

WINNING THE WASTE GAME – AN M & M APPROACH

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Abstract

There are many players in the Waste Game – councils, governments, residents, businesses, individuals and interest groups. The scoring system is complex, being based on the level of satisfaction with services provided and economic, social and environmental effects. As with any game, rules are changing, so players need to be aware and make adjustments to their game plan. For example the government's strategic state-wide approach will be helpful to all players, but increases in the waste levy and the likelihood of more stringent landfill licensing and monitoring may not be welcome for some.

This paper provides case studies of how some players are responding to waste avoidance and resource recovery challenges. It recognises that a strategic framework will help councils assess their particular needs, and outlines the principles underpinning the framework, namely an **M & M** approach – developing integrated systems to **Minimise** resource use and **Maximise** resource recovery. At a detailed action level, an outline is provided of a rating process which has been used by the authors to help council assess options against various criteria. This will enable the right tactics to be decided for the game.

The paper is relevant for local government engineers who have responsibility for developing and/or implementing waste management strategies.

Key Words: Waste game, M&M, minimise resource use, maximise resource recovery, integrated systems

Changing the Rules - The evolution of Football & Waste

“The times they are a’changing” were words from a popular song some time back. With respect to the football and waste games they could have applied to any period in the last 150 years as well as today.

In football, in the early part of the 19th century, the ball was only kicked until a gentleman in England decided to pick it up and run with it. Over the ensuing 150 years or so has seen the evolution of variations of the carrying game such as Rugby, Rugby League, Australian Rules, Gaelic & American football.

In waste, the early disposal methods involved discarding wherever you could and allowing the elements to take care of the waste. This approach was followed by more active approaches such as burning or burying. Latterly variations to the “games” of burning or burying have evolved. These have included recycling, waste to energy recovery and environmentally controlled landfills.

Today, the football and the waste industries face new challenges that are changing the rules of both.

In football, the advent of TV coverage and the sponsorship dollar has led to the need for a more entertaining presentation of the sport.

For example, in Australian Rules, grandstand lights flash to let the umpire know that the game can restart after a TV advertising break, while in Rugby League extensive TV coverage has led to the use of replays to determine the validity of contentious tries. In both codes starting times of many games have been altered to suit TV coverage and rules have been altered to make the codes more attractive in the increasingly competitive entertainment industry.

In the waste industry, factors such as community concerns about environmental issues and resource usage have led to a move from waste disposal to approaches involving **Minimising** resource usage and **Maximising** resource recovery. We call this the **M & M** approach. In many respects, the M & M approach is still in its infancy as decision makers try to cope with the complexity of today's issues. For local government engineers, who have key roles in waste collection and disposal, coming up with solutions which meet the often competing demands of interest groups such as the local communities, state governments, environmentalists and industry is becoming increasingly challenging. This paper aims to assist local government engineers and their respective governments to assess where they should go by describing a decision making process to work through the complexity of waste issues and options.

The Future Influences on the Waste Game

Football clubs are subject to regulation by the code's governing body (as one NRL club found out this year), their operating costs are escalating, but income is not always keeping pace.

Government agencies such as Resource NSW and the EPA can directly affect practices and costs, influencing the waste game. Examples include policies (targets for reduction in waste to landfill), environmental objectives (more stringent landfill licensing and monitoring), economic measures (the waste levy), incentives (assisting creation of shared regional services and facilities) and co-ordinated education programs (media

campaigns). Also, incomes can be affected, particularly by limitations on ratepayer increases (eg due to perceived political consequences) and by market forces.

The impact of the impending NSW-wide strategic approach to waste avoidance and resource recovery should become clear when released late 2002. This will redress a deficiency identified by regional waste boards. Federal government activities (eg national packaging covenant and waste wise construction program) have not been significant to date for councils.

It is understood that the EPA are preparing information on alternative waste technologies, guidelines for composting, materials recycling facilities and transfer stations, which should be useful. Also NSW education initiatives include the environmental education strategy, schools environmental management plans, advertising campaigns for 'our environment – it's a living thing' and for anti-litter.

An emerging influence is the increased scrutiny by auditors of council domestic waste charges.

Community attitudes, as measured by EPA and ABS surveys, generally show that the environment ranks fifth in order of importance behind education, health, employment and crime. Surveys of residents in the Illawarra indicated a relatively high level of satisfaction with the domestic mixed waste and recycling collection services provided by councils (80% to 90%). However despite apparent community attitudes and satisfaction, councils need to avoid complacency, and work towards facilitating the improvement, expansion and integration of waste services throughout their area.

An issue, particularly for coastal councils, is whether any new class 1 landfill sites are likely to be approved in future due to environmental concerns and community opposition. Also the impacts of emerging alternative waste technologies and markets for traditional recyclables and potential recoverable resources will be significant.

Overall, councils should have a long-term strategy and action plans. To assist in

creating the Shoalhaven City Council's solid waste strategy in 2002, the authors used a framework (see Appendix A) with four categories – waste reduction/resource recovery, infrastructure, education and strategic partnerships. Guiding principles were outlined within each category. This provided the basis for developing economic, social and environmental objectives, to ensure that action plans would be in the context of an integrated and sustainable "M&M approach" of minimising resource use and maximising resource recovery.

How can we Play the New Waste Game?

Rule changes have influenced the way professional football is played (eg interchange players), generally quickening plays and leading to increased score lines. Players need to be faster, more skilful and full-time athletes.

Similarly, changes to waste legislation, the reassessment of waste as a resource, and competitive pressures have engendered innovative approaches to resource usage and recovery. Players in the waste game need to keep abreast of regulations, community expectations and market forces. They need to use this knowledge to develop and implement long-term strategies for their whole community of interest.

Domestic waste can comprise half the waste to landfill, depending on the council area. Councils readily accept their role in developing and providing domestic and public waste services, facilities and education, from kerbside collection through processing and recovery to disposal of residuals. Councils also have at least a facilitation role to ensure that adequate services are available to the 'other half' – commercial and construction sectors.

Integrated approaches are essential. Some examples of how councils are playing the game are:

In the early 1990's Shellharbour City Council's waste strategy was aimed at achieving waste minimisation, efficient waste

collection, effective recycling and environmentally safe waste disposal. This was revised to an integrated strategy in 1996, the main controversy being the introduction of an optional fortnightly or weekly domestic kerbside bin collection service. Whilst a survey showed that more than half the respondents preferred a weekly service, only 3% were prepared to pay the additional charge. There was an initial 40% reduction in domestic waste to landfill, 17% increase in domestic recycling and fourfold increase in reprocessing garden waste. Shellharbour's kerbside collection services now include optional fortnightly or weekly 240 litre or 120 litre bins for mixed waste, fortnightly 240 litre bin for recycling, thirteen collections per year of bundled and bagged garden waste, charged on-call clean up and additional bin services. Council's landfill site also includes a resource recovery centre, transfer station for diversion of recyclable/reusable items, garden waste processing and reuse of clean separated building materials. The strategy is currently being revised and expanded.

In the late 1990's Lismore City Council carried out extensive consultation with their community and developed an integrated domestic waste service, based on a weekly organics collection, fortnightly mixed waste collection, a network of recycling drop-off-centres and tip vouchers for annual hard waste disposal. Lismore's five key elements of the service are community education & information, management of organics, recyclables and residual waste, and effective policies & procedures. The organics collection service has expanded and now includes non-domestic (business premises) and central business district properties. Processing of the organic waste is by contract in a large vermi-composting plant, with Council responsible for ensuring an acceptably low level of contamination in the kerbside collected organics bin. This is being achieved through a comprehensive community education program, incentives, a kerbside bin rejection and follow up system, community feedback and promotion.

A regional initiative is currently being implemented in the Snowy River Council, Cooma Council and the Kosciusko National Park areas. In early 2002, Phil Hawley and

Associates were engaged by Snowy River Shire Council to conduct the feasibility assessment phase for the joint management of municipal solid waste in these areas. It demonstrated net benefits for each of the three areas to participate in processing organic waste at Jindabyne, continue recovering recyclables and other resources and land filling residual waste at Cooma. This increases resource recovery, significantly extends the life of Cooma landfill and avoids the need to construct a new landfill in the environmentally sensitive Jindabyne area.

How do we Determine the Best Tactics?

For any football team the coaching staff needs to develop a game plan which addresses the complex components of the game, but which is simplified enough for all players to understand and be able to execute.

Equally in the waste game, a challenge in addressing the complex issues of waste is to use an approach that simplifies the complexity to enable a range of stakeholders to review the issues and hopefully achieve an agreed solution. The risk in over-simplification is that erroneous conclusions could result. Therefore the authors have developed an option assessment approach that was recently used to assess Shoalhaven City Council's long-term options in a number of waste categories.

This approach has the following steps:

1. Identify factors impacting on waste management decisions in the particular local government area or region. These factors could include:
 - a. Reduce Landfill Volumes
 - b. Increase Resource Recovery
 - c. Improve Services to Community
 - d. Improve Environment
 - e. Reduce Illegal Dumping
 - f. Reduce Costs to Community
 - g. Reduce Costs to Council
 - h. Other?
2. Conduct a review to identify the factors and information impacted by a particular waste issue (eg what to do about reducing organic materials currently going to landfill?) for the local government area or region.
3. Identify options for addressing the particular waste issue.
4. For each option identified in step 3 assess impact on the factors identified in step 1 compared to current practice. For example, does the option (eg, fortnightly green waste collection and vertical composting) have a positive or negative impact on the factor (eg reduce landfill volumes) compared to current practice (eg green waste in current mixed waste bins to landfill)? Put these assessments and summary of reasons in a table (see Appendix B). Within the table rank the options with the most positive compared top current practice being 1, the next 2 and so on. This ranking should be regarded as a mixed qualitative/quantitative approach to facilitate decision making by highlighting the most positive options without necessarily rigidly indicating that the option with ranking 1 should definitely be implemented ahead of an option ranked 2. For example, it may be that the highest ranked option is more difficult to implement in the short term than the next one or two ranked options. Also, as indicated in the example in the Appendix, there may be two options with equal ranking that may only be separated by discussion within the stakeholders.
5. Use the table of options and assessments as a basis for discussions within Council, the community and with other stakeholders. While in this approach equal weighting was given to all factors in assessing an option, stakeholders could determine that due to local circumstances a particular factor(s) has a greater weighting than others. The aim has been to highlight major options and issues so that a broad analysis and discussion can take place before any option is selected or discarded.

6. After a particular option has been selected develop an approval and implementation plan taking into account issues such as relevant current contracts, education requirements and potential impacts on any other waste streams.

Who Needs to be Involved in the Waste Game?

There are many involved in professional football. On-field are the players and umpires/referees and off-field are coaches, specialist advisers, club and code officials, sponsors, media and the spectators. Sustainable success can only be achieved through team play.

In the waste game there are also many participants, including waste generators (all of us), service providers, processors, marketers, purchasers, special interest groups, communities and of course governments. Councils have a key involvement, through their domestic and public services, facilities and education programs, and through their collaboration with commercial and construction industries in their area. The 'paying public' have an interest, as residential ratepayers through the annual domestic waste charge, and as users of council and private waste services and facilities. In particular there needs to be involvement of councils, the waste industry and waste generators. Teamwork is needed to achieve sustainable outcomes.

How teams are constituted depends on what is to be achieved. For example when developing council strategies and action plans, the waste industry and generators (representatives of domestic, commercial and industrial sectors) should be involved. In delivering services, improved outcomes can be achieved by effectively implementing performance-based alliance agreements between councils and service providers. Whilst council strategies take into account economic, environmental and social factors, understandably a major consideration is how much would the garbage charge rise if it is decided to implement this improved or new service, and what would be the consequences. This provides a challenge to

present the information using a "triple bottom line" approach.

How do we Score the Waste Game?

In the waste game, there are not yet universally agreed measures for evaluating performance, whereas in football there have been relatively few changes to scoring systems.

Performance indicators need to be developed to provide measures of progress in achieving objectives and to help those responsible improve the level of services provided. Good performance indicators may prompt questions and not necessarily present answers, provide useful information, relate to objectives which have been determined after considering customer needs, be easy to collect and use, be regularly monitored and help staff to improve outcomes.

The Illawarra Waste Board in conjunction with constituent councils prepared a draft list of performance indicators for Council services (see Appendix C). The list was part of a standard reporting protocol developed to assist councils fulfil their obligations under the waste minimisation and management act and it could help councils to develop their own indicators. The indicators are categorised under economic, environmental and social factors for services including kerbside collections for domestic mixed waste, recycling, greenwaste and council clean-up, waste depots, transfer stations and processing plants, buy back centres, public places and household hazardous waste.

As with the myriad of statistics and diagrams now produced for football games, care needs to be taken to avoid data-overload. The detailed indicators will be useful at an operational level, with data gathered at appropriate intervals and graphed to indicate progress and trends. Key indicators can be selected for management reporting purposes. There are still significant difficulties in comparing costs, compounded by the lack of an accepted standard methodologies for calculating the true cost of waste to landfill, and quantification of environmental and

social factors for various waste services. Hopefully Resource NSW will be able to assist in these matters. Also, the theory of user-pays is often not yet applied for all services. A political reality is that an important indicator will be the cost of each service per rate assessment.

Where to from Here?

To ensure future viability and optimal outcomes, football teams need to have long term strategies to sustain competitiveness such as developing juniors, engaging supporters and the media and on-going ground development.

As this paper indicates, issues impacting the future viability of waste management systems are no less diverse. To ensure that optimal outcomes are implemented, given the various and increasing environmental, social and economic demands, this diversity needs to be simplified through analysis that leads to the development of frameworks, analytical tools and appropriate strategies.

Appendix A

Framework for the formulation of a waste strategy

Category	Guiding principles
Waste reduction/ resource recovery	<ul style="list-style-type: none"> ▪ Devise and implement measures that will effectively reduce the amount of waste being disposed of at landfill. ▪ Determine whether it is appropriate to set targets for waste reduction, whether it is one overall target, benchmarks by waste stream or industry or whether it would be more appropriate to facilitate a trend of reducing waste to landfill without setting specific targets. ▪ Target waste reduction programs at priority areas where maximum effectiveness can be achieved taking into account availability of infrastructure. ▪ Ensure that throughout the life of the strategy that appropriate research and investigations are programmed in respect of: <ul style="list-style-type: none"> - technological change - industry and market opportunities.
Infrastructure	<ul style="list-style-type: none"> ▪ Maximise the anticipated life and efficiency of the West Nowra landfill ▪ Endeavour to ensure that operational efficiencies of the West Nowra landfill and transfer stations within Shoalhaven City are maximised taking into account social, economic and environmental considerations so that the broader wellbeing of the community is considered ▪ During the life of the strategy ensure that research, investigation, monitoring and review occurs so that matters are addressed such as: <ul style="list-style-type: none"> - the longer term potential of the West Nowra landfill and transfer stations - emerging alternative technologies which may replace the use of landfill or extend the life of existing landfill - contemporary acceptable environmental standards as dictated by other levels of government and the community - co-location of infrastructure at waste facilities that could increase the potential to reduce waste and increase resource recovery. - the provision of effective services that encourage and facilitate waste avoidance and resource recovery.
Education	<ul style="list-style-type: none"> ▪ Ensure that waste education is targeted so that significant impact can be made in the shorter term on the reduction of waste being disposed of at landfill ▪ Consider the potential to change perceptions and behaviour in respect of waste minimisation and resource recovery. ▪ Develop effective communication strategies with the community and the major identifiable sectors of business. ▪ Encourage innovative communication techniques. ▪ Ensure an understanding that education is a collaborative process and therefore encourage the use of feedback mechanisms such as community and business surveys, whole of government coordination and targeted training.

Category	Guiding principles
Strategic partnerships	<ul style="list-style-type: none"> ▪ Develop strong relationships with State Government agencies such as Resource NSW and the EPA to ensure: <ul style="list-style-type: none"> - a comprehensive understanding of State policy, legislation and future direction - to maximise financial opportunities to facilitate the implementation of projects - to facilitate regional and sub-regional approaches to waste minimisation and resource recovery ▪ Examine possibilities of cooperative arrangements with adjoining councils. ▪ Develop appropriate partnerships with the private sector that enhance the achievement of goals and objectives and facilitate flexible service delivery. ▪ Enhance relationships with the community by identifying and targeting programs and strategies through influential sectors of the community. ▪ Influence the development and State and federal legislation and policies that may impact on waste reduction and resource recovery. ▪ Ensure pro-active and coordinated approaches to state wide issues such as illegal dumping.

Appendix B

Garden Waste Collection Service: Benefit/Cost Impacts compared to current Practice

Scoring: (+) represents a positive impact of option compared to current practice; (0) is neutral; (-) is negative

Option	Reduce Landfill Volumes	Increase Resource Recovery	Improve Services to Community	Improve Environment	Reduce Illegal Dumping	Reduces Costs to community	Reduces Costs to Council	Rating	Rank
Option 1 - Current Practice: Subsidised on call @ \$5/pick up	Neutral impact as it is current practice (0)	current practice (0)	current practice (0)	current practice (0)	current practice (0)	current practice (0)	current practice (0)	0	6
Option 2a - scheduled bundled kerbside service (with grass in bags) for all, costs covered by rate increase	More collected than at present (+)	Resource for processing – bundled produces low contamination (+)	Yes but non/low users pay the same rates as high users (+)	Option for soil improvement or more efficient process for gas collection (+)	Garden waste is a major part of ID (+)	Increases due to higher rates for service (-)	Rates cover changes in costs for collection, processing & landfill reduction (0)	++++	1
Option 2b - as for option 2a but using a mobile garbage bin for collection	Green waste bin likely to reduce landfill by about 25% based on WCC results (+)	Likely > vol than option 2a but more contamination (+)	Yes but non/low users pay the same rates as high users (+)	Option for soil improvement or more efficient process for gas collection (+)	Garden waste is a major part of ID (+)	Higher rates for service - likely to be > increase than option 2a (-)	Rates cover changes in costs for collection, processing & landfill reduction (0)	++++	1
Option 3 - Continue current on call fee for service but implement education program to maximise processing on site eg Earthworks	Increased composting provided program successful (+)	Local resource recovery (0)	Benefit level depends on how many compost now (+)	Reduced transport effects due to home composting (+)	Garden waste is a major part of ID (+)	No change to the major part of community (0)	Increases due to cost of education campaign (-)	+++	3
Option 4 - eliminate current service	Increased garden waste in landfill (-)	Less processing of garden waste (-)	Eliminating current service (-)	Higher level of putrescibles in landfill (-)	Could increase (-)	Marginal reduction in costs to 1- 2% of community (0)	Lower collection cost as not subsidised, but extra landfill cost (0)	-----	7
Option 5 - optional bin service; charged on rates	Level of reduced waste will depend on take-up; assume not much different to present (0)	Depends on use of system compared to present (0)	More convenient for those who opt for system (+)	Depends on use of system compared to present (0)	Low impact - Illegal Dumpers unlikely to use (0)	Costs for users balanced by current pick up charge (0)	No subsidy from Council required (+)	++	4
Option 6 - Subsidise mobile shredding service, owner uses product	Landfill reduction depends on usage - likely marginal; does not collect grass (0)	Marginal if users replace pick up system with this option (0)	More convenient for bulky material only (0)	Localised re-use (+)	Low impact - IDs unlikely to go to trouble (0)	Will depend on cost (0)	Trade off this subsidy against existing subsidy? (0)	+	5

Appendix C

Performance indicators for Council waste services and facilities

service / facility	economic indicator	environmental indicator	social indicator
Collection of domestic <ul style="list-style-type: none"> • mixed waste • greenwaste • recycling • clean up 	<i>For each service:</i> <ul style="list-style-type: none"> • cost per annum (pa) • average (av) cost per household (phh) pa • % of domestic waste charge • av cost per bin size pa • av cost phh per pickup • av cost per tonne collected 	<i>For each service:</i> <ul style="list-style-type: none"> • % contamination • av kg collected phh per pickup • av kg collected per capita per annum (pcpa) • tonnes collected • tonnes landfilled • % diverted from landfill • vehicle kilometres travelled (vkt) 	<i>For each service:</i> <ul style="list-style-type: none"> • % presentation • number (no.) of complaints per 10,000 pickups per category (eg missed, damaged, noise, litter, amenity) • av response time to rectify complaints per category and overall • % of bins repaired or replaced
Council facilities <ul style="list-style-type: none"> • waste depots • transfer stations • processing plants 	<i>For each facility:</i> <ul style="list-style-type: none"> • cost to operate • av cost per tonne 	<i>For each facility:</i> <ul style="list-style-type: none"> • tonnes delivered per source (eg council dws, public places, domestic drop off, commercial, building) and type (eg green, recyclables, clean fill, special wastes etc) • tonnes landfilled • % diverted from landfill • % of facility capacity used pa • rate of landfill compaction (kg/m³) • no. of licence non-compliance incidents 	<i>For each facility:</i> <ul style="list-style-type: none"> • no. of complaints • % of complaints resolved • no. of OH&S incidents • no. of equivalent full time employees
Council operated/contracted buy back centres	<i>For each centre:</i> <ul style="list-style-type: none"> • net cost to council • value of goods sold 	<i>For each centre:</i> <ul style="list-style-type: none"> • tonnes or m³ received • tonnes landfilled • % diverted from landfill 	<i>For each centre:</i> <ul style="list-style-type: none"> • % of population using the centre • no. of equivalent full time employees
Public places waste facilities	<ul style="list-style-type: none"> • cost pa • cost per pickup per bin • cost per bin pa 	<ul style="list-style-type: none"> • tonnes collected • tonnes landfilled • % diverted from landfill 	<ul style="list-style-type: none"> • % unauthorised use - domestic, commercial waste - per category (eg streets, parks, sportsgrounds) • no. follow ups for unauthorised use
Household hazardous waste collection and facilities	<ul style="list-style-type: none"> • cost to council for collections & facilities • cost to council per tonne or litre 	<ul style="list-style-type: none"> • tonnes or litres collected • % diverted from landfill 	<ul style="list-style-type: none"> • % of population using the collections and facilities

Authors' Biographies

John Riggall has thirty eight years experience in private and public organisations. Ten years in Project Management with construction companies. Twenty three years with three Councils as Shire Engineer (Eurobodalla), Manager Operations (Wollongong) and Director Corporate Development (Parramatta). Five years General Manager of the Illawarra Waste Board. Riggall & Associates commenced late 2001, providing strategic planning, project management and organisational development services. John is on IPWEA Environmental Management Panel.

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