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Chemical Security

Precursors to homemade explosives

Consultation Regulation Impact Statement

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Attorney General's Department

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Contents

Disclaimer

Abbreviations

Abbreviation	Description
ABS	Australian Bureau of Statistics
AFSA	Australian Fertiliser Services Association
AGD	Australian Government Attorney-General's Department
APVMA	Australian Pesticides and Veterinary Medicines Authority
ASIO	Australian Security and Intelligence Organisation
COAG	Council of Australian Governments
CSRA	Chemical Security Risk Assessment
CSRAM	Chemical Security Risk Assessment Methodology
CSRAU	Chemical Security Risk Assessment Unit
CWC	Chemical Weapons Convention
FIFA	Fertiliser Industry Federation of Australia
government	Unless otherwise stated, 'government' refers to the Australian Government and state and territory governments.
IGA	Intergovernmental Agreement on Australia's National Arrangements for the Management of Security Risks Associated with Chemicals
NGAG	National Government Advisory Group for chemical security
NICNAS	National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIRG	National Industry Reference Group for chemical security
NPV	Net Present Value
OBPR	Office of Best Practice Regulation
OH&S	Occupational Health and Safety
PACIA	Plastics and Chemicals Industries Association
PwC	PricewaterhouseCoopers
RIS	Regulation Impact Statement

Executive summary

Purpose of this document

PwC has been engaged by the Attorney-General's Department (AGD) to prepare this Consultation Regulation Impact Statement (Consultation RIS) examining proposed measures to enhance security in relation to 11 chemicals that are precursors to homemade explosives.

In line with the Council of Australian Government (COAG) *Best Practice Regulation* guidelines, this Consultation RIS:

- establishes the problem that governments are seeking to address
- identifies a set of policy options to address the identified option
- assesses the costs and benefits of these options, and the effectiveness of each option in addressing the problem, and
- establishes a preferred option for action.

The overarching purpose of a Consultation RIS is to prompt stakeholder feedback on the areas of analysis outlined above. On the basis of this feedback, PwC will prepare a Decision Regulation Impact Statement (Decision RIS), which will potentially refine and expand on the data and analysis provided in this document. Greater information about how individuals and businesses can comment on this Consultation RIS, and a list of specific questions, is provided in Chapter 1 (pages 15-16).

Background

Chemicals are widely used in Australia, by individuals and businesses, and for research and other purposes. Some chemicals that have a range of legitimate and productive uses in Australia can be misused to threaten the health and safety of the Australian public. While such misuse is typically accidental or the result of negligence, the misuse of chemicals can also be intentional. Possible forms of intentional misuse include the formulation of illicit synthetic drugs, poisons and homemade explosives.

In the wake of the 2002 Bali bombings, there has been increasing government concern about intentional misuse. More specifically, Australian governments are concerned about the risks posed by individuals and groups using homemade explosives for criminal purposes (such as terrorism and organised crime). Driving this apprehension is evidence of ongoing interest in the criminal use of homemade explosives by segments of the Australian community. Particularly noteworthy data points include:

- the conviction of five Sydney men in 2009 for a range of terrorism-related offences – these men had sourced and attempted to source a range of precursor chemicals, and

- the accidental death of two men in Adelaide in 2010, when a homemade explosive they were transporting prematurely exploded. Media reports suggest that at least one of the men was a member of a bikie gang, and both men were on their 'way to assassinate a rival gang member.'[1]

The use of homemade explosives for criminal purposes is also a growing international concern, driven by such events as the 2005 London bombings, the attempted Christmas Day bombing in 2009, and the 2011 Oslo bombing.

Problems with current arrangements

Many of the precursor chemicals to homemade explosives (particularly hydrogen peroxide, nitromethane and nitric acid; see Box 1) are currently widely available and easily accessible to the public. These chemicals can be legitimately purchased from relevant points (or 'nodes', as they are referred to in the Consultation RIS) in the supply chain at concentrations that, in many cases, are sufficient to produce a homemade explosive. Ease of 'legitimate' access is, therefore, a key problem with the current arrangements.

Box 1: The 11 identified precursor chemicals

• Hydrogen peroxide (H_2O_2)	• Ammonium perchlorate (NH_4ClO_4)
• Sodium chlorate ($NaClO_3$)	• Sodium nitrate ($NaNO_3$)
• Nitric acid (HNO_3)	• Potassium nitrate (KNO_3)
• Potassium chlorate ($KClO_3$)	• Nitromethane (CH_3NO_2)
• Sodium perchlorate ($NaClO_4$)	• Sodium azide (NaN_3)
• Potassium perchlorate ($KClO_4$)	

Precursor chemicals can also be illegitimately obtained from various nodes in the supply chain – e.g. through theft, providing false information to the seller, or through infiltrating a supply node and taking advantage to facilitate the supply or theft of chemicals.

Individuals or groups seeking to access precursor chemicals would need to overcome only a few barriers that hinder the ability of individuals or groups or divert chemicals for illegitimate use, including:

- general industry practices (e.g. anti-theft procedures)
- the existing regulatory framework governing workplace health and safety in Australia – some existing controls include requirements for secure storage of chemicals to protect the health and safety of employees, and
- ongoing efforts by law enforcement agencies to prevent the use of homemade explosives for criminal purposes.

1 Milnes, Michael and Doug Robertson (2010), 'Two killed in bomb blast in a car at Truscott Rd, Enfield', The Advertiser, 11 February, http://www.adelaidenow.com.au/two-killed-in-bomb-blast-in-a-car-at-truscott-rd-enfield/story-e6frea6u-1225829015870. Accessed on: 31 September 2011.

Comprehensive risk assessments conducted by AGD and feedback from stakeholders have highlighted three areas of vulnerability in how businesses currently manage security risks associated with the precursor chemicals:

- the capacity of industry to deter and prevent the theft and diversion of precursor chemicals – particularly with reference to how businesses assess employee suitability and assess and address security risks (including the implementation of physical and personnel access controls, and informing staff about security risks)
- the capacity of industry to identify the theft and diversion of precursors in a timely manner – vulnerabilities were identified in how businesses monitor and account for precursor chemicals (both in stock and in transit), and
- the capacity of industry to facilitate law enforcement through effective information provision – concerns were raised about the ability of businesses to identify suspicious behaviour, report information to the relevant authorities, and maintain meaningful records (from a law enforcement and intelligence perspective).

Government intervention could be justified if it can be shown that the benefits to the community through the net additional risk reduction exceed the costs to governments, industry and chemical purchasers of the intervention. Because of the lack of relevant data and probability estimates to apply a monetary value to the avoided risk, there will be a level of judgement required in deciding what level of intervention, if any, is justified.

Options

Following the completion of the risk assessments, AGD, in consultation with industry and government representatives, drafted a range of treatment measures to address the identified vulnerabilities. These measures cover such aspects as employee awareness of security risks and stock control (see Table 6 and Appendix F for more detail of the measures). The application of three of the measures (i.e. 'Theft and Diversion Procedures', 'Physical Access Controls' and 'Personnel Access Controls') would be determined following a risk assessment process undertaken by each individual business.

There are four options governments could pursue to encourage businesses to adopt the proposed treatment measures (see Table 1). These options are similar in that they all seek to enshrine the treatment measures as constituting 'best practice' in managing chemical security risks. The key areas of difference between the options are:

- the degree of compulsion – Options 1-3 are voluntary, while businesses would be compelled to adopt the treatment measures under Option 4, the regulatory option
- how the treatment measures are encapsulated – under Options 2-4, the treatment measures would form the basis of a code of practice. Under Option 1, meanwhile, the treatment measures would form the basis of a targeted awareness campaign, and

- ownership of the treatment measures – under Options 1, 3 and 4, governments would assume primary ownership over the treatment measures and encourage businesses to adopt the measures. Under Option 2, primary ownership of the treatment measures would rest with industry.

Table 1: Option summary

Option	Description
Option 1 – A targeted awareness campaign	The purpose of this campaign would be to inform and educate businesses about what they should do to more effectively manage the security risks associated with the precursor chemicals. The treatment measures would form the basis of governments' message about what constitutes 'best practice' in managing security risks.
Option 2 – Industry codes	Six industry-led/developed security risk management codes of practice (representative of groupings of businesses that use/handle the precursor chemicals). These codes would inform businesses about what constitutes 'best practice' in managing chemical security risks. The proposed treatment measures would form the basis of the industry codes.
Option 3 – A government code of practice	This option is similar to Option 2. However, rather than industry developing six industry codes, AGD (in collaboration with/on behalf of all Australian governments) would develop a single code of practice; the intention of which would be to inform businesses about what constitutes 'best practice' in managing the security risks associated with the precursor chemicals.
Option 4 – Regulation	Under this option, AGD (in collaboration with State and Territory governments) would develop a model amendment for each jurisdictions' criminal code. This amendment would create a new criminal offence relating to the negligent possession or supply of precursor chemicals. In addition to the model amendment, AGD would publish the proposed treatment measures as a code of practice (similar to Option 3). The intention is to enable police to charge an individual or business for failing to comply with the code of practice. Businesses that were charged with negligent possession or supply could point to their compliance with the government code of practice as a reasonable defence in any court proceedings.

Impact analysis

This Consultation RIS compares the impacts of these options against the status quo, in which the current arrangements to manage the security risks of the precursor chemicals are continued (most notably, AGD's ongoing Chemicals of Security Concern awareness campaign and existing industry codes that address security risks). There are three points to note in analysing the costs and benefits of the four options:

- stakeholder feedback suggests that businesses want to work with governments in managing chemical security risks, and they are prepared to do so if the costs are not significant and the outcomes are meaningful
- because adoption of the measures would be voluntary under Options 1-3, the expectation is that businesses would only choose to adopt measure if, from the businesses' perspective, the benefits[2] of doing so exceeded or matched the anticipated cost to the business. As such, the voluntary options should not result in a net cost to industry, and

[2] These benefits could include avoided reputational risk, improved business processes and the psychic benefit of contributing to a safer community.

- nonetheless, businesses will incur costs from adopting the treatment measures under Options 1-3. We have thus sought to estimate these costs to highlight the likely impact of the options on industry, and to allow meaningful comparison between the voluntary options and the regulatory option.

Table 2 summarises our estimates of the quantifiable costs associated with the four options. It should be noted that the estimates outlined in Table 2 do not represent all the costs associated with the treatment measures (this Consultation RIS was unable to estimate all the costs associated with the 'Point of Sale' measures, or any of the costs associated with the 'Physical Access Controls' and 'Personnel Access Controls' measures). The costs of the options are thus likely to be greater than the estimates provided in Table 2 – though not markedly greater in the case of Options 1-3, given the voluntary nature of these options.

Table 2: Summary of total costs, Options 1-4 (based on a 7 per cent discount rate)

	Adoption costs (NPV over 10 years, $ millions)	Administrative costs* (NPV over 10 years, $ millions)	Total costs (NPV over 10 years, $ millions)
Option 1 – Targeted awareness campaign	$63.37	$4.23	$67.59
Option 2 – Industry codes	$65.15	$3.71	$68.86
Option 3 – Government code of practice	$74.08	$3.95	$78.04
Option 4 – Regulation	$5,112.70	$3.95	$5,126.65

*Notes: * We based our estimates of administrative costs on data provided by government and other stakeholders. It is important to note that the administrative costs for Option 4 do not include estimates of the costs associated with legislative development, or the effort that would be required to enforce the new offence.*

The key reason for the difference in adoption costs between the options is different expectations of industry uptake of the treatment measures. Drawing on stakeholder feedback (in particular, an online survey of industry), this Consultation RIS assumes that:

- business adoption of the treatment measures is likely to increase from Option 1 to Option 2 to Option 3 to Option 4, and
- due to the significant costs involved, businesses are unlikely to adopt certain measures (principally 'Consignment Control' and 'Inventory Control') under Options 1-3, but will do so under Option 4 (as they will be compelled to do so).

As business adoption of the treatment measures increase, so do the total costs to industry of adopting those treatment measures (hence, the increase in adoption costs across the options). This is reflected in the significantly higher adoption costs associated with Option 4.

Greater detail of the assumptions used in this Consultation RIS about the expected level of adoption under each of the options is provided in Chapter 6 and Appendix I. Input from stakeholders is sought about the reasonableness of the assumptions used in this Consultation RIS about the expected level of adoption of the treatment measures by industry under each of the options. This Consultation RIS is

particularly interested in stakeholder feedback about the voluntary options and whether businesses are more or less likely to adopt the treatment measures if they were encouraged to do so:

- as a result of a targeted awareness campaign or some form of code, and
- by governments or an industry association.

Quantifying the benefits associated with the options is difficult. The key drivers of these benefits – i.e. the volume of precursor chemicals that have been stolen/diverted in Australia, the level of probability that an individual or group will use homemade explosives for criminal purposes in Australia and the likely consequences of such use, and the extent to which the measures will reduce the risk posed by homemade explosives – cannot be reliably identified and calculated on the basis of publicly available information. Accordingly, this Consultation RIS has adopted a break-even approach to provide a framework for comparing the costs and benefits of the four options.

On the basis of this analysis (summarised in Table 3), Options 1-3 would need to be directly responsible for preventing between 0.03 and 0.10 terrorist attacks using homemade explosives (of a similar scale as the 2005 London bombings) over 2012-21 for the costs associated with the options to be justified. Conversely, Option 4 would need to prevent between 2.20 and 6.77 attacks over the same period for the costs associated with that option to be justified.[3]

From a willingness to pay perspective, the average Australian household would have to pay an additional 0.01 per cent of its annual gross income (or approximately $8.78) to cover the costs associated with Options 1-3. Conversely, the average Australian household would have to pay an additional 0.70 per cent of its annual gross income (or $610) to cover the costs associated with Option 4.

Given that this Consultation RIS has not been able to quantify all the costs associated with the treatment measures, the break-even analysis outlined in Table 3 understates the number of terrorist attacks that would need to be prevented (and the proportion of gross annual income the average household would have to be willing to pay) to cover the full costs associated with each of the options. Though given the voluntary nature of the options, this understatement is unlikely to be markedly significant in the case of Options 1-3.

[3] This is not a measure of the likelihood of a terrorist attack occurring in Australia, rather, it is an estimation of the number of otherwise successful terrorist attacks that each option would need to successfully prevent, over and above existing national security programs, to justify the costs associated with the option.

Table 3: Summary of total benefits, Options 1-4

	Total costs (NPV over 10 years, $ millions)	No. of terrorist attacks	% of annual gross household income
Option 1 – Targeted awareness campaign	$67.59	0.03-0.09	0.01%
Option 2 – Industry codes	$68.86	0.03-0.09	0.01%
Option 3 – Government code of practice	$78.04	0.03-0.10	0.01%
Option 4 – Regulation	$5,126.65	2.20-6.77	0.70%

A key question facing this Consultation RIS is the reasonableness of the break-even analysis outlined in Table 3. Our preliminary conclusion, based on stakeholder feedback, is that it would not be reasonable to expect that Option 4 would be able to prevent between 2.20 and 6.77 terrorist attacks using homemade explosives over 2012-21. Furthermore, it would appear reasonable to expect that the average household would be willing to spend an additional 0.01 per cent of its annual gross income on measures aimed at reducing the likelihood of individuals and groups using homemade explosives for criminal purposes, given:

- international studies, which suggests that residents in more terror-prone countries would be willing to pay between 4-8 per cent and 26-37 per cent of annual household income to achieve 'a reduction in terrorist activity to a level that prevails in more peaceful parts of the country',[4] and
- the relatively negligible amount of money involved – in comparison, Australia's consumption of coffee in 2010 is equal to approximately 0.11 per cent of average annual gross household income (or $97).[5]

The Consultation RIS is seeking input from stakeholders about the reasonableness of the results from the break-even analysis, and the preliminary conclusions above.

It is important to note that the results in Table 3 do not account for differences in risk reduction that may be achieved by the options – it highlights that as the options become more expensive, they need to prevent more otherwise successful attacks to justify the outlay of public funds.

The preliminary assessment of this Consultation RIS is that, as more businesses choose to adopt the treatment measures, it seems possible that there is a greater reduction of the likelihood of individuals and groups using homemade explosives for criminal purposes. However, due to a lack of publicly available data, this Consultation RIS is unable to quantify or qualify with any reliability the precise difference in risk reduction between the four options. The reasons for this include:

4 Frey, Bruno S., Simon Luechinger and Alois Stutzer (2009), 'The life satisfaction approach to valuing public goods: The case of terrorism', Public Choice, 138:317-45.

5 Rose, Danny (2010), 'Australia a nation of coffee drinkers', *The Sydney Morning Herald*, http://news.smh.com.au/breaking-news-business/australia-a-nation-of-coffee-drinkers-20100305-pnbb.html. Accessed on: 28 October 2011.

- there has not been a successful terrorist attack in Australia using homemade explosives and therefore 'reduction' is not possible, and
- it is difficult/impossible to measure the success of deterrent measures.

Due to the difficulties of quantifying risk reduction, we have used break-even analysis to provide a basis on which the benefits of the options can be compared.

Stakeholder feedback is nonetheless sought about the likely risk reductions associated with the four options.

Conclusion

The ultimate intent of government action in relation to precursor chemicals is to minimise the incidence and associated impacts of terrorist attacks – and other similarly criminal – uses of homemade explosives that threaten the health and safety of the Australian public. To help achieve this broader objective, the intermediate objectives of government action are:

- to minimise illegitimate access to 11 chemicals that are precursors to homemade explosives, and
- to increase the provision of useable intelligence relating to the illegitimate access of the 11 precursor chemicals to Australian law enforcement and security agencies.

In line with the COAG Best Practice Regulation Guidelines, this Consultation RIS is required to identify a preferred option that generates the greatest net benefit for the community.

Our analysis suggests that Option 4 is not favoured. It is likely to impose significant costs on industry and it is not reasonable to expect that it would be able to prevent between 2.20 and 6.77 terrorist attacks using homemade explosives over 2012-21 – the minimum amount required for the costs associated with the option to be justified on a break-even basis.

Of the remaining three voluntary options, it is difficult for this Consultation RIS to identify one option that clearly generates a greater net benefit for the community than the other options. The costs and the results of the break-even analysis for Options 1-3 are relatively similar. Each of the three options are also broadly aligned with stakeholder preferences expressed during consultations – that is, for an approach that was voluntary and that encapsulated the proposed treatment measures as 'best practice' for managing chemical security risks.

Nonetheless, despite these similarities, and in order to satisfy the COAG Best Practice Regulation Guidelines, this Consultation RIS has identified Option 3 (a government code of practice) as the preferred option. The reasoning in support of this conclusion is fourfold:

- Option 1 is less favoured, as it is questionable how sustainable the impacts of the targeted awareness campaign will be in the medium-to-long term compared to the other options

- if it is reasonable to expect that greater adoption of the treatment measures will generate greater benefits (in terms of risk reduction), then Option 3 is likely to have more benefits than Option 2, but involve more costs
- it would appear more appropriate for governments to develop a code of practice (rather than industry), given that national security is primarily the responsibility of governments, and
- Option 3 is likely to be more practicable and manageable – one body would be responsible for developing and promulgating a code of practice, compared to seven under Option 2. Likewise, it would be easier under Option 3 for law enforcement and intelligence agencies to ensure the code of practice is adaptive to emerging risks.

Stakeholder feedback is sought about the strength of this reasoning and, in particular, three key issues that will ultimately decide which of the options is likely to generate the greatest net benefit to the community:

- the expected level of adoption of the treatment measures by industry under each of the options – is it reasonable to expect that more businesses will adopt the treatment measures under a government code of practice compared with a series of industry codes and/or a targeted awareness campaign?
- the extent to which the options will reduce the likelihood of individuals and groups using homemade explosives for criminal purposes – is it reasonable to expect that the greater the number of businesses that adopt the treatment measures, the greater the likely reduction in risk? and
- the cost effectiveness of the options – if it is assumed that Option 3 has greater costs and benefits than Option 2, will the greater benefits will be worth the greater costs? In other words, will the difference in risk reduction between Option 3 and Option 2 be sufficient to offset the increased costs involved?

This Consultation RIS has also undertaken some additional cost-benefit analysis to reflect stakeholder feedback that some of the proposed treatment measures (such as 'Consignment Control' and 'Inventory Control') were likely to be less effective in managing security risks than other measures. If businesses were not encouraged to adopt these less effective measures, then the costs associated with all of the options would decrease, and the proposed treatment measures would likely gain greater acceptance by stakeholders.

1 About this regulatory impact statement

1.1 Purpose of this Consultation RIS

PwC has been engaged by AGD to prepare this Consultation RIS examining the proposed measures to enhance chemical security in relation to chemicals that are precursors to homemade explosives.

The purpose of a Consultation RIS is 'to canvass the regulatory options under consideration, in order to determine the relative costs and benefits of those options.'[6] Following public consultation, PwC will prepare a Decision RIS; the purpose of which is 'to draw conclusions on whether regulation is necessary, and if so, on what the most efficient and effective regulatory approach might be, taking into account the outcomes of the consultation process.'[7]

This Consultation RIS follows the COAG *Best Practice Regulation* guidelines for regulatory proposals made by Ministerial Councils and National Standards (the Guidelines). This Consultation RIS:

- establishes the problem that governments are seeking to address
- identifies a set of policy options to address the identified problem
- assesses the costs and benefits of these options, and the effectiveness of each option in addressing the problem, and
- on the basis of the analysis, establishes a preferred option for action.

The Guidelines require that a Consultation RIS canvas both regulatory and non-regulatory approaches, and include a status quo or 'no change' option (recognising that not all problems have a cost effective solution through government action).

The Consultation RIS is provided to stakeholders for comment. Particular stakeholder input is sought on those areas where further data is needed and/or where assumptions made in the analysis need to be verified and agreed. The Consultation RIS provides a valuable means through which governments and stakeholders can consider policy and regulatory options in a focused way.

6 COAG (2007), Best Practice Regulation: A Guide for Ministerial Councils and National Standard Setting Bodies, Canberra.
7 Ibid.

1.2 *Report structure*

This Consultation RIS is structured as follows:

- **Chapter 2** provides policy context for the RIS
- **Chapter 3** describes the problem that governments are seeking to address
- **Chapter 4** establishes the objective of government action
- **Chapter 5** describes the policy options being considered in this RIS
- **Chapter 6** assesses the costs and benefits of each option
- **Chapter 7** outlines the approach to consultation that informed this RIS
- **Chapter 8** summaries the anticipated findings, and
- **Chapter 9** details implementation, monitoring and review options for the preferred option.

1.3 *Opportunities to comment on this Consultation RIS*

AGD now seeks input from stakeholders on the proposals outlined in this Consultation RIS. The Consultation RIS is subject to an eight-week consultation period and AGD welcomes any further general comment you might have on data, information or recommendations in this Consultation RIS.

To the extent possible, all submissions will be made available on the chemical security website – www.chemicalsecurity.gov.au. All personal details other than your name and the state or territory in which you reside will be removed before publishing. If any information contained in your submission should be treated as confidential, you should clearly identify the sensitive information and provide your reasons for treating it in-confidence on the submission cover sheet. Submissions received by post will be available in PDF on the chemical security website. AGD does not intend to formally reply to each submission.

The closing date for submissions is **30 March 2012**.

The Consultation RIS and proposed measures are available electronically at www.chemicalsecurity.gov.au/RIS. If you are unable to access the website to obtain a copy of these documents, you can contact Mr Mark Whitechurch on (02) 6141 2925 or at Chemical.Security.RIS@ag.gov.au.

Responses to the Consultation RIS can be provided as follows:

By email (preferred)
Chemical.Security.RIS@ag.gov.au.

In writing

Attention: Mr Mark Whitechurch
Chemical Security Policy Unit
3-5 National Circuit
BARTON ACT 2600

Stakeholders should note that this Consultation RIS has been prepared with a number of general questions/statements throughout the document to which we would appreciate receiving stakeholder responses. AGD also seek particular feedback on a number of specific questions throughout the document and summarised below:

1. ***In the context of the supply chain that uses/handles precursor chemicals, to what extent are security risks likely to be managed in line with societal expectations in the absence of government intervention? (see page 37 for more detail)***
2. ***How appropriate are the groupings that comprise Option 2? Are there alternative ways in which Option 2 could be structured to better capture and represent the constituent sectors of the broader chemical industry? (see page 45 for more detail)***
3. ***Are there any existing regulations or codes of practice (administered either by governments or by industry) that could be easily adapted to deliver the risk treatment measures set out in Table 6? (see page 45 for more detail)***
4. ***To what extent will the four options reduce the risk of homemade explosive use for criminal purposes relative to the status quo? (see page 47 for more detail)***
5. ***If the options are likely to have more than a marginal impact on the risk of homemade explosive use, will the benefits associated with this risk reduction outweigh the costs to governments and industry? (see page 47 for more detail)***
6. ***Do stakeholders have any additional comments about the likely costs and benefits associated with the proposed measures? (see page 50 for more detail)***
7. ***Are the cost assumptions outlined in this Consultation RIS consistent with industry experience? (see Appendix H for all cost assumptions). Are these better estimates of costs available? (see page 50 for more detail)***
8. ***To what extent are the treatment measures likely to be effective in helping businesses manage the security risks associated with the precursor chemicals (including reducing the risk of individuals or groups using homemade explosives for criminal purposes)? (see page 55 for more detail)***
9. ***To what extent are the treatment measures likely to help businesses prevent, detect and deter the licit purchase of precursor chemicals by people with long term criminal intent? (see page 55 for more detail)***
10. ***Should any classes of activities, persons or chemicals (e.g. below a certain concentration) be exempted from the proposed measures? Why? (see page 55 for more detail)***
11. ***Are there any practical measures (alternative to the proposed treatment measures) to address identified risks that this Consultation RIS has not considered? (see page 55 for more detail)***
12. ***How reasonable are the estimates of: (1) the total number of companies that use/handle the precursor chemicals in Australia; and (2) the proportion of these companies that already comply with the proposed treatment measures (particularly 'Inventory Control' and 'Consignment Control')? Appendix I provides greater detail about these estimates. (see page 58 for more detail)***
13. ***Has this Consultation RIS adequately captured very small/backyard businesses that use/handle/sell precursor chemicals? Are there any additional data sources that provide an accurate and comprehensive picture of the number of very small/backyard businesses that use/handle/sell precursor chemicals in Australia? (see page 58 for more detail)***

14. ***This Consultation RIS has made a number of assumptions about the proportion of businesses that are likely to adopt the proposed treatment measures as a result of the options (see Appendix I for more detail). How reasonable are these assumptions? (see page 82 for more detail)***
15. ***Which of the voluntary options are likely to encourage more businesses to adopt the treatment measures? Why? (see page 82 for more detail)***
16. ***Is it appropriate and preferred to reframe the options to focus on those treatments which are seen to be more effective in addressing security risks? (see page 83 for more detail)***
17. ***If the options were to be reframed, which is likely to be most cost effective? For example, would the greater costs of Option 4 (relative to Option 1, Option 2 and Option 3) be worth whatever further reduction in risk that might occur? (see page 83 for more detail)***
18. ***What is the likely effectiveness of a targeted awareness campaign in engendering cultural change in relation to the management of chemical security risks? (see page 93 for more detail)***
19. ***To what extent are the options likely to reduce the risk of individuals and groups using homemade explosives for criminal purposes? Is the regulatory option (Option 4) likely to lead to a greater risk reduction than the voluntary options (Options 1-3)? Are the voluntary options likely to lead to different levels of risk reduction? (see page 93 for more detail)***
20. ***This Consultation RIS assumes that each of the options will reduce, to some extent, the risk of precursor chemicals being used to formulate homemade explosives. Do you agree with this assumption? Are the options likely to deliver greater security benefits than the status quo? Please provide detail in support of your reasoning. (see page 93 for more detail)***
21. ***How reasonable are our assumptions about the expected level of adoption of the treatment measures by industry under each of the options? Is it reasonable to expect that more businesses will adopt the treatment measures under a government code of practice compared with a series of industry codes and/or a targeted awareness campaign? (see page 93 for more detail)***

2 Background

In December 2002, COAG agreed to a national review of the regulation, reporting and security surrounding the storage, sale and handling of hazardous materials. The aim of the review was to assist counter-terrorism efforts by limiting opportunities for, and enhancing the detection of, the illegal/unauthorised use of hazardous materials. The work of the review was divided into four parts: ammonium nitrate; radiological sources; harmful biological materials; and hazardous chemicals (chemicals of security concern).

The December 2002 review was driven primarily by the events of 12 October 2002, where Jemaah Islamiah detonated a series of bombs in the tourist district of Kuta on the Indonesian island of Bali. Eighty-eight Australians were among the 202 people killed. These bombings remain the deadliest terrorist attack on Australians.

In 2004 and 2007, COAG considered the outcomes of the review for Security Sensitive Ammonium Nitrate, radiological sources and harmful biological materials. In 2008, COAG considered, and agreed to the recommendations of, the *Report on Chemicals of Security Concern* – the fourth and final component of the review. Key amongst the Report's recommendations include:

- a set of six overarching principles to guide the development of strategies to manage chemicals of security concern
- the establishment of a Chemical Security Management Framework
- the development of a methodology to assess the risks of chemicals of security concern, and
- the prioritised application of this risk assessment methodology to chemicals of security concern that are precursors to homemade explosives.

Appendix A outlines the overarching principles, the Chemical Security Management Framework, and the risk assessment methodology. The following sections provide greater detail about the precursor chemicals, community and government expectations surrounding the management of terrorism risks, and international regulatory developments in relation to chemicals of security concern.

2.1 Precursors to homemade explosives

As part of the review of hazardous materials, COAG undertook a preliminary assessment of chemicals to identify those that could potentially be accessed by terrorists in the Australian context. This process identified 96 chemicals of security concern. The *Report on Chemicals of Security Concern* recommended that these 96 chemicals be subject to a comprehensive risk assessment process to ensure governments and industry have the required information to identify and implement appropriate capability and control measures to manage risk. The Report also recommended that the risk assessments of the 96 chemicals should be prioritised, with an initial focus on 11 chemicals that are precursors to homemade

explosives ('the precursor chemicals') (Box 1).[8] Appendix B provides further background detail about the precursor chemicals.

The Chemical Security Risk Assessment Unit (CSRAU) within AGD has applied the specially-developed risk assessment methodology to all of the precursor chemicals. The Chemical Security Coordination Unit (CSCU) within AGD has used the results of the risk assessments to develop a set of proposed treatment measures. These measures are intended to assist security and law enforcement agencies in preventing terrorist attacks whilst not impeding the legitimate use of chemicals. This Consultation RIS will assess whether such measures are necessary and if so, how best to implement these risk treatment measures.

The CSRAU is continuing to assess the security risks associated with the remaining 85 chemicals of security concern. As those risk assessments are completed, it is likely that governments will consider developing treatment measures if vulnerabilities are identified. It is possible that the treatment measures and options described in this Consultation RIS could be used to inform the development of treatment measures and approaches for the remaining 85 chemicals of security concern. The analysis in this Consultation RIS should thus be considered in this broader context.

2.2 *Contextual factors*

Community expectations

As the then Commissioner of the Australian Federal Police stated in 2003:

> *The 11 September 2001 attacks, and then more recently and tragically for Australia, the Bali bombings of 12 October 2002, have dramatically altered Government and community expectations in respect of terrorism. There is now a strong government and community expectation to not only monitor terrorist activity, but to disrupt it.*[9]

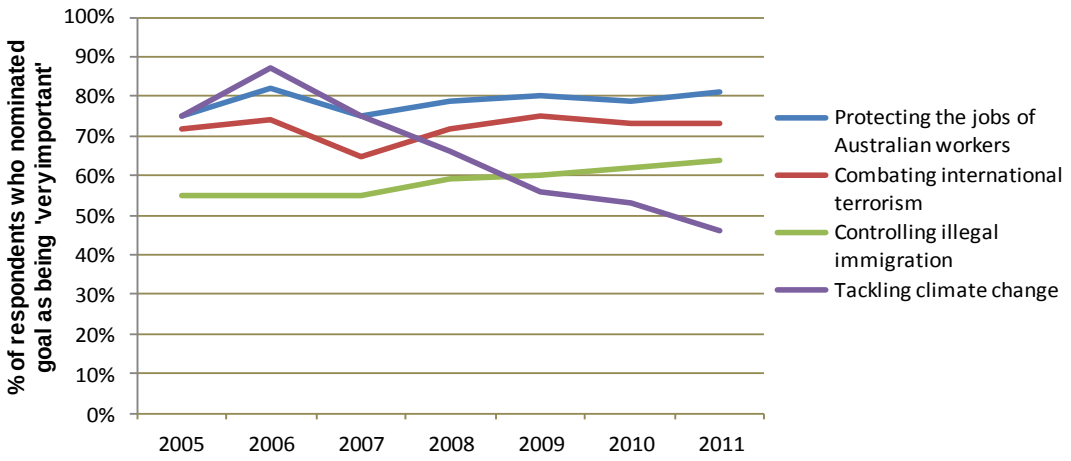
Since the 2002 Bali bombings, the community has continued to see the prevention of terrorist acts as a key policy objective of government (see Figure 1). As part of its inaugural poll of public attitudes towards foreign policy in 2005, the Lowy Institute asked respondents to rate the importance of a range of policy goals. Seventy-two per cent of respondents nominated 'combating terrorism' as a very important goal; below 'improving the global environment', 'strengthening the Australian economy', and 'protecting the jobs of Australian workers' (all of which were seen as very important by 75 per cent of respondents), but above such goals as 'helping to prevent nuclear proliferation' (69 per cent), 'controlling illegal immigration' (55 per cent), and 'promoting democracy in other countries' (34 per cent).[10]

8 A twelfth chemical – perchloric acid – was also initially listed as a precursor to homemade explosives and thus prioritised for risk assessment. Subsequent advice, however, suggested that a risk assessment of perchloric acid as a precursor to homemade explosives is not warranted at this time.

9 Keelty, Mick (2003), 'Closing the circle: The AFP's capacity to fight terrorism', Platypus Magazine, no. 78, pp.4-10.

10 The Lowy Institute (2005), The Lowy Institute Poll 2005: Date book, Sydney.

Figure 1: Trends in perceptions about the perceived importance of selected foreign policy goals[11]



In the most recent Lowy Institute poll, a similar proportion of respondents (73 per cent) nominated 'combating international terrorism' as a very important policy goal. While this was below 'protecting the jobs of Australian workers' (81 per cent), it was above such goals as 'strengthening the Australian economy' (70 per cent), 'controlling illegal immigration' (64 per cent) and 'tackling climate change' (46 per cent).[12] The 2011 Lowy Institute poll also asked respondents whether they thought 'the ability of terrorists to launch another major attack against Australians is now greater, the same, or less than at the time of the 2002 Bali bombings?'[13] Sixty per cent of respondents nominated 'the same', while 19 per cent nominated 'greater'.

While the results of the Lowy Institute poll do not suggest that the public is willing to support any government action to combat terrorism, they do indicate a general expectation that governments will act to protect the community, so long as such protection is reasonable and meaningful.

The Australian Government, meanwhile, outlined its policy position on terrorism in the 2010 *Counter-Terrorism White Paper*. This document notes that while '[n]o government can guarantee that Australians will be free from the threat of terrorist attack', the Australian Government will take 'all necessary and practical action to protect Australia and Australians from terrorism at home and abroad.'[14] 'Necessary and practical' in this context is governed by such factors as proportionality (i.e. ensuring actions are commensurate with identified risks) and cost-effectiveness. Potential actions include 'an effective intelligence capability … effective border

11 Various Lowy Institute polls. See: http://www.lowyinstitute.org/Search.asp?pubtype=9&process=search. Note: the 2005 and 2006 figures for 'tackling climate change' are those of 'improving the global environment'.

12 The Lowy Institute (2011), The Lowy Institute Poll 2011: Australia and the world, Sydney.

13 Ibid.

14 Australian Government (2010), Counter-Terrorism White Paper: Securing Australia, protecting our community, Department of the Prime Minister and Cabinet, Canberra.

management and transport security practices, strong relationships between the Commonwealth and the states and territories, collaborative relationships with business to protect our critical infrastructure and cooperative international relationships.'[15]

International developments

Many countries have become increasingly concerned about the possible use of chemicals for terrorist activities. Approaches to managing the security risks associated with chemicals vary from jurisdiction to jurisdiction (greater detail about the international regulatory arrangements outlined in this section is provided in Appendix D). The United Kingdom has adopted a non-regulatory approach. It generally attempts to improve how legitimate users and handlers of chemicals manage security risks through public awareness campaigns.

Other jurisdictions have adopted different regulatory approaches. The United States Government, for instance, primarily seeks to manage the terrorist threat associated with chemicals by focusing on high-risk chemical facilities. Under its Chemical Facility Anti-Terrorism Standards, the Department of Homeland Security requires all chemical facilities that possess 'chemicals of interest' (of which there are approximately 300) at prescribed threshold levels to prepare a Security Vulnerability Assessment. Those facilities that are subsequently deemed by the Department to be high risk are required to develop and implement a Site Security Plan. This will include measures to satisfy the risk-based performance standards outlined in the Chemical Facility Anti-Terrorism Standards.

Under its *Restricted Components Regulations 2008* (made under the *Explosives Acts 1985*), the Canadian Government has a number of regulatory requirements pertaining to the security of 'restricted components' (i.e. chemicals that can be components of an explosive). These requirements include: the registration of sellers; restricted physical and personnel access; ongoing stock management; restricted sales; adequate record-keeping; and the provision of information about suspicious activity to relevant authorities.

The European Union has instituted a number of regulatory approaches to manage the security risks associated with precursor chemicals. In 2008, the European Union approved the *EU Action Plan on Enhancing the Security of Explosives*. This action plan requires member states to implement a number of measures aimed at:

- improving information sharing and research
- enhancing the capacity of governments and businesses across relevant supply chains to prevent and detect terrorist access to chemicals that are precursors to homemade explosives, and

15 Ibid.

- ensuring member states are able to respond effectively to potential terrorist attacks.[16]

In addition to the Action Plan, the European Union is also currently proposing to prohibit 'the sales of certain chemicals above concentration thresholds to members of the general public. Sales of higher concentrations would only be allowed to users who can document a legitimate need to use the chemical — these users can obtain a licence to purchase the chemical.'[17]

In Singapore, under the *Arms and Explosives Act 2003*, a licence is required to deal in, manufacture, posses and/or store explosive precursors. The Act identifies 15 precursor chemicals as requiring a licence.

Table 4 outlines which of the 11 precursor chemicals identified by COAG are also identified as chemicals of security concern by other countries.

Table 4: Identified precursor chemicals[18]

Precursor chemicals	United States	European Union	Canada	Singapore
Ammonium perchlorate	✓			✓
Hydrogen peroxide	✓	✓	✓	✓
Nitric Acid	✓	✓	✓	
Nitromethane	✓	✓	✓	✓
Potassium chlorate	✓	✓	✓	✓
Potassium nitrate	✓	✓	✓	✓
Potassium perchlorate	✓	✓	✓	✓
Sodium azide	✓			
Sodium chlorate	✓		✓	✓
Sodium nitrate	✓	✓	✓	✓
Sodium perchlorate		✓		✓

16 Council of the European Union (2008), 'EU Action Plan on Enhancing the Security of Explosives', http://register.consilium.europa.eu/pdf/en/08/st08/st08109.en08.pdf. Accessed on: 29 September 2011.

17 European Commission (2010), 'Regulation of the European Parliament and the Council on the marketing and use of explosive precursors', Brussels, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0473:FIN:EN:PDF. Accessed on: 29 September 2011.

18 Marked cells indicate that the chemical has been identified as a chemical of concern in the relevant jurisdiction.

3 Statement of the problem

In order to make a case for government action, a Consultation RIS must first establish the problem to be addressed. This problem forms the basis for further analysis in the Consultation RIS – the objective for government action and policy options should align closely with the description of the problem set out in this chapter.

In accordance with the COAG Best Practice Regulation Guidelines, this chapter:

- presents evidence on the magnitude (scale and scope) of the problem
- documents existing regulation at all levels of government and demonstrates why this regulation is not effectively addressing the problem
- identifies the relevant risks and explains why it may be appropriate for governments to act to reduce them, and
- presents a clear case for considering that additional government action may be warranted, taking account of existing regulation and any risk issues.[19]

3.1 Problem summary

Available evidence suggests that individuals and groups have an ongoing interest in using homemade explosives for criminal purposes – particularly terrorism and organised crime. To formulate a homemade explosive, an individual or group requires access to precursor chemicals. Many of these are widely available, either through legitimate purchase or illegal access (e.g. theft), and can be obtained in sufficient concentrations and volumes. Examples throughout this chapter further illustrate the problem, particularly the ease at which terrorists or criminals could legitimately access precursor chemicals under the status quo.

This Consultation RIS has identified two key gaps in how the security risks associated with the legitimate or illegal access to precursor chemicals are currently managed:

- existing controls are primarily focused on managing the risks posed by chemicals to human health and environmental health. Or, more specifically, the risks posed by the accidental or negligent misuse of chemicals, rather than intentional misuse. Governments currently do not regulate national security risks in relation to chemicals – though these risks have been the focus of a government awareness campaign and a number of self-regulatory codes of practice, and
- gaps exist in the capacity of businesses to manage the security risks associated with the legitimate or illegal access to precursor chemicals. Comprehensive risk

19 COAG (2007), Best Practice Regulation: A Guide for Ministerial Councils and National Standard Setting Bodies, Canberra. RISs developed under the COAG guidelines are reviewed by the Office of Best Practice Regulation (see http://www.obpr.gov.au).

assessments undertaken by AGD identified vulnerabilities in the ability of businesses to deter, prevent and detect the theft and diversion of precursor chemicals, and to facilitate law enforcement through effective information provision.

There is a *prima facie* case for governments to intervene to address gaps in industry capacity, based on the market failure of imperfect information. More specifically, businesses lack sufficient information to make fully informed decisions about the security risks associated with precursor chemicals.

The proposed risk treatment measures have been designed to address gaps in industry capacity to contribute to the objective of minimising, as low as reasonably practicable, the incidence and associated impacts of terrorist attacks using homemade explosives and other similar uses of homemade explosives that threaten the health and safety of the Australian public.

3.2 *Homemade explosives – ongoing interest and potential costs*

The chemical industry in Australia is extensive. There are an estimated 40,000 chemicals approved for use in Australia, which are formulated into over 400,000 trademarked products.[20] In 2006, the Australian Safety and Compensation Council (now Safe Work Australia) estimated that there were 573,700 workplaces in Australia with chemical users.[21]

Most chemicals approved for use in Australia have a range of potential applications. Hydrogen peroxide, for example, is readily available at various concentrations for use in pulp and paper bleaching, the treatment of municipal wastewater, the manufacture of other chemicals, the treatment of root diseases (in horticultural and hydroponics) and various pharmaceutical applications (Appendix B provides greater about the markets for and use of the 11 precursor chemicals).

Some chemicals that have a wide range of legitimate and productive uses in Australia can also be misused to threaten the health and safety of the Australian public. Such misuse can be accidental or the result of negligence. For instance, poorly labelled containers could lead employees to use a different chemical (or the same chemical at a different concentration) in a particular application, causing an unintended and harmful reaction. Australia's system of occupational health and safety, public health and transport safety regulation is designed, in part, to prevent and mitigate the consequences of accidental and negligent misuse of chemicals.

20 COAG (2008), Report on the Control of Chemicals of Security Concern, Canberra.

21 Australian Safety and Compensation Council (2006), 'Draft Regulation Impact Statement: Proposed Revisions to the National OHS Framework for the Control of Workplace Hazardous Substances and Dangerous Goods', September, http://www.safeworkaustralia.gov.au/AboutSafeWorkAustralia/WhatWeDo/Publications/Documents/409/Draft_RIS_Proposed%20Revisions%20to%20the%20National%20OHS%20framework_control_workplace_Hazardous_substances_Dangerous_good.pdf. Accessed on: 6 September 2011.

The misuse of chemicals can also be intentional. Possible forms of intentional misuse can include the formulation of illicit synthetic drugs, poisons and homemade explosives.

In the wake of the 2002 Bali bombings, there has been increasing government concern about the latter. More specifically, Australian governments are concerned about the risks posed by individuals and groups making homemade explosives for use in terrorist attacks.

Terrorism and the use of homemade explosives[22]

As the Australian Government states in its 2010 *Counter-Terrorism White Paper*, terrorism 'has become a persistent and permanent feature of Australia's security environment.'[23] Over the past decade, terrorist attacks have claimed the lives of 111 Australians.[24] While all of these attacks occurred overseas, there has been significant terrorist-related activity in Australia. The *Counter-Terrorism White Paper* notes:

> *Numerous other attacks have been thwarted in Australia. Thirty-eight people have been prosecuted or are being prosecuted as a result of counter-terrorism operations, 35 of whom were prosecuted for terrorism offences pursuant to the Criminal Code Act 1995 … Twenty people have been convicted of terrorism offences under the Criminal Code. More than 40 Australians have had their passports revoked or applications denied for reasons related to terrorism.*[25]

Australia's National Terrorism public alert remains at 'medium', which means government continues to believe that an attack could occur. David Irvine, Director-General of Security at the Australian Security Intelligence Organisation (ASIO), recently stated that:

> *In terms of current threats, the fact that al-Qa'eda and its associated anti-Western transnational terrorist partners have declared Australia to be a legitimate target of attack continues to be a major concern. Of equal concern is that small numbers of Australians have absorbed the ideology of violent religious extremism and have planned or are contemplating and planning acts of terrorism in Australia or overseas. This home-grown brand of terrorism, involving mostly young Australians who have been "radicalised" either by Australian extremists or by overseas inspiration, requires constant vigilance. Particular*

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22 It is difficult to paint a comprehensive picture of the extent to which individuals and groups are seeking to use homemade explosives for criminal purposes. Public information on this topic is limited, due to:

- The clandestine nature of criminal activity – individuals or groups with an interest in using homemade explosives for criminal purposes (whether terrorism or otherwise) generally do not advertise this interest or those instances where they have been successful in securing access to the necessary precursor chemicals.
- Intelligence constraints – Australia's various law enforcement and intelligence agencies have greater awareness of individuals and groups that may be seeking to use homemade explosives for criminal purposes. These agencies are constrained, however, from publicly detailing the extent of their awareness, as doing so could compromise ongoing and future intelligence arrangements.

Given these constraints, this Consultation RIS is unable to rely on empirical evidence to determine the extent to which individuals and groups have an interest in using homemade explosives for criminal purposes. As an alternative, this Consultation RIS draws on a range of anecdotal evidence – drawn from government documents and the academic literature – and a number of recent court cases to highlight trends in historic and likely future use.

23 Australian Government (2010), Counter-Terrorism White Paper: Securing Australia, protecting our community, Department of the Prime Minister and Cabinet, Canberra.

24 Ibid.

25 Ibid.

> *worries are the so-called "lone wolf' or 'stand-alone' groups who act independently and throw off few clues as to malicious intent*.[26]

Terrorists employ a range of weapons to pursue their objectives. Since the 11 September 2001 attacks, terrorists have exhibited a preference for using homemade explosives. As Dowle states, the 'prevalence of [homemade explosives] in terrorist improvised explosive devices is increasing.'[27] Whitlock echoes this statement, noting that '[a]lmost every [al-Qa'ida] terrorist plot in Europe in recent years has followed a simple formula: homemade explosives stuffed into backpacks, shoes, suitcases or car trunks.'[28] The European Commission has confirmed this trend. It noted in a recent analysis of '515 failed, foiled or successfully perpetrated terrorist attacks' reported by seven member states in 2008 that '[homemade explosives], fabricated from chemical precursors, are the means most frequently used to carry out attacks.'[29] Prominent international terrorist attacks that have involved the use of homemade explosives include:

- the 2005 London bombings, which killed 52 civilians
- the attempted Christmas Day bombing in 2009 (involving Northwest Airlines Flight 253), and
- the 2011 Oslo car bomb, which killed eight people.

In the case of the 2005 London bombings and the attempted 2009 Christmas Day bombing, the terrorists involved are suspected to have sourced precursor chemicals through legitimate retail purchase. In his published online notes, Oslo bomber Anders Behring Breivik detailed which chemicals he used and how he obtained them, including through purchases from retailers and specialist chemical suppliers.

In the Australian context, there is evidence of ongoing interest in homemade explosives, and the precursor chemicals that are used to make homemade explosives, for terrorism-related purposes. As COAG stated in 2008, '[t]errorist groups of concern to Australia's domestic security have had the intent and capability to develop and use homemade explosives. These explosives can be prepared from chemicals that are commonly available in Australia.'[30]

Examples of known or alleged threats include:

- Faheem Khalid Lodhi was convicted in August 2006 for 'possessing things connected with terrorist acts' and sentenced to 10 years imprisonment. He possessed a handwritten 'terrorism manual for the manufacture of homemade poisons, explosives, detonators and incendiary devices' and had sought

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26 Irvine, David (2011), 'The John Bray oration', 19 September, http://asio.gov.au/Publications/Public-Statements/2011/19-September-2011-The-John-Bray-Oration.html. Accessed on: 29 September 2011.

27 Dowle, Jim (2006), 'Homemade explosives', Law & Order, 54(10), http://www.hendonpub.com/resources/articlearchive/details.aspx?ID=841. Accessed on :30 July 2011.

28 Whitlock, Craig (2008), 'Al-Qaeda masters terrorism on the cheap', The Washington Post, 24 August, http://www.washingtonpost.com/wp-dyn/content/article/2008/08/23/AR2008082301962.html. Accessed on: 30 July 2011.

29 European Commission (2010), 'Regulation of the European Parliament and the Council on the marketing and use of explosive precursors', Brussels, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0473:FIN:EN:PDF. Accessed on: 29 September 2011.

30 COAG (2008), Report on the Control of Chemicals of Security Concern, Canberra.

information from a chemical supply company 'on a range of precursor chemicals that could be used to prepare explosives.'[31]

- Abdul Nacer Benbrika was convicted in September 2008 on the charge of intentionally being the leader and a member of a terrorist organisation. During the trial, jurors heard recordings of Benbrika quizzing an undercover intelligence officer 'about the use of explosives and whether he could obtain 500kg of explosives made from ammonium nitrate'[32], and
- five Sydney men were convicted in October 2009 of a range of terrorism-related offences. The men had obtained 'step-by-step instructions on how to make bombs capable of causing large-scale death and destruction' and had sourced and attempted to source (through legitimate retail purchases) a range of precursor chemicals, including sulphuric acid, hydrochloric acid, acetone and hydrogen peroxide.[33]

Experience suggests that in successful international attacks and known or alleged domestic threats, the majority of perpetrators have acquired, or sought to acquire precursor chemicals legitimately through the supply chain, particularly by retail purchase. While acquisition of chemicals through theft and diversion is a risk under current arrangements in Australia, it is clear that ease of legitimate access to these chemicals remains a key area of concern for law enforcement agencies and governments (refer to section 3.3 below for further discussion). Recognising this, the proposed measures within this Consultation RIS are designed to minimise (as low as reasonably practicable) legitimate and illegitimate access to precursor chemicals by individuals and groups seeking to formulate homemade explosives for terrorist and criminal purposes.

Broader user of homemade explosives for criminal purposes

It is important to note that the deliberate use of precursor chemicals to make homemade explosives is not limited to terrorism. Individuals or groups may have an interest in using homemade explosives to cause damage, but not necessarily for politically motivated purposes. Rather, they may be driven by the pursuit of monetary gain, or a host of emotional and/or psychological factors. Recent examples of broader interest in homemade explosives include:

- in August 2007, New South Wales police arrested four men in Sydney's southwest, one of whom had 'allegedly ordered 23 litres of chemicals from the Northern Territory on August 10' with the intention of making approximately 40 kilograms of the homemade explosive nitroglycerine to bomb automatic teller

31 COAG (2008), Report on the Control of Chemicals of Security Concern, Canberra; NSW Police (n.d.), 'Case study', http://www.secure.nsw.gov.au/Legislation/Case-study.aspx?id=633240872776807500. Accessed on: 30 July 2011.

32 Hughes, Gary (2008), 'Lies, bombs and jihad', The Australian, 18 September, http://www.theaustralian.com.au/news/features/lies-bombs-and-jihad/story-e6frg6z6-1111117491538. Accessed on: 29 September 2011.

33 Davies, Lisa (2005), 'What home raids found', The Daily Telegraph, 15 November, p.2; Reuters (2009), 'Five men found guilty in Australia of terror plot', 16 October, http://www.reuters.com/article/2009/10/16/idUSSP465220. Accessed on: 30 July 2011.

machines. The group reportedly went outside of the state in order to attempt to fly under the radar of law enforcement [34]

- in March 2009, police uncovered a quantity of 'potentially explosive liquid' outside the home of the head of a bikie gang in western Sydney [35]
- in February 2010, two men were killed in Adelaide when a homemade explosive they were transporting prematurely exploded. Media reports suggest that at least one of the men was a member of a bikie gang, and both men were on their 'way to assassinate a rival gang member'[36], and
- in July 2011, Victorian police arrested a man in Castlemaine. He is alleged to have purchased a range of substances that could be used to manufacture a homemade explosive, including the precursor chemicals potassium nitrate and potassium chlorite.[37] While initial reporting suggests the accused had no links to terrorism, Victorian Police state that he had 'a keen interest in railways and trains.'[38]

The costs of an attack using homemade explosives

The consequences of a terrorist attack using homemade explosives are likely to be substantial particularly given the trend toward the increased lethality of terrorist incidents.[39] Such an event would have both direct and indirect costs. The former involves the 'immediate losses associated with a terrorist attack' and may include 'damaged goods, the value of lives lost, the costs associated with injuries (including lost wages), destroyed structures, damaged infrastructure and reduced short-term commerce.'[40] In addition to these economic costs, the use of homemade explosives in a terrorist attack is likely to have direct social costs, in terms of heightened anxiety, 'grief and mourning', and reduced life satisfaction.[41]

The indirect costs of a terrorist attack using homemade explosives generally concern 'attack-related subsequent losses, such as raised insurance premiums,

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34 Braithwate, David (2007), 'Big dreams but alleged bomb gang nervous about explosives', The Sydney Morning Herald, 30 August, http://www.smh.com.au/news/national/alleged-bomb-gang-nervous-about-explosives/2007/08/29/1188067191570.html. Accessed on: 30 September 2011.

35 Vincent, Michael (2009), 'Homemade bomb found outside top bikie's house', ABC Online, 31 March, http://www.abc.net.au/news/2009-03-31/homemade-bomb-found-outside-top-bikies-house/1636908. Accessed on: 30 September 2011.

36 Milnes, Michael and Doug Robertson (2010), 'Two killed in bomb blast in a car at Truscott Rd, Enfield', The Advertiser, 11 February, http://www.adelaidenow.com.au/two-killed-in-bomb-blast-in-a-car-at-truscott-rd-enfield/story-e6frea6u-1225829015870. Accessed on: 31 September 2011.

37 Dowsley, Anthony (2011), 'Alleged bomb-maker's home still unsafe as bail application adjourned', Herald Sun, 26 July, http://www.heraldsun.com.au/news/more-news/heavily-armed-police-arrest-accused-would-be-bomb-maker-in-castlemaine/story-fn7x8me2-1226101958518. Accessed on: 1 August 2011.

38 Dowsley, Anthony (2011), 'I'm no terrorist says accused as court told of bomb maker's arsenal', Adelaide Now, 27 July, http://www.adelaidenow.com.au/news/national/heavily-armed-police-arrest-accused-would-be-bomb-maker-in-castlemaine/story-e6frea8c-1226102571095. Accessed on: 1 August 2011.

39 A number of statistical studies have observed that, over the past two decades, 'the casualty rate of individual terrorist attacks has increased.' See: Hoffman, Bruce (1999), 'Terrorism trends and prospects', in Ian O. Lesser, et al. (eds), Countering the New Terrorism, Rand Corporation, Santa Monica; and Piazza, James A. (2009), 'Is Islamist terrorism more dangerous?: An empirical study of group ideology, organization, and goal structure', Terrorism and Political Violence, 21(1):62-88.

40 Sandler, Todd and Walter Enders (2008), 'Economic consequences of terrorism in developed and developing countries: An overview', in Terrorism, Economic Development and Openness, eds. Phillip Keefer and Norman Loayza, Cambridge University Press, Cambridge, pp.17-47.

41 Frey, Bruno S., Simon Luechinger and Alois Stutzer (2009), 'The life satisfaction approach to valuing public goods: The case of terrorism', Public Choice, 138(317-45).

increased security costs, greater compensation to those at high-risk locations, and costs tied to attack-induced long-run changes in commerce.'[42] The last of these could take the form of reductions in tourism spending, retail spending and business investment (particularly foreign direct investment).

Estimating the value of costs likely to be associated with a terrorist attack using homemade explosives in Australia is difficult, as the cost drivers (namely, the scale of damage caused by the blast and the nature of the target) are highly variable. Academic literature provides some guidance, in the form of estimates of the costs of historic terrorist attacks. A number of these estimates are discussed in greater detail in Chapter 6.

3.3 *Accessing precursor chemicals*

To formulate a homemade explosive, an individual or group requires access to chemicals that are precursors to homemade explosives. COAG has identified the 11 precursor chemicals listed in Chapter 2 as those that could potentially be accessed by terrorists in the Australian context.

Many of these precursor chemicals (particularly hydrogen peroxide, nitromethane and nitric acid) are currently widely available and easily accessible to individuals – due to the myriad of uses of the precursor chemicals by industry and researchers (Appendix B provides greater detail about the legitimate use of the precursor chemicals in Australia).

Precursor chemicals can be legitimately purchased from relevant nodes in the supply chain at concentrations and volumes that, in many cases, are sufficient to produce a homemade explosive. Detecting the licit purchase of precursor chemicals where the purchaser has malicious intent is difficult, as there is often little or no difference between the physical act of licit purchase with criminal intent and licit purchase with innocent intent. Furthermore, since the amount of precursor chemical required to formulate a homemade explosive may be small, the licit purchase of such chemicals with criminal intent will not necessarily stand out amongst innocent purchases.

Precursor chemicals can also be illegitimately obtained from various nodes in the existing supply chain – e.g. through theft, providing false information to the seller, or through infiltrating a supply node and taking advantage to facilitate the supply or theft of chemicals. Though licit purchase is likely to be an easier means of accessing precursor chemicals for criminal purposes.

While there are a number of options for individuals and groups to access precursor chemicals (either legitimately or illegitimately), obtaining such chemicals is not a

42 Sandler, Todd and Walter Enders (2008), 'Economic consequences of terrorism in developed and developing countries: An overview', in Terrorism, Economic Development and Openness, eds. Phillip Keefer and Norman Loayza, Cambridge University Press, Cambridge, pp.17-47. See also: Krugman, Paul (2004), 'The costs of terrorism: What do we know?', December, http://www.l20.org/publications/9_7Q_wmd_krugman.pdf. Accessed on: 2 August 2011.

risk-free activity. There are a number of barriers in place that individuals and groups would first need to overcome. These barriers may not be considerable, but it is important that this Consultation RIS recognises that these barriers exist. The barriers include:

- general industry practices
- existing controls to manage health and safety risks, and
- ongoing efforts by law enforcement agencies.

These barriers are discussed in turn below.

General industry practices

General industry practices are likely to pose challenges to individuals and groups wanting to steal or divert precursor chemicals. For instance, businesses will generally have some security arrangements in place, since the theft of stock – precursor chemicals or otherwise – represents a direct loss to their bottom line. Likewise, there are commercial incentives for businesses to maintain some form of inventory control to ensure stock is being adequately utilised. Existing controls, however, are not well suited to detecting stock losses quickly (e.g. stocktakes are on an annual basis) or to detecting minor stock losses.

Existing controls to manage health and safety risks

Chemicals, and the businesses that use/handle chemicals, are subject to a complex framework of Commonwealth, State and Territory legislation that provides a suite of controls for the safe and efficacious use of a range of potentially dangerous chemicals. These controls, insofar as they are relevant to the 11 precursors, primarily focus on managing the risks posed by chemicals to human health and environmental health. They range between:

- targeted awareness campaigns (e.g. Phases One and Two of the Chemicals of Security Concern campaign)
- self-regulation (e.g. the Fertcare program)
- industry-government partnerships (e.g. the Frontline Program), and
- regulation (e.g. the National Industrial Chemicals Notification and Assessment Scheme and Standard for the Uniform Scheduling of Medicines and Poisons).

Appendix C provides further detail about this range of existing controls.

Some control measures in place for other purposes may provide an incidental security benefit.[43] For example, the Plastics and Chemicals Industry Association's (PACIA) 'Code of Practice for Supply Diversion into Illicit Drug Manufacture' sets

43 COAG (2008), Report on the Control of Chemicals of Security Concern, Canberra.

out guidance for how businesses can 'protect against the diversion of chemicals and scientific equipment into the illicit production of drugs' – including sales monitoring, record keeping and notification of suspicious orders and enquiries. One of the 11 precursor chemicals (nitromethane) is listed as a Category II precursor in this code.

Some existing controls include requirements that can directly and indirectly hinder the potential for individuals and groups to access precursor chemicals for use in terrorist activity. Examples of controls that can directly hinder the potential for access include:

- the Fertiliser Industry Federation of Australia (FIFA) and Agsafe have developed documents that outline recommended security measures to deter, detect, delay and prevent intentional misuse of chemicals. These are the 'Australian Fertiliser Industry Security Code of Practice', produced by FIFA, and the 'Security Guidelines for Agricultural distributors', produced in partnership by FIFA, Agsafe and the Australian Fertiliser Services Association (AFSA), and
- PACIA has developed 'Site and Supply Chain Security Guidance', which provides information about how businesses can improve their management of security risks, particularly in the context of the theft or diversion of chemicals.

The vast majority of existing controls provide a framework that is designed to protect the community from harm arising from accidental or negligent misuse of chemicals. Existing controls do not directly address security risks arising from the intentional misuse of chemicals for criminal purposes. Options 1-4 outlined in this Consultation RIS are designed to address this shortcoming by delivering a range of measures aimed at minimising, as low as reasonably practicable, legitimate and illegal access to precursor chemicals by individuals and groups seeking to formulate homemade explosives for terrorist and criminal purposes.

Furthermore, stakeholders indicate that there are a number of very small/backyard businesses that are involved in the use and handling of the precursor chemicals. These businesses, almost by definition, lack the time, capacity and interest to comply with existing controls – whether they have a security benefit or not. These businesses also tend not to be members of industry associations and thus are not able to leverage the capacity and self-regulatory frameworks that exist in these forums.

Ongoing efforts by law enforcement agencies

Given the perception of terrorism as a 'real and enduring' risk, Australian governments continue to maintain a security architecture (comprising strategies, plans and Commonwealth and State and Territory arrangements) aimed at preventing terrorist incidents and disrupting terrorist activity.[44] While not talking

44 Australian Government (2010), Counter-Terrorism White Paper: Securing Australia, protecting our community, Department of the Prime Minister and Cabinet, Canberra. See also: Australian Government (2008), National Counter-Terrorism Plan, Canberra.

specifically about precursor chemicals and homemade explosives, David Irvine recently provided a sense of the intensity of Australia's counter-terrorism efforts by noting:

> *While Australia's security alert level has remained at Medium, each year ASIO responds to literally thousands of counter-terrorism leads. The Committee might like to note that we are currently involved in several hundred counter-terrorism investigations and inquiries. These investigations range from Australians in contact with terrorists off-shore, including al-Qa'ida, to the investigation of possible threats to Australian interests from extremist activity, either on or off-shore.*[45]

The ongoing counter-terrorism efforts by law enforcement agencies (including publicised arrests) are likely to act as a deterrent for some individuals or groups wanting to access precursor chemicals for use in terrorist activity.

3.4 *Areas of regulatory concern*

As noted in Appendix A, the CSRAU recently completed comprehensive risk assessments of the 11 precursor chemicals. In line with the agreed methodology, the CSRAU considered four data inputs to analyse the precursor chemicals: impact, employability, level of security concern and vulnerability. The CSRAU collected data for the risk assessments from:

- the Australian Chemical, Biological, Radiological and Nuclear Data Centre, which is hosted by the Australian Federal Police and draws on input from the Australian intelligence community
- the National Industrial Chemical Notification and Assessment Scheme (NICNAS) and the Australian Pesticides and Veterinary Medicines Authority (APVMA), and
- site visits of a representative sample of businesses that use/handle the chemicals – in all, site visits were conducted of 187 businesses.

The CSRAU also sought validation of its initial results through discussions with State and Territory regulators, law enforcement and intelligence agencies, Commonwealth agencies and industry associations at the National Government Advisory Group for chemical security (NGAG) and National Industry Reference Group for chemical security (NIRG) forums.

45 Irvine, David (2011), 'Director-General's Opening Statement Senate Standing Committee on Legal and Constitutional Affairs 25-26 May 2011', 25 May, http://www.asio.gov.au/Publications/Public-Statements/2011/25-May-2011-Opening-Statement.html. Accessed on: 29 July 2011.

Table 5 outlines the high-level results of the risk assessment process for the 11 precursor chemicals. Hydrogen peroxide, nitric acid and nitromethane received an overall security risk rating of High 3/Very High. Sodium chlorate, potassium chlorate, sodium nitrate and potassium nitrate received an overall security risk rating of High 2/High 3. The remainder received an overall security risk rating of either High 1 or Medium.

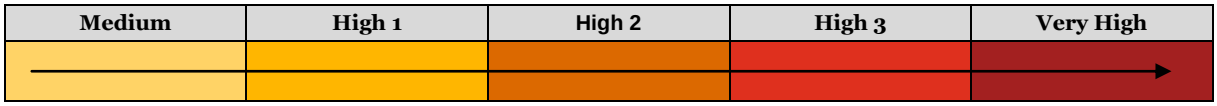
At a more specific level, the risk assessment process identified two areas of vulnerability in how businesses currently manage security risks associated with the precursor chemicals:

- the capacity of industry to *deter* and *prevent* the theft and diversion of precursor chemicals, and
- the capacity of industry to *identify* the theft and diversion of precursors in a timely manner.

Consultations with stakeholders for the purposes of this Consultation RIS have also highlighted a related third vulnerability in current arrangements – specifically, the capacity of industry to facilitate law enforcement through effective information provision. We discuss these three vulnerabilities below.

Table 5: Security risk rating results[46]

Number of DHCs per chemicals	Introducer	Transport/ Logistics	Processor	Wholesaler	Retailer	End User
Ammonium perchlorate	Medium	Medium	Medium	Medium	N/A	Medium
Hydrogen peroxide	High 3	Very High	High 3	Very High	Very High	High 3
Nitric acid	Very High	Very High	Very High	Very High	High 3	Very High
Nitromethane	High 2	High 3	High 3	High 3	Very High	High 3
Potassium Chlorate	High 3	High 3	High 3	High 3	N/A	High 3
Potassium nitrate	High 3	High 3	High 2	High 3	High 2	High 3
Potassium perchlorate	Medium	Medium	Medium	Medium	N/A	Medium
Sodium azide	Medium	High 1	High 1	High 1	N/A	High 1
Sodium chlorate	High 2	High 3	High 2	High 3	N/A	High 3
Sodium nitrate	High 3	High 3	High 2	High 3	N/A	High 3
Sodium perchlorate	Medium	Medium	Medium	Medium	N/A	Medium



3.4.1 *Deterring and preventing the theft and diversion of precursor chemicals*

As part of the risk assessment process, the CSRAU sought information from industry about how businesses currently manage security risks associated with the precursor chemicals. This information identified a number of limitations in the capacity of industry to deter and prevent the theft and diversion of precursor chemicals. Specific areas of concern include:

46 In March 2010, NGAG agreed to adopt the 'As Low As Reasonably Practical' (ALARP) approach to risk treatment. The ALARP approach embraces the concept that risk tolerance should be graduated. The ALARP approach provides flexibility for risks that fall in a middle range of the risk gradient and acknowledges the need for costs and benefits to be considered before risk treatment decisions are made. In line with the ALARP approach, NGAG decided to subject all chemicals/nodes that received a security risk rating of medium or above to further analysis about the suitability of possible treatment measures. Those chemicals/nodes that received a security risk rating of low or very low were deemed to be broadly acceptable and not requiring further treatment measures.

- employee checking – not all businesses have thorough processes in place to assess employee suitability to access/handle precursor chemicals
- risk assessment and planning – nearly a quarter of participating businesses did not have procedures in place to assess security risks and address identified risks
- physical and personnel access controls – more than half of participating businesses either had limited or moderate physical and personnel access controls in place (which can reduce the likelihood of unauthorised access of precursor chemicals)
- point of sale procedures – more than two thirds of participating businesses had limited or moderate order processing/customer validation procedures in place (which can reduce the likelihood of precursor chemicals being sold to persons for unauthorised use)
- transport and delivery procedures – a third of participating businesses indicated they had limited or informal physical access controls during transit (which can reduce the likelihood of precursor chemicals being stolen), and
- security awareness – nearly half of participating businesses indicated they did not provide any information to their staff about the vulnerabilities associated with precursor chemicals and potential security risks.

Appendix E provides further detail of the results of the risk assessment process.

PwC survey of industry

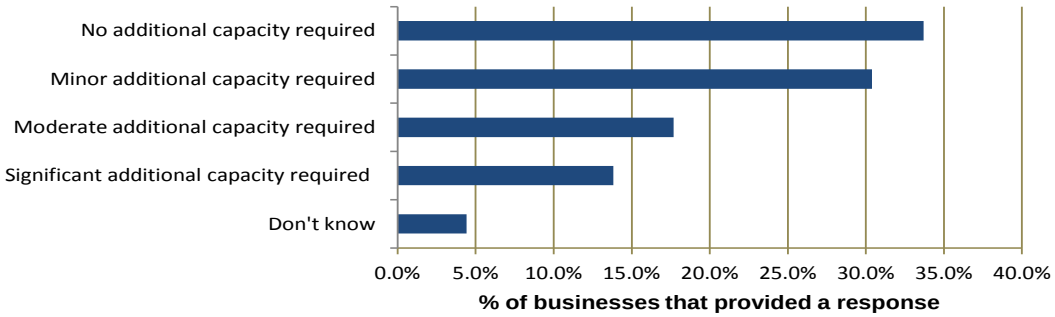
To help inform the development of the Consultation RIS, PwC ran a survey targeting businesses likely to be affected by the governments' treatment measures. As part of this survey, respondents were asked to rate the extent to which they required additional capacity to prevent and deter the theft and diversion of precursor chemicals for illegitimate use. Of the 181 businesses that provided a response to this question, 33.7 per cent indicated 'no additional capacity required', while 61.9 per cent indicated that minor, moderate or significant additional capacity is required (Figure 2). These results align with the risk assessments conducted by the CSRAU. These generally found that:

- a significant minority of businesses were already managing security risks effectively, and
- a majority were managing security risks either to some degree or not at all.

It is important to recognise the limitations of PwC's survey of industry. Principal of these include:

- self-assessment bias – respondents to surveys tend to overestimate their knowledge or performance, and
- self-selection – the sample underlying the survey was not selected randomly or purposively by PwC, but was formed as a result of relevant businesses agreeing to participate in the online survey. As a consequence, the survey sample may not be representative of the broader industry.

Figure 2: Business assessment about its capacity to prevent and deter the theft and diversion of precursor chemicals



3.4.2 *Identifying the theft and diversion of precursor chemicals in a timely manner*

As part of the risk assessment process, the CSRAU sought information from industry about how businesses currently manage security risks associated with the precursor chemicals. This information identified a number of limitations in the capacity of industry to identify the theft and diversion of precursor chemicals in a timely manner. Specific areas of concern include:

- inventory control – approximately 80 per cent of participating businesses indicated they had limited or moderate inventory control measures in place to enable the effective monitoring and accounting of precursor chemicals, and
- consignment control – approximately 40 per cent of participating businesses indicated they had moderate consignment control measures in place to enable effective monitoring and accounting of precursor chemicals during transit.

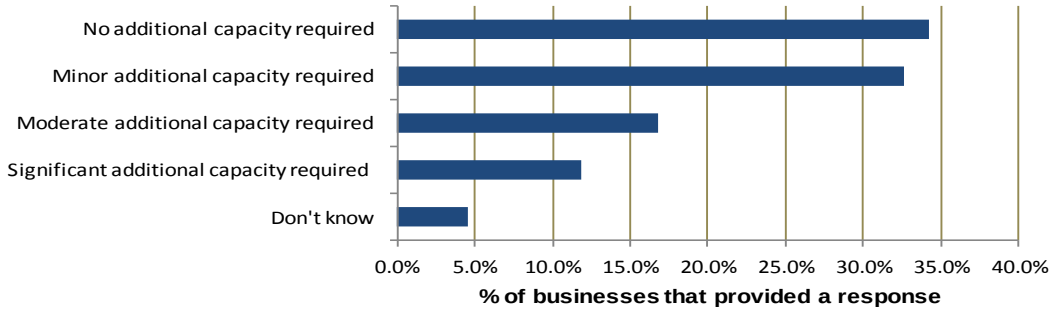
Appendix E provides further detail of the results of the risk assessment process.

PwC survey of industry

Respondents to the online survey were asked to rate the extent to which they required additional capacity to identify the theft and diversion of precursor chemicals in a timely manner. Of the 178 businesses that provided a response to this question, 34.3 per cent indicated 'no additional capacity required', while 61.2 per cent indicated that minor, moderate or significant additional capacity is required (Figure 3). These results align with the risk assessments conducted by the CSRAU. These generally found that:

- a significant minority of businesses were already managing security risks effectively, and
- a majority were managing security risks either to some degree or not at all.

Figure 3: Business assessment about its capacity to identify the theft and diversion of precursor chemicals



3.4.3 *Facilitating law enforcement through effective information provision*

Like general efforts aimed at combating crime, counter-terrorism is dependent on information provided by the public. As the *Counter-Terrorism White Paper* states:

> *Australia's national counter-terrorism effort also requires strong partnerships between relevant agencies and the public. Information from the public has been vital in assisting our agencies to conduct successful investigations into terrorist activities in the past. Knowledge and information about potential threats needs to flow between all sections of the community and our law enforcement and security agencies.*[47]

The importance of intelligence gleaned from the public is also well supported in the broader academic literature. As Kitson famously articulated in the early-1970s: 'If it is accepted that the problem of defeating the enemy consists very largely of finding him, it is easy to recognize the paramount importance of good information.'[48]

Our consultations with stakeholders have raised the prospect that industry's capacity to provide information to the relevant authorities – and thus facilitate effective law enforcement – is limited. Specific areas of concern include the ability of industry to:

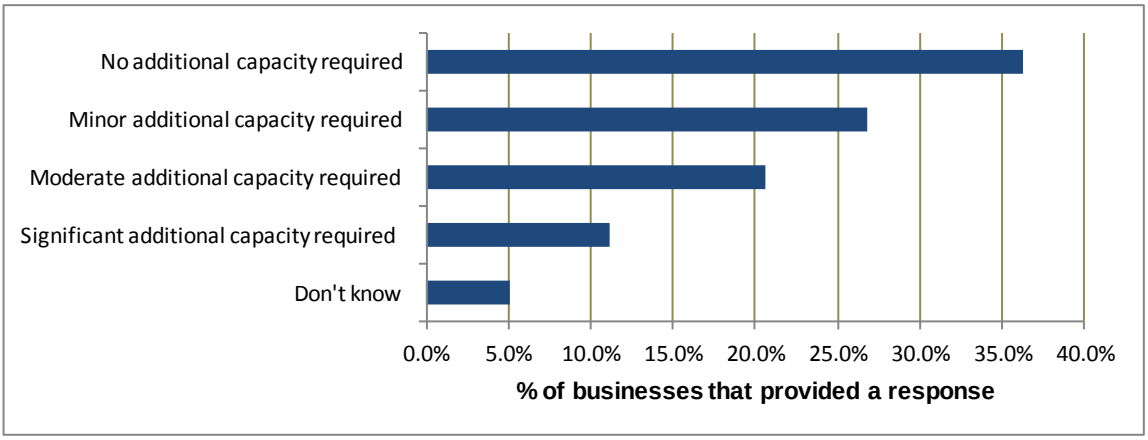
- identify potentially suspicious behaviour relating to precursor chemicals (beyond actual theft and diversion)
- report information relating to the potential misuse of precursor chemicals to the relevant authorities in a timely manner, and
- maintain meaningful records of purchases of precursor chemicals to facilitate potential future investigations.

47 Australian Government (2010), Counter-Terrorism White Paper: Securing Australia, protecting our community, Department of the Prime Minister and Cabinet, Canberra. See also: Australian Government (2008), National Counter-Terrorism Plan, Canberra.

48 Kitson, Frank (1973), Low Intensity Operations: Subversion, insurgency, peacekeeping, Faber, London.

Respondents to the online survey were asked to rate the extent to which they required additional capacity to facilitate law enforcement through effective information provision. Of the 179 businesses that provided a response to this question, 36.3 per cent indicated 'no additional capacity required', while 58.7 per cent indicated that minor, moderate or significant additional capacity is required (Figure 4).

Figure 4: Business assessment about its capacity to facilitate law enforcement through effective information provision



3.5 *Rationale for government intervention*

The analysis above highlights three vulnerabilities in how industry currently manages the security risks associated with the potential misuse of precursor chemicals. These relate to the capacity of industry to:

- deter and prevent the theft and diversion of precursor chemicals
- identify the theft and diversion of precursors in a timely manner, and
- facilitate law enforcement through effective information provision.

The key question for this Consultation RIS is whether there is a need for governments to intervene to address these vulnerabilities. Generally speaking, governments intervene to change behaviour in social or market transactions, believing that 'unregulated behaviour would lead to inferior outcomes'.[49] We are interested in stakeholder views about whether security risks are likely to be managed in the absence of government intervention?

1. ***In the context of the supply chain that uses/handles precursor chemicals, to what extent are security risks likely to be managed in line with societal expectations in the absence of government intervention?***

49 Victorian Competition and Efficiency Commission (2010), Improving the performance of regulators: Annual report 2009–10, September, Melbourne

On the one hand, businesses across the various supply chains experience a range of incentives to prevent the theft or diversion of precursor chemicals for use in terrorism activity, and to provide law enforcement with valuable and timely information. These incentives include:

- potential cost of reputational damage – the reputation of a business is likely to be damaged if it was linked to a terrorist attack that used homemade explosives (e.g. if it was discovered the terrorists in question obtained the necessary precursor chemicals by stealing/diverting them from the business). Such reputational damage may limit the business's future competitiveness (including its ability to expand operations) and/or encourage greater regulatory or law enforcement oversight of its actions
- potential cost of legal action – being linked to a terrorist attack that used homemade explosives may also expose businesses to punitive damages, as victims and relatives of victims may seek to pursue claims against the relevant businesses in the civil courts
- potential cost of lost stock – as noted above, the theft of stock (whether it be precursor chemicals or otherwise) represents a direct loss to the bottom line of businesses, and
- societal norms against terrorism– terrorism (and mass-casualty violence in general) is seen as morally wrong in Australia. The existence of these societal norms is likely to encourage members of the public to participate in counter-terrorism efforts where they know how to do so.

Feedback from stakeholders suggests, however, that these private incentives are unlikely to be strong for all businesses. Stakeholders noted in particular that, because large volumes of precursor chemicals are not required to formulate homemade explosives, individuals or groups may only seek to steal/divert relatively small quantities of precursor chemicals. Consequently, instances of theft/diversion may fall within a business's accepted tolerance for stock loss – especially if the business lacks awareness that the chemicals in question could be used to formulate homemade explosives.

Furthermore, market failures exist that suggest private incentives, by themselves, are insufficient to ensure businesses will manage the security risks associated with precursor chemicals in line with community and government expectations. More specifically, businesses lack sufficient information to make fully informed decisions about the security risks associated with precursor chemicals. Some businesses may be unaware that the 11 precursor chemicals can be used to formulate homemade explosives. This is particularly likely to be the case with certain nodes of the supply chain (e.g. retail and transport/logistics) where scientific qualifications or a comprehensive understanding of chemicals are not required to use/handle the precursor chemicals.

Respondents to the online survey were asked to indicate whether they were previously aware that the 11 precursor chemicals could be used to formulate homemade explosives. Eleven per cent of respondents indicated they were not previously aware, while a further 63 per cent indicated they were aware that some (but not all) of the chemicals were precursors (n=183). Some stakeholders that

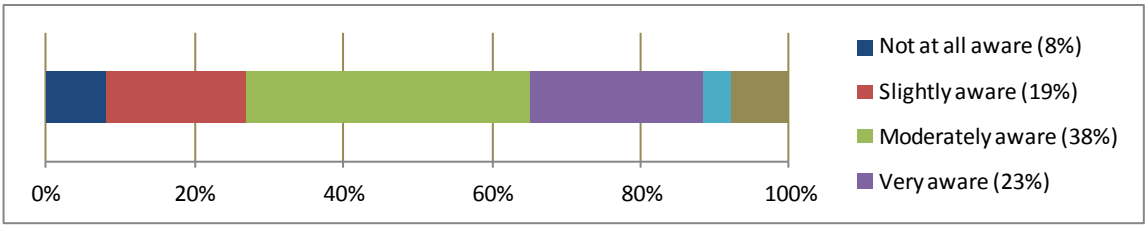
attended the focus groups also noted that, even though they had higher degrees in chemistry and were familiar with using chemicals, they were generally unaware that the precursor chemicals could be used to formulate homemade explosives.

Some businesses may also be unaware of the extent to which individuals or groups are interested in accessing precursor chemicals, or the various ways in which such individuals or groups may attempt to access the chemicals (e.g. through a 'trusted insider' or the establishment of a 'false flag' company). This unawareness may arise because:

- most businesses lack the technical knowledge and expertise (relating to the operational/tactical capabilities and methods of terrorists) to interpret available information
- the cost of obtaining additional information may be prohibitive for some businesses (particularly small-to-medium enterprises)

Respondents to the online survey were asked to indicate how aware they thought other businesses in their industry were of the security risks associated with the precursor chemicals. Eight per cent of respondents indicated 'not at all aware', 19 per cent indicated 'slightly aware' and 38 per cent indicated 'moderately aware' (Figure 5).

Figure 5: Business assessment of their industry's awareness of the security risks associated with precursor chemicals (n=183)



4 Objectives

A Consultation RIS should clearly establish the objective of government action. This objective should relate to the statement of the problem (as provided in the previous chapter) and not prejudge a particular course of action.

The purpose of the statement of objective in a Consultation RIS is to provide a clear and succinct goal (or set of goals) for the policy options to address. The Consultation RIS will assess the effectiveness of the options against this objective, or set of objectives.

We have identified three objectives of government action: an ultimate objective and two intermediate objectives (the latter of which contributes to the former). The ultimate objective is to minimise, as low as reasonably practicable, the incidence and associated impacts of terrorist attacks using homemade explosives and other similar uses of homemade explosives that threaten the health and safety of the Australian public.

The intermediate objectives are:

1 to minimise legitimate and illegitimate access to 11 chemicals that are precursors to homemade explosives by individuals and groups seeking to formulate homemade explosives for criminal purposes

2 to increase the provision of useable intelligence relating to the legitimate and illegitimate access of the 11 precursor chemicals for criminal use to Australian law enforcement and security agencies.

Theses intermediate objectives are aligned with the stated objective of the Intergovernmental Agreement (IGA) on Australia's National Arrangements for the Management of Security Risks Associated with Chemicals – specifically, to establish an effective, coordinated and collaborative national approach to the management of chemical security that seeks to prevent the use of chemicals for terrorist purposes.

5 Statement of options

This Consultation RIS must identify a range of viable options to achieve (in whole or in part) the objectives set out in the previous chapter. Given the risk assessment work suggested specific risk treatment measures, the options here reflect different ways of encouraging or compelling the uptake of the measures.

The following sections detail the proposed risk treatment measures that governments have developed to address identified vulnerabilities in the supply chains for the 11 precursor chemicals, as well as the range of options that could be used to encourage the take-up of the proposed measures.

5.1 Proposed risk treatment measures

The CSCU, in consultation with industry and government representatives, has drafted a range of treatment measures to address the vulnerabilities identified through the risk assessment process. Table 6 summarises the objective of each of the measures and the nodes of the supply chain to which they apply. Appendix F provides greater detail about each of the measures.

It is important to note that application of three of the measures (i.e. 'Theft and Diversion Procedures', 'Physical Access Controls' and 'Personnel Access Controls') would be determined following a risk assessment process undertaken by the business.

Table 6: Summary of proposed risk treatment measures

Measure	Objective	Applicable supply chain nodes
Employee and contracting checking	Limit terrorist access to chemicals of security concern by acquisition through a trusted insider.	Introducer, Processor, Transport/Logistics, Wholesaler, Retailer, End User (Business)
Personnel security awareness	Reinforce the efficacy of other proposed measures by ensuring that personnel are appropriately aware of the security risk profile of the business or organisation in relation to chemicals of security concern.	Introducer, Processor, Transport/Logistics, Wholesaler, Retailer, End User (Business)
Inventory control measures	Businesses or organisations will be able to determine whether chemicals of security concern have been stolen, misplaced or otherwise diverted.	Introducer, Processor, Wholesaler, Retailer, End User (Business)
Receipt of chemical	Businesses and organisations can detect if chemicals of security concern have been stolen or otherwise diverted prior to receiving the product, and, if so, that relevant information is reported to a relevant authority as soon as possible.	Introducer, Processor, Transport/Logistics, Wholesaler, Retailer, End User (Business)
Theft and diversion procedures	Businesses and organisations consider the individual risk of chemicals of security concern being stolen or otherwise diverted and plan steps to reduce the likelihood of these events occurring.	Introducer, Processor, Transport/Logistics, Wholesaler, Retailer, End User (Business)

Measure	Objective	Applicable supply chain nodes
Physical access	Businesses and organisations will restrict physical access to chemicals of security concern commensurate with the risk profile of the business or organisation in order to reduce the likelihood of these chemicals being stolen or otherwise diverted.	Introducer, Processor, Transport/Logistics, Wholesaler, Retailer, End User (Business)
Personnel access	Businesses and organisations will limit access to chemicals of security concern only to persons who have a legitimate need to access the chemicals in order to reduce the likelihood these chemicals being stolen or otherwise diverted.	Introducer, Processor, Wholesaler, Retailer, End User (Business)
Point of sale procedures	Businesses will adopt responsible practices designed to limit the capacity of terrorists or their associates to acquire chemicals of security concern through direct purchase from the business.	Introducer, Processor, Wholesaler, Retailer
Sale and distribution procedures	Businesses will ensure that delivery of orders will be made to persons who have legitimately purchased the chemical in order to reduce the likelihood of the chemical being diverted to terrorists or their associates.	Introducer, Processor, Wholesaler, Retailer
Transporting chemicals of security concern procedures	Businesses and organisations will institute effective physical security and inventory control processes to reduce the likelihood of chemicals of security concern being accidentally or deliberately delivered to or stolen by terrorists or their associates during transport.	Introducer, Processor, Transport/Logistics, Wholesaler, Retailer, End User (Business)

5.2 *Options*

There are four broad approaches that governments could use to encourage industry to adopt the risk treatment measures:

- a targeted awareness campaign
- industry codes
- a government code of practice, and
- regulation.

Each option is documented in turn below, along with the status quo.

5.2.1 *The status quo*

The 'status quo' provides a base case against which options under assessment can be compared. The status quo option represents what would occur in the absence of any specific action by governments to address the problems identified in Chapter 3.

Readers should note that the National Terrorism Public Alert Level is currently at 'medium', which means that authorities believe an attack could occur. When considering the status quo in relation to the four proposed options, it is important to remember that this Consultation RIS does not quantify the likelihood of a terrorist attack under the current environment. Therefore, additional government action (over and above the status quo) to minimise the security risks associated

with chemicals of security concern may not lead to a change in the National Terrorism Public Alert Level.

However, this Consultation RIS does assume that Options 1-4 will – to varying degrees – contribute to the objective of minimising, as low as reasonably practicable, the incidence and associated impacts of terrorist attacks using homemade explosives and other similar uses of homemade explosives that threaten the health and safety of the Australian public.

For this Consultation RIS, the status quo is the continuation of the current arrangements to manage the *security risks* of the precursor chemicals. The current arrangements include:

- a continuation of current controls (both regulatory and self-regulatory) that provide either a direct or incidental security benefit (such as FIFA's 'Australian Fertiliser Industry Security Code of Practice', PACIA's 'Code of Practice for Supply Diversion into Illicit Drug Manufacture' and PACIA's 'Site and Supply Chain Security Guidance')
- a continuation of other measures to improve how businesses manage the security risks associated with the precursor chemicals (e.g. AGD's Chemicals of Security Concern awareness campaign), and
- ongoing efforts by Australian law enforcement and intelligence agencies to detect, disrupt and prevent individuals and groups from accessing precursor chemicals and using homemade explosives for criminal purposes.

5.2.2 *Option 1 – A targeted awareness campaign*

Governments could encourage take-up of the proposed treatment measures by building on Phase One and Phase Two of the Chemicals of Security Concern awareness campaign and launching Phase Three. The purpose of this additional phase would be to inform and educate relevant businesses about 'best practice' approaches to managing the security risks associated with the precursor chemicals. The proposed treatment measures would form the basis of governments' message about what constitutes 'best practice' in managing security risks.

Such a targeted awareness campaign could involve:

- a press release from relevant Ministers to announce the measures, as appropriate
- production of promotional material and/or support tools
- advertising in industry publications and negotiating editorial pieces which could include targeted advertisements for businesses that are likely to be more at risk, and
- utilising the Chemical Security website <Australia.gov.au/chemicalsecurity> to provide detailed information and resources.

Given its current role in administering Phase One and Phase Two of the Chemicals of Security Concern awareness campaign, it is assumed that AGD would be responsible for administering Phase Three.

5.2.3 *Option 2 – Industry codes (self-regulation)*

Industry associations covering businesses that use or handle the precursor chemicals could encourage take-up of the proposed treatment measures by developing new (or expanding existing) security risk management codes of practice. These codes of practice would inform businesses about what constitutes 'best practice' in managing the security risks associated with the precursor chemicals. The proposed treatment measures would form the basis of the industry codes, though industry associations would only include those measures that are relevant to their members.

Based on stakeholder feedback and our own research and analysis (see Appendix G), this option would involve seven industry associations developing an equal number of security risk management codes of practice. These industry associations would develop codes of practice that would be representatives of 'groupings' within the chemical industry. Key groupings would include:

- the importation, manufacture, processing supply and commercial use of industrial chemicals
- the importation, manufacture, processing and supply of fertilisers
- the land transportation of chemicals
- the agricultural use of chemicals (including fertilisers)
- the academic/analytical use of chemicals
- the importation, manufacture and commercial use of pool and spa chemicals, and
- the retail sale of chemicals.

Industry associations would be free to promulgate the code of practice that is most relevant to their membership. There would be no universal mechanism of enforcement. Rather, industry associations would utilise their existing approaches or framework. For example, some industry associations rely on the voluntary uptake of their codes, while others have robust accreditation systems in place to monitor and enforce compliance.

5.2.4 *Option 3 – A government code of practice (quasi-regulation)*

This option is similar to the self-regulatory option outlined above. A security risk management code of practice would be developed to inform businesses about what constitutes 'best practice' in managing the security risks associated with the precursor chemicals. The key difference between Options 2 and 3 is that, under Option 3, governments would be responsible for developing the code of practice.

Though, like Option 2, the government-developed code would be voluntary and non-binding.

The treatment measures would form the basis of the government code of practice, which could include schedules or appendices that provide specific advice to different industries and/or nodes in the supply chain.

Given the role it currently plays in the Chemical Security Management Framework, it is reasonable to expect that AGD would be the lead agency for the code of practice. It would draw on the assistance of NGAG and NIRG to develop the code of practice and to help raise awareness about the existence and purpose of the code of practice amongst industry.

5.2.5 *Option 4 – Regulation*

The regulatory option considered in this Consultation RIS is for the Australian Government (in collaboration with the States and Territories) to develop a model amendment for each jurisdictions' criminal code. This amendment would create a new criminal offence relating to the negligent possession or supply of precursor chemicals. In addition to the model amendment, the Australian Government would publish the proposed treatment measures as a code of practice (similar to Option 3). The intention is to enable police to charge an individual or business for failing to comply with the code of practice.

Businesses charged with negligent possession or supply could point to their compliance with the government code of practice as a reasonable defence in any court proceedings. All jurisdictions (including the Australian Government) would draw on the model amendment in amending their criminal codes. This option would also include a variation to the *Intergovernmental Agreement on Australia's National Arrangements for the Management of Security Risks associated with Chemicals* (in line with Clause 9 of that agreement) to establish the agreed governance arrangements, scope and outcomes of the model amendment. Appendix G provides further detail about the research and analysis that underpins this regulatory option.

5.2.6 *Questions about the options*

2. ***How appropriate are the groupings that comprise Option 2? Are there alternative ways in which Option 2 could be structured to better capture and represent the constituent sectors of the broader chemical industry?***
3. ***Are there any existing regulations or codes of practice (administered either by government or by industry) that could be easily adapted to deliver the risk treatment measures set out in Table 6?***

6 *Impact analysis*

The purpose of this chapter is twofold. First, it aims to provide stakeholders with an indication of the likely impacts that would arise from implementing each of the options outlined in Chapter 5, as well as the relative cost effectiveness of each option in addressing the identified problem. This chapter seeks to achieve this goal by identifying (and quantifying, where possible) the costs and benefits of each option, and comparing these costs and benefits against the status quo.

Second, this chapter aims to prompt feedback from stakeholders about the assumptions and calculations used to estimate costs and benefits – particularly relating to the effectiveness of the treatment measures and the likelihood that the options under consideration will have an impact on the risk posed by individuals and groups using homemade explosives for criminal purposes.

This chapter will first outline the assumptions for the status quo, before discussing the extent to which the option being assessed will result in a net benefit or net cost compared with the status quo.

6.1 *The status quo*

The 'status quo' provides a base case against which options under assessment can be compared. The status quo option represents what would occur in the absence of any specific action by governments to address the problems identified in Chapter 3.

For this Consultation RIS, the status quo is the continuation of the current arrangements to manage the security risks of the precursor chemicals. The current arrangements include:

- a continuation of current controls (both regulatory and self-regulatory) that provide either a direct or incidental security benefit (such as FIFA's 'Australian Fertiliser Industry Security Code of Practice', PACIA's 'Code of Practice for Supply Diversion into Illicit Drug Manufacture' and PACIA's 'Site and Supply Chain Security Guidance')
- a continuation of other measures to improve how businesses manage the security risks associated with the precursor chemicals (e.g. AGD's Chemicals of Security Concern awareness campaign), and
- ongoing efforts by Australian law enforcement and intelligence agencies to detect, disrupt and prevent individuals and groups from accessing precursor chemicals and using homemade explosives for criminal purposes.

By its very nature, maintaining the status quo would not result in any additional implementation costs for industry. However, it would leave unaddressed the identified vulnerabilities in the capacity of industry to contribute to the management of security risks associated with the legitimate and illegal access of precursor chemicals. As a consequence, the current risk posed by individuals and groups using homemade explosives for terrorist and criminal purposes – as well as

associated costs and benefits to industry, governments and society – would remain unchanged.

An important issue for this Consultation RIS is determining to what extent the four options under consideration represent an improvement in how the security risks of precursor chemicals are managed relative to the status quo. To this end, stakeholder feedback is sought on the following questions.

4. ***To what extent will the four options reduce the risk of homemade explosive use for criminal purposes relative to the status quo?***
5. ***If the options are likely to have more than a marginal impact on the risk of homemade explosive use, will the benefits associated with this risk reduction outweigh the costs to governments and industry?***

6.2 *The proposed treatment measures*

The goal of each of the options is to encourage (or compel) relevant businesses to adopt the proposed treatment measures (see Appendix F). This Consultation RIS assumes that, for individual businesses, the *types* of costs and benefits of adopting the proposed treatment measures will be the same across the options. For example, if Option 2 was implemented, a business that adopted the measures under this option would incur the same type of costs as it would if, for example, Option 3 was the implemented option. This is because the risk treatment measures are assumed to be the same across each option.

This Consultation RIS does assume, however, that the *total* costs and benefits of adopting each option will vary from option-to-option, driven by different expectations about the number of businesses that have not already adopted the proposed treatment measures, but are likely to do so upon implementation. As is discussed in more detail in Section 6.3.1, we have assumed that uptake of the measures increases from Option 1 to Option 2 to Option 3 to Option 4.

Given these assumptions, this section first summarises the generic costs and benefits of adopting the proposed treatment measures and which underpin each of the options. Section 6.3 then details the total costs and benefits associated with each of the options.

6.2.1 *Treatment measure costs*

Businesses are likely to incur a range of additional costs as a result of adopting the proposed treatment measures. These costs include:

- procedural – for instance, under 'Employee and Contractor Checking' some businesses would devote additional staff resources to verifying the identity and trustworthiness of new employees, and re-verifying the identity of relevant existing employees. Likewise, 'Theft and Diversion Procedures' would see some businesses devote additional staff resources to undertaking a risk assessment and developing a concordant theft and diversion plan
- purchasing– some of the measures will encourage businesses to purchase additional goods and services. 'Consignment Control', for example, could lead

some businesses to install global positioning system (GPS) units in their vehicles and modify their vehicles so they are capable of storing chemicals under lock and key. Similarly, 'Personnel Access Controls' could mean that some businesses – depending on the outcome of the risk assessment undertaken as part of 'Theft and Diversion Procedures' –install a range of physical access controls, including security lighting, an electronic access system and closed-circuit television (CCTV)

- record-keeping – some of the measures will encourage businesses to maintain records of staff and transactions. 'Point of Sale', for example, encourages/requires businesses to keep a record of a customer's identification if they purchase a precursor chemical. 'Employee and Contractor Checking', meanwhile, asks businesses to maintain contact details of all employees working with, or could work with, precursor chemicals
- education – businesses will have to devote effort to understanding the proposed treatment measures. In addition, 'Security Awareness' requires businesses to provide information to their staff to ensure they are appropriately aware of the security risk profile of the business in relation to precursor chemicals, and
- other – costs could include:
  - increased product development and associated costs – stakeholders noted that introducers and processors could seek to avoid the requirements of the proposed treatment measures by reformulating existing products – with the intention of either removing precursor chemicals or reducing the concentration of precursor chemicals under the threshold concentrations stipulated in Appendix F. Reformulation would impose a range of costs on businesses, including product development and testing, and, in the case of hydrogen peroxide products (including spa and pool chemicals), possibly the need to seek regulatory approval for new products. Reformulation could also increase transportation costs, as businesses may have to purchase greater volumes of products if the concentration of precursor chemicals has been reduced
  - business disruption – stakeholders noted that reconciliations are a major undertaking, requiring significant planning, the diversion of personnel from other tasks, and a temporary suspension of normal business operations. The stipulation for monthly reconciliations could hinder the ability of some businesses to supply customers with precursor chemicals within acceptable timeframes
  - increased health and safety risks – as a whole, the proposed treatment measures are likely to require staff at affected businesses to handle the precursor chemicals more frequently. This increases the risk of accidental or negligent misuse leading to physical harm, and
  - staff discomfort – 'Point of Sale' requires staff to adopt a relatively accusatory posture with customers who are attempting to purchase precursor chemicals. These requirements could increase staff discomfort (particularly with younger staff in transactions with older customers).

Appendix H provides greater detail of the costs (quantifiable and non-quantifiable) associated with each of the proposed treatment measures. It is important to note that:

- industry stakeholders during the focus groups did not provide estimates of the costs likely to be associated with 'Receipt of Chemical' and 'Sales and Distribution'. This was primarily because stakeholders saw the checking of orders (both at receipt and distribution) as standard business practice (driven by commercial incentives to ensure orders are aligned with payment) and thus unlikely to impose additional costs
- this Consultation RIS has not quantified the costs associated with 'Physical Access Controls' and 'Personnel Access Controls'. While both measures have the potential to impose a range of additional costs on industry, the extent of these costs will ultimately be determined by each business's risk assessment and theft and diversion plan. As a consequence, the costs associated with 'Physical Access Controls' and 'Personnel Access Controls' cannot be reliably quantified. Appendix H does, however, outline some costs estimates relating to these measures, and
- this Consultation RIS is not able to quantify the full range of costs associated with 'Point of Sale' and 'Consignment Control'. With reference to 'Point of Sale', the costs of this measure will primarily be driven by the number of transactions involving the precursor chemicals. This Consultation RIS has not been able to access reliable transaction data for the precursor chemicals. With reference to 'Consignment Control', we have not been able to quantify the cost of transporting precursor chemicals under 'lock and key', due to a lack of data about the number of precursor chemical consignments.

Table 7 details our estimates of the quantifiable costs of the treatment measures for the average business that uses/handles the precursor chemicals, by relevant node in the supply chain. The cost assumptions that underpin these estimates were obtained primarily during the industry focus groups. Where possible, we relied on node-specific assumptions to calculate our estimates (e.g. we used estimates provided by processors to calculate processor costs). Where this was not possible, we relied on assumptions from other nodes (e.g. for 'Theft and Diversion Procedures', we based our estimates for processors on introducer data). Appendix H provides greater detail of how this Consultation RIS has estimated the costs of the treatment measures.

At first glance, some of the estimates outlined in Table 7 appear inconsistent – in particular, processor costs for 'Inventory Control' and wholesaler costs for 'Theft and Diversion Procedures'. Both these estimates are based on data provided by relevant nodal stakeholders during the focus groups. Stakeholder feedback is sought about the reasonableness of all the estimates provided in Table 7.

Table 7: The costs of adopting the treatment measures for the average business that uses/handles the precursor chemicals, by supply chain node (NPV over 10 years)

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Employee and Contractor Checking	$3,377	$2,312	$2,359	$1,712	$1,853	$3,097
Security Awareness	$17,062	$17,201	$13,904	$3,077	$3,645	$1,546
Inventory Control	$38,942	$656,751	$23,837	$18,204	$117,040	n/a
Receipt of Chemical	$0	$0	$0	$0	$0	$0
Theft and Diversion Procedures	$56,000	$56,737	$173,188	$1,147	$1,353	$920
Physical Access Controls	-	-	-	-	-	-
Personnel Access Controls	-	-	-	-	-	-
Point of Sale	$30,068	$0	$0	$0	n/a	n/a
Sales and Distribution	$0	$0	$0	$0	n/a	n/a
Consignment Control	$0	$0	$0	$0	$0	$4,823,664

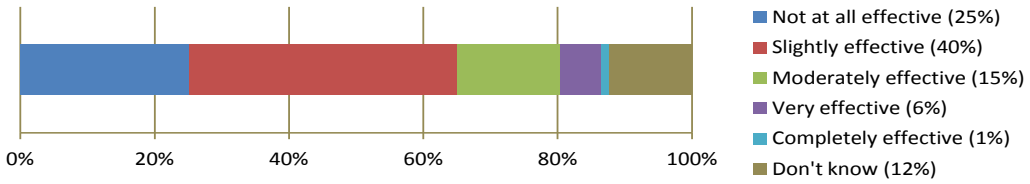
6. ***Do stakeholders have any additional comments about the likely costs and benefits associated with the proposed measures?***
7. ***Are the cost assumptions outlined in this Consultation RIS consistent with industry experience? (see Appendix H for all cost assumptions). Are these better estimates of costs available?***

6.2.2 *Treatment measure benefits*

'Theft and Diversion Procedures' and 'Security Awareness' are likely to improve the capacity of some businesses to deter, prevent and detect the theft and diversion of precursor chemicals. The latter will help ensure staff are aware about what security risks exist, what they should look out for, and what should they do if they identify suspicious activity. Stakeholders noted, however, that 'Security Awareness' could be counterproductive if inadequate support is provided by governments to help businesses in developing messages and communication strategies to engage with their staff.

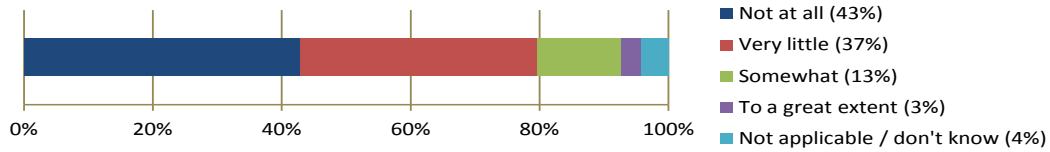
Nonetheless, while 'Theft and Diversion Procedures' and 'Security Awareness' are likely to have some effect on business capacity to deter, prevent and detect theft and diversion, industry stakeholders did not believe the treatment measures as a whole would be overly effective in reducing the theft and diversion of precursor chemicals from their business. Twenty-five per cent of respondents to the online survey indicated that they believed the proposed treatments would be 'not at all effective' in reducing theft and diversion, while a further 40 per cent indicated that the measures would be only slightly effective (Figure 6).

Figure 6: Business perceptions on the extent to which the proposed treatment measures are expected to reduce the theft and diversion of precursor chemicals (n=163)



Respondents to the online survey were also asked to what extent would the proposed treatment measures lead to reduced stock loss. A plurality (43 per cent) indicated 'not at all', while a further 37 per cent indicated 'very little' (Figure 7).

Figure 7: Business perceptions on the extent to which the proposed treatment measures are expected to lead to reduced stock loss (n=163)



Other stakeholders noted that such measures as 'Security Awareness' and 'Theft and Diversion Procedures' are likely to help build a security culture amongst Australian businesses – in the sense that businesses would begin taking national security issues into consideration as part of their day-to-day operational practices (in relation to precursor chemicals and other products of security concern).

'Point of Sale' could improve the quality of information provided by industry to law enforcement and intelligence agencies; facilitating government efforts to combat the use of homemade explosives for criminal purposes. Government stakeholders noted that, ideally, businesses would not only report suspicious activity, but also be able to provide the relevant authorities with information to allow them to track and identify the alleged source of the suspicious activity. By encouraging/requiring the recording of a purchaser's identification and greater use of cashless transactions, 'Point of Sale' procedures will increase the likelihood that businesses can provide law enforcement and intelligence agencies with traceable information.

Stakeholders questioned whether 'Inventory Control' would produce tangible benefits – they generally did not believe that the measure would improve the capacity of businesses to detect the theft and diversion of precursor chemicals. Key areas of concern include:

- there are a number of reasons why volumes of chemicals and chemical products can vary over a reconciliation period – such as differences in temperature and poor record keeping – that are not related to criminal activity. As a result, businesses would generally find it difficult to determine whether a discrepancy in

stock records was suspicious in the absence of a physical break-in or identified suspicious behaviour

- one stakeholder noted in particular that, with precursor chemicals that are used and handled in large quantities (such as potassium nitrate, hydrogen peroxide and nitric acid)

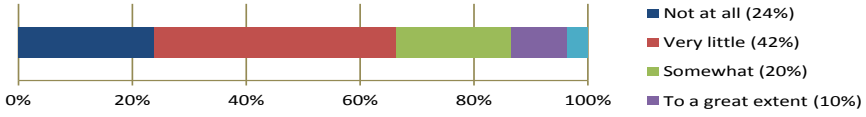
> *The concept of "accurate" monthly stocktakes is frankly a dream. You can get people to give you numbers, but even if this were somehow implemented, the likelihood that this data would be accurate enough for security purposes is inconceivable. Again, you don't need much material – and a few tens of kilos (or even 100's kg) going missing is in the noise.*[50]

This perspective was echoed by a number of other stakeholders, and

- ASIO noted that it 'has doubts over whether "inventory control" would be a practical way to achieve the objectives of reducing legitimate and illegitimate access to precursor chemicals. A preferred alternative would be to implement measures which educate businesses on how to better identify and report suspicious transactions in a timely, effective manner. This would be both cheaper for businesses and more meaningful to the efforts of intelligence and law enforcement agencies.'[51]

During the focus groups, some industry stakeholders maintained that the proposed treatment measures could encourage businesses to improve their general inventory management practices though they saw this as being only a slight benefit. This perspective was shared by respondents to the online survey; 42 per cent of whom indicated that the treatment measures would lead to enhanced inventory management by only a 'very little' extent. A further 24 per cent indicated the treatment measures would not lead to enhanced inventory management (Figure 8).

Figure 8: Business perceptions on the extent to which the proposed treatment measures are expected to lead to enhanced inventory management (n=163)

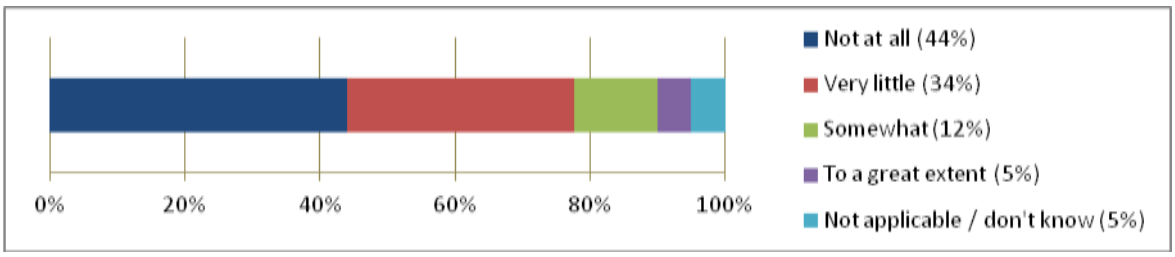


Stakeholders also questioned whether 'Employee and Contractor Checking' would produce tangible benefits. They noted that terrorists generally prefer to use people with no prior history of criminal or unusual behaviour during operations. Businesses would unlikely be able to detect such 'cleanskins' using the methods outlined under 'Employee and Contractor Checking' (which focus on checking photo identification, scrutinising CVs and contacting referees).

50 Private correspondence submitted to PwC.
51 Feedback from ASIO.

Respondents to the online survey were asked to what extent would the requirement for greater employee screening lead to enhanced staff quality. A plurality (44 per cent) of respondents indicated 'not at all', while a further 34 per cent indicated 'very little' (Figure 9).

Figure 9: Business perceptions on the extent to which the proposed treatment measures are expected to lead to enhanced staff quality (n=161)



Stakeholders also questioned whether 'Consignment Control' would generate security benefits commensurate with the costs it would impose on business. While the measure may make it harder for individuals or groups to steal precursor chemicals during transit, it would not eliminate the risk – and potentially could shift the risk of theft away from "individual goods" to entire vehicles. Stakeholders also maintained that the measures would unlikely increase the capacity of transport/logistics companies to detect the theft/diversion of precursor chemicals, given current use of tamper seals.

Some stakeholders questioned whether it would be necessary to apply the treatment measures to all users of chemicals. For instance, it was noted that some users already had to meet stringent character and competency requirements (e.g. persons who are permitted to handle explosives). There may be thus little benefit in requiring these users to adopt the proposed treatment measures. Other stakeholders noted that, while universities generally use all of the 11 precursor chemicals, they tend to only use small volumes. As a consequence, 'the overarching risk is fairly low and likelihood of someone identifying theft/miss-use is already high.'[52]

One of the key objectives of the proposed treatment measures is to reduce the risk of individuals and groups using homemade explosives for terrorist or similar criminal purposes. A number of stakeholders questioned whether the measures would be effective in achieving this objective. They noted that:

- precursor chemicals have a myriad of legitimate uses in Australia – ranging from industrial to consumer applications. This wide use provides individuals and groups with a large number of potential access points, and makes it more difficult for regulators and law enforcement agencies to exert control over who accesses precursor chemicals

[52] Private correspondence submitted to PwC.

- not only are precursor chemicals widely used and available in Australia, but individuals and groups only need access to relatively small volumes of precursor chemicals (between five and 50 kilograms) to formulate homemade explosives capable of causing significant harm.[53] This means that, in the absence of severely curtailing the use of precursor chemicals in Australia, security controls are likely to remain relatively porous. As one stakeholder noted, '[w]hen such large quantities are being stored, handled, moved around, and spilt (written off) no one notices a few tens of kilos going missing'[54], and
- intelligence suggests that terrorist networks are becoming increasingly sophisticated in their planning and operations. As a result, some stakeholders felt that most terrorists would be able to circumvent the treatment measures and still be able to access precursor chemicals without triggering the attention of law enforcement and intelligence agencies.

Other stakeholders maintained, however, that the proposed treatment measures, by enhancing the capacity of businesses to deter, prevent and detect theft and diversion, and increasing the quality of information businesses could provide law enforcement and intelligence agencies, would add an extra barrier that individuals and groups would need to overcome to access precursor chemicals. This extra barrier would, in turn, increase the effort individuals and groups must expend to access precursor chemicals, as well as the chances that they would be detected as they attempted to do so.

In comments provided to AGD and PwC about the proposed treatment measures, ASIO noted that:

- 'any improvements in the timeliness and quality of information reported to the [National Security Hotline], either by industry or the general public, would be a good outcome of AGD's chemical security work program'
- '[b]roadly speaking, any risk treatment measure that makes it more difficult for terrorists or criminals to legitimately, or otherwise, obtain precursor chemicals for malicious purposes is a positive outcome'
- 'ASIO's view is that if AGD can successfully create a 'culture of security awareness' across chemical supply chains it will become inherently more difficult for terrorists and criminals to access precursor chemicals to carry out their malicious intent'
- 'ASIO and [the Australian Federal Police] share the view that risk treatment measures which have a strong deterrent effect are effective in changing terrorist behaviour such that it reduces the risk to the community. For example, more stringent point-of-sale procedures where retailers request identification details from the purchaser and create an auditable trail of transaction records will have a

53 This observation underpins recent European Commission efforts to regulate precursor chemicals. See: European Commission (2010), 'Regulation of the European Parliament and the Council on the marketing and use of explosive precursors', Brussels, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0473:FIN:EN:PDF. Accessed on: 29 September 2011.

54 Private correspondence submitted to PwC.

deterrent effect and thereby reduce the risk of acquisition of precursor chemicals for malicious purposes', and

- 'any risk treatment measure which requires the production of photo identification to purchase precursor chemicals is likely to have a deterrent effect at little or no cost to business. It may also improve the quality of information that could be made available to authorities relating to any incidents.'[55]

On balance, the available evidence suggests that the proposed treatment measures are likely to reduce the risk of individuals and groups using homemade explosives for criminal purposes – though the extent of this reduction is unlikely to be large. Stakeholder feedback is sought about the likely effectiveness of the proposed treatment measures.

8. ***To what extent are the treatment measures likely to be effective in helping businesses manage the security risks associated with the precursor chemicals (including reducing the risk of individuals or groups using homemade explosives for criminal purposes)?***
9. ***To what extent are the treatment measures likely to help businesses prevent, detect and deter the licit purchase of precursor chemicals by people with long term criminal intent?***
10. ***Should any classes of activities, persons or chemicals (e.g. below a certain concentration) be exempted from the proposed measures? Why?***
11. ***Are there any practical measures (alternative to the proposed treatment measures) to address identified risks that this Consultation RIS has not considered?***

6.3 *Costs and benefits of the options*

This section details the total costs and benefits associated with each of the options. It is important to note that Options 1, 2 and 3 are essentially voluntary options. Under these options, businesses would be encouraged, *not* compelled, to adopt the proposed treatment measures.

From an economic perspective, a business will only incur costs voluntarily if it believes these costs are likely to be offset by associated benefits (to either the business or the broader community). Estimating voluntarily incurred costs is thus not a straightforward exercise, as business perceptions of the balance between the costs and benefits of a yet-to-be-undertaken activity are often unclear and can be difficult to reliably ascertain.

This notwithstanding, this Consultation RIS does include estimates of costs voluntarily incurred by businesses under Options 1, 2 and 3. These estimates are provided primarily to allow for meaningful comparison between the voluntary options and Option 4. To estimate voluntarily incurred costs, this Consultation RIS draws heavily on stakeholder feedback – particularly the online survey, which prompted respondents to approximate industry adoption of the proposed treatment measures under each of the options.

[55] Feedback from ASIO.

6.3.1 *Option 1 – Targeted awareness campaign*

Costs

Option 1 will impose two broad costs on the Australian community: adoption costs and administrative costs. Adoption costs are the costs borne by industry from adopting the treatment measures. The quantum of uptake costs associated with Option 1 is a function of two factors:

- the additional costs to businesses of the treatment measures relative to the status quo, and
- the number of businesses that do not already adopt the proposed treatment measures, but are likely to adopt them as a result of the targeted awareness campaign (the expected level of adoption).

The additional costs to business under Option 1 are those described in Section 6.2.1 and Appendix H. The expected level of adoption under Option 1 is likely to be low (reflecting the voluntary nature of the targeted awareness campaign) but not insignificant. During the industry focus groups, stakeholders repeatedly noted that businesses wanted to do the 'right thing' in terms of managing chemical security risks, but lacked adequate information about how to do so. Furthermore, as noted earlier, businesses face a range of private incentives to manage chemical security risks – including the potential cost of reputational damage, the potential cost of legal action and societal norms against terrorism. It is therefore reasonable to expect that a targeted awareness campaign could encourage some businesses to alter their behaviour and adopt some of the proposed treatment measures.

Conversely, feedback from stakeholders suggests that some measures – 'Consignment Control' and 'Inventory Control' in particular – are likely to impose significant additional costs on industry. Given the scale of these costs, as well as the vehemence that characterised industry comments about these measures in earlier focus group meetings, it is assumed in this analysis that no businesses will adopt 'Consignment Control' and 'Inventory Control' under Option 1. Additional feedback suggests that wholesalers, retailers and end-users may be less likely to adopt the proposed treatment measures under a voluntary approach – given that businesses across these nodes are more likely to be small-to-medium enterprises and thus face a range of capacity constraints.

Table 8 details our estimates of the number of businesses that use/handle at least one of the precursor chemicals, do not currently adopt the proposed treatment measures, and are likely to adopt the measures as a result of a targeted awareness campaign.

The estimates in Table 8 were calculated by first identifying all businesses across the relevant supply chains that use or handle the 11 precursor chemicals. This work was predominantly informed by the risk assessments undertaken by AGD, and supplemented by Australian Bureau of Statistics (ABS), IBISWorld statistics and our own analysis. One possible gap in our analysis relates to very small/backyard businesses that use/handle the precursor chemicals. Stakeholders noted that there are a large number of these businesses. However, it is unclear what proportion of

these businesses have been captured by ABS and IBISWorld statistics – and, in turn, this Consultation RIS. Stakeholder feedback is sought about this issue.

Second, for each measure and supply chain node, we estimated what proportion of businesses that use/handle the precursor chemicals are likely to already comply with the treatment measures. This analysis was primarily informed by stakeholder feedback collected through the industry focus groups.

Lastly, drawing on the results of the online survey and broader feedback received from stakeholders during the focus groups, we estimated what proportion of businesses that do not already adopt the treatment measures are likely to do so as a result of a targeted awareness campaign. This proportion ranges from 0 per cent to 22.5 per cent (in the case of wholesalers, retailers and end-users) to 45 per cent (in the case of introducers, processors and transport/logistics).

Appendix I provides greater detail about the basis of the estimates outlined in Table 8. Given the cost estimates in this Consultation RIS are primarily driven by expected level of adoption, stakeholder feedback is sought about the reasonableness of our assumptions and calculations detailed in Appendix I.

Table 8: Expected number of businesses that currently do not adopt the treatment measures, but are likely to do so under Option 1

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Employee and Contractor Checking	2-29	9-170	4-7	110-1,104	2,331-3,691	144-386
Security Awareness	31	179	7	1,104	3,885	577
Inventory Control**	0	0	0	0	0	n/a
Receipt of Chemical*	0	0	0	0	0	0
Theft and Diversion Procedures	31	179	7	1,104	3,885	577
Physical Access Controls***	-	-	-	-	-	-
Personnel Access Controls***	-	-	-	-	-	-
Point of Sale	31	179	15	1,104	n/a	n/a
Sales and Distribution*	0	0	0	0	n/a	n/a
Consignment Control**	0	0	0	0	0	0

Notes: ** No businesses are expected to adopt 'Receipt of Chemical' and 'Sales and Distribution' under this option, because all businesses are assumed to already comply with these measures.*

*** No businesses are expected to adopt 'Inventory Control' and 'Consignment Control' under this option, due to the significant costs associated with these measures.*

**** This Consultation RIS did not estimate the number of businesses that would likely adapt 'Physical Access Controls' and 'Personnel Access Controls' under this Option, due to the difficulties of estimating the costs associated with these measures (see Appendix H).*

12. How reasonable are the estimates of: (1) the total number of companies that use/handle the precursor chemicals in Australia; and (2) the proportion of these companies that already comply with the proposed treatment measures (particularly 'Inventory Control' and 'Consignment Control')? Appendix I provides greater detail about these estimates.

13. Has this Consultation RIS adequately captured very small/backyard businesses that use/handle/sell precursor chemicals? Are there any additional data sources that provide an accurate and comprehensive picture of the number of very small/backyard businesses that use/handle/sell precursor chemicals in Australia?

Drawing on those additional costs that we have been able to quantify for each of the measures (which are described in detail in Appendix H) and the estimates outlined in Table 8, this Consultation RIS estimates that the aggregate adoption costs associated with Option 1 (in NPV terms) is $63.4 million over 2012-21. As Table 9 outlines, end-users (business) and processors are expected to account for the largest shares of the adoption costs for Option 1 (52 per cent and 21.6 per cent, respectively). These results are primarily driven by the expected level of adoption for end-users, and the cost assumptions associated with processors adopting the treatment measures.

It should be stressed that the estimates outlined in Table 9 do not represent all the costs associated with the treatment measures (this Consultation RIS was unable to

estimate all the costs associated with the 'Point of Sale' measures, or any of the costs associated with the 'Physical Access Controls' and 'Personnel Access Controls' measures). The costs of the options are thus likely to be larger than estimated provided in Table 9.

Table 9: Estimated adoption costs, Option 1, NPV over 10 years (millions)

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics	Total
Employee and contractor checking	$0.11	$0.46	$0.03	$3.20	$13.53	$2.73	**$20.06**
Security awareness	$0.53	$3.08	$0.10	$3.40	$14.16	$0.89	**$22.16**
Inventory control**	$0.00	$0.00	$0.00	$0.00	$0.00	n/a	**$0.00**
Receipt of chemical*	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**
Theft and diversion procedures	$1.73	$10.15	$1.29	$1.27	$5.26	$0.53	**$20.22**
Physical access controls***	-	-	-	-	-	-	**-**
Personnel access controls***	-	-	-	-	-	-	**-**
Point of sales procedures	$0.93	$0.00	$0.00	$0.00	n/a	n/a	**$0.93**
Sales and distribution*	$0.00	$0.00	$0.00	$0.00	n/a	n/a	**$0.00**
Consignment Control**	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**
NPV over 10 years (millions)	**$3.29**	**$13.69**	**$1.43**	**$7.86**	**$32.95**	**$4.15**	**$63.37**

Notes: ** No costs have been calculated for 'Receipt of Chemical' and 'Sales and Distribution', given the assumption that businesses already comply with these measures.*

*** No costs have been calculated for 'Inventory Control' and 'Consignment Control', given the assumption that no businesses would voluntary adopt these measures due to the significant costs involved.*

**** No costs have been calculated for 'Physical Access Controls' and 'Personnel Access Controls', due to the difficulties of estimating the costs associated with these measures (see Appendix H).*

Table 10 details the estimated administrative costs associated with Option 1. These costs are derived from costing data provided by AGD for Phase One of the Chemicals of Security Concern awareness campaign. Appendix J provides greater detail about the basis of the estimated administrative costs.

Table 10: Estimated administrative costs, Option 1

NPV over 10 years (millions)	
Staff time	$2.54
Communication expenses	$0.12
Travel expenses	$1.56
Total	**$4.23**

Administrative costs for Option 1 will primarily be borne by governments. Key types of administrative costs include:

- additional staff time – government personnel will be required to oversee, plan, develop and implement the targeted awareness campaign
- communication expenses – goods or services that governments will purchase to assist with the communication of the targeted awareness campaign. These goods and services can include market research, promotional material, advertising, and postage, and
- travel expenses – costs incurred in booking flights and accommodation as AGD personnel travel to communicate and raise awareness of the proposed treatment measures.

Under Option 1, it is assumed that AGD will dedicate a section to developing and implementing the targeted awareness campaign (including outreach efforts), and that the campaign will run for a period of three years. It is possible that State and Territory governments and various industry associations will also dedicate staff resources to assist with the targeted awareness campaign. The level of this additional staff effort, however, is uncertain and, consequently, is not included in our estimates.

AGD has advised that the administrative cost estimates for Option 1 would be sufficient to support a minimalistic targeted awareness campaign. The costs of a more extensive awareness campaign will likely be greater than those outlined in Table 10.

Table 11 details the estimated total costs associated with Option 1.

Table 11: Estimated total costs, Option 1

NPV over 10 years (millions)	
Adoption costs	$63.37
Administrative costs	$4.23
Total	**$67.59**

Benefits

Option 1 will generate the benefits discussed in Section 6.2.2; though the extent of these benefits is likely to be limited, due to the assumptions about the relatively

small number of companies that will adopt the proposed treatment measures under the option (see Table 8). Key benefits include:

- enhanced business capacity to deter, prevent and detect the theft and diversion of precursor chemicals (though uptake of 'Theft and Diversion Procedures' and 'Security Awareness')
- better quality information provided by industry to law enforcement and intelligence agencies about the theft and diversion of precursor chemicals (though uptake of 'Point of Sale' procedures), facilitating government efforts to combat the use of homemade explosives for criminal purposes, and
- a slight reduction in the risk of individuals and groups using homemade explosives from criminal purposes.

Option 1 is also likely to have some non-security benefits for those businesses that adopt the proposed treatment measures, such as enhanced inventory management.

Quantifying the benefits associated with Option 1 is difficult. The key drivers of these benefits – i.e. the volume of precursor chemicals that have been stolen/diverted in Australia, the level of probability that an individual or group will use homemade explosives for criminal purposes in Australia and the likely consequences of such use – cannot be reliably identified and calculated on the basis of publicly available information.

Accordingly, we have adopted a break-even approach to provide a framework for comparing the costs and benefits of Option 1. Break-even analysis is, in the words of Mueller and Stewart, 'a standard procedure for getting around the difficulties of estimating the likelihood and consequences of an undesirable event.'[56] In this context, we use break-even analysis to illustrate the number of terrorist attacks using homemade explosives that would need to be directly prevented by Option 1 for the costs of the option to be justified (or 'break even'). We have focused on terrorist attacks (rather than all possible use of homemade explosives for criminal purposes) because:

- combating terrorism is the primary policy rationale for seeking to identify and address the security risks associated with precursor chemicals, and
- more reliable estimates exist of the potential terrorist use of homemade explosives, compared with other potential criminal uses (e.g. blowing up ATMs).

To undertake break-even analysis, we needed an estimate of the costs of an 'average' terrorist attack using homemade explosives. Given there have not been any successful terrorist attacks using homemade explosives in Australia, we have relied on estimates surrounding the 2005 mass transit bombings in London. These

56 Mueller, John and Mark G. Stewart (2011), Terror, Security, and Money: Balancing the risks, benefits and costs of homeland security, Oxford University Press, New York. See also: Latourrette, Tom and Henry H. Willis (2007), 'Using Probabilistic Terrorism Risk Modelling For Regulatory Benefit-Cost Analysis: Application to the Western Hemisphere Travel Initiative Implemented in the Land Environment', Working Paper, RAND, Santa Monica; and OECD (2008), 'Introductory handbook for undertaking regulatory impact analysis', http://www.oecd.org/dataoecd/48/14/44789472.pdf. Accessed on: 28 October 2011.

attacks involved the use of homemade explosives made from precursor chemicals, and were responsible for the deaths of 52 people. The 2005 London bombings thus provide an approximation of the likely costs associated with the use of homemade explosives by terrorists in Australia. It is important to note, however, the limitations of applying the cost estimates of the 2005 London bombings in the Australian context:

- due to Australia's lack of a subway system, individuals or groups could not exactly replicate the 2005 London bombings in Australia (though a number of Australian cities have partial underground mass transit systems), and
- the cost estimates of the 2005 London bombings are driven, in part, by the indirect cost of reduced tourism. Tourism accounts for a greater share of GDP in the United Kingdom than it does in Australia.[57]

Based on recent data compiled by Mueller and Stewart, the total costs of the 2005 London bombings are estimated to have been £2.4 billion, or 0.19 per cent of British GDP (Table 12). Applying this percentage to Australian GDP in 2010-11, a London-style attack in Australia would cause an estimated $2.5 billion in costs.

Table 12: Cost estimates of the 2005 London bombings[58]

Description	Estimate
Loss of lives (52 people)	£220 million[59]
Repair costs – London Underground and London Buses	£63 million
Lost revenue:	
• **London Underground**	£11 million
• **Restaurants**	£40 million
• **Tourism**	£450 million
• **Retailers**	£1,600 million
Total costs	£2,385 million
Total costs as a proportion of UK GDP (2005)	0.19%
Estimated cost of a London-style attack in Australia (using 2010-11 GDP)	$2,489 million

In their 2008 study, Ungerer et al. presented a case study that investigated the economic effects of a successful terrorist attack on Australian soil similar in scope

57 According to Deloitte, tourism was worth £115.4bn to the UK economy in 2009, or 8.9 per cent of GDP. In Australia, tourism was worth $34 billion to the domestic economy in 2009-10, or 2.6 per cent of GDP. See: Deloitte (2010), 'The economic contribution of the Visitor Economy', prepared for Visit Britain, http://www.visitbritain.org/Images/Economic%20case%20for%20the%20Visitor%20Economy%20-%20Phase%202%20-%2026%20July%202010%20-%20FINAL_tcm29-14561.pdf. Accessed on: 16 October 2010; Department of Resources, Energy and Tourism (2010), 'Tourism Satellite Account 2009-10: A summary of results', http://www.ret.gov.au/tourism/Documents/Tourism%20Statistics/2009-10%20TSA%20summary%20of%20key%20results%20web%20factsheet.pdf. Accessed on: 16 October 2010.

58 Mueller, John and Mark G. Stewart (2011), Terror, Security, and Money: Balancing the risks, benefits and costs of homeland security, Oxford University Press, New York. See also: United Kingdom Department of Culture, Media and Sport (2006), 'Freedom of Information Request – Information relating to the London suicide bombing attacks on the British tourism industry', http://www.culture.gov.uk/images/freedom_of_information/109692_inf_released.pdf. Accessed: 16 October 2011.

59 This estimate is based on the assumption that the value of a statistical life is $6.5 million. It is important to note that the Office of Best Practice Regulation advises that the value of a statistical life to be used in RISs is $3.5 million. Using the OBPR estimate, the human costs in Table 12 would decrease from £220 million to approximately £120 million. See: OBPR (2008), 'Best practice regulation guidance note: Value of statistical life', www.finance.gov.au/obpr/docs/ValuingStatisticalLife.rtf. Accessed: 8 December 2011.

'to the July 2005 suicide bombings in London.'[60] Using their analysis, the total costs of such an event would equal 0.11 per cent of GDP, or $1.5 billion in 2010-11 dollars (Table 13). It is important to note that Ungerer et al. maintain their 'estimate is likely to be an underestimate', given assumptions used in other studies about the economic impact of terrorism and natural disasters.[61]

Table 13: Estimated costs of a terrorist attack in Australia similar in scope to the 2005 London bombings[62]

Description	Estimate
Human cost	$140 million[63]
Capital cost	$70 million
Post event response and investigation	$100 million
Economic losses to business	$1,046 million
Total costs (2006-07 dollars)	£1,356 million
Total costs as a proportion of GDP (2006-07)	0.11%
Total costs (2010-11 dollars)	$1,489 million

Based on the estimates outlined in Table 12 and Table 13, we assume that the costs of a London-style terrorist attack in Australia using homemade explosives would range between $1.5 billion and $2.5 billion.

Using this range, and different assumptions about when the attacks would occur (to account for discounting), Option 1 would need to prevent between 0.03 and 0.09 terrorist attacks using homemade explosives over 2012-21 to cover the costs associated with the measures (Table 14).

Table 14: Number of terrorist attacks required to be prevented over 2012-2021 for Option 1 to break-even[64]

Assumed total costs of attack	If attack occurred in 2012	If attack occurred in 2021
Lower bound - $1,489 million	0.05	0.09
Upper bound - $2,489 million	0.03	0.05

It is important to note that the estimates for the costs of a London-style terrorist attack outlined in Table 12 and Table 13 include both direct (i.e. loss of lives) and indirect economic impacts (i.e. the impact of fear on tourism). In estimating the

60 Ungerer, Carl, Henry Ergas, Scott Hook and Mark Stewart (2008), 'Risky business: Measuring the costs and benefits of counter-terrorism Spending', ASPI Special Report, no.18.

61 Ibid.

62 Ibid.

63 This estimate is based on the assumption that the attack would kill 50 people and injure 500. Ungerer et al. also assume that the cost of a human fatality is $1.9 million (in line with estimates used by the Bureau of Regional and Transport Economics) and the cost of an injury ranges from $16,000 to $400,000 per person. It is important to note that the Office of Best Practice Regulation advises that the value of a statistical life to be used in RISs is $3.5 million. Using the OBPR estimate, the human costs in Table 13 would increase from $140 million to $220 million. See: OBPR (2008), 'Best practice regulation guidance note: Value of statistical life', www.finance.gov.au/obpr/docs/ValuingStatisticalLife.rtf. Accessed: 8 December 2011.

64 In undertaking the break-even analysis, we first calculated a 2012 NPV and a 2021 NPV for our lower and upper bound estimates of the costs of a terrorist attack (using a 7 per cent discount rate). We did this to account for the time value of money and to recognise that a terrorist attack today would have a greater present value than a terrorist attack in 10 years. Second, we then divided the estimated total cost of Option 1 (as outlined in Table 11) by the 2012 NPV and 2021 NPV for our lower bound estimate and the 2012 NPV and 2021 NPV for our upper bound estimate. For example, our estimated total cost of Option 1 is $67.59 million. Dividing this figure by $1,391 million (the 2012 NPV) for our lower bound estimate) equals 0.05.

costs of the options, however, this Consultation RIS has only focused on direct impacts (e.g. the costs to industry of complying with the measures); the indirect flow-on impacts of the options to the economy have not been calculated. We believe this is appropriate because the economy wide impacts of the voluntary options are likely to be marginal (given the relative quantum of direct impacts involved). Stakeholder feedback is sought about how reasonable our approach to conducting break-even analysis is.

An alternative break-even approach to that outlined above is to focus on how much an average household would have to pay in order to cover the costs associated with Option 1. This approach seeks to capture the value that people place on security – or, more specifically, the absence of terrorism using homemade explosives. While Option 1 may impose costs on the community, these costs may be less than what the community is willing to pay for controls that improve their security.

Using 2010 data, we estimate that the average Australian household would have to pay an additional 0.01 per cent of its annual gross income (or $8.78) to cover the costs associated with Option 1 (Table 15). In comparison, Australia's consumption of coffee in 2010 (in the form of coffee beans and instant coffee) is equal to approximately 0.11 per cent of average annual gross household income.[65]

Table 15: Increase in average annual household income required for Option 1 to break-even[66]

	Estimates
Number of households	8,395,000
Average annual gross household income (2009-10)	$87,776
NPV cost of Option 1 as a proportion of gross household income	0.0092%
Average annual equivalised disposable household income (2009-10)	$44,096
Equivalised disposable household income as a proportion of gross household income	50.2%
NPV cost of Option 1 as a proportion of equivalised disposable household income	0.0178%

The results in Table 15 suggest that the average Australian household would have to be willing to pay only a marginal proportion of its disposable income to cover the costs associated with Option 1. This compares favourably with willingness to pay estimates derived from other countries. Using a Life Satisfaction Approach, Frey et al. estimate that, to achieve 'a reduction in terrorist activity to a level that prevails in the more peaceful parts of the country':

- a resident of Northern Ireland would be willing to pay between 26 per cent and 37 per cent of annual household income (over the period 1975-98), and
- a resident of Paris would be willing to pay between 4 per cent and 8 per cent of annual household income (over the period 1973-98).[67]

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65 Rose, Danny (2010), 'Australia a nation of coffee drinkers', *The Sydney Morning Herald*, http://news.smh.com.au/breaking-news-business/australia-a-nation-of-coffee-drinkers-20100305-pnbb.html. Accessed on: 28 October 2011.

66 ABS (2010), 'Australian social trends, 1998-2010', Cat. 4102.0; ABS (2011), Household income and income distribution, 2010', Cat. 6523.0.

While these figures are not directly applicable to the Australian context, they do provide an indication of the willingness to pay of international populations to achieve greater security from terrorism.

Given that this Consultation RIS has not been able to quantify all the costs associated with the treatment measures, the break-even analysis outlined in Table 14 and Table 15 understates the number of terrorist attacks that would need to be prevented (and the proportion of gross annual income the average household would have to be willing to pay) to cover the full costs associated with each of the options.

6.3.2 *Option 2 – Industry codes*

Costs

Option 2 is expected to impose the same type of adoption costs as Option 1, but the value of these costs will be higher, due to a greater expected level of uptake. We have assumed a greater proportion of businesses will adopt the proposed treatment measures under Option 2 compared with Option 1 because:

- respondents to the online survey were asked to nominate what proportion of businesses in their industry would likely adopt the proposed treatment measures if they were encouraged to do so by a relevant industry association. The average response to this question was 54.9 per cent (n=146) – approximately 8 percentage points higher than the response for a targeted education campaign. It should be stressed, however, that the results of the online survey are not statistically significant
- Option 2 would involve the development of seven industry codes, targeted at particular groupings of chemical users and handlers. This arrangement may make the treatment measures more relevant to individual businesses, increasing the likelihood of uptake, and
- Option 2 would also involve industry (though the relevant industry associations) taking ownership of the development and promulgation of the proposed treatment measures. This may also increase the likelihood of uptake.

Option 2, however, does not include a formal mechanism to communicate and distribute the industry codes to those businesses that are not members of an industry association. Uptake of the treatment measures by these businesses is thus expected to be low.

Table 16 details our estimates of the number of businesses that: use/handle at least one of the precursor chemicals; do not currently adopt the proposed treatment measures; and are likely to adopt the measures as a result of an industry code. The

67 Frey, Bruno S., Simon Luechinger and Alois Stutzer (2009), 'The life satisfaction approach to valuing public goods: The case of terrorism', Public Choice, 138:317-45.

proportion of businesses that are expected to adopt the measures ranges from 0 per cent to 27.5 per cent (in the case of wholesalers, retailers and end-users) to 55 per cent (in the case of introducers, processors and transport/logistics). Appendix I provides greater detail about the basis of these estimates.

Table 16: Expected number of businesses that currently do not adopt the treatment measures, but are likely to do so under Option 2

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Employee and Contractor Checking	2-36	11-208	5-9	135-1,349	2,849-4,511	176-472
Security Awareness	38	219	9	1,349	4,749	705
Inventory Control**	0	0	0	0	0	n/a
Receipt of Chemical*	0	0	0	0	0	0
Theft and Diversion Procedures	38	219	9	1,349	4,749	705
Physical Access Controls***	-	-	-	-	-	-
Personnel Access Controls***	-	-	-	-	-	-
Point of Sale	38	219	18	1,349	n/a	n/a
Sales and Distribution*	0	0	0	0	n/a	n/a
Consignment Control**	0	0	0	0	0	0

Notes: ** No businesses are expected to adopt 'Receipt of Chemical' and 'Sales and Distribution' under this option, because all businesses are assumed to already comply with these measures.*

*** No businesses are expected to adopt 'Inventory Control' and 'Consignment Control' under this option, due to the significant costs associated with these measures.*

**** This Consultation RIS did not estimate the number of businesses that would likely adapt 'Physical Access Controls' and 'Personnel Access Controls' under this Option, due to the difficulties of estimating the costs associated with these measures (see Appendix H).*

Drawing on those additional costs that we have been able to quantify for each of the measures (which are described in detail in Appendix H) and the estimates outlined in Table 16, this Consultation RIS estimates that the aggregate adoption costs associated with Option 2 (in NPV terms) is $65.2 million over 2012-21. As Table 17 outlines, end-users (business) and processors are expected to account for the largest shares of the adoption costs for Option 2 (50.3 per cent and 25.1 per cent, respectively). These results are primarily driven by the expected level of adoption for end-users, and the cost assumptions associated with processors adopting the treatment measures.

Table 17: Estimated adoption costs, Option 2, NPV over 10 years (millions)

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics	Total
Employee and Contractor Checking	$0.04	$0.15	$0.02	$2.08	$9.02	$0.91	**$12.22**
Security Awareness	$0.64	$3.76	$0.13	$4.15	$17.31	$1.09	**$27.08**
Inventory Control**	$0.00	$0.00	$0.00	$0.00	$0.00	n/a	**$0.00**
Receipt of Chemical*	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**
Theft and Diversion Procedures	$2.11	$12.41	$1.58	$1.55	$6.42	$0.65	**$24.72**
Physical Access Controls***	-	-	-	-	-	-	**-**
Personnel Access Controls***	-	-	-	-	-	-	**-**
Point of Sale	$1.13	$0.00	$0.00	$0.00	n/a	n/a	**$1.13**
Sales and Distribution*	$0.00	$0.00	$0.00	$0.00	n/a	n/a	**$0.00**
Consignment Control**	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**
NPV over 10 years (millions)	**$3.92**	**$16.32**	**$1.73**	**$7.78**	**$32.75**	**$2.65**	**$65.15**

Notes: ** No costs have been calculated for 'Receipt of Chemical' and 'Sales and Distribution', given the assumption that businesses already comply with these measures.*

*** No costs have been calculated for 'Inventory Control' and 'Consignment Control', given the assumption that no businesses would voluntary adopt these measures due to the significant costs involved.*

**** No costs have been calculated for 'Physical Access Controls' and 'Personnel Access Controls', due to the difficulties of estimating the costs associated with these measures (see Appendix H).*

Administrative costs for Option 2 will be borne by governments and the relevant industry associations. Based on feedback provided by stakeholders, the key type of administrative cost will be additional staff time. More specifically, government personnel will be required to oversee and contribute to the development of the industry codes. Likewise, staff at each of the industry associations will be require to develop, promulgate and monitor the industry codes.

The relevant industry associations are likely to incur some additional costs in communicating the industry codes (e.g. in printing and posting promotional material). Our consultations with stakeholders suggested, however, that these costs are likely to be marginal.

Under Option 2, it is assumed that AGD will dedicate two staff members to oversee and contribute to the development of the industry codes. The amount of AGD staff effort will equal 1.2 FTEs initially, decreasing to just over 0.5 FTE at the end of the

10-year period. Based on feedback provided by stakeholders, each industry association will dedicate 1 FTE to developing and promulgating the industry codes in the first two years, decreasing to 0.25 FTE at the end of the 10-year period.

Table 18 details the estimated administrative costs associated with Option 2. Appendix J provides greater detail about the basis of the estimated administrative costs.

Table 18: Estimated administrative costs, Option 2

NPV over 10 years (millions)	
Staff time	
• **AGD**	$0.92
• **Industry associations**	$2.79
Total	**$3.71**

Table 19 details the estimated total costs associated with Option 2.

Table 19: Estimated total costs, Option 2

NPV over 10 years (millions)	
Adoption costs	$65.15
Administrative costs	$3.71
Total	**$68.86**

Benefits

While Option 2 will generate the same type of benefits as Option 1, this Consultation RIS assumes that the extent of benefits delivered by Option 2 will be greater than those accrued by Option 1. This is based on the assumption that more businesses will adopt the treatment measures under Option 2 compared to Option 1.

Due to a lack of publicly available data about the current risk posed by individuals and groups using homemade explosives for criminal purposes, this Consultation RIS is unable to quantify or qualify with any reliability the exact difference in risk reduction between Option 1 and Option 2 – beyond the assumption that Option 2 is likely to have a greater impact on extant risk than Option 1. Quantifying the level of risk reduction associated with each of the options is difficult, given that:

- there has not been a successful terrorist attack in Australia using homemade explosives and therefore 'reduction' is not possible, and
- it is difficult/impossible to measure the success of deterrent measures.

Due to the difficulties of quantifying risk reduction, we have used break-even analysis to provide a basis on which the benefits of the options can be compared.

Using the same underlying assumptions as outlined for Option 1, we estimate that:

- Option 2 would need to prevent between 0.03 and 0.09 terrorist attacks over 2012-21 to cover the costs associated with the measures (Table 20)

- the average Australian household would have to pay an additional 0.01 per cent of its annual gross income (or $8.78) to cover the costs associated with Option 2.

Table 20: Number of terrorist attacks required to be prevented over 2012-2021 for Option 2 to break-even

Assumed total costs of attack	If attack occurred in 2012	If attack occurred in 2021
Lower bound - $1,489 million	0.05	0.09
Upper bound - $2,489 million	0.03	0.05

The break-even analysis for Option 2 is similar to that of Option 1.

6.3.3 *Option 3 – Government code of practice*

Costs

Option 3 is expected to impose the same type of adoption costs as Options 1 and 2, but the total of these costs will be higher, due to a greater expected level of uptake. We have assumed a greater proportion of businesses will adopt the proposed treatment measures under Option 3 compared with Option 1 and 2 because:

- respondents to the online survey were asked to nominate what proportion of businesses in their industry would likely adopt the proposed treatment measures if they were encouraged to do so by governments through a standard or code of practice. The average response to this question was 57.4 per cent (n=145) – approximately 10 percentage points higher than the response for a targeted education campaign and 3 percentage points higher than the response for an industry code. It should be stressed, however, that the results of the online survey are not statistically significant, and
- as noted by the Commonwealth Interdepartmental Committee on Quasi-Regulation, quasi-regulatory arrangements like a government code of practice can encourage higher levels of uptake than self-regulatory arrangements, due to uncertainty amongst industry about the status and enforceability of quasi-regulation.[68]

Table 21 details our estimates of the number of businesses that: use/handle at least one of the precursor chemicals; do not currently comply with the proposed treatment measures; and are likely to adopt the measures as a result of an industry code. The proportion of businesses that are expected to adopt the measures ranges from 0 per cent to 30 per cent (in the case of wholesalers, retailers and end-users) to 60 per cent (in the case of introducers, processors and transport/logistics). Appendix I provides greater detail about the basis of these estimates.

[68] Commonwealth Interdepartmental Committee on Quasi-Regulation (1997), *Grey Letter Law*, December, Canberra.

Table 21: Expected number of businesses that currently do not adopt the treatment measures, but are likely to do so under Option 3

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Employee and Contractor Checking	2-39	12-227	6-10	147-1,472	3,108-4,921	192-515
Security Awareness	41	239	10	1,472	5,180	769
Inventory Control**	0	0	0	0	0	n/a
Receipt of Chemical*	0	0	0	0	0	0
Theft and Diversion Procedures	41	239	10	1,472	5,180	769
Physical Access Controls***	-	-	-	-	-	-
Personnel Access Controls***	-	-	-	-	-	-
Point of Sale	41	239	20	1,472	n/a	n/a
Sales and Distribution*	0	0	0	0	n/a	n/a
Consignment Control**	0	0	0	0	0	0

Notes: ** No businesses are expected to adopt 'Receipt of Chemical' and 'Sales and Distribution' under this option, because all businesses are assumed to already comply with these measures.*

*** No businesses are expected to adopt 'Inventory Control' and 'Consignment Control' under this option, due to the significant costs associated with these measures.*

**** This Consultation RIS did not estimate the number of businesses that would likely adapt 'Physical Access Controls' and 'Personnel Access Controls' under this Option, due to the difficulties of estimating the costs associated with these measures (see Appendix H*

Drawing on those additional costs that we have been able to quantify for each of the measures (which are described in detail in Appendix H) and the estimates outlined in Table 21, this Consultation RIS estimates that the aggregate adoption costs associated with Option 3 (in NPV terms) is $74.1 million over 2012-21. As Table 22 outlines, end-users (business) and processors are expected to account for the largest shares of the adoption costs for Option 3 (51.2 per cent and 24.1 per cent, respectively). These results are primarily driven by the expected level of adoption for end-users, and the cost assumptions associated with processors adopting the treatment measures.

Table 22: Estimated adoption costs, Option 3, NPV over 10 years (millions)

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics	Total
Employee and Contractor Checking	$0.05	$0.20	$0.03	$2.82	$12.03	$1.21	**$16.34**
Security Awareness	$0.70	$4.10	$0.14	$4.53	$18.88	$1.19	**$29.54**
Inventory Control**	$0.00	$0.00	$0.00	$0.00	$0.00	n/a	**$0.00**
Receipt of Chemical*	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**
Theft and Diversion Procedures	$2.30	$13.54	$1.72	$1.69	$7.01	$0.71	**$26.96**
Physical Access Controls***	-	-	-	-	-	-	**-**
Personnel Access Controls***	-	-	-	-	-	-	**-**
Point of Sale	$1.24	$0.00	$0.00	$0.00	n/a	n/a	**$1.24**
Sales and Distribution*	$0.00	$0.00	$0.00	$0.00	n/a	n/a	**$0.00**
Consignment Control**	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**
NPV over 10 years (millions)	**$4.29**	**$17.84**	**$1.89**	**$9.03**	**$37.92**	**$3.11**	**$74.08**

Notes: ** No costs have been calculated for 'Receipt of Chemical' and 'Sales and Distribution', given the assumption that businesses already comply with these measures.*

*** No costs have been calculated for 'Inventory Control' and 'Consignment Control', given the assumption that no businesses would voluntary adopt these measures due to the significant costs involved.*

**** No costs have been calculated for 'Physical Access Controls' and 'Personnel Access Controls', due to the difficulties of estimating the costs associated with these measures (see Appendix H).*

Administrative costs for Option 3 will primarily be borne by governments. Key types of administrative costs include:

- additional staff time – government personnel will be required to oversee, plan, develop and promulgate the code of practice
- communication expenses – goods or services that governments will purchase to assist with the communication of the code of practice. These goods and services can include market research, promotional material, advertising, and postage, and
- travel expenses – costs incurred in booking flights and accommodation as AGD personnel travel to communicate and raise awareness of the code of practice.

Under Option 3, it is assumed that AGD will dedicate a section to developing and promulgating the code of practice (including outreach efforts). The amount of AGD staff effort will equal 5.5 FTEs initially, decreasing to just over 0.5 FTE at the end of the 10-year period. It is possible that State and Territory governments and various industry associations will also dedicate staff resources to assist with communicating and monitoring the impact of the government code of practice. The level of this additional staff effort, however, is uncertain and, consequently, is not included in our estimates.

Under Option 3, industry (primarily through the relevant industry associations) and the State and Territory governments are also likely to dedicate additional staff time to developing and promulgating the government code of practice. Industry in particular is likely to be active in attending consultations and composing submissions to help shape the government code of practice. However, based on stakeholder feedback, it is assumed additional staff time at the State and Territory government and industry levels will be marginal. Consequently, this additional staff time has not been quantified.

Table 23 details the estimated administrative costs associated with Option 3. Appendix J provides greater detail about the basis of the estimated administrative costs.

Table 23: Estimated administrative costs, Option 3

	NPV over 10 years (millions)
Staff time	$3.07
Communication expenses	$0.78
Travel expenses	$0.01
Total	**$3.95**

Table 24 details the estimated total costs associated with Option 3.

Table 24: Estimated total costs, Option 3

	NPV over 10 years (millions)
Adoption costs	$74.08
Administrative costs	$3.95
Total	**$78.04**

Benefits

While Option 3 will generate the same type of benefits as Options 1 and 2, this Consultation RIS assumes that the extent of the benefits delivered by Option 3 will be greater than those delivered under Options 1 and 2. This is based on the assumption that more businesses will adopt the treatment measures under Option 3 compared to Options 1 and 2.

Due to a lack of publicly available data about the current risk posed by individuals and groups using homemade explosives for criminal purposes, this Consultation RIS is unable to reliably quantify or qualify the exact difference in risk reduction between Option 3 and Options 1 and 2 – beyond the assumption that Option 3 is

likely to have a greater impact on extant risk than Option 1 and Option 2. Quantifying the level of risk reduction associated with each of the options is difficult, given that:

- there has not been a successful terrorist attack in Australia using homemade explosives and therefore 'reduction' is not possible, and
- it is difficult/impossible to measure the success of deterrent measures.

Due to the difficulties of quantifying risk reduction, we have used break-even analysis to provide a basis on which the benefits of the options can be compared.

Using the same underlying assumptions as outlined for Options 1 and 2, we estimate that:

- Option 3 would need to prevent between 0.04 and 0.10 terrorist attacks over 2012-21 to cover the costs associated with the measure (Table 20), and
- the average Australian household would have to pay an additional 0.01 per cent of its annual gross income (or $8.78) to cover the costs associated with Option 3.

Table 25: Number of terrorist attacks required to be prevented over 2012-2021 for Option 3 to break-even

Assumed total costs of attack	If attack occurred in 2012	If attack occurred in 2021
Lower bound - $1,489 million	0.06	0.10
Upper bound - $2,489 million	0.03	0.06

In comparison, Options 1 and 2 would need to prevent between 0.03 and 0.09 terrorist attacks over 2012-21 to cover the costs associated with the measures.

6.3.4 *Option 4 – Regulation*

Costs

Like Options 1-3, Option 4 will impose two broad costs on the Australian community: adoption costs and administrative costs. With reference to the former, Option 4 will impose the same type of adoption costs as Options 1-3, but the total of these costs will be higher, due to a greater expected level of adoption. We have assumed a greater proportion of businesses will adopt the proposed treatment measures under Option 4 compared with Options 1-3 because:

- respondents to the online survey were asked to nominate what proportion of businesses in their industry would likely adopt the proposed treatment measures if governments mandated the measures through some form of regulation. The average response to this question was 69.8 per cent (n=145) – approximately 23 percentage points higher than the response for a targeted education campaign, 15 percentage points higher than the response for an industry code, and 12 percentage points higher than the response for a government code of practice. It should be stressed, however, that the results of the online survey are not statistically significant, and

- the threat of criminal sanction is likely to incentivise a greater number of businesses to adopt the proposed treatment measures.

Table 26 details our estimates of the number of businesses that: use/handle at least one of the precursor chemicals; do not currently comply with the proposed treatment measures; and are likely to adopt the measures as a result of an industry code. The proportion of businesses that are expected to adopt the measures is 70 per cent across all of the nodes. Appendix I provides greater detail about the basis of these estimates. It is important to note that, unlike Options 1-3, we assume businesses will adopt 'Consignment Control' and 'Inventory Control' under Option 4, due to the mandatory nature of the option. Appendix I provides greater detail about the basis of these estimates.

It should be noted that, in estimating the likely uptake of the measures under Option 4, this Consultation RIS drew on feedback (primarily collected through the online survey) about what level of compliance could be expected if governments mandated the treatment measures. In their preliminary advice on the Consultation RIS, the National Government Advisory Group on Chemical Security questioned whether Option 4, as currently structured, would mandate the measures, and thus achieve the levels of uptake outlined in Table 26. Stakeholder feedback is sought about this issue.

Table 26: Expected number of businesses that currently do not adopt the treatment measures, but are likely to do so under Option 4

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Employee and Contractor Checking	2-46	14-264	14-23	343-3,434	7,253-11,483	224-601
Security Awareness	48	278	23	3,434	12,088	897
Inventory Control	20	53	20	3,434	5,439	n/a
Receipt of Chemical*	0	0	0	0	0	0
Theft and Diversion Procedures	48	278	23	3,434	12,088	897
Physical Access Controls**	-	-	-	-	-	-
Personnel Access Controls**	-	-	-	-	-	-
Point of Sale	48	278	23	3,434	n/a	n/a
Sales and Distribution*	0	0	0	0	n/a	n/a
Consignment Control	0	0	0	0	0	449-897

Notes: ** No businesses are expected to adopt 'Receipt of Chemical' and 'Sales and Distribution' under this option, because all businesses are assumed to already comply with these measures.*

*** This Consultation RIS did not estimate the number of businesses that would likely adapt 'Physical Access Controls' and 'Personnel Access Controls' under this Option, due to the difficulties of estimating the costs associated with these measures (see Appendix H).*

Drawing on those additional costs that we have been able to quantify for each of the measures (which are described in detail in Appendix H) and the estimates outlined in Table 26, this Consultation RIS estimates that the aggregate adoption costs associated with Option 3 (in NPV terms) is $5.1 billion over 2012-21. As Table 27

outlines, the vast majority of these costs (82.5 per cent) are borne by the transport/logistics node and are primarily driven by the substantial costs that are assumed to be associated with 'Consignment Control'. For instance:

- 'Consignment Control' accounts for 99 per cent (or $4.2 billion) of the total costs borne by the transport/logistics node
- end-users (business) account for the second largest share of adoption costs – $739.2 million, or 14.4 per cent of the total. This figure is primarily driven by the expected level of adoption for this supply chain node, and
- 'Consignment Control' imposes the most costs of all the measures – $4.2 billion, or 82.4 per cent of the total. 'Inventory Control' accounts for the second largest share of adoption costs – $735 million, or 14.4 per cent of the total.

Table 27: Estimated adoption costs, Option 4, by node, NPV over 10 years (millions)

Measure	Introducer	Processor	Whole-saler	Retailer	End-user (business)	Transport/ logistics	TOTAL
Employee and contractor checking	$0.17	$0.72	$0.09	$11.44	$42.11	$4.25	**$58.78**
Security awareness	$0.82	$4.79	$0.32	$10.57	$44.06	$1.39	**$61.94**
Inventory control	$0.78	$34.73	$0.48	$62.51	$636.63	n/a	**$735.14**
Receipt of chemical*	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**
Theft and diversion procedures	$2.68	$15.79	$4.02	$3.94	$16.35	$0.83	**$43.61**
Physical access controls**	-	-	-	-	-	-	**-**
Personnel access controls**	-	-	-	-	-	-	**-**
Point of sales procedures	$1.44	$0.00	$0.00	$0.00	n/a	n/a	**$1.44**
Sales and distribution*	$0.00	$0.00	$0.00	$0.00	n/a	n/a	**$0.00**
Consignment control	$0.00	$0.00	$0.00	$0.00	$0.00	$4,221.80	**$4,221.80**
TOTAL	**$5.90**	**$56.03**	**$4.91**	**$88.46**	**$739.15**	**$4,228.26**	**$5,122.70**

Notes: ** No costs have been calculated for 'Receipt of Chemical' and 'Sales and Distribution', given the assumption that businesses already comply with these measures.*

*** No costs have been calculated for 'Physical Access Controls' and 'Personnel Access Controls', due to the difficulties of estimating the costs associated with these measures (see Appendix H).*

Table 28 outlines the estimated adoption costs for Option 4 broken down by individual chemical and risk treatment measure. The costs in Table 28 should be treated as indicative only. They are intended to highlight the costs between

chemicals of adopting the measures – to inform the Decision RIS having regard to any feedback from this Consultation RIS.

While the costs in Tables 27 and 28 are based on the estimated number of businesses that use each of the precursor chemicals, the costs in the latter are higher because the former does not take into account the considerable number of businesses that use, handle or sell more than one of the precursor chemicals to homemade explosives. This has led to 'double counting' of costs in Table 28.

For example, this Consultation RIS has estimated that there are approximately 14,500 businesses that use, handle or sell hydrogen peroxide in Australia. It is this figure that underpins the estimated adoption costs of Option 4 for hydrogen peroxide outlined in Table 28.

Based on stakeholder feedback, it is likely businesses that use, handle or sell more than one precursor chemical would incur the same costs in adopting the proposed treatment measures as those companies that use, handle or sell only one precursor chemical. Accordingly, this Consultation RIS has based its estimates of the adoption costs associated with each of the options on a number of assumptions about the extent to which businesses use, handle or sell more than one precursor chemical. These assumptions are detailed in Appendix I.

Table 28: Estimated adoption costs, Option 4, by chemical, NPV over 10 years (millions)

Employee and contractor checking	$34.06	$34.53	$7.49	$7.10	$7.43	$7.10	$7.01	$9.21	$25.18	$7.58	$8.90
Security awareness	$35.90	$36.39	$7.89	$7.48	$7.83	$7.48	$7.39	$9.71	$26.53	$7.99	$9.38
Inventory control	$426.04	$431.89	$93.65	$88.76	$92.89	$88.82	$87.71	$115.19	$314.89	$94.83	$111.30
Receipt of chemical*	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Theft and diversion procedures	$25.27	$25.62	$5.56	$5.27	$5.51	$5.27	$5.20	$6.83	$18.68	$5.63	$6.60
Physical access controls**	-	-	-	-	-	-	-	-	-	-	-
Personnel access controls**	-	-	-	-	-	-	-	-	-	-	-
Point of sales procedures	$0.83	$0.85	$0.18	$0.17	$0.18	$0.17	$0.17	$0.23	$0.62	$0.19	$0.22
Sales and distribution*	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Consignment control	$2,446.67	$2,480.30	$537.82	$509.75	$533.47	$510.09	$503.72	$661.51	$1,808.34	$544.62	$639.18
TOTAL	**$2,968.78**	**$3,009.58**	**$652.59**	**$618.53**	**$647.31**	**$618.95**	**$611.21**	**$802.67**	**$2,194.24**	**$660.84**	**$775.58**

Notes: ** No costs have been calculated for 'Receipt of Chemical' and 'Sales and Distribution', given the assumption that businesses already comply with these measures.*

*** No costs have been calculated for 'Physical Access Controls' and 'Personnel Access Controls', due to the difficulties of estimating the costs associated with these measures (see Appendix H).*

Administrative costs for Option 4 will primarily be borne by governments. Key types of administrative costs include:

- additional staff time – government personnel will be required to:
  - develop the model amendment to jurisdictional criminal codes
  - update jurisdictional criminal codes to reflect the model amendment (which will include securing policy approval, drafting, securing legislative approval and promulgation)
  - develop and promulgate the code of practice, and
  - enforce the new criminal offence in the event of an individual or group using homemade explosives for criminal purposes (including investigation and legal costs).
- communication expenses – goods or services that governments will purchase to assist with the communication of the model amendment and the code of practice. These goods and services can include market research, promotional material, advertising, and postage, and
- travel expenses – costs incurred in booking flights and accommodation as government personnel travel to communicate and raise awareness of the model amendment and the code of practice.

Under Option 4, it is assumed that AGD will dedicate a section to developing the model amendment and developing and promulgating the code of practice. The amount of AGD staff effort will equal 5.5 FTEs initially, decreasing to just over 0.5 FTE at the end of the 10-year period.

We have not quantified the costs associated with each jurisdiction updating their criminal codes to reflect the model amendment, due to uncertainty about the full range of applicable costs. This being said, there are some public estimates that provide a sense of the costs associated with achieving legislative change. These include:

- in Western Australia, the average cost of legislative amendments drafted in 2003-04 was in the order of $52,000,[69] and
- in the United Kingdom it was estimated that implementing regulatory changes relating to European Works Councils would involve an administrative cost of amending legislation of approximately $400,000.[70]

In addition, we have not quantified:

- the costs associated with each jurisdiction enforcing the new criminal offence in the event of an individual or group using homemade explosives for criminal

[69] Western Australian Department of Local Government and Regional Development 2004, *Annual Report 2003-2004*.

[70] United Kingdom Department of Trade and Industry (UK) 1998, *Implementation of the Regulations on European Works Councils — Regulatory Impact Assessment,* London.

purposes. The extent of these costs will be driven by the actual use of homemade explosives and the operational requirements of relevant law enforcement agencies – factors which are unknown at this time, and

- the costs associated with industry contributing to the development and promulgation of the new criminal offence (e.g. attending consultations, reviewing documents and composing submissions). Based on stakeholder feedback, it is assumed these industry costs are likely to be marginal.

Table 29 details the estimated administrative costs associated with Option 4. Appendix J provides greater detail about the basis of the estimated administrative costs.

Table 29: Estimated administrative costs, Option 4

	NPV over 10 years (millions)
Staff time	$3.07
Communication expenses	$0.78
Travel expenses	$0.01
TOTAL	**$3.95**

Table 30 details the estimated total costs associated with Option 4.

Table 30: Estimated total costs, Option 4

	NPV over 10 years (millions)
Adoption costs	$5,122.70
Administrative costs	$3.95
TOTAL	**$5,126.65**

Benefits

While Option 4 will generate the same type of benefits as Options 1-3, , this Consultation RIS assumes that the extent of the benefits delivered by Option 4 will be greater than the benefits delivered by Options 1-3. This is based on the assumption that more businesses will adopt the treatment measures under Option 4.

Due to a lack of publicly available data about the current risk posed by individuals and groups using homemade explosives for criminal purposes, this Consultation RIS is unable to quantify or qualify with any reliability the exact difference in risk reduction between Option 4 and the voluntary options – beyond the assumption that Option 4 is likely to have a greater impact on extant risk than Options 1-3. Quantifying the level of risk reduction associated with each of the options is difficult, given that:

- there has not been a successful terrorist attack in Australia using homemade explosives and therefore 'reduction' is not possible, and
- it is difficult/impossible to measure the success of deterrent measures.

Due to the difficulties of quantifying risk reduction, we have used break-even analysis to provide a basis on which the benefits of the options can be compared.

Using the same underlying assumptions as outlined for Options 1-3, we estimate that:

- Option 4 would need to prevent between 2.20 and 6.77 terrorist attacks over 2012-21 to cover the costs associated with the measure (Table 20), and
- the average Australian household would have to pay an additional 0.70 per cent of its annual gross income (or $610.68) to cover the costs associated with Option 4.

Table 31: Number of terrorist attacks required to be prevented over 2012-2021 for Option 4 to break-even

Assumed total costs of attack	If attack occurred in 2012	If attack occurred in 2021
Lower bound - $1,489 million	3.68	6.77
Upper bound - $2,489 million	2.20	4.05

6.3.5 *Summary*

Table 32 provides a summary of the quantifiable costs and break-even analysis for Options 1-4. Key issues to note:

- the listed adoption costs do not capture the full range of adoption costs associated with the options. We have not quantified the costs of 'Physical Access Controls' and 'Personnel Access Controls'. Furthermore, due to a lack of reliable transaction and consignment data, we have not quantified the full costs of 'Point of Sale' and 'Consignment Control'
- the difference in adoption cost estimates between Option 4 and Options 1-3 is driven by 'Consignment Control' and 'Inventory Control'. We assume that no businesses will adopt these measures under Options 1-3, given the range of costs involved. We assume that a proportion of businesses will adopt 'Consignment Control' and 'Inventory Control' under Option 4, however, because the measures will be mandated, and
- the administrative cost estimates provided under Option 4 do not include costs associated with updating jurisdictional criminal codes to reflect the model amendment and enforcing the new criminal offence. The administrative costs associated with Option 4 are thus likely to be considerably larger than $3.95 million.

Table 32: Summary of quantifiable costs and break-even analysis, Options 1-4

	Adoption costs (NPV over 10 years, $ millions)	Administrative costs (NPV over 10 years, $ millions)	Total costs (NPV over 10 years, $ millions)	Break-even	
				No. of terrorist attacks	*% of annual gross household income*
Option 1 – Targeted	$63,37	$4.23	**$67.59**	0.03-0.09	0.01%

	Adoption	Administrative	Total costs	Break-even	
awareness campaign					
Option 2 – Industry codes	$65.15	$3.71	**$68.86**	0.03-0.09	0.01%
Option 3 – Government code of practice	$74.08	$3.95	**$78.04**	0.03-0.10	0.01%
Option 4 – Regulation	$5,112.70	$3.95	**$5,126.65**	2.20-6.77	0.70%

14. ***This Consultation RIS has made a number of assumptions about the proportion of businesses that are likely to adopt the proposed treatment measures as a result of the options (see Appendix I for more detail). How reasonable are these assumptions?***
15. ***Which of the voluntary options are likely to encourage more businesses to adopt the treatment measures? Why?***

6.4 *Additional cost benefit analysis*

As noted in greater detail in Appendix H, stakeholders during consultations raised concerns about the likely effectiveness of a number of the proposed treatment measures. These concerns related to:

- 'Employee and Contractor Checking' – it was noted that terrorists generally prefer to use people with no prior history of criminal or unusual behaviour during operations. Businesses would unlikely be able to detect such 'cleanskins' using the methods outlined under 'Employee and Contractor Checking'
- 'Inventory Control' – stakeholders maintained that, in the absence of physical evidence of a break-in, it would be difficult for businesses to determine whether variations in reconciliations were the result of theft/diversion or other phenomena. Stakeholders also noted that, with those precursor chemicals that are used and handled in significant quantities, it would be very difficult to achieve an accurate monthly reconciliation or to detect when small volumes (e.g. 10-20 kilograms) have potentially been stolen/diverted, and
- 'Consignment Control' – stakeholders questioned whether this measure would generate security benefits commensurate with the costs it would impose on business. While the measure may make it harder for individuals or groups to steal precursor chemicals during transit, it would not eliminate the risk – and potentially could shift the risk of theft away from the level of individual goods to entire vehicles. Stakeholders also maintained that the measures would unlikely increase the capacity of transport/logistics companies to detect the theft/diversion of precursor chemicals, given current use of tamper seals.

Given this feedback, we have undertaken additional cost-benefit analysis of Options 1-4. This additional analysis assumes that the three treatment measures that were seen by stakeholders to be less effective will not be included in any of the options. The results of this additional analysis are provided in Table 33.

Table 33: Summary of quantifiable costs and break-even analysis, Options 1-4, based on all and select treatment measures

	All treatment measures			Select treatment measures		
	Total costs (NPV over 10 years, $ millions)	Break-even		Total costs (NPV over 10 years, $ millions)	Break-even	
		No. of terrorist attacks	*% of annual gross household income*		*No. of terrorist attacks*	*% of annual gross household income*
Option 1 – Targeted awareness campaign	**$67.59**	0.03-0.09	0.01%	**$47.53**	0.02-0.06	0.01%
Option 2 – Industry codes	**$68.86**	0.03-0.09	0.01%	**$52.64**	0.02-0.07	0.01%
Option 3 – Government code of practice	**$78.04**	0.03-0.10	0.01%	**$61.69**	0.03-0.08	0.01%
Option 4 – Regulation	**$5,126.65**	2.20-6.77	0.70%	**$110.94**	0.05-0.15	0.02%

As Table 33 illustrates, restricting the options to those treatment measures that were seen by stakeholders to be more effective does reduce the costs of all of the options – dramatically so in the case of Option 4, the costs of which decrease by 98 per cent. Stakeholder feedback is sought about the appropriateness of reframing the options.

16. ***Is it appropriate and preferred to reframe the options to focus on those treatments which are seen to be more effective in addressing security risks?***
17. ***If the options were to be reframed, which is likely to be most cost effective? For example, would the greater costs of Option 4 (relative to Option 1, Option 2 and Option 3) be worth whatever further reduction in risk that might occur?***

6.5 *Sensitivity analysis*

Sensitivity analysis[71] was undertaken on the 7 per cent discount rate used to calculate NPV figures in this Consultation RIS. Table 34 highlights the impact that alternative discount rates (specifically, 3 per cent and 10 per cent) have on the total cost estimates for the four options.

Table 34: Alternative discount rates

	7 per cent	3 per cent	10 per cent
Option 1 – Targeted awareness campaign	$67.59	$76.51	$62.23
Option 2 – Industry codes	$68.86	$77.00	$63.65

[71] As the OBPR states, 'There may be considerable uncertainty about predicted impacts and their appropriate monetary valuation. Sensitivity analysis provides information about how changes in different variables will affect the overall costs and benefits of the regulatory proposal. It shows how sensitive predicted net benefits are to different values of uncertain variables and to changes in assumptions. It tests whether the uncertainty over the value of certain variables matters, and identifies critical assumptions.' See: OBPR (2010), Best Practice Regulation Handbook, Canberra.

	7 per cent	3 per cent	10 per cent
Option 3 – Government code of practice	$78.04	$87.74	$72.18
Option 4 – Regulation	$5,126.65	$6,207.62	$4,495.47

The results in Table 34 highlight the impact that different assumptions about the time value of money can have on the estimated costs of options. If the time value of money is assumed to be low (i.e. 3 per cent), then the NPV for the options will increase (relative to the 7 per cent used in this Consultation RIS), as less of the costs will be discounted in future years. Conversely, if the time value of money is assumed to be high (i.e. 10 per cent), then the NPV for the options will decrease (relative to the 7 per cent used in this Consultation RIS), as more of the costs will be discounted in future years.

7 Consultation

As part of this Consultation RIS process, PwC undertook comprehensive consultation with key government and industry stakeholders with the aim of collecting valuable data to feed into the Consultation RIS process.

PwC sought to undertake numerous and varied consultations during the development of the Consultation RIS – given the complexity of the subject matter and the need to engage with stakeholders to ensure the best available evidence was accessed.

This included:

- six face-to-face interviews with Commonwealth Government agencies
- ten face-to-face interviews with industry associations
- eight focus groups with representatives from each State and Territory government
- fourteen focus groups with industry (located in Adelaide, Brisbane, Darwin, Hobart, Melbourne, Perth and Sydney), and
- an online survey of industry.

7.1 Government engagement

PwC consulted with various government stakeholders across all jurisdictions. Prior to the consultations, PwC distributed a discussion paper to all government stakeholders to ensure they were informed about the scope and purpose of the Consultation RIS, and had an opportunity to prepare for the topics discussed in the consultations. Each government stakeholder was also given the opportunity to provide additional information via email after the consultation. Table 35 lists the government stakeholders engaged with during the RIS process and the means of consultation.

Table 35: Government stakeholders consulted during the RIS process

Jurisdiction	Department/agency	Means of consultation
Multi	National Government Advisory Group on Chemical Security National Industry Reference Group on Chemical Security	Face to face meetings (Canberra)
Commonwealth	Attorney-General's Department Australian Federal Police Australian Security Intelligence organisation Australian Pesticide and Veterinary Medicines Authority Department of Innovation, Industry, Science and Research National Industrial Chemicals Notification and Assessment Scheme Department of Agriculture, Fisheries and Forestry Department of Health and Ageing Department of Prime Minister and Cabinet	Face to face meetings (Canberra and Sydney)
Australian	Chief Minister's Department	Focus group

Jurisdiction	Department/agency	Means of consultation
Capital Territory	Office of Industrial Relations Office of Regulatory Services, Justice and Community Safety Directorate Emergency Services Agency Department of Justice and Community Safety ACT Policing Work Safety ACT	(Canberra)
Northern Territory	Department of Chief Minister NT Police NT Worksafe NT Fire and Rescue Service Department of Health Department of Resources Department of Natural Resources	Focus group (Darwin)
New South Wales	Department of the Premier and Cabinet NSW Police Workcover NSW Ministry for Police and Emergency Services NSW Fire and Rescue Better Regulation Office Department of Primary Industries Department of Transport Independent Transport Safety Regulator Rural Fire Service Ministry of Transport NSW Office of Environment and Heritage	Focus group (Sydney)
Queensland	Department of Justice and Attorney-General Department of Environment and Resource Management Queensland Health Department of Employment Economic Development and Innovation Queensland Police Service Department of Transport and Main Roads	Focus group (Brisbane)
South Australia	Department of the Premier and Cabinet Country Fire Service South Australia Police Department of Trade and Economic Development Biosecurity SA, Department of Primary Industries and Resources S A Metropolitan Fire Service. Safework SA SA Health Department of Health	Focus group (Adelaide)
Tasmania	Department of the Premier and Cabinet Tasmania Fire Service Department of Justice Department of Primary Industries, Parks, Water and Environment Department of Health and Human Services Tasmania Police	Focus group (Hobart)

Jurisdiction	Department/agency	Means of consultation
Victoria	Worksafe Victoria Victoria Police Department of Primary Industries Metropolitan Fire and Emergency Services Board Department of Premier and Cabinet	Focus group (Melbourne)
Western Australia	Department of Mines and Petroleum WA Premier and Cabinet Fire and Emergency Services Authority Chemistry Centre WA WA Police Department of Health Department of Agriculture	Focus group (Perth)

7.2 *Industry engagement*

PwC engaged with industry via three methods – face-to-face interviews, focus groups and an online survey. A discussion paper was distributed to relevant industry associations and participants in the focus groups prior to the consultations. Each industry stakeholder was also given the opportunity to provide additional information via email after the consultations.

Face-to-face interviews were conducted with the following industry associations:

- ACCORD Australasia Ltd
- Australian Logistics Council
- Australian National Retailers Association (ANRA)
- AusVeg
- Fertilizer Industry Federation of Australia (FIFA)
- National Farmers' Federation (NFF)
- Pharmacy Guild of Australia
- Plastics and Chemicals Industries Association (PACIA)
- Swimming Pool & Spa Association (SPASA) of New South Wales Ltd, and
- Universities Australia.

Focus groups were held in multiple jurisdictions with the following participants.

Table 36: Industry focus groups participants contacted during the RIS process

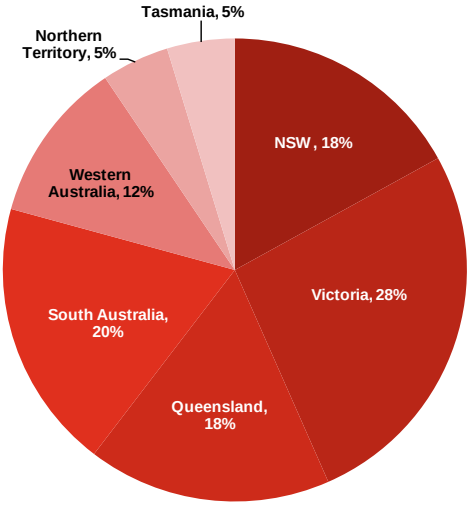
Australian Vinyls Corporation	Flowers Growers Group of NSW	Solvay Interox
AusVeg	Haifa	Tasmanian Farmers & Graziers Association
Baileys Fertiliser	Incitec Pivot Limited	The Australian National University
BASF Australia	James Cook University	The Loose Leaf Lettuce Company
Charles Darwin University	KPMG	The Pharmacy Guild of Australia
Concordia College	MF Produce	Toll Global Express
Coogee Chemicals	Murdoch University	Toll North (QLD)
Curtin University	New South Wales Farmers' AssociationNufarm Australia	Toll North (VIC)
DGL Aust	Nuplex Industries	Univar
DGL logistics	Nursery & Garden Industry Australia	University of Queensland
Ecolab	Orica Australia	University of Technology
EE Muir and Sons	PACIA	University of Western Australia
Eka Chemicals	Port of Brisbane	Vegetables WA
Elders	Protected Cropping Australia	Victorian Farmers Federation
Evonik Australia	Queensland Resources Council	Victoria University
Evonik Degussa Peroxide	Redox	Wesfarmers Chemicals
Farragher	Selleys Yates	
FBT Transwest	Sinclair Knight Merz	
Flinders University		

PwC used the online survey to supplement the consultation process. This was intended to ensure that small-to-medium enterprises had the greatest possible opportunity to contribute to the development of the Consultation RIS (given they tend to be time poor and not able to attend face-to-face meetings).

PwC distributed the online survey by asking the industry representatives of NIRG to invite their members to participate in the survey. We also asked the industry representatives to remind their members to complete the survey one week before the survey was due to close. We also sought to encourage businesses to complete the survey by emailing the survey to all stakeholders that attended our focus groups – asking them to pass the survey on to all businesses they believed would likely be affected by the proposed treatment measures.

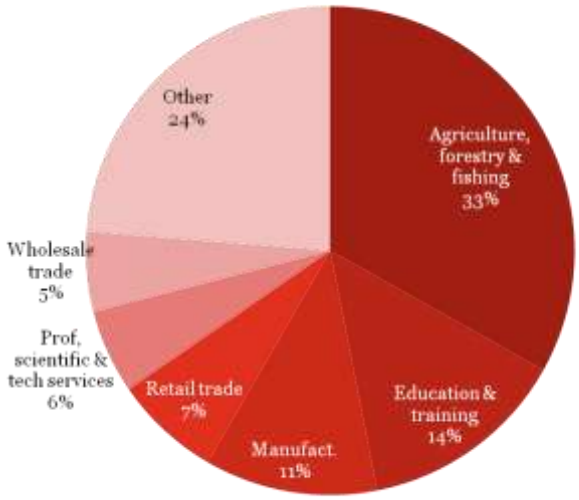
The survey was open for a period of three weeks. A total of 339 responses were received, though 106 (or 31 per cent) of these had no information recorded for any of the questions. Figure 10 shows the distribution of responses by jurisdiction.

Figure 10: Distribution of survey responses, by jurisdiction



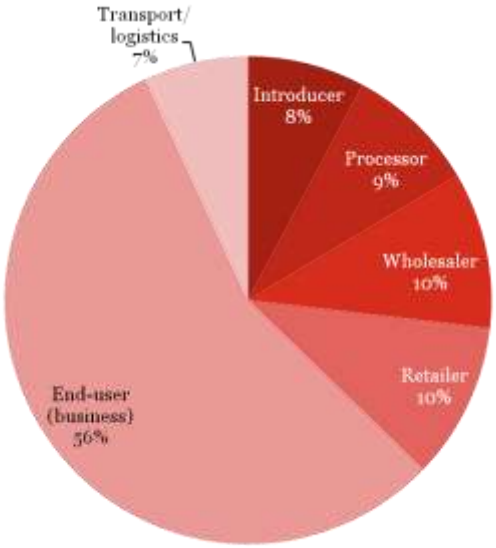
Responses were received from 19 industries across the country (Figure 11). The greatest number of responses were received from the agriculture, forestry and fishing industry (33 per cent).

Figure 11: Distribution of survey responses, by industry



The survey aimed to capture the full effects of the proposed measures along the supply chain (Figure 12). All supply chain nodes were captured with the largest response received from businesses in the end-user supply chain node (45 per cent).

Figure 12: Distribution of survey responses, by supply chain node



8 *Evaluation and conclusion*

The ultimate intent of government action in relation to precursor chemicals is to minimise the incidence (as low as reasonably practicable) and associated impacts of terrorist attacks using homemade explosives and other similar uses of homemade explosives that threaten the health and safety of the Australian public. To help achieve this broader objective, the intermediate objectives of government action are:

- to minimise illegitimate access to 11 chemicals that are precursors to homemade explosives, and
- to increase the provision of useable intelligence relating to the illegitimate access of the 11 precursor chemicals to Australian law enforcement and security agencies.

All four options considered in this Consultation RIS are likely to contribute to the ultimate and intermediate objectives of government action, although for reasons set out in earlier parts of this Consultation RIS, the extent that each option might meet the objectives is unknown at this stage. By encouraging the uptake of the proposed treatment measures (particularly 'Security Awareness', 'Theft and Diversion Procedures' and 'Point of Sale Procedures'), the options are likely to improve the capacity of some businesses to deter, prevent and detect the theft and diversion of precursor chemicals, and the quality of information provided by industry to law enforcement and intelligence agencies. It is important to note, however, that the effectiveness of some treatment measures is questionable. Feedback from stakeholders suggest that 'Inventory Control', 'Consignment Control' and 'Employee and Contractor Checking' are likely to have a marginal impact on how businesses manage security risks and interact with law enforcement and intelligence agencies.

In line with the COAG Best Practice Regulation Guidelines, this Consultation RIS is required to identify a preferred option that generates the greatest net benefit for the Australian community.

The results of the cost-benefit analysis suggest that mandating the treatment measures through regulation (Option 4) is likely to impose significant costs on industry. Furthermore, it does not appear reasonable, based on feedback received from stakeholders, that delivery of the proposed treatment measures through regulation would be able to prevent between 2.20 and 6.77 terrorist attacks using homemade explosives over a 10-year period. Consequently, Option 4 is not favoured having regard to Australia's National Terrorism public alert level, which stands at 'medium'.

Of the three voluntary options, it is difficult for this Consultation RIS to identify one option that clearly generates a greater net benefit for the community than the other two. The costs and the results of the break-even analysis for Options 1-3 are relatively similar – or at least not so divergent as to preclude any of the voluntary options at this stage.

Each of the three options are also broadly aligned with stakeholder preferences expressed during consultations – that is, for an approach that was voluntary and that encapsulated the proposed treatment measures as 'best practice' for managing chemical security risks.

Nonetheless, despite these similarities, and in order to satisfy the COAG Best Practice Regulation Guidelines, this Consultation RIS has identified Option 3 (a single government code of practice) as the preferred option. The reasoning in support of this conclusion is fourfold:

- Option 1 is less favoured, as it is questionable how sustainable the impacts of the targeted awareness campaign will be in the medium-to-long-term. Stakeholder feedback is sought about the likely effectiveness of a targeted awareness campaign in engendering cultural change in relation to the management of chemical security risks
- this Consultation RIS assumes that the level of benefits generated by an option is directly proportionate to adoption levels. That is, greater adoption of the proposed treatment measures will generate greater aggregate benefits. Earlier feedback from stakeholders suggests that more businesses are likely to adopt the proposed treatment measures under Option 3 relative to Option 2. Based on this assumption and stakeholder feedback, this Consultation RIS assumes that Option 3 will have more benefits than Option 2
- it would appear more appropriate for governments to develop a code of practice (rather than industry), given that national security is primarily the responsibility of governments, and
- Option 3 is likely to be more practicable and manageable – one body would be responsible for developing and promulgating a code of practice, compared to seven under Option 2. Likewise, it would be easier under Option 3 for law enforcement and intelligence agencies to ensure the code of practice is adaptive to emerging risks.

As this is a Consultation RIS, the above conclusion is preliminary. It is based on available evidence and a number of assumptions about the likely effectiveness of the options.

Significant uncertainty exists about the extent to which the treatment measures and options will reduce the risk of homemade explosive use for criminal purposes. The assumption used in this Consultation RIS – that an increase in industry adoption of the treatment measures will result in a greater level of risk reduction – requires validation from stakeholders and other sources.

Likewise, the estimates of costs and benefits in this Consultation RIS are based on assumptions of the extent to which businesses would adopt the treatment measures under each option. While these assumptions draw on stakeholder feedback (collected through an online survey and nationwide focus groups), further validation of our assumptions is sought from stakeholders.

Lastly, while this Consultation RIS assumes that the four options would increasingly be able to minimise the risk of precursor chemicals being used to make

homemade explosives for terrorist and criminal purposes, the extent to which Options 1-4 offer a policy alternative that is superior to current arrangements is uncertain. On the one hand, continuation of the status quo would leave unaddressed the identified gaps in how businesses currently manage the security risks associated with legitimate and illegal access to precursor chemicals. However, as this Consultation RIS does not have a clear picture about the extent to which the options could reduce the security risks associated with precursor chemicals, it is possible that some of the options may only be marginally more effective than the status quo in managing these risks.

To ensure the Decision RIS is able to draw on best available evidence, stakeholder feedback is sought in relation to the following questions.

18. ***What is the likely effectiveness of a targeted awareness campaign in engendering cultural change in relation to the management of chemical security risks?***
19. ***To what extent are the options likely to reduce the risk of individuals and groups using homemade explosives for criminal purposes? Is the regulatory option (Option 4) likely to lead to a greater risk reduction than the voluntary options (Options 1-3)? Are the voluntary options likely to lead to different levels of risk reduction?***
20. ***This Consultation RIS assumes that each of the options will reduce, to some extent, the risk of precursor chemicals being used to formulate homemade explosives. Do you agree with this assumption? Are the options likely to deliver greater security benefits than the status quo? Please provide detail in support of your reasoning. (see page 93 for more detail)***
21. ***How reasonable are assumptions made in this Consultation RIS about the expected level of adoption of the treatment measures by industry under each of the options? Is it reasonable to expect that more businesses would adopt the treatment measures under a government code of practice compared with a series of industry codes and/or a targeted awareness campaign?***

Alternative options

Feedback provided by stakeholders suggests that some treatment measures are likely to be less effective in managing security risks than others. Stakeholders have questioned in particular the effectiveness of 'Consignment Control', 'Inventory Control' and 'Employee and Contractor Checking'.

Reflecting this stakeholder feedback, this Consultation RIS undertook additional cost-benefit analysis to explore what the likely impacts of the four options would be if they did not include those measures that are seen as being less effective. Summarised in Table 33, the results of this additional analysis suggests that the costs associated with the 'alternative' options are less than those of the 'normal' options – significantly so in the case of Option 4.

We have not included the results of the additional cost-benefit analysis in our discussion of the preferred option, as we did not discuss the alternative options with stakeholders during our initial consultations. We are seeking, however, stakeholder feedback about:

- whether it is appropriate and preferred to reframe the options to focus on those treatment measures that are seen to be more effective in addressing security risks
- which, of the four alternative options, is likely to be more cost effective – for example, would the greater costs of Option 4 (relative to Option 1, Option 2 and Option 3) be worth whatever further reduction in risk that might occur?

9 Implementation and review

If Option 3 is still identified as the preferred option after the public consultation period and the finalisation of the Decision RIS, the following broad steps would be undertaken to implement and monitor Option 3.

9.1 Implementation

All jurisdictions will undertake the implementation of Option 3, in conjunction with relevant industry associations. AGD, on behalf of the Australian Government, will take responsibility for developing and promulgating the code of practice on behalf of COAG. The other jurisdictions and relevant industry associations will contribute to the development and promulgation of the industry codes, and provide assistance, where required.

An implementation plan will be developed and approved through NGAG, in consultation with NIRG.

The treatment measures and Option 3 have been developed with the current National Terrorism Public Alert ('medium') in mind. If the alert level were to change, this may require re-consideration of the level of risk mitigation. The monitoring and review processes would be designed to allow for this.

9.2 Monitoring and review

It is foreseen that the effects of the proposal will be evaluated within three years after the end of the implementation period. Core indicators for possible monitoring and evaluation include:

Impacts

- enhanced business capacity to prevent, detect and deter illegitimate and legitimate access to precursor chemicals by individuals and groups wanting to formulate homemade explosives for criminal purposes
- increased business and community contribution to intelligence and law enforcement efforts to prevent the use of homemade explosives for criminal purposes, and
- increased harmonisation and uniformity of outcomes across the Commonwealth, states and territories.

Outcomes

- increased number of suspicious transactions identified and reported
- increased number of incidents involving homemade explosives detected and prevented, and

- increased number of terrorists and other criminals apprehended.

Outputs

- increased number of retailers and other supply chain stakeholders reached through awareness-raising campaigns, education and training, etc., and
- a code of practice developed by governments to cover all industry groupings and increased numbers of businesses signing up to these Codes of Conduct.

Monitoring and evaluation could make use of reports made to the National Security Hotline.

Appendices

Appendix A Policy and regulatory framework

1 Overarching principles

The 2008 COAG Report on Chemicals of Security Concern outlined six overarching principles to guide the development of strategies to manage chemicals of security concern:

1 control measures should be proportionate to the assessed risk of the use of chemicals for terrorist purposes

2 the development of strategies for control measures should be nationally coordinated and agreed outcomes nationally consistent

3 control measures should, where possible, be built on existing industry and/or government arrangements

4 proposed control measures should be cost effective and subject to a cost benefit analysis

5 control measures should be developed in partnership between government and industry so that appropriate knowledge and needs can be integrated effectively and efficiently, and

6 Australia should take account of arrangements applied in other countries to achieve common security outcomes that do not restrict industry competitiveness and the trade of chemicals.

2 Chemical Security Management Framework

The Framework was set up following the 2008 COAG Report. The objective of the Framework is to limit opportunities for the use of chemicals by terrorists through improvements in Australia's capability, monitoring and control mechanisms. It aims to provide a structured process for developing and implementing measures that are proportionate to the assessed risk, to enhance the security of chemicals on an ongoing basis. The Framework comprises:

- an agreed approach to conduct security risk assessments across all elements of the supply chain of chemicals of potential security concern
- several initial strategies to improve the security around chemicals. These include:
  - improving community awareness of the security risks posed by chemicals of security concern
  - enhancing the capability of industry to contribute to the security of chemicals, building on existing industry activities where possible, and
  - measures to enhance the capability of government agencies involved in managing the security risks of the terrorist misuse of chemicals, and

- management and governance arrangements to allocate roles and responsibilities, and establish ongoing coordination and consultation arrangements, between governments and between governments and industry.

Subsequent to COAG's adoption of the Framework, the Commonwealth and State and Territory governments signed the Intergovernmental Agreement on Australia's National Arrangements for the Management of Security Risks Associated with Chemicals (IGA) in October 2008 (Box 2 provides an overview of Australia's regulatory framework for chemicals). The objective of the IGA is to establish an effective, coordinated and collaborative national approach to the management of chemical security that seeks to prevent the use of chemicals for terrorist purposes. Key governance and coordination arrangements established under the IGA include:

- a Chemical Security Coordination Unit (CSCU) – to coordinate the national implementation of the Framework and a Chemical Security Risk Assessment Unit (CSRAU) to develop the risk assessment methodology and conduct risk assessments
- a National Government Advisory Group on Chemical Security (NGAG) – comprising officials from the Commonwealth, State and Territory governments, including appropriate representation from jurisdictional police, and
- a National Industry Reference Group on Chemical Security (NIRG) – comprising representatives from relevant industry sectors.

Box 2: The regulation of chemicals in Australia[72]

The framework for regulating chemicals in Australia is complex. In its 2008 landmark study on *Chemicals and Plastics* Regulation, the Productivity Commission highlighted four reasons for this complexity:

- The allocation of constitutional powers – 'under the Constitution, the Commonwealth has powers over trade and corporations, but the states (and territories) have most of the constitutional powers to directly regulate the use of chemical.'
- Different regulatory streams – the regulation of chemicals in Australia has 'traditionally been organised around distinct end uses', such as 'industrial chemicals, agricultural chemicals and veterinary medicines, pharmaceutical and therapeutic goods, and food.'
- The incorporation of chemical regulation in broader regulatory frameworks – 'chemicals regulation largely exists within, or is grafted onto, generic regulatory frameworks that govern public health, occupational health and safety (OHS), transport safety, agriculture, the environment and national security.'
- The existence of self-regulation – the chemicals industry has traditionally been active in regulating its own practices.

Australia thus does not have a single framework for the regulation of chemicals, with a single Act or regulator. Rather, the 'net result is that there are numerous Acts, regulations and codes, and there are many different regulators, government agencies and industry groups involved in chemical regulation.'

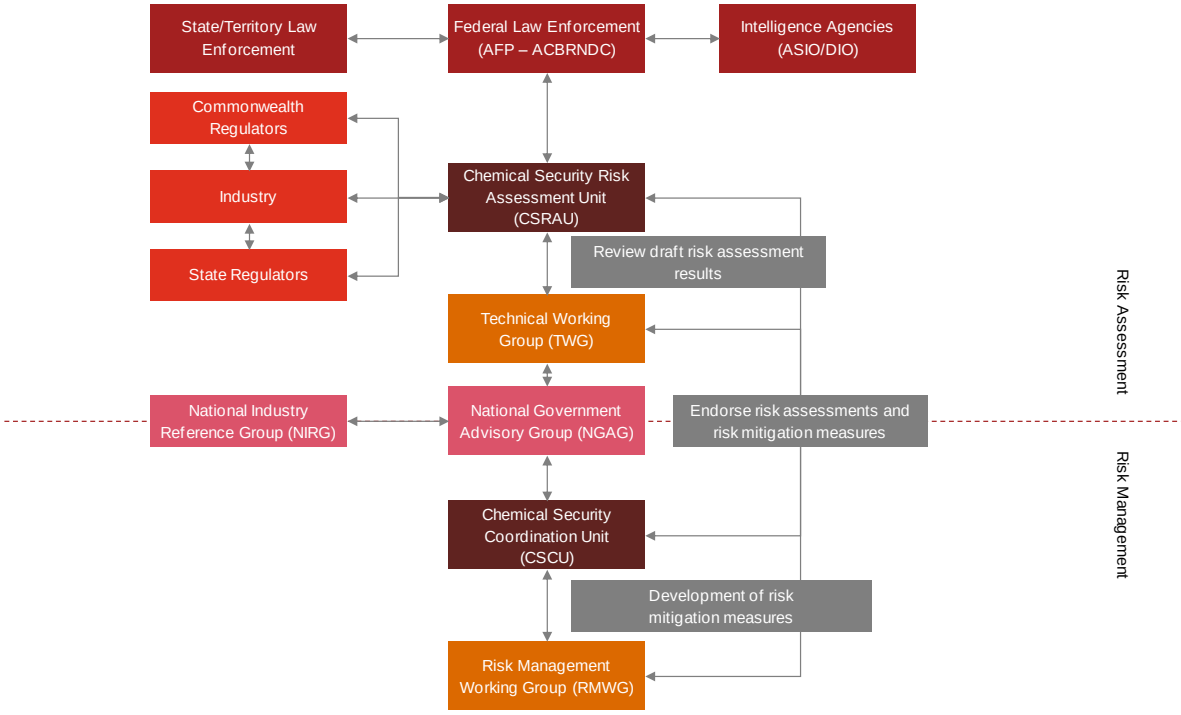
Following the release of the Productivity Commission's report, COAG agreed to a number of reforms, including the establishment of a new governance framework to oversee chemicals and plastics regulatory reform. Key to this new governance framework is the Memorandum of Understanding for Chemicals and Plastics Regulatory Reform between all Australian governments, and the establishment of the Standing Committee on Chemicals.

[72] Department of Innovation, Industry, Science and Research (2011), 'Standing Committee on Chemicals', http://www.innovation.gov.au/Industry/ChemicalsandPlastics/SCOC/Pages/default.aspx, accessed on: 28 September 2011; Productivity Commission (2008), Chemicals and Plastics Regulation, Research Report, Melbourne.

3 Chemical security risk assessment methodology

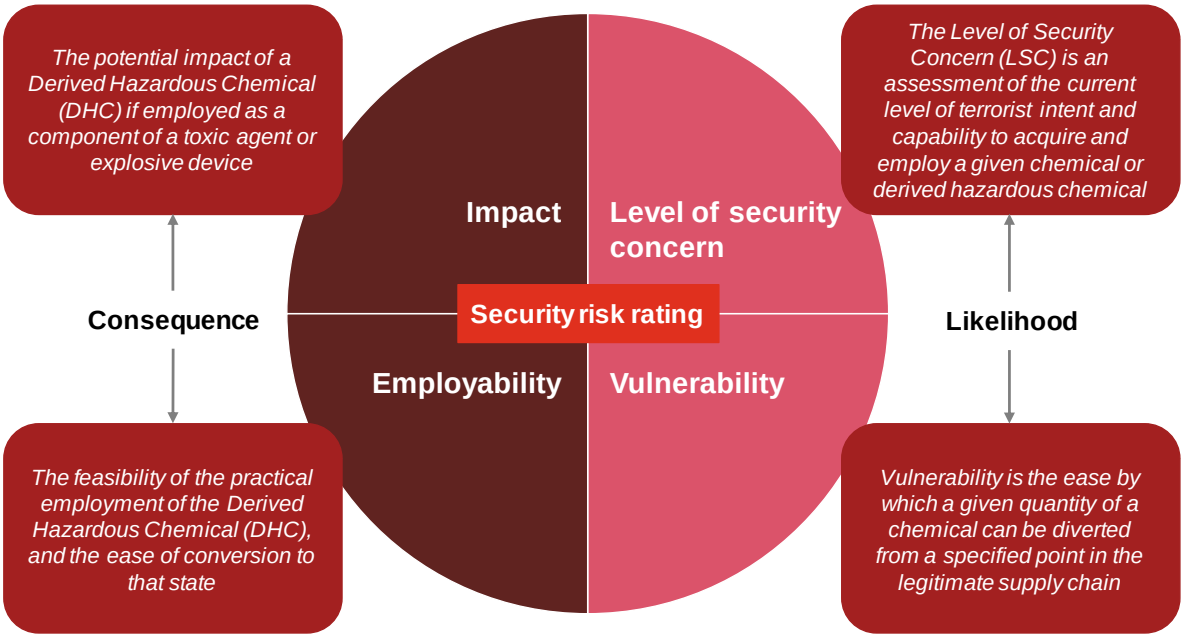
In July 2009, NGAG approved the Chemical Security Risk Assessment (CSRA) process (Figure 13).

Figure 13: Chemical security risk assessment process



The Chemical Security Risk Assessment Methodology (CSRAM) tool underpins the CSRA process. The CSRAM assesses the security risk posed by the diversion of security-sensitive chemicals from the legitimate supply chain for use by terrorists. It calculates a risk rating based on information obtained from law enforcement and intelligence partners and a representative sample of companies that handle the chemical. The CSRAM can assess chemicals in their pure form as well as with reference to the derived hazardous chemicals they may be used to create. At a high level, the CSRAM is based on the Australian Standard for Risk Assessment (AS4360) and compliant with its successor, the International Standard for Risk Management AS/NZS ISO 31000. The CSRAM assesses four data inputs in developing a security risk rating: impact, employability, level of security concern, and vulnerability (Figure 14).

Figure 14: Chemical Security Risk Assessment Methodology



Appendix B Background to the 11 chemicals of security concern

1 Overview

Table 37 provides a summary of our estimates of the number of businesses that use/handle the 11 precursor chemicals across Australia. Greater detail about how we calculated these estimates is provided in Appendix I. It is important to note that the supply chain figures presented below do not account for double counting between chemicals across nodes, and between nodes.

Table 37: Supply chain summary, precursor chemicals

	Introducers	Processors	Wholesalers	Retailers	End-users (business)	Transport/ logistics
Hydrogen Peroxide	50	461	33	8524	2830	1,487
Nitric Acid	49	346	30	124	11548	
Sodium Chlorate	12	46	13	0	611	
Potassium Chlorate	7	46	9	0	455	
Sodium Perchlorate	14	46	4	0	592	
Potassium Perchlorate	10	46	8	0	455	
Ammonium Perchlorate	3	46	1	0	431	
Sodium Nitrate	18	115	22	0	1253	
Potassium Nitrate	46	115	25	816	7146	
Nitromethane	8	46	5	109	554	
Sodium Azide	9	23	4	0	1241	

The following sections provide greater detail about the precursor chemicals, highlighting their major properties, typical uses of the chemicals in the Australian context, and potential issues of security concern.

2 Hydrogen peroxide

Hydrogen peroxide (H_2O_2), designated CAS number 7722-84-1, is a very pale blue liquid, slightly more viscous than water and appears colourless in dilute solution. It is a weak base, has strong oxidizing properties, and is a powerful bleaching agent.

It is estimated 11,517 tonnes of hydrogen peroxide are introduced into Australia each year for genuine use in a range of industries and products. Hydrogen peroxide is widely used in diverse industry sectors such as paper and pulp bleaching, laundry, food and beverage, dairy, hair and beauty, mining, pool and spa, pharmaceuticals, water treatment, cleaning.

Industrial uses: Due to its oxidising properties, hydrogen peroxide is often used as a bleach or cleaning agent. Data provided by AGD suggests that currently in

Australia, 70 per cent of hydrogen peroxide is used for paper bleaching. Other bleaching applications such as a purifier for water treatments are becoming more important as hydrogen peroxide is seen as an environmentally benign alternative to chlorine based bleaches. For laboratory use, 30 per cent solutions are most common but commercial grades from 70 per cent to 98 per cent are available. Concentrations above 68 per cent are considered to be hazardous and typically buyers must submit to inspection.

Non-industrial uses: It is used in the health and beauty sectors given its bleaching or stripping properties. It can be used as a toothpaste or oral debriding agent, a tooth whitener, mouthwash, hair dye, bleaching treatments, and skin treatments (not wound care as commonly thought). For consumers, it is usually available from pharmacies and large supermarkets at 3 per cent and 6 per cent concentrations.

Issues of security concern: Hydrogen peroxide is seen as a hazardous chemical as it is used in the derivation of chemicals such as tri-acetone tri-peroxide (TATP). These chemicals have been used in terrorist attacks such as the 2005 London bombings, and in disrupted terrorist attempts such as the December 2001 'shoe bomber' attack in the United States, and the 2006 plan to bomb transatlantic flights between the united Kingdom and the United States and Canada.

3 Nitric acid

Nitric acid (HNO_3), designated CAS number 7697-37-2, is a colourless liquid with strong oxidising properties. Nitric acid reacts violently with many organic materials and the reactions may be explosive.

It is estimated 2,264 tonnes of nitric acid are introduced into Australia each year for genuine use in a range of industries and products. In Australia, nitric acid is widely used in diverse industry sectors such as mining, food and dairy, food and beverage, metal processing and treatment, chemical processing and supply.

Industrial uses: Nitric acid is commonly used as a strong oxidising agent and its main use is for the production of fertilisers. Other important uses include in the manufacture of explosives and for the cleaning of food and dairy equipment primarily to remove precipitated calcium and magnesium compounds. Typical businesses that use this chemical include smelters, water/metal treatment facilities and dairy farms.

Non-industrial uses: Nitric acid can be found in the home in some dental products.

Issues of security concern: Nitric acid may react violently with powerful reducing agents causing fire and explosion and is used in the production of chemicals such as urea nitrate (UN) and nitro-glycerine (NG). It is a cause for concern as these chemicals have been used in terrorist attacks such as the 1993 bombing of the World Trade Centre in the United States.

4 Sodium chlorate

Sodium chlorate ($NaClO_3$), designated CAS number 7775-09-9, is a compound containing sodium, chlorine and oxygen. In pure form, it is a white crystalline substance, readily soluble in water.

It is estimated 23,689 tonnes of sodium chlorate are introduced into Australia each year for genuine use in a range of diverse industries and products. In Australia, sodium chlorate is widely used in industry sectors such as mining, metal treatment, paper production, and food chemicals as well as as a laboratory and diagnostic reagent.

Industrial uses: Sodium chlorate is primarily used as a bleaching agent whereby a large percentage of the chemical is used in the bleaching of pulp. It is also used in the treatment of metal and water and in the food manufacturing industry due to its disinfectant properties.

Non-industrial uses: Within the household, sodium chlorate can be commonly found in bleach and is frequently used as a disinfectant, bleaching agent or as a chlorination treatment. The concentration within these household products is largely at very low volumes with sodium chlorate generally being in a 3 per cent – 6 per cent solution. It can also be used as a non-selective herbicide.

Issues of security concern: Sodium chlorate is a cause for concern as it presents a risk of fire and explosion if contained within dry mixtures with other substances as it is a strong oxidant and reacts violently with combustible and reducing materials. Specifically, it reacts with many organic materials to form shock sensitive mixtures.[73] Generally, marketed formulations contain a fire retardant. However, this would have little effect if deliberately ignited.

5 Potassium chlorate

Potassium chlorate ($KClO_3$), designated CAS number 3811-04-9, is a compound containing potassium, chlorine and oxygen. In pure form, it is a white crystalline substance, readily soluble in water.

It is estimated 5 tonnes of potassium chlorate are introduced into Australia each year for genuine use in a range of diverse industries and products. In Australia, potassium chlorate is used in industry sectors such as fireworks and explosives, and as a laboratory and diagnostic reagent.

Industrial uses: Potassium chlorate is most often industrially used as an oxidising agent, disinfectant or cultivator. It is also commonly used within products such as matches, fireworks and explosives as it will react and burn vigorously in combination with most combustible material.

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[73] National Institute for Occupational Safety and Health, International Chemical Safety Card 1117, Chemical Dangers, http://www.cdc.gov/niosh/ipcsneng/neng1117.html

Non-industrial uses: Potassium chlorate is found in the household within mouth wash and gargles as it is used as a mild astringent for inflammatory conditions of the mouth and pharynx.

Issues of security concern: Potassium chlorate is considered to be a chemical of concern as chemicals derived from it have been used in terrorist attacks such as the 2002 Bali bombings and the 2003 bombing of the JW Marriott Hotel in Jakarta.

6 Sodium perchlorate

Sodium perchlorate ($NaClO_4$), designated CAS number 7601-89-0, is an inorganic compound containing sodium, chlorine and oxygen. It is a white crystalline, hygroscopic solid that is highly soluble in water and in alcohol.

It is estimated 396 tonnes of sodium perchlorate are introduced into Australia each year for genuine use within industries and products. In Australia, sodium perchlorate is used in industry sectors such as mining and smelting, and as a laboratory and diagnostic reagent.

Industrial uses: Sodium perchlorate is often used within laboratories, often as a nonreactive electrolyte across a range of fields. It is also used in the manufacture of explosives and matches due to its ability to produce oxygen.

Non-industrial uses: n/a.

Issues of security concern: Sodium perchlorate is considered to be a chemical of concern as chemicals derived from it have been found in homemade explosive materials within Australia.

7 Potassium perchlorate

Potassium perchlorate ($KClO_4$), designated CAS number 7778-74-7, is an inorganic salt compound containing potassium, chlorine and oxygen. It is commonly obtained as an odourless white crystalline powder and is a strong oxidiser that reacts with many organic substances.

It is estimated 415 tonnes of potassium perchlorate are introduced into Australia each year for genuine use within a range of industries and products. In Australia, potassium perchlorate is used in industry sectors such as fireworks and explosives, smelting, and as a laboratory and diagnostic reagent.

Industrial uses: Potassium perchlorate is a commonly used strong oxidiser and is used in the fireworks and explosives industry in the manufacture of fireworks, ammunition percussion caps, explosive primers, propellants and sparklers due to its strong reactive force. Other uses include within laboratories and as a rocket propellant due to its fast burn rate.

Non-industrial uses: Potassium perchlorate may be found within some medications as it can be used to treat hyperthyroidism. It may also be used as a disinfectant.

Issues of security concern: Potassium perchlorate is considered to be a chemical of concern as chemicals derived from it have been found in homemade explosive materials within Australia.

8 Ammonium perchlorate

Ammonium perchlorate (NH_4ClO4), designated CAS number 7790-98-9, is the ammonium salt of perchloric acid and is a compound containing nitrogen, hydrogen, chlorine and oxygen. In pure form, it is commonly observed as an odourless white crystalline powder and is a strong oxidiser that reacts with many organic substances.

It is estimated 0.068 tonnes of ammonium perchlorate are introduced into Australia each year for genuine use within a range of industries and products. In Australia, ammonium perchlorate is used in industry sectors such as fireworks and explosives, rocketry, and as a laboratory and diagnostic reagent.

Industrial uses: Ammonium perchlorate is a powerful oxidiser resulting in its use largely within fireworks and explosive organisations. Further, due to its important oxidising capabilities, it has a long history of use for the manufacture of solid propellants such as rockets and missiles. It can also be found in laboratories across Australia.

Non-industrial uses: n/a.

Issues of security concern: Ammonium perchlorate is considered to be a chemical of concern as chemicals derived from it have been found in homemade explosive materials within Australia.

9 Sodium nitrate

Sodium nitrate ($NaNO_3$), designated CAS number 7631-99-4, is an inorganic compound containing sodium, nitrogen and oxygen. It is a salt, hygroscopic, and exists as white powder or colourless crystals, with a sweet smell. It is highly soluble in ammonia and alcohol.

It is estimated 2,204 tonnes of sodium nitrate are introduced into Australia each year for genuine use within a range of industries and products. In Australia, sodium nitrate has a variety of industry uses including as an ingredient in fertilisers, pyrotechnics, as a food preservative and as a solid rocket propellant.

Industrial uses: Sodium nitrate is used in a variety of sectors. It is commonly used as an ingredient in fertilisers and can be found in many laboratories across Australia. It is also less commonly used in pyrotechnics, in metal treatment, as a food preservative and as a solid rocket propellant.

Non-industrial uses: Sodium nitrate may be found in the home or those places dealing with glass or pottery making as it is used in glass and pottery enamels.

Issues of security concern: Sodium nitrate is considered to be a chemical of concern given its use in products such as fireworks and other pyrotechnic

materials. Pyrotechnic powders from fireworks, black powder, and smokeless powders are several examples of readily available materials used for the assembly of IEDs and account for 54 percent of all explosive materials, according to the Bureau of Alcohol, Tobacco, Firearms and Explosives.

10 Potassium nitrate

Potassium nitrate (KNO_3), designated CAS number 7757-79-7, is an inorganic compound containing potassium, nitrogen and oxygen. It is not particularly hygroscopic, is only moderately soluble in water but is soluble in glycerol, ammonia, and slightly soluble in ethanol. Potassium nitrate is a salt, and occurs as a crystalline, odourless white powder.

It is estimated 19,532 tonnes of potassium nitrate are introduced into Australia each year for genuine use within a range of industries and products. In Australia, potassium nitrate has a number of industry uses including fertilisers, fireworks and rocketry, and also in food preservation.

Industrial uses: Potassium nitrate can be found in a variety of products however it is most commonly used as a fertiliser as it is a natural solid source of nitrogen and potassium which are two of the predominant chemicals required by plants. It can also be found within rocket propellants and fireworks due to its efficient oxidising properties. Its oxidising properties also make the chemical ideal for the use in the heat treatment of metals.

Non-industrial uses: Potassium nitrate may be found in the home in some toothpastes designed for sensitive teeth.

Issues of security concern: Potassium nitrate is considered to be a chemical of concern given its use in products such as fireworks and other pyrotechnic materials. Pyrotechnic powders from fireworks, black powder, and smokeless powders are several examples of readily available materials used for the assembly of IEDs and account for 54 percent of all explosive materials, according to the United States Bureau of Alcohol, Tobacco, Firearms and Explosives.

11 Nitromethane

Nitromethane (CH_3NO_2), designated CAS number 75-52-5, is a simple organic nitro compound that is commonly obtained as a slightly viscous, highly polar, colourless liquid with a characteristic chloroform-like odour.

It is estimated 37 tonnes of nitromethane are introduced into Australia each year for genuine use within a range of industries and products. In Australia, nitromethane is widely used in industry sectors such as pharmaceuticals, analytical laboratories, as a racing fuel in high performance racing and in hobby shops as a fuel component in radio-controlled models.

Industrial uses: Nitromethane has a variety of applications. It is used within laboratories across Australia for extractions, as a reaction medium and as a

cleaning solvent. It is widely found in organisations that manufacture pharmaceuticals, pesticides, explosives or coatings.

Non-industrial uses: Nitromethane is used by those within the racing scene or those who deal with miniature engines. It is used as a racing fuel in drag racing and is an important component in the fuel for miniature internal combustion engines used in radio controlled models and other miniature engines.

Issues of security concern: Nitromethane is considered to be a chemical of concern as when mixed with other chemicals it can form an explosive composition. It has been found that nitromethane is a more energetic high explosive than TNT but is insensitive. In April 1995, a truck containing approximately 5,000 pounds (2,300 kg) of ammonium nitrate, nitromethane, and diesel fuel was detonated in front of the Alfred P. Murrah Federal Building (the Oklahoma City Building). It was the largest terrorist attack on American soil in history before the September 11 attacks and remains the deadliest act of domestic terrorism in American history.

12 Sodium azide

Sodium azide (NaN_3), designated CAS number 26628-22-8, is an inorganic salt compound containing sodium and nitrogen. It occurs as a colourless, odourless, crystalline solid (salt-like) or solution. It is soluble in water or liquid ammonia, slightly soluble in alcohol and insoluble in ether. Synonyms and trade names include azium, smite, azide and sodium salt of hydrazoic acid.

It is estimated 1.7 tonnes of sodium azide are introduced into Australia each year for genuine use within a range of industries and products. In Australia, sodium azide is used in industry sectors such as smelting, as a biocide in hospitals and laboratories and in dairies.

Industrial uses: Sodium azide can be found in a range of sectors. Due to its explosive nature it is used as the predominant gas forming component in many car airbag systems and airplane escape chutes whereby a collision will trigger a charge causing the sodium azide to explode and release nitrogen gas inside the bag/chute. It is also used as a chemical preservative in hospitals and laboratories as well as within the agriculture sector for pest control. It can also be found in laboratories whereby it is used in organic synthesis as well as inorganic azide compounds.

Non-industrial uses: n/a.

Issues of security concern: Sodium azide is considered to be a chemical of concern as it is used in the formation of chemicals such as lead azide whereby these chemicals are then used in detonators.

Appendix C Existing controls

This appendix provides further detail of the range of controls that seek to manage the risks posed by chemicals to human and environmental health. It does not provide an overview of all controls that relate to the use and handling of all chemicals in Australia. Rather, it provides a summary of the key existing controls that are relevant to the 11 precursor chemicals.

Targeted awareness campaigns

Following the signing of the Intergovernmental Agreement, AGD launched Phase One of the Chemicals of Security Concern campaign. This was aimed at raising general awareness within the community and industry about the potential for everyday household chemicals to be misused by terrorists, and encouraging people to report suspicious activity to the National Security Hotline. AGD is about to release Phase Two of the Chemicals of Security Concern campaign. Phase Two is intended to be more targeted than Phase One; providing tailored messages about security risks to different segments across the relevant chemical supply chains.

Self-regulation

Numerous forms of self-regulation exist across all chemical sectors and all elements of the supply chain. These include 'stewardship programs, codes of practice and training and accreditation programs.'[74] Examples of self-regulation include:

- Agsafe has a Code of Conduct that members must abide by that involves training and accreditation focused on safety and regulatory obligations, and
- the Fertcare program, a joint initiative between the Fertiliser Industry Federation of Australia (FIFA) and Australian Fertiliser Services Association (AFSA), offers training, quality assurance, certification and accreditation that covers environment, food safety and OH&S issues.

Industry-government partnerships

An example of an industry-government partnership in the chemical sector is Customs Watch (formerly the Frontline Program), a ooperative program between Customs and Border Protection and industry groups involved in international trade and transport that aims to prevent illegal activities.[75]

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74 COAG (2008), Report on the Control of Chemicals of Security Concern, Canberra.

75 Australian Customs and Border Protection Service (2011), 'Customs Watch', http://www.customs.gov.au/customswatch/partnerships.asp. Accessed on: 24 January 2012.

Regulation

More than 140 pieces of Commonwealth and State and Territory legislation exist in Australia for the regulation of chemicals. Controls vary between jurisdictions and are covered by a variety of regulatory bodies that deal with different aspects of regulation, such as OH&S, the environment, public health and international obligations (such as the Chemical Weapon Convention). Examples of regulation include:

- under the *Industrial Chemicals (Notification and Assessment) Act 1989*, new industrial chemicals must be assessed by NICNAS and listed in the Australian Inventory of Chemical Substances before being supplied in Australia. NICNAS's legislative role focuses on the assessment of risks to public health, occupational health and safety and the environment. The assessment is of the chemical used rather than the product in which it is contained. NICNAS also has a program for reviewing the safety of existing chemicals
- the Commonwealth *Agricultural and Veterinary Chemicals Code Act 1994* requires agricultural and veterinary chemical products to be evaluated by the APVMA and included in the Register of Chemical Products before they can be supplied to the marketplace. The APVMA's legislative role focuses on assessing the product's efficacy and the potential impact on public health, worker safety, the environment and trade. It can impose restrictions relating to end-use safety, quality and efficacy of products permitted to be supplied in Australia
- the Poisons Standard (sometimes called Standard for the Uniform Scheduling of Medicines and Poisons or SUSMP) contains the decisions of the Department of Health and Ageing on the classification of chemicals and medicines for inclusion in relevant legislation and the model provisions regarding containers and labels, and recommendations about other controls on medicines and chemicals. Its purpose is to promote uniformity in the scheduling of substances and in labelling and packaging requirements throughout Australia. Under the Commonwealth *Therapeutic Goods Act 1989* scheduling considerations include the intrinsic hazards (toxicity) of the chemical substance, safety in use, the need for the substance and its potential for abuse. Scheduling decisions have no effect until they are included in State and Territory legislation and sometimes this means that controls differ between jurisdictions
- the land transport of dangerous goods is regulated under State and Territory legislation that reflect the Australian Dangerous Goods Code Road and Rail (ADGC) that provides that consistent technical requirements for the land transport of dangerous goods across Australia. The ADGC and associated model legislation is maintained by the National Transport Commission, and
- all states and territories have a principal Occupational Health and Safety Act that codifies the duties of care under common law. These are supported by detailed requirements set out in regulations. Under these regulations, chemicals that pose a physical hazard to people, property or the environment (e.g. explosive goods) are regulated as 'dangerous goods'. Such goods are generally required to be stored in a secure manner. The focus on physical hazards (as opposed to

security risks) will remain the same under the hazardous substances regulatory package.

Appendix D International regulatory arrangements

1 United States

The Chemical Facility Anti-Terrorism Standards (CFATS) are a set of US government security regulations governing the security of high-risk chemical facilities. They establish risk-based performance standards for the security of high-risk chemicals facilities.[76] The CFATS requires chemical facilities to prepare Security Vulnerability Assessments, which identify facility security vulnerabilities, and to develop and implement Site Security Plans, which include measures that satisfy the identified risk-based performance standards.

Any chemical facility that possesses a chemical of interest at or above the applicable screening threshold quantity for that chemical facilities must undertake a Chemical Security Assessment Tool (CSAT) Top-Screen to make a preliminary assessment of what risk tier they are categorised. The on-line questionnaire must be completed by facilities that possessed any chemical on the CFATS Chemicals of Interest List.[77] A risk-based tiering structure has been developed that focuses resources on high-risk chemical facilities. Facilities are assigned to one of four risk-based tiers ranging from high (Tier 1) to low (Tier 4) risk. Assignment of tiers is based on an assessment of the potential consequences of a successful attack on assets associated with chemicals of interest.

The list of chemicals of interest contains approximately 300 chemicals and forms Appendix A of the CFATS. Ten out of the eleven precursor chemicals identified by COAG are on the *CFATS Chemicals of* Interest *List*.[78]

2 United Kingdom

The National Counter Terrorism Security Office (NaCTSO) is responsible for the protection of crowded places, the protection of hazardous sites and dangerous substances, and assisting to protect the Critical National Infrastructure. The United Kingdom adopts a non-regulatory approach to the management of the security risks posed by chemicals of security concern. The focus of NaCTSO initiatives is public awareness including:

- 'Know your customer' campaign – This initiative aims to raise awareness among site operators about the 'dual-use' nature of their products and give basic advice about ensuring they supply those products to known customers[79]

[76] http://www.dhs.gov/files/laws/gc_1166796969417.shtm [Accessed 26 September 2011].
[77] http://www.dhs.gov/xlibrary/assets/chemsec_appendixa-chemicalofinterestlist.pdf [Accessed 26 September 2011].
[78] Sodium perchlorate (NaClO4) is not on the CFATS Chemicals of Interest List.
[79] http://www.nactso.gov.uk [Accessed 26 September 2011].

- 'Secure your fertiliser' – this initiative seeks to raise awareness of the risks of ammonium nitrate and ammonium nitrate-based fertilisers [80]
- Project ARGUS – this initiative is a training program designed to assist industry sectors prepare for, deal with, and recover from terrorist attacks [81]
- Vulnerability Self Assessment Tool (VSAT) – this tool is aimed at industry to reduce the vulnerability of 'crowded places' across the UK. This initiative allows owners/operators of these sites to determine their vulnerability to attack[82], and
- Fertiliser Industry Assurance Scheme (FIAS) – this voluntary assurance scheme seeks to address some of the security issues around fertiliser by requiring members to submit to an annual independent audit of their operations. The UK government encourages and supports this industry initiative as an alternative to further legislation.[83]

3 Europe Union (EU)

The *EU Action Plan on Enhancing the Security of Explosives* (the Action Plan) contains measures relating to the prevention, detection and response, as well as horizontal measures, such as the development of information sharing mechanisms and platforms, supporting research and working with partners both in and outside the EU.

Work on reducing the risk of misuse of certain chemicals to fabricate home-made explosives is carried out within the Standing Committee on Precursors. The Action Plan promotes preventive measures, such as the tightening of security along the entire supply chain of commercial explosives in the EU, including production, transport, storage, commercialisation and final use.

The EU is currently proposing a regulatory response to certain chemicals of security concern. These measures have been introduced to the European Parliament under the REACH legislation; however, they not yet come into force. REACH is the Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals. When REACH is fully in force, it will require all companies manufacturing or importing chemical substances into the EU in quantities of one tonne or more per year to register these substances with the European Chemicals Agency.[84] The following chemicals (and their concentration thresholds) have been identified as high risk chemicals by the European Chemicals Agency:

Chemical	Concentration
Hydrogen peroxide	12%

80 http://www.secureyourfertiliser.gov.uk [Accessed 26 September 2011].

81 http://www.nactso.gov.uk/OurServices/Argus.aspx [Accessed 26 September 2011].

82 http://www.nactso.gov.uk/OurServices/VSAT.aspx [Accessed 26 September 2011].

83 http://www.agindustries.org.uk [Accessed 26 September 2011].

84 http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/428&type=HTML [Accessed 26 September 2011].

Chemical	Concentration
Nitromethane	30%
Nitric acid	3%
Potassium chlorate	40%
Potassium perchlorate	40%
Sodium perchlorate	40%
Ammonium nitrate	16% by weight of nitrogen in relation to ammonium nitrate
Hexamine	30%
Acetone	95%
Potassium nitrate	5% by weight of nitrogen in relation to potassium nitrate
Sodium nitrate	5% by weight of nitrogen in relation to sodium nitrate
Calcium nitrate	5% by weight of nitrogen in relation to calcium nitrate

Eight out of the 11 precursor chemicals identified by COAG have been identified by the European Chemical Agency.[85] Following the results of the impact assessment work, the preferred policy option entails:

- setting concentration thresholds for the sales of precursors, with a system to report on suspicious transactions for certain precursors
- developing a licensed consumer system to allow for sales of higher concentrations
- adding voluntary measures to support the reporting of suspicious transactions and the implementation of the licensed consumer system, as well as other relevant action to raise awareness in the supply chain
- restricting the sales of chemicals that exceed concentration thresholds to users who can prove a legitimate need to use the chemical
- that 'economic operators' record the purchaser's details for any transactions of the above substances (or products containing them) and that the above records be kept for at least five years and be made immediately available for inspection at the request of authorities
- that 'economic operators' report suspicious transactions of chemicals without delay[86], and
- penalties for infringement of the Regulations.

4 Canada

The Explosives Regulatory Division with the Department of Natural Resources is responsible for administering the *Explosives Act* and its regulations. Since 2008,

[85] Ammonium perchlorate, sodium azide and sodium chlorate have not been identified by the European Chemicals Agency.

[86] Conditions that constitute suspicious transactions include unwillingness to provide proof of identity, purchases with unusual quantities and/or concentrations for the specific products, lack of clarity on intended use of the product, unusual combination of product purchases, and insistence on paying in cash.

sellers and users of the following restricted components have been required to meet security measures as specified in the *Restricted Components Regulations 2008*:

- hydrogen peroxide (at a concentration of 30 per cent or higher)
- ammonium nitrate (at a concentration of 28-34 per cent of nitrogen or higher)
- nitric acid (at a concentration of 68 percent or higher)
- nitromethane
- potassium chlorate
- potassium perchlorate
- sodium chlorate
- potassium nitrate, and
- sodium nitrate.

Compliance with the Restricted Components Regulations requires:

- enrolment on the list of sellers of restricted components
- maintenance of a list of employees who have access to restricted components
- examination of purchaser identification prior to sale
- maintenance of detailed sales records
- provision of secure storage (sellers only)
- weekly inspection of stock to determine if there has been tampering, theft or loss and relevant reporting (sellers only), and
- denial of sale if there is reason to believe the product will be used for a criminal purpose.[87]

Additional control measures exist for ammonium nitrate. Eight out of the eleven precursor chemicals identified by COAG are identified in the *Restricted Components Regulations*.[88]

5 Singapore

The Arms and Explosives (Amendment) Act 2007 inserted a requirement into the *Arms and Explosives Act 2003,* which requires people to acquire a licence to deal in, manufacture, posses and/or store explosive precursors. Fifteen precursor chemicals have been identified as requiring a licence (Table 38).

[87] http://laws.justice.gc.ca/PDF/Regulation/S/SOR-2008-47.pdf [Accessed 26 September 2011].

[88] Ammonium perchlorate, sodium perchlorate and sodium azide have not been identified in the Restricted Components Regulation.

Table 38: Precursor chemicals requiring a license in Singapore

Chemical	Exclusions
Ammonium nitrate	• Aqueous solutions containing less than 60 per cent weight in weight of ammonium nitrate. • Any mixture, including a fertilizer, which contains ammonium nitrate and in which any part of the nitrogen content having a chemically determined ammonium equivalent constitutes, together with that equivalent, less than 28 per cent, by weight of the said mixture.
Ammonium perchlorate	-
Barium nitrate	• Preparations and solutions containing less than 10 per cent, weight in weight, of barium nitrate.
Guanidine nitrate	-
Hydrogen peroxide	• Preparations and solutions containing not more than 20 per cent, weight in weight, of hydrogen peroxide.
Potassium chlorate	-
Potassium nitrate	• Preparations and solutions containing less than 5 per cent, weight in weight, of potassium nitrate or a combination of both potassium nitrate and sodium nitrate.
Potassium nitrite	• Aqueous solutions containing less than 5 per cent weight in weight, of potassium nitrite.
Potassium perchlorate	-
Sodium chlorate	-
Sodium nitrate	• Preparations and solutions containing less than 5 per cent, weight in weight, of sodium nitrate or a combination of both sodium nitrate and potassium nitrate.
Sodium nitrite	• Aqueous solutions containing less than 5 per cent, weight in weight, of sodium nitrite.
Sodium perchlorate	-
Perchloric acid	-
Tetranitromethane	-

Nine out of the eleven precursor chemicals identified by COAG require a licence in Singapore.[89]

[89] It is assumed that tetranitromethane is a form of nitromethane. Nitric acid and sodium azide have not been identified in the Arms and Explosives Act.

Appendix E Results of the risk assessment process

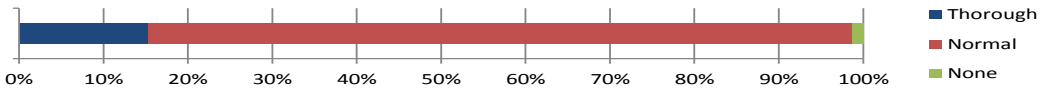
1 Deterring and preventing the theft and diversion of precursor chemicals

As part of the CSRA process, the CSRAU sought information from industry about how businesses currently manage security risks associated with the precursor chemicals. This information identified a number of limitations in the capacity of industry to deter and prevent the theft and diversion of precursor chemicals. Specific areas of concern include:

Employee checking

According to AGD, robust processes for assessing employee suitability to access/handle precursor chemicals can reduce the vulnerability to insider theft and diversion. Of those businesses that provided information to the CSRAU, 1.3 per cent indicated they did not undertake any checks, 83.4 per cent indicated they undertake normal checks, and 15.3 per cent indicated they undertake thorough checks (Figure 15).

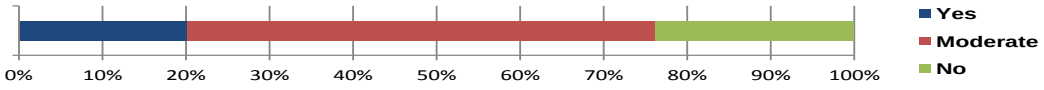
Figure 15: Extent of processes in place to assess employee suitability (n=463)



Risk assessment and planning

According to AGD, a formal security risk assessment and planning processes can identify possible points of vulnerability to theft/diversion and appropriate mitigation measures. Of those businesses that provided information to the CSRAU, 23.8 per cent indicated they did not have procedures in place to assess security risks and address identified risks, and 56.2 per cent indicated they had moderate procedures in place (Figure 16).

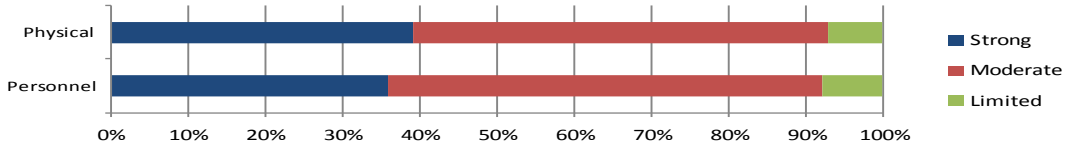
Figure 16: Extent of risk assessment and planning (n=463)



Physical and personnel access controls

According to AGD, robust physical and personnel access controls can reduce the likelihood of unauthorised access and, in turn, the vulnerability of precursor chemicals to theft/diversion. Of those businesses that provided information to the CSRAU, 7.1 per cent indicated they had no physical access controls in place, and 53.8 per cent indicated they had moderate physical access controls in place. Likewise, 7.8 per cent of respondents indicated they had no personnel access controls in place, and 56.4 per cent indicated they had moderate personnel access controls in place

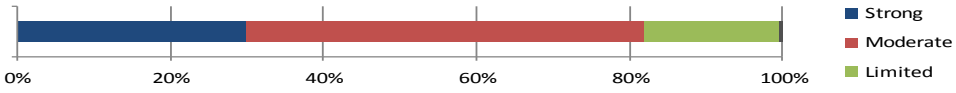
Figure 17: Degree of physical and personnel access controls (n=463)



Point of sale procedures

According to AGD, robust order processing/customer validation procedures can reduce the likelihood of precursor chemicals being sold to persons for unauthorised use. Of those businesses that provided information to the CSRAU, 17.7 per cent indicated they had limited point of sale procedures, 52 per cent indicated they had moderate point of sale procedures, 16 per cent indicated they had strong point of sale procedures (the question was not applicable to the remaining 29.8 per cent).

Figure 18: Extent of point of sale procedures (n=248)



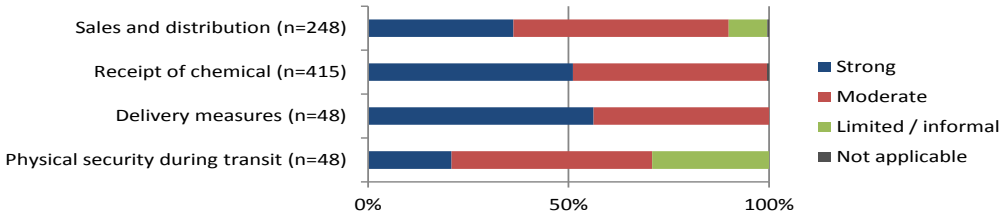
Transport and delivery procedures

According to AGD, robust verification procedures can reduce the likelihood of precursor chemicals being diverted during delivery and delivered to unauthorised recipients. Furthermore, robust physical security measures during transport can reduce the vulnerability of precursor chemicals to theft/diversion by preventing and/or deterring unauthorised access. Of the relevant businesses that provided information to the CSRAU:

- 9.7 per cent indicated they had informal procedures in place to monitor the sales/distribution of precursor chemicals, and 53.6 per cent indicated they had moderate sales/distribution procedures in place

- 48.4 per cent indicated they had moderate procedures in place to ensure the receipt of all precursor chemicals ordered
- 43.8 per cent indicated they had moderate procedures in place to prevent delivery of precursor chemicals to unauthorised recipients
- 29.2 per cent indicated they had limited physical access controls during transit and 50 per cent indicated they had moderate physical access controls during transit (Figure 19).

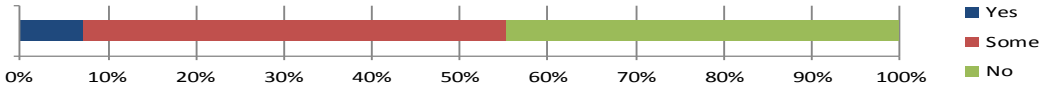
Figure 19: Extent of transport and delivery procedures



Security awareness

According to AGD, staff that have undertaken dedicated security training can have an increased awareness of the main points of vulnerability at that point in the supply chain and possible measures to mitigate vulnerability. Of those businesses that provided information to the CSRAU, 44.7 per cent indicated they provided no security awareness training, and 48.2 per cent indicated they provided some security awareness training (Figure 20).

Figure 20: Extent of security awareness training (n=463)



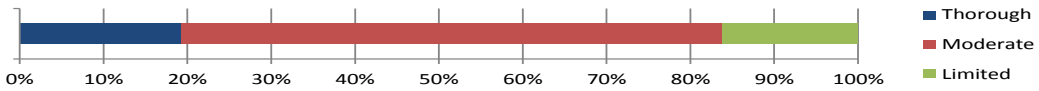
2 Identifying the theft and diversion of precursor chemicals in a timely manner

As part of the CSRA process, the CSRAU sought information from industry about how businesses currently manage security risks associated with the precursor chemicals. This information identified a number of limitations in the capacity of industry to identify the theft and diversion of precursor chemicals in a timely manner. Specific areas of concern include:

Inventory control

According to AGD, robust inventory control measures that enable effective monitoring and accounting can reduce the vulnerability of the chemical to unauthorised removal, theft or diversion. Of those businesses that provided information to the CSRAU, 16.2 per cent indicated they had limited inventory control measures in place, and 64.6 per cent indicated they had moderate inventory control measures in place (Figure 21).

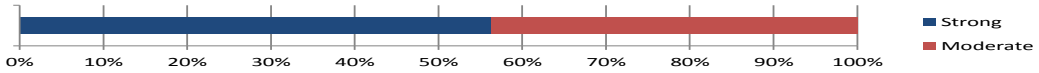
Figure 21: Robustness of inventory control measures (n=463)



Consignment control

According to AGD, robust consignment control measures and procedures that enable effective monitoring and accounting of chemical consignments will increase control of precursor chemicals and reduce the likelihood of its undetected removal. Of those businesses that provided information to the CSRAU, 43.8 per cent indicated they had moderate consignment control measures in place (Figure 22).

Figure 22: Robustness of consignment control measures (n=48)



Appendix F Proposed treatment measures

The document on the next page details the treatment measures that governments have proposed to address identified vulnerabilities in the supply chains for the 11 precursor chemicals. This document was distributed to all stakeholders as part of the consultation process that informed development of the Consultation RIS.

Appendix G Analysis in support of selected options

This appendix provides further detail of the analysis that supported our choice of the options outlined in Chapter 5.

1 Option 2 – Industry codes of practice

While our consultations with stakeholders revealed strong support for the industry code option, they also highlighted some impracticalities with the option. These include:

- A single industry code is unlikely to be feasible, given that no existing industry association has appropriate representation of all businesses likely to be affected by the proposed treatment measures. One industry association could volunteer to develop and maintain the code on behalf of all industry associations. Questions remain, however, around what governance arrangements would be required to make such an approach work – particularly with reference to how other industry associations would contribute to the development and maintenance of the code, and how adoption of the code would be encouraged and monitored, and
- Expecting all industry associations covering businesses that use or handle the precursor chemicals to develop a security risk management code of practice is also unlikely to be feasible. Not every industry association is likely to have the capacity to develop a security risk management code of practice, let alone monitor and encourage uptake. A plethora of industry codes increase the potential for regulatory inconsistency, leading to confusion amongst those businesses covered by more than one code.

An alternative approach suggested to us by stakeholders is for a small number of industry associations to develop codes of practice on behalf of the broader chemical industry. This selection of industry associations would ideally be representative of 'groupings' within the chemical industry. Industry associations would be free to promulgate the code of practice that is most relevant to their membership. There would be no universal mechanism of 'enforcement'; rather, industry associations would utilise their existing approaches to encourage uptake of the measures (e.g. some industry associations rely on the voluntary uptake of their codes, while others have robust accreditation systems in place to monitor and enforce compliance).

Given this stakeholder feedback, we have based our industry code option on the alternative approach outlined above. This option would involve seven industry associations developing an equal number of security risk management codes of practice. These industry associations would develop codes of practice that would be representatives of 'groupings' within the chemical industry. Key groupings would include:

- the importation, manufacture, processing supply and commercial use of industrial chemicals

- the importation, manufacture, processing and supply of fertilisers
- the land transportation of chemicals
- the agricultural use of chemicals (including fertilisers)
- the academic/analytical use of chemicals
- the importation, manufacture and commercial use of pool and spa chemicals, and
- the retail sale of chemicals.

2 Option 4 – Regulation

Governments could compel industry to adopt the proposed treatment measures through some form of regulation. Ideally, governments would do so using an existing regulatory framework – given that a key principle of the Chemical Security Management Framework is 'control measures should, were possible, be built on existing industry and/or government arrangements.' Stakeholders and our research have highlighted a range of possible existing regulatory frameworks that could be used to address security risks:

- the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)
- the Hazardous Substances Regulatory Package (HSRP)
- the Australian Dangerous Goods Code (ADGC)
- NICNAS, and
- APVMA's Restricted Chemical Products (RCPs) framework.

The suitability of these existing regulatory frameworks, however, is questionable (see Table 39 for more detail). Some, such as the SUSMP and HSRP, are not fit-for-purpose for managing security risks and would require multi-jurisdictional intervention at the ministerial level to broaden policy objectives to include consideration of national security alongside human health and safety. The likelihood of securing such intervention is uncertain. Other existing regulatory frameworks, such as the ADGC, only focus on one node of the chemical supply chain (i.e. transport/logistics). It would appear impractical to invest resources in expanding the ADGC to cover all nodes in the supply chain for just 11 chemicals.

There is some potential to use NICNAS or the APVMA's RCPs framework to manage security risks. This potential, however, is limited, given:

- NICNAS is primarily a risk assessment body – It does not have the power to mandate controls (this power lies with the states and territories). An additional regulatory framework would be required at the State and Territory level to operationalise security risk recommendations produced by NICNAS, and to ensure state and territory regulations are nationally consistent. In other words, NICNAS offers little in the way of existing regulatory structure that could be used to generate efficiencies, and

- It would be technically possible to broaden the legislation underpinning the RCPs framework to include national security as a risk factor to consider in restricting access to certain chemical products. In the context of the precursor chemicals, however, the RCPs framework is limited. Only a relatively small number of products containing precursor chemicals (primarily spa and pool chemicals containing hydrogen peroxide) are covered by APVMA and could therefore potentially be controlled by the RCPs framework. It does not offer a practical means of covering all chemical products containing precursor chemicals.

Table 39: Existing regulatory frameworks[90]

Regulatory framework	Scope and objective	Appropriateness as a means of regulating security risks
Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)	Through its classification of medicines and poisons into Schedules, the SUSMP forms the basis of State and Territory regulations aimed at controlling the use and handling of medicines and poisons across Australia where there is a potential risks to human health and safety.	A number of stakeholders highlighted the SUSMP as a possible means of regulating security risks, given industry's familiarity with using the scheduling framework to control access to certain chemicals. Feedback from the Department of Health and Ageing, however, suggests that: • incorporating security as a focus of the SUSMP would require a significant broadening of the policy objectives underpinning the scheduling framework, and • there is little appetite amongst health Ministers for such a change.
Australian Dangerous Goods Code (ADGC)	'Dangerous goods are substances or articles that, because of their physical, chemical (physicochemical) or acute toxicity properties, present an immediate hazard to people, property or the environment.' Developed and maintained by the National Transport Commission, the ADGC sets out the requirements for transporting dangerous goods by road or rail.	All 11 precursor chemicals are already classified under the ADGC (primarily as oxidising substances). The focus of the ADGC is limited to the transport of dangerous goods. It would appear impractical to invest resources in expanding the ADGC to cover all nodes in the supply chain for just 11 chemicals.
Hazardous Substances Regulatory Package (HSRP)	'Hazardous substances are those that, following worker exposure, can have an adverse effect on health.' The HSRP forms a blueprint for the legislative control of hazardous substances used in the workplace. It consists of Model Regulations, National Standards, Codes of Practice and Guidance Material.	The primary focus of the HSRP is on minimising potential risks to human health and safety arising from the negligent or accidental misuse of chemicals in the workplace. The HSRP is currently not fit-for-purpose for managing risks relating to the intentional misuse of chemicals. Similar to the SUSMP, incorporating security as a focus of the HSRP would require a significant broadening of the

[90] APVMA (2011), 'Restricted Chemical Products', http://www.apvma.gov.au/products/restricted.php. Accessed on: 4 October 2011; NICNAS (2011), 'About NICNAS', http://nicnas.gov.au/About_NICNAS.asp. Accessed on: 4 October 2011; Safework Australia (2011), 'Hazardous substances and dangerous goods', http://safeworkaustralia.gov.au/SAFETYINYOURWORKPLACE/HAZARDOUSSUBSTANCESANDDANGEROUSGOODS/Pages/HazardousSubstancesAndDangerousGoods.aspx. Accessed on: 4 October 2011.

Regulatory framework	Scope and objective	Appropriateness as a means of regulating security risks
		policy objectives underpinning the hazardous substances framework.
Restricted Chemical Products (RCPs)	APVMA has the ability to declare certain chemical products as RCPs 'if special training, and/or other requirements, are needed to be able to handle or use the chemical.'	It would be technically possible to broaden the legislation underpinning the RCPs framework to include national security as a risk factor to consider in restricting access to certain chemical products. However, only a handful of products containing precursor chemicals (primarily spa and pool chemicals containing hydrogen peroxide) are covered by APVMA and could therefore potentially be controlled by the RCPs framework.
NICNAS	NICNAS 'provides a national notification and assessment scheme to protect the health of the public, workers and the environment from the harmful effect of industrial chemicals'. It also 'assesses all chemicals new to Australia and assesses those chemicals already used (existing chemicals) on a priority basis, in response to concerns about their safety on health and environmental grounds.'	NICNAS advised that it could be possible to expand the scope of the *Industrial Chemicals (Notification and Assessment) Act 1989* to include national security as a focus of the risk assessments undertaken by NICNAS. NICNAS, however, does not have power to mandate controls relating to its risk assessments. An additional regulatory framework would be required at the State and Territory level to operationalise security risk recommendations produced by NICNAS, and to ensure State and Territory regulations are nationally consistent.

Given the analysis above, we have based our regulatory option on the assumption that governments will need to establish a new regulatory framework to manage the security risks associated with precursor chemicals. We have also assumed that the new regulatory framework will:

- involve both the Australian and State and Territory governments, given the division of constitutional powers (national security with reference to the former, and use and control of chemicals with reference to the latter), and
- seek to achieve nationally consistent outcomes.

Two observations underpin this last assumption. First, an overarching principle of the Chemical Security Management Framework agreed by COAG is 'the development of strategies for control measures should be *nationally coordinated* and agreed outcomes *nationally consistent*.' Second, the management of security risks associated with precursor chemicals is likely to benefit from national consistency. As part of its recent study into Australia's chemicals and plastics regulatory framework, the Productivity Commission highlighted six factors where "[n]ationally consistent approaches to regulatory policy can offer significant

benefits" (see Box 3).[91] Three of these apply to the management of security risks associated with precursor chemicals. Specifically:

- there is potential for significant interjurisdictional spillovers (e.g. individuals or groups could exploit a vulnerability in one jurisdiction and detonate the resultant homemade explosive in another jurisdiction)
- there is potential for high transaction costs resulting from a diversity in rules and regulations (a number of businesses that use/handle precursor chemicals operate across State and Territory boundaries – particularly in end-user businesses and transport/logistics companies), and
- managing security risks associated with precursor chemicals is a national security objective.

Box 3: Factors where nationally consistent approaches offer significant benefits[92]

- 'there are readily identifiable areas of common interest or sizeable economies of scale and scope arising from central provision or organisation (for example, defence, external affairs and social insurance or savings systems)
- 'there are significant interjurisdictional spillovers associated with the provision of a good or service at the sub-national level (for example, interstate transport systems)
- 'a diversity in rules or regulations is likely to give rise to high transaction costs with insufficient offsetting benefits (for example, regulation of companies that operate across State and Territory boundaries)
- 'there is scope for the mobility of capital and labour across jurisdictions to undermine the fiscal strength of the sub-national level of government (for example, where there are differences in tax bases; or welfare entitlements)
- 'there are benefits from harmonisation with other countries and the capacity to learn from and benchmark our performance against overseas practices that are most likely to be realised when there is a national regime in place , and
- 'national security could be undermined by inconsistent approaches to regulation'.

There are a number of different approaches Australian governments could adopt to achieve nationally consistent outcomes in managing chemical security risks. The Productivity Commission, for instance, has identified eight mechanisms for implementing national approaches to regulation:

- referral of powers to the Commonwealth
- template legislation – 'involves one jurisdiction [either the Commonwealth or a state/territory] enacting a law that is then applied by other jurisdictions as their law'[93]
- model legislation – 'involves the drafting of a model document that each participating jurisdiction draws on in drafting its own legislative instruments'[94]
- harmonising subordinate legislation

[91] Productivity Commission (2009), Chemicals and Plastics Regulation: Lessons for National Approaches to Regulation, Supplement to Research Report, Melbourne.

[92] Ibid.

[93] Ibid.

[94] Ibid.

- mutual recognition – where the states and territories recognise the standards and approvals of other jurisdictions
- implementing agreed principles – 'involves governments agreeing on a set of principles that they then implement as they see fit'[95]
- Memorandums of Understanding, and
- service level agreements – 'contracts that establish the terms for cooperation between agencies on certain matters.' [96]

Of these eight approaches, the last three ('implementing agreed principles', 'Memorandums of Understanding' and 'service level agreements') are unlikely to be effective in achieving nationally consistent outcomes. The reasons for this include:

- As the Productivity Commission notes, the three approaches tend to focus on reaching agreement and achieving national consistency with reference to processes and not necessarily outcomes. The Productivity Commission was critical in particular about the use of the agreed principles approach to manage the security risks associated with security sensitive ammonium nitrate (SSAN). The Productivity Commission found that this approach had not been effective in achieving national consistency and, 'as a result, the arrangements for controlling [SSAN] are imposing unnecessary administration and compliance burdens.'[97] The Productivity Commission thus concluded that '[e]xtending these regulatory arrangements to other chemicals of security concern could have significant costs for business, and should therefore not be considered.'[98]
- Service level agreements and Memorandums of Understanding have typically been used in chemicals and plastics regulation to reach agreement within jurisdictions (i.e. between government agencies), rather than between jurisdictions.[99] This lack of familiarity is likely to make governments less willing to use these approaches to establish a new regulatory framework.

'Mutual recognition' and 'harmonising subordinate legislation' do not appear appropriate mechanisms for implementing the proposed treatment measures. The former is primarily used with reference to the regulation of products or services that cross-jurisdictional boundaries; whereas the proposed treatment measures are focused on industry practices and operations. The latter, meanwhile, is hampered by the lack of relevant subordinate legislation across the states and territories.

Of the remaining three approaches, 'model legislation' is likely to be the most practical in implementing the proposed treatment measures. 'Referral of powers' and 'template legislation' are likely to offer greater benefits in terms of achieving nationally consistent outcomes. However, model legislation is likely to be more

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95 Ibid.

96 Ibid.

97 Productivity Commission (2008), Chemicals and Plastics Regulation, Research Report, Melbourne.

98 Ibid.

99 Productivity Commission (2009), Chemicals and Plastics Regulation: Lessons for National Approaches to Regulation, Supplement to Research Report, Melbourne.

palatable to the states and territories, as it allows them to retain 'a greater degree of autonomy over the regulatory instruments concerned, both in terms of their introduction and their subsequent amendments.'[100] Stakeholders supported this judgment during our consultations, noting in particular the infrequent use of referral of powers in the federal context.

There are two possible forms that model legislation to implement the proposed treatment measures could take. One form is for the Australian Government (in collaboration with the states and territories) to develop model legislation mandating businesses that use or handle the precursor chemicals to apply the proposed treatment measures to their business practices. Such model legislation could mandate the proposed treatment measures either prescriptively or in a performance-based framework. State and Territory governments would draw on the model legislation in drafting or amending their legislation to manage security risks. State and Territory governments would also be responsible for monitoring and enforcing compliance with their legislation.

Another form of model legislation would be for the Australian Government (in collaboration with the State and Territory governments) to develop a model amendment for each jurisdictions' criminal code. This amendment would create a new criminal offence relating to the negligent possession or supply of precursor chemicals. In addition to the model amendment, the Australian Government would publish the proposed treatment measures as a code of practice (similar to Option 3). The intention is to enable police to charge an individual or business for failing to comply with the code of practice. Businesses that were charged with negligent possession or supply could point to their compliance with the government code of practice as a reasonable defence in any court proceedings. All jurisdictions (including the Australian Government) would draw on the model amendment in amending their criminal codes.

Those stakeholders who commented on this issue generally maintained that the 'criminal code model legislation' is likely to be more practical than the 'mandated model legislation'. The primary reason for this is that the former was seen to be 'neater' than the latter. The criminal code model legislation would not require governments to monitor or enforce compliance (only to investigate relevant businesses in the event that an individual or group used homemade explosives for criminal purposes). It would nonetheless provide businesses with a strong incentive to adopt the code of practice. The mandated model legislation, on the other hand, was seen to place too much of an administrative burden on the states and territories. There was also considerable uncertainty amongst government stakeholders about which State and Territory agencies would assume responsibility for administering the mandated model legislation.

Given this feedback, the regulatory option considered in this Consultation RIS is for Australian governments to develop a model amendment to each jurisdictions'

[100] Ibid.

criminal code, creating an offence relating to the negligent supply of precursor chemicals for use in criminal activity.

Appendix H Costs of the proposed treatment measures

1 Employee and Contractor Checking

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (33 per cent) nominated 'to a great extent' for 'Employee and Contractor Checking'. A further 31 per cent nominated 'somewhat' (Figure 23). Converting the qualitative scale into a quantitative scale,[101] the average response to this question was 2.9.

Figure 23: Business perceptions of the extent to which 'Employee and Contractor Checking' will impose additional costs (n=160)

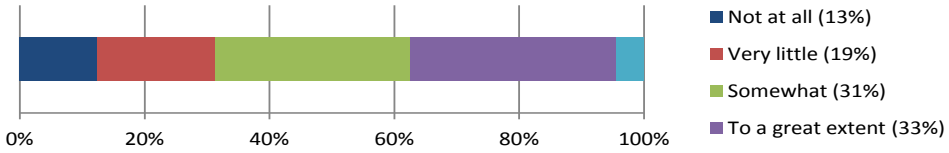

Table 40 summarises stakeholder feedback about the likely costs of 'Employee and Contractor Checking' for those businesses that do not already take-up the measure.

Table 40: 'Employee and Contractor Checking', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Procedural	• Verifying identity and determining trustworthiness of new employees will require a 'responsible person' to check the photo identification of new employees, check the CVs of new employees (where possible), contact referees (where possible), and account for discrepancies. • Re-checking the identity of existing employees will require a 'responsible person' to check the photo identification of relevant employees – involving staff effort from the 'responsible person' and the relevant employees. • The measure also requires a 'responsible person' to have appropriate policies in place for the employment screening of existing employees, and that these policies be clearly drafted and readily available to	• Many employers like school labs, universities, farmers, maritime ports, fertiliser companies and trucking companies already do employee checks however, some sectors, such as horticulture, which have high turnover and low skilled labour may not verify identity pre-employment. Verifying identity of contractors is not common and is difficult. Estimates of time impost range from negligible to 1 hour per employee. • Verifying of trustworthiness is less common than verifying of identity. Most of the universities consulted indicated they did not verify trustworthiness. Estimates of time impost range from 0.5 to 2.5 hours per employee. • Re-verifying identity is also less common, with some trucking companies saying they

[101] 'Not at all' = 1, 'very little' = 2, 'somewhat' = 3, and 'to a great extent' = 4.

Type of cost	Description	Qualitative and quantitative evidence
	employees.	currently do this and some universities and farmers saying they do not. Estimates of time impost range from 0.1 to 3.75 hours per employee.
Record keeping	• The measure requires a 'responsible person' to update a contact list of all employees that use/handle (or could potentially use/handle) precursor chemicals at least annually.	• Keeping a list would be relatively easy for some trucking businesses but for university labs the impact is less obvious. Estimates of time impost range from 1 to 7.5 hours per year.

Table 41 sets out some of the assumptions used in calculating the cost of this measure. Other assumptions such as the number of businesses, businesses' expected uptake of these measures, discount rates and wage rates can be found in Appendix I.

Table 41: Summary of assumptions used to determine cost estimates for the 'Employee and contractor checking' measure

Assumption	Unit	Value	Notes and source
Employee turnover rate	%	9%	ABS, 6105.0 Australian labour market statistics, July 2011, Table 1: EMPLOYED PERSONS, Expected future duration with current employer/business: Original – May 2011
Employee promotion rate	%	11%	ABS, 6209.0 Labour mobility, February 2010, Table 2: Persons who were working at February 2010, Changes in employer/business or work – by sex
Proportion of businesses that are employing			ABS, 8165.0 Counts of Australian businesses, including entries and exits: Businesses by industry class by main state by employment size ranges 2008-09, February 2011. • The following industries were used in this calculation:
• **Introducer**	%	58%	ANZSIC Industry Categories 1811 – 1899
• **Processor**	%	58%	ANZSIC Industry Categories 1811 – 1899
• **Wholesaler**	%	55%	ANZSIC Industry Categories 3301, 3323, 3491, 3609
• **Retailer**	%	62%	ANZSIC Industry Categories 3323, 3720, 4271, 4279, 9511
• **End-user**	%	48%	ANZSIC Industry Categories 0111-0700, 0801, 0804, 0809, 1111-1220, 1510, 1701, 1821, 1829, 1841, 2110-2229, 2412, 2419, 2811, 2921, 4279, 6910, 6925, 6999, 7311, 8102, 9511
• **Transport/Logistics**	%	44%	ANZSIC Industry Categories 4610 and 5102
Average number of employees per business			ABS, 8165.0 Counts of Australian businesses, including entries and exits: Businesses by industry class by main state by employment size ranges 2008-09, February 2011. • The following industries were used in this calculation:
• **Introducer**	number	37	ANZSIC Industry Categories 1811 – 1899
• **Processor**	number	37	ANZSIC Industry Categories 1811 – 1899
• **Wholesaler**	number	26	ANZSIC Industry Categories 3301, 3323, 3491, 3609
• **Retailer**	number	20	ANZSIC Industry Categories 3323, 3720, 4271, 4279, 9511
• **End-user**	number	25	ANZSIC Industry Categories 0111-0700, 0801, 0804,

Assumption	Unit	Value	Notes and source
			0809, 1111-1220, 1510, 1701, 1821, 1829, 1841, 2110-2229, 2412, 2419, 2811, 2921, 4279, 6910, 6925, 6999, 7311, 8102, 9511
• **Transport/Logistics**	number	17	ANZSIC Industry Categories 4610 and 5102

2 Security awareness

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (43 per cent) nominated 'somewhat' for 'Security Awareness'. A further 24 per cent nominated 'very little' (Figure 24). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.7.

Figure 24: Business perceptions of the extent to which 'Security Awareness' will impose additional costs (n=160)

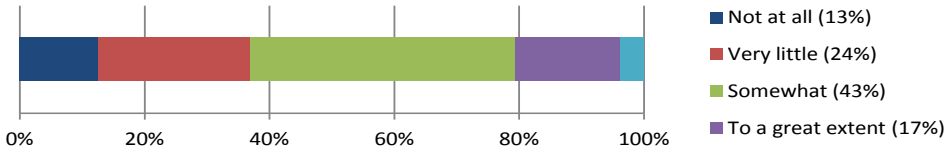

Table 42 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 42: 'Security awareness', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Procedural	• Developing security awareness program through the responsible person identifying which specific job roles have access to chemicals of security concern and are need to be trained on security awareness	• There are varying levels of security awareness training in place. Some businesses are very good at security awareness, such as in the mining and pharmacy sectors, others such as university laboratories and farms do not have measures in place. Estimates of the impost range from outsourcing at a cost of $400 per course to between 30 and 60 days for a university to develop an internal module.
Education	• Prepare and provide information on issues such as: – Potential for the chemicals' dangerous use – Identifying these products in the business – Clarifying the legitimate uses of the products and their recommended quantities – How to ascertain the customer's needs for the product	• As noted above, some organisations have security awareness measures in place, some do not but others have similar induction processes that may be supplemented by security awareness training. Estimates of time impost range from 0.13 to 2 hours per employee.

Type of cost	Description	Qualitative and quantitative evidence
Notification	• Notifying suspicious behaviour or transactions to the National Security Hotline or using the relevant internal reporting channels	• No evidence gathered on this regard.

Some of the assumptions used for the calculation of costs associated with the 'Security awareness' measure are stated in Table 43. Other assumptions such as the number of businesses, businesses' expected uptake of these measures, discount rates and wage rates can be found in Appendix I.

Table 43: Summary of assumptions used to determine cost estimates for the 'Security awareness' measure

Assumption	Unit	Value	Notes and source
Proportion of businesses that are employing			ABS, 8165.0 Counts of Australian businesses, including entries and exits: Businesses by industry class by main state by employment size ranges 2008-09, February 2011. • The following industries were used in this calculation:
• **Introducer**	%	58%	ANZSIC Industry Categories 1811 – 1899
• **Processor**	%	58%	ANZSIC Industry Categories 1811 – 1899
• **Wholesaler**	%	55%	ANZSIC Industry Categories 3301, 3323, 3491, 3609
• **Retailer**	%	62%	ANZSIC Industry Categories 3323, 3720, 4271, 4279, 9511
• **End-user**	%	48%	ANZSIC Industry Categories 0111-0700, 0801, 0804, 0809, 1111-1220, 1510, 1701, 1821, 1829, 1841, 2110-2229, 2412, 2419, 2811, 2921, 4279, 6910, 6925, 6999, 7311, 8102, 9511
• **Transport/Logistics**	%	44%	ANZSIC Industry Categories 4610 and 5102
Average number of employees per business			ABS, 8165.0 Counts of Australian businesses, including entries and exits: Businesses by industry class by main state by employment size ranges 2008-09, February 2011. • The following industries were used in this calculation:
• **Introducer**	number	37	ANZSIC Industry Categories 1811 – 1899
• **Processor**	number	37	ANZSIC Industry Categories 1811 – 1899
• **Wholesaler**	number	26	ANZSIC Industry Categories 3301, 3323, 3491, 3609
• **Retailer**	number	20	ANZSIC Industry Categories 3323, 3720, 4271, 4279, 9511
• **End-user**	number	25	ANZSIC Industry Categories 0111-0700, 0801, 0804, 0809, 1111-1220, 1510, 1701, 1821, 1829, 1841, 2110-2229, 2412, 2419, 2811, 2921, 4279, 6910, 6925, 6999, 7311, 8102, 9511
• **Transport/Logistics**	Number	17	ANZSIC Industry Categories 4610 and 5102
Proportion of employees trained on security awareness per annum			
• **Proportion of current employees retrained per annum**	%	100%	This is based on the proposed measures.

Assumption	Unit	Value	Notes and source
• **Number of new employees (calculated as a proportion of current employees)**	%	9%	ABS, 6105.0 Australian labour market statistics, July 2011, Table 1: EMPLOYED PERSONS, Expected future duration with current employer/business: Original – May 2011
Amount of time to develop a security awareness information program, one-off.			
• **Introducers and processors**	Number of hours	225	Based on their relative sizes, it is assumed the capacity of universities to develop a security awareness information program for training staff is about the same as that for processors and introducers. Hence, use the same cost information gained from PwC consultations.
• **Wholesalers**	Number of hours	0	PwC consultations with wholesalers found they can outsource the cost and is therefore included in the cost of providing staff with information
• **Retailers**	Number of hours	11.25	No data for retailers. While universities suggests 225 hours, this seems high for retailers given their less complicated operations and that generally they only deal with one chemical. On the basis of this, PwC have assumed 1-2 days.
• **End-users**	Number of hours	22.7	This range includes universities' 225 hour estimates gained from PwC consultations, but is weighted towards small businesses as they make up 93% of the organisations in this category (ABS, 8165.0 Counts of Australian businesses, including entries and exits: Businesses by industry class by main state by employment size ranges 2008-09, February 2011: ANZSIC Industry Categories 0111-0700, 0801, 0804, 0809, 1111-1220, 1510, 1701, 1821, 1829, 1841, 2110-2229, 2412, 2419, 2811, 2921, 4279, 6910, 6925, 6999, 7311, 8102, 9511)
• **Transporters**	Number of hours	14	This range includes universities' 225 hour estimates, gained from PwC consultations, as some transporters are large businesses, but is weighted towards small businesses as they make up 97% of the organisations in this category (ABS, 8165.0 Counts of Australian businesses, including entries and exits: Businesses by industry class by main state by employment size ranges 2008-09, February 2011: ANZSIC Industry Categories 4610 and 5102)
Amount of time/cost to provide staff with information, per annum.			
• **Introducers, Processors, Retailers, End-users**	Number of hours	0.41	PwC consultations.
• **Wholesalers**	Number of hours	2	Time of staff to attend course. PwC consultations.
• **Transporters**	Number of hours	0.21	PwC consultations.

3 Inventory control

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their

business. A plurality of respondents (34 per cent) nominated 'somewhat' for 'Inventory control'. A further 28 per cent nominated 'very little' (Figure 25). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.7.

Figure 25: Business perceptions of the extent to which 'Inventory control' will impose additional costs (n=163)

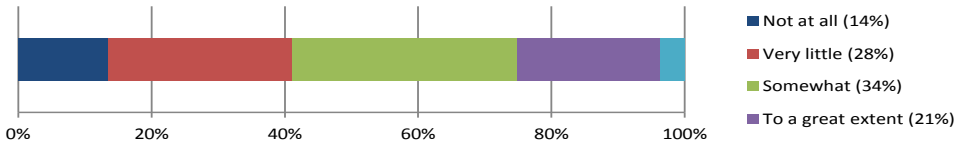

Table 44 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 44: 'Inventory control', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Procedural	• The development and implementation of an inventory control system • Undertaking reconciliations of inventories on a monthly basis at least	• Not all organisations have inventory control systems in place so some businesses would have to develop systems. One estimate of the impost of developing a system was 75 hours. • Not many organisations consulted do monthly reconciliations; some do yearly, half yearly or quarterly. For some businesses, such as those in the horticulture sector or large universities, which have many labs and hundreds of thousands of packages, monthly reconciliations would be impossible. Estimates of impost from monthly reconciliations range from 0.5 hours to 4,590 hours.
Notification	• Notifying authorities when inventory is missing due to suspicious loss via the National Security Hotline.	• Accurate reconciliation is difficult as volumes of chemicals can vary for a range of reasons such as inaccurate accounting, production issues, and the temperature or atmospheric conditions can affect volume by plus or minus ten per cent. This makes identifying suspicious loss difficult. If all loss was reported it would be quite a costly burden. However some businesses, such as processors do report suspicious loss to police already.

Some of the assumptions used for the calculation of costs associated with the 'Inventory control' measure are stated in Table 45. Other assumptions such as the number of businesses, businesses' expected uptake of these measures, discount rates and wage rates can be found in Appendix I.

Table 45: Summary of assumptions used to determine cost estimates for the 'Inventory control' measure

Assumption	Unit	Value	Notes and source
Time to develop and implement receipt of chemical system, one-off			
• **Introducers, processors, wholesalers, retailers, end-users**	Number of hours	75.00	PwC consultations (one university provided estimate)
Time to undertake reconciliation, monthly			
• **Introducers**	Number of hours	7.50	PwC consultations with introducers
• **Processors**	Number of hours	120	PwC consultations with processors. One processor estimated 4590 hours. PwC noted these estimates but that other estimates with lower time imposts, such as those provided by a university, considered the time involved in measuring the 11 chemicals (across 5-6 sites) seemed more reasonable. As such, this estimate was multiplied by 10 to represent the larger number of sites that processors seem to have (one has 68 sites). A median of the range of values was then used because of the skewed information. Also included the time cost for introducers doing inventory reconciliations as these are similar operations to processors.
• **Wholesalers**	Number of hours	3.50	PwC consultations with wholesalers
• **Retailers**	Number of hours	3.50	PwC consultations with wholesalers (data was provided from pharmacy retailers but was on a per-unit basis and therefore insufficient)
• **End-users**	Number of hours	22.5	PwC consultations with end-users. A large estimate of 2000 hours by an university was provided and hence an overall estimate was calculated using a median.

4 Receipt of chemical

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (31 per cent) nominated 'very little' for 'Receipt of chemical'. A further 28 per cent nominated 'somewhat' (Figure 26). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.4.

Figure 26: Business perceptions of the extent to which 'Receipt of chemical' will impose additional costs (n=162)

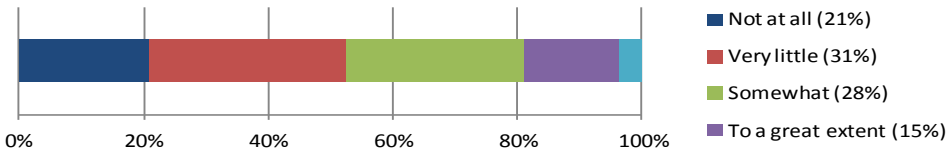

Table 46 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 46: 'Receipt of chemical', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Procedural	• The development and implementation of a receipt of chemical system which reconciles the order with the quantity of product received and which is able to identify discrepancies	• Most businesses already do this as it makes commercial sense to reconcile orders with goods actually received. However there is a limit to this; is not reasonable to assume that horticulturalists will ensure the one tonne ordered is correct to the kilogram. Also it is not sensible to handle dangerous chemicals more than necessary. An estimate of the additional time impost was for 1 to 2 hours for 1 to 2 people. This was not utilised as there was no information on the frequency of this cost.
Notification	• Notifying authorities when inventory is missing due to suspicious loss via the National Security Hotline.	• Businesses would notify the police, if losses identified cannot be accounted for by any other reason, mainly for insurance purposes.

As noted earlier, this Consultation RIS has not quantified the costs of 'Receipt of Chemical', due to feedback received from stakeholders that the vast majority of businesses already adopt this measure.

5 Theft and diversion procedures

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (31 per cent) nominated 'somewhat' for 'Theft and diversion procedures'. A further 29 per cent nominated 'to a great extent' (Figure 27). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.9.

Figure 27: Business perceptions of the extent to which 'Theft and diversion procedures' will impose additional costs (n=161)

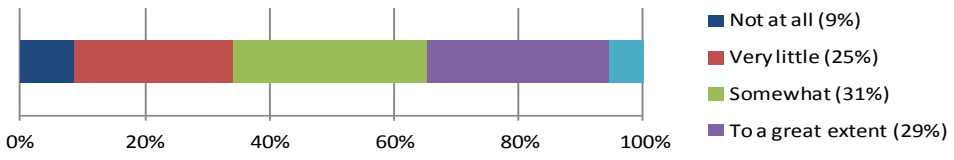

Table 47 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 47: 'Theft and diversion procedures', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Record	• That a theft and diversion plan is created	• Some organisations have theft and diversion plans in place already – Miners,

Type of cost	Description	Qualitative and quantitative evidence
	• The plan is updated annually	university labs, chemical processors and trucking companies for example – but businesses for which the chemicals are less central to their operations – such as farming operations – are less likely to have plans in place. Estimates of the impost of developing a theft and diversion plan range from 3.75 to 1,950 hours.
Procedural	• An appropriate risk assessment is undertaken based on AS/NZS ISO 31000:2009 • That the risk assessment is reviewed annually • Put a plan to detect and prevent shoplifting in place	• As with the above-mentioned types of businesses, those with plans in place will do formal risk assessments as a part of their current operations. However while not all businesses do formal risk assessments, many others will do informal risk assessments, as it is commercially rational to prevent theft and diversion. Estimates of the impost from formal risk assessments range from 3.75 hours to 1,950 hours. • Estimates of the impost from reviewing the risk assessment annually range from 0.5 hours to 1 hours.
Notification	• Suspicious loss identified is reported through the National Security Hotline	• No evidence gathered on this regard.

Table 48 sets out some of the assumptions used in calculating the cost of this measure. Other assumptions such as the number of businesses, businesses' expected uptake of these measures, discount rates and wage rates can be found in Appendix I.

Table 48: Summary of assumptions used to determine cost estimates for the 'Theft and diversion procedures' measure

Assumption	Unit	Value	Notes and source
Undertake risk assessment, one-off			
• **Introducers**	$	30,000	PwC consultations with introducers (this is the costs of outsourcing).
• **Processor**	$	30,000	PwC consultations with introducers (this is the costs of outsourcing).
• **Wholesalers**	Numbers of hours	1,462.50	PwC consultations with wholesalers
• **Retailer**	Numbers of hours	7.5	PwC consultations with universities and schools. Wholesalers' information assumed to be irrelevant.
• **End-user**	Numbers of hours	11.25	PwC consultations with end-users and wholesalers. Median used to calculate due to highly skewed information.
• **Transporters**	Numbers of hours	9.375	PwC consultations with end-users and introducers. Assume that, given most transporters are small businesses, few will have the resources to spent the same amount on this as introducers. Therefore use median rather than average.
Review risk assessment, per year (starting from year two)			

Assumption	Unit	Value	Notes and source
• **Introducers, processors, wholesalers, retailers, end-users, transporters**	Number of hours	0.75	PwC consultations with end-users
Develop theft and diversion plan, one-off			
• **Introducers**	$	30,000	PwC consultations with introducers (this is the costs of outsourcing).
• **Processor**	$	30,000	PwC consultations with introducers (this is the costs of outsourcing).
• **Wholesalers**	Numbers of hours	1,462.50	PwC consultations with wholesalers
• **Retailer**	Numbers of hours	7.5	PwC consultations with universities and schools. Wholesalers' information assumed to be irrelevant.
• **End-user**	Numbers of hours	11.25	PwC consultations with end-users and wholesalers. Median used to calculate due to highly skewed information.
• **Transporters**	Numbers of hours	9.375	PwC consultations with end-users and introducers. Assume that, given most transporters are small businesses, few will have the resources to spent the same amount on this as introducers. Therefore use median rather than average.

6 Physical access procedures

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (31 per cent) nominated 'to a great extent' for 'Physical access procedures'. A further 30 per cent nominated 'somewhat' (Figure 28). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.9.

Figure 28: Business perceptions of the extent to which 'Physical access procedures' will impose additional costs (n=162)

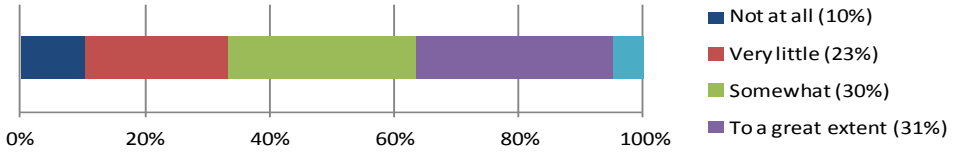

Table 49 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 49: 'Physical access procedures', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Publication and	• Installing deterrent signage such as "No trespassing" and "Authorised	• No evidence gathered on this regard.

Type of cost	Description	Qualitative and quantitative evidence
documentation	access only".	
Procedural	• Arrange workplace to the extent possible so that unescorted visitors can be noticed easily	• Some businesses, such as maritime ports, already have rigorous security processes in place. No cost estimates on this regard were gathered.
Purchasing	• Installing physical access restrictions such as: • locks on exterior and interior doors • security illumination	• Some organisations have security restrictions in their workplaces requiring staff to have on them access keys. Some universities have chemical storerooms and several staff to manage the operations and security of the stores. Some wholesalers have closed circuit television systems. One estimate for the installation of CCTV is $30,000 per site.

This Consultation RIS has not quantified the costs associated with 'Physical Access Controls' and 'Personnel Access Controls'. While both measures have the potential to impose a range of additional costs on industry, the extent of these costs will ultimately be determined by each business's risk assessment and theft and diversion plan. As a consequence, the costs associated with 'Physical Access Controls' and 'Personnel Access Controls' cannot be reliably quantified.

7 Personnel procedures

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (36 per cent) nominated 'somewhat' for 'Personnel procedures'. A further 23 per cent nominated 'to a great extent' (Figure 29). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.8.

Figure 29: Business perceptions of the extent to which 'Personnel procedures' will impose additional costs (n=162)

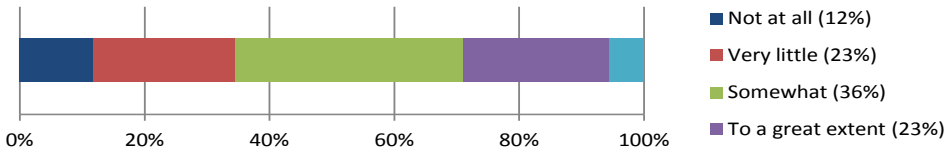

Table 50 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 50: 'Personnel procedures', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Procedural	• Access is restricted to authorised personnel • Visitors are escorted while on site	• Some businesses have personnel security access procedures in place. An estimate of the impost from developing a key management system was 7.5 to 15 hours per year.

Type of cost	Description	Qualitative and quantitative evidence
Record	• Visitors and contractors have their credentials checked and are signed in	• No evidence gathered on this regard.

This Consultation RIS has not quantified the costs associated with 'Physical Access Controls' and 'Personnel Access Controls'. While both measures have the potential to impose a range of additional costs on industry, the extent of these costs will ultimately be determined by each business's risk assessment and theft and diversion plan. As a consequence, the costs associated with 'Physical Access Controls' and 'Personnel Access Controls' cannot be reliably quantified.

8 Point of sales procedures

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (38 per cent) nominated 'not applicable/don't know' for 'Point of sales procedures'. A further 22 per cent nominated 'not at all' (Figure 30). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.2.

Figure 30: Business perceptions of the extent to which 'Point of sales procedures' will impose additional costs (n=161)

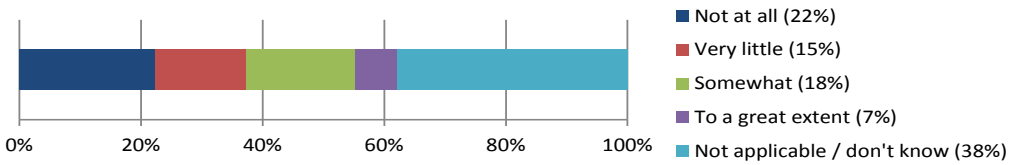

Table 51 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 51: 'Point of sales procedures', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Record	• End-user declarations are completed and stored by the organisation • End-user declarations are updated when customers ordering pattern changes	• End-user declarations were generally believed to be an onerous measure. There are costs from filling out the forms but there can also be 24-hour delays. Estimates of the impost from this measure range from 0.08 hours to a 2+ hours per customer.
Procedural	• Only sell to customers with proven identities • Verify the use of chemicals • Accept non-cash methods of payment only • Chemicals are located behind the counter or similar barrier	• Some businesses already verify the customer's identity but for other products – pharmacies for example verify ID for pseudoephedrine. • No information was gathered with regard to verifying the customers' use of the chemical. • While some businesses such as introducers already do most transactions on a credit basis, accepting a cashless basis

Type of cost	Description	Qualitative and quantitative evidence
		for transactions would be very costly for retailers and wholesalers. Estimates of the impost of going cashless are 3% per transaction. • Pharmacies noted that putting chemicals behind the counter would not be burdensome.
Notification	• Reporting of suspicious transactions to the National Security Hotline	• No evidence gathered on this regard.

Table 52: Summary of assumptions used to determine cost estimates for the 'Point of sales procedures' measure

Assumption	Unit	Value	Notes and source
Process end-user declaration, per customer			
• Introducers	Hours per customer	1.17	PwC consultations with introducers.
• Introducers	Number of customers	450	PwC consultations with introducers.

This Consultation RIS is not able to quantify the full range of costs associated with 'Point of Sale'. The costs of this measure will primarily be driven by the number of transactions involving the precursor chemicals. This Consultation RIS has not been able to access reliable transaction data for the precursor chemicals. This Consultation RIS has been able to quantity, however the cost for non-retail nodes in processing end-user declarations.

9 Sales and distribution

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (37 per cent) nominated 'not applicable/don't know' for 'Sales and distribution'. A further 23 per cent nominated 'not at all' (Figure 31). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.1.

Figure 31: Business perceptions of the extent to which 'Sales and distribution' will impose additional costs (n=160)

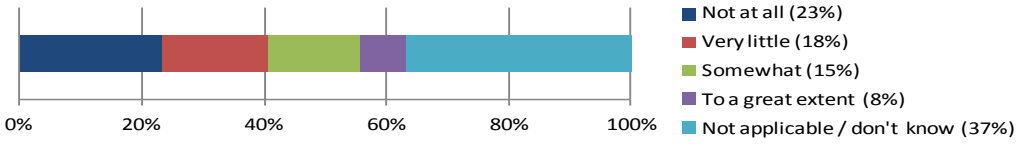

Table 53 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 53: 'Sales and distribution', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Procedural	• Verify orders so that outgoing quantities and concentrations of chemicals match the appropriate orders. • Supervise the loading of chemicals • Utilise pre-approved transport	• No evidence gathered on this regard.
Record	• Maintain appropriate documentation	• No evidence gathered on this regard.

As noted earlier, this Consultation RIS has not quantified the costs of 'Sales and Distribution', due to feedback received from stakeholders that the vast majority of businesses already adopt this measure.

10 Consignment control

Respondents to the online survey were asked to indicate the extent to which the proposed treatment measures are likely to impose additional costs on their business. A plurality of respondents (27 per cent) nominated 'not applicable/don't know' for 'Consignment control'. A further 23 per cent nominated 'somewhat' (Figure 32). Converting the qualitative scale into a quantitative scale, the average response to this question was 2.5.

Figure 32: Business perceptions of the extent to which 'Consignment control' will impose additional costs (n=162)

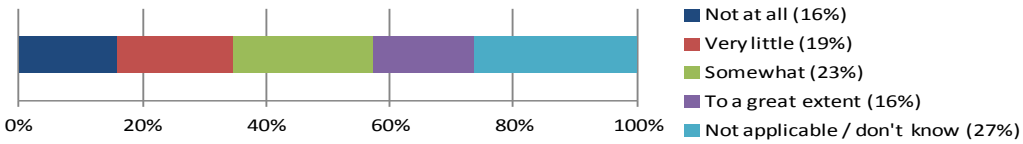

Table 54 summarises stakeholder feedback about the likely costs of 'Security Awareness' for those businesses that do not already adopt the measure.

Table 54: 'Consignment control', cost summary

Type of cost	Description	Qualitative and quantitative evidence
Purchasing	• Goods must be under lock and key at all times therefore some physical security systems may need to be installed	• Many businesses will transport goods under some form of 'lock and key' but to what degree of 'lock and key' the measures seek to achieve was unclear and therefore the additional cost of this measure was hard to determine. Some trucking companies do not have the infrastructure for lock and key and therefore this would have to be purchased and assembled. This would include GPS units. Estimates of the impost of installing these are between $300 and $3000 per unit. Estimates of the impost of buying security tags for tanks range between $5 and $6 per tag.
Procedural	• Must be under lock and key at all times	• As noted above the additional cost was

Type of cost	Description	Qualitative and quantitative evidence
	• When transported by road, vehicles must not be unattended unless left in a secure location as well as being under lock and key • A system to monitor the location of the consignment during transportation (e.g. GPS) must be implemented and maintained • Only delivers to nominated recipients	hard for some organisations to determine. However many thought the procedure would be impractical as for small businesses that buy chemicals in small amounts and leave in their vehicles while doing other errands this would mean devoting whole journeys to buying chemical and transporting it back to their workplace. For trucking companies, the estimates of the impost for keeping goods under lock and key were requiring two drivers per truck. The lock and key procedures were estimated to increase costs of transporting these chemicals by between 30% and 50%. For other businesses, an estimate of the impost of keeping goods under lock and key while in transport was for 37.5 hours per year. • Overall, consignment measures estimated to increase road transport costs by between 35% and 525%. • Some trucking businesses already have GPS units installed enabling the location of the consignments to be tracked. However, this would be impractical for some mining businesses, as GPS does not operate when underground. Estimates of the impost from monitoring the location of consignments range between $240 and $360 per truck per annum. • No evidence gathered with regard to only delivering to nominated recipients.
Record	• An accurate weight measurement of the chemicals must be recorded at the loading and unloading stages of transport • A record should be maintained that loads are delivered with all seals and locks intact.	• Accurate measuring is difficult for businesses such as horticulturalists that are unlikely to have weighbridges. No estimates of the impost of this were obtained. • An estimate of the impost of reconciling seals, tags or locks was for 1 hour per consignment.

Table 55 sets out some of the assumptions used in calculating the cost of this measure. Other assumptions such as the number of businesses, businesses' expected uptake of these measures, discount rates and wage rates can be found in Appendix I.

Table 55: Summary of assumptions used to determine cost estimates for the 'Consignment control' measure

Assumption	Unit	Value	Notes and source
Ensure chemicals are kept under lock and key during transit, per trip			
• End-users	Hours per year	37.5	PwC consultations with end-users (farmers).
• Transporters	Increase in drivers	100%	PwC consultations with transporters revealed two-drivers would be required. Assume all transporters currently use only one driver per trip and that the number of drivers needs to double.

Assumption	Unit	Value	Notes and source
Implement monitoring system, per vehicle			
• Transporters	$ per GSP unit	$1,375	PwC consultations with transporters.
Monitor monitoring system, per vehicle			
• Transporters	$ per truck	$300	PwC consultations with transporters. Also assumed that the number of trucks currently with GPS installed (50%) is the same as the number of GPS units currently monitored.
Number of truck drivers in Australia	Number	231,900	ABS, unpublished data, 2009 – cited by PwC, Regulatory Impact Statement on safe rates, safe roads, 2011.
Number of commercial road transport vehicles in Australia			
• Victoria	Number	668,903	ABS, 9208.0 Survey of motor vehicle use, 12 months ended 31 October 2010, Table: State/territory of registration – type of vehicle, August 2011, page 12
• New South Wales	Number	781,968	"
• Australian Capital Territory	Number	26,633	"
• Queensland	Number	749,426	"
• South Australia	Number	213,670	"
• Northern Territory	Number	41,066	"
• Western Australia	Number	377,242	"
• Tasmania	Number	97,652	"
Proportion of commercial road transport vehicles in Australia assumed to handle precursor chemicals	%	3	PwC has estimated that at least 5 per cent of commercial and courier transport businesses were involved in the transport of at least one of the precursor chemicals.

11 General cost-benefit assumptions

Assumption type	Amount	Source
Discount rate	7% (sensitivity analysis also undertaken at 3% and 10%)	PwC
Timeframe for analysis	10 years	PwC
Rate of inflation	2.5%	PwC
Average wage rate	$61.72 per hour	This figure is derived from the *Victorian Guide to Regulation*, and adjusted using an inflation rate of 2.5 per cent. VCEC, *Victorian Guide to Regulation*

Appendix I Expected levels of uptake

This appendix details PwC's calculations and assumptions regarding expected levels of adoption for each of the options under consideration in this Consultation RIS. We estimated the expected levels of adoption for the options by:

- identifying the total population of businesses the use or handle the precursor chemicals across Australia
- estimating what proportion of the total population is likely to already comply with the proposed treatment measures, and
- estimating what proportion of those businesses that do not already adopt the measures would likely do so as a result of the options.

In undertaking the above analysis, we drew on statistics compiled by the Australian Bureau of Statistics (ABS) and IBISWorld, feedback provided by stakeholders through the focus groups and online survey, and discussions with AGD. The sections provide further detail of our analysis.

1 Total population of businesses

The chemical industry in Australia is extensive. There are an estimated 40,000 chemicals approved for use in Australia, which are formulated into over 400,000 trademarked products.[102] In 2006, the Australian Safety and Compensation Council (now Safe Work Australia) estimated that there were 573,700 workplaces in Australia with chemical users.[103]

While there is a reasonable understanding about the aggregate size of the chemical industry in Australia, there is little available information about market characteristics for particular chemicals. To overcome this lack of data, we adopted the following approach.

First, in line the CSRAM developed to assess the security risks associated with the chemicals of security concern, we conceptualised the supply chain for the precursor chemicals as comprising of six nodes (Table 56).

[102] COAG (2008), Report on the Control of Chemicals of Security Concern, Canberra.

[103] Australian Safety and Compensation Council (2006), 'Draft Regulation Impact Statement: Proposed Revisions to the National OHS Framework for the Control of Workplace Hazardous Substances and Dangerous Goods', September, http://www.safeworkaustralia.gov.au/AboutSafeWorkAustralia/WhatWeDo/Publications/Documents/409/Draft_RIS_Proposed%20Revisions%20to%20the%20National%20OHS%20framework_control_workplace_Hazardous_substances_Dangerous_good.pdf. Accessed on: 6 September 2011.

Table 56: Supply chain nodes

Node	Description
Introducer	First point in the supply chain and either import or manufacture the chemical
Processor	Reformulate or repackage the chemical and on sell to wholesalers, retailers or end users
Wholesaler	Sell primarily to businesses and institutions and do not repackage or reformulate
Retailer	Sell primarily to individuals and do not repackage or reformulate the chemical
End-user (business)	Consume the chemical in their business/institutional processes
Transport/logistics	Multiple points in the supply chain and includes transport and storage of chemicals

Second, we identified those nodes for which we had reliable and reasonably complete data. These were:

- Introducers – through its agreement with NICNAS, AGD was provided with comprehensive information about what companies introduce the precursor chemicals into Australia. AGD provided us with a de-identified version of this data, and
- Wholesalers – we purchased a copy of *Database of Australian and New Zealand Chemical Manufacturers and Wholesalers*, published by Chemical Advisory Services. We used this database to identify wholesalers that sold the precursor chemicals in Australia.

Third, for the remaining nodes, we used ABS and IBISWorld statistics to identify broader populations of businesses that could potentially use or handle the precursor chemicals. We then estimated what proportion of these broader populations actually use or handle the precursor chemicals. Table 57 provides greater detail about our analysis and assumptions.

Table 57: Summary of population analysis, processors, retailers, end-users and transport/logistics

Node	Broader population	Actual population	Notes
Processor	**2,307**	**461**	Using ABS statistics, identified the total number of businesses across Australia that are classified as 'Basic Chemical and Chemical Product Manufacturing' (ANZSIC Subdivision 18). Of this broader population, we assumed 20 per cent use or handle at least one of the precursor chemicals. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
Retailer			On the basis of advice provided by AGD, we identified seven types of retailers that sell precursor chemicals:
	3,880	3,880	• Supermarkets – in 2011, there were an estimated 3,880 supermarkets across Australia. Feedback provided by ANRA suggests all supermarkets would sell hydrogen peroxide or products containing hydrogen peroxide. *Source: IBISWorld (2011), 'Industry Report G5111, Supermarkets and Other Grocery Stores in Australia'.*
	3,784	3,784	• Pharmacies – in 2011, there were an estimated 3,784 pharmacies across Australia. Feedback provided by the Pharmacy Guild and individual pharmacist suggests all pharmacies would sell hydrogen peroxide.

Node	Broader population	Actual population	Notes
			Source: IBISWorld (2011), 'Industry Report G525A, Pharmacies in Australia'.
	220	156	• Pool and spa shops – using membership lists published by Swimming Pool and Spa Associations (SPASAs) in New South Wales, Queensland, Victoria and South Australia, and our own extrapolations, we estimated that there are 220 Pool and Spa shops across Australia. Based on advice from AGD that use of hydrogen peroxide in pool maintenance varies across Australia due to differences in climate, we assumed 70 per cent of Pool and Spa shops sell products containing hydrogen peroxide. *Source: Various SPASA websites.*
	23,487	705	• Hairdressers/salons – in 2011, there were an estimated 23,487 hairdressers and salons across Australia. Based on advice from AGD, we assumed that only 3 per cent of hairdressers/salons sell hydrogen peroxide or products containing hydrogen peroxide at concentrations of concern to government. *Source: IBISWorld (2011), 'Industry Report Q9526, Hairdressing and Beauty Salons in Australia'.*
	108	108	• Hobby stores – in 2011, there were an estimated 1,210 enterprises across Australia involved in toy and game retailing. According to the ABS, the sale of hobby equipment accounted for 8.9 per cent of toy and game retailing in 1998-99. Based on both these figures, we estimated that there are 108 hobby stores across Australia; all of which sell nitromethane. *Source: ABS (2000), 'Retail industry', Cat. 8624.0; IBISWorld (2011), 'Industry Report G5242, Toy and Game Retailing in Australia'.*
	2,472	124	• Cleaning suppliers – in 2011, there were 2,472 industrial and agricultural chemical wholesalers. We estimated that 5 per cent of these businesses were involved in the sale of cleaning products containing nitric acid. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	2,472	816	• Rural suppliers – in 2011, there were 2,472 industrial and agricultural chemical wholesalers. We estimated that 33 per cent of these businesses were involved in the sale of potassium nitrate. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	36,423	**9,573**	
End-user (business)			On the basis of advice provided by AGD, we identified a range of end-users that use precursor chemicals:
	39	39	• Universities – there are 39 universities in Australia. We assumed every university uses all of the precursor chemicals.
	3,373	1,687	• Analytical laboratories – in 2011, there were 3,373 analytical laboratories in Australia. We assumed 50 per cent of these laboratories used at least one of the precursor chemicals. *Source: IBISWorld (2011), 'Industry Report L7810, Scientific Research in Australia'.*

Node	Broader population	Actual population	Notes
	113	113	• Pulp and paper – in 2011, there were 113 pulp and paper bleachers in Australia. We estimated that all pulp and paper bleaching organisations used hydrogen peroxide as a bleaching agent. *Source: IBISWorld (2011), 'Industry Report C2331, Pulp, Paper and Paperboard Manufacturing in Australia'.*
	228	182	Pool and Spa cleaners – using membership lists published by Swimming Pool and Spa Associations (SPASAs) in New South Wales, Queensland, Victoria and South Australia, and our own extrapolations, we estimated that there are 228 Pool and Spa cleaning organisations across Australia. We assumed 80 per cent of Pool and Spa cleaning organisations use products containing hydrogen peroxide. *Source: Various SPASA websites.*
	23,487	705	• Hairdressers/salons – in 2011, there were an estimated 23,487 hairdressers and salons across Australia. Based on advice from AGD, we assumed that only 3 per cent of hairdressers/salons use hydrogen peroxide or products containing hydrogen peroxide at concentrations of concern to government. *Source: IBISWorld (2011), 'Industry Report Q9526, Hairdressing and Beauty Salons in Australia'.*
	304	243	• Water utility organisations – in 2011, there were an estimated 304 water utility organisations across Australia. We estimated that 80 per cent of these organisations use at least one of the precursor chemicals in their business processes. *Source: IBISWorld (2011), 'Industry Report D3701, Water Supply in Australia'.*
	805	644	• Mining – based on advice from AGD and our research, the use of some of the precursor chemicals occurs in iron ore (ANZSIC class code 0801), gold ore (ANZSIC class code 0804) or other metal ore (ANSZIC class code 0809) mining. In 2011, there were an estimated 805 mining organisations across Australia that mined iron ore, gold ore or other metal ore. We estimated that 80 per cent of these organisations use at least one of the precursor chemicals in their business processes. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	1,653	165	• Smelters – in 2011, there were 1,653 smelting organisations across Australia consisting of iron smelting and steel manufacturing (ANZSIC class code 2110), aluminium smelting (ANZSIC class code 2132) and copper, silver, lead and zinc smelting (ANZSIC class code 2133) organisations. There is no available data regarding chemical usage by smelting organisations. On this basis, we assumed 10 per cent of these organisations used at least one of the precursor chemicals. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*

Node	Broader population	Actual population	Notes
	1,650	165	• Metal treatment – in 2011, there were 1,650 metal processing and treatment organisations across Australia. There is no available data regarding chemical usage by metal processing and treatement organisations. On this basis, we assumed 10 per cent of these organisations used at least one of the precursor chemicals. *Source: IBISWorld (2011), 'Industry Report C2764, Metal Coating and Finishing in Australia'.*
	433	108	• Oil field organisations – in 2011, there were 1,653 oil and gas extraction organisations across Australia (ANZSIC class code 0700). There is no available data regarding chemical usage by oil and gas extraction businesses. On this basis, we assumed 25 per cent of these organisations use sodium perchlorate in their business procedures. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	21	21	• Firework/explosives – in 2011, there were an estimated 21 organisations across Australia that manufactured fireworks and/or explosives. Based on advice from AGD, we assumed that 100 per cent of firework/explosive organisations use at least one of the precursor chemicals in the manufacture of their products. *Source: IBISWorld (2011), 'Industry Report C2541, Explosive Manufacturing in Australia'.*
	12,600	6,300	• Food and beverage – in 2011, there were 12,600 food and beverage manufacturing organisations across Australia (ANZSIC subdivision code 11 and 12). We estimated that 50 per cent of these organisations use nitric acid in their business processes. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	6,230	3,115	• Dairy– in 2011, there were an estimated 6,230 dairy farms across Australia. We estimated that 50 per cent of these organisations use at least one of the precursor chemicals in their business processes. *Source: IBISWorld (2011), 'Industry Report A0130, Dairy Cattle Farming in Australia'.*
	291	29	• Plastics – in 2011, there were 291 organisations manufacturing plastics across Australia, specifically, the manufacture of synthetic resin and synthetic rubber (ANZSIC class code 1821) and the manufacture of other basic polymer (ANZSIC class code 1829). There is no available data regarding chemical usage by these businesses. On this basis, we assumed 10 per cent of these organisations use at least one of the precursor chemicals in the manufacture of their products. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	6,000	6,000	• Horticulturists – in 2011, there were an estimated 6,000 horticulturists across Australia. Feedback provided by FIFA suggests all horticulturists use potassium nitrate. *Source: Fertilizer Industry Federation of Australia (2006), 'Analysis Paper on Calcium Nitrate and Potassium Nitrate'.*

Node	Broader population	Actual population	Notes
	609	61	• Hazardous waste – in 2011, there were 609 hazardous waste treatment and disposal organisations across Australia (ANZSIC class code 2921). There is no available data regarding chemical usage by these businesses. On this basis, we assumed 10 per cent of hazardous waste disposal and treatment organisations use at least one of the precursor chemicals. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	284	142	• Dental products – in 2011, there were 284 organisations across Australia that manufactured dental medical and surgical equipment. There is no available data regarding chemical usage by these organisations. On this basis, we assumed 50 per cent of dental medical and surgical equipment manufacturing organisations use at least one of the precursor chemicals. *Source: IBISWorld (2011), 'Industry Report C2832, Medical and Surgical Equipment Manufacturing in Australia'.*
	315	32	• Pharmaceuticals – in 2011, there were 315 pharmaceutical and medicinal product manufacturing organisations across Australia (ANZSIC class code 1841). There is no available data regarding chemical usage by these organisations. On this basis, we assumed 10 per cent of pharmaceuticals and medicinal product businesses use at least one of the precursor chemicals in the manufacture of their product. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	2,307	231	• Chemical producer – in 2011, there were 2,307 basic chemical and chemical product manufacturing businesses across Australia (ANZSIC class codes 1811, 1812, 1813, 1821, 1829, 1831, 1832, 1841, 1842, 1851, 1852, 1891, 1892, and 1899). There is no available data regarding chemical usage by these organisations. On this basis, we assumed 10 per cent of basic chemical and chemical product manufacturing businesses use at least one of the precursor chemicals in their business processes. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*
	149	15	• Scientific instruments – in 2011, there were 149 organisations in Australia that manufactured analytical laboratory instruments. There is no available data regarding chemical usage by these organisations. On this basis, we assumed 10 per cent of these businesses use at least one of the precursor chemicals in their business procedures. *Source: IBISWorld (2011), 'Industry Report C2839, Measurement and Other Scientific Equipment Manufacturing in Australia'.*
	192	19	• Petroleum products – in 2011, there were 192 petroleum refining and petroleum fuel manufacturing organisations across Australia (ANZSIC class code 1701). There is no available data regarding chemical usage by these organisations. On this basis, we assumed 10 per cent of these businesses use at least one of the precursor chemicals in the course of the business processes. *Source: ABS (2011), 'Counts of Australian businesses, including entries and exits', Cat. 8165.0.*

Node	Broader population	Actual population	Notes
	23	23	• Drag racing – in 2011, there were an estimated 23 drag racing locations across Australia. Based on advice from AGD, we assumed that 100 per cent of these locations handle nitromethane as it forms a component of drag racing fuel. *Source: Australian National Drag Racing Association (2011), 'ANDRA Tracks'*, http://www.andra.com.au/sanctioned-tracks.html.
	61,106	**20,038**	
Transport/ logistics			On the basis of advice provided by AGD, we identified two streams of transport that handle precursor chemicals:
	44,562	2,228	• Commercial – in 2011, there were 44,562 transport organisations involved in shipping freight by road. We estimated that 5 per cent of these organisations were involved in the transport of at least one of the precursor chemicals. *Source: IBISWorld (2011), 'Industry Report I6110, Road Freight Transport in Australia'.*
	5,008	250	• Courier – in 2011, there were 5,008 transport organisations involved in the collection and delivery service of products. We estimated that 5 per cent of these organisations were involved in the collection and/or delivery of at least one of the precursor chemicals. *Source: IBISWorld (2011), 'Industry Report J7110, Postal and Courier Services in Australia'.*
	49,570	**2,479**	

The last step we took was to account for double counting of businesses between nodes (i.e. businesses that may operate as introducers and as wholesalers). Analysis provided by AGD suggests that approximately 14 per cent of businesses that use or handle precursor chemicals can be classified as two or more supply chain nodes.[104] We thus reduced our population figures to reflect this advice. Table 58 provides a summary of our analysis.

Table 58: Total population of businesses that use or handle precursor chemicals, by State and Territory

	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	Total
Introducer	22	19	14	8	4	1	0	0	**68**
Processor	126	112	81	47	24	5	1	2	**398**
Wholesaler	6	14	3	5	6	0	0	0	**33**
Retailer	1,635	1,198	928	496	436	123	58	31	**4,906**
End-user (business)	4,206	5,452	2,896	1,682	2,065	632	235	100	**17,268**
Transport/ logistics	646	505	405	342	165	33	23	16	**2,135**
Total	**6,641**	**7,301**	**4,326**	**2,580**	**2,700**	**794**	**317**	**150**	**24,809**

[104] As part of the CSRA process for the 11 precursor chemicals, the CSRAU surveyed and conducted site visits of 187 businesses. Of these 187 businesses, 24 were classified as being two supply chain nodes, while three businesses were classified as being three supply chain nodes.

2 Existing compliance

Once we had determined the total population of businesses that use or handle the precursor chemicals, we sought to estimate what proportion of these businesses were likely to already comply with all or some of the proposed treatment measures. Our estimates of existing compliance are overwhelming based on feedback provided by stakeholders during the focus groups and face-to-face interviews. Table 59 summarises our assumptions about what proportion of businesses that use/handle the precursor chemicals are likely to already comply with the treatment measures.

Table 59: Existing compliance assumptions, by treatment measure and supply chain node

Node/activity	Level of compliance	Notes
Employee and Contractor Checking		
Introducers		
Pre-employment – Verify identity	95%	During consultations, introducers indicated that they had robust HR processes in place – including, in a large number of cases, the use of police checks. Some introducers, however, do not seek to determine the trustworthiness of new employees (focusing instead on their competencies to perform the desired role). Very few introducers indicated that they currently re-verify the identity of existing employees.
Pre-employment – Determine trustworthiness	83%	
During employment – Re-verify identity	5%	
Processors		
Pre-employment – Verify identity	95%	During consultations, processors indicated that they had robust HR processes in place – including, in some cases, the use of police checks. Some processors, however, do not seek to determine the trustworthiness of new employees (focusing instead on their competencies to perform the desired role). Very few processors indicated that they currently re-verify the identity of existing employees.
Pre-employment – Determine trustworthiness	83%	
During employment – Re-verify identity	5%	
Wholesalers		
Pre-employment – Verify identity	40%	Wholesalers indicated that they generally seek to verify the identity of new employees, as well as check CVs and call referees. They also indicated, however, they employ a number of casual and itinerant staff (as forklift operators, etc.) that are not subject to rigorous scrutiny. Furthermore, no wholesalers indicated that they currently re-verify the identity of existing employees.
Pre-employment – Determine trustworthiness	20%	
During employment – Re-verify identity	0%	
Retailers		
Pre-employment – verify identity	90%	A number of retailers (particularly pharmacies and supermarkets) indicated that they verify identity of new employees. We did not receive information about existing compliance for 'pre-employment – determine trustworthiness' and 'during employment – re-verify identity'.
Pre-employment – determine trustworthiness	0%	
During employment – re-verify identity	0%	
End-users (business)		
Pre-employment – verify identity	40%	A large number of end-users during the focus groups indicated that they do not check photo identification of new employees. A larger

Node/activity	Level of compliance	Notes
Pre-employment – determine trustworthiness	10%	number indicated that they do not seek to verify the trustworthiness of new staff (through checking of CVs or otherwise) – because either they lacked the capacity to do so (e.g. horticulturalists) or they are more concerned with verifying competencies. Like most of the other nodes, very few end-users indicated that they re-verify the identity of existing employees.
During employment – Re-verify identity	5%	
Transport/logistics		
Pre-employment – Verify identity	75%	Transport/logistics stakeholders indicated that they currently undertake a number of staff checks before and during employment. These checks include police checks and obtaining Maritime Identification Security Cards (MISCs) (which involve an ASIO check). This feedback suggests that medium and large transport/logistics businesses would likely already comply with the pre-employment requirements. Some stakeholders also indicated that they currently re-verify the identity of existing employees on a triennial or quarterly basis (generally as employees have to reapply for their MISC).
Pre-employment – Determine trustworthiness	75%	
During employment – Re-verify identity	33%	
Security Awareness		
Introducers	0%	Some businesses (primarily introducers and transport/logistics) indicated that they provide their staff with some security awareness already, but this tends to be general in nature and not focused on the security risks associated with the precursor chemicals and their potential theft/diversion for use in homemade explosives. Consequently, we assume that all businesses would either have to re-visit their existing security awareness processes or develop a new security awareness process because of this measure.
Processors	0%	
Wholesalers	0%	
Retailers	0%	
End-users (business)	0%	
Transport/logistics	0%	
Inventory Control		
Introducers	60%	With the exception of horticulturalists and some small-to-medium enterprises, the general view from the focus groups was that businesses already conduct regular stocktakes (either formally or informally). However, businesses generally stocktake on an annual, half-yearly or quarterly basis; rather than monthly, as stipulated under the measure. Thus, our estimates for existing compliance try to capture how many additional stocktakes businesses will have to conduct, based on node-specific feedback.
Processors	80%	
Wholesalers	15%	
Retailers	0%	
End-users (business)	55%	
Receipt of Chemical		
Introducers	100%	The general feedback we received from stakeholders was that essentially all businesses already comply with this measure. It was seen as standard business practice, driven by commercial incentives, to ensure purchasers of chemicals received what they paid for. Consequently, we assume that all businesses currently comply with this measure.
Processors	100%	
Wholesalers	100%	
Retailers	100%	
End-users (business)	100%	
Transport/logistics	100%	
Theft and Diversion Procedures, Physical Access Controls, Personnel Access Controls		
Introducers	0%	The general feedback we received from stakeholders was that most businesses had at least informally assessed the risks posed by the theft of stock, and put in place various physical and personnel access controls to address these risks. Very few businesses, however, had formally assessed the security risks associated with precursor chemicals. Consequently, we assume no businesses currently comply with these three measures.
Processors	0%	
Wholesalers	0%	
Retailers	0%	
End-users (business)	0%	
Transport/logistics	0%	
Point of Sale		
Introducers	0%	Based on feedback received during the focus groups, we assume that no businesses currently require customers to sign an EUD before
Processors	0%	

Node/activity	Level of compliance	Notes
Wholesalers	0%	purchasing a precursor chemical (or product containing a precursor chemical).
Retailers	0%	
Sales and Distribution		
Introducers	100%	The general feedback we received from stakeholders was that essentially all businesses already comply with this measure. It was seen as standard business practice, driven by commercial incentives, to ensure purchasers of chemicals were given what they paid for. Consequently, we assume that all businesses currently comply with this measure.
Processors	100%	
Wholesalers	100%	
Retailers	100%	
Consignment Control		
Transport/logistics		
Not leaving vehicle unattended	0%	Based on feedback received from transport/logistics companies during the focus groups.
Installation and monitoring of GPS	50%	

3 Expected adoption

Once we had determine what proportion of businesses were likely to already comply with all or some of the proposed treatment measures, we sought to estimate what proportion of the remaining businesses are likely to adopt the measures as a result of the four options under consideration. The sections below detail our analysis and assumptions.

Option 1 – Targeted awareness campaign

The expected level of adoption under Option 1 is likely to be low (reflecting the voluntary nature of the targeted awareness campaign) but not insignificant. During the industry focus groups, stakeholders repeatedly noted that businesses wanted to do the 'right thing' in terms of managing chemical security risks, but lacked adequate information about how to do so. Furthermore, respondents to the online survey were asked to nominate what proportion of businesses in their industry would likely adopt the proposed treatment measures as a result of a targeted education campaign. The average response to this question was 46.7 per cent (n=146). It is therefore reasonable to expect that a targeted awareness campaign could encourage some businesses to alter their behaviour and adopt some of the proposed treatment measures.

Conversely, feedback from stakeholders suggests that some measures – 'Consignment Control' and 'Inventory Control' in particular – are likely to impose significant additional costs on industry. Given the scale of these costs, the absence of any off-setting benefits from the measures for industry, and the vehemence that characterised industry comments about the measures during consultations, it is likely that no businesses will adopt 'Consignment Control' and 'Inventory Control' under Option 1.

Additional feedback that we received about the expected level of adoption under Option 1 includes:

- Supermarkets indicated that hydrogen peroxide is a low volume, low margin product and they stock it primarily as a courtesy for older demographic customers. As a result, they were unlikely to adopt any measure that added additional costs to their business. If mandated to comply, supermarkets indicated they would stop stocking hydrogen peroxide
- Some universities indicated that they would be unlikely to adopt the proposed treatment measures unless they were mandated. These stakeholders noted that in a university environment with limited funds, and multiple competing demands for those funds, it would be difficult to secure institutional support for the proposed treatment measures unless they were mandated by regulation
- Horticulturalists maintained that, while some growers would have the capacity to understand and adopt the proposed treatment measures, the majority would be likely to struggle to comply under either a voluntary or mandatory scheme. It was noted in particular that many horticultural farms are operated by persons from a Culturally and Linguistically Diverse (CALD) background. For example, in a recent study commissioned by the Department of Agriculture, Fisheries and Forestry (DAFF), it was found that CALD persons represented 28.9 per cent of persons employed in mushroom and vegetable growing and 17.1 per cent of persons employed in fruit and tree nut growing (compared with 6.7 per cent for the total Australian agriculture, fisheries and forestry industries workforce).[105] Stakeholders contended that CALD persons were less likely to adopt the proposed treatment measures than horticulturalists generally, due to a lack of English literacy and cultural mistrust of authority, and
- A number of stakeholders noted that wholesalers, retailers and end-users may be less likely to adopt the proposed treatment measures under a voluntary approach – given that businesses across these nodes are more likely to be small-to-medium enterprises and thus face a range of capacity constraints.

Drawing on the feedback outlined above, Table 60 outlines our assumptions about expected levels of adoption under Option 1, by supply chain node and measure. Key assumptions to note:

- No businesses will adopt 'Inventory Control' and 'Consignment Control'
- No businesses will adopt 'Receipt of Chemical' and 'Sales and Distribution', given the assumption that businesses already adopt these measures
- 45 per cent of introducers, processors and transport/logistics will adopt all other measures. This figure was derived from rounding the results of the online survey
- 22.5 per cent of wholesalers, retailers and end-users will adopt 'Employee and Contractor Checking', 'Security Awareness' and 'Theft and Diversion Procedures'. This figure was derived from halving the assumption above and is intended to

[105] Kancans, Robert, Nyree Stenekes and Treena Benedictos (2010), 'Improving engagement of culturally and linguistically diverse persons in agriculture, fisheries and forestry', for the Department of Agriculture, Fishers and Forestry, July, Australian Bureau of Agricultural and Resource Economics – Bureau of Rural Sciences, Canberra.

represent feedback from stakeholders about capacity constraints across the three supply chain nodes, and

- 22.5 per cent of retailers will adopt 'Point of Sale', while 45 per cent of wholesalers will adopt the same measure. This reflects AGD advice about the capacity of the two nodes to adopt the measure.

Table 60: Expected adoption assumptions for Option 1, by treatment measure and supply chain node

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport /logistics
Employee and Contractor Checking	45%	45%	22.5%	22.5%	22.5%	45%
Security Awareness	45%	45%	22.5%	22.5%	22.5%	45%
Inventory Control	0%	0%	0%	0%	0%	0%
Receipt of Chemical	-	-	-	-	-	n/a
Theft and Diversion Procedures	45%	45%	22.5%	22.5%	22.5%	45%
Physical Access Controls	-	-	-	-	-	-
Personnel Access Controls	-	-	-	-	-	-
Point of Sale	45%	45%	45%	22.5%	n/a	n/a
Sales and Distribution	-	-	-	-	n/a	n/a
Consignment Control	0%	0%	0%	0%	0%	0%

Option 2 – Industry codes

Given that Option 2 is essentially a voluntary approach, we have based our assumptions for expected levels of adoption on the assumptions used in Option 1 (particularly in terms of the relativities between nodes and measures). The key difference is that we have assumed a greater proportion of businesses will adopt the proposed treatment measures under Option 2 compared with Option 1. This assumption is based on three factors:

- Respondents to the online survey were asked to nominate what proportion of businesses in their industry would likely adopt the proposed treatment measures if they were encouraged to do so by a relevant industry association. The average response to this question was 54.9 per cent (n=146) – approximately 8 percentage points higher than the response for a targeted education campaign
- Option 2 would involve the development of seven industry codes, targeted at particular groupings of chemical users and handlers. This arrangement may make the treatment measures more relevant to individual businesses, increasing the likelihood of uptake, and

- Option 2 would also involve industry (though the relevant industry associations) taking ownership of the development and promulgation of the proposed treatment measures. This may also increase the likelihood of uptake.

Table 61 outlines our assumptions about expected levels of adoption under Option 2, by treatment measure and supply chain node. Key assumptions to note:

- No businesses will adopt 'Inventory Control' and 'Consignment Control'
- No businesses will adopt 'Receipt of Chemical' and 'Sales and Distribution', given the assumption that businesses already adopt these measures
- 55 per cent of introducers, processors and transport/logistics will adopt all other measures. This figure was derived from rounding the results of the online survey
- 27.5 per cent of wholesalers, retailers and end-users will adopt 'Employee and Contractor Checking', 'Security Awareness' and 'Theft and Diversion Procedures'. This figure was derived from halving the assumption above and is intended to represent feedback from stakeholders about capacity constraints across the three supply chain nodes, and
- 27.5 per cent of retailers will adopt 'Point of Sale', while 55 per cent of wholesalers will adopt the same measure. This reflects AGD advice about the capacity of the two nodes to adopt the measure.

Table 61: Expected adoption assumptions for Option 2, by treatment measure and supply chain node

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Employee and Contractor Checking	55%	55%	27.5%	27.5%	27.5%	55%
Security Awareness	55%	55%	27.5%	27.5%	27.5%	55%
Inventory Control	0%	0%	0%	0%	0%	0%
Receipt of Chemical	-	-	-	-	-	n/a
Theft and Diversion Procedures	55%	55%	27.5%	27.5%	27.5%	55%
Physical Access Controls	-	-	-	-	-	-
Personnel Access Controls	-	-	-	-	-	-
Point of Sale	55%	55%	55%	27.5%	n/a	n/a
Sales and Distribution	-	-	-	-	n/a	n/a
Consignment Control	0%	0%	0%	0%	0%	0%

Option 3 – Government code of practice

Given that Option 3 is essentially a voluntary approach, we have based our assumptions for expected levels of adoption on the assumptions used in Option 1 (particularly in terms of the relativities between nodes and measures). The key

difference is that we have assumed a greater proportion of businesses will adopt the proposed treatment measures under Option 3 compared with Options 1 and 2. This assumption is based on two factors:

- Respondents to the online survey were asked to nominate what proportion of businesses in their industry would likely adopt the proposed treatment measures if they were encouraged to do so by governments through a standard or code of practice. The average response to this question was 57.4 per cent (n=145) – approximately 10 percentage points higher than the response for a targeted education campaign and 3 percentage points higher than the response for an industry code, and
- As noted by the Commonwealth Interdepartmental Committee on Quasi-Regulation, quasi-regulatory arrangements like a government code of practice can encourage higher levels of uptake than self-regulatory arrangements, due to uncertainty amongst industry about the status and enforceability of quasi-regulation.[106]

Table 62 outlines our assumptions about expected levels of adoption under Option 3, by treatment measure and supply chain node. Key assumptions to note:

- No businesses will adopt 'Inventory Control' and 'Consignment Control'
- No businesses will adopt 'Receipt of Chemical' and 'Sales and Distribution', given the assumption that businesses already adopt these measures
- 60 per cent of introducers, processors and transport/logistics will adopt all other measures. This figure was derived from rounding the results of the online survey
- 30 per cent of wholesalers, retailers and end-users will adopt 'Employee and Contractor Checking', 'Security Awareness' and 'Theft and Diversion Procedures'. This figure was derived from halving the assumption above and is intended to represent feedback from stakeholders about capacity constraints across the three supply chain nodes, and
- 30 per cent of retailers will adopt 'Point of Sale', while 60 per cent of wholesalers will adopt the same measure. This reflects AGD advice about the capacity of the two nodes to adopt the measure.

Table 62: Expected adoption assumptions for Option 3, by treatment measure and supply chain node

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Employee and Contractor Checking	60%	60%	30%	30%	30%	60%
Security Awareness	60%	60%	30%	30%	30%	60%

[106] Commonwealth Interdepartmental Committee on Quasi-Regulation (1997), Grey Letter Law, December, Canberra.

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Inventory Control	0%	0%	0%	0%	0%	0%
Receipt of Chemical	-	-	-	-	-	n/a
Theft and Diversion Procedures	60%	60%	30%	30%	30%	60%
Physical Access Controls	-	-	-	-	-	-
Personnel Access Controls	-	-	-	-	-	-
Point of Sale	60%	60%	60%	30%	n/a	n/a
Sales and Distribution	-	-	-	-	n/a	n/a
Consignment Control	0%	0%	0%	0%	0%	0%

Option 4 – Regulation

Under Option 4, we have assumed a relatively high and universal level of adoption. Our estimate of expected adoption is primarily informed by the online survey. Respondents to the survey were asked to nominate what proportion of businesses in their industry would likely adopt the proposed treatment measures if governments mandated the measures through some form of regulation. The average response to this question was 69.8 per cent (n=145) – approximately 23 percentage points higher than the response for a targeted education campaign, 15 percentage points higher than the response for an industry code, and 12 percentage points higher than the response for a government code of practice.

Table 63 outlines our assumptions about expected levels of adoption under Option 4, by treatment measure and supply chain node.

Table 63: Expected adoption assumptions for Option 4, by treatment measure and supply chain node

	Introducer	Processor	Wholesaler	Retailer	End-user (business)	Transport/ logistics
Employee and Contractor Checking	70%	70%	70%	70%	70%	70%
Security Awareness	70%	70%	70%	70%	70%	70%
Inventory Control	70%	70%	70%	70%	70%	70%
Receipt of Chemical	-	-	-	-	-	n/a
Theft and Diversion Procedures	70%	70%	70%	70%	70%	70%
Physical Access Controls	-	-	-	-	-	-
Personnel Access Controls	-	-	-	-	-	-
Point of Sale	70%	70%	70%	70%	n/a	n/a
Sales and Distribution	-	-	-	-	n/a	n/a
Consignment Control	0%	0%	0%	0%	70%	70%

Appendix J Administrative costs

1 General assumptions

Assumption type	Amount	Source
Government staff costs	EL2 – $204,265.08 p.a. EL1 – $179.375.00 p.a. APS6 – $133,611.06 p.a. APS4 – $107,599.89 p.a.	Costs are specified at the mid-ranges for salary bands as at 5/08/2010 (as determined by AGD's 2010 Enterprise Agreement) and then multiplied by 1.75 to account for on-costs and overheads (in line with the Victorian Guide to Regulation).
Industry association staff costs	Hourly wage of $61.72.	$54 in 2006 values, inflated to 2011 values, Government of Victoria (2007), 'Victorian Guide to Regulation', 2nd edition, Department of Treasury and Finance, Melbourne.
Translator/ interpreter costs	$660 per day	Derived from the Department of Immigration and Citizenship's interpreting service charges (http://www.immi.gov.au/living-in-australia/help-with-english/help_with_translating/service-charges.htm).
Average flight cost	$706 per flight	Fully flexible return flight between Sydney and Melbourne (Serko).
Average accommodation cost	$247	Derived from ATO's reasonable travel allowances – average of all capitals, includes accommodation, meals and incidentals (http://law.ato.gov.au/pdf/pbr/td2010-019.pdf).

2 Option 1 assumptions

Assumption type	Amount	Source
Government staff effort	EL2 – 0.5 FTE (2012-2014) EL1 – 3 FTE (2012-2014) APS6 – 1.5 FTE (2012-2014) APS4 – 0.5 FTE (2012-2014)	Doubled figures provided by AGD about level of staff effort required for Phase One of the Chemical of Security Concern awareness campaign.
Translator/ interpreter effort	Interpreter services – 260 days (to assist in development of communication materials; one-off); 26 days p.a. as part of targeted outreach (2012-14).	PwC
Travel frequency	National roadshow (eight capitals, plus five regional centres) – 2 AGD staff members (2012). Targeted outreach – 1 trip each fortnight– 1 AGD staff member, 1 interpreter for every second trip (2012-14).	PwC
Communication expenses	Advertising – $615,905.96 (one-off) Market research – $675,500.00 (one-off) Promotional material – $138,160.00 (one-off) Misc expenses – $240,888.24	Quadrupled figures provided by AGD about communication expenses required for Phase One of the Chemical of Security Concern awareness campaign.

Assumption type	Amount	Source
	(one-off)	

3 Option 2 assumptions

Assumption type	Amount	Source
Government staff effort	EL2 – 0.2 FTE (2012-13), 0.05 FTE (2014-21) EL1 – 1 FTE (2012-13), 0.5 FTE (2014-21)	PwC
Industry association staff effort	6 FTEs (2012-13), 2.5 FTE (2014), 1.25 FTE (2015-21)	Stakeholders during consultation suggested that it would take 1 FTE for an industry association to develop and promulgate an industry code.

4 Option 3 assumptions

Assumption type	Amount	Source
Government staff effort	EL2 – 0.5 FTE (2012-14), 0.2 FTE (2015), 0.05 FTE (2016-21) EL1 – 3 FTE (2012-14), 1 FTE (2015), 0.5 FTE (2016-21) APS6 – 1.5 FTE (2012-14), APS4 – 0.5 FTE (2012-14)	Doubled figures provided by AGD about level of staff effort required for Phase One of the Chemical of Security Concern awareness campaign. PwC
Translator/ interpreter effort	Interpreter services – 260 days (to assist in development of communication materials; one-off); 26 days p.a. as part of targeted outreach (2012-14).	PwC
Travel frequency	National roadshow (eight capitals, plus five regional centres) – 2 AGD staff members (2012). Targeted outreach – 1 trip each fortnight– 1 AGD staff member, 1 interpreter for every second trip (2012-14).	PwC
Communication expenses	Advertising – $307.953 (one-off) Market research – $338,250 (one-off) Promotional material – $69,080 (one-off) Misc expenses – $120,444 (one-off)	Doubled figures provided by AGD about communication expenses required for Phase One of the Chemical of Security Concern awareness campaign.

5 Option 4 assumptions

Assumption type	Amount	Source
Government staff effort	EL2 – 0.5 FTE (2012-14), 0.2 FTE (2015), 0.05 FTE (2016-21) EL1 – 3 FTE (2012-14), 1 FTE (2015), 0.5 FTE (2016-21) APS6 – 1.5 FTE (2012-14),	Doubled figures provided by AGD about level of staff effort required for Phase One of the Chemical of Security Concern awareness campaign. PwC

Assumption type	Amount	Source
	APS4 – 0.5 FTE (2012-14)	
Translator/ interpreter effort	Interpreter services – 260 days (to assist in development of communication materials; one-off); 26 days p.a. as part of targeted outreach (2012-14).	PwC
Travel frequency	National roadshow (eight capitals, plus five regional centres) – 2 AGD staff members (2012). Targeted outreach – 1 trip each fortnight– 1 AGD staff member, 1 interpreter for every second trip (2012-14).	PwC
Communication expenses	Advertising – $307.953 (one-off) Market research – $338,250 (one-off) Promotional material – $69,080 (one-off) Misc expenses – $120,444 (one-off)	Doubled figures provided by AGD about communication expenses required for Phase One of the Chemical of Security Concern awareness campaign.

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