The Australian Wool Industry
Emergency Animal Disease Preparedness RD&E Strategy 2013-16

Minimising the trade impacts of Emergency Animal Disease for the Australian Wool Industry

VERSION APPROVED BY FAWO EAD WORKING GROUP

NOVEMBER 2013

THE FEDERATION OF AUSTRALIAN WOOL ORGANISATIONS
Executive summary

Purpose
This document outlines a research, development and extension (RD&E) strategy to minimise the potential trade impacts on the Australian wool industry arising from emergency animal disease (EAD) outbreaks. The purpose of The Australian Wool Industry Emergency Animal Disease Preparedness RD&E Strategy 2013-16 is to:

- Identify RD&E priorities for EAD preparedness along the wool pipeline and, in doing so, move towards fulfilling the wool industry’s obligations under the EAD Response Agreement and National Animal Biosecurity Research Development and Extension Strategy;
- Ensure the identified RD&E is carried out as effectively and efficiently as possible;
- Promote the industry’s understanding of the importance of, and its collaboration towards achieving, a well-developed state of EAD preparedness; and
- Establish the mechanisms and culture needed to maintain the industry’s EAD preparedness into the future.

The scope of this Strategy:

- **Is confined to** the shorn wool pipeline from farm to market; that is, it is concerned with the mitigation of supply chain and trade risks (such as product traceability) rather than disease response risks (such as diagnostic capability or vaccination)
- **Is not confined to** foot-and-mouth disease (FMD), although FMD is the yardstick for devastating EADs – the Strategy embraces preparedness for any and all EADs.

Background
The Australian wool industry is heavily dependent on exports. The uninterrupted capacity to export is critical to the Australian wool industry. So too is the global wool trade highly dependent upon Australian exports. Australia supplies approximately 25% of the world’s wool supply, including approximately 60% of the apparel wool and 90% of the fine apparel wool needed to meet global demand and markets.

There exists an international framework for the management of animal health and disease in respect to trade. This framework is overseen by the World Organisation for Animal Health (OIE), of which Australia and most other countries are members. The OIE’s ‘Terrestrial Animal Health Code’ underpins the Agreement on the Application of Sanitary and Phytosanitary Measures among members of the World Trade Organisation.

Australia’s EAD response system is closely aligned with the provisions of the Terrestrial Code. This alignment ensures that, as far as possible, the trade response to an EAD outbreak in Australia will be based upon the results of internationally-agreed scientific research.

Australia’s biosecurity framework is strong by international standards, but there are gaps. These gaps have been highlighted by the ‘Beale review’ (2008) and ‘Matthews review’ of 2011. Prompted by these reviews and by various international disease outbreaks over the last two decades, Animal Health Australia and its members have sought to strengthen Australia’s biosecurity system.
Some of the gaps in Australia’s EAD response system would have particular impact on the wool industry. For example, there are no AUSVETPLAN manuals for wool-specific enterprises.

An EAD outbreak would impose very substantial costs on the wool industry, depending on the specific disease involved. These costs would arise from the response to the disease itself, and the trade impact. Wool has the advantage over other commodities of being non-perishable and therefore able to be stockpiled. However, the short-term depletion of the pipeline could be very damaging, particularly if some later-stage players for whom wool is optional move to other fibres.

The wool industry’s strong export orientation places it at significant risk should Australia face an outbreak of an EAD that might be transmitted by wool. Trading partners would immediately place a ban on imports of Australian wool and this ban would remain in place until each country’s authorities were satisfied that the wool posed no threat to national biosecurity. National judgements of biosecurity threats are not always entirely founded in science but in any case will err on the side of caution.

For the wool industry, the major EAD risks are considered to be FMD, sheep and goat pox, bluetongue and screwworm fly, but there are many others beside these. ABARES estimated in 2013 that an outbreak of FMD would cost the Australian wool industry around $2.2b in lost revenue under a range of scenarios. Greasy wool from the UK was excluded from China for 18 months during and after the UK’s 2001 FMD outbreak. Effective EAD prevention, speedy response to an outbreak should it occur, and well-planned trade continuity measures are critical for the Australian (and indeed the global) wool industry. Central to these measures is the concept of ‘biosecurity’.

The wool industry has strong incentives to participate actively in efforts to improve national EAD preparedness. Aside from the obvious economic self-interest of doing so, the industry has obligations under the Emergency Animal Disease Response Agreement and the National Animal Biosecurity Research, Development and Extension Strategy (NABRDES).

Strategy development and context
This Strategy has been developed by the Federation of Australian Wool Industries (FAWO), specifically FAWO’s EAD Working Group, with the assistance of AWI. The Strategy represents the wool industry’s contribution to the NABRDES, itself a component of the National Primary Industries RD&E Framework.

Vision
The Vision of this Strategy is that:

The Australian wool industry is well prepared for an emergency animal disease (EAD) outbreak, and the industry is highly regarded by Government, trading partners and international animal health authorities in this respect.

The high level of preparedness of the Australian wool industry will be seen in:

- Maximised time- and cost-effectiveness of the Government / industry response;
- Minimised reputational damage to the Australian industry;
- Minimised disruption to flows of Australian wool to the world’s markets, and;
- The most rapid possible return to normal business for wool growers and customers.
Gap analysis
For the Vision to be achieved – that is, for the Australian wool trade to be resumed as rapidly as possible following the outbreak of an EAD – the following effective elements need to be in place:

- **Active disease surveillance**, so that EADs are identified early;
- **An effective governance framework** for responding to an EAD detection, well tested during ‘peacetime’;
- **An operational disease response framework**, based upon sound scientific knowledge, validated and strongly linked to international (OIE) standards and also well tested;
- **Structures and systems** to guide activities directed at restoring trade, including provisions for partitioning affected from unaffected areas (zoning) and certifying product safety;
- **The technologies and materials** required to mount the response and recovery, including diagnostic tests, vaccines, disinfectants and so on;
- **Financial and human capacity** to mount the activities required, including oversight, disease detection and response, trade negotiations; and
- **Strong and well-coordinated communications** between industries, governments and trading partners.

Key findings of a strengths, weaknesses, opportunities and threats analysis are:

- Australia generally, and the wool industry specifically, are reasonably well placed to respond to an EAD outbreak but there are gaps in our preparedness.
- The gaps in our preparedness require a range of responses from the conduct of R&D to the revision of response plans, the establishment of cross-sectoral structures and the conduct of training and extension activities, including ‘stress-testing’ parts of the response system.
- Addressing the gaps identified will require the contribution and participation of numerous parties, including wool industry individuals, companies and organisations; government; overseas trading partners; and other bodies such as the OIE.

**Strategy**
The Australian Wool Industry Emergency Animal Disease Preparedness RD&E Strategy 2013-16 is summarised as follows:
The four programs are described in greater detail in the Strategy. The indicative budget for the Strategy is $200,000pa for three years, indicatively allocated as follows:

<table>
<thead>
<tr>
<th>Program</th>
<th>Priority</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Underpinning knowledge</td>
<td>1: Storage</td>
<td>75</td>
<td>75</td>
<td>-</td>
<td>150</td>
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<tr>
<td></td>
<td>2: Disinfection</td>
<td>40</td>
<td>-</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>3: Traceability</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>2: Structures and systems</td>
<td>1: AVP updating</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>2: New manual</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>3: Stress testing</td>
<td>-</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>4: Structures</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3: Understanding and capacity</td>
<td>1: Database</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2: Training</td>
<td>25</td>
<td>10</td>
<td>65</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>3: Communication</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4: Coordination</td>
<td></td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>600</td>
</tr>
</tbody>
</table>

**Monitoring and evaluation**

Seven critical success factors for the Strategy have been identified, and a detailed monitoring and evaluation plan developed.
Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAHL</td>
<td>Australian Animal Health Laboratory [of CSIRO]</td>
</tr>
<tr>
<td>ABARES</td>
<td>Australian Bureau of Agricultural and Resource Economics and Sciences</td>
</tr>
<tr>
<td>ACWEP</td>
<td>Australian Council of Wool Exporters &amp; Processors</td>
</tr>
<tr>
<td>AHA</td>
<td>Animal Health Australia</td>
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<tr>
<td>AUSVETPLAN</td>
<td>Australian Veterinary Emergency Plan</td>
</tr>
<tr>
<td>AWI</td>
<td>Australian Wool Innovation</td>
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<tr>
<td>DA</td>
<td>Department of Agriculture (C'th)</td>
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<tr>
<td>EAD</td>
<td>Emergency animal disease</td>
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<tr>
<td>EADRA</td>
<td>Emergency Animal Disease Response Agreement</td>
</tr>
<tr>
<td>FAWO</td>
<td>Federation of Australian Wool Organisations</td>
</tr>
<tr>
<td>FMD(V)</td>
<td>Foot-and-mouth disease (virus)</td>
</tr>
<tr>
<td>NABRDES</td>
<td>National Animal Biosecurity Research, Development and Extension Strategy</td>
</tr>
<tr>
<td>NCWSBA</td>
<td>National Council of Wool Selling Brokers of Australia</td>
</tr>
<tr>
<td>IWTO</td>
<td>International Wool Textile Organisation</td>
</tr>
<tr>
<td>OIE</td>
<td>World Organisation for Animal Health</td>
</tr>
<tr>
<td>PISC</td>
<td>Primary Industries Standing Committee</td>
</tr>
<tr>
<td>PTWMA</td>
<td>Private Treaty Wool Merchants of Australia</td>
</tr>
<tr>
<td>RD&amp;E</td>
<td>Research, development and extension</td>
</tr>
<tr>
<td>SCoPI</td>
<td>Standing Council on Primary Industries</td>
</tr>
<tr>
<td>SPS</td>
<td>Sanitary and phytosanitary</td>
</tr>
<tr>
<td>TMAG</td>
<td>Trade and Market Access Group</td>
</tr>
<tr>
<td>WTO</td>
<td>World Trade Organisation</td>
</tr>
</tbody>
</table>

1. Purpose

This document outlines a research, development and extension (RD&E) strategy to minimise the potential trade impacts on the Australian wool industry arising from emergency animal disease (EAD) outbreaks. RD&E is critical to the continuous improvement of effective EAD responses (Figure 1).
The purpose of The Australian Wool Industry Emergency Animal Disease Preparedness RD&E Strategy 2013-16 is to:

- Identify RD&E priorities for EAD preparedness along the wool pipeline and, in doing so, move towards fulfilling the wool industry’s obligations under the EAD Response Agreement (EADRA) and National Animal Biosecurity Research Development and Extension Strategy (NABRDES) (see below);
- Ensure the identified RD&E is carried out as effectively and efficiently as possible;
- Promote the industry’s understanding of the importance of, and its collaboration towards achieving, a well-developed state of EAD preparedness; and
- Establish the mechanisms and culture needed to maintain the industry’s EAD preparedness into the future.

The scope of this Strategy:

- **Is confined to** the shorn wool pipeline from farm to market; that is, it is concerned with the mitigation of supply chain and trade risks (such as product traceability) rather than disease response risks (such as diagnostic capability or vaccination)

- **Is not confined to** foot-and-mouth disease (FMD), although FMD is the yardstick for devastating EADs – the Strategy embraces preparedness for any and all EADs.

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1 Where RD&E may be required in disease response, proposals would be considered by AWI’s On-Farm R&D section in conjunction with other relevant bodies such as Meat & Livestock Australia
2. Background

2.1. Australia’s role in the global wool industry

The Australian wool industry is heavily dependent on exports. In the year from April 2012 to March 2013, Australia exported 324 mkg of wool. Of this, 89.5% was exported in greasy form, the remainder as scoured wool, carbonised wool, carded wool or noils/waste.

The destinations for Australian wool for the year April 2012 – March 2013 are shown in Figure 2. China is by far our dominant trading partner, taking 74% of Australia’s wool exports.

The uninterrupted capacity to export is critical to the Australian wool industry. So too is the global wool trade highly dependent upon Australian exports. Australia supplies approximately 25% of the world’s wool supply, including approximately 60% of the apparel wool and 90% of the fine apparel wool needed to meet global demand and markets. Figure 3 shows Australia’s dominance as a wool exporting nation, while Figure 4 shows the importance of Australian wool at the fine end of the micron range.

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2. Australian Wool Exports Snapshot, 7 May 2013 (using ABS data)
3. Australian Wool Exports Snapshot, 7 May 2013 (using ABS data)
2.2. Global arrangements for EAD response

There exists an international framework for the management of animal health and disease in respect to trade. This framework is overseen by the World Organisation for Animal Health (OIE), of which Australia and most other countries (including China) are members. The OIE publishes the ‘Terrestrial Animal Health Code’, whose aim is to ‘assure the sanitary safety of international trade in terrestrial

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5 Australian Bureau of Agricultural Research, Economics and Statistics, Agricultural commodity statistics 2012
animals...and their products\textsuperscript{7}. The Code underpins the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) among members of the World Trade Organisation (WTO).

The Code details, for each disease, standards for diagnostic testing, disinfection, establishing national or zonal freedom from the disease and so on. The Code also includes a range of general provisions covering animal disease, diagnosis, surveillance and notification; risk analysis; quality of veterinary services; disease prevention and control; trade measures, import/export procedures and veterinary certification; veterinary public health; and animal welfare.

Australia’s EAD response system (EADRA, AUSVETPLAN and other components) is closely aligned with the provisions of the Terrestrial Code. For example, AUSVETPLAN requirements with respect to the time required for any possible foot-and-mouth disease (FMD) virus to be deactivated within a wool bale are identical to those of the Code. This alignment ensures that, as far as possible, the trade response to an EAD outbreak in Australia will be based upon the results of internationally-agreed scientific research.

2.3. Australia’s EAD response system

Australia’s biosecurity framework is strong by international standards. Its elements include:

- The Emergency Animal Disease Response Agreement (EADRA), in which governments and industries have defined the manner in which Australia will prepare for and respond to EADs from governance, operational and financial perspectives;
- The Australian Veterinary Emergency Plan (AUSVETPLAN), an extensive and detailed series of documents detailing the strategies, procedures and underpinning scientific justification for EAD responses;
- The National Animal Health Information System, a database used to collate, manage, analyse and report on data from a range of disease surveillance activities such as the National Significant Disease Investigation Program;
- The National Animal Health Laboratory Network;
- The National Livestock Identification Scheme;
- Various training programs in emergency animal disease response and related areas; and

Notwithstanding the strengths of existing systems in Australia, there are gaps. The equine influenza outbreak of 2007/08 was considered to have exposed some of these gaps, particularly in quarantine, as identified in the subsequent ‘Beale review’\textsuperscript{8}. The ‘Matthews review’\textsuperscript{9} of 2011 also highlighted a number of weaknesses in specific reference to Australia’s foot-and-mouth disease preparedness.

Prompted by various FMD and bovine spongiform encephalopathy (‘mad cow disease’) outbreaks over the last two decades, Animal Health Australia (AHA) and its members, notably the Department of Agriculture (DA), have sought to strengthen Australia’s biosecurity system. The Commonwealth

\textsuperscript{7} OIE website, http://www.oie.int/international-standard-setting/overview/
\textsuperscript{9} Matthews, ‘A review of Australia’s preparedness for the threat of foot-and-mouth disease’, October 2011
Government report ‘Reform of Australia's biosecurity system: An update since the publication of One Biosecurity: a working partnership’ (2012)\textsuperscript{10}, states:

\textit{The reforms being undertaken position the department to meet this increasing demand and to ensure the biosecurity system is effective and sustainable into the future. The reform program is consistent with the themes outlined in the Beale review, informed by previous reviews and stakeholder needs; and underpinned by five key principles:}

- Implementing a risk-based approach to biosecurity management
- Managing biosecurity risk across the continuum – offshore, at the border and onshore
- Strengthening partnerships with stakeholders
- Being intelligence-led and evidence-based
- Supported by modern legislation, technology, funding and business systems.

Some of the gaps in the EAD response system would have particular impact on the wool industry. For example, there are no AUSVETPLAN manuals for wool-specific enterprises (although work on a Wool Enterprise Manual is now nearing completion).

\textbf{2.4. The wool industry’s exposure to EADs}

An EAD outbreak would impose very substantial costs on the wool industry, depending on the specific disease involved. These costs would arise from two principal areas:

1. The cost of responding to the disease itself. The EADRA defines cost-sharing formulae for different diseases depending on the extent to which they impact on private versus public good and on the industries considered to be involved. FMD, for example, is a Category 2 disease. Eighty percent of the disease response would be paid for by Commonwealth and State/Territory Governments and 20% by industry, split between cattle, sheep/goats and pigs according to gross value of production.

Disease response costs include salaries and wages of those involved in the response, operating expenses, capital costs and compensation for affected producers. These costs can be huge. The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) estimated in 2013 that just the control of an FMD incursion could cost between $60m (for a small outbreak) and $373m (for a large multi-state outbreak)\textsuperscript{11}.

2. The cost of the trade impact. This cost is very difficult to judge, as it depends very much on the response of trading partners and many other factors. In the ABARES study, the present value of revenue loss across all industries, over ten years, was estimated at between $5.6b and $51.8b. The revenue loss to the wool industry was $2.2b in all scenarios. This assumed exports of 44\% of baseline in year 1, 96\% in year 2 and 100\% thereafter\textsuperscript{12}. The revenue losses were relatively low for wool compared with other commodities such as meat and dairy.

\textsuperscript{10}Released by the Minister for Agriculture, Fisheries and Forestry, Senator the Hon. Joe Ludwig, 7 March 2012
\textsuperscript{11}ABARES, ‘Potential socio-economic impacts of an outbreak of foot-and-mouth disease in Australia’, October 2013
\textsuperscript{12}By way of comparison, greasy wool from the UK was excluded from China for 18 months during and after the UK’s 2001 FMD outbreak (John Lambert, personal communication)
Wool has the advantage over other commodities of being non-perishable and therefore able to be stockpiled. Notwithstanding this advantage, the wool industry’s strong export orientation places it at significant risk should Australia face an outbreak of an EAD that might be transmitted by wool. Trading partners would immediately place a ban on imports of Australian wool and this ban would remain in place until each country’s authorities were satisfied that the wool posed no threat to national biosecurity. National judgements of biosecurity threats are not always entirely founded in science but in any case will err on the side of caution.

At the level of the global industry, the short-term depletion of the pipeline could be very damaging, particularly if some later-stage players for whom wool is optional move to other fibres.

Exporting scoured rather than greasy wool is one option to ensure wool poses no threat of disease transmission. However, there are currently only three wool scours in Australia, after many moved offshore during the last ten years. Total Australian scouring capacity is now 15.5mkg. This capacity is nowhere near sufficient to process Australia’s annual production of 240-245mkg greasy wool to meet demand in a timely way.

For the wool industry, the major EAD risks are considered to be foot-and-mouth disease (FMD), sheep and goat pox, bluetongue and screwworm fly, but there are many others beside these – including Rift Valley fever, which prevented greasy wool exports from South Africa to China for 12 months in 2010-11. New diseases also emerge regularly.

It is clear that effective EAD prevention, speedy response to an outbreak should it occur, and well-planned trade continuity measures are critical for the Australian (and indeed the global) wool industry. Central to these measures is the concept of ‘biosecurity’. The NABRDES defines biosecurity as ‘the management of risks to the economy, animal and human health, the environment and the community, of pests and diseases entering or emerging, and establishing and spreading’. Biosecurity is thus a broad concept. It can be considered to include activities related to the resumption of trade in the event of an EAD because such activities rely upon, and must contribute to, high standards of biosecurity.

The wool industry has strong incentives to participate actively in efforts to improve national EAD preparedness. Aside from the obvious economic self-interest of doing so, the industry has obligations under the EADRA and NABRDES. Any industry whose poor biosecurity practices contributed to the occurrence or extended presence of an EAD could be legally required to meet a relatively larger proportion of the cost of response than other parties.

This Strategy aims to ensure that the wool industry has in place all of the components of an effective EAD response as are reasonably possible. Just as importantly, it aims to establish in the industry the systems and culture that will ensure EAD preparedness is subject to an approach of continuous improvement.

3. Strategy development and context
This Strategy has been developed by the Federation of Australian Wool Industries (FAWO), specifically FAWO’s EAD Working Group, with the assistance of AWI. The Strategy has evolved from a

concept paper developed with the guidance of the Working Group and with executive and administrative support from Australian Wool Innovation.

The Strategy represents the wool industry’s contribution to the National Animal Biosecurity Research Development and Extension Strategy 2013-16 (NABRDES). The NABRDES is a component of the National Primary Industries RD&E Framework, an initiative of the Standing Council on Primary Industries (SCoPI). The aim of this framework is ‘to ensure Australia’s RD&E capacities are aligned nationally with future industry and community needs, to initiate collaboration that strengthens Australia’s position internationally and to ensure that RD&E delivery is both more efficient and effective’.

The NABRDES forms part of a national architecture of RD&E strategic planning for the livestock industries. It will be implemented through the governance structure shown in Figure 5.

*Figure 5 Implementation model for National Animal Biosecurity Research, Development and Extension Strategy (source: Draft NABRDES 2013-16, January 2013)*

In Figure 5, the Implementation Committee is the principal forum for coordination and communication among animal biosecurity stakeholders. It comprises Australian, State and Territory Governments, the animal-based RDCs (including AWI) and universities. It endorses the strategic directions and annual work plan as proposed by the Steering Group.

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This Strategy is envisaged as a living document that will develop over time through the joint input of the FAWO EAD Working Group members, DA, AHA and the Australian Animal Health Laboratory (AAHL).

A more detailed history of the development of this Strategy is provided in Appendix 1.

4. Stakeholders

The direct stakeholders in this Strategy – that is, groups who are directly affected by it, are:

- FAWO Full and Associate Members, and the individuals and organisations represented by them:
  - Australian Council of Wool Exporters & Processors Inc;
  - Australian Wool Innovation Ltd;
  - The National Council of Wool Selling Brokers of Australia Inc;
  - Australian Wool Testing Authority Ltd;
  - Australian Wool Exchange Ltd;
  - WoolProducers Australia;
  - Australian Superfine Wool Growers’ Association Inc (Associate);
  - CRC for Sheep Industry Innovation (Associate);
  - Department of Agriculture WA (Associate); and
  - Department of Primary Industries Victoria (Associate)

- Department of Agriculture (DA);
- Animal Health Australia (AHA);
- The International Wool Textile Organisation (IWTO)
- Players in the wool pipeline around the world.

Indirectly, the rest of the global textile industry (clothing brands, retailers etc) are also stakeholders of this Strategy, as are communities and businesses around Australia whose livelihoods rely to some extent on the wool industry. A serious EAD event which halted Australian wool exports, for any significant period, would have major negative consequences throughout the pipeline.

5. Vision

The Vision of this Strategy is that:

*The Australian wool industry is well prepared for an emergency animal disease (EAD) outbreak, and the industry is highly regarded by Government, trading partners and international animal health authorities in this respect.*

*The high level of preparedness of the Australian wool industry will be seen in:*

- Maximised time- and cost-effectiveness of the Government / industry response;
- Minimised reputational damage to the Australian industry;
- Minimised disruption to flows of Australian wool to the world’s markets, and;
- The most rapid possible return to normal business for wool growers and customers.
6. Gap analysis

For the Vision to be achieved – that is, for the Australian wool trade to be resumed as rapidly as possible following the outbreak of an EAD – the following effective elements need to be in place:

- Active disease **surveillance**, so that EADs are identified early;
- An effective **governance framework** for responding to an EAD detection, well tested during ‘peacetime’;
- An **operational disease response framework**, based upon sound scientific knowledge, validated and strongly linked to international (OIE) standards and also well tested;
- **Structures and systems** to guide activities directed at restoring trade, including provisions for partitioning affected from unaffected areas (zoning) and certifying product safety;
- The **technologies and materials** required to mount the response and recovery, including diagnostic tests, vaccines, disinfectants and so on;
- **Financial and human capacity** to mount the activities required, including oversight, disease detection and response, trade negotiations; and
- **Strong and well-coordinated communications** between industries, governments and trading partners.

The following is an analysis of strengths, weaknesses, opportunities and threats (SWOT), in respect to the elements described above, from a wool industry perspective:

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-established and tested national EAD response plans and structures</td>
<td>Declining and inadequate State government resourcing of EAD preparedness</td>
</tr>
<tr>
<td>Established, cooperative industry bodies</td>
<td>Infrequent, expensive national preparedness exercises</td>
</tr>
<tr>
<td>Strong relationship between the wool industry and Animal Health Australia, DA and other key stakeholders</td>
<td>Gaps in EAD response plans with respect to wool, especially in respect to survival of disease agents in wool bales</td>
</tr>
<tr>
<td>Strong relationships with overseas customers</td>
<td>Inappropriate provisions in EAD response plans, such as listing of caustic soda to disinfect bales</td>
</tr>
<tr>
<td>Heavy reliance by China on wool from Australia</td>
<td>Little if any EAD-related business continuity planning by wool industry enterprises</td>
</tr>
<tr>
<td>Some (limited) national experience within EADs (notably equine influenza)</td>
<td>Lack of robust, proven system to trace wool forwards or backwards along the supply chain, allowing rapid identification of the geographic origin of all bales</td>
</tr>
<tr>
<td>Lessons learned from other wool-exporting countries</td>
<td>Limited capacity to process wool on-shore</td>
</tr>
<tr>
<td></td>
<td>No demonstrated national experience of successfully mounting a ‘zoned’ response to a major grazing livestock EAD</td>
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<tr>
<td></td>
<td>Lack of a coordinated wool industry EAD response strategy</td>
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<td></td>
<td>Declining private veterinary sector in farm animals</td>
</tr>
<tr>
<td>Opportunities</td>
<td>Threats</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>• Current DA interest in EAD preparedness, particularly FMD, and receptiveness to working with industry</td>
<td>• Biosecurity seen as a low risk and therefore not a high priority by industry players</td>
</tr>
<tr>
<td>• Growing understanding among industry players of the importance and practice of good biosecurity</td>
<td>• Loss of corporate knowledge</td>
</tr>
<tr>
<td>• Work being undertaken in other wool producing countries (virus survival etc) – opportunity to leverage Australian efforts</td>
<td>• Declining resources (levy and other) to address gaps in EAD preparedness</td>
</tr>
<tr>
<td>• National Animal Biosecurity R,D&amp;E Strategy</td>
<td>• Occurrence of an EAD before critical gaps can be addressed</td>
</tr>
<tr>
<td>• Revision of EAD response plans with industry input to address gaps</td>
<td>• Lack of capability to address identified gaps</td>
</tr>
<tr>
<td>• Strengthening of EAD preparedness / communication structures involving industry, government and trading partners</td>
<td></td>
</tr>
</tbody>
</table>

Key findings of the SWOT are as follows:

- Australia generally, and the wool industry specifically, are reasonably well placed to respond to an EAD outbreak but there are gaps in our preparedness. And whilst Australia has dealt with equine influenza and other outbreaks, neither the nation nor the wool industry has direct experience in dealing with a major EAD in the grazing livestock industries.
- The gaps in our preparedness require a range of responses from the conduct of R&D to the revision of response plans, the establishment of cross-sectoral structures and the conduct of training and extension activities. ‘Stress-testing’ parts of the response system is also needed given our lack of ‘combat experience’.
- Addressing the gaps identified will require the contribution and participation of numerous parties, including wool industry individuals, companies and organisations; government; overseas trading partners; and other bodies such as the OIE. AWI and FAWO will play a critical role in catalysing the activities undertaken as part of this Strategy.

7. Deliverables

Given the gaps and opportunities identified in the SWOT this Strategy will, by 30 June 2016, deliver the following:

1. Reports that address gaps in our scientific knowledge of important EADs.
2. Revised AUSVETPLAN and other manuals, incorporating the improved knowledge arising from scientific research, among other improvements.
3. New AUSVETPLAN manual(s) where gaps currently exist.
4. Detailed and ‘stress-tested’ protocols for the tracing of any given sample or lot of wool forwards or backwards along the supply chain.
5. Training in EAD response, delivered to staff of wool industry enterprises such as testing houses and stores.
6. Governance structures in place, with terms of reference, for joint industry / government activities to restore trade during and after an EAD.
7. A database of key contacts throughout the wool pipeline in trading partner countries.
8. Communication activities on EAD preparedness along all parts of the wool pipeline in Australia and overseas, including IWTO.

The requirement for other deliverables may arise during the course of the Strategy.

8. Strategy

8.1. Overview

The Australian Wool Industry Emergency Animal Disease Preparedness RD&E Strategy 2013-16 is summarised in Figure 6 below.

Figure 6 Overview of Australian Wool Industry Emergency Animal Disease Preparedness RD&E Strategy 2013-16

Details of the individual programs are described below.
8.2. Program 1: Underpinning knowledge

8.2.1. Rationale
Effective EAD responses rely heavily on a detailed, scientific understanding of the disease agent involved: conditions that favour or hinder its survival, how it is transmitted, the host’s response to it and so on.

There are gaps in our knowledge of agents that could cause damaging EAD outbreaks. For example, despite a massive body of research on FMD virus, our understanding of its survival in wool bales is quite scant. These knowledge gaps limit the effectiveness of potential EAD responses. For example, the uncertainty concerning FMDV survival time means that wide safety margins must be applied to minimise the risk that baled wool carries the virus.

Gaps also exist in non-disease aspects of the industry’s response to an EAD. In particular, it is not clear that any given lot or sample of wool could be traced, from any given point in the supply chain, backwards towards the farm or forwards towards the market. Such traceability will be critical during an EAD outbreak to restore trade.

8.2.2. Priorities

1. Storage requirements for wool bales in a range of environments / temperatures
The top priority for the wool industry during an EAD outbreak will be to convince trading partners that Australian wool poses them no biosecurity threat. This means demonstrating that any given lot of wool has an almost-zero risk of carrying the disease agent in question.

The interior of a wool bale offers a protective environment for disease agents that may be present. A major determinant of agent survival time in a wool bale will be temperature. The sensitivity of various viruses, especially FMD virus, to heat is generally well described. There is much less information available on the temperatures reached at various points inside wool bales stored under a range of conditions.

A project will be conducted that will:

- Identify devices suitable for the measurement of temperature inside wool bales;
- Undertake preliminary studies to validate the thermometers and testing protocols;
- Undertake a larger field trial to characterise, in detail, temperature gradients within bales under a range of storage and environmental conditions;
- Develop recommendations for storage periods to inactivate various disease agents in wool bales;
- Seek endorsement for these recommendations from Australian and international authorities; and
- Modify AUSVETPLAN and other documents accordingly.

Indicative budget: $75k per annum in years 1 and 2.

2. Decontamination of wool bales
It will be highly desirable during an EAD outbreak to remove shorn wool from quarantined properties, so that (a) the owners can realise some cash flow, provided the wool market is trading
and (b) there are fewer potentially infective materials for the disease response team to deal with. If wool were to be removed from a property under quarantine then, among other steps, the bales would require external disinfection before they could be trucked.

The AUSVETPLAN FMD Disease Strategy currently specifies caustic soda as the chemical to be used to disinfect the outside of wool bales. The industry has alerted AHA that caustic soda is an inappropriate choice because it dissolves wool fibres. Citric acid is thought to be a suitable alternative but work is required to examine its feasibility for this purpose (including application rates, cost, effects on bale material and inks) or identify other alternatives.

Indicative budget: $50k in year 1.

3. Traceability of wool through the chain

It is not clear that any given bale or sample of wool could be traced forward from its property of origin to any point downstream in the supply chain. The inability to trace wool that has left an infected or suspect property or area just prior to an EAD outbreak would be highly detrimental to efforts to control the outbreak and to persuade trading partners to resume purchases of Australian wool.

Work will be undertaken as part of this plan to prepare detailed maps of all wool flows through the supply chain (including bulkclassed and interlotted wools, and grab, core, tuft and midside samples). The study will describe the systems that could be used to track these wools and develop protocols for use during an EAD outbreak.

It will be important to keep this information current. The protocols will also be ‘stress-tested’ as part of this plan (see priority 2.3).

Indicative budget: $30k in year 2.

8.2.3. Key performance indicators

- Delivery of specified outputs on time and within budget
- In the case of disease agent research, review and approval by DA, AHA, OIE etc indicating rigour of findings

8.3. Program 2: Structures and systems

8.3.1. Rationale

The path to ‘commercialisation’ or ‘adoption’ of EAD-related R&D outcomes differs somewhat from that of most other new knowledge gained from industry-funded R&D. Because it forms part of an insurance policy against future risks, the value of this new knowledge is captured when it is incorporated into response plans and structures to be used when it is needed.

The Australian system for responding to emergency animal diseases is called AUSVETPLAN. AUSVETPLAN is ‘a comprehensive series of manuals that sets out the various roles, responsibilities and policy guidelines for agencies and organisations involved in an EAD response’. These manuals are of various types: including ‘disease strategies’ (how specific diseases will be dealt with) and

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‘enterprise manuals’ (how specific enterprises such as saleyards should deal with an EAD). AUSVETPLAN manuals are subject to a process of constant review and updating as new information comes to hand.

Program 2 will ensure that AUSVETPLAN manuals with relevance to the wool industry are kept updated with the best available information including new knowledge arising from Program 1. For some sectors of the wool industry, entirely new manuals are needed, and these will also be created as part of this plan.

8.3.2. Priorities

1. Revision of current AUSVETPLAN manuals to incorporate latest knowledge

There is a very large number of AUSVETPLAN documents, from disease strategies to enterprise manuals and operational procedures manuals. These are reviewed and updated according to a rolling three-year schedule.

Over the life of this Strategy, several AUSVETPLAN documents with relevance to wool will be updated. The FAWO Working Group is expected to have input into:

- Bluetongue Disease Strategy – final check before Animal Health Committee final endorsement, following significant updates in light of the outcomes of Exercise Phantom Fox, the review of the FMD AUSVETPLAN Disease Strategy and refinements to the definitions.
- Foot-and-mouth Disease Strategy – being revised in light of comments received at the FMD Roundtable of September 2012. Draft version expected later in 2013 for a 6-week comment period. The outcomes of research described in this Strategy (Program 1) will be also incorporated as results become available.
- Rift Valley fever Disease Strategy – final check before Animal Health Committee for final endorsement, following significant updates in light of the review of the FMD AUSVETPLAN Disease Strategy and refinements to the definitions.
- Scrapie Disease Strategy – currently being reviewed by a subject-matter expert.
- Screw worm fly Disease Strategy – currently being reviewed by an expert writing group.
- Vesicular stomatitis Disease Strategy – currently being reviewed by an expert writing group.
- Disposal procedures Operational Manual – currently being reviewed by an expert writing group.
- Livestock welfare and management Operational Manual – currently being reviewed by a subject-matter expert.
- Public relations Operational Manual – currently being reviewed by an expert writing group.
- Valuation and compensation Operational Manual – currently subject to the formation of a writing group, for which a representative from the FAWO EAD WG will be sought.

In addition to the above, outcomes from Program 1 of this Strategy will be progressively fed into the relevant AUSVETPLAN manuals.

Indicative budget: $10k per annum in years 1, 2 and 3 to obtain expert external advice where required. Other costs including participation in writing groups to be captured in Program 4 budget.
2. Development of a new AUSVETPLAN manual for wool industry enterprises

There are currently no AUSVETPLAN manuals for wool industry-specific enterprises such as testing houses, wool stores, processors or exporters. The wool industry’s response to an EAD outbreak would be enhanced if a manual were available that detailed:

- The nature of wool industry-specific enterprises (inputs, outputs, emergency diseases of concern, relevant regulations and standards);
- Risk reduction and contingency planning measures; and
- Response plans for enactment in the event of an EAD (including expectations re continuity of operation, obligations to contribute to the disease response).

A project is already underway to develop, in consultation with industry organisations, a wool industry enterprise manual. This manual is expected to be completed a short time into the life of this Strategy.

Indicative budget: nil. The project has been funded separately by DA.

3. ‘Stress-testing’ of EAD response sub-systems

The Australian EAD response framework is subject to regular testing through the running of simulation exercises, usually involving imagined FMD outbreaks. In recent years there has been a particular emphasis on training and professional development for the Rapid Response Team, a group of around 50 government personnel who would fill key management positions in control centres during a response. Whole-of-system exercises such as Exercise Minotaur (2002) are very expensive and time-consuming.

There is a role for industries such as wool to ‘stress-test’ particular components of the EAD response with particular emphasis on the industry’s restoration of trade. The immediate priority is tracing wool through the pipeline. An exercise could be held at moderate cost to test protocols developed in Program 1, Priority 3. This is something animal health authorities are unlikely to carry out except as part of a broader exercise, yet the potential value to the wool industry in reducing risk is enormous. The exercise(s) might be conducted as desktop or in real time.

Exercises of this type have previously been carried out to simulate incidents related to pesticide residues on wool.

Indicative budget: $25k per annum in years 2 and 3.

4. Establishment of industry and industry/Gov’t structures to prepare for and manage wool-related EADs

The experience of wool-producing countries that have dealt with EADs, notably South Africa, is that effective communication between government and industry of both the exporting and importing countries is critical to a rapid resumption of trade. Whilst there are important processes and negotiations that must take place between governments, industry has much to offer, most notably its understanding of the practicalities of product movement and its relationships among the domestic industry of the trading partner.
A structure for industry input into trade resumption efforts during an EAD – the Trade and Market Access Group (TMAG) – existed around ten years ago, although it has disappeared. The TMAG was convened by DA. It does not appear in the EADRA, however.

A recommendation of the SED Consulting report (2012) was that FAWO ‘should approach DA, as a matter of priority, seeking clarification of the industry consultation arrangements that would be followed by DA in the case of an EAD. If a satisfactory response is not received, FAWO should seek the views of other affected industries (sheepmeat, beef, livestock exports etc) in regard to the current arrangements and develop a joint approach to DA to reinstitute the TMAG or similar body’.

Indicative budget: included in the Program 4 budget.

8.3.3. Key performance indicators
- Delivery of specified outputs on time and within budget
- Review and approval by DA and AHA of revised and new AUSVETPLAN manuals
- Successful ‘stress-testing’ of manuals, protocols and structures

8.4. Program 3: Understanding and capacity

8.4.1. Rationale
While Program 2 ensures ‘hard’ systems are in place to guide the wool industry’s response to an EAD outbreak, these systems will not be effective if the people involved in implementing them do not have the understanding, capacity or relationships to do so effectively. Program 3 will help to address these important aspects of EAD preparedness in the industry.

8.4.2. Priorities
1. Development of a key contact database
A key lesson learned by wool-exporting countries that have suffered EAD outbreaks is the over-riding importance of having, from the exporting and importing countries, ‘the right people talking to each other’. This will partly be addressed by Program 2, Priority 4, and partly by this Priority.

The wool industry will establish a database of key positions and personnel throughout the pipeline, in Australia and overseas, particularly in key markets (China). Personnel within FAWO, the Australian Council of Wool Exporters & Processors (ACWEP), AWI and other organisations already have good relationships and these need to be captured in a database to ensure they are not lost when individuals move on or retire (acknowledging that the database will need to be kept continuously updated). The database will also underpin the communications activities of Program 4.

The development of such a database was a recommendation of the SED Consulting report (2012).

Indicative budget: $10k in year 1.

2. Training in EAD preparedness and response for industry personnel
The wool industry enterprise manuals to be produced in Program 2, Priority 2 will provide the opportunity and base material required to run training courses in EAD preparedness and response for wool industry personnel. This training may be done in conjunction with Program 2, Priority 3: ‘Stress-testing’ of EAD response sub-systems, so that a ‘learning-by-doing’ environment is created.
Indicative budget: $25k in year 1, $10k in year 2, $65k in year 3.

3. Communication with stakeholders

It is important that all parts of the wool supply chain and other stakeholders (AHA, DA etc) are kept apprised of the Australian wool industry’s efforts in EAD preparedness, in order to:

- Raise awareness of the importance of EAD preparedness;
- Increase confidence that, in the event of an EAD outbreak, the wool industry will be well prepared to deal with it;
- Encourage participation and training and other activities; and
- Demonstrate the constructive use of levy and government dollars through AWI.

This will be a relatively low-key communications program involving:

- Participation in meetings with DA, AHA and others;
- Presentations in forums such as IWTO where the opportunities arise;
- Press releases and articles in the AWI publication ‘Beyond the Bale’;
- Communications through newsletters, web links etc of state farming organisations and other wool industry organisations (e.g. ACWEP, National Council of Wool Selling Brokers of Australia (NCWSBA) and Private Treaty Wool Merchants of Australia (PTWMA)); and
- Material on the FAWO and AWI web sites.

Indicative budget: included in the Program 4 budget.

8.4.3. Key performance indicators

- Participation in extension and training activities
- Understanding and confidence of various stakeholders

8.5. Program 4: Coordination

8.5.1. Rationale

The activities of this Plan will require coordination and management.

8.5.2. Priorities

Activities will include:

- Preparing project proposals to AWI including, as necessary, justification for investment;
- Preparing of project briefs;
- Identifying and contracting providers to undertake work;
- Monitoring project progress through milestones and other means and taking corrective action to address problems;
- Facilitating or at least ensuring the shepherding of new information and standards through the appropriate channels, e.g. OIE, IWTO; and
- Reporting to AWI, FAWO, IWTO, AHA and other stakeholders on program progress.

It is likely that the individual or organisation employed in the coordinator role would also undertake some or all of the work identified in other Programs – in particular:
• Program 2, Priority 1: Revision of current AUSVETPLAN manuals to incorporate latest knowledge;
• Program 2, Priority 4: Establishment of industry and industry/Gov’t structures to prepare for and manage wool-related EADs;
• Program 3, Priority 2: Development of a key contact database;
• Program 3, Priority 3: Communication with stakeholders.

Indicative budget: $50k per annum over 3 years.

8.5.3. Key performance indicators
• Timely delivery of outputs (projects commenced, milestone reports delivered) according to agreed workplan

9. Budget
The indicative budget for the Strategy is $200,000pa for three years. The breakdown of the budget by Program and by year is shown in Table 1.

*Note: the allocation of investment between programs and between years may vary from that presented once more precise estimates of project costs are available.*

<table>
<thead>
<tr>
<th>Program</th>
<th>Priority</th>
<th>Budget ($’000)</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Underpinning knowledge</td>
<td>1: Storage</td>
<td></td>
<td>75</td>
<td>75</td>
<td>-</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>2: Disinfection</td>
<td></td>
<td>40</td>
<td>-</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>3: Traceability</td>
<td></td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>2: Structures and systems</td>
<td>1: AVP updating</td>
<td></td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>2: New manual</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>3: Stress testing</td>
<td></td>
<td>-</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>4: Structures</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3: Understanding and capacity</td>
<td>1: Database</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2: Training</td>
<td></td>
<td>25</td>
<td>10</td>
<td>65</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>3: Communication</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4: Coordination*</td>
<td></td>
<td></td>
<td>50*</td>
<td>50*</td>
<td>50*</td>
<td>150*</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>600</td>
</tr>
</tbody>
</table>

* Coordination budget includes activities across all areas including 2.4, 3.1 and 3.3

It is hoped that the AWI funding made available for the Strategy will be augmented by cash and in-kind contributions from other sources.
10. Monitoring and evaluation

10.1. Critical success factors
The success of this RD&E Strategy will depend on a number of factors. These are listed in Table 2, with the measures that will be taken to ensure they are met.

Table 2 Critical success factors for the Strategy and steps taken to meet these

<table>
<thead>
<tr>
<th>Critical success factor</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptance of the Plan by FAWO</td>
<td>• Approval sought from FAWO Executive Committee</td>
</tr>
<tr>
<td></td>
<td>• Regular updates on Plan implementation provided to Committee via members of the Working Group and the Secretary</td>
</tr>
<tr>
<td>Willingness of the AWI Board to provide funding for the Strategy</td>
<td>• Approval sought from AWI Board, and any concerns addressed</td>
</tr>
<tr>
<td></td>
<td>• Outcomes reported regularly to the Board</td>
</tr>
<tr>
<td>Shared ownership and engagement of Strategy activities by all sectors of the wool pipeline</td>
<td>• Scoping and design of activities in close consultation with industry – to ensure outcomes are credible</td>
</tr>
<tr>
<td></td>
<td>• Extensive communication on the Strategy with all parts of the industry in Australia and overseas</td>
</tr>
<tr>
<td>Leverage of knowledge, skills and resources within the wool industry</td>
<td>• Appointment of a Coordinator (Program 4) with strong links into the industry</td>
</tr>
<tr>
<td>Demonstrated leadership</td>
<td>• Coordinator to take lead role in communicating the importance and benefits of the Strategy and act as Strategy ‘Champion’</td>
</tr>
<tr>
<td>Avoidance of duplication in RD&amp;E</td>
<td>• Consultation with other woolgrowing countries prior to initiating projects (especially South Africa)</td>
</tr>
<tr>
<td></td>
<td>• Reviews of existing literature and discussion with knowledgeable people where prior R&amp;D may have been done</td>
</tr>
<tr>
<td>Link of RD&amp;E to NABRDES</td>
<td>• Strategy linked to NABRDES through AWI membership of Implementation Committee</td>
</tr>
</tbody>
</table>
### 10.2. Monitoring and evaluation framework

<table>
<thead>
<tr>
<th>PROGRAMS</th>
<th>1. Underpinning knowledge</th>
<th>2. Structures and systems</th>
<th>3. Understanding and capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIVITIES</td>
<td>- R&amp;D on deactivation of disease agents in wool bales and samples</td>
<td>- Revision of AUSVETPLAN manuals to incorporate latest knowledge including outputs of Program 1</td>
<td>- Development of a key contact database</td>
</tr>
<tr>
<td></td>
<td>- R&amp;D on external decontamination of wool bales</td>
<td>- Development of new AUSVETPLAN manual for wool industry enterprises</td>
<td>- Training in EAD preparedness for industry personnel</td>
</tr>
<tr>
<td></td>
<td>- Investigation of means and development of protocols to trace wool (bales and samples) through all parts of the supply chain</td>
<td>- ‘Stress-testing’ of EAD response sub-systems</td>
<td>- Communication with all parts of the wool supply chain and other stakeholders (Government, AHA etc)</td>
</tr>
<tr>
<td>OUTPUTS/OPTIONS</td>
<td>- Accurate time / temperature deactivation curves for major disease agents in wool</td>
<td>- AUSVETPLAN manuals for wool industry enterprises (stores, testing houses) in place; ‘wool’ elements of other AVP manuals (disease, operational) updated and kept current</td>
<td>- Strong, constructive relationships between FAWO and other players (Government, AHA etc)</td>
</tr>
<tr>
<td></td>
<td>- List of chemical agent(s), proven to disinfect wool bales of major EAD agents, that are safe to use, inexpensive, readily available and able to be internationally (OIE) recognised</td>
<td>- Traceability protocols in place and tested for soundness</td>
<td>- Understanding of the components of the wool industry’s EAD preparedness among FAWO members, Gov’t, AHA</td>
</tr>
<tr>
<td></td>
<td>- Demonstrated method to trace wool bales and samples backwards or forwards from any point in the supply chain</td>
<td>- Terms of reference for committees in place</td>
<td>- High level of confidence in the industry’s preparedness among FAWO members and overseas customers</td>
</tr>
<tr>
<td></td>
<td>- AUSVETPLAN manuals for wool industry enterprises (stores, testing houses) in place; ‘wool’ elements of other AVP manuals (disease, operational) updated and kept current</td>
<td>- Contact lists of key personnel in industry and Gov’t, Australia and overseas, in place and kept current</td>
<td>- Understood and confidence in the components of the wool industry’s EAD preparedness among FAWO members, Gov’t, AHA</td>
</tr>
</tbody>
</table>

#### VISION
- Maximised effectiveness and efficiency of Gov’t / industry response
- Greatest possible confidence in biosecurity of Australian wool during / post EAD
- Most rapid possible restoration of wool flows to the market

#### MEASURES OF SUCCESS
- Delivery of specified outputs on time and within budget
- Review and approval by DA, AHA, OIE etc indicating rigour
- Delivery of specified outputs on time and within budget
- Review and approval by DA and AHA (AVP)
- Successful ‘stress-testing’ of manuals, protocols and structures
- Participation in extension and training activities
- Understanding and confidence of various stakeholders
- Project management processes by AWI (milestones, project reviews)
- Submission to DA and AHA for review and approval (AVP)
- Project management processes by AWI (milestones, project reviews)
- Tracking of participation in training and extension activities
- Independent surveys of major stakeholder groups
| TARGETS | TBC | TBC | TBC |
11. Supporting documents and references


Appendix 1: History of the development of this Strategy

Responsibility for EAD preparedness was historically the domain of the Commonwealth and State / Territory Governments. In 1996, Animal Health Australia (AHA) was formed as a partnership between the two levels of Government, the livestock industries and some service providers. Since that time the role of AHA and the emphasis on joint government / industry responsibility for animal health policy and practice in Australia has grown.

A further watershed was the signing in 2002 of the Emergency Animal Disease Response Agreement (EADRA) by governments and industry. The EADRA sees all parties take responsibility for EAD prevention, preparedness and response, including the meeting of significant financial obligations should an EAD occur.

For the wool industry’s part, activities supporting EAD preparedness have generally been carried out by AWI or Wool Producers Australia (WPA), or the respective predecessors of these organisations. There has been little if any attempt to engage the entire supply chain in EAD preparedness. Recognition of this problem led to the establishment by FAWO of an EAD Working Group in 2011. The purpose of this group is to ensure FAWO member organisations are fully aware of:

- Developments in EAD preparedness at Government level (Department of Agriculture or DA) and Animal Health Australia (AHA);
- The implications for the wool industry should there be an exotic animal disease outbreak;
- The procedures required to deal with an outbreak on-farm, off-farm and in the trade;
- Links to other organisations at state, national and international levels; and
- The importance of awareness and extension.

This has resulted in:

- Greater involvement with the Department of Agriculture (DA) and Animal Health Australia (AHA);
- Participation in AHA and DA workshops;
- Participation at higher level through the Industry / Government Working Group;
- The opportunity to provide input to existing and new strategies for the preparedness of an EAD outbreak, such as the AUSVETPLAN manuals and the National Animal Biosecurity Research, Development and Extension Strategy (NABRDE); and
- FAWO being recognised at the appropriate body to address these issues given its knowledge of and links into the entire Australian wool industry.

In addition, following a series of workshops and a review undertaken by SED Consulting, the Working Group developed an initial R&D concept paper that highlighted areas requiring further work to address gaps in EAD preparedness specific to the wool industry.

This RD&E Strategy has evolved from this concept paper with the guidance of the FAWO EAD Working Group and with executive and administrative support from Australian Wool Innovation.
Appendix 2: FAWO EAD Working Group terms of reference

Terms of Reference
The FAWO Exotic Animal Disease Working Group is a forum for provision of expert advice and related services to FAWO members with the goal of maximising Australia’s preparedness for EAD outbreaks. Specifically, the Working Group reviews and provides expert assessment of Australia’s preparedness for an EAD outbreak, focussing on:

1. Assessment and analysis of potential disruptions to wool trade flows in the event of EAD emergencies, within a variety of potential outbreak scenarios, and producing quantitative estimates of potential disruptions to industry flows;
2. Considering and recommending specific actions for improving preparedness and minimising disruptions to flow of wool to trade customers, including identifying potential sources of funding support if required, and;
3. Monitoring of progress toward maximised industry preparedness.

Composition
The composition of the Working Group shall be determined by agreement of the FAWO Executive. Ordinarily, participants will be drawn from the broader membership of the FAWO Executive Committee, but may be supplemented by individuals external to this Committee, as required, by agreement of the FAWO Executive. Specifically, an Animal Health Australia Nominee is suggested as a Working Group member.

Conduct of meetings
Meetings will be chaired by the Chairman of the FAWO Executive Committee or nominee, and FAWO will provide secretarial support.

Minutes of the meetings will be kept, and Working Group decisions and action points disseminated to Group members, and provided to the FAWO Executive.

The FAWO Executive will be provided, on a 6-monthly basis, with a summary status report from the Chair of the Working Group, covering the general conduct if the Working Group and rating the state of industry EAD preparedness.

Frequency of meetings
Meetings will be held on an as-needs basis, although expected to occur at least 6-monthly.

The calling of meetings will be through the Chair of the FAWO Executive Committee.

Working Group expenses
Working Group members will cover their own expenses incurred in the conduct of meetings, and AWI will consider covering any expenses associated with provision of specific expert advice to the Group, upon written request.
Appendix 3: SED Consulting report (Executive summary)

This report has been commissioned by Australian Wool Innovation, on behalf of the Federation of Australian Wool Organisations (FAWO), to provide an overview of the exotic animal disease (EAD) threats to the wool industry and recommendations on how to reduce the risks posed by these diseases. The emphasis of the report is on trade rather than production risks.

The Emergency Animal Disease Response Agreement (EADRA) lists 65 emergency diseases. Of these, 20 can affect sheep. As previously concluded by Brightling & Williams (2001) the major threats to the Australian wool industry are foot-and-mouth disease (FMD), sheep pox, bluetongue and screw-worm fly. Scrapie and Rift Valley fever are potentially very serious in their impact but rated as lesser threats due to the low risk of introduction.

FMD continues to be the most threatening animal disease globally. It is highly acute, highly contagious and causes heavy production losses, particularly in cattle and pigs. Fortunately for Australia, our close neighbours are free of FMD, but it is found in parts of the Philippines and Malaysia. Recent notable outbreaks have occurred in the United Kingdom and parts of Europe in 2001 and again in the UK in 2007, Japan (2010), Korea (2010) and South Africa (2011). FMD is most feared for its impact on trade. The Productivity Commission (PC) estimated in 2002 that an outbreak of FMD in Australia would cost the livestock industries anywhere between $5.7 (3-month outbreak) and $12.8 billion (12 months) in revenue loss.

Australia’s response to an outbreak of FMD would be to stamp out the disease – i.e. to eradicate it. There has been much international debate about the financial, social and environmental impacts of this approach since the UK outbreaks. Technologies such as vaccine and diagnostic test pairings that allow differentiation of infected from vaccinated animals (or ‘DIVA’) may lead to alternative approaches to FMD management in future. Some of these issues, as well as other perceived gaps in Australia’s strategies to deal with FMD, are currently under review.

The World Organisation for Animal Health (OIE) sets rules for the re-establishment of FMD-free status in countries previously not affected by FMD. A country can apply to have its free status restored three months after the last FMD case where a stamping-out policy and serological surveillance is undertaken. The OIE recommends that countries importing wool from a country with FMD should require that the product has been processed to ensure destruction of the virus using one of several prescribed procedures. One of these is the storage of wool at 18°C for four weeks, or 4°C for four months, or 37°C for eight days.

Sheep and goat pox is an acute disease that can cause high mortalities. A major concern about sheep and goat pox is that the virus is relatively hardy. It survives for up to three months in wool or hair or dry scab material and up to six months if the material is kept out of direct sunlight (e.g. in a bale). The most likely route of introduction to Australia would be via contaminated objects or with livestock ships returning from the Middle East. Australia’s response strategy to an outbreak of sheep and goat pox would be to stamp out the disease.

Bluetongue is another acute disease of sheep that can result in high mortalities and severe productivity impacts. The virus is spread by small biting midges whose distribution determines the extent of the disease. Australia states that ‘clinical bluetongue disease has not been observed in commercial flocks and herds of any susceptible species in Australia’ but clinical bluetongue was observed in one sheep in a sentinel flock near Darwin in 1989 and there was also a ‘small outbreak in a non-commercial sheep flock near Darwin in 2001’. Serotypes of the virus are also regularly detected through surveillance. Many observers believe that the appearance of clinical bluetongue in sheep is only a matter of time.
While bluetongue is a significant threat to the productivity of the sheep industry it may not be so to trade. The virus can only be spread by vectors having access to live animals, blood or semen, not wool. However, China has previously suspended wool imports from Australia due to bluetongue.

The ‘New World’ and ‘Old World’ screwworm produce larvae that feed on the skin of warm-blooded animals, potentially causing debilitating disease and death. Screwworm fly has been detected twice in Australia but it has never become established here. It would be very difficult to eradicate if it did become established. Like bluetongue, screwworm fly would impose production costs but would be unlikely to affect trade of wool.

A number of significant reviews and ‘stress-tests’ of the Australia’s EAD preparedness system have been undertaken in recent years. The recent Matthews Review, ‘Foot-and-mouth Disease: A Review of Australia’s Preparedness’ (2011) purports to be generally positive about Australia’s FMD preparedness, but it seriously challenges many of the assumptions associated with it – for example, that Australia’s disease management response capacity will be sufficient to deal with an outbreak. The Review makes 55 recommendations to address 11 issues including inadequate traceability arrangements for sheep. There is no specific commentary in regard to the post-farm wool industry.

Animal Health Australia (AHA) is facilitating a review of Australia’s FMD response policy. One of the issues under discussion is the handling of wool in AUSVETPLAN. The disease response strategy allows, during an outbreak, for the movement of wool from ‘declared premises’ and ‘restricted areas’ provided it is treated in a prescribed way – involving (for example) spraying bales with caustic soda and storing for 12 weeks or scouring in an industrial plant. There is a recognition that such steps will be difficult to implement especially since there is little industrial scouring capacity left in Australia. The Response Policy Review will culminate in a revised AUSVETPLAN Disease Strategy for FMD but not before the end of 2012.

The wool supply chain has recently been mapped by FAWO. The amount of wool held within each of the industry stocks is not well quantified. There is no single system tracking the movement of wool bales through the chain and there is no system of uniquely identifying bales. However, each bale does carry a (non-unique) farm brand, a description of the wool (e.g. ‘AAAM’) and a bale number which should, in combination with a region of origin, provide unique identification except where interlotting or bulk classing has taken place.

An information stream that does allow the identification of wool bale ownership is the wool testing system managed by the Australian Wool Testing Authority (AWTA). All but a very small number of wool lots sold in Australia have a sample taken for testing. The sample links the wool itself with the owner of the wool and their property details.

In the event of an EAD outbreak, however, the issue for baled wool will not be traceback (the ability to identify the origin of a given bale of wool in the system) but rather trace-forward (the ability to find all bales that came from a particular property of interest). The question is whether the current system could manage this quickly and effectively. Interlotting and bulk classing present specific concerns.

If an outbreak of an FMD (as a worst-case example of an EAD) were to occur:

1. The disease response would dictate a ‘standstill’ of susceptible livestock around the outbreak. There would also be risk-based controls on the movement of products such as wool from farms.
2. The agency managing the disease response would undertake trace-back and trace-forward of animals, animal products and anything else that might transmit the disease. In the case of wool, it would be looking for wool that left any infected or suspect premises within a certain period prior to the
appearance of clinical signs with a view to treating or destroying it. In reality, wool confined to a bale in a store or sent direct for scouring carries virtually zero risk of being a source of new infections within Australia and any virus present will lose infectivity over time. The OIE defines periods of storage, which vary according to the temperature, which will render risk-free any wool potentially contaminated with FMD.

3. Governments of countries that buy Australian wool would place an immediate ban on its importation while the disease situation was clarified and either Australia regained its free status, or arrangements satisfactory to the importer were put in place to demonstrate that wool presented no risk.

Distinct from the disease response is the need to satisfy trading partners that Australian wool poses no risk to their biosecurity. The steps that would be required in this respect are less easy to predict. During the UK FMD outbreak, China accepted wool shorn prior to the date of the outbreak provided the outsides of bales and insides of shipping containers were disinfected. In the case of the South African outbreak, the European Union accepted bales of wool without disinfection if they went direct to scour. It is not clear what would happen to wool that is already in transit to overseas markets on the announcement of an outbreak.

Facilities along the supply chain that would be affected by an EAD should have risk management measures in place in case of an outbreak. AUSVETPLAN enterprise manuals have been developed for a number of high-risk facilities such as feedlots, abattoirs and saleyards, and consideration should be given to develop similar manuals for wool stores, processors and exporters. The expectations of wool stores, scours etc in relation to trace-forward and segregation of identified lots of is one of the issues that would be addressed in an enterprise manual.

In respect to re-establishing trade during or after an EAD outbreak, the Department of Agriculture (DA) would be the Government’s lead agency. DA may activate a National Coordination Centre (NCC) which would play a number of roles, including coordination of responses with industry bodies and endeavouring to maintain market access or regain lost access through the provision of technical briefings and other information to trading partners and overseas posts. However, there is no formal structure for consultation with industry similar to the Trade Market Access Group (TMAG) that existed at the time of Exercise Minotaur in 2002. The lack of clarity about industry’s role in re-establishing trade during and after an EAD is of significant concern. The South African experience in particular highlighted the importance of a coordinated government / industry response during an EAD. Industry has much to offer in negotiations towards the re-establishment of trade, especially its relationships among the domestic industry of the trading partner.

The possible responses of major trading partners is explored. These will be guided to some degree by science and to a much greater degree by other factors, the most important of which will be the country’s own economic interests. The experience of South Africa during its FMD outbreak, and the strong mutual reliance of Australia and China in respect to wool, leads this review to conclude that China would be disposed towards having trade resumed as soon as possible were Australia to suffer an FMD outbreak.

Arising from this review, four recommendations are made (whether to be actioned by AWI, FAWO or some other body is for industry negotiation):

1. The wool industry should test its capacity for rapid and effective traceability by running an exercise to simulate the tracing of several lots of wool identified as having been sold from an FMD-infected or -suspect property. The exercise should deliberately involve lines of wool that may be difficult to trace –
for example, wool from small holdings that ends up in bulkclassed and interlotted lines – as well as less ‘mainstream’ supply chains (smaller brokers, private sales etc).

2. The wool industry should approach DA, as a matter of priority, seeking clarification of the industry consultation arrangements that would be followed by DA in the case of an EAD. If a satisfactory response is not received, FAWO should seek the views of other affected industries (sheepmeat, beef, livestock exports etc) in regard to the current arrangements and develop a joint approach to DA to reinstitute the TMAG or similar body. Any outcomes need to be reflected in the wool industry’s own EAD response plan.

3. The wool industry should consider developing and maintaining a database of key international personnel who may need to be contacted in the case of an EAD. Although such people are recorded in the private directories of Australian industry players, a database would reduce the risk associated with individuals retiring or being otherwise unavailable at a time of crisis. The database would be a supplement to the industry’s EAD response plan.

4. The wool industry should prepare enterprise manuals, for incorporation into the AUSVETPLAN suite of EAD response plans and resources, covering wool stores, processors and exporters. The manuals should be prepared in consultation and collaboration with the AUSVETPLAN manager at Animal Health Australia.
Appendix 4: Further detail on Program 1 projects

The following descriptions of the projects described in Program 1 were developed by Dr Peter Morgan of the Australian Council of Wool Exporters & Processors and Private Treaty Wool Merchants of Australia.

Storage requirements for wool bales in a range of environments / temperatures

It will be critical to ensure that the design of the following work is well thought out to minimise the risk of wasted time and / or money.

It is easy to obtain an electronic recording device. The bigger task is to identify one suitable for the Group’s work.

A quick Google search indicates that there is a large range of available devices that vary in size, robustness, sophistication and price, e.g. the Thermocron Sensors identified by Paul Swan in his email of 28 August range from $55 to $200, or more.

1. **Critical criteria**
   These include:
   - Is it sufficiently robust to be placed in a wool bale without being damaged during pressing? Perhaps the thinner the better. Credit card size devices are available.
   - Does the device store data for subsequent retrieval, or can it transmit data in real time to a nearby Reader / PC. There is a price difference.
   - The “recyclability” of the devices.
   - The ease of placing the measurement devices in the bale during pressing and the need not to over-inconvenience the pressing operation.
   
   It will be necessary to develop procedures that enable easy identification of the devices when the bales are unpacked to recover them at the completion of each trial.

2. **Implications of using devices which store data for later retrieval**
   - If the device stores data for subsequent download to a Reader / PC, it will not be possible to retrieve the data from wool bales until each trial is completed. This is not seen as a problem. But it highlights the importance of good experimental design.
   - The storage capacity of the device may become critical. The greater the storage capacity, the higher the price. For example, the basic Thermocron Sensor, which has a list price of $50 per unit, has a capacity of 2,048 measurements. Hourly measurements would reach 2,048 measurements in 85 days. If additional measurements are required, the next model Thermocron Sensor will store 8,000 measurements. But, its list price is $199.
     - Development of appropriate methods of reporting temperature and changes in-temperature, e.g. Minimum, Average or pooled Hours / Days x Temperature.
     - Development of procedures that simplify the recovery of the temperature recording Devices at the completion of trials.
   - Other ??

3. **Preliminary work with a small number of wool bales**
   It is recommended that the first step with wool bales should be some preliminary trial work with a small of wool bales to:
   - Obtain an understanding of the temperature recording process.
Determine the most critical places to record temperature and temperature changes within the bale. For example:
  - For bales standing alone, is it the centre of the bale; or is it near the side that is sitting on the ground?
  - What if the bale is surrounded by others in a stack? It would be expected that this will be the most common situation.

It is envisaged that:
  - This work would be conducted at a city based Bulk Class warehouse.
  - A starter point for the assessing the most suitable locations might involve 12 locations, as suggested in the following table (X marks the “spot”).

The number of days recording would probably be quite short, as the trials are preliminary and are of a logistical as well as a technical nature.

There would almost certainly be some “tweaking”, while assessing the most suitable parts of the bale to place the sensors in the when the full trials commence.

<table>
<thead>
<tr>
<th>Along the length of the bale</th>
<th>Across the bale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Near the side of the bale</td>
</tr>
<tr>
<td>Near bottom</td>
<td>X</td>
</tr>
<tr>
<td>Near centre</td>
<td>X</td>
</tr>
<tr>
<td>Near top</td>
<td>X</td>
</tr>
</tbody>
</table>

4. **Preliminary trial work to test the experimental design for future field work**
   This could also be done in a city based bulk class operation. It is envisaged that this work would be used to finalise the experimental design for the collection of appropriate data in ongoing trials.
   Factors to be considered include:
   - The number of bales to be measured, and over what period.
   - The number of locations to be included to collect data over a range of ambient temperatures.

5. **Measurement of the changes in temperature at different places within wool bales under a variety of temperature conditions**
   This would be done following the completion of the above work and will include:
   - Freshly shorn wool in shearing sheds under a variety of ambient temperatures.
   - In different parts of stacks within wool stores under a variety of ambient temperatures.

**Decontamination of wool bales**
Perusal of the OIE list of suitable disinfectants suggests that citric acid is a likely candidate. It is relatively low in cost and appears to be readily available. But, in what quantities is not yet known.

Investigation is necessary to:

1. **Determine if wool is affected by citric acid**
   Although this is considered unlikely, it is still essential to perform this work.
This could probably be done at AWTA by use of the IWTO Draft Test Method, DRAFT TM 04 (Method of Test for Determining the Solubility of Wool in Alkali). This Test Method is used to detect damage to wool fibres caused by a number of chemicals, including acids.

Or, some other appropriate Method.

2. Determine whether citric acid has any impact of the pack itself, or on bale marking inks

3. Calculate the quantities of citric acid that would be required under different disease outbreak scenarios

OIE Manuals describe a 0.2% solution of citric acid as a very effective disinfectant for use with FMD virus: The following table calculates some theoretical quantities of citric acid.

### Quantities of citric acid required for two application rates of a 0.2% solution for varying numbers of bales treated

<table>
<thead>
<tr>
<th>Quantity of 0.2% citric acid used per bale</th>
<th>Number of bales treated</th>
<th>1</th>
<th>1,000</th>
<th>10,000</th>
<th>100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 litre / bale</td>
<td>5 gm</td>
<td>5 kg</td>
<td>50 kg</td>
<td>500 kg</td>
<td></td>
</tr>
<tr>
<td>5 litres / bale</td>
<td>10 gm</td>
<td>10 kg</td>
<td>100 kg</td>
<td>1,000 kg</td>
<td></td>
</tr>
</tbody>
</table>

4. Check the price and availability of citric acid across Australia

Details on both would ideally be included as part of an Enterprise Manual for the wool industry.

5. Consider alternate, or additional, disinfectants

This will be necessary if citric acid does have a deleterious effect on wool; or there are cost or availability issues.

It will be sensible to have a list of recommended disinfectants from the OIE List.

**Traceability of wool through the chain**

It will be necessary to investigate the issues involved in tracing wool bales, to develop draft procedures and to trial these procedures.

The following draft table provides a general description of the key wool bale movements.

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm</td>
<td>Regional store</td>
<td>Metropolitan store</td>
</tr>
<tr>
<td>Regional store</td>
<td>Another local store (e.g. if additional storage space is required)</td>
<td>Metropolitan store</td>
</tr>
<tr>
<td>Metropolitan store</td>
<td>Another local store (e.g. if additional storage space is required)</td>
<td>Dump</td>
</tr>
<tr>
<td>Dump</td>
<td>Port and international customers</td>
<td></td>
</tr>
</tbody>
</table>
It will also be necessary to investigate the issues involved in tracing wool samples, to develop draft procedures and to trial these procedures.

The following draft table provides a general description of the key sample movements.

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab sample</td>
<td>Store where the wool is grab sampled</td>
<td>Store where the samples are displayed Location where the wool is sub sampled (tufted) for staple measurement – could be another store, or an AWTA location</td>
</tr>
<tr>
<td></td>
<td>Store where the samples are displayed</td>
<td>The show floor Store where the samples are prepared for subsequent sale (done after the samples are removed from the show floor - this could be the same store, or another store)</td>
</tr>
<tr>
<td></td>
<td>Store where the samples are prepared for subsequent sale</td>
<td>Another local store (e.g. if to be further rehandled and / or amalgamated with other wool Dump Local wool processing plant</td>
</tr>
<tr>
<td></td>
<td>Any other store</td>
<td>Dump Local wool processing plant</td>
</tr>
<tr>
<td></td>
<td>Dump</td>
<td>Port and international customers</td>
</tr>
<tr>
<td></td>
<td>Local wool processing plant</td>
<td>Port and international customers Local customers</td>
</tr>
<tr>
<td>Core samples for yield and diameter testing; and Tufts of full length staples for staple length &amp; strength testing</td>
<td>Store where the wool is core sampled; and the location where the tufts are taken from the grab samples (see above)</td>
<td>AWTA laboratory where testing is conducted</td>
</tr>
<tr>
<td>Surplus core and tuft samples</td>
<td>AWTA laboratory</td>
<td>A wool store for preparation for sale Local wool processing plant</td>
</tr>
<tr>
<td></td>
<td>Wool store</td>
<td>Dump Local Wool processing plant</td>
</tr>
<tr>
<td></td>
<td>Dump</td>
<td>Port and international customers</td>
</tr>
<tr>
<td></td>
<td>Local wool processing plant</td>
<td>Port and international customers Local customers</td>
</tr>
<tr>
<td>Miscellaneous samples taken from individual sheep</td>
<td>Farm</td>
<td>AWTA A laboratory which specialise in testing samples from individual sheep</td>
</tr>
<tr>
<td>Surplus sample material</td>
<td>Laboratory</td>
<td>A wool store for preparation for sale</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local wool processing plant</td>
</tr>
<tr>
<td>Wool Store</td>
<td>Dump</td>
<td>Local Wool processing plant</td>
</tr>
<tr>
<td>Dump</td>
<td></td>
<td>Port and international customers</td>
</tr>
<tr>
<td>Local wool processing plant</td>
<td></td>
<td>Port and international customers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local customers</td>
</tr>
</tbody>
</table>