REFRIGERANT RECLAIM AUSTRALIA

2nd October 2015

Dr Richard Chadwick
General Manager
Adjudication Branch
Australian Competition and Consumer Commission
GPO Box 3131
Canberra ACT 2601

Authorisation A91256 – Revocation and Substitution

Dear Dr Chadwick,

As previously advised, Refrigerant Reclaim Australia Ltd (RRA) is seeking the revocation of the current authorisation, A91256, and the substitution of a new authorisation.

Our circumstances are largely unchanged as we continue to develop and manage Australia's refrigerant product stewardship scheme.

Enclosed please find Form FC appropriately completed, and we look forward to working with the ACCC to ensure our product stewardship program continues to thrive and comply.

Please contact me anytime should you require further information or clarification on any matter pertaining to our application and operations.

Yours sincerely,

Michael Bennett

General Manager RRA Ltd

Refrigerant Reclaim
Australia Limited
ABN 75 061 197 206

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Braddon, ACT 2612
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Canberra, ACT 2601,
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Form FC

Commonwealth of Australia

Competition and Consumer Act 2010 — subsection 91C (1)

APPLICATION FOR REVOCATION OF A NON-MERGER AUTHORISATION AND SUBSTITUTION OF A NEW AUTHORISATION

To the Australian Competition and Consumer Commission:

Application is hereby made under subsection 91C (1) of the *Competition and Consumer Act 2010* for the revocation of an authorisation and the substitution of a new authorisation for the one revoked.

PLEASE FOLLOW DIRECTIONS ON BACK OF THIS FORM

1. Applicant

(a) Name of applicant:

A91515

Refrigerant Reclaim Australia Limited (RRA)

(b) Description of business carried on by applicant:

RRA is the industry funded not-for-profit product stewardship organisation that recovers, reclaims and destroys ozone depleting (ODS) and synthetic greenhouse gas (SGG) refrigerants. The product stewardship program is funded by a levy on the import and sale of new refrigerant that is authorised under ACCC Determination A91256.

(c) Address in Australia for service of documents on the applicant:
RRA Ltd
GPO Box 753
Canberra ACT 2601
Facsimile: 02 6230 4533

Email: michael.bennett@refrigerantreclaim.com.au

2. Revocation of authorisation

(a) Description of the authorisation, for which revocation is sought, including but not limited to the registration number assigned to that authorisation:

Authorisation was granted to RRA, Determination A91256, to continue to operate a product stewardship scheme to recover ozone depleting and synthetic greenhouse gas refrigerants to be destroyed, stored, or reclaimed and sold. The authorisation allowed RRA to expand the scope of the scheme to allow industry participants (which are part of the RRA Board) to discuss and agree to:

- reduce the level of the levy applied to each kilo of refrigerant imported and sold in Australia
- set the values of rebates paid to contractors and wholesalers
- the processes used to reclaim recovered refrigerant to on-sell
- consider alternative destruction services either in Australia or offshore

(b) Provide details of the basis upon which revocation is sought:

The current authorisation expires in May 2016 and the circumstances requiring an authorisation remain the same.

3. Substitution of authorisation

(a) Provide a description of the contract, arrangement, understanding or conduct whether proposed or actual, for which substitution of authorisation is sought:

3. (a) (i) Discussion and agreement by various industry participants (RRA Board) to set and for importers to consistently apply a levy in addition to the price of ozone depleting and synthetic greenhouse gas refrigerants imported into or manufactured and sold in Australia.

3. (a) (ii) Discussion and agreement by various industry participants (RRA Board) to determine the value of rebates to be paid by RRA to wholesalers and contractors for the return of recovered refrigerant.

3. (a) (iii) Discussion and agreement by various industry participants (RRA Board) to determine the processes and disposal practices that will be applied to recovered refrigerant; the main options for such processes and practices being storage, reclamation and sale, and destruction in Australia or offshore.

(b) Description of the goods or services to which the contract, arrangement, understanding or conduct (whether proposed or actual) relate:

3. (b) (i) Levy. Importers pay a levy to RRA on the import and sale of new refrigerant in Australia. The value of the levy is recovered by adding the fee to the price of new refrigerant when it is sold into the distribution chain. The fee may appear as a separate line item on the invoice and is common across all bulk refrigerant importers and suppliers. Importers of equipment containing refrigerant usually do not display the levy but include it their price.

The levy applied to imported and sold refrigerants is $2.00 per kilogram. The value of the levy was originally set at $1.00 when the program

commenced in 1993. The expansion of the program to include the take-back of synthetic greenhouse gases and the passing and implementation of the Ozone Protection and Synthetic Greenhouse Management Act, along with other initiatives, caused a strong rise in the amount of refrigerant being recovered and destroyed. To remain sustainable additional funds were required and applications were made, and approved, resulting in the levy increasing to $1.50 in 2006, and $2.00 in 2008. RRA does not foresee the requirement for a further increase in the next five (5) year period.

All importers of refrigerant, both in bulk and pre-charged in equipment, must have an import licence issued by the Department of Environment. A condition of that licence is that they take responsibility for the refrigerant they import by participating in a product stewardship scheme. Thus far all importers have chosen to enter into an agreement with RRA to participate in the industry-wide product stewardship program and to contribute the levy. The agreement provides that RRA may at any time audit the amount of levy payable by the importer.

For ease of administration RRA has a range of reporting and payment periods. Bulk importers report imports and sales on a monthly basis; large equipment importers report on a quarterly basis; and small equipment importers pay annually.

The agreement also allows for suspension and termination of an agreement with an importer. Should an importer fail to report or pay the required levy then they may be suspended from the product stewardship program. Further, the agreement between RRA and the importer may be terminated by either party with 180 days notice, or due to breaches of the agreement or winding up and liquidation.

3. (b) (ii) Rebates. Rebates are fees paid to wholesalers and contractors for the recovery, handling and return of refrigerant. In the case of wholesalers the rebate is part compensation for the costs they incur. For contractors, the rebate is an incentive to recover and return refrigerant. The values of the rebates are set by RRA and agreements require wholesalers to pay the contractor rebate as a minimum fee for the return of refrigerant.

Rebates are paid to wholesalers to reimburse some of the costs involved in managing the take back recovered refrigerant. Wholesalers provide market access; their branch networks act as the collection points, cylinders, decanting services and administration that enables the product stewardship program to function effectively.

Calculating the quantum of the wholesaler rebate has proved problematic in the past. PricewaterhouseCoopers was engaged to survey costs incurred but the data provided by wholesalers varied widely. The current value of the levy, $7.50, is unchanged since 2008 and was determined through consultation with wholesalers whilst keeping RRA's financial sustainability in mind.

Rebates are paid to contractors to provide an incentive to recover and return used, contaminated and unwanted refrigerant. Contractors are generally able to pass on the costs of recovery to the equipment owner. However, a weak regulatory environment with little or no compliance activity necessitated the provision of a financial incentive. The contractor rebate has remained unchanged at $3.00 since 2008.

3. (b) (iii) Processes. There are a number of processes that may be applied to recovered refrigerant but ultimately it must be either safely stored for subsequent reclamation or destruction, reclaimed to new specification and placed back in the market, or safely destroyed.

Since the last application all contaminated and unwanted refrigerant collected by RRA has been destroyed. The largest volume was destroyed using the argon plasma-arc facility in Melbourne. Some 50 tonnes of recovered refrigerant was destroyed through an upgraded cement plant in Yarwun, Queensland. RRA worked with the plant owner to help upgrade the plant to destroy fluorocarbons.

(c) The term for which substitute authorisation of the contract, arrangement or understanding (whether proposed or actual), or conduct, is being sought and grounds supporting this period of authorisation:

A term of five (5) years is sought for this authorisation.

4. Parties to the contract, arrangement or understanding (whether proposed or actual), or relevant conduct, for which substitution of authorisation is sought

(a) Names, addresses and description of business carried on by those other parties to the contract, arrangement or understanding (whether proposed or actual), or the relevant conduct:

The companies and associations noted below are all members of RRA with rights equivalent to those of shareholders; except that RRA does not pay dividends. Should cease operations our Constitution requires that any funds remaining be provided to the CSIRO for atmospheric research. There are other companies and associations that conduct similar operations in the industry that are not members of RRA, but all companies in the industry participate in the product stewardship scheme.

The Directors of RRA are listed separately along with the industry association that nominated them for the Board.

Manufacturers and Importers (Bulk)

Manufacturers and Importers (Bulk) are large international corporations that manufacture ODS and SGG refrigerants offshore and import them in bulk quantities to Australia for sale to distributors, wholesalers and original equipment manufacturers. The last Australian fluorocarbon manufacturing plant ceased operations in 1995.

- Company: The Chemours Company (Australia) Pty Ltd
  Contact: Mr. John McCormack
  Address: Locked Bag 2067, North Ryde BC, NSW 1670
- Company: Arkema Pty Ltd
  Contact: Mr. Brian Jecks
  Address: PO Box 323, Canterbury, VIC 3126
- Company: Ixom Operations Pty Ltd
  Contact: Cathy Brice
  Address: 1 Nicholson St, Melbourne, VIC 3000
- Company: Honeywell Polymers (Australia) Pty Ltd
  Contact: Michael Hettrick
  Address: 71 Queens Road, Melbourne, VIC 3004

Manufacturers and Importers (Equipment)

Manufacturers and Importers (Equipment) may be large international corporations, or locally owned firms, that manufacture and/or import refrigeration plant and components, air-conditioning plant and components, motor vehicles, and a range of other equipment types all of which contain either ODS or SGG refrigerants, for sale into the Australian market.

- Company: Daikin Australia Pty Ltd
  Contact: Mr. Robert Beggs
  Address: PO Box 120, Moorebank, NSW 1875
- Company: Fujitsu General (Aust) Pty Ltd
  Contact: Mr. Peter Cashel
  Address: Eastern Creek Drive, Eastern Creek, NSW 2148
- Company: Mitsubishi Electric Company Australia Pty Ltd
  Contact: Mr. John Taylor
  Address: PO Box 11, Rydalmere, NSW 2116

Importers and Distributors

Importers and Distributors may be international corporations or locally owned companies that import and locally purchase ODS and SGG

refrigerants in bulk quantities for sale to wholesalers and original equipment manufacturers.

- Company: A-Gas Australia Pty Ltd
  Contact: Ms. Louise McCann
  Address: 9/11 Oxford Road, Laverton North, VIC 3026
- Company: Atomic Capital Australia Pty Ltd
  Contact: Paul Keedle
  Address: PO Box 355, Yarra Glen, VIC 3775

Importers and Wholesalers

Importers and Wholesalers may be international corporations or locally owned companies that import and locally purchase ODS and SGG refrigerants in bulk quantities for sale to contractors, end users, and original equipment manufacturers. Typically, they will have a number of geographically dispersed outlets dedicated to supplying a range of equipment and refrigerants to the industry.

- Company: Actrol Parts Pty Ltd
  Contact: Mr. Andrew Leach
  Address: 118 Burwood Highway, Burwood VIC 3125
- Company: BOC Gases Ltd
  Contact: Ms. Anna Condell
  Address: 10 Julius Avenue, North Ryde, NSW 2113
- Company: Heatcraft Australia Pty Ltd
  Contact: Ms. Kirsty Harder
  Address: Locked Bag 6501, Milperra, NSW 1891

Industry Associations

The refrigeration and air-conditioning industry has numerous industry associations representing the interests of their various constituencies.

- Association: Air-conditioning Refrigeration Equipment Manufacturers Association
  Contact: Mr. Mark Padwick
  Address: PO Box 1615, North Sydney, NSW 2059
- Association: Air-conditioning Refrigeration Wholesalers Association
  Contact: Mr. Gary Kenworthy
  Address: 19 King Street, Blackburn, VIC 3130
- Association: Refrigerants Australia
  Contact: Dr. Greg Picker
  Address: Level 10, 15 Green Square Close, Fortitude Valley, QLD 4006
- Association: Refrigeration Air Conditioning Contractors

		Association (RACCA)
	Contact:	Mr. Kevin O'Shea
	Address:	817 Princes Highway, Tempe, NSW 2044
•	Association:	Vehicle Air-conditioning Specialists of Australasia (VASA)
	Contact:	Mr. Ian Stangroome
	Address:	66 Rowells Road, Lockleys, SA, 5032

Directors of Refrigerant Reclaim Australia Limited

Mr. John McCormack	Chairman
Mr. Peter Cashel	Vice-Chairman
Mr. Kevin O'Shea	Secretary/Treasurer
Mr. Brett Fraser	Director
Mr. Greg Groppenbacher	Director
Mr. Brian Jecks	Director
Mr. Andrew Leach	Director
Mr. Mark Mitchell	Director

(b) Names, addresses and descriptions of business carried on by parties and other persons on whose behalf this application is made:

This application is made on behalf of RRA and its directors and members, and those companies and persons that have entered into agreements with RRA including: seventeen (17) bulk refrigerant importers; the 1,062 importers of equipment containing refrigerant; and thirty (30) wholesalers whose businesses and branches (some 400) take back and handle recovered refrigerant for collection by RRA.

(c) Where those parties on whose behalf the application is made are not known - description of the class of business carried on by those possible parties to the contract or proposed contract, arrangement or understanding:

Not applicable.

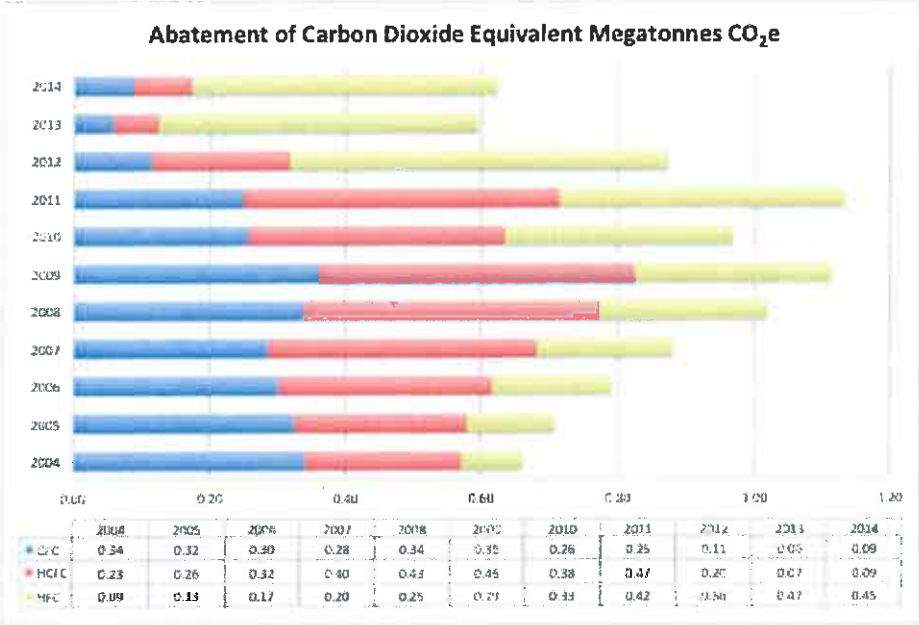
5. Public benefit claims

(a) Arguments in support of application for substitution of authorisation:

The RRA program has facilitated the recovery of approximately 5,400 tonnes of ozone depleting and synthetic greenhouse gas refrigerants since the program began in 1993. In achieving this RRA has provided a significant public benefit as described below.

- RRA takes back between 30% and 50 % of all unwanted recovered refrigerant and the program has been globally recognised through awards from the United Nations Environment programme and the US EPA. Please see **Appendix 1** for a calculation of refrigerant available for recovery and return.
- Assisting Australia meet obligations to control the consumption and production of ozone depleting substances under the Montreal Protocol. The program has so far prevented the emission of sufficient ozone depleting refrigerant to destroy more than ten (10) million tonnes of stratospheric ozone.
- Significant contribution to Australia meeting the greenhouse emission reduction targets set out in the Kyoto Protocol. The program has so far prevented the emission of the equivalent of ten (10) million tonnes of carbon dioxide through the collection and destruction of synthetic greenhouse gas refrigerants, such as HFCs, HCFCs and CFCs.

Chart 1: Abatement of CO_2e 2004-2014



- Encouraging environmental responsibility by industry through the promotion of sound practises and creating awareness of the impacts from industry activities.
- Providing industry with a proven program that complies with all regulatory requirements, and provides the opportunity for all sectors of the industry to meet their environmental and regulatory obligations. RRA is a critical component in a comprehensive industry-wide co-regulatory approach to the reduction of negative

environmental impacts. Other components of the program include licensing of importers, sellers, purchasers and technicians, audits of trade contractors, a prohibition on preventable emissions, and the requirement for recovery and safe disposal of ODS and SGG refrigerants.

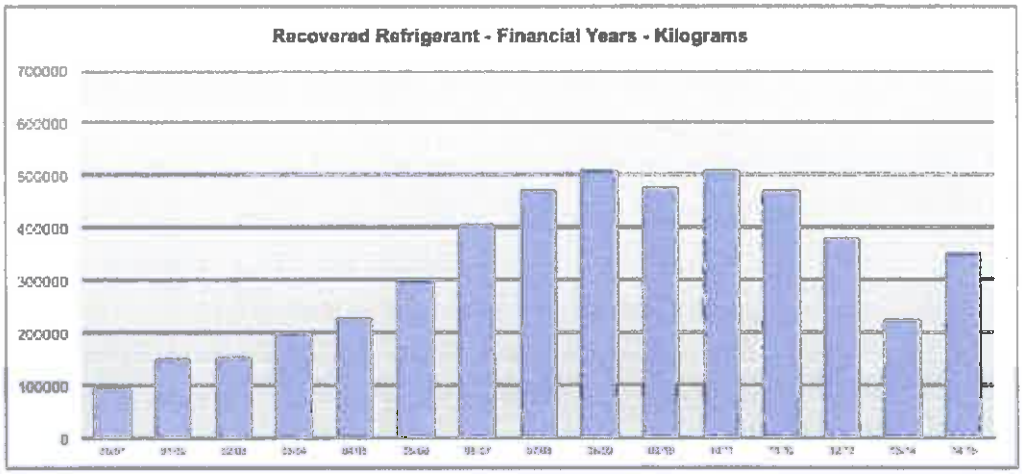
Since the granting of the current authorisation in 2010 there has been considerable upheaval in the refrigerant market. The introduction of a carbon price on 1 July 2012 led to the elevation of prices for the hydrofluorocarbon (HFCs) synthetic greenhouse gas refrigerants. The magnitude of the price increases caused behavioural shifts in the market particularly with the level of reuse.

As can be seen in Chart 2 below, the volume of refrigerant being collected resumed growth in FY11 following the negative impacts of the GFC. However, the rate of recovery declined again in the first half of calendar 2012 and the decline accelerated after the carbon pricing was introduced. Recovery continued to diminish until the repeal of the carbon pricing legislation in 2014.

Contractors and wholesalers retained large quantities of recovered refrigerants, particularly HCFC22. Whilst some of the retained refrigerant was reclaimed much was reused despite its quality being highly suspect. The use of impure and contaminated refrigerant leads to plant operating inefficiently, higher indirect emissions of CO_2 due to increased power consumption, higher maintenance costs, and shorter service life.

The repeal of the carbon pricing legislation resulted in lower refrigerant prices. Collections of recovered refrigerant increased almost immediately as stored poor quality and unwanted types of refrigerant were handed in. Considerable quantities of recovered refrigerant are still being reclaimed.

Chart 2: Annual Volume Recovered Refrigerant



(b) Facts and evidence relied upon in support of these claims:

- All cylinders and drums of recovered refrigerant taken back by RRA are tested using a gas chromatograph mass spectrometer to ascertain their contents, and to identify the type and volume of ODS and SGG refrigerants being returned.
- The resulting chemical analyses are used to calculate the potential reduction in ozone depletion, and the estimated level of abatement of the emission of synthetic greenhouse gases.
- The science of ozone depletion and climate change, and the relationship between the phase-out of ODS refrigerants and the use of SGG refrigerants is well explained in the Intergovernmental Panel on Climate Change (IPCC) / Technical and Economic Assessment Panel (TEAP) Special Report Safeguarding the Ozone Layer and the Global Climate System.

6. Market definition

Provide a description of the market(s) in which the goods or services described at 3 (b) are supplied or acquired and other affected markets including: significant suppliers and acquirers; substitutes available for the relevant goods or services; any restriction on the supply or acquisition of the relevant goods or services (for example geographic or legal restrictions):

The market is the market for importation, distribution, sale and use of ozone depleting and synthetic greenhouse gas refrigerants in Australia.

- Refrigerants are manufactured offshore and imported as bulk or contained in equipment.
- If contained in equipment, such as split air conditioning systems, refrigerators, or motor vehicles, it is not handled directly but included in the sale of the product.
- If refrigerant is imported as bulk it is sold to original equipment manufacturers, or decanted into small cylinders for distribution and sale to authorised contractors and technicians.
- Refrigerants are either ozone depleting or synthetic greenhouse gases. However, ozone depleting refrigerants are also powerful greenhouse gases.
- Ozone depleting refrigerants are being phased out of use under the Montreal Protocol. CFCs were banned from import in 1995. Progressively, HCFC imports are being restricted such that only a small quantity will be available from 2015.
- New refrigerants that do not deplete the ozone layer are now widely available and commercialised. Progress is now being made with the

replacement of high global warming potential (GWP) refrigerants to further reduce environmental impacts.

- There is a large volume of installed refrigerant in Australia that will remain and require recovery and destruction to prevent emission after low GWP refrigerants have been introduced. At present the installed bank of refrigerant exceeds 43,000 tonnes and continues to grow. Please see **Appendix 2** for a description of the installed bank of refrigerant.
- RRA anticipates the need to maintain recovery and safe disposal operations until at least 2030.

7. Public detriments

(a) Detriments to the public resulting or likely to result from the substitute authorisation, in particular the likely effect of the conduct on the prices of the goods or services described at 3 (b) above and the prices of goods or services in other affected markets:

7. (a) (i) Levy. The imposition of a levy on the import and sale of new refrigerant, and its universal application, may have the effect of increasing the price of goods containing refrigerant and services involving the supply of refrigerant. However, the price effect is likely to be low as the additional cost is relatively minor compared to the total consumer price of each unit, and quantities of refrigerant contained in each unit are small. The price impact is also likely to be small with regards to services where the value of the levy is minor compared to costs of labour and components.

7. (a) (ii) Rebates. The setting of the rebates by the RRA Board requires a minimum payment to contractors returning recovered refrigerant, and determines the level of reimbursement of costs provided to wholesalers.

7. (a) (iii) Processes. Should RRA choose to reclaim recovered refrigerant which is effectively the creation of new refrigerant by using distillation or other processes, the effect maybe increased competition to some replacement products such as HFC's and HC's that might otherwise have gained higher sales. The volume is unlikely to be greater than 250 tonnes in a total bulk market of 3,700 tonnes. On the other hand should RRA choose not to reclaim recovered refrigerant such action may be seem as a restriction of the availability of a product that might compete with the alternative products of its contributors and members, thereby potentially reducing competition in the market.

(b) Facts and evidence relevant to these detriments:

6. (b) (i) Levy. The cost of the levy is a small component of the price of goods.

Table 1: Levy Cost as a Component of Consumer Price

Unit or Service Type	Average charge of refrigerant	Cost of levy per unit @$2.00 / kg	Estimated consumer cost of unit
Split System Air Conditioner	1.5 kg	$3.00	$2,000
Refrigerator / Freezer	0.2 kg	$0.40	$1,000
Motor Vehicle Air Conditioner	0.7 kg	$1.40	$20,000
Motor Vehicle AC Service	0.7 kg	$1.40	$300
Medium Size Supermarket	500 kg	$1,000	$500,000

6. (b) (ii) Rebates. RRA has contracts with wholesalers that specify the rebates paid to them and that must be paid to contractors.

6. (b) (iii) Processes. RRA has reclaimed refrigerant for supply back to the market in its earlier years of operations. Where strong demand for phase-out products exists (then CFC12 and now HCFC22) reclamation may be cost effective as the price of the increasingly scarce refrigerant increases.

8. Contracts, arrangements or understandings in similar terms

This application for substitute authorisation may also be expressed to be made in relation to other contracts, arrangements or understandings (whether proposed or actual) that are, or will be, in similar terms to the abovementioned contract, arrangement or understanding

(a) Is this application to be so expressed?

Not applicable.

(b) If so, the following information is to be furnished:

(i) description of any variations between the contract, arrangement or understanding for which substitute authorisation has been sought and those contracts, arrangements or understandings that are stated to be in similar terms:

Not applicable.

(See Direction 9 of this Form)

(ii) Where the parties to the similar term contract, arrangement or understanding(s) are known - names, addresses and description of business carried on by those other parties:

Not applicable.

(iii) Where the parties to the similar term contract, arrangement or understanding(s) are not known — description of the class of business carried on by those possible parties:

Not applicable.

9. Joint Ventures

(a) Does this application deal with a matter relating to a joint venture (See section 4J of the *Competition and Consumer Act 2010*)?

This application does not deal with any matters relating to joint ventures. However, it is possible that RRA may seek to enter into a joint venture with other parties to establish destruction and/or reclamation facilities should such an action provide clear advantages in the long term achievement of RRA's objectives.

(b) If so, are any other applications being made simultaneously with this application in relation to that joint venture?

No.

(c) If so, by whom or on whose behalf are those other applications being made?

Not applicable.

10. Further information

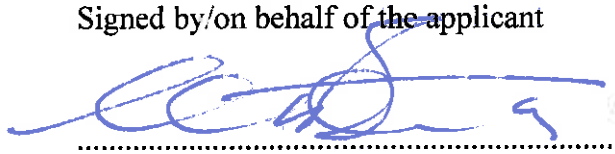
(a) Name, postal address and telephone contact details of the person authorised by the parties seeking revocation of authorisation and substitution of a replacement authorisation to provide additional information in relation to this application:

Mr. Michael Bennett
RRA Ltd
GPO Box 753
Canberra ACT 2601
Facsimile: 02 6230 4533

Email: michael.bennett@refrigerantreclaim.com.au

Dated: 1st October 2015

Signed by/on behalf of the applicant



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(Signature)

Michael Bennett
(Full Name)

Refrigerant Reclaim Australia Limited
(Organisation)

General Manager.
(Position in Organisation)

Appendix 1

Potential Recovery

RRA takes back all recovered refrigerant presented to it by the market. It is necessary for RRA to carefully forecast returns, budget costs, and calculate the required funding to remain viable in the long term. RRA takes advice from and consults with the industry to seek to determine the amount of refrigerant expected to be recovered, and the anticipated growth over time.

However, RRA is at the same risk of market and economic fluctuations, faces the same impacts of national regulatory changes, and operates in the same global industry as any commercial organisation. In recent years RRA has experienced the marked decline in economic activity due to the global financial crisis, the many and often unintended consequences of carbon pricing, and now the phase-down of high GWP refrigerants.

To understand how much refrigerant is available for recovery it is necessary to first understand how much has been sold into the market. In 2014/15 the total sales of bulk refrigerant was 3,140 tonnes, but for the purpose of this calculation 3,200 tonnes will be assumed. Understanding the applications to which this new refrigerant is applied will provide a guide as to how much is available for recovery. Industry advice is that 300 tonnes is used for original equipment manufacturing, 1,000 tonnes for new applications, 900 tonnes for automotive air conditioning service, and 1,000 tonnes for commercial, industrial and domestic service. Please note the figures are approximations and differ markedly from the last assessment. The Australian refrigerant market has undergone substantial change in the last five (5) years: original equipment manufacturing has decreased; imports of equipment already charged with refrigerant have increased; new and installed systems leak less; and recycling and reuse has grown strongly.

It is only during service operations, and decommissioning, that refrigerant is available for recovery, yet much of the refrigerant used in service work is for replacing that which has leaked during operation. In the automotive sector it is estimated that whilst 900 tonnes is used in the service sector approximately 300 to 400 tonnes of refrigerant is available for recovery. In the commercial/industrial service sector of the 1,100 tonnes used approximately 300 to 500 tonnes is available for recovery.

The decommissioning and disposal of equipment, such as motor vehicles and air conditioning systems, provides the opportunity for recovering refrigerant. It is difficult to estimate the amount of refrigerant available from decommissioned equipment and it is the sector where the greatest potential for increased recovery exists. Australia does not have product stewardship schemes for end-of-life motor vehicles or consumer durables such as refrigerators and air conditioners.

Approximately 700,000 motor vehicles are disposed of annually. As these are generally older vehicles about 80% will have air conditioning systems. Research indicates that EOL vehicles contain 190 tonnes that should be available for recovery.

Approximately 10 million air conditioning systems are installed in Australia with an average charge of 1.6 kilograms. Around half these systems were installed in the last five years and will not be due for retirement for many years due to an average life of fifteen years. However, looking forward it is best to base the potential amount available for recovery on the full installed base. Using an annual leakage rate of 3% the amount available for recovery on decommissioning each year is 880 tonnes.

The amount of refrigerant available for recovery from other refrigeration and air conditioning plant is not known to any certainty but is likely to be in the order of 300 tonnes per annum based on a fifteen year equipment life and two thirds of the charge being present when decommissioned.

The majority of refrigerant recovered in Australia is reused, most usually in the system from which it was extracted. The amount of refrigerant retained and reused by contractors and technicians is unknown. It is known that the volume retained for reuse increases inline with price of the refrigerant and its scarcity.

Table 2: Calculating Percentage of Recovery

Applications for New Refrigerant		
OEM	300	
New Installations	1000	
Automotive Service	900	
Comm/Ind/Dom Service	1000	
Total Sales	**3200**	
Available for Recovery	**Range of Estimations**	
Automotive Service	300	400
Comm/Ind/Dom Service	300	500
EOL Vehicles	190	240
EOL AC	680	880
EOL Commercial	300	400
Available for Recovery	1770	2420
Amount Retained and Reused	-1000	-1400
Amount Available to be Returned	770	1040
Amount Returned to RRA	-350	-350
Balance Available for Recovery	420	690
Percentage Recovery	**-45.5**	**-33.6**

NB: Based on the volume collected in 2014/15.

Appendix 2

The Australian Refrigerant Bank

Chart 3 displays the projected transition of the installed bank of refrigerant in Australia through to 2025 in tonnes of refrigerant. Chart 4 displays the same transition but expressed at millions of tonnes of carbon dioxide equivalent.

Refrigerant bank transition by gas species based on assumptions in tonnes (above) and Mt CO_2-e (below)

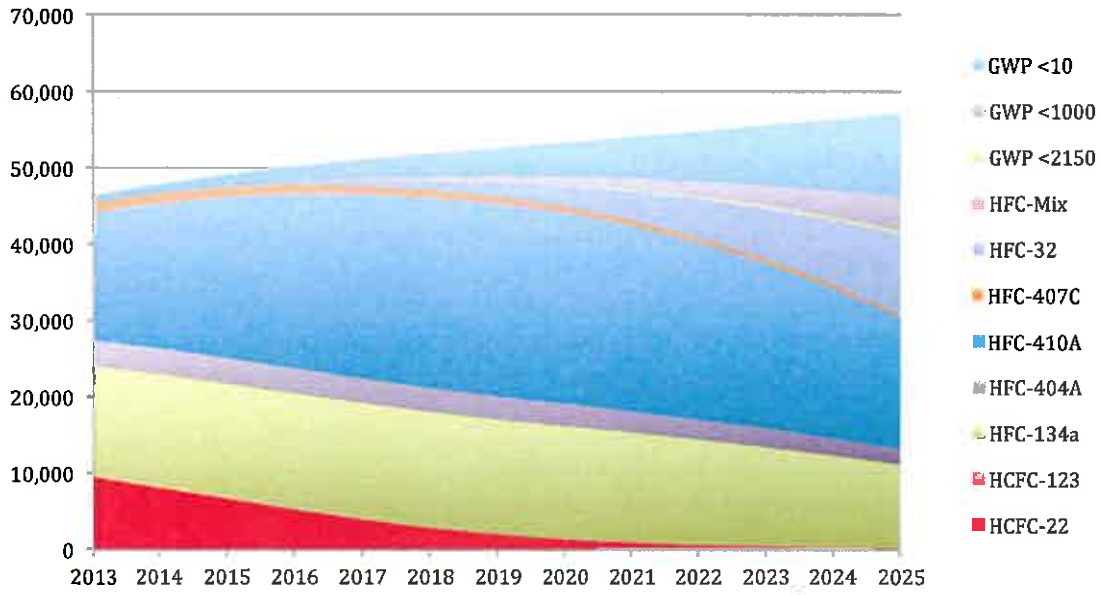

Chart 3: *Refrigerant bank transition from 2013 to 2025 by gas species in tonnes based on model assumptions.*

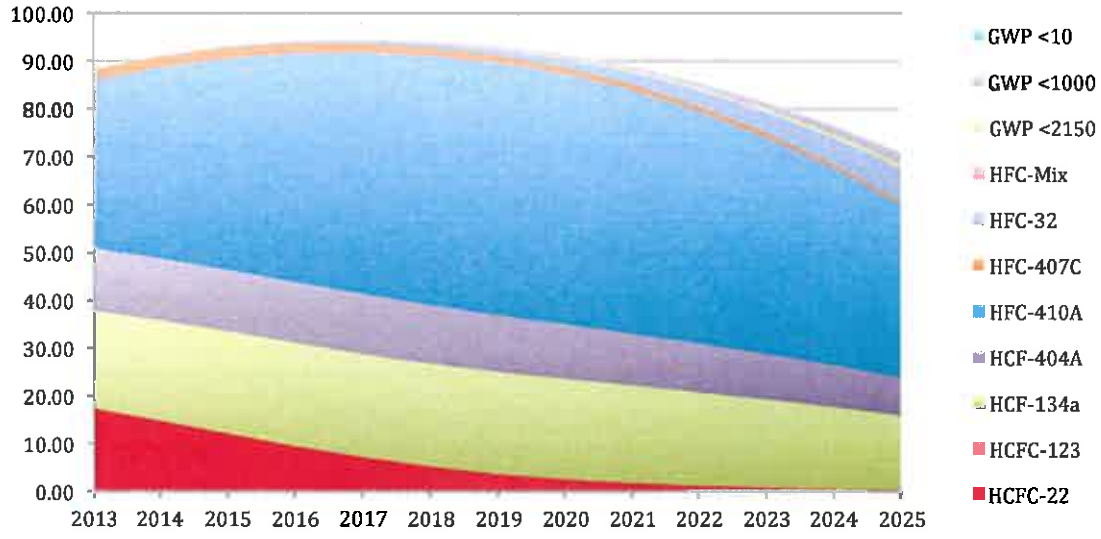

Chart 4: *Refrigerant bank transition from 2013 to 2025 by gas species in Mt CO_2-e (AR4) based on model assumptions.*

The quantities and types of refrigerants in use in 2030 will be markedly different from those used today. The installed bank of refrigerant will migrate to products with lower GWP's and, most likely, increased flammability. The chart immediately above (Chart 3), extracted from the report HFC Consumption in Australia etc, describes the projected change in refrigerant consumption. The inclusion of products used in other sectors is not material. The projection is a guideline only but it aptly demonstrates the changing shape of consumption and the expected uptake of lower GWP products.

There are many influences on the types and quantities of refrigerants that will be used throughout the next fifteen years. However, it is most likely that governments and international agreements and protocols will have the most profound and far-reaching impacts. Global environment protection actions will ultimately determine the types of refrigerants used, their availability, and thereby price. Such actions will also drive technological change, not just in refrigerants but also for cooling and heating more generally. Unilateral actions by national governments, in the absence of global accords, may have similar effects.

Global accords and country-based initiatives that already impact Australia will be even more influential in the future. These include:

- Montreal Protocol
- United Nations Framework Convention on Climate Change
- Kyoto Protocol (and its successor)
- European F-Gas regulations
- USA SNAP and other program initiatives
- Japanese industry/environment accords on emission reduction

Australian legislation and regulations will also strongly influence the types and quantities of refrigerant consumed, and the amount recovered and ultimately destroyed. Whereas legislation causing the phase out or down of high GWP refrigerants will dictate consumption, regulations that govern the handling and management of EOL equipment have the potential to impact significantly on the volume of refrigerant being recovered.