occupational Health and Safety Commission (NOHSC) Guidelines, relevant Statutory Regulations, Codes of Practice and Robson Environmental survey/inspection procedures.

The presence of asbestos in a bulk sample is determined by Polarised Light Microscopy (PLM) with dispersion staining techniques.

Robson Environmental has taken care to ensure that this report includes the most accurate information available. This report does not constitute a full register of asbestos containing materials at the above establishment as required by State Legislation and the National Code of Practice. The material assessments, recommendations and/or conclusions contained in this report must not be used to excuse a person of their responsibility to work in accordance with relevant Statutory Requirements, Codes of Practice, Guidelines, Material Safety Data Sheets, Work Instructions or reasonable work practices.

Yours sincerely,

Neill Ross
Senior Hazardous Materials Consultant
Licensed Asbestos Assessor
Mobile: 0437 697 705
1/8 Station Street, Fyshwick ACT 2609
T: 02 6239 5536 F: 02 6239 5539
E: neill@robbenvironmental.com.au
# Appendix 2
## Certificate of Analysis

**Amdal Ltd**

**Material Analysis & Assessment**

---

### Asbestos Identification Report

**CLIENT:** Robex Laboratories Pty. Ltd.  
**ADDRESS:** 9 Wycliffe St, Ryde NSW 2112  
**JOB NO:** 1128  
**SAMPLE DESCRIPTION:** Samples delivered  

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample size</th>
<th>Description</th>
<th>Asbestos detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>4139-A1</td>
<td>02 4x0x0</td>
<td>Brown roofing</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4139-A2</td>
<td>02 4x0x0</td>
<td>Brown roofing</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4139-A3</td>
<td>02 4x0x0</td>
<td>Brown roofing</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4139-M</td>
<td>02 4x0x0</td>
<td>Brown roofing</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4139-A5</td>
<td>02 4x0x0</td>
<td>Brown roofing</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>4126-A6</td>
<td>02 0x0x0</td>
<td>Pipe lagging/roofing</td>
<td>No</td>
</tr>
<tr>
<td>4126-A7</td>
<td>02 4x0x0</td>
<td>Pipe lagging/roofing</td>
<td>No</td>
</tr>
<tr>
<td>4126-A8</td>
<td>02 4x0x0</td>
<td>Grey flooring</td>
<td>No</td>
</tr>
<tr>
<td>4126-A9</td>
<td>02 4x0x0</td>
<td>Brown flooring</td>
<td>Chrysotile</td>
</tr>
</tbody>
</table>

---

**APPROVED SIGNATORY:** Macrae Kennedy  
**APPROVED IDENTIFIER:** [Signature]

---

1. **DATE:** 15 July 2008  
2. **REPORT NO:** SNASH405X  
3. **PAGE NO:** 1 of 1  
4. **SAMPLE DESCRIPTION:** Samples delivered

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Robson Laboratories Pty Ltd

Address: 9 Lyell St, Fyshwick ACT, 2609

Phone: (02) 6244 7100  Fax: (02) 6244 7197

UNIT 3, 250 O'Connell Road, Worrigee NSW 2570

Material Analysis & Assessment

ASBESTOS-FORMING MINERAL IDENTIFICATION REPORT

CLIENT: Robson Laboratories Pty Ltd

JOBS: 4129

CLIENT: Royal Prince, Wollongong Hospital

JOB LOCATION: Samples delivered

RESULTS:

PROCEDURE:
The samples were analysed by X-ray diffraction, which determines the relative abundance of minerals present. Minor components such as phlogopite and serpentine were not detected by this technique.

RESULTS:
The report contains estimated percentages of asbestos-forming minerals based on X-ray diffraction analysis. These estimates are large and variable errors which depend on the nature of the sample, particularly to degree of heterogeneity and the nature of the matrix. They should be considered approximations at best and no guarantee is given as to their accuracy.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description</th>
<th>Chrysotile Est. %</th>
<th>Other minerals detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>4129-A1</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
<tr>
<td>4130-A4</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
<tr>
<td>4129-A2</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
<tr>
<td>4129-A1</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
<tr>
<td>4129-A1</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
<tr>
<td>4128-A6</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
<tr>
<td>4132-A6</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
<tr>
<td>4128-A6</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
<tr>
<td>4128-A6</td>
<td>Sheet thick brown bearing</td>
<td>5</td>
<td>Chrysotile, nickel</td>
</tr>
</tbody>
</table>

TESTING OFFICER: N. Rees

Note: Chrysotile is a type of asbestos mineral commonly known as ``serial asbestos''. It is not listed in the Canadian asbestos regulations.

Other minerals listed are trace or negligible. They were identified by powder X-ray diffraction, X-ray fluorescence, and atomic absorption. The results presented in this report are based on the material submitted to us.

The results presented in this report are based on the material submitted to us. A full set of data from the results is available to the responsible officer(s) at Robson Laboratories.
Material Analysis & Assessment

Effective Environmental Solutions

Fibre Identification Certificate of Analysis

Report Number: 6654
Date of Report: 13.11.2012
Sample Taken by: Robson Environmental

Client: CJCAZ - CELOUC
Address: 164 Oakville Street, Pyrmont, NSW 2009
Contact Person: David Newman
Telephone: 02 9239 9006
Fax: 02 9239 9004
Email: dm@robsonenviro.com.au

Test Specification(s) Employed: AS/NZS 5604.1 & NZS 14000.2

Fibres of a similar type are normal in Cementitious composites and results of the test are not significant. The manufacturer is advised to compare the test results with the results obtained from a similar material to determine if the material is suitable for use in the intended application.

Client's favourite signature

Drew Stand
Approved Manager

M. Ball
Approved Manager