

Waste management and hazardous substances





Objectives

1. The quantity of waste generated is reduced.
2. The quantity of residual wastes for disposal is minimised through reuse, recycling and resource recovery.
3. Adverse effects on the environment and human health from the inappropriate disposal of residual liquid and solid wastes are avoided or, where this is not possible, remedied or mitigated.
4. The potential for any accidental or unanticipated effects to arise as a result of the use, storage, transportation and disposal of hazardous substances is minimised and any adverse effects that do occur are remedied or mitigated.





Doing well

- The amount of waste put in landfills has been falling since 2000.
- Landfill gas is collected at two landfills and used for fuel.
At another landfill, it is collected and flared.
- Full compliance with resource consents for landfills and sewage treatment plants has improved from 15 per cent in 1999 to 62 per cent in 2004.
- Estimated volumes of dairy shed effluent recycled onto land more than doubled from 1,353 cubic metres in 1995 to 3,153 cubic metres in 2004.
During the same period, the amount discharged to rivers dropped from 636 cubic metres to 42 cubic metres.
- Over 12 tonnes of hazardous material has been collected and sent overseas for destruction.

Must improve

- Only around 20 percent of materials that can be recycled – glass, plastic and paper – are actually sent for recycling.



The rubbish put in the region's landfills in 2004 would nearly half fill the stadium. Up to 20 percent of this could have been diverted for composting or recycling.

What a waste

Waste, as defined by the Ministry for the Environment (MfE) in its 2002 *New Zealand Waste Strategy*, is any material – solid, liquid or gas – that is unwanted and/or unvalued, and discarded or discharged by its owner.

Waste used to be mostly a disposal issue. Solid waste was put in a rubbish dump and liquid waste – like sewage – was discharged into rivers and the sea. Waste disposal sometimes harmed the environment and wasted potentially valuable resources as well. Throwing waste away is evidence that we're not using resources efficiently.

The Regional Policy Statement promotes a waste management framework that sees waste as a resource, rather than a problem. In other words, if we're to deal with the impacts of waste, we have to start by reducing the amount we create. We can then follow the rest of the "waste management hierarchy" – reusing unwanted materials, recycling materials from waste, recovering resources (such as energy) from waste, and disposing of residual waste safely. MfE's Waste Strategy also favours this approach.

Reducing the amount we throw away would:

- lower the social costs and health risks of waste
- reduce damage to the environment from waste disposal
- increase economic benefit to the community by using materials more efficiently.

Waste management is an important part of living sustainably.

We can't measure the quantity of waste generated. This is because it's impossible to monitor the quantities of unwanted materials that are sold or given away, such as at garage sales, second hand shops or over the internet. For this report, Objectives 1 and 2 have been measured in terms of quantities of unwanted material disposed of at landfills and at recycling centres; and quantities of liquid waste collected and disposed of from sewage treatment plants and the agricultural industry.

Objective 3 has been measured by the level of compliance with resource consents for landfills and sewage treatment plants, and the number of waste pollution incidents reported on our Pollution Hotline.

Where we are now

The responsibility for waste management rests chiefly with city and district councils. Under the Local Government Act 2002, they must prepare a waste management plan setting out how waste is managed in their district. Such plans cover all kinds of waste and must state who will collect it, and how waste will be reduced, reused, recycled, recovered, treated and disposed of.

Landfills

The Waikanae landfill in Kapiti closed in 2003, leaving nine municipal landfills in the region – Paraparaumu, Porirua, Wellington (northern and southern), Wainuiomata, Silverstream, Martinborough, Carterton and Masterton. There are two privately owned landfills in Wellington, but Greater Wellington has no data on the volumes and kinds of waste they receive.

All city and district councils in the region monitor the waste arriving at their landfills and recycling centres. Their information has gone into this report, summarised in Table 10.1 (Note, the most recent Kapiti data is 2002).

| District | Tonnes landfilled 1999 | Tonnes landfilled 2004 | Tonnes composted 2004 | Kilograms landfilled per person 2004 | Kilograms recycled per person 2004 |
|-------------|------------------------|------------------------|-----------------------|--------------------------------------|------------------------------------|
| Kapiti | 45,514 | 43,299 | 12,785 | 1,020 | 28 |
| Porirua | 107,809 | 69,453 | None | 1,123 | 47 |
| Hutt cities | 134,120 | 147,058 | None | 1,064 | 37 |
| Wellington | 118,173 | 107,533 | 26,194 | 628 | 57 |
| Wairarapa | 11,700 | 15,534 | 9,086 | 395 | 89 |
| Region | 417,316 | 382,877 | 48,065 | 837 | 49 |

Table 10.1:
Volumes of solid waste landfilled, composted and recycled annually.

In 2004, the region's landfills took 382,877 tonnes of material – about 837 kg per person, down by 20 per cent on the 1,019 kg per capita figure of 2001. Records for 1999, when the last *Measuring Up* was published, were not based on weight. An estimated 417,316 tonnes of waste went to landfills then, or about one tonne per person. Data for 1995, when the Regional Policy Statement was made operative, are insufficient to make any useful comparisons.

Porirua more than halved the per capita volume of waste sent to its landfills between 2001 and 2004, but regionally, Porirua residents still landfilled the most waste in 2004 (1,123 kg/year per person). They were closely followed by Hutt Valley residents (1,064 kg/year per person). Wairarapa residents had the lowest rate of landfilled waste in the region in 2004 (395 kg/year per person), less than half of Porirua and Hutt city residents.



Since 1996, the number of cans sent for recycling in Wellington City has doubled from about 350 tonnes to just over 700 tonnes.

Overall, the total amount of waste sent to landfills has been falling each year, except at Wainuiomata and Silverstream landfills.

The rising amount of waste sent to these landfills could be because their landfill fees are less expensive than the nearest alternatives at Porirua and Wellington, and because they don't divert green waste from the landfill.

Recycling centres

All districts in the region run recycling stations where paper, cans, and glass can be disposed of at no charge. Porirua, Upper Hutt, Lower Hutt, Wellington, Masterton, Carterton and South Wairarapa also have kerbside recycling collections in residential areas.

In 2004, 22,519 tonnes of material were diverted from landfills for recycling, equating to about 49 kg per person. Recycling figures prior to 2000 are inadequate, so this figure cannot be compared with the amounts diverted in 1999 or 1995.

Wairarapa sent the most waste for recycling in 2004 at 89 kg per person. Kapiti Coast – where there is no kerbside recycling service – sent the least, at 28 kg per person. During the last five years, each council has examined the composition of waste in its landfills. The results show that the bulk of recyclable material – mostly paper and cardboard – still gets dumped. More than 30,000 tonnes of paper and cardboard is being landfilled annually, as against the 6,000 tonnes that is being recycled.

Composting at landfills

All landfills except Porirua, Silverstream and Wainuiomata divert green waste for composting. Overall, some 48,000 tonnes of green waste is composted each year, reducing the demand on landfills by 22 per cent. If a similar proportion of green waste was diverted from Porirua and the Hutt landfills, another 48,000 tonnes of green waste would be composted.

Landfill gas

Three landfills in the region collect the gas that decomposing waste produces. This gas is mainly made up of the greenhouse gas methane. Gas collected from Porirua and Silverstream landfills is used for fuel, while at Wellington's southern landfill it is collected and flared. Flaring gas reduces the amount of methane discharged into the environment. The remaining six landfills do not collect gas, allowing it to vent naturally instead. Greater Wellington does not have information about the amount of gas collected each year.

Liquid waste

The region's liquid waste is discharged to the sea, fresh water and land.

There are 12 municipal sewage treatment plants in the region; two – Wainuiomata and



Waikanae – having closed down in the last five years. Seaview and Paraparaumu plants now service those communities. Today, about 413,440 people – or 90 per cent of the region’s population – live in areas served by reticulated sewerage.

The sewage treatment plants treat 183,135 cubic metres of sewage and industrial wastewater every day. There are also three small privately-owned plants in the region, belonging to a motel, a rural business and a school.

The rest of the population – around 43,000 people – relies on systems like septic tanks. These discharge some 8,700 cubic metres of sewage every day.

In 2004, there were eight piggeries in the region, the same as in 1995. Greater Wellington has no information about the number of pigs in each, so it’s difficult to gauge the total effluent they produce. The largest piggery in the region – with around 11,000 pigs – might produce up to 30 cubic metres of raw effluent daily.

The number of dairy farms in the region rose from 197 to 229 in the ten years up to 2005. Herd sizes also increased. This meant that the number of cows in the region went from 70,550 in 1999 to a peak of 74,224 in 2003. By 2004, dairy cow numbers had decreased slightly to 74,010.

Sewage effluent is by far the biggest proportion of liquid waste in the region. Almost all of it – 94 per cent – is discharged to coastal or fresh water. The nitrogen load on the Ruamahanga River from sewage adds up to around 74 tonnes per year, most of it (58 tonnes) coming from the Masterton plant. Each summer since 2003-04, the Carterton plant has discharged to land, reducing the nitrogen load on the river by nearly four tonnes a year.



Wellington City Council’s sewage treatment plant at Moa Point near Wellington serves a population of about 130,000. The sewage is treated by screens, aerated tanks, bioreactors, clarifiers and finally ultra violet light for disinfection. The treated effluent is discharged from a 1.8 km outfall into Cook Strait.

| | To land 1995 | To fresh water 1995 | To land 2004 | To fresh water 2004 | To coastal water 2004 |
|--|--------------|---------------------|--------------|---------------------|-----------------------|
| Sewage effluent discharged (m ³ / day) | Not reported | Not reported | 10,816 | 29,108 | 151,903 |
| Estimated dairy effluent discharged (m ³ / day) | 1,353 | 636 | 3,153 | 42 | 0 |

Table 10.2: Volumes of liquid waste produced daily, and the receiving environments.

In 1995, 68 per cent of all dairy farms discharged their dairy shed effluent to land, with the rest discharging to water. By 2004, this had changed to 99 per cent of all dairy farms discharging to land.

This practice has significantly cut the amount of dairy shed effluent pumped into rivers, despite a 60 per cent increase in the number of dairy cows in the region. It translates to a 70-tonne reduction in nitrogen discharged into the rivers – down to just 5 tonnes in 2004. However, these figures don’t include effluent from stock access and stock crossings – the volumes of effluent reaching streams this way is not monitored.



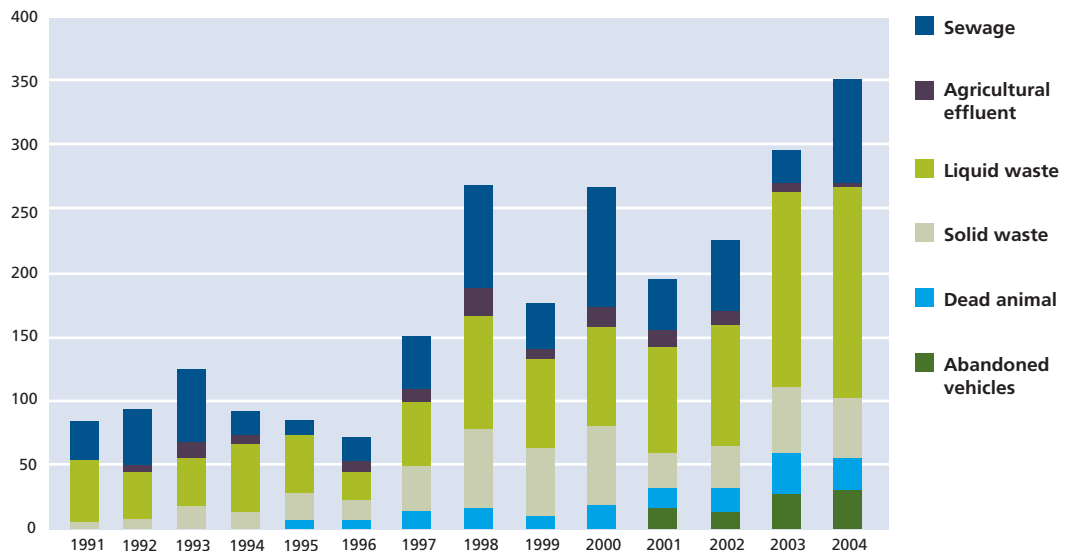
Managing the effects

Greater Wellington controls the environmental impacts of landfill waste and sewage discharges. We do this by imposing conditions on resource consents issued under the Resource Management Act 1991 (RMA), and by checking to see that those conditions are met. We also respond to all reported pollution incidents and unconsented activities around the clock. Any person who disposes of waste without a resource consent faces enforcement action.

Compliance with resource consents for landfills and sewage treatment plants has improved steadily over the last five years. In 1999, only one in 12 landfills and three out of 14 sewage treatment plants met all consent conditions – a compliance rate of 15 per cent. By 2004, this rate had increased to 62 per cent. Greater Wellington requires all condition breaches to be rectified as soon as they are discovered.

Liquid waste, including sewage and agricultural, accounted for twice as many pollution incidents as solid waste during the surveyed period (see figure 10.1). The overall increase in reported incidents may stem from a growing awareness in the community of Greater Wellington's role in environmental management, rather than any increase in actual incidents.

Figure 10.1: Reported pollution incidents about waste increased from fewer than 100 per year prior to 1997 (except for 1993, with 127) to 348 in 2004. The trend is for reported incidents to increase.



Hazardous substances and hazardous waste

Objective 4 of the Regional Policy Statement has been measured against the number of hazardous substance pollution incidents reported since 1991, the amount of hazardous material Greater Wellington and city and district councils have collected and disposed of, and the number of known contaminated sites cleaned up since 1995.

Pollution incidents

Our records show that reported incidents involving hazardous material or hydrocarbons (such as petrol and oil) varied between 27 and 38 each year during 1991-1995, but have been increasing steadily ever since, totalling 127 in 2004. Hydrocarbons are typically responsible for at least twice the incidents of other hazardous materials.



Calls to the pollution hotline show a rising trend over the last 14 years, with around three times more calls in 2004 than in 1991. Incidents are affecting land, fresh water and sea at much the same rate.

As far as possible, the pollution control team ensures that any adverse effects from pollution incidents are dealt with by those responsible.

Hazardous waste collections

Greater Wellington collected 22.3 tonnes of unwanted agrichemicals from rural properties during 2001-03. They ranged from the banned insecticide DDT to herbicides such as Round Up or Tordon, which can still be used. Of the chemicals collected, 11.6 tonnes (52 per cent) were sent overseas for safe treatment and disposal. A further 6.8 tonnes (31 per cent) were treated and disposed of in New Zealand. The remaining 3.8 tonnes (17 per cent) were cleared for reuse.

Some landfills in the region accept hazardous waste, then send it for treatment or disposal elsewhere. Wellington City Council's southern landfill accepts around 7,650 litres of hazardous wastes every year. In addition, they collect over 10,000 litres of waste oil annually and send it for recycling. Kapiti Coast District Council's Otaihanga landfill accepts about 1,068 tonnes of hazardous waste, including waste oil, annually. Masterton District Council's landfill accepts about 2,250 tonnes of hazardous waste annually, including waste oil and special waste. We don't have data from Upper Hutt City about the amount of hazardous waste collected at the Silverstream landfill, and the Wainuiomata and Porirua landfills do not accept hazardous waste.

Upper Hutt and Hutt city councils run household hazardous waste collections annually, collecting an average of 7.4 tonnes a year since 2002. In three years of collecting, they have sent 19.1 tonnes (mostly paint) for recycling, 2.5 tonnes for treatment and safe disposal in New Zealand, and half a tonne overseas for destruction.

Contaminated land

Contaminated land is a legacy of poor waste management. In the late 1990s, Greater Wellington began compiling information about sites with a history of using, storing or manufacturing hazardous substances, including closed landfills. By 2004, there were more than 1,600 sites on the database.

Under the RMA, city and district councils govern the subdivision, use and development of contaminated land. Their staff have direct access to Greater Wellington's database, and use information on it when assessing subdivision and land use applications. Our records show that they look at the database between 300 and 400 times a week.

Greater Wellington has investigated some of the sites on the database for soil contamination. So far, 136 have been managed or cleaned up, 102 have been confirmed as contaminated but await remediation, and 36 have been judged clean. Because some have yet to be tested, the full number of contaminated sites is unknown.

Leachate leaking from a closed landfill in Wellington City. A toxic brew produced when water drains through decomposing rubbish, this leachate was reported to Greater Wellington's pollution control team. It was traced to a broken pipe, which was duly repaired so the leachate could be sent to sewer.



What's being done

Dealing with waste

Before we can follow the waste hierarchy – to reduce, reuse, recycle, and recover resources – waste has to be checked for its recycling or reuse potential. Someone then has to make that happen. This means the behaviour of the people discarding recyclable waste must be changed, and uses or markets found for the recycled material.

MfE's Waste Strategy sets targets for waste minimisation, hazardous waste management, and waste disposal. In line with the Strategy's principle of full cost pricing, some landfill operators in the region run charging policies that reflect disposal costs and encourage waste reduction and recycling. All city and district councils charge according to the type of waste and whether it comes from householders or commercial operators.

Charges for clean fill and green waste are generally cheapest, if not free. Specialised waste, like fridges, cars and tyres are more expensive. No one charges for the paper, glass and cans taken to recycling centres.

In 2004, MfE introduced a national environmental standard requiring greenhouse gases from landfills of over one million tonnes capacity to be collected and destroyed (or utilised). The Ministry is also developing 'product stewardship' schemes, which encourage producers, brand owners, importers and consumers to help manage the environmental effects of their products throughout their life cycle. Wastes that are particularly hard to manage, such as computer parts, cars and used oil, get the highest priority.

In 2004, Greater Wellington looked at attitudes to waste and waste reduction for our social marketing campaign, *Be the Difference*. This campaign aims to raise environmental awareness and promote personal action among the region's residents. We wanted to find out:

- people's level of awareness about waste and waste issues
- what sort of information would inspire them to change their attitudes and behaviour towards waste.

We found that, of all sustainability issues, people responded most readily to rubbish and recycling, but that enthusiasm was compromised in those districts without kerbside recycling. Conversely, regular collections (weekly) sustained recycling habits. We also found widespread scepticism about what happens to recycled materials, so there was an opportunity to educate about what happens to recycled and 'binned' material. People do not see composting organic waste as waste management and think it's only useful for fertilising their gardens.

As a result of the survey, Greater Wellington focused its campaign for waste on educating people about what can be recycled, why it's important, and what happens to recycled materials.



Hazardous substances management

Greater Wellington has produced two fact sheets: *Hazardous Substances*, which outlines how people can lessen risks from hazardous substances, and *Petroleum Hazards*, dealing with the risks of transporting and storing petroleum products. Both are available on Greater Wellington's web site.

Two reports have also been produced on the nature and distribution of hazards associated with petroleum transportation, where petroleum products are stored, and their vulnerability to natural hazards. These reports are *Petroleum Transportation Hazards in the Wellington Region*, and *Natural Hazards Risk Associated With Petroleum Storage, Wellington Region*.

Where to from here?

Population trends and the local economy typically drive waste volumes. From 2000 to 2004, the region's Gross Domestic Product (GDP) growth rate of 3.9 per cent was third nationally behind Manawatu-Wanganui and Canterbury. Our nominal GDP per capita of \$36,732 was the highest in New Zealand (New Zealand Institute of Economic Research, 2004). Despite this growth, the amount of waste sent to landfills since 1999 has fallen. It seems then, that we can expect total waste volumes to keep dropping, so long as city and district councils continue to compost green waste and divert paper, plastic and glass for recycling.

The Carterton landfill closed in September 2004, and three more are expected to close in the next two years – Wellington's northern landfill (December 2005), Masterton's landfill (December 2006), and Kapiti's Otaihanga landfill (2007). With the exception of Wainuiomata, the five remaining municipal landfills all have a good compliance history. Wainuiomata is expected to fill up and close by 2013. If compliance continues to improve, the environmental impacts of landfills in the region should decrease.

The amount of liquid waste produced and disposed in the region depends largely on the number of people and animals in the region, and the kinds of industry it supports. It's possible that per capita sewage volumes may fall if we use more water efficient appliances (washing machines, dishwashers, showers, and dual flush toilets), though any such drop is likely to be offset by an increase in the region's population. If the overall number of dairy cows in the region keeps falling, as it has since 2003, then dairy farm effluent volumes will follow suit.

No sewage treatment plants are expected to close in the next decade. Those serving Martinborough and Carterton operate under new consents, granted in the last five years, that oblige them to improve effluent quality by 2010.

Consents for the plants serving Featherston and Masterton are under review and should be finalised within the next five years.



Masterton's landfill, on the banks of the Ruamahanga River, will close down by December 2006. After this, waste will be collected here and transported elsewhere for disposal, probably out of the region.

A 2005 amendment to the Resource Management Act 1991 placed new functions on regional councils and city and district councils for contaminated land. Regional councils now hold the responsibility of “investigation of land to identify and monitor contaminated land”, while controlling the subdivision, use and development of contaminated land rests with city and district councils. This will give them more power to decline subdivision consents or applications to change land use if it is contaminated. It could also give landowners an incentive to clean up contaminated land before subdividing.

Investigating the soils near the Waiwhetu Stream, Hutt City, 2005. The stream bed was contaminated by waste from nearby heavy industry from the 1940s until the installation of a trade waste sewer in 1978. With financial assistance from the Ministry for the Environment’s contaminated site remediation fund, Greater Wellington and Hutt City Council are investigating options for cleaning up the stream bed in its lower reaches.



More information

Croucher, Bruce, 2005. *Soil quality monitoring technical report*. Greater Wellington.

Forsyth, Kirsten, 2005. *Waste management and hazardous substances – background report*. Greater Wellington.

Ministry for the Environment, 2002. *New Zealand Waste Strategy*.

