Submission to the Productivity Commission
INQUIRY INTO WASTE GENERATION AND RESOURCE EFFICIENCY

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Waste Type: Organic

In Summary

The focus of this submission is the potential contributions that agriculture and particularly horticulture can make to reusing organic wastes.

- The safe and orderly reuse of organic wastes as Recycled Organic (RO) products will benefit from establishing minimum standards for land application. Minimum standards could defer to relevant legislation dealing with resource protection, crop, public and community health, and biosecurity. Managing this could be by licensing participants in the RO industry and requiring demonstrated compliance with the standards. Product quality should be encouraged and left to industry to develop!
- Composting offers a widely accepted mechanism for addressing possible contamination, health and biosecurity issues that are associated with organic waste materials.
- Compost and other RO products used in agriculture do not attract benefits associated with the current/proposed renewable energy and carbon trading process, however the use of compost demonstrably improves environmental outcomes via improved soil performance and reduced use of fertiliser, irrigation and pesticides.
- More creative support is warranted for the waste hierarchy and particularly its implied preference for recycling organic wastes over energy recovery. It is acknowledged that there will be cases where incineration/energy recovery may provide better outcome with some waste streams, particularly when highly mixed and contaminated.
- Carbon/renewable energy credits and planning processes tend to disadvantage the economics of the RO industry and favour energy recovery.
- Processes of diverting organics from landfill need to allow adequate time for markets development of organic products in order to avoid diversion of these wastes to energy recovery as a short term solution.
- Of the agricultural markets, horticulture and particularly intensive vegetable, vine and fruit growing offer the most potential because of their intensive use of inputs (fertiliser, irrigation and pesticides) and their usual proximity to urban waste generation.
- Economic returns associated with compost use are widely demonstrated in many industries, however returns are generally small and in prevailing situations,

frequently cannot compete with other organic materials including manures and biosolids.

- Costs associated with using compost and other RO products is a major limitation to its widespread use in agriculture.
- Maximising the performance and therefore benefits of RO products in agriculture will require longer term work to establish better management systems and practices that increase and maintain soil organic matter.
- Waste collection processes need to focus on recovering source separated waste streams including food wastes.
- Existing composting technology can handle all organic waste streams including liquids and sludge's that include grease trap waste and biosolids.
- Recycled organic strategies need to embrace all waste streams, both urban and agricultural. The composting process benefits from access to a diversity of source separated waste streams because it allows better process control and options for managing contaminants by dilution – 'the solution to pollution'!
- Composting processes are amongst the most capable for managing health and bio contaminant issues associated with organic waste management.
- Enabling organic reuse via land and in particular agricultural use affords opportunity to capture community/society benefits that are wider than the sustainable reuse of organic wastes that include reclaimed water. These are associated with having and maintaining productive rural areas around and ultimately within intensive population areas that provide fresh food, employment, tourism, regional social diversity and enhanced protection of environmental values.

Background to Department of Agriculture's involvement

Investigations into how the use of compost made from urban and agricultural organic wastes could benefit horticultural production commenced in 1996. It recognised the opportunity for mutual benefit to both urban and rural communities as well as agriculture and continues to develop our understanding of how these benefits can be maximised.

More recently the work has focussed on quantifying benefits of compost use in vegetable production in terms of improved yields and reduced fertiliser costs. The work has sought to identify other benefits including improvements to soil performance. It has also explored aspects of management practices that were initially based on using clay to improve the performance of light sandy soils that are widely used in vegetable production. This approach is relevant to the reuse of other wastes that have potential to improve physical soil properties, such as fly ash and by-products from the mineral extraction industries.

The term 'Carbon Based agriculture/horticulture' was coined to better capture the intent of the work. It reflects the evolution of the investigation focus from identifying how compost improves crop performance to the broader benefits associated with how compost contributes to soil organic matter and therefore soil performance.

Considerations

This submission is based on a previous discussion paper that is contained in the recent report to Horticulture Australia titled 'Identifying the benefits of composted soil amendments to vegetable production. Conducted over four years, the work included a PhD studentship at the University of WA and a significant component dealing with heavier soils that was conducted by Victorian Primary Industries at Knoxfield.

This discussion paper considered issues relating the development of agriculture as a market for compost. Although not intended to be a policy document, its considerations and recommendations were used by a stakeholder working party in a report to the WA Waste Management board on 'Standards for the application of organics (including compost) to land in WA. This report is available for public comment. The following considerations address four of the five points listed under the scope of this enquiry that are numbered in parenthesis:

- Promoting organic waste recycling (1, 2, 4)
- Agricultural market development (2, 4, 5)
- Organic resource (waste) collection and management (2,4)
- Land use planning and the significance of agriculture to urban development (1, 2).

Promoting organic waste recycling

Diversion of wastes from landfill commenced some time ago and although agriculture was identified as a potential market for the significant organic waste component , there has been little strategically focussed efforts to develop this market.

This is reflected in one of the findings of the National Compost Roadmap Project that identified a range of government policies, strategies and regulations directed at organic diversion from landfill, but few if any to drive the marketing of RO products and principally compost products.

The reality is that without appropriate policy and the consistent application of regulations, the development of agriculture as a market for compost, at least in the short to medium term, will be limited.

Summary: *Degradation of soils associated with agricultural practices have been responsible for the demise of many civilisations. It would be unwise to assume that the lessons for soil management and the benefits of soil organic matter could be ignored and that we can apply 'modern technology such as global food transportation and the application of 'bio technologies' to avoid this problem.*

Soil organic matter policy

The generally accepted hierarchy of waste management options places reuse above energy recovery. Because of potential risks, the reuse of organic waste requires composting or pasteurisation however this is still preferred to energy recovery because of the substantial contributions that RO products can make to soil organic matter and soil performance and ultimately to the protection of our water resources as well as the general environment.

Recognition of the importance of managing soil quality and more specifically, the importance of improving and maintaining soil organic matter, will support the recovery and recycling of organic wastes that is in accordance with the waste management

hierarchy. This approach is in line with declarations by the American Society for Soil Science and the European Union directive EU-25 relating to soil protection.

This approach directs energy recovery to handling components of the organic waste stream that cannot be processed by the Recycled Organics Industry and is in general agreement with the Sustainability Guide and Industry Code of Practice developed by the Energy from Waste Division of the Waste Management Association of Australia (WMAA).

The reuse of organics as a higher order use of organic resources is embodied in the waste hierarchy and is generally acknowledged in various state waste management strategies. Implementation policy to restrict landfilling of organics therefore needs to recognise the importance and the current state of agricultural market development. If this preferred reuse of organic wastes is to be achieved, landfill diversion that exceeds market capacity to reuse organics, will favour energy recovery and once the capital investment has been made, this use of organic wastes will not be readily reversed.

Summary: *In the interest of improving local, regional and global sustainability, policy recognising the importance of managing soil quality and the potential role of organic wastes as embodied in the waste hierarchy, needs to be acknowledges at the highest policy level. This will help to ensure that strategy development and implementation better support the reuse of organic wastes and avoid short term less appropriate decisions associated with having to manage accumulating unmarketable RO products or having to make large capital investment decisions into MSW recovery technologies before adequate information becomes available.*

Minimum quality standards on the reuse of organic wastes

The application of minimum quality standards for the application of all organic materials to the land will protect soil and water resources, environmental and social values, and aid biosecurity. This approach will better allow many RO products including compost to compete on the basis of performance rather than least cost as is currently the case with manures, biosolids and non pastuerised mulches. This arises because these products have few if any processing costs or as in the case of biosolids, are heavily subsidised.

Requiring compliance with minimum standards on the land application of ALL Recycled Organic products will make a significant contribution towards to market development and create confidence in their use.

A model for implementing minimum standards for land application of organic materials could be the Californian approach that licenses compost producers and requires them to demonstrate compliance with a set of standards that protect health and natural resource quality.

Minimum standards would be based largely on existing standards and regulations that apply to various materials and industry sectors. The proposed minimum standards would ensure that Recycled Organic Products:

- Are adequately pasteurised to manage disease, pest and weeds and address biosecurity concerns – AS 4454.
- Comply with heavy metal standards – the Californian standards developed by the US Department of Agriculture should be considered.

- Comply with or develop standards for chemical, biotoxins and other contaminants based on risk assessment such as Hazard Critical Control Point (HCCP) analysis.
- Comply with human health standards – State Health Acts.
- Address Occupational Health and Safety concerns associated with contaminants such as glass and possibly plastics.

Summary: *The application of minimum standards for the use of all organic materials to waste will address many of the impediments to developing the agricultural markets of RO products.*

Environmental credits

The developing carbon trading market is accessible to the renewable energy but not the RO industry. Given the potential for energy recovery to compete with recycling of organic wastes and limitations for developing markets for recycled products, priority should be given to developing a parallel incentive system for recycling organic wastes that is at least the equivalent of renewable energy credits.

The reuse of organic waste provides an environmental service to society and therefore the need to develop priority markets such as intensive horticultural industries, justifies the application of 'environmental credits' that would reduce their cost to these industries. This potential reduction in cost could also be complimented by other cost reduction approaches such as increasing costs to the waste generators under general 'extended producer responsibility' (EPR) principals.

Finally the manufacture and use of RO products need to be viewed within environmental approval processes as an essential component of sustainable development rather than the potential cause of environmental problems. Potentially this could reduce costs associated with drawn out planning approval process for RO industry developments and reduce costs associated with approval conditions.

Summary: *The use of RO products in agriculture should be viewed as an environmental service to society. Therefore the provision of environmental credits that have some monetary return will assist these industries to remain competitive and to make the necessary adjustments to their management systems.*

Agricultural market development considerations.

Recognition that agriculture is potentially a major compost market resulted in the national 'Compost Roadmap Project' focussing on this market sector.

Of the agricultural markets, horticulture and particularly intensive vegetable, vine and fruit growing offer the most potential because of their intensive use of inputs (fertiliser, irrigation and pesticides) and their usual proximity to urban waste generation.

In addition to policy and regulations, developing the agricultural market for RO products will require a concerted effort to reduce its cost in the short term and to build confidence in its long term value through the development of improved production systems.

An immediate approach could be to redirect a proportion of current landfill levies to provide a rebate on the use of Recycled Organic Products, possibly within targeted

market sectors. This approach would better drive product consumption than the current use of levy funds that tend to encourage processing without a well defined 'market development focus.

It can also be argued that many current applications of the land fill levies favours the production of minimum cost and 'minimum' quality products and therefore provide disincentives to the development of a RO industry that focuses on producing appropriate quality "fit for purpose" products that are suited to different agricultural markets.

Funding agricultural market development also needs to focus less on demonstration of product use and more on identifying critical aspects of compost quality, developing management practices that incorporate compost use into improving productivity and the capture of social and environmental benefits that are associated with improving soil carbon and hence soil performance.

Summary: *Development of the agricultural market for RO products will continue to be slow and favour alternatives such as energy recovery unless changes are put in place to ensure that the use of RO products will consistently increase grower financial returns.*

Organic resource (waste) collection and management considerations

The quality of organic wastes is an important consideration for the RO industry because it will influence their ability to manufacture products for various markets and maximise the diversion of organic wastes to land use.

Feedstock management

The RO industry will benefit from having accesses to a range of homogeneous feedstocks. Particularly in relation to composted products, blending feedstocks minimises processing cost and improves product quality options by better managing the critical carbon to nitrogen ratio and porosity of the composting material and by allowing contaminant management via dilution.

If a contaminant enters the waste stream, source separation will minimise disruption to compost production because the contaminant is likely to be restricted to only one feedstock.

While MSW composting and the various associated technologies provides a mechanism for reusing a significant component of our waste streams that are currently being lost to landfill, there are a number of factors to consider. This approach:

- Offers engineering solutions that are usually un-proven on a commercial scale and that may add significantly to the energy requirements of the organic waste recovery process;
- Lacks flexibility in management of contaminants;
- Restricts options for producing different products whose quality would better target a wider range of markets;
- Requires large capital investment that is likely to reduce efforts to clean up and better separate waste streams;

MSW composting facilities are playing a role in diverting organic waste from landfill and marketing should be managed by exactly the same set of standards that are applied to all products of the RO Industry, as discussed earlier.

Steps or incentives to ensure that MSW based RO products reflect production cost will ensure that performance drives consumption and will enable the market place to determine what processes and products succeed.

Product differentiation could involve embedding a 'product disclosure' approach within an industry managed quality management 'Seal of Approval' program. A number of models exist and disclosure involves RO industry members agreeing to provide a minimum level of product information so that more informed purchasing decisions can be made. This approach will also benefit from market education programs. The challenge lies in ensuring that products of a lower grade are not seen as substitutes for higher grade products.

Summary: *Strategies that increase the use of RO products in agriculture will benefit from the:*

- *Collection and delivery of homogeneous waste streams to the RO industry.*
- *Development of products that are suited to different market sectors*

Contaminant management

In the interest of improving RO products from both MSW and source separated feedstock, efforts are needed to remove contaminants from the organic waste stream that potentially reduce compost quality. In addition to the removal of household chemicals and bio toxins including heavy metals, efforts to deal with inert contaminants are also needed.

Replacing plastic 'shopping bags' with biodegradable bags made from 'compostable' Polycarbonate plastics that are derived from starch and cellulose rather than hydrocarbons from the petroleum industry, would significantly improve the quality of most composts. The use of biodegradable plastic film/bags and potentially other plastic products will be more expensive. Their introduction therefore needs to be managed in conjunction with regulatory compliance rather than through voluntary process in order to ensure that additional costs are applied equally to all parties. This approach is likely to significantly benefit the composting of food wastes that invariably have high levels of plastic contamination.

Efforts are needed to minimise the potential for unexpected contaminants to disrupt all components of the Recycled Organics Industry. Recent issues, principally in the USA and New Zealand, with herbicide (clopyralid) highlight this potential risk. An approach could be for the National Pesticide Registration Authority to request information on biodegradability, at least within aerobic composting processes, as part of the pesticide registration processes.

Summary: *Approaches are needed to remove or address contaminant issues and they need to ensure that changes are orderly and that they minimise distortion to implementing 'zero waste' principals .*

Land use planning and agricultural significance to urban development

Strengthening land use planning policy to better manage the continued urbanisation of rural areas and the associated productive agricultural land will support the development of agricultural markets for recycled organic products. Achieving these changes are likely to be improved by promoting the importance of strategically located rural areas in:

- Managing urban wastes and particularly organic wastes that include reclaimed water
- Providing local fresh food production that offers much greater security in terms of food quality, safety and security of supply.
- Providing additional sources of employment and business opportunity including tourism.
- Underpinning rural economy, better managing soil and water quality and facilitating the retention of environmental, ecological and social diversity associated with rural landscapes.

The problems with the current failure to prevent this include:

- The long term nature of benefits from using RO products to soil performance can be correctly viewed as a capital investment. The current transitory nature of intensive horticultural industries that are strategically located to utilise these products therefore act as a disincentive to their use.
- The costs of organic recycling will increase because of greater transport costs and particularly in the case of the reusing reclaimed water, significant costs for relocating infrastructure.
- Decline in the extent and range of natural ecosystems that result from declining local rural economies as rural industries are lost.
- Reduced opportunity for urban communities to interact with rural community values and services.

Summary: *To date attempts to challenge the current land use planning paradigm that allows short term economic considerations for the property development industry, as well as rural landholders to continue to urbanise rural land have failed.*

The potential to successfully challenge this situation arises from growing recognition of:

- *The need to utilise urban as well as agricultural organic wastes to improve the quality of land and make more efficient use of irrigation as well as fertilisers and pesticides.*
- *Food safety and health benefits associated with local production that maximises food freshness and quality.*