PRICING POLICIES OF
THE WASTE RECYCLING AND PROCESSING
SERVICE OF NSW
INDEPENDENT PRICING AND REGULATORY TRIBUNAL
OF NEW SOUTH WALES

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April 1996
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FOREWORD

The NSW Government is currently implementing a reform package which seeks to provide a sustainable and broadly accepted framework for solid waste management in this state. The framework is intended to protect the environment, to allocate the responsibilities and costs for waste management fairly and to minimise the overall cost to the community.

"Not in my backyard!" is a common response to the question of where to put the waste we all create. Nobody wants waste around. And that's why we are willing to pay others to dispose of it for us. Unfortunately, waste banished from our own "backyard" invariably ends up in somebody else's. In a highly populated city like Sydney finding acceptable disposal sites has become increasingly difficult.

This review considers the scope for pricing policies to deal with the various problems related to solid waste management. The review suggests a number of principles that should be applied in setting prices. It concludes that prices should include all costs of landfill, including external environmental costs and the cost of replacing the landfill space used up. However, the evidence presented to this inquiry does not demonstrate that if all such costs were included, the price of landfill would be substantially higher than at present.

Simply raising waste disposal prices may do little to discourage the creation of waste. While higher landfill charges will encourage alternatives such as recycling, it will also encourage other alternatives such as long haul of waste out of the Sydney region and illegal dumping. The net result of raising prices may therefore have greater adverse impacts on the environment as well as higher costs for the community.

Other approaches, such as addressing community concerns about the development of new landfill capacity, may lead to better environmental and economic outcomes than simply raising prices.

Landfill capacity has become more scarce in Sydney. Although the disposal price should reflect the cost of replacing scarce landfill space, this replacement cost is unlikely to be significantly above the current cost. This is because the scarcity is driven not by a physical shortage of geologically suitable sites, but by reluctance on the part of communities to accept landfill development. If community concerns can be addressed by the Government's waste reform package, the current scarcity of landfill space will also be addressed. The replacement cost will then be reflected in the cost of implementing the reform package.

The reform package advocates a more competitive industry structure for the provision of putrescible waste disposal and alternatives. This has a number of implications for the pricing policies of Waste Service NSW. Firstly, in a competitive market, it would not be appropriate for Waste Service NSW to be subject to price regulation by the Pricing Tribunal. Secondly, Waste Service NSW should not bear responsibility for reducing the volume of waste-to-landfill unless its competitors carry a similar obligation. While there remains some uncertainty about how the responsibility to reduce waste-to-landfill is to be allocated, it is understood that the primary responsibility will reside with the new regional Waste Boards and their constituent local councils. Thirdly, it would be inappropriate under a competitive industry structure for Waste Service NSW to undertake non-commercial activities directed at implementing government policy (such as green waste reprocessing) unless it had a client who was prepared to pay for such services. Local councils are likely to be in the
market for such services, in order to meet their waste-to-landfill reduction obligations. They should have the freedom to seek such services from sources in addition to Waste Service NSW.

This review focuses on landfill pricing which is at the end of the waste "pipe". Changing prices for landfill disposal are likely to have a relatively small impact on the amount of waste generated. However, introducing cost reflective pricing for waste collection and incorporating disposal costs into purchase prices of products where appropriate are likely to have a greater impact on reducing the amount of waste generated at the beginning of the waste pipe.

This inquiry has not been concerned with setting prices for Waste Service NSW. Depending on the industry structure and policy arrangements put in place, it may not be appropriate for Waste Service NSW to be subject to price regulation. This is a matter for Government.

Thomas G Parry
Chairman
April 1996
1 OVERVIEW AND RECOMMENDATIONS

1.1 Introduction

In May 1995, the Premier requested the Independent Pricing and Regulatory Tribunal (formerly the Government Pricing Tribunal of NSW) to undertake a review of the pricing policies of the Waste Recycling and Processing Service of NSW (Waste Service NSW). Under the terms of reference for the review, the Tribunal was requested to "take into account studies which have pointed to historical under-pricing in waste disposal" (the terms of reference are included in Appendix A).

In carrying out reviews, the Tribunal is required to have regard to a wide range of issues listed in Section 15 of the Independent Pricing and Regulatory Tribunal Act 1992. During the course of this review, amendments to the legislation added further issues to Section 15 and reporting requirements were made more specific in Section 15(2).

Schedule 4(5) requires the Tribunal to use its best endeavours in investigations begun before the commencement of the amendments to cover the additional matters and to include a statement of the reasons why it did not have regard to any of the matters concerned. As this inquiry was at an advanced stage when the amendments commenced in January 1996 it was not practicable for the Tribunal to specifically address the additional factors. However the wide scope of the terms of reference of the review and the focus on demand management issues (one of the new Section 15 issues) has meant that the review has given comprehensive consideration to most of the major issues involved.

The Tribunal was not requested to determine Waste Service NSW's prices. This review does not examine the hazardous waste and liquid waste components of Waste Service NSW's business. Nor does it examine municipal waste disposal charges.

How much should we pay to dispose of solid waste, and how should the price be determined?

This report considers these questions from three angles:

a) What should the price be to recover the efficient costs of current disposal of waste, including environmental management costs and the cost of replacing landfill space used up?

b) Are measures to reduce the impact that disposal has on the environment likely to raise the current costs of dealing with waste?

c) How effective would raising prices be in discouraging the generation and disposal of waste and in encouraging alternatives to disposal?

This review suggests a set of principles for setting prices for Waste Service NSW. It then considers the current costs which Waste Service must recover and other costs of waste management that might legitimately be incorporated in waste disposal prices either through Waste Service NSW charges or through levies. These other costs include the incremental costs of replacing existing landfill capacity, additional environmental costs and costs associated with meeting other waste management goals (such as the Government's target of reducing waste-to-landfill by 60%).
In a purely commercial sense, Waste Service NSW appears to operate its facilities efficiently. There does not appear to be substantial scope for reductions in operating expenditure at present.

Sydney is running out of available landfill capacity for disposing of putrescible waste. There are two possible ways of solving this scarcity: either establish more landfill capacity or reduce the amount of putrescible waste going to landfill. Pricing has a role to play in both solutions.

When there is a scarcity in most markets, the price increases, leading to a greater supply and a lower demand for the commodity until supply and demand balance. However, simply raising waste disposal prices is unlikely to provide an optimal solution to the landfill scarcity problem. The scarcity of landfill capacity in Sydney is not due to a lack of potential suppliers. Indeed, there are several companies, in addition to Waste Service NSW, which see it as a potentially highly profitable business opportunity. Rather, the scarcity occurs primarily because local communities have strongly resisted landfill facilities being located in their neighbourhood. This opposition has been inspired both by concern over the likely environmental and amenity impacts that landfill imposes on the local area and by suspicions that more equitable and environmentally sound options are available for dealing with waste. Raising the price will do little to allay these concerns. Some have suggested levying a "host fee" on waste disposal prices and paying this to local councils as a way of addressing such concerns and overcoming local resistance. While it is appropriate to compensate local communities for loss of amenity, it is unlikely that cash payments alone would be accepted by local communities as an adequate response to their concerns.

To reduce the environmental and amenity costs of landfill, the EPA will soon release Environmental Management Guidelines for Solid Waste Landfills. All landfills in NSW must comply with these guidelines. To ensure that alternatives to landfill preferred by the community (such as waste minimisation, recycling, and green waste reprocessing) are encouraged, the Government has legislated a target of reducing waste-to-landfill by 60% per capita based on 1990 levels by the year 2000.

Both these initiatives are likely to reduce external environmental costs, but raise the direct financial cost of waste management. This, in turn, may mean that waste disposal charges need to rise. As it is not yet clear how the landfill guidelines will be applied and how the waste-to-landfill reduction target will be achieved, the Tribunal is unable at present to estimate the costs of these initiatives or how these costs may impact on prices.

As landfill space becomes more scarce, the cost of replacement landfill space could become more expensive. It has been argued that the cost of replacement should be incorporated into current prices in order to reflect the true value of landfill being used up, to conserve existing capacity and thereby defer the need to invest in expensive replacement capacity. According to some estimates, this could as much as double the current landfill charges.

The Tribunal believes that, in principle, the price should reflect the replacement cost. However, in practice, the replacement cost is unlikely to be significantly above the current cost. As noted above, the scarcity is driven not by a physical shortage of land, but by a reluctance on the part of communities to accept landfill developments. If this reluctance can be overcome by the initiatives set out above, then the scarcity of landfill space can also be overcome. The replacement cost will then be reflected in the added cost of implementing the above initiatives. This cost is likely to be substantially lower than the estimates of replacement costs that have been presented to the Tribunal (see Section 5.6).
The industry reform package envisages more competitive industry structure in the provision of putrescible waste disposal and alternatives. Therefore, it would not be appropriate for Waste Service NSW to be subject to price determinations by the Tribunal. Nor would it be appropriate under a competitive industry structure for Waste Service NSW to undertake non-commercial activities directed at implementing government policy (such as enclosed composting) unless it had a client who was prepared to pay for such services, or its competitors carried an equivalent obligation.

In a competitive market, the responsibility to achieve government objectives should reside outside the soon to be corporatised Waste Service NSW. While there remains some uncertainty about where this responsibility lies in the new industry structure, it is understood that the primary responsibility for meeting the waste-to-landfill reduction target will be with the new regional Waste Boards and their constituent local councils. To fulfil this responsibility, these Waste Boards (or their constituent councils) may choose to contract with Waste Service NSW, or other bodies, to provide waste management alternatives to landfill. Any additional costs involved in such activities may then be raised by increasing councils’ domestic waste charges, or be funded from the State Government’s newly created Waste Planning and Management Fund. This approach may avoid the need for waste disposal charges to rise to fund alternatives. However, it raises questions whether there are adequate incentives for Waste Boards and local councils as regional monopolies to seek the lowest cost means of managing waste and implementing their waste reduction plans.

Landfill is essentially the end of the waste "pipe". Raising prices for landfill disposal is likely to have a relatively small impact on the amount of waste generated. Introducing cost reflective pricing on waste collection and incorporating disposal costs into purchase prices of products where appropriate are likely to have a greater impact on reducing the amount of waste entering the waste pipe at the point of generation.

### 1.2 Pricing principles

The Tribunal considers that the following principles should form the basis of Waste Service NSW's pricing policies:

- **Cost reflectivity**
  The cost of disposal of waste for landfill should reflect the full efficient cost of providing this service.

- **Encouragement of efficiency**
  Charges should be set to create incentives for the service provider to improve performance and reduce costs.

- **Incorporation of external costs**
  For waste management prices to fully reflect costs, they should also incorporate all the indirect or "external" environmental and other costs of such activities.

- **Minimisation of environmental impact**
  Subject to technological and economic feasibility, prices should be set to encourage minimisation of the adverse environmental impacts of waste management.
Independent Pricing and Regulatory Tribunal

- Competitive neutrality
  The charges for waste management services provided by one service provider should not create artificial barriers to competition by another provider.

- Non discriminatory pricing
  Charges for waste management services should reflect the cost of managing that type and amount of waste. Charges should not depend on the source of the waste.

- Concern for equity
  Parties responsible for creating waste should bear the cost of managing it. Within the above constraints, the costs of managing waste should not fall disproportionately upon those with more limited capacity to pay.

- Compatibility with other social objectives
  Other social objectives, such as a community preference for alternatives to landfill, should be considered in determining prices.

There may be some tension between some of the above principles. For example, increasing the level of competition in the industry may provide further encouragement for efficiency, but may also lead to pressures to reduce environmental standards in order to cut costs. The principles may need to be applied differently under a competitive industry structure than under one where Waste Service NSW has an effective monopoly over putrescible waste disposal. A combination of competition and regulation is likely to be required regardless of industry structures.

1.3 Conclusions

In accordance with the terms of reference and applying the form of the above principles to the pricing policies of Waste Service NSW, the Tribunal draws the following conclusions:

Current revenue is adequate for Waste Service NSW's present activities, given current environmental management standards.
Waste Service NSW's prices are now approximately $44 per tonne weighted average charge including the s.72 waste disposal levy of $7.20 per tonne. Current charges are adequate to cover Waste Service NSW's current operating and capital costs including:

- future rehabilitation and environmental management of filled sites
- an appropriate return on assets
- replacement of current landfill capacity
- provision of some recycling facilities at landfills and transfer stations.

There is limited scope for operating cost reduction within Waste Service NSW.
Recent tenders for operation of transfer station and landfill sites have been very competitive. The cost of operation is therefore unlikely to decline substantially in the near future. The competitive tender process should limit future pressures for operating cost increases.

There may be some scope for reducing projected capital expenditure.
In particular, significant savings in capital expenditure might be achieved if it was not considered necessary in the context of the new competitive market structure for Waste Service NSW to build up a 15 year landbank. Provided current captive customers are not
Overview and recommendations

required to fund investment to increase future capacity, this is essentially a matter between Waste Service NSW and its shareholder, the NSW Government.

**Higher environmental standards are likely to mean higher charges.**
Charges may need to rise to recover the cost of meeting the EPA’s new Environmental Guidelines for Solid Waste Landfills. According to figures provided by the EPA, the additional cost could be as much as $14 per tonne. The actual impact will depend on the current standard of environmental management and on how the guidelines are applied. The final guidelines are expected to be released in the near future. The Tribunal is concerned that the cost of implementing these guidelines may significantly exceed any environmental and other benefits. Such standards should be imposed only where it has been shown that the environmental benefits exceed the cost.

**The prices paid by customers of landfill should reflect the cost of replacing the landfill space consumed.**

The replacement cost of current landfill capacity is the cost of the least expensive potentially available equivalent new landfill capacity or the cost of equivalent capacity of alternatives to landfill such as recycling. To the extent that these incremental replacement costs reflect the economic costs of replacing landfill capacity with equivalent landfill capacity, these costs should be recovered by Waste Service NSW. To the extent that the incremental replacement costs reflect policy decisions by the Government, the EPA or the regional Waste Boards to use alternatives to landfill, these costs should be borne by the agency responsible for implementing the policy. The Government agency can then contract with Waste Service NSW or others for the provision of the relevant services. A waste disposal levy or similar mechanism may be an appropriate source of such funding. Cost reflective charges for alternative waste options which exceed landfill charges would discourage the use of such options and defeat the intent of waste policy.

**Current prices already adequately reflect incremental replacement costs.**
Estimates of the cost of replacing existing landfill range from lower than the current cost to $35 per tonne. Assuming that acquiring new landfill capacity is consistent with the Government’s 60% waste-to-landfill reduction target, the Tribunal considers that the real incremental replacement cost is likely to be less than $5 per tonne and may be as low as zero. Waste Service NSW currently has enough landfill capacity to last, at current disposal rates, until about 2005. Given that Waste Service NSW is expected to earn an adequate rate of return on the basis of current real prices while investing in replacing landfill capacity, the Tribunal considers that the scarcity value of landfill is already adequately reflected in current waste disposal charges.

**No physical scarcity of potential landfill space.**
There is at present no physical scarcity of potential landfill space in the Sydney metropolitan area. There is however, a scarcity of currently available landfill space, because of the reluctance of communities in the Sydney area to host such facilities. This reluctance is associated with concern over the local environmental and amenity impacts associated with hosting the facilities, and with broader concerns that more environmentally benign and cost effective solutions to waste are being neglected in favour of landfill.

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1 Provided that the current disposal pattern of one Council area's accepting waste from 28 of 41 Sydney Councils is continued.
These concerns can be addressed by:

a) minimising the short and long term impacts of landfill operations on the local environment by, for example, excluding toxic household chemicals and batteries from the putrescible waste stream
b) compensating local communities for the amenity impact of hosting landfill facilities
c) encouraging maximum use of alternatives to landfill wherever these are less environmentally damaging and cheaper for society as a whole
d) encouraging the participation of affected communities in the proposal development and decision making process.

Current revenue is not sufficient to meet the 60% reduction target.
The current level of Waste Service NSW's revenue is unlikely to be sufficient to cover the costs involved in achieving the Government's 60% waste-to-landfill reduction target.

However, Waste Service NSW charges need not rise for the above reason.
The 60% waste reduction target is a legislative principle and a state-wide goal. No single agency is responsible for meeting the target and no single sector of the community will be required to achieve a 60% reduction. If Waste Service NSW is not charged with the responsibility for achieving the waste-to-landfill reduction target, it is not necessary for waste disposal charges received by Waste Service NSW to increase for this purpose.

The allocation of responsibility for meeting the waste-to-landfill reduction target needs to be clarified.
The current waste reduction target as expressed in the Waste Minimisation and Management Act 1995 sets out an objective of achieving "by the end of 2000, a 60% reduction in the amount of waste disposed of in NSW (being a per capita reduction based on 1990 disposal rates)". It is not yet clear what the base line figure for 1990 is, or how responsibility for meeting the target is to be allocated. It is therefore unclear how much, if at all, Waste Service NSW is required to reduce the volume of waste it disposes to landfill.

Waste Service NSW's obligations to undertake interim waste-to-landfill reduction activities should be made explicit.
If Waste Service NSW is required to undertake non-commercial waste management activities, while its competitors are not, the non-commercial component of these activities should be funded by the agency of state or local government responsible for achieving the target. Interim funding arrangements may be necessary over the next two years, pending the development and implementation of the regional waste plans and industry waste reduction plans. Such funding should be transparent and open to competition from other service providers where possible.

Funding for higher cost alternatives to landfill (such as increased recycling or green waste processing to meet the waste-to-landfill reduction target) should be provided by the agency or agencies responsible for reducing waste-to-landfill. Such funding should be allocated on a competitive basis where possible. Funds for such purposes should be raised by either:

- a statutory levy such as the present waste disposal (Section 72) levy, or
- higher charges on waste-to-landfill levied by regional Waste Boards.
The current differential between council and commercial rates should be removed. Waste Service NSW's proposal to remove the differential over three to five years seems to be an appropriate period for achieving this.

**Current Rate of Return is adequate.**
Over the past two years, Waste Service NSW has earned an average nominal post-tax cash return on equity of 12%. In 1995/96, Waste Service NSW expects to earn a return higher than this. This is a healthy rate of return for a business such as Waste Service NSW. Waste Service NSW's current real prices provide an adequate basis for maintaining this level of return.

**Changing prices for waste disposal may have little impact on disposal volumes.**
The ability of price signals to change behaviour depends on how and where price (and/or levy) changes are applied. Changing charges at landfill gates will have a significant impact only on waste generators who pay these unit charges directly. Such changes are unlikely to have a significant impact on domestic waste disposal volumes if they are simply passed on in municipal rates as an increase in the fixed annual charge for domestic waste management.

**More cost reflective charging structures for waste services at the point of collection are likely to have a greater impact on waste disposal volumes.**
Levies imposed at the point of production or purchase of material destined to end up as waste and progress towards more cost reflective charging for collection of waste by local councils are likely to have a more significant impact on waste disposal volumes than increasing Waste Service NSW prices. In addition to conducting education and information programs on recycling, local councils should further develop user pays systems for waste services (eg different rates for different bin sizes, or charge according to the number of bin collections).

**Further study is required.**
The Tribunal has received a range of estimates for:

- the costs of waste and recycling collection services
- the costs of alternatives to landfill
- the internal and external environmental costs of landfill (and its alternatives)
- the amenity costs of landfill.

Better information is needed to narrow the range of these estimates. This will facilitate the setting of prices, levies and policy targets.
1.4 Recommendations

The Tribunal makes the following recommendations for consideration by the Government:

Recommendation 3.1
The following principles should form the basis of Waste Service NSW charges for landfill and transfer station services
1. Cost reflectivity
2. Encouragement of efficiency
3. Incorporation of external costs
4. Minimisation of environmental impact
5. Competitive neutrality
6. Non discriminatory pricing
7. Consideration of equity impacts
8. Compatibility with other social objectives
These principles should apply regardless of the level of competition existing in the industry. Wherever possible, such instruments should encourage, rather than conflict with, competition.

Recommendation 4.1
The economic rate base used for regulatory and pricing purposes should allow for the amortisation of the full capital cost of landfill space (including land value) over the life of the landfill sites.

Recommendation 4.2
Landbank acquired by Waste Service NSW for the future development of landfills, but not in service, should be excluded from the rate base used to determine the required rate of return.

Recommendation 4.3
Waste Service NSW's current real revenue is adequate to cover its current activities and should not be increased for this purpose.

Recommendation 5.1
The prices paid by customers of landfill should reflect the replacement cost of the landfill space consumed. However, the cost of disposing of putrescible waste to future landfill sites in the Sydney region (provided such sites are approved) is unlikely to be significantly higher than the current cost of landfill disposal.

Recommendation 5.2
Where replacement cost reflects Government policy to reduce waste-to-landfill, the cost should be borne by the agency responsible for meeting the target, or be recovered by means of a levy on waste-to-landfill rather than accrue as additional revenue to Waste Service NSW.

Recommendation 5.3
The obligations of Waste Service NSW to acquire landfill capacity in the context of a more competitive market structure should be clarified.
Recommendation 6.1
Landfill prices should incorporate the full environmental costs. Where such costs are not presently matched by the costs incurred by operators, the additional revenue raised could in part be directed to redressing such impacts directly, or to funding alternatives to landfill, such as recycling programs.

Recommendation 6.2
The efficient costs of satisfying the environmental standards embodied in the EPA’s new Environmental Management Guidelines for Solid Waste Landfills should be recovered through Waste Service NSW charges. These guidelines may involve significantly greater costs and necessitate an increase in Waste Service NSW's real revenue.

Recommendation 6.3
The EPA should introduce higher standards for the operation of landfills wherever the environment and other benefits of the new guidelines are shown to exceed the cost of meeting them. Conversely, such guidelines should not be imposed where the benefits are less than the associated cost.

Recommendation 6.4
Landfill charges should include compensation for any local amenity costs which may be imposed on communities hosting landfills. Such compensation could be paid either out of the funds received from the waste disposal levy, or by the landfill owner/operator. Such compensation should not determine the siting of landfill facilities. Pending refinement of estimates of amenity costs, a host fee comparable to the rehabilitation enhancement fee paid at the Belrose and Grange Avenue landfills ($1 per tonne) could also be paid at other putrescible landfills.

Recommendation 6.5
Additional costs of waste minimisation or the replacement of landfill capacity could be funded by a levy on waste-to-landfill or part of such a levy. (Taxes for revenue raising purposes should be identified separately.) The setting of such taxes is a matter for Government rather than the regulators.

Recommendation 6.6
Estimates of the external environmental and amenity costs of landfill disposal should be refined.

Recommendation 7.1
The obligations, if any, of Waste Service NSW to divert waste away from landfill under the 60% waste-to-landfill reduction target should be clarified.

Recommendation 7.2
The incremental cost of meeting the 60% waste-to-landfill reduction target should be borne by the agencies responsible for meeting the target. For putrescible waste, this is understood to be the responsibility of the proposed regional Waste Boards, not of Waste Service NSW. Funding for waste reduction initiatives should be available to Waste Service NSW and other service providers on an equitable, commercial and, where appropriate, competitive basis. This will provide Waste Service NSW an opportunity to enhance its return on assets and profitability by offering waste management alternatives on a commercial basis.
Recommendation 7.3
If Waste Service NSW is required to undertake higher cost alternatives to landfill activities in order to reduce waste-to-landfill prior to the implementation of regional waste plans, such obligations should be formalised through commercial contracts.

Recommendation 7.4
Meeting the Government's target of reducing waste-to-landfill by 60% per capita by the year 2000 may require Waste Service NSW to accept considerably less waste for landfill disposal. In such an event, Waste Service NSW charges may need to rise to the extent necessary to recover landfill related fixed costs over a smaller sales volume.

Recommendation 8.1
The differential between council and commercial rates should be removed. Removing the differential over a three to five year period should be sufficient to allow adjustment.

Recommendation 8.2
In market segments where Waste Service NSW does not face effective competition (eg putrescible waste at present), transfer stations should earn a rate of return equivalent to that of landfill sites. If the Government wishes as a matter of policy to reduce traffic to landfill sites, this should be achieved by an explicit subsidy and/or levy.

Recommendation 8.3
Waste Service NSW's landfill operation should be accounted separately from other waste disposal alternatives (eg recycling and green waste composting).

Recommendation 8.4
Differential landfill charges which reflect difference in costs (eg for whole car tyres, expanded foam) should be left to landfill owners and operators to determine. Surcharges and bans based on type of waste (eg green waste, paper, household chemicals, etc) should be specified by Government or EPA. Such surcharges and bans should be set in the context of alternative disposal or processing methods and appropriate enforcement mechanisms.

Recommendation 8.5
On grounds of practicality, efficiency and cost reflectivity, Waste Service NSW should continue to rely on weight based, rather than volume based, charges for receipt of waste at transfer stations and landfill sites.

Recommendation 9.1
Having regard to the business of Waste Service NSW and its capital structure, which approximates the private sector, the appropriate nominal post tax cost of equity for Waste Service NSW should be in the range 13% to 14.5%.

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2 POLICY CONTEXT

2.1 Sydney's Waste: What's the Problem?

The disposal of waste costs the people of NSW tens of millions of dollars each year. Either through direct payments or indirectly through local council rates, we all pay to cover the costs of waste disposal. In addition to the financial cost of waste itself, waste management and disposal involves a range of less obvious costs and problems. The collection and transportation of waste uses fuel, produces air pollution and increases traffic on our roads. Waste buried as landfill can produce unpleasant odours and flammable methane gas, and it can contaminate ground and surface water if not handled properly. If waste is burned, it pollutes the air and creates ash that is disposed of as landfill.

It is at least technically possible to reuse or recycle much of the resources we currently throw away (green waste, food waste, paper, metals, glass, some plastics, etc), or to avoid the production of materials that will become waste. In some cases this can reduce net costs, but it often involves additional costs. Where these additional costs are lower than the external environmental and other costs of disposal, society benefits both economically and environmentally. It is also possible that by developing alternatives to disposal, efficiencies of scale and scope will be found that make these alternatives more cost and resource effective. On the other hand, where avoidance, recycling, or reuse involves greater costs and consumption of resources, such as energy, the best environmental and economic outcome may be achieved by disposal. Until all external costs are included in the cost of landfill disposal (and its alternatives), the generation and management of waste will involve imposing avoidable costs on the environment and the economy.

Although the amount of material entering the waste stream for disposal has fallen since the peak before the recession of the early 1990s, Sydney still disposes of more than 2.7 million tonnes of solid waste annually.

Figure 2.1 Recorded waste disposed of in Sydney Metropolitan Region

![Graph showing recorded waste disposed of in Sydney Metropolitan Region]

Source: EPA.
Notes:
(1) The 1995 figures are projected from the waste disposed in Sydney in the first half of 1995.
(2) The 60% target line illustrates the straight line reduction required to meet the target of reducing waste to landfill by 60% per capita by year 2000 based on the 1990 disposal rates. The target takes into the account the population growth of Sydney metropolitan region over 1990-1995.
As shown in Figure 2.1, the latest available data indicates that the waste disposal tonnage is rising again. There are also concerns that large amounts of waste may be unrecorded at disposal. This is due to under-reporting of waste at some non-putrescible landfills and to illegal dumping.

The volume of waste disposed is divided roughly evenly between council and community waste on the one hand and commercial and industrial waste on the other. The current level of total reported waste disposed of in Sydney is equivalent to about 800 kilograms of waste per capita. The trend in per capita waste disposal is shown in Figure 2.2.

![Figure 2.2 Reported per capita waste disposal in Sydney Region](image)

Source: Waste Service NSW.

It is difficult to compare waste disposal volumes in Australian cities because there is no existing standard for measuring waste disposal. One comparison of solid waste disposal among the different major Australian cities is shown in Figure 2.3.

![Figure 2.3 Solid waste disposal to landfill in Australia’s major cities](image)

Note that Figure 2.3 excludes waste disposed by other means, such as incineration. However, on a per capita basis, Sydney's waste disposal appears to have fallen sharply to a level lower than most other Australian cities. In 1991/92, greater Melbourne disposed of 2.9 million tonnes to landfill [Gutteridge, Haskins & Davey, p.16]. This is roughly the same total amount that Sydney disposed of in the same year, despite Sydney's having about 17% more people.

As shown in Figure 2.4, Australians tend to generate considerably more solid waste than many other developed countries.

**Figure 2.4 Waste generated in OECD countries, 1990**

![Graph showing waste generated in OECD countries, 1990](image)


illustrated in Figure 2.5.

**Figure 2.5 Composition of waste disposed of in Waste Service NSW landfills**

![Pie chart showing composition of waste in NSW landfills](image)

Source: Waste Service NSW.

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2 150,000 tonnes per annum in Sydney.

3 It has been suggested that this may reflect under-reporting because of Sydney's higher waste disposal levy.

4 1994 population Melbourne: 3.20 million, Sydney: 3.74 million. However, caution must be exercised in comparing waste disposal figures between cities as there are likely to be differences in both definition and measurement method.
The EPA estimates, "1.5 million tonnes of green waste is generated in NSW: 33% garden waste, 25% wood waste and 42% food waste. Of this, 1.18 million tonnes or 78% goes to landfill." [EPA State of the Environment 1995, p. 235]

2.2 Current prices

Current Waste Service NSW prices are set out in Appendix B. The price for mixed waste disposal at landfill, including the $7.20 per tonne waste disposal levy, is $32.40 per tonne for municipal councils and $43.30 per tonne for commercial customers. At transfer stations the prices are $49.90 per tonne and $57.80 per tonne respectively. Council waste makes up about two thirds of waste received by Waste Service NSW for landfill, and commercial waste provides the other third. Waste Service NSW estimates that the weighted average charge for waste delivered to landfill and transfer stations from council and commercial customers is $44.00 per tonne. [Waste Service NSW submission, p. 14.1]

As shown in Figure 2.6, these charges are significantly lower than in densely populated European cities, but comparable to other relatively low population density cities in Australia and the United States.

Figure 2.6 Comparison of landfill prices (mixed waste)

Notes:
(1) Paris figure applies to most packaging materials.
(2) Australian figures are representative of metropolitan prices for commercial waste at landfill.
(3) Amcor, Submission 141; other sources.

The cost of landfill itself represents a small part of the total cost of waste disposal. The cost of collecting and transporting waste usually constitutes a significantly larger proportion of costs. This could be in the range of $50-$150 per tonne, depending on the location and type of waste. The cost of receiving waste at a transfer station may be in the range of $15 to $25 per tonne, depending on distance and other factors. Assuming an average collection, transfer and haulage cost of, say, $125 per tonne and assuming that the current Waste Service NSW landfill charge of $25.20 (council customer) at least covers the operating and capital cost of landfill, then the cost of landfill amounts to about one sixth (16%) of the total cost of disposal of waste-to-landfill.
Current municipal domestic waste disposal charges (as paid through council rates) vary considerably from council to council, but are about $100 per rateable property. This charge covers the council costs of collection and transport to Waste Service NSW facilities as well as Waste Service NSW disposal charges.

2.3 Historical background

The key functions relating to the waste management industry are ownership, operation, control (management) and regulation. This section traces how the responsibility for these functions has evolved in the Sydney area over the past three decades.

Before 1970, waste management was the responsibility of local government. This meant that local councils were typically owner, operator, manager and regulator of waste management in their respective areas. It is claimed that council operated or sanctioned landfills created health hazards through poor management practices, including the acceptance of both liquid and solid waste. Landfills were not optimally located to accept waste, and there was inadequate planning for future needs, [Denlay 1995, p. 5].

The Barton Report of May 1970 identified a critical waste situation confronting Sydney that required the creation of a single co-ordinated waste disposal authority. The acceptance of this report led to the establishment of the present service, with the Waste Disposal Act (1970) leading to the formation of the Metropolitan Waste Disposal Authority (MWDA) in 1971.

The MWDA's powers extended to the acquisition of land, the operation of facilities or negotiation of contracts to have agents operate them and, under Section 29 of the Act, the imposition of levies on any operators receiving waste (Denlay 1995, p. 6). The overall aims were the efficient and environmentally acceptable co-ordinated collection, transportation and disposal of Sydney's waste. The immediate objective was to phase out putrescible waste disposal at council depots and transfer this to MWDA run facilities. To this end, the MWDA progressively assumed control of some council run facilities and established new ones.

In 1975 the MWDA was invested with the powers of waste regulator when, through Part 5 of the Act, it gained the power to license waste disposal operators. This power was

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5 This is generally still the case for waste management outside the Sydney region.
subsequently diluted with the establishment of the State Pollution Control Commission, now the Environment Protection Authority (EPA). Licensing powers were transferred to the EPA along with the collection of the s.29 levy in March 1992.

During this period, pricing practice focused on maintaining council tipping fee increases at regional depots below the rate of inflation. The capacity to receive waste was increased under the MWDA's Waste Management Plan. Six new MWDA landfill sites were established. By 1987, the total volume of waste disposed of in the Sydney region exceeded 3 million tonnes.

The MWDA was renamed the Waste Management Authority (WMA) in July 1989, and released its Solid Waste Strategy in 1990. This strategy was based on accommodating an anticipated increase in waste levels from 3.4 million to 5.2 million tonnes over 20 years through waste minimisation, recovery and recycling, and waste processing. Increased landfill capacity was required despite the waste reducing elements of the strategy. Two major expansions of landfill capacity were proposed

- a 291 ha landfill at Londonderry in Sydney's west
- the extension by 124ha of the Lucas Heights landfill.

Further capacity was to be generated by 'overtopping' the Lucas Heights site with further waste.

In the face of local council opposition, these proposals were abandoned. The shelving of these expansions provided a watershed in the approach to waste management, it signalled the end of a strategy which centred on disposing of an ever growing waste stream through a continual expansion in landfills owned and operated by the WMA.

The need to address solutions to the waste volume problem in the face of revised landfill capacity projections may have been an important catalyst to a government Green Paper on waste management (Hartcher, September 1992) and a Joint Select Committee Upon Waste Management (NSW Parliament, September 1993).

The Green Paper outlined the following objectives [Hartcher 1992, p. 6]:

- reducing per capita waste disposed of by 50% by 2000 compared with the 1990 level
- separating the roles of operator and regulator by making environmental regulation of waste disposal the responsibility of the EPA
- making community based decisions on the location of new landfill sites
- recognising the concerns and rights of local communities, including the right of host communities to be compensated for the amenity cost of landfill
- pricing disposal to landfills to cover full environmental and social costs, and incorporation of the replacement cost in the disposal charges, as an encouragement to landfill conservation and recycling
- encouraging minimisation through incentives and regulation
- promoting a diversity of waste service providers.

The Green Paper (1992) noted that the then Government had effectively ended Waste Service NSW’s de facto monopoly over putrescible waste disposal through its decision not to acquire any further landfill sites or build any new transfer stations other than those
already planned. The Government proposed asking the Pricing Tribunal to review the effects of the above proposals on Waste Service NSW's pricing policies.

Following the Green Paper, the Joint Select Committee recommended that

- pricing for waste disposal should more realistically reflect the full establishment, remediation and long term replacement costs as well as the short term environmental and social costs associated with the facility
- the Government Pricing Tribunal (now the Independent Pricing and Regulatory Tribunal) should review the effects of any changes in prices for landfill disposal
- all local councils should consider the implementation of a user pays system for domestic garbage based on either volume or weight. Pricing should be structured so that households which recycled and fully minimised waste should pay significantly less than those which failed to do so
- the Council Recycling Rebate (CRR) should be extended to other recyclable materials such as industrial, building and organic wastes
- any extension of the Waste Levy outside the Sydney Metropolitan Area should be imposed only with the agreement of the regions involved
- The Waste Levy should be used to enable viable and efficient recycling enterprises to be developed, but it should not be used in the long term to sustain them if they remained inefficient or non-viable
- a substantial proportion of the Waste Levy collected should be used to establish innovative waste minimisation programs, support technical research in this area, and fund education programs
- the cost of monitoring compliance with regulatory standards set by the EPA should be borne by the waste management operator involved
- a diversity of waste service providers should be permitted to own and/or operate putrescible waste disposal facilities
- on-site recycling facilities for all recyclable waste should be a development requirement of every landfill site and the EPA, through the licensing process, should ensure maximum possible separation of recyclable and reusable materials at each site
- state legislation should prevent (through a licensing regime on the industry) any single company or government agency owning or managing more than a prescribed percentage of waste infrastructure and services
- regional groupings of councils should be established to organise waste management by consensus between councils with the approval of the Waste Authority.

Community opposition to the expansion of existing landfills and to the establishment of new ones run by private interests has prompted action by local councils in the Sydney region and by the State Government. The proposed extension of the region's largest landfill, at Lucas Heights in Sydney's south, has been abandoned and a private putrescible waste landfill at Badger's Creek has been blocked in the Land and Environment Court by council opposition. The development application for another private putrescible landfill at Erskine Park has been withdrawn.
2.4 Industry structure

Waste Service NSW was established to serve the Metropolitan Waste Disposal Region. Under the Waste Disposal Act 1970, Waste Service NSW was made responsible for the establishment and operation of depots, including facilities for:

- processing liquid industrial waste
- disposing liquid, sludge and intractable waste
- treating, storing and disposing of domestic and industrial solid waste.

The current structure of Sydney's solid waste recycling and disposal industry is illustrated in Figure 2.8. Likely changes to this structure as a result of the Government's reform package are discussed in Section 2.5.

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6 The areas which constitute the Metropolitan Waste Disposal Region are shown in the map in Appendix C. Putrescible waste from the local government areas of Botany, Randwick, Sydney, South Sydney, Waverley and Woollahra is directed to the Waverley Woollahra Process Plant (the Waterloo Incinerator).
Waste Service NSW is the dominant operator of waste disposal facilities in the Sydney region. To date, Waste Service NSW has, in practice, but not in law, had monopoly control and ownership of putrescible waste disposal facilities throughout most of Sydney. Private sector companies currently operate all putrescible transfer stations and landfill sites under contract to Waste Service NSW. Several private companies and local councils own, control and operate non-putrescible landfill sites. There is keen competition among private companies (and Waste Service NSW) for landfill disposal of non-putrescible waste.

Key features of the industry structure illustrated above are:

- While councils retain responsibility for the collection of waste and kerbside recyclables, these services are commonly provided by private collectors under contract to councils.
- Transfer stations and landfills receiving council waste are owned by Waste Service NSW, which has management responsibility, but which contracts out all operations to private operators. Recycling facilities are provided at these centres.
- Commercial and industrial waste generators dispose of the majority of their non-putrescible waste to private operators who own and operate landfill sites.
- Privately owned landfills are managed by a few large operators/owners which have committed capital that may exceed $10 million per site and a large number of small scale 'quarry fill' operations conducted as an adjunct to sand and gravel merchant activities.

2.5 NSW Government waste reform package

Government policy is expressed in the state-wide waste reform package released in November 1995 and the Waste Minimisation and Management Act enacted in December 1995. These reforms will alter the industry structure set out above. Several changes bear upon this review.

The new reform package includes the following features:

- A hierarchical approach to waste management prioritising consumption reduction, followed by product reuse, material recycling and biodegradation and then landfill disposal of residues.
- The principle of achieving "by the end of 2000 a 60% reduction in the amount of waste disposed of in NSW (being a per capita reduction based on 1990 disposal rates)" [Waste Minimisation and Management Act 1995, s. 3],
- The Minister for Urban Affairs and Planning is foreshadowed as the consent authority for regional establishment of putrescible landfill proposals is foreshadowed.
- The release of Environment Guidelines for Solid Waste landfills is foreshadowed.
- Waste Service NSW will be reconstituted as a state owned corporation.
- The expansion of incineration facilities as a means of disposal is banned.

The key components of achieving the waste-to-landfill reduction target are:

- regional waste plans to be developed by the proposed regional Waste Boards
- industry waste reduction plans to be developed by nominated industry sectors
- a Green Waste Action Plan (since released) and a ban on garden waste to landfill by 1998 (subject to availability of productive alternatives).

7 The exceptions being Hawkesbury Council which operates a putrescible landfill and the councils serviced by the Waterloo Incinerator (ie Botany, Randwick, Sydney, South Sydney, Waverley and Woollahra).
8 The Castlereagh Secure Landfill is operated by Waste Service NSW directly, not by private contractors.
Independent Pricing and Regulatory Tribunal

Under the new Act, public sector control, but not operation, of putrescible waste disposal is enshrined in law. The Act requires all metropolitan municipal councils to join new regional Waste Boards. Individual metropolitan councils that do not wish to join a Waste Board must seek an exemption from the Ministers for Environment and Local Government. These new Boards will be constituted as public authorities and, subject to a range of strict criteria, will have the power to establish and control putrescible waste landfills. It is likely, therefore, that in the medium term, Waste Service NSW will not have monopoly control over the disposal of putrescible waste either in law or in practice in any part of NSW. The 60% waste-to-landfill reduction target has been accompanied by a stated intention to require industry to make financial contributions to support community based reduction schemes and recycling programs.

Under the new structure, it is no longer the role of Waste Service NSW to develop a waste reduction plan or to be a manager of the waste stream. Waste Service NSW's role will be simply that of one participant among others in the market for providing waste management services. This will essentially extend Waste Service NSW's current status in the non-putrescible sector to the putrescible sector. The major remaining difference will be that, unlike non-putrescible landfill, all putrescible waste disposal will be publicly controlled.

In its submission to this review, Waste Service NSW has proposed that it adopt a "systems pricing" approach of using higher waste disposal prices to subsidise prices for alternatives to landfill such as garden waste reprocessing and composting. With the introduction of competition, this approach may be inappropriate and unsustainable. In a competitive market, other services could undercut Waste Service NSW's higher disposal charges, leaving it with an ever shrinking revenue base from which to fund its more expensive alternatives. If a "systems pricing" approach is to be applied, it should apply to the industry as a whole. This issue is discussed in Section 7.2.

It is anticipated that the transition to the new industry arrangements may take up to two years. During this period, the Government will establish the regional waste management boards which will assume responsibility for developing and implementing waste reduction plans for particular regions. Even when the industry is open to more competition, it is likely that Waste Service NSW will remain the dominant provider of putrescible waste services in the short term at least.

In the light of the above reforms, this report focuses on developing pricing principles for Waste Service NSW as the dominant, but not monopoly, provider of putrescible waste disposal facilities in Sydney. The pricing principles are equally valid to existing and proposed industry structures. However, the means for applying the principles will differ. Although these principles have been developed primarily with Waste Service NSW in mind, they should also be applicable to other putrescible waste management service providers.
2.6 National Competition Policy Agreement

Another government priority that bears upon pricing and reform of the waste industry is the National Competition Policy, as agreed at the April 1995 Council of Australian Governments. The Competition Principles Agreement which emerged from that meeting states,

"The objective of competitive neutrality is the elimination of resource allocation distortions arising out of public ownership of entities engaged in significant business activities: Government businesses should not enjoy any net competitive advantage simply as a result of their public sector ownership. These principles apply only to the business activities of publicly owned entities, not to the non-business, non-profit activities of these entities." [COAG April 1995, p. 5]

"The principles set out in this agreement will apply to local government, even though local governments are not Parties to this Agreement. Each State and Territory Party is responsible for applying those principles to local government." [COAG April 1995, p. 11]

Although the Agreement allows for exceptions where there are strong public benefit arguments, the Agreement implies that the establishment of competition in the putrescible waste industry is not just a matter of policy, but an obligation.
3 ELEMENTS OF WASTE PRICING

3.1 Pricing principles

The setting of prices, whether by the market or a regulator, is a powerful tool for achieving a range of objectives in society. These objectives include:

- expanding economic activity and raising living standards
- protecting the environment
- fostering a fair, equitable distribution of society's material resources.

For some commodities, such as fruit and vegetables, for which there is a highly competitive market, prices are essentially set by the laws of supply and demand. Other prices, such as the price for police services are set by government and not subject to pressures of supply and demand. Most commodities are subject to a mix of competition and regulation and this mixture changes from time to time.

In the case of Waste Service NSW, prices have been heavily regulated. They are currently set by the Minister for the Environment on advice from Waste Service NSW. If

- no service provider had significant monopoly power to set prices
- all environmental and amenity costs were included
- there were no broader social objectives that could not be achieved to an adequate extent through market processes

it might be argued that leaving price setting to the market would lead to an optimal, efficient outcome. However, this is not true for the current waste industry in NSW.

Given the imperfections of the waste market, the question arises, whether it is possible to regulate prices to achieve a better outcome than would be achieved by the unfettered operation of the market. The Tribunal is of the view that a well functioning market is likely to produce better outcomes than a well intentioned regulator. However, to achieve the broader objectives of Government, a mix of regulatory, tax and subsidy programs may be desirable.

There are a number of possible regulatory and market measures including:

- mandatory waste reduction targets
- bans on specific activities
- minimum performance guidelines
- incorporating external environmental costs into prices through economic instruments such as a levy on waste-to-landfill or "tradable dumping rights"
- encouragement of real competition where possible
- mandatory reporting and benchmark competition
- subsidies for particular activities.

Each of these measures has varying impacts on the operation of the waste market.

A mix of the above may be preferable to relying on any one measure. Where a mix of measures is applied, care must be taken to ensure that the measures are consistent and to avoid duplicating effort or incentives. For example, it would be inconsistent to apply a levy
on waste disposal to internalise the external costs of landfill and then also to apply that levy to alternatives to landfill that did not involve the same external costs. Similarly, it would be a duplication of incentives for Waste Service NSW to recover the full cost of green waste processing from its customers and to provide it with a Government subsidy to support this activity.

The Tribunal considers that the following set of principles should form the basis of Waste Service NSW's pricing policies:

(a) Cost reflectivity
(b) Encouragement of efficiency
(c) Incorporation of external costs
(d) Minimisation of environmental impact
(e) Competitive neutrality
(f) Non discriminatory pricing
(g) Concern for equity
(h) Compatibility with other social objectives.

These principles are discussed below. There may be tension between some of these principles.

Cost reflectivity

The cost of waste disposal to landfill should reflect the full cost of providing this service, including costs. If the price is lower than the cost, the revenue shortfall must be recovered from other sources. This means either that the cost of other goods and services is higher than necessary, or that the community must pay higher taxes to support cheap waste disposal. Furthermore, if the price of landfill is set below cost, landfill will tend to displace waste management alternatives which are less expensive in the long term. Waste minimisation, recycling and reuse will be discouraged, and limited landfill space will be used up too rapidly. This will lead to an economically inefficient outcome as the total cost of managing waste will be higher than necessary. If, on the other hand, the cost of landfill is set higher than the full cost of providing the service, more costly alternatives will displace landfill disposal. This will also raise the overall cost to the community of dealing with waste.

There are at least three cases where it may be economically efficient to levy prices above financial costs in order to reflect economic costs better.

i) It might be argued that alternatives to landfill are less costly than landfill in terms of total resource use but are currently under-utilised, due to non financial considerations (eg lack of information, underdeveloped market, etc.) In such cases, raising landfill charges to discourage landfill in favour of alternatives could lower the overall cost of waste management. (However, the profit should not accrue to Waste Service NSW.) However, higher landfill charges may also encourage other undesirable alternatives, such as illegal disposal. It may be better to subsidise the desired alternative to landfill directly.

ii) Given that Government must somehow raise revenue to pay for its functions, it may be preferable to tax landfill by "pricing in" external costs. This is an example of the general argument for "green" taxes. The revenue from such taxation need not be retained by the waste operators.
iii) Where the future costs of landfill are expected to be higher than the current cost, reflecting the anticipated higher costs in current prices can reduce total costs over time by encouraging alternatives that are more costly than present landfill, but are cheaper than future landfill.

In each of the above examples that this is not so much a case of departing from cost reflectivity as of reflecting more fully the total long term costs.

**Encouragement of efficiency**

Simply setting charges to recover costs may provide little incentive for operators to improve their efficiency. Price setting should also create incentives to improve performance based on reasonable estimates of the scope for efficiency improvements.

Charges should also be set to optimise administrative efficiency. While it may be cost reflective to set a specific price for each type of waste, this would be very costly to administer.

**Incorporation of external costs**

If they are to fully reflect costs, waste management charges should incorporate all the indirect or "external" costs that these activities impose on third parties such as local communities or future generations. These external costs may include:

i) site specific impacts:
- the risk of toxic leachate contaminating ground and surface water
- the risks associated with release of landfill gas including odour and fire
- the loss in value of homes in the vicinity of a new landfill site

ii) non-site specific impacts
- climate change partly caused by the release of greenhouse gases from landfill
- transport corridor impacts including traffic congestion.

Waste Service NSW’s landfill charges have already internalised some previously external costs. Thus, these costs are no longer external costs. For example, in order to provide for post closure care and restoration Waste Service NSW levies a small amount for every tonne of waste disposed. Charges also include the cost of controlling leachate to prevent ground and surface water contamination the cost of and collecting landfill gas for use in generating electricity. The EPA’s new guidelines for landfill operation will require all landfill operations throughout NSW to meet a range of stringent environmental standards. This will reduce the extent of adverse environmental costs and internalise these previously external costs. These guidelines are discussed in Chapter 6.

Some other external costs are not currently included in Waste Service NSW’s charges. For example, the cost of reduced amenity for local communities should be included in the cost of waste services. Noise, traffic congestion and other impacts of a large number of waste trucks passing through a suburb impose significant costs on the local community. The potential costs of climate change due to the emission of greenhouse gases from landfill are not generally explicitly incorporated in waste charges.\(^9\) Although hard to estimate, these

\(^9\) Waste Service NSW currently collects a $1 per tonne fee for landfill at the Belrose and Grange Avenue landfill sites. This money is held in trust to cover the cost of enhanced restoration of the landfill site.
are real costs of landfill and thus, should be incorporated in the charges paid by customers to ensure that cheaper options (e.g., waste avoidance) are used to full advantage.

Although economic, and environmental principles suggest that external costs should be incorporated in waste charges, it is far from clear that Waste Service NSW should retain or disburse such additional funds.

Alternative means of incorporating external costs into waste charges is by means of a specific levy. The EPA currently collects a $7.20 per tonne levy on waste disposal to cover the external environmental and amenity costs. This s.72 (formerly s.29) waste disposal levy raises the perceived charge for waste to incorporate external costs without accumulating unwarranted cash surpluses for Waste Service NSW.

**Minimisation of environmental impact**

Subject to technological and economic feasibility, prices should be set to encourage the minimisation of the adverse environmental impacts of waste management.

**Competitive neutrality**

The charges for waste management services provided by Waste Service NSW or other service providers should not create artificial barriers to competition by another provider. Where a business operates in both competitive and non-competitive markets there may be an incentive to raise prices in the monopoly sector to cross-subsidise its prices in the competitive sector and gain an unfair competitive advantage. There should be no unwarranted cross-subsidies between different activities, such as between landfill operations and transfer stations or say, between putrescible waste disposal and non-putrescible waste disposal.

**Non discriminatory pricing**

The charge for waste management services should depend on the type and amount of waste, not on who is seeking the service. There should be no arbitrary differences in charges between customers seeking the same waste management services.

**Concern for equity**

Equity is always a matter requiring judgement, but should not be ignored for this reason. Equity embraces a range of issues from user pays and polluter pays to the idea that those least able to pay for a service should not be unfairly disadvantaged by having less access to the service. In one view, it implies that parties responsible for creating waste should bear the cost of managing it. This has both geographical and generational dimensions. The present generation should not impose costs of managing its waste on future generations. Nor should the present generation's waste management strategies diminish the net resources available to future generations. Similarly, communities in one geographical area should not be obliged to accept the costs of managing the waste created in another area without fair and adequate compensation. Within the above constraints, the costs of waste management should not fall disproportionately on those with more limited capacity to pay.
Compatibility with other social objectives

Other social objectives need to be considered in determining prices. Government is the appropriate authority for setting such objectives. The above principles should be applied thoughtfully, to ensure that prices are consistent with outcomes reasonably expected by the community. It is possible that waste charges could be set to be consistent with each of the above principles and still not achieve important community objectives. For example, small amounts of toxic household chemicals such as those in solvents and paints are among the worst contaminants of putrescible landfill. Although it might be consistent with the above principles to set a higher charge for accepting these wastes, to do so would encourage individuals to include these in mixed putrescible waste or to dispose of them illegally. Instead, Waste Service NSW has a policy of not charging for small quantities of such waste delivered to a transfer station or to the mobile household chemical collection service.

Application of the above principles may not, in themselves, be sufficient to meet the Government's target of 60% waste-to-landfill reduction by the year 2000. The Government has announced a number of measures to meet this target. These measures involve costs for the Government or the wider community but advance the Government's broad objectives. Transparency regarding both the costs and benefits of such measures is important.

Recommendation 3.2
The following principles should form the basis of Waste Service NSW charges for landfill and transfer station services:

2) cost reflectivity
2) encouragement of efficiency
3) incorporation of external costs
4) minimisation of environmental impact
5) competitive neutrality
6) non discriminatory pricing
7) consideration of equity impacts
8) compatibility with other social objectives.

These principles should apply regardless of the level of competition existing in the industry. Wherever possible, such instruments should encourage, rather than conflict with, competition.

A well functioning market may be expected to operate in accordance with these principles. However, due to the extent of external costs associated with the solid waste industry, the market may need to be complemented by licensing guidelines, tax, social programs or regulatory requirements to address environmental, equity or social concerns.

Applying the above principles requires a number of steps, including:

(i) setting and prioritising waste management objectives
(ii) estimating the costs that need to be covered by prices
(iii) allocating costs to specific activities: transfer stations, haulage, landfill, recycling
(iv) differentiating prices, where appropriate, according to factors such as waste type, location, extent of processing required, etc.
Steps (ii) and (iii) are mainly the domain of Waste Service NSW. Steps (i) and (iv) require management decisions by Waste Service NSW and policy decisions by Government. This chapter has discussed some of the issues that should be considered in the first step of setting objectives. The following chapters examine the subsequent steps.

### 3.2 Cost components

In addition to current costs a number of other costs may need to be incorporated into Waste Service NSW prices. These other costs include:

- incremental replacement costs
- additional environmental and amenity costs
- costs of meeting other social objectives such as reducing waste-to-landfill.

Current costs are considered in Chapter 4. Other costs are considered in Chapters 5, 6 and 7 respectively. The structure of legitimate costs, as discussed in this report, is set out in Figure 3.1

**Figure 3.1  Costs of waste disposal**

<table>
<thead>
<tr>
<th>Economic Costs</th>
<th>Accounting Costs</th>
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<tbody>
<tr>
<td>Additional external environmental costs</td>
<td>Profit and Tax</td>
</tr>
<tr>
<td>Local amenity costs</td>
<td>Interest</td>
</tr>
<tr>
<td>Costs of meeting waste-to-landfill</td>
<td>Accounting Depreciation</td>
</tr>
<tr>
<td>reduction target</td>
<td>Current operating costs (incl. environmental management costs)</td>
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<tr>
<td>Incremental replacement costs</td>
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<td>Return on Capital</td>
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<tr>
<td>Economic Depreciation</td>
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<tr>
<td>Current operating costs (incl.</td>
<td></td>
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<tr>
<td>environmental management costs)</td>
<td></td>
</tr>
</tbody>
</table>

Current prices already capture, at least partly, each of the costs set out in Figure 3.1:

- Current costs of operating landfill are the major component of landfill costs.
- Environmental costs are partly built into landfill costs through the capital and operating costs of environmental control. External environmental costs are at least partly covered by the s.72 waste disposal levy.
- Replacement costs are at least in part captured within landfill costs.
Elements of waste pricing

- Local amenity costs are at least partly covered by the waste disposal levy and by "rehabilitation enhancement" fees at two sites.
- The cost of reducing waste-to-landfill is partly covered by the cost of waste recycling and reprocessing activities at landfill and transfer station facilities and by expenditure on research and development into alternatives to landfill.

The recommended means for recovering each of the cost components mentioned in Figure 3.1 is described below.

**Current landfill costs**

Current landfill costs include:
- operating and maintenance costs including environmental management costs
- depreciation of capital investment in buildings, land etc and depletion of landfill capacity
- return on capital invested.

As illustrated above, these costs should be and currently are, incorporated in Waste Service charges for waste disposal.

There are significant differences in how economic and financial costs are calculated. Current operating costs are essentially equivalent from both perspectives, while economic and accounting depreciation may vary quite significantly.

In its purest sense economic depreciation is the change in value of the existing asset base over time.\(^\text{10}\) This is the net effect of the erosion of service capacity and changes in the market value of the assets. The latter is linked to changes in current costs of modern equivalent assets.

Accounting depreciation is commonly a matching of past capital expenditure with revenue, over the assumed life of the assets. In some cases this can approximate economic depreciation. However, in the case of the Waste Service, accounting standards do not allow inclusion of the lowering of the value of land assets as landfill capacity is used up.

Accounting costs also exclude other costs which are part of economic costs. Direct inclusion of such costs in prices received by operators could result in very strong cash flows and high levels of accounting profit.

**Current landfill costs include the costs of meeting existing environmental standards**

It is likely that Waste Service NSW landfills will be required to comply with more stringent environmental management guidelines in future. Enhanced environmental management is likely to mean higher costs. These higher costs should be reflected in Waste Service NSW landfill charges when they are incurred. (See Section 6.3)

**Replacement cost**

Depleted landfill capacity can be replaced by new landfill capacity or by alternatives to landfill. The cost of replacing landfill capacity used up can be less than or greater than the historical cost of existing capacity. If the replacement cost is greater than the historical cost, the incremental replacement costs could be recovered by the agency responsible for acquiring new capacity. If this agency is deemed to be Waste Service NSW, then costs...

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10 Excluding new investment.
should be recovered through Waste Service NSW landfill charges. If replacement of current capacity is to be left to the market, then market forces may be relied upon to reflect future replacement costs as capacity constraints are approached. If ensuring adequate replacement capacity is acquired is a Government, EPA or Waste Board responsibility, then a levy on all waste disposal may be appropriate. (See Chapter 5)

**Amenity costs**

The presence of a landfill in the neighbourhood is likely to have negative impacts on local amenity, if for no other reason than the presence of a number of rubbish trucks on local roads transporting waste to landfill. If compensation for amenity impacts is subject to regulation, then such costs could be recovered through a levy on waste disposal. In this case, compensation for amenity costs could be directed to the host community or other party bearing the cost, where that party can be identified. (See Section 6.5)

**Costs of waste reduction target**

Mindful of the environmental costs that waste-to-landfill disposal involves, the Government has, on behalf of the community, expressed a desire to reduce the volume of waste-to-landfill. The agency responsible for achieving the waste-to-landfill reduction target should recover these costs. If this is deemed to be Waste Service NSW, then it should recover these costs through its landfill charges. If the agencies responsible for meeting the waste-to-landfill reduction target are the new regional Waste Boards and industry through industry waste reduction plans, these bodies should recover the costs through their respective rates and prices. Alternatively the additional costs could be funded by an explicit levy. (See Chapter 7)

**Additional external environmental costs**

Given that redressing external environmental costs is the primary objective for:
- establishing a target of reducing waste-to-landfill
- raising environmental management standards
- including compensation for loss of amenity
- replacing landfill with higher cost alternatives,
there may be no need to raise waste-to-landfill charges still further, once the cost of these initiatives has been factored into prices through a levy or otherwise. However, if it is judged that the price is still too low to cover all environmental costs, then such additional environmental costs could be included in the price through a further waste disposal levy. If the cost of the above objectives has been recovered, then this levy, if anything remains of it, need not be directed to measures to reduce waste-to-landfill or its external impacts.

Unlike the inclusion of local externality costs or the funding of the costs of meeting the 60% target, this economic externality is not matched by an expenditure requirement. In this case, hypothecation can require arbitrary levels of inappropriate expenditure.
4. COSTS OF CURRENT ACTIVITIES

4.1 Introduction

Waste Service NSW's revenue should be at least sufficient to recover the efficient cost of its legitimate current activities. These costs include: the cost of operating its landfill and transfer station facilities, the present and future cost of environmental management of the sites, the capital cost of establishing these facilities, and the overhead cost of the corporate functions of the organisation.

This chapter provides an analysis of the current cost structure of waste disposal, reviews the efficiency of the operating costs, and discusses the scope of further cost savings. Issues relating to capital costs and asset valuation are also reviewed and discussed.

Additional costs such as incremental replacement costs, costs of meeting more stringent environmental standards and costs of meeting other social objectives are examined and discussed in subsequent chapters.

4.2 Waste disposal costs

The Tribunal has received a number of estimates of landfill operating costs. Pacific Waste Management indicates this may be in the range of $25-$40 per tonne. Costs estimated by Maunsell range between $60-$90 per tonne.

The costs of waste disposal at Waste Service NSW's landfills and transfer stations can be sub-divided into:

- costs of operating the landfills and transfer stations
- repair and maintenance of plant, buildings, roadways and drainage, leachate and odour control, security services, etc
- leasing of land, water rates, council rates and land tax
- provisions for restoration and depreciation of operating assets
- overheads.

4.3 Direct operating costs

In order to contain costs, Waste Service NSW contracts out 90% and 75% respectively of the operating cost of its solid waste and liquid waste system through competitive tendering. The recent trend of Waste Service NSW's waste management operating costs and throughput are shown in Figure 4.1 below.
Figure 4.1 Operating costs of waste disposal

<table>
<thead>
<tr>
<th>Year</th>
<th>Contract expenses</th>
<th>Other non-contract expenses</th>
<th>Transfer to provisions (note1)</th>
<th>Tonnes to landfill</th>
<th>Recycling tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>1400</td>
<td>200</td>
<td>800</td>
<td>1200</td>
<td>1600</td>
</tr>
<tr>
<td>1992</td>
<td>1600</td>
<td>1800</td>
<td>1000</td>
<td>1400</td>
<td>1600</td>
</tr>
<tr>
<td>1993</td>
<td>1800</td>
<td>2000</td>
<td>1200</td>
<td>1600</td>
<td>1800</td>
</tr>
<tr>
<td>1995</td>
<td>2200</td>
<td>2400</td>
<td>1600</td>
<td>2000</td>
<td>2200</td>
</tr>
</tbody>
</table>

Source: Waste Service NSW and Auditor General's annual reports on Waste Service NSW.

Notes:
(1) Provisions for depreciation of plants and equipment, amortisation and restoration of landfill sites.
(2) 1990/91 covers a 15 month accounting period.
(3) The above figures have been adjusted by inflation factors based on the Consumer Price Index, Sydney.

Overall, the cost structure has been relatively stable and consistent for throughput tonnage handled by Waste Service NSW over the period 1991-95. The bulk of solid waste received by Waste Service NSW is disposed of to landfills. A small proportion is recovered for recycling. Contractor expenses are by far the major component of operating costs. The other significant cost component is the provision for the restoration and after-care of landfill sites. Over the past five years a total of $9.5m has been set aside from the operating surplus.

The waste disposal operations of Waste Service NSW are carried out through a network of waste management facilities which comprise five landfills and six transfer stations. An analysis of the unit operating costs of the landfills and transfer stations shows the following components:

Figure 4.2 Waste management centre average current unit costs of operation*)


Notes:
(1) Based on current contract rates.
(2) Based on depreciation provided for the year ended 30 June 1995.

Contract costs exclude haulage costs for recyclable materials\(^1\) and disposal of non-putrescible waste in private landfills. Other direct costs including major repairs and

\(^1\) Reduced by the sale proceeds of the recyclables.
maintenance, environmental sampling and analysis, leachate control and management and supervision costs.

As shown in Figure 4.2, transfer stations have a different cost structure from that for landfill. Unit costs of transfer stations are 83% higher than for landfill. Based on the current contract rates and average throughput levels, the direct unit costs of landfills and transfer stations ranged from $12 to $25 over the past five years (1995/96 prices). The contract unit cost for a transfer station is twice as much as that for landfill. The differentials are mainly attributable to additional haulage costs and slightly higher processing costs for handling recyclable materials. At least part of the higher costs of transfer stations is offset by the lower transport costs for customers who avoid the longer journey to a landfill site.

Other direct costs represent 14% of total direct costs for landfills and 8% for transfer stations. Contract costs represent on average 69% of total direct costs for landfill and 81% for transfer stations.

The unit cost of landfill and transfer stations has risen over the past five years, particularly for landfills. In real terms, landfill and transfer station costs have increased by $4.20 and $1.80 per tonne, compared with costs in 1991/92. Waste Service NSW attributes the increases to costs to: higher environmental compliance costs, development of waste recycling and processing facilities, increasing available capacity, and improving air space usage at existing landfill sites. A reduction in waste quantities received, particularly from commercial and industrial sources also contributes to the increase in unit costs.

Though presently at a very low level recycling and processing costs cannot be quantified in the present contract costs. However, these costs are becoming increasingly significant as the operation of recycling and green waste expands. There seems to be a need to "unbundle" the recycling and other waste disposal alternatives operation from the landfill operation so their respective profitability and return can be identified separately and, more importantly, any cross-subsidies to uneconomical activities can be made transparent.

Figure 4.3 Trend of solid waste unit costs

Source: Derived from Symonds Travers Morgan (STM) report "Efficiency in Operation and Tendering for Landfill and Transfer Station Facilities of the Waste Service NSW (November 1995).

Note:
(1) Unit costs used in compiling the above index are adjusted to 1995/96 prices.
Over the throughput range of facilities operated, economies of scale appear to be substantially more profound for transfer stations than for landfills.

Competition in tendering for contracts to operate landfills and transfer stations has been vigorous in recent times. This process is effective in producing efficient prices for operating its facilities. Competition is maintaining this outcome.

Unit cost reductions up till 1994/95 were attributable mainly to productivity improvements through competitive tendering and contracting. The level of ongoing competition is likely to mean that prices for operating its facilities remain efficient. However, the scope of cost savings may be limited unless innovation in waste processing is encouraged by the competitive tendering and contracting.

In view of the number of variables affecting operating conditions, costs and productivity, it is difficult to compare solid waste disposal costs, nationally and internationally. The following variables may impact on operating costs:

- coverage of operations
- waste stream composition
- economies of scale
- environmental standards
- accounting methods in respect of cost allocation and valuation of landfill sites
- externalities and environmental levies.

Research carried out by STM shows waste disposal costs in Australia range from $8 per tonne to $23 per tonne, excluding the collection and haulage of waste and the opportunity cost of the airspace of the landfill. The current operating costs of Waste Service NSW's facilities fall within this range."

In the UK, the cost of a new landfill site in urban/industrial areas of low cost land and with annual throughput of 200,000 tonnes ranges from $22 per tonne to $25 per tonne. When the cost of land is taken into consideration, waste disposal costs in Australia compare favourably with those of the UK where land available for landfill is much scarcer than in Australia.

It is expected that tighter environmental controls and regulations will increase future landfill operating costs. On the other hand, larger scale, regionally run landfills will tend to reduce overall costs through economies of scale and productivity improvements.

4.4 Overhead expenses

Overhead expenses account for about 16% of Waste Service NSW's operating costs. These marketing, planning, management and administration expenses are allocated to core business activities of Waste Service NSW. In 1994/95, overhead expenses amounted to $9.8m.

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Predominantly, overhead expenses are allocated on the basis of staff time spent on each activity while non-wage expenses are allocated to related activities. In 1994/95 the allocation of overheads to Waste Service NSW's business lines was as follows:

- 50% to landfill depots
- 34% to transfer stations
- 6% to Liquid Waste Plant and the Castlereagh depot
- 4% to consulting activities.

In 1994/95, corporate services' overhead expenses amounted to $9.8m, with the following break down:

<table>
<thead>
<tr>
<th>Table 4.1 Waste Service NSW corporate services expenses (1994/95)</th>
<th>($'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>1,748</td>
</tr>
<tr>
<td>Planning</td>
<td>1,190</td>
</tr>
<tr>
<td>Engineering services</td>
<td>796</td>
</tr>
<tr>
<td>Management &amp; administration</td>
<td>2,446</td>
</tr>
<tr>
<td>Computer, office accommodation and depreciation</td>
<td>1823</td>
</tr>
<tr>
<td>Superannuation, accrued leave and staff development</td>
<td>1807</td>
</tr>
<tr>
<td>Total</td>
<td>9,810</td>
</tr>
</tbody>
</table>

Source: Symonds Travers Morgan report "Efficiency in Operation and Tendering for Landfill and Transfer Station Facilities of the Waste Service NSW (November 1995)

Corporate services accounts for 20% of total Waste Service NSW employees, but contributes 32% of the total overhead expenses of $9.8m. High per employee expenses reflect the higher salary costs of staff categorised as corporate services staff.

If the contractors' operational staff (approximately 140) currently working in Waste Service NSW landfills and transfer stations were taken into account, the ratio of corporate services staff to total staff would be reduced to 11%. This ratio does not appear to be unreasonable and inconsistent with Waste Service NSW's role of providing an integrated waste management service. This implicitly includes waste education and minimisation programs over the past five years.

It is anticipated that staff numbers in the financial services area will reduce over the next three years, as councils become more computer-oriented, thereby reducing clerical liaison with Waste Service NSW and the accounts payable system becomes fully computerised.

4.5 Capital expenditure

Waste Service NSW projects capital expenditure in the order of $120m over the next five years, compared with $76m spent in the past five years (Figure 4.5). Of the forecast capital expenditure, 86% or $103m relates to solid waste.

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16 25 out of a total of 125 employees.
Notably, 33% of capital expenditure is devoted to acquiring a landbank for developing new landfill sites. Another 35% is directed to maximising landfill space in existing landfills, such as Lucas Heights and Eastern Creek.

Only 15% of capital expenditure relates to development of Waste Service NSW's recycling, materials recovery and composting facilities to meet Government's 60% waste diversion target. 60% of the forecast capital expenditure to 2000 will be spent in the next two years.

4.6 Asset valuation and economic rate base

Waste Service NSW has considerable capital invested in landfills and transfer stations, with a written down value of $102m at 30 June 1995. The cumulative provision for depreciation of the operating assets stood at $40.5m. Provision for the replacement of operating assets is currently made on all waste management centre assets except land. The land value of Waste Service NSW's landfill and transfer station assets amounted to $13.65m, representing approximately 33% of the waste management centre assets as shown in Figure 4.6 below.

The current depreciation accounting standard (Australian Accounting Standard 4 (AAS4)) adopts the cost allocation approach to measuring depreciation. Thus, land cost is not systematically depreciated and charged against revenue in each accounting period expected.
to benefit from its use. However, land is not regarded by the standard as a "depreciable asset" in view of the fact that land normally has an indefinitely useful life".

Consequently, the depreciation charge allowed by Waste Service NSW for its landfill assets is insufficient to cover the cost of replacing the service potential of those assets at the end of their economic lives. The low depreciation charge has effectively overstated the operating profit of the landfill operations and the surplus available for distributions. To a certain extent, landfill cost is also distorted when evaluating investments in recycling and other disposal alternatives.

There is a further issue concerning whether the landfill sites as a whole should be depreciated or whether their component parts should be depreciated separately.

The Treasury is of the view that for charging purposes the capital cost of landfill space should be amortised over the life of any landfill. It could then be regarded as an exhaustible resource for the purposes of establishing pricing principles."

If landfill space were regarded as an exhaustible resource as defined by the current accounting standards, "depletion" would need to be accounted for according to the estimated exhaustion of the landfill space, in a fashion similar to mines, oil wells, quarries and similar assets of a wasting nature. "Depletion" relates to the "charge against revenues of the net cost of natural resources"."

In view of the uniqueness of Waste Service NSW's business and the nature of its operating assets, it may be necessary to adopt a more realistic approach when amortising the landfill assets.

Treasury is also of the view that the economic rate base method as contained in the concept paper, "Infrastructure Asset Valuation for Purposes of Price Regulation" (May 1995) could be applied to the pricing of Waste Service NSW's landfill operations.20 In determining the value for Waste Service NSW's rate base, landfill space could be treated as if it were an exhaustible resource, in order to give recognition to the wasting nature of landfill assets. Depletion could be provided on the individual landfill sites annually, according to the rate of space being filled in the accounting period.

The economic rate base used for regulatory and pricing purposes may be different from the assets value used for statutory financial reporting purposes. For example, the UK utility companies adopt historical cost accounting for statutory financial reporting purposes. However, the capital base for regulatory and pricing purposes is developed on a different valuation and accounting basis." Similarly, Treasury could adopt a different basis for establishing the rate base used by Waste Service NSW for measuring returns on capital and pricing purposes.

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17 Depreciation of Non-current Assets, Australian Accounting Research Foundation, Discussion paper No 20, 1994 (page 81).


19 As above (page 82).

20 As above.

21 The accounting policies used in regulatory accounts by British Gas are based on current cost accounting. OFWAT developed a "Regulatory Capital Value" by reference to the market valuation.
Waste Service NSW has provided for substantial investment in land/space over the next five years. Waste Service NSW stresses that waste disposal is its core business and the most lucrative. Planned investments in a landbank "are essential for developing additional landfill capacity so that Waste Service NSW can maintain its present market position in Sydney and extend its services outside the Sydney metropolitan area.

The Tribunal considers that landbank yet to be acquired by Waste Service NSW for the future development of landfill sites should not be included in the capital base for the purpose of determining the rate of return for Waste Service NSW. This is because it is not yet producing any income. If the landbank investments are included in the capital base Waste Service NSWs present customers effectively pay for future assets which are not used in providing the service. It would seem unreasonable to expect a return on assets which are not yet in service. Likewise, assets which are surplus to requirements and uneconomic investments should be excluded from the rate base.

Unlike some of the Government owned utilities (eg water) whose assets can be regarded as having infinite lives, the estimated useful lives of Waste Service NSW's landfill assets average ten to fifteen years based on the current usage rate. In view of the comparatively short-lived assets of Waste Service NSW, the differential between historical cost and current replacement cost may be less significant. However, the Tribunal considers that the capital base needs to be adjusted if there are any major changes in the construction costs for landfill facilities or in general price levels.

In line with private sector practices, Waste Service NSW reviews the carrying amounts of all non-current assets at least annually to determine whether they exceed their recoverable amount. At the close of the 1994/95 financial year, an independent review was undertaken of Waste Service NSW's operating assets. As a result, land was revalued downward by $4.74m. This effectively brought Waste Service NSW's operating assets closer to their current replacement cost.

4.7 Conclusions

The competitive tendering and contracting being undertaken by Waste Service NSW producing efficient prices for operating its facilities. The level of ongoing competition is maintaining this outcome. Given the fact that Waste Service NSW contracts out 86% and 91% of the operating costs of landfills and transfer stations to the private sector, scope for further cost savings in the operation of its facilities can be achieved only by way of technological improvements and improved capital efficiency.

The current landfill costs of Waste Service NSW compare favourably with the national average and with those of the UK when the cost of land is taken into account.

The level of overhead expenses appears reasonable in the light of Waste Service NSW's corporate objective of providing an integrated waste management service. There is no noticeable duplication of functions or activities within the organisation.

As the recycling and green waste operations assume increasing significance, accounting separation of these from the landfill operation appears to be highly desirable. This will enable the respective profitability and return of these different operations to be identified separately. Any cross-subsidies to the non-commercial component of such activities will be transparent.
The recent valuation by Waste Service NSW of its major operating assets provides a reasonable basis for determining the rate base for pricing and measuring returns on capital. In establishing the economic rate base for Waste Service NSW recognition needs to be given to the "wasting" nature of the landfill assets. Valuation methodologies different from those employed for statutory financial reporting purposes may be used to develop an economic rate base which reflects its true economic value. In this regard landfill space can be treated as an exhaustible resource and its capital cost amortised over the economic life of the individual landfill sites. This will ensure that the consumption of the service potential of its operating assets is matched against the revenue.

However, the Tribunal considers that the landbank acquired by Waste Service NSW for future development of landfill sites, but not yet in service, should be excluded from the rate base.

**Recommendation 4.1**

*The economic rate base used for regulatory and pricing purposes should allow for the amortisation of the full capital cost of landfill space (including land value) over the life of the landfill sites.*

**Recommendation 4.2**

*Landbank acquired by Waste Service NSW for the future development of landfills, but not in service, should be excluded from the rate base used to determine the required rate of return.*

**Recommendation 4.3**

*Waste Service NSW's current real revenue is adequate to cover its current activities and should not be increased for this purpose.*
5 REPLACEMENT COSTS

5.1 Introduction

Several submissions mention the cost of replacing landfill capacity as an issue that needs to be considered in setting Waste Service NSW charges. It has been suggested that Waste Service NSW charges are insufficient to cover the costs of replacing the landfill space used up. For example, the former Government's 1992 Waste Management Green Paper states, "Travers Morgan, a consultant employed by the Government to review the economics of the waste industry estimated that the Waste Service may be charging Councils as much as $20-$30 less than the full replacement cost." [Hartcher, p. 71] However, since the Travers Morgan study was completed in February 1992, the price (including the waste disposal levy) for waste disposal for Councils has risen by over $16 per tonne."

If waste disposal charges do not fully reflect the replacement cost of landfill capacity, questions of intergenerational equity arise, as future users will have to pay more for waste disposal. It is inefficient if there are options for dealing with waste that are more expensive than the current cost, but cheaper than the replacement cost. Such options would be foregone if the price reflected the current cost until the existing capacity was exhausted. Charging on a replacement cost basis ensures that all cost effective alternatives are exploited before the next facility is required.

The replacement cost of landfill may be higher than current cost for a number of possible reasons:

- higher cost of land
- higher cost of waste haulage
- higher cost of operations (e.g. to meet more stringent environmental standards)
- higher costs of gaining approval
- requirement to replace landfill with more costly alternatives

There is no apparent reason why the other direct costs of landfill should be significantly greater than the current costs of a modern engineered landfill operated by Waste Service NSW, such as at Lucas Heights. These other direct costs include:

(a) capital costs (buildings, machinery, site preparation, and final restoration)
(b) operating costs (fuel and maintenance, administration, financing charges), and
(c) corporate overheads (head office functions, research and development, planning and management).

Recovering the capital cost of landfill sites may be based on either historical cost or replacement cost. The historical cost approach recovers the actual cost of the existing assets over the life of the existing facility. The replacement cost approach builds up sufficient funds to purchase the next facility during the life of the existing site.

Whether the replacement cost is higher than the current prices and, if so, how much higher are empirical questions that depend on the physical and practical availability of landfill space or of alternatives to landfill, and the cost of these alternatives.

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22 Council landfill charge as of 10 January 1992 was $15.94 per tonne (including s.29 levy of $2.80 per tonne). Council landfill charges for 1995/96 are $32.40 per tonne (s.29 levy $7.20 per tonne).
5.2 Higher cost of land

The cost of land itself accounts for less than $2 per tonne (see Box 1) of landfill costs. This is less than 10% of total landfill costs, and less than 5% of the average charge per tonne of waste disposal (including operation of landfill and transfer stations and haulage costs).

There are two reasons why the cost of land for new landfill capacity may be higher than the current price. These are:

1. because accounting practice does not allow the costs of the land to be depreciated as the landfill capacity is exhausted
2. because suitable low cost land is scarcer now than it was when existing sites were established.

The value of land for a landfill site is determined by from the volume of waste which can be placed on the land. As this capacity is used up, the value of the site for landfill falls. With other assets, reduction in future capacity is recognised through the inclusion of depreciation in accounting costs. However, accounting standards do not allow for depreciation of a site as it is filled. This may reflect a view that for other uses, land values usually appreciate rather than depreciate over time. Such a view results in an understatement of the annual costs of a landfill site.

In practice, Waste Service NSW has not recovered the cost of land depreciation. However, it has earned a rate of return on the asset value of the land. To the extent that Waste Service NSW pays for building up its landbank out of current charges, the replacement cost of land is included in current charges so the issue of land depreciation does not arise. A significant fraction of Waste Service NSW's landfill sites (Grange Avenue and part of Lucas Heights) are leased rather than owned. The cost of these leases is included in current charges and, provided the lease is at market rates, therefore reflects the land replacement cost. The Tribunal has not aware of any evidence to suggest why the lease cost of this land would be below a market rate, or why future leases at other sites should be expected to be significantly higher than these current lease costs.

Low cost options for new landfill capacity in the Sydney region include:

- expanding capacity at existing putrescible landfills
- accepting putrescible waste at suitable landfills that currently accept only non-putrescible waste
- developing a new site in a disused quarry, subject to environmental suitability.

(eg one submission identified a quarry in Sydney that is scheduled to close in the next few years. This quarry will then have 11 million cubic metres of air space, roughly equivalent to the total current remaining putrescible capacity in Sydney. This quarry will have few other possible alternative uses.)

23 There are several other possible sites in the Sydney metropolitan area. Such quarries have very limited alternative uses and the land value is therefore relatively low.
Another component that needs to be considered in the cost of acquiring land for landfill is the cost of gaining approval for developing the land as a landfill site, including the costs of environmental assessment and community consultation. It is understood that a recent (unsuccessful) attempt to gain approval for development of a major putresable landfill in Sydney cost in the order of $2 million. Including this in the cost of land acquisition would have raised the unit cost of landfill capacity by about $0.20 per tonne.

**5.3 Higher cost of transport**

Waste haulage from transfer stations to landfill costs about $6 per tonne. This accounts for about 14% of average waste charges. This cost is liable to increase for replacement landfill if new sites are established further from the source of the waste.

Drawing on previous studies, Symonds Travers Morgan has estimated the cost of transporting waste at about 12 - 14 cents per net tonne kilometre [Symonds Travers Morgan, study, p. 21]. For a 48 km return journey from Rockdale transfer station to Lucas Heights landfill, this would be $5.76 to $6.72 per tonne. If a replacement site was established in Sydney’s south-west, this could entail an additional 30-40 km of haulage, involving a further $3.60 to $5.60 per tonne of waste from this particular transfer station. On the other hand, a new landfill site in the north-west of Sydney could lead to a reduction...
in the average haulage distance from transfer stations, since most waste from Sydney's northern suburbs is currently transported to Lucas Heights on the southern fringe of Sydney. For long haul out of the Sydney region, the transport cost could be $40 per tonne or more, depending on how far away the disposal site was. However, current Government policy opposes the transfer of Sydney's waste outside the Sydney region.

It is not yet clear whether replacement of existing landfill capacity will involve additional transport costs. As it takes several years to develop a new landfill site, incorporating any incremental transport cost into Waste Service NSW charges can be deferred until the new site is chosen and any increase in transport costs is identified.

5.4 Higher cost of operation

The cost of operating a landfill site depends on its geology and other site specific factors. There is no reason to expect that these factors will necessarily involve higher costs for new landfill operating to the same standards as current landfill facilities.

Productivity improvements through technological and other change, driven partly by competition, have tended to lower the cost of landfill operation over time. On the other hand, the imposition of more stringent environmental standards raises operating costs. Analysis undertaken by Waste Service NSW of its own system wide unit costs from 1982/83 to 1995/96 show that the real cost fell by almost 50% between 1982/83 and 1990/91, but then increased again to 83% of the 1982/83 level by 1995/96. Waste Service NSW attributes this recent upward trend to costs associated with:

- increasing available capacity to improve usage at existing landfill sites
- meeting higher environmental compliance costs
- developing waste recycling and processing facilities.

Higher environmental compliance costs reflect higher environmental standards for landfill operation. The development of waste recycling and processing facilities reflects both environmental obligations and the Government's objective of reducing waste-to-landfill. Both these drivers may significantly raise future replacement costs, but are also likely to raise current costs by a comparable amount. They could be considered as an incremental replacement cost only if they did not apply to existing landfill. If guidelines are introduced which apply to new but not to existing landfills, there may be reason to incorporate the higher replacement cost at that time. The cost impact of higher environmental standards is discussed further in Chapter 6. The cost impact of the Government's 60% waste-to-landfill reduction target is discussed in Chapter 7.

To date, Waste Service NSW has set its prices according to historical cost rather than replacement cost. However, if the cost of the replacement capacity is the same as the historical cost of the existing capacity, the charges levied will be the same under both approaches. As it may be expected that cheaper options will be used first, a replacement cost approach would tend to lead to higher current charges. Offsetting this tendency, technological improvement, exploitation of economies of scale, and other improvements in productivity will tend to lower replacement cost relative to historical cost.

The Tribunal considers that a replacement cost approach to pricing is more appropriate than a historical cost approach. Given the above considerations, the cost of disposing of
putrescible waste to future landfill sites in the Sydney region (provided such sites are approved) is unlikely to be significantly higher than the current cost of landfill disposal.

5.5 Cost of replacing landfill capacity with alternatives

The cost of replacing landfill capacity depends on which options are available for replacing landfill. This, in turn, depends on community and government judgements about the acceptability of different forms and locations of waste management. The above discussion has considered only the cost of replacing depleted landfill capacity with new landfill capacity. There are, of course other options to replacing landfill capacity.

The Government's waste-to-landfill reduction target may mean that other more expensive options must replace landfill disposal. Replacement costs for alternative options may vary from the current (historical) cost of landfill (about $20-$25 per tonne) for further waste minimisation and recycling, to $70-$80 per tonne for composting and other advanced technologies. Even waste avoidance, which is probably the cheapest alternative, entails the costs of public information and education campaigns to encourage it.

There appears to be significant potential for less environmentally damaging and, in some cases, more cost effective means of dealing with waste. Table 5.2 shows indicative costs of various waste management alternatives to landfill disposal. The broad range of estimates reflects the poor state of knowledge in this area. Green waste reprocessing is a case in point. The Tribunal has received a wide range of estimates of the cost of processing green waste, from $18 to $200 per tonne. Only by developing these alternatives will their efficient costs be established.

Some alternatives to landfill are briefly discussed below.

**Landfill bioreactor**

Waste Service NSW is conducting research into operating landfills as "bioreactors". The bioreactor recirculates leachate through the landfill waste to optimise the conditions for "garbage-eating bacteria" speeding up the decomposition of waste. This process greatly accelerates the biodegradation process, breaking organic waste down into mainly methane, carbon dioxide, and water. The process has cost and environmental advantages of

- speeding up the stabilisation of landfill
- conserving landfill capacity
- allowing quicker recovery of methane for electricity generation.

Waste Service NSW is considering the bioreactor as an important element in its plans to reduce waste-to-landfill in line with the Government's target. There may be debate regarding whether the bioreactor is a legitimate "alternative" to landfill. Although the bioreactor is essentially a landfill, the amount of landfill space consumed by a tonne of waste in a bioreactor shrinks more quickly and is therefore less than the space consumed by a tonne of waste to a conventional landfill. If conserving landfill space and avoiding the need to acquire more landfill space is the objective of the 60% reduction target, the bioreactor serves this purpose. If the objective of the target is to divert waste from landfill to be reused, or recycled and substitute for virgin resources, then the bioreactor is probably not a legitimate alternative to landfill. It is up to the Government to clarify the objective.
behind the 60% reduction target and to determine whether the bioreactor is a legitimate alternative.

Table 5.2 Cost of waste management alternatives to landfill disposal

<table>
<thead>
<tr>
<th>Processing Technology</th>
<th>Cost ($/tonne)</th>
<th>Source (submission to Tribunal unless otherwise stated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerbside Recycling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Net average cost (incl. collection)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melbourne</td>
<td>$55.95</td>
<td>ALC</td>
</tr>
<tr>
<td>Sydney</td>
<td>$60.90</td>
<td></td>
</tr>
<tr>
<td>Adelaide</td>
<td>$78.06</td>
<td></td>
</tr>
<tr>
<td>Perth</td>
<td>$100.84</td>
<td></td>
</tr>
<tr>
<td>• Collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sydney</td>
<td>up to $250</td>
<td>LGRC (cited in LRRA submission)</td>
</tr>
<tr>
<td>Rural areas</td>
<td>$79 – $117</td>
<td>LRRA</td>
</tr>
<tr>
<td>Green Waste Processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Composting</td>
<td>$40</td>
<td>Waste Service NSW</td>
</tr>
<tr>
<td></td>
<td>≥$30</td>
<td>Maunsell</td>
</tr>
<tr>
<td>Composting and transport</td>
<td>$30-$40$^8</td>
<td>Hornsby Council</td>
</tr>
<tr>
<td>Chipping and transport</td>
<td>$74.90$</td>
<td>Ryde City Council</td>
</tr>
<tr>
<td>Bioremediation</td>
<td>$18</td>
<td>EARTH</td>
</tr>
<tr>
<td>Collection</td>
<td>$23$</td>
<td>EARTH</td>
</tr>
<tr>
<td>Direct delivery</td>
<td>$174$</td>
<td>EPA</td>
</tr>
<tr>
<td>Intermediate depot</td>
<td>$161</td>
<td></td>
</tr>
<tr>
<td>Food Waste Processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Enclosed composting</td>
<td>$60</td>
<td>Waste Service NSW</td>
</tr>
<tr>
<td>• Composting and transport</td>
<td>$120</td>
<td>Ryde City Council</td>
</tr>
<tr>
<td>• Bio-conversion</td>
<td>$15-20</td>
<td>ECOS</td>
</tr>
<tr>
<td>Mixed Waste Processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Incineration</td>
<td>$200 - $600$^4</td>
<td>GHD Pty Ltd</td>
</tr>
<tr>
<td>Western Europe</td>
<td>$80$</td>
<td>WWPP (public hearing)</td>
</tr>
<tr>
<td></td>
<td>$30-165</td>
<td>ALC submission</td>
</tr>
<tr>
<td>• Refuse derived fuel (RDF)</td>
<td>$70</td>
<td>Waste Service NSW</td>
</tr>
<tr>
<td></td>
<td>$50-60$</td>
<td>EPA</td>
</tr>
<tr>
<td></td>
<td>$90-100</td>
<td>Maunsell</td>
</tr>
<tr>
<td>• Composting</td>
<td>$20 - $25$^7</td>
<td>Universal Greening</td>
</tr>
<tr>
<td>• Neutralysis</td>
<td>$70</td>
<td>Waste Service NSW</td>
</tr>
<tr>
<td></td>
<td>$90-100</td>
<td>Maunsell</td>
</tr>
</tbody>
</table>

1 Based on $40 processing cost.
2 Sale of end products is reported to fully recover this cost.
3 Excluding provision of bins, $150 and $137, respectively.
4 Meeting German emission standards.
5 After upgrading Waverley Woodlaha Process Plant (WWPP) facility.
6 Methane produced from RDF production could return about $15 per tonne of waste.
7 Excluding lease costs of land.
8 Net cost to resident.

Waste avoidance

Significant progress has been made towards waste avoidance. Further advances depend on people consuming less or changing their consumption patterns in preference of products.
that generate less waste. Better price signals are important to encouraging greater waste avoidance. There is some scope for reducing waste from packaging, but in general, avoiding waste generation will only be achieved only by reducing consumption. Meanwhile, diverting small volume toxic materials, such as household chemicals and batteries could have a major impact on reducing the harmful effects of landfill.

**Recycling programs**

The kerbside recycling scheme was credited with 15.5% of the total reduction in total domestic waste disposal in Sydney in 1994 [EPA, 1995, p. 238]. Although kerbside recycling avoids the disposal cost for the diverted recyclables of the waste stream (paper, PET, aluminium, and glass) the savings are not sufficient to cover the additional cost of a separate collection. The average cost of a recycling service for a tonne of material is estimated at $253 and the (1994) cost recovery ratio on a tonne of recyclable products is estimated to average 57% (ie 24% - 109% for individual products). To provide an incentive for councils to participate in recycling programs, the Council Recycling Rebate (CRR) Scheme, which provided a subsidy of $20 per tonne of collected recyclable, was introduced. A number of submissions suggest that most existing recycling collection services are just at break even and without the rebate, the recycling scheme would not be viable. This scheme lapsed at the end of 1995, but has been supplanted by the Waste Planning and Management Fund. Other evidence suggests that the viability of recycling programs varies widely depending on the material in question. For example, aluminium and glass and probably paper are likely to be cost effective without a subsidy, but other materials such as steel cans and many plastics may be uneconomic even with a subsidy.

**Green waste processing and composting**

As shown in figure 2.4, green waste (wood and garden waste) and food waste each comprise over 20% of waste received at Waste Service NSW landfills. Green waste has been identified as a major means of reducing the amount of waste disposed to landfill. Waste Service NSW processed 30,000 tonnes of green waste in 1994/95. This processing essentially involves chipping the waste and then on selling to other companies for composting and use in potting mix. Waste Service NSW plans to increase this recycling to 150,000 by the year 2000. The scope for expanding green waste processing depends heavily on the development of markets. Market development in turn depends on improved quality control. The EPA released its green waste strategy for NSW in March. Standards Australia is developing an industry standard for green waste.

The costs for green waste processing are shown in Table 5.2. Waste Service NSW estimates that the current cost for its green waste operations will fall below $40 per tonne as volumes increase. This is comparable to the current cost of waste disposal through a transfer station.

The Local Government and Shires Associations (LGSA) states that "... $40 per tonne for green waste processing is considered to be accurate, but it does not include the cost of collection, which may be in the vicinity of $100 per tonne" [LGSA submission, p. 16].

By contrast, Hornsby Council has suggested a much lower cost. "Further, the estimates to date indicate that the cost per tonne would not exceed $30-$40 per tonne to the resident [including collection]." [Letter to the Tribunal, 15 December 1995]

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Incineration

The most frequently suggested alternative form of disposal within the Sydney region is incineration. Modern incineration technology can provide thorough, well controlled combustion at high temperatures. It reduces the waste volume by approximately 90% and generates substantial energy (heat, power). Although, incineration has the potential to reduce targeted waste-to-landfill, public concerns about the environmental and health effects of some components of its gas emissions (e.g. heavy metals, organochlorines) mean that the establishment of new incineration facilities is likely to face at least as much community and political opposition as landfill. State of the art pollution control devices that can reduce gas emissions and meet environmental standards are expensive to install and would increase the cost of incineration making it about twice as expensive as landfill on current charges.

Refuse derived fuel

Refuse derived fuel (RDF) involves the processing of waste into pellets, 'fluffs', or briquettes with increased calorific value and greater bulk density form for transport. RDFs are suitable fuel substitutes mainly for the cement, metal and paper manufacturing industries. This method has been adopted widely.

Neutralysis

Neutralysis involves recovering energy from waste and producing a light weight aggregate from noncombustible waste residues. Ryde Council argues that this option should not be considered until a proven track record is available. It suggests "there are no long term facilities currently servicing municipal solid waste steam in operation anywhere in the world". [Ryde Council Submission, p.2]

5.6 Landfill depletion and scarcity value

If the replacement cost of landfill is found to be higher than the cost of existing capacity, it does not automatically follow that the full incremental replacement cost should be incorporated into current charges. The present value of a given incremental replacement cost will depend on how soon the cost for the replacement will be incurred. For example, if the cost of replacement of landfill was determined to be $50 per tonne higher than the current cost, but there was sufficient existing capacity to last 20 years may not be appropriate to raise the cost of landfill by $50 per tonne today. If instead the cost of waste disposal was raised by $13 per tonne and this additional $13 was invested at a real interest rate of 7%, in 20 years this investment would be worth $50. On the other hand, if replacement capacity is required in five years, a full $35 will need to be added to current charges to provide for the $50 incremental replacement cost in five years' time. The present value of the additional replacement cost can therefore be regarded as the "scarcity value".

This scarcity value depends on three factors:
(i) the incremental replacement cost of landfill capacity
(ii) how soon this replacement cost will be incurred
(iii) the discount rate.
Table 5.3 Estimates of landfill scarcity costs

<table>
<thead>
<tr>
<th>Source</th>
<th>Cost ($/tonne)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA (Travers Morgan)</td>
<td>6.24</td>
</tr>
<tr>
<td>NSW Treasury</td>
<td>13 - 18</td>
</tr>
<tr>
<td>Maunsel</td>
<td>5.50 - 19</td>
</tr>
</tbody>
</table>

1 Resource rent calculated assuming $70 per tonne alternative processing technologies, increasing to $32-33 by 2005 to reflect increasing scarcity. Landfill capacity assumed to be exhausted by 2006.
2 The lower and higher values are based on 17 and 7 years' remaining landfill capacity, respectively.

NSW Treasury has suggested that a royalty reflecting the scarcity of landfill space should be levied on the cost of landfill. Treasury has suggested that $13 to $33 per tonne may be appropriate in addition to a long run average cost of landfill of $35 per tonne. These figures are based on an assumed price of alternative waste disposal of $70 per tonne. The above estimates of both the long run average cost of landfill and the cost of alternative technologies are high compared to estimates from Waste Service NSW.

Since the acceptability of waste management options depends on perceptions of their social and environmental impact, replacement costs might be reduced by:

(a) reducing the adverse impacts of landfill disposal, by for example, excluding toxic substances from entering landfills and reducing the proportion of organic matter directed to landfill and installing effective leachate controls

(b) raising public awareness of the real costs and impacts of different forms of disposal. Reducing the negative impacts of landfill may be the cheapest means of lowering the overall cost of landfill and waste disposal.

Waste Service NSW has about 14.5 million cubic metres of available landfill space (enough for about 14.5 million tonnes of waste). Waste Service NSW currently accepts about 1.6 million tonnes of solid waste per annum. To meet the Government's 60% waste-to-landfill reduction target, this would have to fall to 1 million tonnes of waste by the year 2000. Waste Service NSW states in its submission:

"Based on the current rate of waste input, and no change to currently approved design levels or the air space usage factor, Waste Service landfills have a remaining life of about nine years. On the assumption that waste input will fall in line with the Government's waste reduction target, and Waste Service retains its current market share, remaining life would be extended to about 13 years. Improvement in air space usage factor or increases in air space would further increase this life. Conversely, increasing rates of waste input would shorten life." [Waste Service NSW submission, p.28]

On this basis, new landfill capacity may be needed between 2005 and 2009. However, under the new industry structure, such capacity may not have to be provided by Waste Service NSW.

The higher the discount rate, the lower the current value that will be attributed now to the cost of replacing landfill capacity in the future, and the lower the current scarcity value will be. Discount rates are typically set by reference to the risk free market interest rates, and are usually cited in the range of 6-10%. For example, NSW Treasury calculated its estimates of the scarcity value on the basis of real discount rates of 7% and 10% [NSW Treasury, p.11]. However, there is also an argument that these discount rates that might be appropriate for
individuals and companies in financial markets, are too low for society as a whole which is likely to adopt a more long term perspective. The EPA endorses such an approach stating,

"Overseas studies have suggested discount rates of 15\text{ to }1.9\% \text{ (OECD 1994). The EPA therefore supports the use of a real discount rate of 2\% for evaluating the replacement cost of the landfill void.} \text{ [EPA submission, p. 10]}\)

EPA has cited a replacement cost of $6 \text{ - } $24 per tonne \text{ [EPA submission p. 6].} \text{ The lower figure is based on a haulage cost of 30 cents per tonne kilometre and an "optimistic" scenario of an assumed life of existing capacity of six years. These assumptions are pessimistic relative to the figures cited above.}\)

If it were not for the difficulties in gaining development approval and constraints arising from community concerns over impacts, the direct cost of establishing new putrescible landfill capacity in the Sydney metropolitan area would be relatively low and may be lower than the cost of existing capacity.

\textit{Recommendation 5.1}\n
\textit{The prices paid by customers of landfill should reflect the replacement cost of the landfill space consumed. However, the cost of disposing of putrescible waste to future landfill sites in the Sydney region (provided such sites are approved) is unlikely to be significantly higher than the current cost of landfill disposal.}\n
\textit{Recommendation 5.2}\n
\textit{Where replacement cost reflects Government policy to reduce waste-to-landfill, the cost should be borne by the agency responsible for meeting the target, or be recovered by means of a levy on waste to landfill rather than accrue as additional revenue to Waste Service NSW.}\n
\textit{Recommendation 5.3}\n
\textit{The obligations of Waste Service NSW to acquire landfill capacity in the context of a more competitive market structure should be clarified.}
6 ENVIRONMENTAL COSTS

6.1 Introduction

Landfills can have a range of negative environmental impacts. These impacts can be either on the site of the landfill or off site. The EPA has identified the environmental issues of primary concern relating to landfill as:

(i) leachate and sediment contamination of ground and surface water.
(ii) emission to the atmosphere of landfill gas which can be odorous, toxic, flammable and contributing to the greenhouse effect.
(iii) land management and conservation to ensure that minimal land is required for or degraded by landfilling and that the land is restored for optimal alternative use after landfilling is completed.
(iv) minimising the potential hazards and adverse amenity impacts of fire, birds, dust, odour, pests, weeds, vermin, noise and litter. [Environment Protection Authority, June 1995, Revised Draft Environmental Management Guidelines for Solid Waste Landfills, p. 7-91.

Even where landfill operations fully comply with current guidelines, some environmental costs and risks of adverse environmental impact remain and should be taken into account.

It is often difficult to attribute an accurate monetary value to external environmental impacts (e.g. greenhouse gas emission). There is still much work to be done to develop techniques for more realistic environmental accounting. Although difficult to quantify these environmental costs are nevertheless real. Table 6.1 provides estimates of the environmental costs of landfill disposal:

<table>
<thead>
<tr>
<th>Source</th>
<th>Components</th>
<th>Cost ($million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maunsell</td>
<td>Contingencies</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td>Road haulage</td>
<td>0.40 - 0.60</td>
</tr>
<tr>
<td></td>
<td>Local amenities</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6.50</td>
</tr>
<tr>
<td>EPA</td>
<td>Health</td>
<td>0.07 - 4.60</td>
</tr>
<tr>
<td></td>
<td>Amenity</td>
<td>3.70 - 5.00</td>
</tr>
<tr>
<td></td>
<td>Transport</td>
<td>2.30 - 2.90</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6.10 - 12.50</td>
</tr>
<tr>
<td>ALC</td>
<td>Meeting new landfill standards</td>
<td>&gt; 5.00</td>
</tr>
</tbody>
</table>

1. Long term liability for water and soil contamination, excluding costs of impacts of greenhouse gas emissions from landfill.
2. Traffic congestion and maintenance costs. These are calculated based on 0.20 per truck kilometre and a return trip for a truck travelling a typical journey from Eastern Suburbs to a landfill.
3. Compensation to local communities for loss of amenity due to noise, visual effects, odours, and litter resulting from landfill operations.
4. Excludes scarcity cost. Estimates include deaths and medical costs avoided through leachate and gas control programs and amenity benefits (using hedonic pricing and willingness to pay estimates).
5. Traffic noise, emission, accidents and congestion costs.
6. Expected increase in cost to rural landfills to meet higher environmental standards.
7. These costs are based on a hypothetical "base Case which assumes that existing operators have not adopted any of the practices proposed in the [EPA] guidelines. [Travers Morgan, 1995, p. 11]. This assumption will overstate both the benefits and the compliance costs of adopting the proposed practices.
Some of the components of these external environmental costs are discussed below.

**Long term impacts on groundwater and soil**

The possibility of system failure is ever-present. System failure could result in leachate contamination of groundwater and surface water. According to the EPA, "Leachate is generally saline, high in ammonia and nutrients (phosphates, nitrates and sulphates), contains elevated levels of heavy metals (such as copper, zinc and cadmium) and organic compounds (such as phenols, polychlorinated biphenyls (PCB) and possibly pesticide residues." \[EPA Submission, p. 41\] Ammonia is toxic to fish. In combination with other nutrient constituents, it can result to excessive algal growth. Heavy metals and non-volatile organic compounds (eg PCBs) can persist in soil and water for up to 30 years, depending on the physical and biological conditions of the soil and/or water system. Therefore, there is a potential liability of future remediation works. Some existing landfills incorporate these liabilities into their contingency costs. The exact amount to cover such contingencies depends on the level of controls implemented in the landfill. While landfills of lower standard should set aside a higher contingency cost, landfills with more stringent controls require less.

**Impacts of landfill gas emissions**

Landfill gas is a volatile mixture dominated by carbon dioxide and methane, but also including significant proportions of hydrogen, nitrogen and oxygen from early breakdown phases. It also contains a number of trace gas components, which can be toxic or carcinogenic if present in heavy concentrations. Examples of major trace components are: vinyl chloride and benzene, toluene and hydrogen sulphide.

According to EPA, "The main environmental hazards from landfill gas relate to its flammability, its ability to form explosive mixtures with air, and its toxic and asphyxiant properties". \[EPA Submission, p. 4\]

Landfill gas represents a significant contributor to greenhouse gas emissions. Landfill has been identified as a major generator of methane, contributing between 7% and 20% of the global sources \[Maunsell submission, p. 23\].

**Transport corridor and local amenity impacts**

Waste collection, haulage and disposal impose significant external costs on the community. Noise pollution, increased congestion and increased traffic accidents on vehicle haul routes or near transfer stations and landfills, are amongst the corridor impacts. EPA also notes the broader impact due to vehicle emissions of noxious and greenhouse gases. Moreover, oil and other liquids leaking on to roads adds to water pollution through urban run-off.

Other potential hazards and amenity impacts from landfills include fire, birds, noise, dust, odour, pests, vermin and litter.

**Recommendation 6.1**

Landfill prices should incorporate the full environmental costs. Where such costs are not presently matched by the costs incurred by operators, the additional revenue raised could in part be directed to redressing such impacts directly, or to funding alternatives to landfill, such as recycling programs.
6.2 Internalising environmental costs

The extent and severity of environmental impacts depends on what goes into the landfill and how well it is contained. A well-planned and managed landfill involves much smaller environmental impacts than one that is poorly sited and carelessly run. Although it is often hard to identify who is affected by these environmental impacts, they nevertheless impose real costs on the community and should be accounted for in pricing landfill.

Environmental costs can be either "internal", that is, imposed on the agents responsible for them, or "external", that is, imposed on other parties. The "polluter pays" concept essentially means that all environmental costs should be internalised, giving those responsible an incentive to reduce pollution as well as ensuring that other parties are not disadvantaged by the polluter.

There are essentially two ways for implementing this principle:

(i) setting standards for environmental performance
(ii) charging a levy related to the level of pollution.

Environmental performance standards oblige the regulated body to undertake whatever steps and bear whatever costs are necessary to avoid an environmental impact above a given level. To be efficient, such standards should be set at a level where the control cost is equal to the environmental cost. However, there may still be some external environmental cost within the performance standard. To be fair, those local areas which can be identified to bear this residual cost should be compensated. The feasibility of such compensation will depend upon the capacity to target effectively such payments.

Charging a levy related to the level of pollution means that those responsible for the pollution will have an incentive to reduce the pollution wherever the cost of reduction is less than the levy. To be efficient, such a levy should be set equal to the environmental cost. To be fair, the proceeds of levy should be directed to those bearing the environmental cost.

Both performance standards and an environmental levy are currently applied to landfill in the Sydney area.

6.3 Landfill guidelines

Waste Service NSW currently operates its landfill operation according to relatively high environmental standards. All landfills must implement landfill gas and leachate collection systems. Odour and pest problems are limited by covering the landfilled waste as soon as possible and at the end of each day.

"Those costs associated with leachate impacts, landfill gas emissions and amenity impacts derived from emission of dust and noise from the site can be largely internalised by observance of the requirements of the proposed EPA Environmental Management Guidelines." [EPA submission, p. 8.]

To be precise, rather than internalising environmental costs, this approach displaces them with (internal) environmental control costs. EPA is soon to release Environmental Guidelines for Solid Waste Landfills. Charges may need to rise to recover the cost of meeting these new guidelines. A study conducted for EPA by Travers Morgan concluded that the incremental capital and operating costs for implementing the new guidelines for a
large landfill on a good site would be $14.33 per tonne [Travers Morgan, Cost Benefit Analysis of Landfill Management Guidelines, April 1995, p. v]. Given that Waste Service NSW already has leachate and landfill gas control systems in place, some of this cost is probably already incorporated into charges. On the other hand, some existing control infrastructure may be made redundant by the new guidelines. Even if the additional cost of upgrading is only half the above estimate, this would raise charges by more than $7 per tonne or more than $11 million per annum on current waste disposal volumes.

The actual cost impact will depend on nature of the final guidelines, and how they are applied. To optimise economic and environmental outcomes, it is important that guidelines are set at a level where the cost of meeting them is approximately equal to the environmental costs they are intended to control. The guidelines should be tightened wherever the cost of doing so is less than the environmental cost avoided. Similarly, standards should not be raised where the associated cost exceeds the environmental benefits derived. The Travers Morgan study cited above concluded that the gross benefit of $23.68 per tonne significantly exceeded the gross costs of $14.33 per tonne. However, the Tribunal is concerned that the cost of implementing these guidelines, as presented in the June 1995 draft guidelines may exceed their environmental and other benefits.

The benefit cost analysis was based on several assumptions that are not relevant to Waste Service NSW landfills. For example, $15 of the $23.68 per tonne benefit was attributed to "landfill opportunity savings" achieved by doubling the compaction rate of waste. [Travers Morgan, p.32.] The Guidelines stipulate a compaction rate of 850 kg/m³. [EPA, 1995a, p. 521. For this to represent a doubling of the compaction rate, the present compaction rate would need to be 425 kg/m³. In fact, current Waste Service NSW compaction rates are about 1000 kg/m³. If the benefits of compaction are excluded then the benefits of the guidelines as calculated by the study fall to $8.68, well below the costs of $14.33. Several other assumptions relating to both costs and benefits are not pertinent to Waste Service NSW landfills. The benefit cost analysis therefore does not present a strong case in support of the guidelines, at least in relation to Waste Service NSW.

Greater environmental and economic benefits might be achieved by directing scarce funds more towards removing the harmful components from the waste stream and developing alternatives to landfill such as waste minimisation or green waste processing and less towards ensuring extremely high environmental safeguards at landfill sites.

To be efficient, performance standards should relate as closely as possible to the level of environmental impact or performance. For example, if the objective is to ensure that zero leachate contaminates ground water, an explicit standard to this effect is likely to be more efficient than stipulating that a specific thickness of a specified material should lie between the landfill and the water table. EPA endorses this approach in the draft guidelines:

"It is with a view to promoting and achieving best environmental performance that the EPA has selected a performance based approach rather than the prescription of actions or design specifications and standards for these Guidelines. The inflexibility of a prescriptive approach would not reward operators for judicious site selection or technical management innovation as the mechanisms for arriving at the most environmentally beneficial solution." [EPA Draft Guidelines p. 3.1

However, the draft guidelines also include numerous prescriptions regarding materials and methods. The extent to which landfill operators have the freedom to depart from these prescriptions in observing the guidelines may need clarification.
Recommendation 6.2
The efficient costs of satisfying the environmental standards embodied in the EPA’s new Environmental Management Guidelines for Solid Waste Landfills should be recovered through Waste Service NSW charges. These guidelines may involve significantly greater costs and necessitate an increase in Waste Service NSW’s real revenue.

Recommendation 6.3
The EPA should introduce higher standards for the operation of landfills wherever the environment and other benefits of the new guidelines are shown to exceed the costs of meeting them. Conversely, such guidelines should not be imposed where the benefits are less than the associated costs.

6.4 Waste disposal levy
Under s.29 of the former Waste Disposal Act (and under s.72 of the new Waste Management and Minimisation Act (1995) a levy is payable to the EPA for the disposal of waste. The current levy is set at $7.20 per tonne. The EPA has described the purpose of this levy as:

"Those costs that cannot be internalised using traditional regulatory approaches are in part accounted for by contributions made under the waste disposal levy. These costs include residual emission costs, residual amenity costs (which may exceed amenity costs attributable to on-site activities), transport corridor impacts and intergenerational costs associated with overuse of land and other natural resources.

"The objective of the Section 29 levy is to internalise the less site-specific external costs of waste disposal and thereby reduce market distortions. The effect of the Section 29 levy in practice is to increase the price of solid waste disposal to a point where consumers are exposed to the full cost of their actions. The Section 29 levy should therefore help to reduce the total volume of waste-to-landfill providing effective options are made explicitly available to consumers." [EPA submission, p.9]

To the extent that those who bear the cost of the externality can be identified, the proceeds of the levy should be directed to them. To the extent that they cannot be specifically identified, the levy should accrue to the Government.

6.5 Compensation for amenity impacts
Where a particular party can be identified as being subject to external costs, revenue raised by incorporating external costs into prices should be used to compensate the affected party.

As waste is, by definition, material that people do not want, it is not surprising that people dislike having such material stored or disposed of in landfills in their neighbourhood. While the host and communities near the landfill facility benefit through reduced waste transport costs, these are seldom seen as adequate compensation.

With existing landfill sites, the cost of reduced local amenity may already have been incorporated in the lower cost of housing in the area. In this case, compensation should be directed to community assets and amenity improvement. Where a new landfill site is proposed, it may be appropriate to compensate individuals.

Host fees are one way of incorporating local external costs into prices. These host fees could be added to the waste charges and forwarded to the local council. In principle, host fees
could be set through a market approach, where the community which is willing to provide a landfill site for the lowest host fee is selected for the establishment of new landfill. This raises equity concerns about whether this provides richer communities with an easy option for off loading their waste problems on to poorer communities. Such an approach could lead to severe inequities as poorer communities may be unable to match the bids of wealthier communities to avoid a landfill in their area. Host fees should not become the determining factor in siting landfill. Only those locations which are environmentally appropriate (ie geologically suitable for landfill activities, distant from water courses and catchment areas, or have no other over-riding environmental value) should be considered for landfill development. Questions regarding who should make decisions about host fees on behalf of the local community are also raised.

At present, with the exception of Belrose and Grange Avenue, local councils and communities receive no financial compensation for hosting landfills. Host fees should be paid to host councils or communities now on grounds of equity and to build confidence in the mechanism before new capacity is required. Further study is required to establish more rigorous estimates of the amenity cost to local communities, the appropriate level of the host fees, their method of disbursement, and guidelines for what they should be spent on. In the meantime, a nominal host fee of the order of $1 per tonne could be paid to host councils by putrescible waste operators. On current waste-to-landfill volumes this would amount to about $1.6 million per annum.

Host fees should be directed to each affected community. While these may be paid to the council in whose area the landfill resides, such facilities are often sited close to municipal boundaries. Thus, neighbouring councils or those on major routes for waste disposal trucks may also suffer the impact, and therefore warrant compensation.

The LGSA states:

"The concept of host fees is accepted in principle, but they must not become the major determining factor for siting of landfills." [LGSA submission, p. 13.1]

In opposing host fees, the EPA states:

"Currently, contributions made under s.94 of the EPA & Act and s.29 of the Waste Disposal Act are the mechanisms used to account for site-specific and non site-specific amenity impact respectively. A separate host fee levy would therefore have the potential implication of double counting these costs. The EPA feels that amenity impacts should be retained within the s.94 and s.29 contributions thereby minimising administrative costs and allowing the funds generated to be targeted in a manner that maximises net social benefit. This does not preclude negotiated grants from the landfill operator/owner to local host communities affected by the presence of a landfill during the planning process." [EPA submission, p.9.]

A new waste disposal levy has been established under s.72 of the Waste Minimisation and Management Act (1995) to supplant the s.29 levy under the former Waste Disposal Act. According to the Waste Reforms booklet published by the EPA, the purpose of this levy is "to discourage waste disposal and promote waste reprocessing alternatives" [Waste Reforms, 1995, p. 6]. Although neither this booklet nor the new Act refers to the site-specific and non site-specific amenity impacts cost of a landfill operation, the s.29 levy may be intended to cover, and be sufficient to cover these costs. If so, then as noted by the EPA, to introduce a new levy to raise funds for a host fee would double count these costs. However, the s.29 levy clearly does not in practice act as a host fee, as no part of this money raised is currently directed as compensation to host communities or councils.
Recommendation 6.4
Landfill charges should include compensation for any local amenity costs which may be imposed on communities hosting landfills. Such compensation could be paid either out of the funds received from the waste disposal levy, or by the landfill owner/operator. Such compensation should not determine the siting of landfill facilities. Pending refinement of estimates of amenity costs, a host fee comparable to the rehabilitation enhancement fee paid at the Belrose and Grange Avenue landfills ($1 per tonne) could also be paid at other putrescible landfills.

Recommendation 6.5
Additional costs of waste minimisation or the replacement of landfill capacity could be funded by a levy on waste-to-landfill or part of such a levy. (Taxes for revenue raising purposes should be identified separately.) The setting of such taxes is a matter for Government rather than the regulators.

Recommendation 6.6
Estimates of the external environmental and amenity costs of landfill disposal should be refined.
7 COSTS OF ACHIEVING OTHER WASTE MANAGEMENT GOALS

7.1 Introduction

The terms of reference for this Inquiry require the Tribunal to examine, "the proposals outlined in the Government's Waste Management and Recycling Strategy of March 1995 insofar as they relate to pricing, including the Government's waste reduction objectives". The Government's waste reduction objectives relate to waste disposal pricing in two respects. Firstly, raising the price of disposal is one way of discouraging disposal, making alternatives to disposal relatively more attractive by comparison. Secondly, raising waste disposal prices is a way of funding alternatives to disposal which may be more expensive than disposal itself, in order to reduce waste-to-landfill. This chapter discusses both these issues.

7.2 Government's waste-to-landfill reduction target

As noted in Chapter 2, the current waste reduction target as presented in the Waste Minimisation and Management Act 1995 establishes an objective of achieving "by the end of 2000, a 60% reduction in the amount of waste disposed of in NSW (being a per capita reduction based on 1990 disposal rates)." There may be significant additional costs in meeting this target, for the following reasons:

- Many alternatives to landfill are more expensive, even when the external costs of landfill are included.
- Some alternatives to landfill which may be cheaper in the long run, are more expensive now due to the absence of economies of scale, or because they have yet to be fully developed (e.g. green waste processing).
- Some alternatives which may be cheaper even now, must be charged below cost either to create an incentive for diversion from the landfill waste stream (e.g. glass and paper recycling), or because it is impractical to charge for waste minimisation. The cost of these activities must therefore be covered by some other source.

Several submissions question the efficiency and practicality of the Government's waste-to-landfill reduction target. For example, the Australian Chamber of Manufacturers states:

"Manufacturing industry is also a keen supporter of waste minimisation and its optimisation [having reduced its waste-to-landfill by 40% per capita since 1990]. However, we consider any unilateral reduction target set by the NSW Government is prone to inefficiencies, both economically and environmentally. ACM further believes appropriate pricing of all economic factors involved with waste management will provide the necessary market forces to achieve the optimum balance between recycling and disposal." [ACM submission, p. 1.]

If all external environmental and other costs were included in all prices, there would be no economic efficiency grounds for a waste-to-landfill diversion target. However, there is little prospect of this occurring in the near future. Chapter 6 discussed the environmental costs associated with landfills and how these might be incorporated into waste disposal prices. Another set of environmental external costs is associated with the production of materials that end up in landfill. These costs include the external costs associated with exploiting virgin resources through, forestry for paper, sand mining for glass, limestone mining for concrete, as well as causing greenhouse gas emissions and other impacts from energy

25 Australian Chamber of Manufacturers, Kimberly Clark, Pacific Waste Management, Maunsell.
production for transporting, processing and refining raw materials. Ideally, these costs should be included at the point of production. Assessing the value of these impacts is beyond the scope of the present inquiry.

If all external costs of extraction and production were included, then the price of many virgin materials would rise relative to reused or recycled materials. This would raise the demand for recycled materials, diverting some waste from landfill. As long as external costs for virgin materials are not internalised, a target of diverting waste from landfill, even an arbitrary one, could lead to a more economically efficient level of recycling, reuse and waste minimisation than if no target were in place. Needless to say, a target based on an accurate analysis of the external costs of virgin versus recycled materials and conservation is likely to lead to a more efficient outcome than one based on an arbitrary target. In practice, estimating external costs usually requires numerous assumptions that may be no better grounded that the 60% waste-to-landfill reduction target.

Although the above could provide some justification on economic efficiency grounds for a waste-to-landfill diversion target, it is recognised that in formulating policy, the Government must balance a number of factors, of which economic efficiency is only one. The community may prefer to encourage further diversion of waste from landfill, even if all external costs of landfill disposal and exploitation of virgin resources were incorporated into prices and landfill was still to be cheaper.

7.3 Impact of higher charges on waste disposal volumes

Simply raising waste disposal prices alone is unlikely to reduce significantly the amount of waste generated and disposed of. The cost of landfill represents a small part of the total cost of waste disposal. As shown in Figure 2.5, even when the cost of transfer station operation, haulage to landfill and the waste disposal levy are included, the price of disposal is still only about half of the cost of waste collection. Therefore, even raising waste disposal prices by 100%, would raise the cost to the waste generators by only about 33%.

Although it is difficult to single out the impact of price changes from other factors, it appears that waste generation is very insensitive to price changes. There has been little empirical research on this issue in Australia, but the EPA cited four studies conducted in the United States. These studies suggested "a demand elasticity of -0.12 to -0.15 for domestic waste disposal services, and -0.29 for commercial waste services" [EPA submission, p. 11]. For an elasticity of -0.15, a doubling of the price of disposal would reduce waste disposal by only 15%.

The effectiveness of such price signals in changing behaviour depends on how and where price (and/or levy) changes are applied. Changing charges at landfill gates will have a significant impact only on waste generators who pay these direct unit charges. This change is unlikely to have a significant impact on domestic waste disposal volumes if they are simply passed on as an increase in the fixed annual charge for domestic waste management in municipal rates.

Consumers are not aware of the full costs of their purchasing and disposal decisions that generate waste. More cost reflective charging structures for waste services are likely to have a greater impact on waste disposal volumes. Councils could further develop user pays systems for waste services (eg different rates for different bin sizes), in addition to providing continuing education and information programs on recycling. Manufacturers do
not yet bear the cost of disposing of the products and packaging they produce. Options to address this problem could include a pre consumer levy and deposits on those items (or their containers) that contribute disproportionately to the cost of landfill, such as batteries, paint and household chemical containers.

Imposing levies at the point of production or purchase of material that is destined to end up as waste, and introducing volume (or weight) related charging for collection of waste by local councils are likely to have a more significant impact on waste disposal volumes than increasing Waste Service NSW prices. In comparing alternative pricing mechanisms, administrative costs need to be considered.

7.4 Impact of waste reduction target on Waste Service NSW

Although the intent of the Government’s waste-to-landfill reduction target is clear, the base line figure for per capita waste disposal level was in NSW in 1990 is not known precisely. Furthermore, the specific allocation of responsibility for meeting the target has yet to be determined. Therefore how much Waste Service NSW needs to reduce its waste-to-landfill levels by is unclear.

Assuming that Waste Service NSW is required to reduce its share of the waste stream to landfill proportionate to the state wide reduction target, this would mean reducing the amount it disposes to landfill from the current level of about 1.6 million tonnes per annum to about 1 million tonnes per annum.

Waste Service NSW has estimated that waste minimisation activities may be able to reduce waste-to-landfill by 100,000 tonnes per annum by the year 2000 at an average cost of $20 per tonne. [Waste Service NSW submission p. 13] Other options for managing waste include additional recycling, green waste reuse, centralised composting and neutralysis. The costs range from $20 to $80 per tonne. The weighted average cost of alternatives for this plan is $45 per tonne, (which is comparable to Waste Service NSW’s current average charge for waste disposal to landfill of $44 per tonne, including the s.29 levy). To recover this cost purely from disposal charges, the weighted average charge would need to rise by approximately $5 per tonne to $50.70 per tonne of waste disposed.

Waste Service NSW states that to achieve this target,

"would require the continuation of a public monopoly over the putrescible waste stream, a regulatory system to prevent 'leakage' from this waste stream and a systems pricing approach to encourage source separation of waste streams. . ."

"A systems price can also be utilised as a pricing tool to further encourage source separation of wastes able to be processed. This could include higher charges for mixed wastes, allowing greater charge reductions for separated wastes. . ." [Waste Service NSW submission, pp. 14,15]

"A systems price will also protect innovative waste reduction initiatives by Waste Service from market alienation due to necessary higher charges than landfill. For example, it would be unwise for Waste Service to introduce an enclosed composting facility for food wastes when pricing policies dictated that facility costs must be reflected in individual facility charges, as little or no waste would be received due to substantially cheaper landfill or transfer station disposal options."

While this approach may achieve the target for this part of the waste stream, it may conflict with other elements of the Government's waste reform strategy, and with the principle of competitive neutrality.
The waste reform package allows for competition between (publicly controlled) putrescible waste service providers. The approach advocated by Waste Service NSW appears to rely on not just a public monopoly, but on a Waste Service NSW monopoly. This is how it is able to raise prices on a captive putrescible landfill market in order to fund for alternatives to landfill. If Waste Service NSW did not have a monopoly, customers would have an incentive to direct their putrescible waste to other publicly controlled facilities that did not include this additional cost in their charges.

Waste Service NSW's obligations to undertake interim waste-to-landfill reduction activities should be made explicit. If Waste Service NSW is required to promote higher cost alternative waste management activities, while its competitors are not, the additional cost of these activities should be funded. Such funding should be transparent and could be managed by the relevant agency of State or local government. This type of arrangement may be particularly important over the next couple of years, until the regional waste plans and industry waste reduction plans are implemented.

7.5 Role of levies and prices

A more competitive market in the provision of waste services has a number of implications for the role of prices and levies in the context of the 60% waste-to-landfill reduction target.

As noted above, achievement of this target could require a range of waste management options some of which may have a higher financial cost. Pricing and funding mechanisms should facilitate the commercial provision of such services on a competitive basis. This includes provision of options such as recycling or green waste processing services separately from landfill operation.

If prices are set purely on the basis of financial costs incurred for each waste management options, those options with a higher direct financial cost than landfill may not be commercially viable. The prices would encourage users to continue to put waste to landfill wherever possible. For example, if the price for accepting household green waste at a reprocessing facility is greater than the price for accepting domestic mixed waste to landfill, there will be an incentive for households not to use the green waste facility.

Hence, simple operation of competitive markets and commercial pricing for each waste management option will not achieve the target reduction in waste-to-landfill. Some form of "intervention" is necessary.

While it seems appropriate that the cost of developing and financially supporting alternatives to landfill should be incorporated into the price of waste disposal, it is not necessary that this incorporation be effected by Waste Service NSW. Alternatives include:

- imposing a levy on waste disposal and directing funds raised to alternatives to landfill. Such funds could be made available on a competitive basis to Waste Service NSW, local councils and other eligible service providers
- requiring regional Waste Boards and industry groups to meet specific waste-to-landfill reduction targets, therefore obliging them to fund any alternatives to landfill which they require to meet these targets. Member councils of regional Waste Boards may then raise their municipal waste charges to cover this expense, while industry may include the additional costs in their prices. Regional Waste Boards and industry
Costs of achieving other waste management goals

groups may then wish to contract with Waste Service NSW or other service providers for the provision of landfill alternatives.

- inclusion of cross-subsidies in pricing structures through a "systems pricing" approach.

The options are not mutually exclusive. Attempts to set regulatory requirements may be undermined if the price signals sent to users of waste services run counter to the regulatory requirements. Such tension between financial incentives and regulatory requirements would create strong incentives to circumvent the regulatory requirements.

The relative role of cross-subsidies in pricing or an explicit levy will depend, in part, on the structure of the market.

If the regional Waste Boards have complete:

- control of the waste stream within a region
- can set prices for receiving waste at each waste facility in their area

then the Waste Boards could use a "systems" based pricing approach. Under this approach the Boards could contract with a range of waste operators but prices for waste-to-landfill disposal would include a component to offset the costs of contracting for provision of alternative waste services. To the extent that "systems" prices cannot be effected by regional Waste Boards, greater reliance would need to be put on regulatory controls.

This approach may be less successful to the extent Boards do not have full control over the waste stream. Potential gaps could occur through:

- transportation of waste outside each region
- less effective control over private or commercial waste streams
- "leakage" from putrescible to non-putrescible waste streams.

An explicit levy with broad coverage across the waste stream could be a more effective instrument if the above gaps are significant.

A levy would:

- introduce an explicit price premium on all waste-to-landfill irrespective of source
- provide a source of co-funding for alternatives to landfill to ensure such options are commercially viable at prices which are attractive to waste disposers.

Funds could be allocated to alternative waste operations through competitive tenders, to promote efficiency. The size of the pool of funds - and hence the levy - would be determined by the amount of "alternatives to landfill" to be purchased to achieve the 60% target.

Use of a levy in this manner, would enhance the effectiveness of regulatory requirements. It may also reduce the extent of such requirements. Decisions on the level and allocation of the levy could be devolved to the agencies with responsibility for achievement of the 60% target.

Each of the above alternatives for funding the cost of meeting the waste-to-landfill reduction target appear to be consistent with the Government's waste reform package and competitive neutrality principles. However, they make take time to become operational. Given that the year 2000, when the target is to be reached, is less than four years away, it
may be prudent to make provisions for approaching the target ahead of these more competitive arrangements.

Given its history and expertise, Waste Service NSW may be particularly well placed to build up its green waste processing capacity or to invest in a pilot, enclosed composting facility. In order to expedite such activities without creating undue barriers to competition at a later date, the Government could contract with Waste Service NSW to provide these services. Contracts could be established with or without a competitive tendering process. The Government could then finance the contracts with the s.72 levy, adjusting the levy if necessary. Care should be taken to ensure that such contracts do not lock in a competitive advantage or disadvantage for Waste Service NSW.

In general, funding for alternatives to landfill should be raised by the agency responsible for managing the waste or meeting the waste reduction target. For this reason, it is important to clarify the obligations of each waste producer and manager regarding the waste-to-landfill reduction target. Although, Waste Service NSW has presented a plan to reduce its waste stream to landfill in line with the target, it is unclear whether Waste Service NSW regards this as an obligation, or whether it should be aiming to reduce its waste stream to landfill by a greater or lesser amount. Given that much has been done by local councils to reduce the putrescible waste stream, it might be appropriate to require a greater proportion of the remaining reduction be achieved in the commercial and industrial non-putrescible sector. Or, given that the difficulties in siting new disposal facilities are particularly acute in the metropolitan region, it may be appropriate to require a greater than 60% reduction in this area. Alternatively, Waste Service NSW may be regarded as one service provider among many, without explicit responsibility for reducing the amount of waste it receives and dispose to landfill.

Recommendation 7.1
The obligations, if any, of Waste Service NSW to divert waste away from landfill under the 60% waste-to-landfill reduction target should be clarified.

Recommendation 7.2
The incremental cost of meeting the 60% waste-to-landfill reduction target should be borne by the agencies responsible for meeting the target. For putrescible waste, this is understood to be the responsibility of the proposed regional Waste Boards, not of Waste Service NSW. Funding for waste reduction initiatives should be available to Waste Service NSW and other service providers on an equitable, commercial and, where appropriate, competitive basis. This will provide Waste Service NSW an opportunity to enhance its return on assets and profitability by offering waste management alternatives on a competitive basis.

Recommendation 7.3
If Waste Service NSW is required to undertake higher cost alternatives to landfill activities in order to reduce waste-to-landfill prior to the implementation of regional waste plans, such obligations should be formalised through commercial contracts.

Recommendation 7.4
Meeting the Government’s target of reducing waste-to-landfill by 60% per capita by the year 2000 may require Waste Service NSW to accept considerably less waste for landfill disposal. In such an event, Waste Service NSW charges may need to rise to the extent necessary to recover landfill related fixed costs over a smaller sales volume.
8 STRUCTURE OF PRICING

8.1 Introduction

The previous four chapters have considered the total costs that should be recovered through waste disposal prices. This chapter turns to the issue of how these total costs should be distributed across the various different prices that the Waste Service NSW levies. This question has significant implications for equity, efficiency and competitive neutrality. In particular, this chapter considers:

- the differential between prices charged to councils relative to commercial customers;
- the differences between transfer station and landfill charges, and;
- differences in charges based on the type of waste.

Finally it examines some of the arguments for and against volume based charges as an alternative to the current weight based system.

8.2 Council / commercial differential

Waste Service NSW currently charges commercial customers $7.90 per tonne (16%) more than it charges local council customers for waste received at transfer stations. For waste received at landfill sites, commercial customers are charged $10.90 (34%) more than councils. The Tribunal has received no evidence to suggest that this difference reflects a difference in cost of managing the waste from these two customer groups.

Waste Service NSW notes in its submission to the Inquiry,

"Prior to 1989, charges for the disposal of council and commercial [waste] were the same. However, in response to the significant increase in commercial waste being diverted to the then MWDA centres, Waste Service increased charges for commercial waste by 43%. The objective of this rise was to conserve the remaining putrescible landfill capacity for [putrescible] Council waste and encourage the private sector to establish non-putrescible landfill sites. ... this policy was successful. As ample capacity is now available for commercial waste at private landfills, Waste Service can see no justification for the maintenance of the differential, but political constraints have prevented its removal." [Waste Service NSW submission, p. 32.1]

The Local Government and Shires Associations (LGSA) which represents local councils has, a different view. In its submission to the Inquiry, the LGSA recommends that councils continue to pay lower charges than commercial customers for three reasons:

(i) Waste Service NSW was established with local council assets.
(ii) Local councils have a role as a community service provider.
(iii) Local councils cannot claim tax deductibility.

These reasons are considered below.

Waste Service NSW was established out of council assets

Waste Service NSW was established through the amalgamation of a number of local council waste facilities in 1971. However, these facilities could be considered as liabilities rather than "assets". Due to poor environmental management, the costs of rehabilitating these landfill sites may have been significantly greater than the value of the land and capital equipment. In this sense, the creation of Waste Service NSW could be seen as helping local councils to get "out of a hole".

65
As the differential in payments for waste disposal was created in 1989, 18 years after the transfer of facilities to establish Waste Service NSW, there is no clear precedent for a return on these assets. If local councils were able to establish a legitimate equity position in Waste Service NSW on the basis of transferred assets, then it would be more appropriate to receive a return on this equity as dividend, rather than as a differential charge. Such a dividend could be paid to these particular councils in proportion to the value of the equity they contributed.

**Councils as community service providers**

Local councils clearly do have a role as a community service provider, but this role is usually funded out of council rates or grants from the State or Commonwealth Governments, rather than through a discount on services provided by a State Government business enterprise.

**Difference in tax treatment**

The LGSA suggests that local councils should continue to face lower charges than commercial customers because commercial operators can claim this as a tax deductible expense. Local Councils cannot claim waste charges as a tax deductible expense because they are exempt from paying corporate income tax. If local councils do not receive such discounts for water, electricity and an array of other goods and services, it is unclear why they should benefit from a discount for waste disposal.26

The above arguments do not provide an adequate rationale for maintaining the current differential between council and commercial charges.

There have been allegations that some local council services have exploited their lower disposal charge by providing a commercial trade waste disposal service in competition with private contractors. It has been reported that the Local Government Customer Council may no longer consider the council/commercial differential to be appropriate. [Waste Service NSW 1994/95 Annual Report, p. 14.]

Waste Service NSW has proposed increasing council charges to equal charges for commercially produced waste over a 3 to 5 year period. This would lead to a substantial increase in revenue for Waste Service NSW.

Alternatively, the council/commercial differential could be removed by re-balancing the council and commercial rate at a new uniform level equivalent to Waste Service NSW's current level of revenue. The appropriate approach for removing the differential will depend on what the appropriate level of revenue is deemed to be.

**Recommendation 8.1**

*The differential between council and commercial rates should be removed. Removing the differential over a three to five year period should be sufficient to allow adjustment.*

26 While the post-tax cost of each $1 spent on landfill charges for a tax-paying company may be 64 cents, the company still requires $1 in pre-tax income to pay this expense. That is the pre-tax income required for tax-paying companies or local governments to meet these expenses is the same despite the apparent lower post-tax cost for companies.
8.3 Transfer station versus landfill charges

Waste Service NSW relies on a regional system of transfer station and landfill. The operation of transfer stations involves additional capital and operating expenditure, but reduces overall transport costs by bulking up waste. The trucks that carry waste from transfer stations to landfills generally have four times the tonnage capacity of council trucks bringing the waste into the transfer stations and more than 100 times that of small vehicles. The use of transfer stations reduces the total number of kilometres that waste carrying vehicles must travel, thereby reducing transport costs, fuel consumption and air pollution, traffic congestion, amenity impacts and (arguably) road maintenance costs.

Reflecting the additional costs of establishing and running transfer stations, charges for accepting waste at transfer stations are higher than at landfill sites (see Appendix B). Nevertheless, council and commercial customers deliver waste to transfer stations because the difference in charges is less than the additional transport costs of carrying waste to the landfill sites.

Waste Service NSW's submission states,

"Current charges for disposal of council waste at transfer stations recover the full cost including disposal at landfill, restoration and rehabilitation, depreciation of landfill capital investment and an equal share of the overheads of providing the solid waste system. To optimise use of the system, and reduce traffic flow to landfill sites, prices at transfer stations are set to at least cover costs; the return from the solid waste management system is generated principally from landfill operations..."

"Waste Service NSW tries to reduce amenity loss around landfills by minimising traffic movements. Good management practice also suggests that minimisation of vehicle presence on the landfills is warranted in the interests of keeping landfill operating costs down and minimising safety risks." [Waste Service NSW submission, p. 31]

The current difference in charges for receiving mixed waste from local councils at transfer stations and landfills is $17.50. For commercial customers, the difference between transfer station and landfill charges is $14.50.

The Tribunal is not aware of any reason why there should be a greater differential between landfill and transfer station charges for councils. Or, indeed, a difference between what councils and commercial customers pay at either collection point.

Analysis conducted by Symonds Travers Morgan for this review suggests that the direct costs of operating transfer stations (ie excluding overheads and contribution to return on assets) exceeds $20 per tonne. This suggests that current differentials between landfill and transfer station charges may be insufficient to cover the long run cost of transfer stations.

To encourage efficiency, the difference in charges between landfill and transfer stations should equal the long run costs of operating transfer stations, including their capital cost.

Where Waste Service NSW is in a monopoly position (as it currently is for putrescible waste in most of Sydney) cross-subsidising transfer stations from landfill charges (beyond the external cost) raises no problem in terms of unfair trading, as there are no competitors.

If Waste Service NSW operated in a competitive market (as it does in the non-putrescible sector) and chose to cross-subsidise its transfer stations, this would simply make its landfill
charges (which must be commensurably higher) less competitive. This would not contravene competitive neutrality principles.

If, however, higher charges for putrescible waste at landfill are cross subsidising lower charges for non-putrescible waste at transfer stations, this could constitute anti-competitive behaviour.

Recommnedation 8.2

In market segments where Waste Service NSW does not face effective competition (eg putrescible waste at present), transfer stations should earn a rate of return equivalent to that of landfill sites. If the Government wishes as a matter of policy to reduce traffic to landfill sites, this should be achieved by an explicit subsidy and/or levy.

8.4 Type of waste

Waste Service NSW currently sets charges for different types of waste at different rates per tonne. The differences are illustrated in Table 8.1. These differences in charges reflect various objectives:

- to set charges which reflect the cost of managing the waste
- to encourage the recycling of recyclable materials
- to reduce the disposal of toxic chemicals in landfill.

These are all legitimate objectives in waste management. However, the latter two objectives are potentially in conflict with the first. Where there is uniformity of prices and management across the industry, differential prices can effectively promote recycling and discourage the dumping of toxic household chemicals from landfill. The de facto monopoly of Waste Service NSW over the disposal of putrescible waste approximates this uniformity.

Table 8.1 Charges for commercial waste at Waste Service NSW landfills

<table>
<thead>
<tr>
<th>Mixed waste</th>
<th>$43.30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed waste containing over 25% clean paper</td>
<td>not accepted</td>
</tr>
<tr>
<td>Mixed waste containing over 25% contaminated paper</td>
<td>$63.30</td>
</tr>
<tr>
<td>Domestic Recyclables</td>
<td></td>
</tr>
<tr>
<td>Separated asphalt bricks concrete and tiles</td>
<td>Free</td>
</tr>
<tr>
<td>&lt;2 tonnes</td>
<td>Free</td>
</tr>
<tr>
<td>&gt;2 tonnes</td>
<td>$43.30</td>
</tr>
<tr>
<td>Untreated wood and garden waste</td>
<td>$38.30</td>
</tr>
<tr>
<td>Tree trunks</td>
<td>$77.30</td>
</tr>
<tr>
<td>Car and truck tyres</td>
<td></td>
</tr>
<tr>
<td>shredded</td>
<td>$43.30</td>
</tr>
<tr>
<td>unshredded</td>
<td>$128.00</td>
</tr>
<tr>
<td>Bulk demolition</td>
<td>$77.00</td>
</tr>
<tr>
<td>Foamed plastics</td>
<td></td>
</tr>
<tr>
<td>Chemicals (paint, paint solvents, household cleaners)</td>
<td>$713.20</td>
</tr>
</tbody>
</table>

The establishment of competition in the putrescible waste market (albeit with public sector control) is likely to undermine this uniformity. For example, Waste Service NSW currently under-recover the costs of processing green waste. It compensates for this shortfall by higher than cost recovery charges for mixed waste. A new entrant in the putrescible waste
disposal market, could charge a higher price for receiving green waste (or simply not offer green waste processing as a service) and undercut Waste Service NSW charge for the receipt of mixed waste. This would tend to attract the profitable mixed waste business away from Waste Service NSW, leaving it with a smaller revenue base from which to subsidise green waste processing. This would create a strong incentive for Waste Service NSW to either match the pricing strategy of the new entrant, or decrease its non-commercial activities in green waste processing.

It can be argued that the provision of such services is simply a matter of good business practice, to establish a reputation as a responsible operator. However, without denying the importance of a conscientious approach to operating, it seems unwise to establish financial signals that advantage the irresponsible operator over the more responsible one.

There are two ways to overcome this:

(i) oblige all waste management service providers to undertake the same non-commercial activities; and/or
(ii) fund the non-commercial activities separately so waste management service providers have an incentive to undertake them.

The EPA's Draft Environmental Guidelines for Solid Waste adopt the former approach. Under best practice Draft Guidelines, landfills which accept more than 100 tonnes per week would be required to 'maximise the reuse of delivered waste'. Landfills will be required to submit plans for recycling facilities and provide details of plans for the 'processing and/or marketing of recycling materials separated and for disposal of those materials separated but not suitable for recycling'.

In a competitive market, Waste Service NSW should be free to negotiate bundled and unbundled services with its customers. However, it should not be obliged to fund non-commercial activities unless all its competitors are subject to the same obligations.

In order to establish the non-commercial component of the cost of these activities, it is necessary that Waste Service NSW undertake a rigorous accounting separation of these activities.

**Green waste**

Waste Service NSW currently discounts the receipt of green waste below the mixed waste rate, at by $3 per tonne for councils and $5 per tonne for commercial customers (see Appendix B). This differential provides an incentive for customers to separate green waste from the mixed waste stream. It also may reflect the lower cost of processing green waste compared to disposing of it as landfill. According to Waste Service NSW's submission to the Inquiry, "the weighted average cost for disposal and processing at Waste Service NSW facilities in 1995 is approximately $44, including the Section 29 levy of $7.20 per tonne" [Waste Service submission, p. 13]. Waste Service NSW estimates the cost of green waste recycling at $40 per tonne [Waste Service submission, p. 13], excluding the Section 29 levy.

Under s.29 of the former Waste Disposal Act, a waste disposal levy is imposed: "The occupier of a depot shall pay to the [EPA] in respect of all waste received at that depot for treatment, storage or disposal" a levy. [NSW Govt, Waste Disposal Act 1970 No. 97, s.29]. This levy has been payable on all solid waste, including waste for recycling such as green waste and recyclable paper. The new Waste Minimisation and Management Act replaces
the s.29 levy with a new waste disposal levy under Section 72 of the new Act. The new Act allows regulations which "provide for the exemption of specified wastes from the calculation of contributions (including, for example, wastes that are recycled, reprocessed or reused)". [NSW Govt, Waste Minimisation and Management Act 1995 No. 102, s.72]. It may be expected that green waste will be exempted from the levy under the regulations which are due to be released soon. The cost differential that this creates should be reflected in charges for the different materials. The Waste Disposal Levy is currently set at $7.20 per tonne.

Recommendation 8.3
Waste Service NSW's landfill operation should be accounted separately from other waste disposal alternatives (eg recycling and green waste composting).

Recommendation 8.4
Differential landfill charges which reflect difference in costs (eg for whole car tyres, expanded foam) should be left to landfill owners and operators to determine. Surcharges and bans based on type of waste (eg green waste, paper, household chemicals, etc) should be specified by Government or EPA. Such surcharges and bans should be set in the context of alternative disposal or processing methods and appropriate enforcement mechanisms.

8.5 Volumetric pricing

The terms of reference for this review require that the Tribunal consider "the effect of alternative pricing policies ... including the consumer cost and environmental implications of [Waste Service NSW] charges being based on weight or volume of waste, and the potential overall value of these types of waste charging". [See Appendix A.]

At present, Waste Service NSW charges for waste disposal at landfill and transfer station on the basis of weight only. However, higher charges are levied for some low density types of waste such as polystyrene foam ($713.20 per tonne at landfill) and whole car tyres ($110 per tonne at landfill).

Landfill capacity is limited by the availability of space, which of course, is, volume. For this reason, it may seem more cost reflective and therefore more efficient to charge on the basis of volume rather than weight. Although superficially appealing, there are a number of problems in moving to a volumetric charging system. These include:

- difficulties of estimating volume
- differences in volume between gate and final landfill.

Waste arrives at Waste Service NSW facilities in a wide range of vehicles. It is difficult to estimate the carrying volume of each vehicle. It is also difficult to estimate how full the vehicle is. Charging on the basis of contentious estimates of volume is likely to decrease customer satisfaction and may be liable to abuse. Charging by weight, where weight is measured at certified, calibrated weighbridges, is a much more reliable, less contentious system of charging. Where weighbridges are not installed, many of the difficulties related to volumetric charging also apply to estimating tonnage. Weighbridges are currently installed at all Waste Service NSW transfer stations and landfill, but are not mandatory at all landfill sites. The draft EPA landfill guidelines require that all landfill operations accepting in excess of 25,000 tonnes per annum should install a weighbridge. [EPA guidelines, p. 50.1]
The second major problem relating to measuring volume is that waste may be significantly compressed between arrival at a facility and final disposal in landfill. Consider two loads of waste arriving at a landfill. The first load occupies twice the volume of the second and is compressible, but the second is not compressible. If the loads are charged on the basis of volume, the first will cost twice as much as the second to dispose of, even though in the ground, both loads may consume the same volume of landfill. Charging on the basis of volume would create strong incentives to compact waste loads before delivery to Waste Service NSW depots. Such compaction might involve unnecessary expense for the customer and make the waste harder to process.

Waste Service NSW states in its submission to this Review, "The only fair and verifiable means of charging is by weight. This is recognised internationally and all international standard prices are quoted by weight" [WasteServiceNSW Submission, p. 43.1]

Recommendation 8.5

On grounds of practicality, efficiency and cost reflectivity, Waste Service NSW should continue to rely on weight based rather than volume based charges for receipt of waste at transfer stations and landfill sites.

On the other hand, volumetric pricing may be a more viable means pricing for the collection of waste. Some councils and many commercial waste collection operators charge on a volume related basis.
9. FINANCIAL ISSUES

9.1 Introduction

Operating on a user pays basis, Waste Service NSW has been financially self supporting since its establishment. The main source of income is derived from charges for the disposal and treatment of solid and liquid waste. Waste Service NSW also provides specialist waste management consulting services to councils and other government agencies. Since 1991/92 Waste Service NSW has been required to pay a dividend to the Government.

Waste Service NSW currently has 60% of Sydney’s solid waste market, representing 80% of the council/community and 30% of the commercial/industrial waste stream.

In this chapter, financial issues such as profitability, rate of return, distributions to Government and capital structure, that impact on the financial performance of Waste Service NSW, are discussed and reviewed.

9.2 Revenue and gross margin

Waste Service NSW’s operations generate relatively stable cash flows to meet debt repayments and capital expenditure. Charges for waste disposal reflect the costs of providing, maintaining, rehabilitating and improving the amenity of disposal facilities, as well as achieving a return on assets. Over the past five years the operating margin\(^{27}\) fluctuated within the band of 33% to 38% of gross revenue as shown in Figure 9.1.

![Figure 9.1 Waste disposal revenue and margin](image)

Source: Derived from Waste Service NSW audited financial statements.

Note:

1. The accounting period 1990/91 covers 15 months. Figures have been adjusted to a 12 month basis.
2. The revenue and cost figures have been adjusted to 1994/95 prices by inflation factors based on the Consumer Price Index, Sydney.

Over the period 1991-1995 there was an overall decline of 17% in tonnage of waste disposed at Waste Service NSW’s facilities. This represented a 49% reduction in the

\(^{27}\) Operating margin represents revenue minus depot costs excluding statutory levy and interest expenses.

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commercial/industrial waste stream, offset by a modest increase in council/community waste (Figure 9.2).

**Figure 9.2 Waste disposed to Waste Service NSW facilities**

Source: Waste Service NSW submission to the Pricing Tribunal.

The level of revenue was maintained by increases in waste disposal charges, in particular, solid waste charges. Solid and liquid charges have increased in nominal terms by 24% and 11% respectively over the period 1991-1995.

### 9.3 Return on sales and assets

Despite a relatively stable gross margin, Waste Service NSW's earnings before interest and tax (EBIT) fell sharply from $21m in 1990/91 (adjusted to a 12 month basis) to $5.5m in 1994/95, a reduction of 75% in real terms. As a result, return on sales decreased considerably from 32% in 1990/91 to 14% in 1994/95 (Table 9.1).

The fall in earnings (before interest and tax) was mainly due to the enactment of the Protection of the Environment Administration Act 1991, which requires contributions under S.29 of the Waste Disposal Act to be paid into the State Consolidated Fund. The levy is designed to capture external costs and to encourage alternatives to landfill disposal. This levy is paid by all landfill and incinerator operators in Sydney. Over the period from 1991/92 to 1994/95, $21.6 million was paid by Waste Service NSW through the levy.

Detailed income and expenditure statements for financial years 1990/91 to 1994/95 are set out in Schedule A to this chapter.

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28 Prior to the enactment of the Environment Protection Administration Act 1991, statutory contributions under S.29 registration and licensing fees were kept by Waste Service NSW. Under the new Waste Minimisation and Management Act 1995 S.29 levy has been supplanted by S.72 levy.
Table 9.1 Return on sales and assets

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<tbody>
<tr>
<td>EBIT/Sales (%)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Waste Service NSW</td>
<td>32</td>
<td>28</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>All Companies</td>
<td>10</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>na</td>
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<tr>
<td>Average</td>
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<tr>
<td>EBIT/Total Assets (%)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Waste Service NSW</td>
<td>23</td>
<td>13</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>All Companies Average</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>na</td>
</tr>
</tbody>
</table>

Source: Derived from Waste Service NSW audited financial statements.

Notes:
(1) The accounting period consists of 15 months. Figures have been adjusted to 12 month basis.

Despite the s.29 levy, in the past five years Waste Service NSW achieved a return on sales and assets either in excess of or comparable to the All Companies Average.

The cash flow return and accounting return on equity from 1993 to 1997 is shown in Table 9.2. Results for 1996 and 1997 are projections of Waste Service NSW. Over the period the average post tax cash return on equity approximates 12% in nominal terms. There has been a 27% increase in the average disposal charge in 1995 and this lifted the equity return (accounting) from 9.4% in 1994/95 to 16.4% in 1995/96.

Table 9.2 Cash return on equity

<table>
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<tbody>
<tr>
<td>Net cash flow from operating activities</td>
<td>22</td>
<td>14</td>
<td>17</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>Less: tax equivalents</td>
<td>--</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Post tax net cash flows</td>
<td>22</td>
<td>11</td>
<td>13</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>Less: replacement capital expenditure</td>
<td>13</td>
<td>3</td>
<td>8</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Cash available for distributions</td>
<td>9</td>
<td>8</td>
<td>5</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Equity at end of financial year</td>
<td>72</td>
<td>74</td>
<td>73</td>
<td>78</td>
<td>83</td>
</tr>
<tr>
<td>Cash return on equity</td>
<td>13%</td>
<td>11%</td>
<td>8%</td>
<td>15%</td>
<td>12%</td>
</tr>
<tr>
<td>Accounting return on equity</td>
<td>14.0%</td>
<td>8.5%</td>
<td>9.4%</td>
<td>16.6%</td>
<td>14.7%</td>
</tr>
</tbody>
</table>

Source: Waste Service NSW audited financial statements.

Notes:
(1) Estimates provided by Waste Service NSW.
(2) Borrowings exceed repayment of loan in the above financial years.
(3) Commencing 1993/94, Waste Service NSW is required to pay tax equivalents.
(4) This figure includes substantial expenditure on landbank for the future development of landfill and alternatives. This expenditure tends to increase the capacity of Waste Service NSW, rather than just maintain the existing capacity. Should this expenditure be excluded the cash return on equity would become 18.7%.

29 As for Waste Service NSW, the return of the All Company Average is calculated on modified historical cost of assets.
Being structured as a government trading enterprise (GTE), Waste Service NSW is required to achieve, "a target return on total assets calculated on a nominal before-company-tax basis, equal to the GTE's unique, prevailing weighted average cost of capital;... NSW Treasury has estimated that the pre-tax weighted average cost of capital required for Waste Service NSW could range from 18.1% to 21.2%, based on a target capital structure of 30% debt and 70% equity. This is equivalent to a post tax cost of equity of 14% to 16.8%.

There is a disparity between the Treasury's target return and the 1994/95 return achieved by Waste Service NSW. It appears that the target return cannot be met without a further real increase in waste disposal charges. Waste Service NSW expects to achieve a return on assets of 16.6% in 1995/96. This is still short of the Treasury's pre tax weighted cost of capital of 18.1%-21.2%. Detailed discussion on the appropriate rate of return is set out in section 9.5 below.

### 9.4 Dividends, tax equivalents and statutory charges

Waste Service NSW, being structured as a government trading enterprise, is subject to commercially based dividend and tax equivalents payments to the State Government. Since 1993/94, Waste Service NSW has been required to pay 70% of its operating surplus as dividends and tax equivalents.

Over the period from 1990/91 to 1994/95, dividend and tax equivalents of $77m in aggregate were made to the Government, including a special dividend of $20m in 1992/93 (Table 9.3). Investments held by Waste Service NSW were markedly reduced to fund the special dividend.

In addition, Waste Service NSW has been required to pay a statutory levy under s.29 of the Waste Disposal Act 1970 (now s.72 of the Waste Minimisation and Management Act 1995).

<table>
<thead>
<tr>
<th>Table: 9.3 Dividends, tax equivalents and statutory charges ($m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-------------------</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Tax equivalents</td>
</tr>
<tr>
<td>Dividends</td>
</tr>
<tr>
<td>Special dividends</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>Waste disposal levy</td>
</tr>
</tbody>
</table>

Source: Derived from Waste Service NSW audited financial statements.
Notes:
(1) Operating surplus before tax and abnormal items.
(2) Figure not available.

Although declining in real terms, the payout ratio (dividends and tax equivalents) of Waste Service NSW is comparable to the All Company Average of 70%.[^31]

9.5 Capital structure

Capital structure refers to the mix of debt and equity used to finance the operations of a firm. It has important implications for the value of a firm. As shown in Figure 9.3, the debt/equity ratio of Waste Service NSW in 1994/95 was 21.7%, compared with the almost negligible level of 1.8% in 1990/91. Over the period, the debt level gradually increased from a very small amount of $1.5m in 1990/91 to a more commercial level of $15.9m in 1994/95.

![Figure 9.3 Capital structure and debt/equity ratio](image)

Source:
(1) Waste Service NSW audited financial statements.

Despite increased level of borrowings, Waste Service NSW’s debt/equity ratio remains comparatively low and is well below the proposed gearing level of 50% for the newly amalgamated electricity distributors in NSW. It is also low compared with the All Company Average (which is calculated on modified historical cost basis) as shown in Table 9.3.

The reduction in equity in 1992/93 reflected the payment of a special dividend of $20m to the Government (Figure 9.4). Total assets grew by only 9% over the past five years. Detailed financial statements for the period 1991 to 1995 are set out in Schedule A.

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34 That is debt/debt + equity.
The determination of capital structure and its potential impact on the value of the firm are considered in the NSW Government's paper, "Capital Structure Policy for New South Wales GTEs". According to this report, level of debts of a GTE should:

- enable the GTE to sustain a good investment grade rating in the long term
- enable financing of approved capital expenditure
- provide flexibility for relevant contingencies based on the GTE's business risk.

In the light of the above guidelines, a study commissioned by the GTE Reform Steering Committee NSW Government suggests that Waste Service NSW can adequately service $70m in debt while retaining an investment grade credit rating due to the following three factors:

- the existing low gearing level
- the projected capital expenditure program to achieve the 60% waste reduction target

The study suggests that a target capital structure for Waste Service NSW could be 30% debt and 70% equity, modelled on the capital structure of companies operating in the Australian and US mining and transportation sector. This recommended debt/equity ratio may be considered low for Waste Service NSW, which for the time being at least still maintains a de facto monopoly position for most of its business. As a government monopoly, its risk characteristics should be considerably lower than the market average and therefore Waste Service NSW is capable of sustaining a higher level of debt. However, how long Waste Service NSW will retain its dominant market position is uncertain.

To achieve the Government's waste disposal diversion target, considerable capital expenditure is projected for the next five years. An appropriate capital structure will provide the optimal mix of funds to meet the capital expenditure requirements and thus enhance the financing efficiency and economic value of Waste Service NSW.

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Notes:

35 If Waste Service NSW is a GTE of "average risk profile", the relevant benchmark financial ratios are: fund flow interest cover-3.25, funds flow net debt pay back-5.5, internal financing ratio-90.

36 NSW Treasury submission to the Government Pricing Tribunal on Waste Inquiry, November, 1995 [page 8].

37 A security with the same risk characteristics as the market will have a beta of one. Commonly, the major government utilities tend to have asset betas of significantly less than 1.
9.6 Rate of return

The providers of capital require, or expect compensation for tying up funds in an asset or group of assets. This is the opportunity cost foregone in exposing capital funds to risks through investment in projects with uncertain outcomes. The compensation or return required relates to risks associated with the assets in which capital is invested. The higher the risk, the greater is the return required by the investor. The Capital Asset Pricing Model (CAPM) is used to quantify the additional return required for bearing additional risk relative to a risk free asset, taking into account the market risk as a whole. 38

An appropriate rate of return is required to allow any business to maintain its financial integrity, attract capital for system expansion and generate sufficient revenue to service debts and dividends. Where prices do not reflect the full costs of operation, including a required return on the capital employed, inappropriate investment and consumption decisions may result.

The economic cost of capital is represented by the weighted average cost of capital (WACC) which reflects the weighted average of the risk of a business's assets and the financial risk of the business. The latter is determined by the proportion of debt and equity included in the capital structure of the business. It is noted that a corporatisation study of Waste Service NSW indicated that a target capital structure could be 30% debt and 70% equity (equivalent to debt/equity ratio of 43%), as modelled on the capital structure of companies operating in the Australian and US mining and transportation sectors.

However, the All Company Average indicates that the average debt/equity ratio in the past five years ranges from 40% to 50%. Given its present low debt level and monopoly over the putrescible waste management in the interim, Waste Service NSW has considerable debt servicing capacity. Within limits, a higher gearing level will lower the weighted average cost of the capital of Waste Service NSW. The Tribunal considers that a debt/equity ratio of 50% may be more appropriate in view of the relatively low business risk of Waste Service NSW.

A key input in calculating the cost of capital is the estimation of a business's asset beta. This measures the market risk of a business in relation to the market average. The average asset beta equals 1. Treasury suggests a proxy asset beta for Waste Service NSW could range from 0.8 to 1.2, based on the findings of the corporatisation study of Waste Service NSW. The finding is based on observed beta factors for US companies with operations similar to those of Waste Service NSW (ie involving mainly the sorting, transport and disposal of solid and liquid waste).

Waste Service NSW is not yet operating in a competitive market for putrescible waste and has a virtual monopoly of scheduled waste. New entrants face high capital costs to obtain new landfill site due to the "not in my backyard factor. In view of the dominance of Waste Service NSW in the waste management market, the inherent business risk of the Waste Service NSW may be lower than that of the US publicly listed companies used in developing the proxy beta. Rather, the present risk profile of Waste Service NSW is more

closely aligned with that of major government utilities such as electricity and water utilities which tend to have asset betas significantly less than one.

A review of US utilities and non-regulated low risk industrial companies found that the average beta was 0.7, with 68% of the companies observed having a beta in the range of 0.55 to 0.85.\(^{39}\) This beta range can be used in estimating the WACC for Waste Service NSW. However, if the market risk of Waste Service NSW increases in the medium term as a result of the changes in the waste industry structure introduced by the newly enacted Waste Minimisation and Management Act, 1995, the asset beta may need to be revised upward.

For estimating the Waste Service NSW's return, Treasury recommends a market premium of 7%. The market risk premium for the Australian equity market lies within the range of 6% to 8%. However, there has been considerable debate regarding the period over which the market risk premium is measured. Research undertaken by Professor Bob Officer of the Melbourne Graduate School of Management indicates that over the past 100 years, the market premium has averaged 8%. Further studies indicate that in recent times, with the deregulation and internationalisation of capital markets in Australia, this premium may have been reduced to 6%.\(^{40}\)

Applying the following data:

- equity beta of 0.8\(^{41}\)
- market risk premium of 6%
- risk free return of 9%\(^{42}\)

the cost of equity (nominal post tax) for the Waste Service NSW is estimated to be 13.5%. If a market risk premium of 7% is assumed, the nominal post tax cost of equity would be 14.3%.

Issues relating to asset valuation and economic rate base are discussed in section 4.5.

**9.7 Pricing scenarios**

Four scenarios of Waste Service NSW's solid waste business line are examined in order to assess its revenue requirements and financial viability in the light of

- the 60% waste diversion target
- reduction of revenue as a result of reduced landfill volume
- capital and operating expenditure required for expanding the recycling and material recovery facilities at landfill sites and transfer stations.

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\(^{41}\) Based on debt equity ration of 30/70.

\(^{42}\) Approximates the 10 Year Bond rate over the last 12 months.
Case 1: Base case

This scenario is constructed to assess the level of profitability and return of the Waste Service NSW in the absence of the 60% reduction target. The base case assumes:

- a decrease in per capita volume of waste to landfill, but a smaller reduction than the 60% target;
- landfill and transfer station charges rise by the average expected inflation rate of 4% while the waste disposal levy remains constant at $7.20;
- capital expenditure associated with the research and development of new waste processing methods and material recovery and processing facilities are excluded.

The base case is compared with the other scenarios discussed below.

Case 2: Achievement of 60% waste diversion target with prices increasing by CPI

This scenario relies on achieving the targeted 60% reduction by 2000, but with waste disposal charges being increased by the average expected inflation of 4%. The achievement of this target involves higher levels of capital expenditure associated with resource recovery and recycling activities than for the base case. In order to encourage separation of green waste, charges are set lower than those for mixed waste. The outcome of this scenario illustrates the full impact of the 60% diversion target on the financial viability and returns on investment of Waste Service NSW.

Case 3: Achievement of 60% waste diversion and 10% return on assets

This scenario incorporates the following factors:

- achieving the 60% waste diversion target combined with higher level of operating costs and capital expenditure associated with the additional recycling capability required to meet the target as projected by Waste Service NSW;
- increasing landfill and transfer station charges to cover higher operating costs and provide 10% return on assets;
- adjusting pricing to remove differential between council and commercial charges by 2000.

This scenario is used to assess the extent of price increases required to maintain the same level of return on assets (10%) as in the base case.

Case 4: Achievement of 60% waste diversion and Treasury target rate of return

The underlying assumptions case 4 are the same as for case 3, except that higher landfill and transfer station charges are projected to meet Treasury’s higher return on assets and equity targets.

The outcomes of the above scenarios are detailed below.

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43 Given increasing environmental awareness, it is likely that significant voluntary increases in recycling would occur even without a deliberate government waste reduction policy.

44 To approximate the return on assets achieved by Waste Service NSW in 1994/95 and in the base case.
Revenue and operating costs

The aggregate revenue and operating costs over the period 1996-2000 is shown in Figure 9.5.

**Figure 9.5 Revenue and operating costs (solid waste)**

As a result of the higher operating and capital costs associated with the 60% diversion target, additional revenue is required to maintain the operating margin and return.

As shown in Figure 9.5, the revenue stream under case 4 provides Waste Service NSW with more than sufficient revenue to cover increased operating costs and to maintain the present level of operating margin and return.

Prices

The charges for council mixed waste to landfill that emerges for the four cases are shown in Figure 9.6. A more complete illustration of all landfill and transfer station charges under each scenario is set out in Schedule B to this chapter.

**Figure 9.6 Council landfill charges (mixed waste)**

Operating margin

In the absence of the 60% waste diversion target, the level of operating margin is around 17% to 20%. This is higher than the operating margin currently projected by Waste Service NSW. With prices increased by the forecast inflation of 4%, the operating margin is reduced
from 15% to around 7% due to higher operating costs associated with the 60% waste diversion target.

**Figure 9.7  Operating margin\(^{45}\) (solid waste)**

The operating sales margin under case 4 improves significantly to 28% due to the substantial price increases incorporated into the scenario in order to meet the Treasury's return targets for Waste Service NSW.

**Capital expenditure**

Except in case 1 additional capital expenditure is projected to achieve the waste diversion target. This is mainly associated with the design, development and construction of green waste recycling facilities and material recovery facilities at landfills and transfer stations. Aggregate capital expenditure projections over the period 1996-2000 are shown below.

**Figure 9.8  Capital expenditure projections (solid waste)**

Note:
1. Capital expenditure under case 2 are previous estimates of Waste Service NSW while the case 3 and 4 capex is the latest Waste Service NSW projections.

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\(^{45}\) Operating margin represents solid waste revenue less variable and fixed operating costs but excludes interest and tax.
Return on assets

The return on assets profile in respect of the scenarios is as follows:

![Figure 9.9 Return on assets](image)

Case 4 shows a substantially higher return on assets, ranging from 17%-23% over the period 1996-2000 because of higher disposal charges. This is significantly higher than the average return of 8%-9% achieved by Waste Service NSW in the past three years. The substantial improvement in return also reflects the pricing strategy, aiming at removing the differentials between the council and commercial prices by increasing council charges to the level of the commercial charges.

The declining return on assets under case 2 illustrates the combined effect of:

- declining revenue due to reduced landfill volume
- higher recycling costs
- higher interest costs associated with the substantial capital expenditure program to facilitate waste diversion.

These factors bring the return on assets down to 3% in 2000.

Distributions to Government

As shown in Figure 9.10, the aggregate distributions (tax equivalents and dividends) to the Government over the next five years would be around $40m under the base case and case 3 (modelled on the same level of operating surplus and return on assets as the base case, but with a 60% diversion target). The distributions projected in case 4 double that of the base case, due to increased operating surpluses by reason of higher price increases being factored into the scenario in order to meet the Treasury's target return.

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46 Earnings before interest and tax/total assets at end of financial year.
If prices increase by only the CPI inflation rate of 4%, profit and return deteriorate dramatically because of higher operating costs and capital expenditure associated with recycling activities. This is clearly demonstrated by case 2 where the distributions reduce to 44% of the base case.

**Debt and equity**

As a result of the growing capital expenditure level over the period, there is considerable demand on cash flows, as indicated in the rising debt/equity ratio which falls into the range of 43%-57% towards 2000. However, this is still consistent with the All Company Average of 50%-60%.

By contrast, in case 4 the debt/equity ratio falls substantially, despite significant growth in capex. This reflects the strong operating cash flows underpinning this scenario. The cash flows are sufficient to cover the capex and also reduce debt to a level even lower than in 1994/95.

It is clear from the above analysis that increases in landfill and transfer station charges to meet Treasury's target return generate sufficient cash flows for its substantial capital expenditure program while providing a higher return on assets and equity than was achieved by Waste Service NSW in 1994/95. This is well above the All Company Average. Distributions to Government double by reason of the enhanced operating surpluses.

It is estimated that the council landfill prices will need to be increased by around 25% in real terms over the next five years in order to sustain a 10% return on assets (pre tax) of Waste

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**Figure 9.10  Tax equivalents and dividends**

![Tax equivalents and dividends](image)

**Figure 9.11  Debt and equity ratio**

![Debt and equity ratio](image)
Service NSW's solid waste business while allowing the differential in council and commercial charges to be eliminated.

9.8 Conclusions

Overall, Waste Service NSW is in a sound financial position as evidenced by the stable cash flow generated by its operations and a return comparable to that of the private sector over the past five years. Although profit and return on assets have decreased since 1990/91, the declining trend is being reversed in 1995/96 with return on assets estimated to increase substantially to around 16.6%.

Given its present low debt level, its de facto monopoly over putrescible waste and its legal monopoly over liquid waste management, Waste Service NSW has considerable debt servicing capacity. The gearing level of Waste Service NSW can be brought closer to that of the private sector, which averages 50%-60%, without compromising a good investment grade rating and while maintaining financial flexibility to cover contingencies.

With a capital structure which approximates the private sector, and having regard to the business risk profile of Waste Service NSW, it is considered that the appropriate cost of equity for Waste Service NSW is around 13.5% (nominal post tax).

Recommendation 9.1

Having regard to the business of Waste Service NSW and its capital structure, which approximates the private sector, the appropriate nominal post tax cost of equity for Waste Service NSW should be in the range of 13% to 14.5%.

Schedule A

WASTE SERVICE NSW

Financial Summary For Five Reporting Periods

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue ($m)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Regional depots</td>
<td>79.8</td>
<td>61.7</td>
<td>61.7</td>
<td>65.1</td>
<td>70.1</td>
</tr>
<tr>
<td>Other</td>
<td>8.0</td>
<td>7.1</td>
<td>3.3</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>87.8</td>
<td>68.8</td>
<td>65.0</td>
<td>66.8</td>
<td>71.9</td>
</tr>
<tr>
<td><strong>Expenditure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depots operating costs</td>
<td>54.2</td>
<td>38.4</td>
<td>39.0</td>
<td>44.2</td>
<td>45.8</td>
</tr>
<tr>
<td>Statutory contributions</td>
<td>1.7</td>
<td>5.9</td>
<td>7.1</td>
<td></td>
<td>6.9</td>
</tr>
<tr>
<td>Management and administration</td>
<td>6.0</td>
<td>5.7</td>
<td>5.2</td>
<td>4.0</td>
<td>4.6</td>
</tr>
<tr>
<td>Technical and research</td>
<td>4.1</td>
<td>4.6</td>
<td>2.8</td>
<td>3.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Interest payable</td>
<td>0.4</td>
<td>0.1</td>
<td>0.1</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>64.7</td>
<td>50.5</td>
<td>53.0</td>
<td>58.8</td>
<td>62.5</td>
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<tr>
<td>Abnormal items-write off</td>
<td>1.3</td>
<td>1.9</td>
<td></td>
<td></td>
<td>4.6</td>
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<tr>
<td><strong>Operating surplus after abnormal</strong></td>
<td>23.1</td>
<td>17.0</td>
<td>10.1</td>
<td>8.0</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>Tax equivalents</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.6</td>
</tr>
<tr>
<td>Operating capital after tax</td>
<td>23.1</td>
<td>17.0</td>
<td>10.1</td>
<td>8.0</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Dividend/Tax to State Government</strong></td>
<td>8.5</td>
<td>8.6</td>
<td>27.1</td>
<td>5.6</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Balance Sheet</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td>49.0</td>
<td>42.2</td>
<td>8.8</td>
<td>9.0</td>
<td>21.9</td>
</tr>
<tr>
<td>Non-current assets</td>
<td>64.6</td>
<td>88.5</td>
<td>101.5</td>
<td>105.8</td>
<td>102.1</td>
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<tr>
<td><strong>Total</strong></td>
<td>113.7</td>
<td>130.7</td>
<td>110.4</td>
<td>114.8</td>
<td>123.9</td>
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<tr>
<td>Current liabilities</td>
<td>13.4</td>
<td>23.6</td>
<td>19.1</td>
<td>22.3</td>
<td>19.8</td>
</tr>
<tr>
<td>Non-current liabilities</td>
<td>17.3</td>
<td>15.5</td>
<td>19.5</td>
<td>18.3</td>
<td>30.8</td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td>30.6</td>
<td>39.1</td>
<td>38.5</td>
<td>40.6</td>
<td>50.6</td>
</tr>
<tr>
<td>Net assets</td>
<td>83.0</td>
<td>91.6</td>
<td>71.9</td>
<td>74.2</td>
<td>73.3</td>
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<tr>
<td><strong>Capital and retained earnings</strong></td>
<td>83.0</td>
<td>91.6</td>
<td>71.9</td>
<td>74.2</td>
<td>73.3</td>
</tr>
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</table>


Notes:
(1) Period 1991 consists of 15 months (65 weeks).
(3) Dividends in 1993 included a $20 million special dividend.
WASTE SERVICE NSW

Statements of Cash Flows
($million)

<table>
<thead>
<tr>
<th>For the year ended 30 June</th>
<th>1993</th>
<th>1994</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cash flows from operating activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receipts from trade debtors</td>
<td>63.2</td>
<td>65.7</td>
<td>67.5</td>
</tr>
<tr>
<td>Payments to trade creditors, suppliers and employees</td>
<td>(36.6)</td>
<td>(45.0)</td>
<td>(44.2)</td>
</tr>
<tr>
<td>Interest received</td>
<td>1.5</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Net cash flow from operating activities</strong></td>
<td>28.0</td>
<td>20.9</td>
<td>23.6</td>
</tr>
<tr>
<td><strong>Cash flows from investing activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payments for property, plant and equipment</td>
<td>(25.8)</td>
<td>(12.5)</td>
<td>(8.2)</td>
</tr>
<tr>
<td>Proceeds from sale of property, plant and equipment</td>
<td>0.7</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Net cash flows from investing activities</strong></td>
<td>(25.1)</td>
<td>(12.0)</td>
<td>(7.7)</td>
</tr>
<tr>
<td><strong>Cash flows from financing activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proceeds from borrowings</td>
<td>2.0</td>
<td>10.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Payment of bank loans</td>
<td>(0.5)</td>
<td>(4.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Net cash flows from financing activities</strong></td>
<td>1.5</td>
<td>5.8</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Cash flow to Government</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statutory contributions</td>
<td>(5.9)</td>
<td>(7.1)</td>
<td>(6.9)</td>
</tr>
<tr>
<td>Dividends paid</td>
<td>(28.6)</td>
<td>(7.1)</td>
<td>(5.4)</td>
</tr>
<tr>
<td><strong>Tax equivalent</strong></td>
<td></td>
<td></td>
<td>(1.5)</td>
</tr>
<tr>
<td>Waste minimisation reserve transferred to EPA</td>
<td>(2.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net cash flows to Government</strong></td>
<td>(37.2)</td>
<td>(14.1)</td>
<td>(13.8)</td>
</tr>
<tr>
<td><strong>Net increase in cash held</strong></td>
<td>(32.8)</td>
<td>0.6</td>
<td>7.0</td>
</tr>
</tbody>
</table>

| Cash at beginning of financial year | 34.6 | 1.8 | 2.4 |

| Cash at end of financial year | 1.8 | 2.4 | 9.5 |


Note:
(1) 1990/91 and 1991/92 cashflows are not shown here because they are presented in the outdated source and application of funds format.
Schedule B

LANDFILL AND TRANSFER STATION CHARGES
(including Waste Disposal Levy)

Case 1 and 2: charges increase by CPI

Case 3: charges to maintain 10% return on assets

Case 4: charges to meet Treasury return on asset and equity targets

Note: Charges are expressed in dollar of the year.
10 OTHER ISSUES

10.1 Equity concerns

Although the cost of waste disposal probably represents no more than 0.1% of average household expenditure, it has significant implications in relation to inter-generational and geographical equity.

The present generation should not impose the costs of managing its waste on future generations. Nor should the present generation’s waste management strategies diminish the net resources available to future generations. Communities in one geographical area should not be obliged to accept the costs of managing the waste created in another area without fair and adequate compensation.

This social or intra-generational equity principle is particularly important in dealing with essential services. In principle, equity concerns could be addressed by taxes and transfer payments. However, governments have often decided that disadvantaged consumers can be better targeted by direct assistance tied to a particular service. Waste disposal services are essential for public health reasons. However, the equity impact charges have on the less well off is probably less of a concern for waste services than for other essential services such as health, water or electricity. Even if a consumer has no capacity to pay for waste management, it is impossible to deny access to such services, since this consumer could dump rubbish in a neighbour’s bin, in a public bin, or in the street. Those less well off are also less likely to generate so much rubbish. Waste management services tend to comprise a significantly smaller component of household expenditure than other essential services. For rental accommodation, domestic waste management services are usually paid for by the property owner through council rates.

Broader notions of intergenerational and geographical equity are much more pertinent to the issue of waste.

The principle that the present generation should not impose the costs of managing its waste on future generations and neither should the present generation’s waste management strategies diminish the net resources available to future generations, is linked to the principles of ecologically sustainable development (ESD). To the extent that waste avoidance and minimisation activities promote ESD, these principles require the present generation to support and bear the costs of such activities. Where present waste management practices are likely to incur future liabilities or additional replacement costs, these costs should be reflected in the current costs of managing waste.

Geographical equity means that the costs and benefits of managing wastes should be fairly distributed across a whole region. Communities in one area should not be obliged to accept the costs of managing the waste created in another area without adequate compensation. One way of supporting this objective is to ban transfers of waste between regions. However, this may mean that areas with limited capacity to manage or dispose of waste face much higher costs for dealing with waste than a neighbouring area with greater waste management capacity.

Negotiating "host fees" between regions, where those generating the waste in one area compensate another area for accepting waste on their behalf, may lead to a better outcome.
for both communities. In earlier sections, the concept of host fees as a way of incorporating external costs is discussed. Some submissions to this Inquiry have suggested that host fees could be financial, or take the form of community programs (eg sports development, improved parks and other facilities). Care must be exercised in applying this mechanism to avoid negative impacts on social equity, that is, where a community was prepared to accept a host fee, not because of its greater capacity to manage wastes but because of its disadvantaged socio-economic status.

Again, waste avoidance and minimisation schemes would also support the geographical equity principle because waste minimised at the point of generation does not require transportation, treatment and disposal in other places.

### 10.2 Illegal disposal

Pricing alone is not enough to achieve desirable waste management outcomes. For example, increasing waste-to-landfill disposal charges will make alternatives such as waste minimisation and recycling more attractive, but it is also likely to encourage the illegal disposal of waste. Such illegal disposal includes dumping waste in bushland, disposal of putrescible waste in non-putrescible landfills, and the under-reporting of waste at landfills to reduce disposal costs. Some submissions acknowledge such illegal activities. There needs to be flow control and regulations with penalties to deter such behaviour. Export of waste out of Sydney to rural areas is another possible reaction to higher waste disposal prices. Therefore, the same pricing policies, if not the same price, should be encouraged in rural areas close to the metropolitan area. The Government has acknowledged this in part by extending the waste disposal levy beyond the Sydney metropolitan area.

Increases in the waste disposal levy from 56 cents per tonne in 1991 to $7.20 per tonne in 1995 have created a strong incentive for waste producers to direct their waste towards waste facility operators who deliberately or inadvertently under-report disposal volumes.

The Tribunal is not aware of any evidence to suggest that Waste Service NSW under-reports the volume of waste it receives. As Waste Service NSW has calibrated weighbridges at all its facilities, it would be difficult to under-report. The fact that Waste Service NSW's revenue is also dependent on recorded waste volumes and that Waste Service NSW is Government owned means that it has little incentive to help customers avoid the waste disposal levy.

Waste Service NSW notes that,

"...in an environment where there is poor monitoring of illegal disposal, price rises will tend to reduce the rate at which landfills are filled, but with attendant risks of illegal dumping and associated environment costs. If increased charges for disposal are to be effective it is imperative that they be accompanied by effective monitoring." [Waste Service NSW submission, p. 51]

Under-reporting of waste disposal at landfill facilities also complicate the tasks of setting and measuring progress towards the waste-to-landfill reduction target.

---

48 Pioneer Australia, Pacific Waste Management, Kimberly Clark Australia.
REFERENCES


Morin R A, Regulatory Finance Utilities' Cost of Capital.


Pacific Waste Management, Environmental Management Guidelines for Solid Waste Landfills Submission, Environmental Protection Authority of New South Wales, NSW, 1995


Travers Morgan Pty Ltd, Steering Committee for the Study of the Economics of the Solid Waste Management Industry in Sydney, draft Working Papers, Sydney, 1992


APPENDIX A: TERMS OF REFERENCE

The Government Pricing Tribunal is conducting a review of the pricing policies for the services of the Waste Recycling and Processing Service of NSW.

This review has been referred to the Tribunal by the Premier pursuant to Section 12(1)(b) of the Government Pricing Tribunal Act 1992. The services concerned were gazetted as government monopoly services under Section 4 of the Act on 18 May 1995.

The review will take into account studies which have pointed to historical underpricing in waste disposal. The review will not directly consider pricing policies for any local or planning bodies which may be established in the future. However, issues relating to any other public operators will be considered in principle in advance of a formal reference being made.

While having regard to the matters listed in Section 15 of the Government Pricing Tribunal Act 1992, the review is to examine:

1. the proposals outlined in the Government's Waste Minimisation and Recycling Strategy of March 1995 insofar as they relate to pricing, including the Government's waste reduction objectives

2. the economic development, urban development, environmental, distributional and social impacts on present and future generations that arise from existing policies and that may arise from any program of price restructuring

3. the impact of landfill depletion and the future availability and location of landfill sites and alternative waste disposal, minimisation and management technologies on the Service's current pricing, and on the future costs of asset replacement

4. the cost of providing the Service's waste services at landfills and transfer stations, taking into account its full operating costs, transport costs, long term replacement costs, external costs and after closure care costs, while having regard to the wider costs of protection of the environment and the level of compensation for lost amenity that may need to be provided to specific communities that host new or expanded waste facilities

5. the need to ensure that the Waste Service operates at optimal efficiency to avoid unnecessary upward pressures on the pricing of waste services

6. the effect of alternative pricing policies on the demand for waste services, and the implications for landfill and waste infrastructure development, including the consumer cost and environmental implications of the Service's charges being based on weight or volume of waste, and the potential overall value of these types of waste charging

7. the impact of more stringent environmental standards on the costs and benefits of providing services and the efficient pricing of services

8. the implications of efficient pricing policies for the Service's capital structure and for the rate of return on assets to its shareholder, the Government
9. the impact on pricing policies of Government financial policies, including those relating to Financial Distribution, Monitoring, Capital Structure, Social Programs, Tax Equivalents and Government Guarantee Fees

10. the impact on pricing policies of any arrangement that the Service has entered into for the exercise of its functions by some other person or body, including the implications for pricing of the level of contracted out operations

11. the extent and implications of cross subsidies and differences in charges relating to location (e.g., landfill site versus transfer stations), source (e.g., domestic versus industrial wastes) and treatment (e.g., waste-to-landfill versus waste recycled/reprocessed)

12. the implications for pricing policies of the proposed corporatisation of the Service.
APPENDIX B: WASTE SERVICE NSW CHARGES 1995/96

Effective 1 July 1995 - 30 June 1996
All charges include the s.72 waste disposal levy of $7.20 per tonne

<table>
<thead>
<tr>
<th>Mixed wastes</th>
<th>Commercial Transfer Stations ($ per tonne)</th>
<th>Landfills ($ per tonne)</th>
<th>Council Transfer Stations ($ per tonne)</th>
<th>Landfill ($ per tonne)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated wood and garden waste</td>
<td>52.80</td>
<td>38.30</td>
<td>46.90</td>
<td>29.40</td>
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<tr>
<td>Mixed wastes containing paper with &gt;25% clean paper with &gt;25% contaminated</td>
<td>82.80</td>
<td>not accepted</td>
<td>63.30</td>
<td></td>
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<tr>
<td>Bulk demolition</td>
<td>833.00</td>
<td>not accepted</td>
<td>713.20</td>
<td></td>
</tr>
<tr>
<td>Foamed plastics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt, bricks, concrete, tiles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated and &lt;2 tonnes</td>
<td>not accepted</td>
<td>free (one load per day)</td>
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<tr>
<td>Separated and &gt;2 tonnes</td>
<td>not accepted</td>
<td>43.30</td>
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APPENDIX D: LIST OF SUBMISSIONS

Association of Liquidpaperboard Carton Manufacturers Inc.
Australian Chamber of Manufactures
Cessnock City Council
ECOS
Environment Protection Authority
Friends of the Earth
Hawkesbury-Nepean Catchment Management Trust
Hawkesbury City Council
Kimberly-Clark Australia
Kolback Environmental Services Limited
Ku-ring-gai Municipal Council
Litter & Recycling Research Association
Maunsell & Partners Pty Ltd
NSW Treasury
NSW Waste Service
Pacific Waste Management Pty Limited
Pioneer Australia Waste Management P/L
Ryde City Council
Sutherland Shire Council
Toxic Chemicals Committee
Universal Greening Pty Ltd
Vaucluse Progress Association
Warringah Council
Waverley Woollahra Process Plant
Western Sydney Regional Organisation of Councils
Willoughby City Council
**APPENDIX E: LIST OF ACRONYMS**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ACM</td>
<td>Australian Chamber of Manufacturers</td>
</tr>
<tr>
<td>COAG</td>
<td>Council of Australian Government</td>
</tr>
<tr>
<td>CPA</td>
<td>Competition Principles Agreement</td>
</tr>
<tr>
<td>CRR</td>
<td>Council Recycling Rebate</td>
</tr>
<tr>
<td>EPA</td>
<td>Environment Protection Authority</td>
</tr>
<tr>
<td>ESD</td>
<td>ecologically sustainable development</td>
</tr>
<tr>
<td>IPART</td>
<td>Independent Pricing and Regulatory Tribunal</td>
</tr>
<tr>
<td>LGSA</td>
<td>Local Government and Shires Associations</td>
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<td>MWDA</td>
<td>Metropolitan Waste Disposal Authority</td>
</tr>
<tr>
<td>NCP</td>
<td>National Competition Policy</td>
</tr>
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<td>PCB</td>
<td>polychlorinated biphenyls</td>
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<td>PWM</td>
<td>Pacific Waste Management</td>
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<tr>
<td>RDF</td>
<td>Refuse derived fuel</td>
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<td>STM</td>
<td>Symonds Travers Morgan</td>
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<td>Waste Management Authority</td>
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<td>WWPP</td>
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