



PaintCare Trade Trial



**ToxFree Solutions Ltd
Sustainability Victoria
Australian Paint Manufacturers Federation
Master Painters Association**

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Background

On 11 April 2013 the COAG Standing Council on Environment and Water (SCEW) agreed to place the development of product stewardship arrangements for waste architectural and decorative (A&D) paint on the 2013/14 SCEW work plan. Waste architectural and decorative paint was then listed on the priority product list released by the Australian Government on 30 June 2013.

Ministers asked officials to develop a work program in partnership with the paint industry to deliver a draft national model scheme by the end of 2014 for SCEW consideration at the first meeting of 2015.

The Australian Paint Manufacturers Federation (APMF) is one of the oldest industry associations in Australia. The APMF represents 34 paint manufacturing companies in all states and territories with a combined revenue stream of \$2.5 billion. Together, the APMF membership accounts for ~90% of all paint manufactured in Australia.

The paint industry estimates 11% of architectural and decorative (A&D) paint sold in Australia becomes residual (18,000 tonnes including packaging) per annum with estimates in the region of 5% requiring disposal (Nolan ITU, 2004). Household chemical collection models, operated by state governments, collect and treat large volumes waste paint. Of the chemicals collected >65% is waste paint by cost and ~80% by volume (Sustainability Victoria, 2011). These services are theoretically only available to households, leaving waste A&D paint from trade sources unmanaged. A&D paint from both trade and domestic sources are essentially the same chemical and therefore require the same management approach. Alternative disposal for waste trade paint is costly between \$2-4 per litre promoting unsafe and inappropriate disposal methods.

Waste paint may contain a number of environmentally harmful substances including heavy metals and surfactants which inhibit oxygen and the photosynthesis process when disposed of in waterways and may leachate when disposed of in landfill in solid form. Therefore, effective management is required to increase the recovery of waste A&D paint in Australia and prevent this product from polluting the environment at end-of-life.

Scope of Activities

From 31 March through to 31 August 2013, Toxfree partnered with Sustainability Victoria (SV), the Master Painters Association and the Australian Paint Manufacturers Federation (APMF) to conduct the 'PaintCare' trial at six existing Detox Your Home (DHY) sites for the purpose of collecting, managing and disposing of waste trade paint and providing previously unknown data on the potential volume of unwanted trade paint in the trade community as well as behaviour patterns of participating trade painters.

Having successfully collected in excess of 127 tonnes of unwanted trade paint (including packaging); the success of the trial would suggest that there is a need in the trade painting community to provide a safe, accessible and cost effective service of removing and managing significant quantities of unwanted trade paint.

The sites were selected to offer a broad geographical coverage as well as the ability to service the extra volume and resources required to carry out a successful trial. The sites selected were:

- Metropolitan Melbourne Sites
 - Monash
 - Melton
 - Mornington
- Regional Victorian Sites
 - Barwon
 - Shepparton
 - Bendigo

Initially, additional paint storage units (1.2 cubic meter stillage's) were deployed to the sites which were dedicated for use in the PaintCare trial. Signage on the stillage's was provided by way of magnetic identification to separate the identity of the PaintCare trial from existing DYH unwanted/waste paint. The collections were co-ordinated either with an existing scheduled DYH service or on demand as required by the host site. Both Monash and Melton requested an extra weekly pickup specifically to collect material from the PaintCare trial. The paint collected was managed in the usual manner through energy recovery and steel and plastic recycling streams.

Trial Observations

Promotion versus volume

The program was not promoted heavily prior to commencing or in the early stages as there was concern that legacy material held by painters in personal storage may rapidly erode the available funding before information could be gathered on the volume and types and issues around 'waste arising' material that was likely to be generated. The program was promoted, however, through the Master Painters' Australia Victoria branch on their website and in emails and flyers to its members. The intention of the trial was not to collect large volume, but to understand this previously undefined waste stream

As expected, the program did not gather a lot of traction in the first six weeks averaging 3,074 kg per week compared to the overall average during the trial of 4,727 kg per week. For the final eight weeks of the trial the volume levelled out to around 4,000 kg per week combined from all of sites.

Figure 1 shows the subscription to the trial over time. The time lag in the beginning can be seen as the messaging begins to be communicated through the Master Painters Association members for the first six weeks, then a spike in volume at week seven, followed by the normalisation from weeks 20 through to 27.

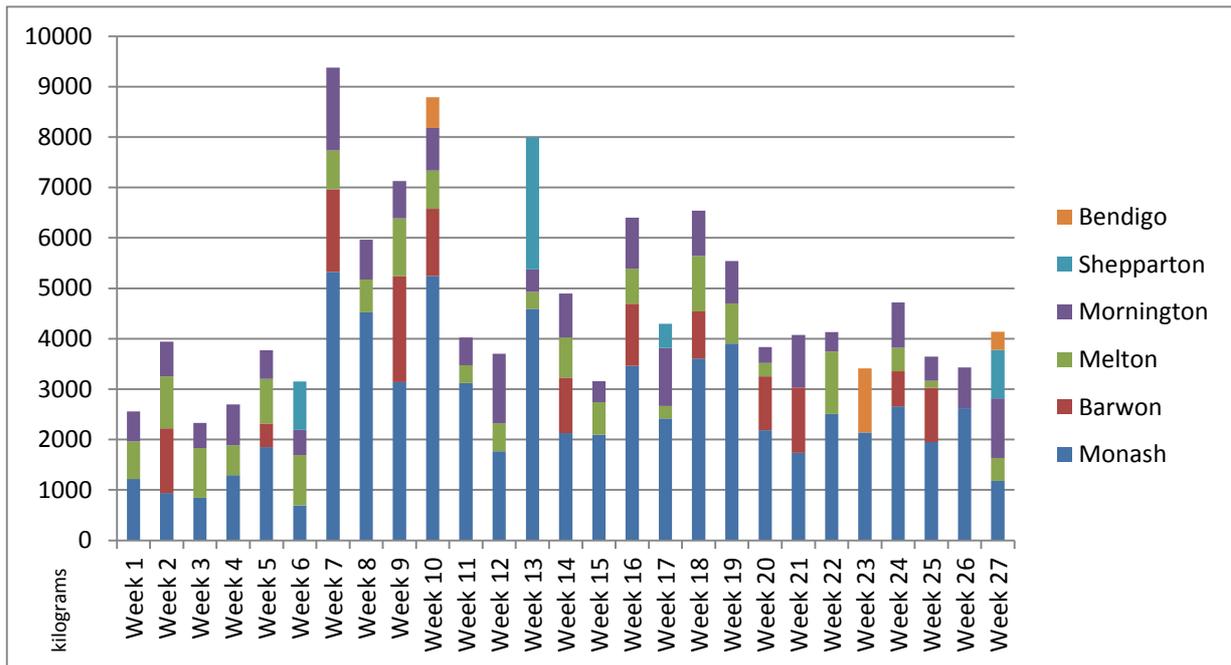


Figure 1 – Volume trends per site

Contamination

There were two potential sources of contamination during the trial. The first and more easily identifiable was that of non-target materials being incorrectly placed into the PaintCare stillage’s. Although this was not a significant quantity it would still need to be considered in a larger scale program. Non-target materials could include thinners/turpentine for brush washing or other more hazardous materials from different products streams hidden in the used paint cans.

The second source of contamination from the trial point of view was target material that did not come from target sources. That is, materials not coming from trade painters but domestic sources. Even though the stillage’s used for the trial were clearly labelled and, wherever possible geographically isolated at the facilities, there was the potential for material from non-target sources to find its way into the PaintCare stillage’s. This material was obviously not able to be quantified once the stillage’s were collected however it was noted by drivers collected PaintCare materials, that on occasions the stillage’s were stored together with domestic material once full. Similarly, the reverse may also have been possible whereby members of the public could potentially have utilised the PaintCare stillage’s as opposed to the DHY stillage’s.

Data analysis

During the six months of the trial a total of 127.6 tonnes was collected and processed. The data was captured weekly and analysed to allow for future financial and operational modelling. Figure 2 shows the volume collect per site and the ratio between solvent and water-based paints being 31% and 69%

respectively. Sales figures suggest water-based paint is approximately 90% of the market which provides an indication of a time lag between purchase and disposal. The data also shows that future collections will continue to trend towards a higher rate of water-based paints. This can be seen in more mature paint collections operating in other countries showing an approximate 85:15 ratio of water-based to solvent based paint coming through the waste stream.

Site	(kg) Solvent Based	(kg) Water Based	Total paint + packaging collected (kg)	Detox Volume 6 months	Site disposal Cost Summary	Site Hours	Site Collection Cost Summary	Total (ex GST)	% by weight
Barwon	4071	10144	14,215	23,556	\$ 16,347.25	16.0	\$ 1,680.00	\$ 18,027.25	11%
Melton	4781	11884	16,665	26,912	\$ 19,164.75	43.0	\$ 4,515.00	\$ 23,679.75	13%
Monash	21289	47872	69,161	71,110	\$ 79,535.15	108.0	\$ 11,340.00	\$ 90,875.15	54%
Mornington	6602	13734	20,336	55,226	\$ 23,386.40	30.5	\$ 3,202.50	\$ 26,588.90	16%
Shepparton	1609	3410	5,019	4,742	\$ 5,771.85	4.0	\$ 420.00	\$ 6,191.85	4%
Bendigo	612	1623	2,235	10,948	\$ 2,570.25	3.0	\$ 315.00	\$ 2,885.25	2%
Total (kg)	38964	88667	127,631	192,494	\$ 146,775.65	204.50	\$ 21,472.50	\$ 168,248.15	100%
	31%	69%			87%		13%		

Figure 2 – Collection volume and cost

Figure 2 identifies the cost ratio between transport and disposal at 13% and 87% respectively, indicating the collection time and transport to be efficient. Sales of A&D paint in Australia are split approximately to 55% trade and 45% domestic. On average, collection volumes of trade waste paint were 63% that of collection volumes of domestic waste paint (figure 3). It may be that the volume of trade waste paint collected is less than the volume of domestic waste paint collected due to more accurate sizing of surface area and paint required by trained trade painters, and that trade painters have the option of leaving the residual paint with the client. However, this percentage, calculated from the PaintCare trial data, will assist in modelling a national scheme and estimating collection rates.

Figure 3 also shows the ratio between metro and regional centres. Monash collected 54% of the total volume which does not represent a 'normal' collection site. Detox your Home site at Monash also collects the highest volume of domestic waste paint. Therefore, Monash was chosen because of its high through-put as a busy DYH collection site, and to see how including trade waste paint would impact an already high collecting site. Figure 3 indicates that the further away from a metro centre the less paint is available for collection and the less the sites are used, this was also observed by transfer station managers and ToxFree staff in the trial. This would have implication designing accessibility of a national scheme.

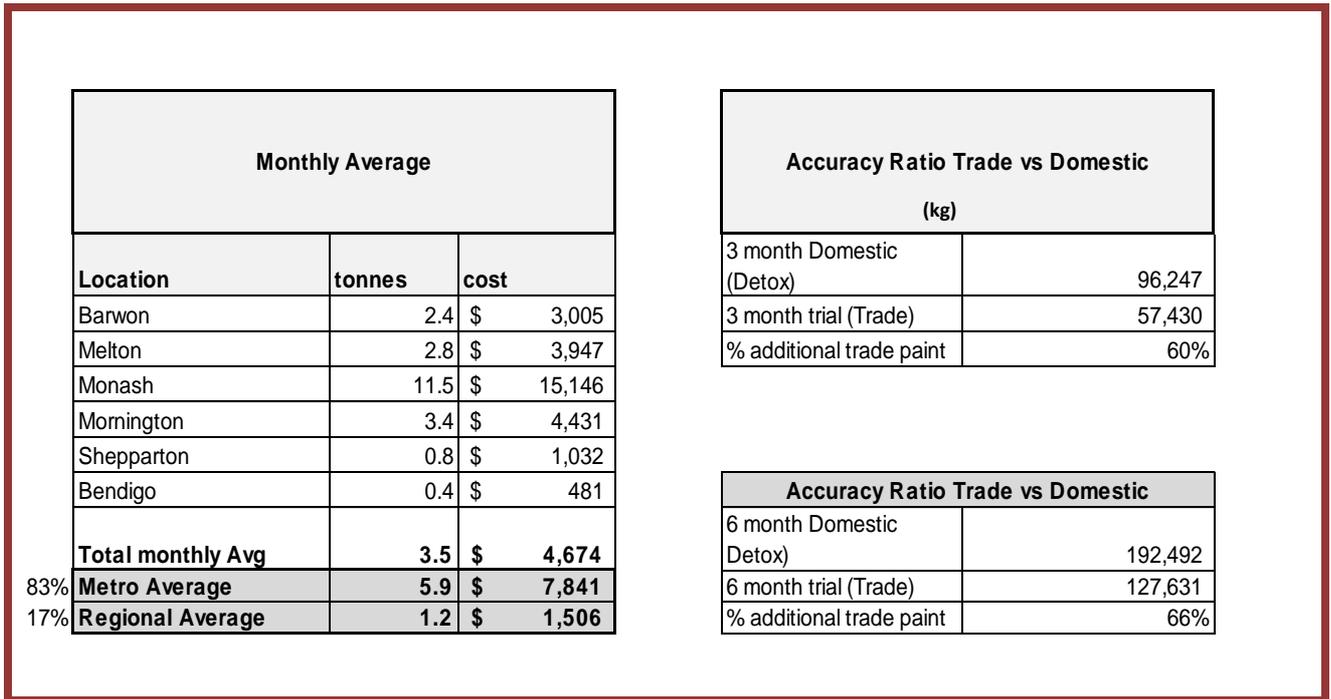


Figure 3 – Average volume and cost

Figure 4 shows the volume collected per week and cumulatively over the life of the trial. It can be seen that the weekly volume is relatively linear allowing for volume predictions to be made against the cumulative total.

The data shows collection rates stabilised at week 20 indicating the amount of time needed for sites to stabilise once opened. This can be applied to rolling out a progressive national collection model.

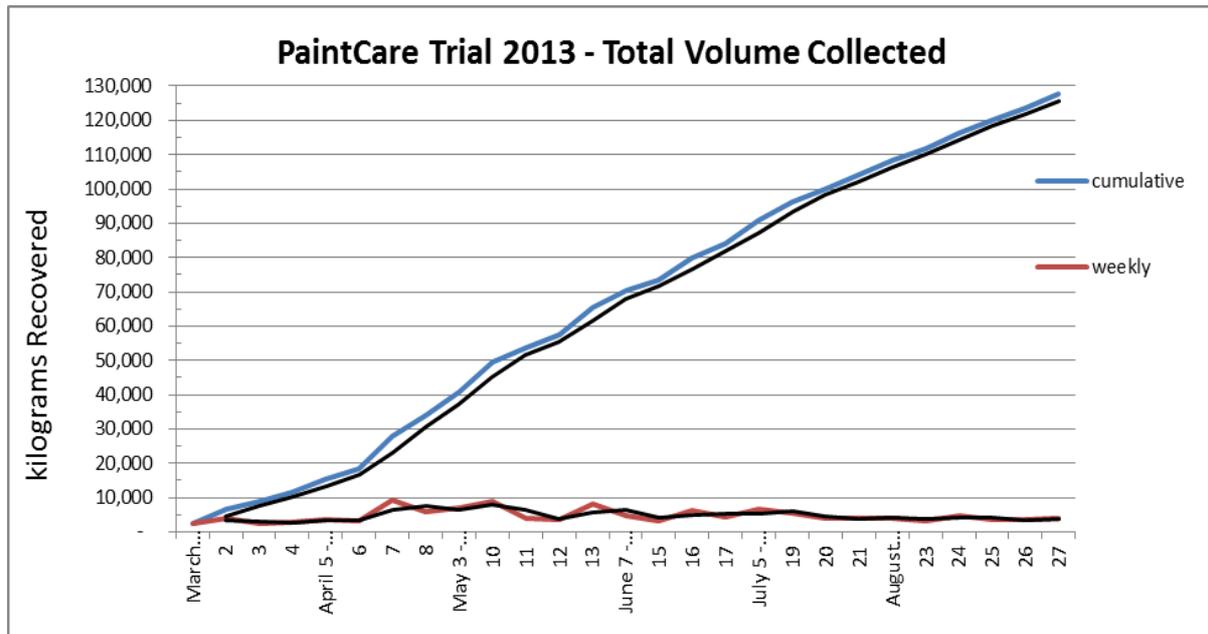


Figure 4 – weekly and cumulative trends

Considerations for larger scale collection

Resources

In the event that volumes were to increase, resources and capacities at the permanent facilities to deliver a collection program may become stretched. Consideration will need to be given to the following:

- Extra deliveries and collections may result in traffic management issues;
- Extra stillage's on site may create storage issues;
- Extra volumes of materials on various sites may create compliance issues with respect to the storage and handling of Dangerous Goods.
- EPA classifications differ state to state for waste deriving from trade sources

Servicing

The extra volume of material collected may require shorter turnaround times depending on the behaviours of the trade painters. Consideration will need to be given to the scheduling of regular and on-call services. Although this was sufficiently managed for the duration of the trial, depending on the geographic needs of the service, strong communication between the host site and the collection/management agency will be a key success factor.

Depending on how much use is made of the collection points on the weekends, the requirement for servicing and stillage's may be stretched. For example, if a large volume is dropped off on the weekend, then a booking can only be made on the following Monday means servicing the site is not likely to be conducted until at least the Tuesday. This may be mitigated by having a regular servicing schedule

supported by an on call arrangement where necessary and/or an emergency call arrangement for after-hours callout (i.e. weekend) service. Careful monitoring of the transport / processing cost ratio will be needed to ensure efficiencies are met and the system does not become too cost heavy on transport of waste paint rather than processing of waste paint.

Segregation

Depending on the model scheme, segregation between trade and domestic may be required to analyse data from different waste streams. To achieve this, clear separation of the stillages would be required along with training transfer station staff and separate communications for the two waste streams. However, segregation would incur greater costs and may create problems on the ground when one stream is a capacity. It would be recommended that PaintCare collect both streams indiscriminately with waste tracking audits conducted as required.

Segregation of non-target materials is also a key area of consideration to avoid the potential of incompatible dangerous goods being stored on site and ultimately transported in appropriately. This may be mitigated by offering ongoing training to host sites as well as robust agreements in place with willing participating sites.

Resource Recovery Considerations

A key output for the management of waste paint is ensuring there is a sustainable approach and existing end-markets for the collected material. This should not only be restricted to waste paint but extended to the waste packaging of paint products. The trial indicated that approximately 69% of the total waste paint received was water-based waste paint. As this figure rises toward the current sales figure of 90%, energy recovery costs will increase. Research into alternative processing methods for water-based paint will be required.

The current reprocessing for waste paint as a product is via energy recovery where by the calorific value inherent in the material is utilised in the cement manufacturing process as a fuel substitute. As the volume of water based waste paint continues to grow, this diminishes the calorific value of waste paint as a whole. Whilst the current practice is to combine low calorific materials with high calorific yielding waste streams the energy present in the final product is of low use/value if energy recovery continues as the primary reprocessing use for waste paint, especially as water-based paint consumption rises.

However, it is important to understand the long term economic impact of increasing volumes of water-based products and their effect on the fuel application. It is therefore of equal importance to investigate other possible end uses for water-based paint and their potential to add value to current markets and processes. Similarly, the packaging of water based materials is trending towards plastic as opposed to steel. The existing practice to compress steel packaging is less effective on plastic due to the memory within polymers. This makes plastic packaging less attractive to using pressure as the means to de-package and more attractive to alternative processes such as shredding.

Summary

Overall, PaintCare was a successful trial collecting 127.6 tonnes and demonstrating the need for a safe, accessible and cost effective system for collecting and processing waste paint from both trade and domestic sources. It is clear that waste residual paint exists in significant volume and trade painters want to do the right thing and drop off their waste paint for processing. This observation is consistent with discussions with the Master Painters Association.

The overall cost of collection and processing during the trial was \$168,248 which breaks down to \$1.32 per kg. The processing costs were 87% of the total costs with the site collection costs at 13%. Therefore, research into reducing the processing costs or changing the end-of-life usage from energy recovery to an application with a higher market value will reduce the high processing weighting. It is worth noting that the total costs did not include any advertising material of site launch events. This would incur additional costs at the national level. Flyers and posters were printed and distributed via the Master Painters Association and launch events conducted at five of the six sites at a cost of approximately \$15,000. However, communication was not factored into the trial as it was shared across the APMF, MPA and SV. In the event of a national model a standard communications plan including a fixed budget will need to be factored into the operational costs.

The results of the trial quantifiably evidence previous assumptions on the existence of trade waste paint and the need for a safe and accessible system to receive the waste. It would be recommended that PaintCare collect both trade and domestic streams indiscriminately to minimise on-the-ground issues which may arise from segregation. Data from the different waste streams can be captured through waste tracking audits as and when required.

Waste paint from trade sources, until now has not be quantified making the PaintCare trial a first of its kind in Australia. Data captured from the trial will be applied to the development of a national paint stewardship model which industry and government are currently working toward.

References

Nolan-ITU, 2004 Paint and Paint Can Recovery – National Audit and Strategic Plan prepared for the Australian Paint Manufacturers' Federation.

SV (Sustainability Victoria), 2011 Detox Your Home Strategic Review Public Report. Available at http://www.sustainability.vic.gov.au/resources/documents/Detox_Your_Home_Strategic_Review_WEB.pdf

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