

**ENVIRONMENTAL PROTECTION  
EXPENDITURE ACCOUNT**

**- For The Public Sector -**

**Year Ended June 2001**

Statistics New Zealand

July 2002

## *Acknowledgement*

Statistics New Zealand would like to acknowledge the contribution made by staff members Alex Bayley and Chase O'Brien. This report was prepared by the Regional and Environmental Statistics Division and published by the Publishing and Library Services Division of Statistics New Zealand.

## *Further information*

For further information on the statistics in this report, or on other publications or products, contact our Customer Services Centres.

### **Auckland**

Private Bag 92003  
Phone 09 357 2100  
Fax 09 379 0859

### **Wellington**

PO Box 2922  
Phone 04 495 4600  
Fax 04 495 4617

### **Christchurch**

Private Bag 4741  
Phone 03 374 8700  
Fax 03 374 8864

### **Internet**

**Home page:** <http://www.stats.govt.nz>

**Email:** [info@stats.govt.nz](mailto:info@stats.govt.nz)

## *Liability statement*

Statistics New Zealand gives no warranty that the information or data supplied contain no errors. However, all care and diligence has been used in processing, analysing and extracting the information. Statistics New Zealand will not be liable for any loss or damage suffered by the customer consequent upon the use, directly or indirectly, of the information supplied in this document.

## *Reproduction of material*

Any table or other material published in this report may be reproduced and published without further licence, provided that it does not purport to be published under government authority and that acknowledgement is made of this source.

## TABLE OF CONTENTS

<b>A. INTRODUCTION.....</b>	<b>1</b>
A.1 Background to environmental protection expenditure (EPE).....	1
A.1.1 EPE accounting .....	1
A.1.2 Defining environmental protection activities and natural resource management (NRM) .....	1
A.1.3 The benefits of measuring EPE .....	2
A.1.4 International EPE reporting .....	2
<b>B. OVERVIEW OF INSTITUTIONAL SECTORS INVOLVED IN EPE.....</b>	<b>4</b>
B.1 Local government .....	4
B.1.1 City councils.....	4
B.1.2 District councils.....	4
B.1.3 Regional councils .....	4
B.1.4 Unitary councils.....	5
B.2 Central government .....	5
B.2.1 Departmental output classes .....	5
B.2.2 Non departmental output class.....	5
B.2.3 Other expenses incurred by the Crown.....	5
B.3 Private sector .....	6
B.4 Household sector .....	6
<b>C. AN OVERVIEW OF EPE ACCOUNTS FOR NEW ZEALAND.....</b>	<b>7</b>
C.1 Overview of the Provisional Environmental Protection Expenditure Account 2000/2001 .....	7
C.1.1 Scope of the provisional account.....	7
C.1.2 Data source options for the provisional account.....	7
C.1.3 Significance of information gaps.....	8
C.2 Overview of the proposed full EPE account.....	9
C.2.1 Options for compiling a full account .....	9
C.2.2 Stand alone survey costings.....	11
<b>D. CLASSIFICATIONS AND DEFINITIONS.....</b>	<b>12</b>
D.1 Classification system used for the EPE account.....	12
D.1.1 Rationale behind EPE classification system.....	13
D.2 Classification system used for the NRM account.....	14
D.2.1 Rationale behind NRM classification system.....	14
<b>E. SOURCES AND METHODS FOR THE PROVISIONAL ACCOUNT.....</b>	<b>15</b>
E.1 Sources and methods for local government .....	15
E.1.1 Details of data sources .....	15
E.1.2 Inclusions and exclusions .....	15
E.1.3 Compiling the raw data .....	16
E.1.4 Estimates for gaps in data .....	16
E.1.5 Reviewing and reconciling the output figures.....	17
E.2 Sources and methods for central government .....	17
E.2.1 Details of data sources .....	17
E.2.2 Inclusions and exclusions .....	18
E.2.3 Compiling the raw data .....	18
E.2.4 Estimates for gaps in data .....	18
E.2.5 Reviewing and reconciling the output figures.....	18
<b>F. NEW ZEALAND'S ENVIRONMENTAL PROTECTION ACTIVITIES EXPENDITURE BY DOMAIN .....</b>	<b>19</b>
F.1 Summary table of environmental protection activities expenditure for the year ended June 2001 .....	19
F.2 Appraisal of data by domain .....	20
F.2.1 Waste management expenditure for the year ended June 2001.....	20
F.2.2 Wastewater management expenditure for the year ended June 2001 .....	22
F.2.3 Pollution abatement expenditure for the year ended June 2001 .....	23
F.2.4 Protection of biodiversity and landscape expenditure for the year ended June 2001 .....	25
F.2.5 Research and development expenditure for the year ended June 2001 .....	27
F.2.6 Environmental protection (not classified elsewhere) expenditure for the year ended June 2001.....	28
<b>G. NEW ZEALAND'S NRM EXPENDITURE BY DOMAIN .....</b>	<b>29</b>
G.1 Summary table of NRM expenditure for the year ended June 2001.....	29
G.2 Appraisal of data by domain.....	30
G.2.1 Regulatory control expenditure for the year ended June 2001 .....	30

G.2.2 Inland water management expenditure for the year ended June 2001 .....	32
G.2.3 Land management expenditure for the year ended June 2001 .....	33
G.2.4 Other resource management expenditure for the year ended June 2001 .....	34
<b>H. FUTURE DEVELOPMENTS.....</b>	<b>36</b>
H.1 Development of classification categories .....	36
H.2 Expanding the scope of the accounts.....	36
H.2.1 Natural hazard account.....	36
H.2.2 Exploitation of natural resources account.....	37
H.2.3 Environmental taxes account.....	37
H.2.4 Environmentally beneficial activities account.....	37
<b>I. GLOSSARY .....</b>	<b>38</b>
<b>J. BIBLIOGRAPHY .....</b>	<b>39</b>
<b>K. APPENDICES .....</b>	<b>40</b>
(i) Comparison table of classification system used with SEEA (CEPA 2000) and COFOG classifications .....	40
(ii) Comparison of the composition of environmental protection activity expenditure between New Zealand and Australia .....	41
(iii) Example of the same question appended to an AES survey and on a stand-alone EPE survey .....	42

## **A. Introduction**

---

This document is the first in what may become an annual investigation into environmental protection expenditure and its importance to the New Zealand economy. Environment protection expenditure (EPE) is an internationally recognised term used to describe all goods and services aimed at protecting the environment and encouraging the sustainable use of the earth's natural resources.

The purpose of this provisional account is twofold. Firstly, to present an estimate of EPE in New Zealand for the 2000/01 financial year from readily available expenditure data. Secondly, to research and present proposals on how a full account for EPE might be collected in future years.

### **A.1 Background to environmental protection expenditure (EPE)**

#### **A.1.1 EPE accounting**

Environmental protection expenditure (EPE) is a blanket term in the context of environmental accounting, and in practice is made up of a number of sub-accounts which aim to paint a complete picture of the 'environment industry'. The two core sub-accounts are for environmental protection activities (EPA) and natural resource management (NRM). Other possible sub-accounts are discussed in Section H, Future Developments.

Although the NRM sub-account works in conjunction with the EPA sub-account, the two are separate and do not overlap. The scope of the NRM sub-account includes activities where the primary aim is the sustainable use of natural resources for both social and economic reasons. The EPA account, on the other hand, covers the pure protection of the natural environment from the harmful effects of socio-economic activities. It is important to distinguish clearly between NRM and EPA. For example, if the reason for the establishment of a reserve is to protect the species it contains, it should be included as part of the EPA sub-account. If the primary reason for the reserve is for recreation, but through its creation it allows species to thrive, it should be included in the NRM sub-account

#### **A.1.2 Defining environmental protection activities and natural resource management**

The United Nations System for Integrated Environmental and Economic Accounting (SEEA) defines environmental protection activities as those activities whose principal purpose or function is to protect the natural environment, and to prevent or alleviate the adverse effects of human activities, which can be economic or social. Activities include the provision of both goods and services, some of which will be more instantly apparent than others. The environmental benefits of upgrading a city's stormwater reticulation network may not be as immediately obvious as the designation of a new national park. Both will, however, result in significant benefits to the natural environment, together with the non-environmental benefits they provide such as minimising the risk of homes flooding.

Activities where only a portion of the expense may be attributed to environmental protection may be included, provided there is a clearly identifiable benefit to the environment, for example the removal of chlorofluorocarbon gases from refrigerators. The protection, restoration or creation of natural habitats and biodiversity, such as the creation of predator-free environments and native bird recovery or rescue programmes, are also included, as is expenditure incurred monitoring the quality of air and fresh and marine water. Expenditure to improve internal use of residuals should also be included, for example putting the equipment in place to enable the use of black liquors – one of the main waste products of the pulp paper industry – for heating.

There is no international agreement defining natural resource management. In the New Zealand context, natural resource management activities are defined as those activities whose focus is the sustainable management of natural resources. Section 5, part II, of the 1991 Resource Management Act (RMA) defines sustainable management as “managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing, and for their health and safety, while (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations, (b) safeguarding the life-supporting capacity of air, water, soil and ecosystems, and (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.”

### **A.1.3 The benefits of measuring EPE**

The primary reason for compiling EPE estimates is to help analysis of the impact of economic and social policy on the environment. EPE information covers a wide range of environmental issues, from wastewater management to river and flood control, and from landfill site remediation to pollution abatement.

The benefits of having complete EPE accounts over time are that:

- They allow an estimate of the contribution of the ‘environment industry’ towards gross domestic product (GDP), and can be presented as satellite accounts to supplement the national accounts.
- They assist analysis of the impact of economic policy on the environment.
- They provide an indication of the economic response by industrial and institutional sectors to environmental protection regulations and policies, through changes in demand for associated products and services.
- They provide an indication of the level of demand for goods and services provided by the ‘environmental management industry’, and an indication of how much is spent on environmental protection by the industrial and institutional sector.
- They identify the sectors that are financing EPE.
- They allow for a comparison of the type and level of New Zealand’s EPE against the EPE of other countries.

Note that this initial set of EPE accounts is not complete, and is for one year only (2000/01). It does not provide all the benefits noted above. For more discussion on the benefits of EPE accounts and how they can be realised, see Section C.

### **A.1.4 International EPE reporting**

A number of countries have begun attempting to estimate the level of their EPE, with many countries producing EPE accounts in the past decade. Much of the pioneering EPE work was done by European Union countries. Canada and Australia are also leaders in the development of EPE accounts, with the Australian Bureau of Statistics (ABS) publishing national EPE accounts from 1991/92 onwards.

The first international accounts concentrated on measuring the costs associated with the prevention and response to pollution, guided by the Pollution Abatement and Control framework (PAC) developed by the Organisation for Economic Co-operation and Development (OECD). During the mid 1990s, the United Nations (UN) broadened the scope of environmental reporting with the publication of its SEEA. The SEEA recommended a number of new environmental accounts be established to supplement the 1993 System of National Accounts (SNA), which was already widely used to report national economic activity. One of the proposed environmental accounts referred to EPE. Eurostat, the European Union’s statistical agency, further developed the idea of an EPE account within the European System for the Collection of Economic Information on the Environment (SERIEE). It was also responsible for developing the Classification on Environmental Protection Activities (CEPA), the classification system that forms the basis of most national classifications, including this provisional account for New Zealand.

The SEEA was the first to suggest that the EPE account for a country be made up of a number of complementary, but mutually exclusive, sub-accounts to enable a complete picture of expenditure to be built up. Of the suggested sub-accounts, two significant ones are the EPA sub-account and the NRM sub-account.

Of these, the EPA sub-account is by far the most developed internationally, using a widely accepted standard classification, (CEPA). By contrast, the NRM sub-account is still at an early stage of development internationally, and, as the SEEA observes, it has no internationally recognised classification of what activities are to be included. The SEEA suggests that work on NRM sub-accounts will often depend on the specific characteristics and issues of the particular country. For example, in an arid country, water resources are a priority, whereas forest management might be more important to another country. The scope of the NRM sub-account for New Zealand has been based on general guidelines in the most recent version of the SEEA handbook, and on work undertaken by the Australian Bureau of Statistics

To enable a full account to be compiled for a nation's EPE, and thus enable many of the applications of the account to be applied, the SEEA notes that a number of separate aspects of a nation's economy must be analysed. This analysis must include details of expenditure and revenue, as well as gross fixed capital formation data, for the main sectors of a nation's economy.

## **B. Overview of institutional sectors involved in EPE**

---

### **B.1 Local government**

Local government in New Zealand is made up of four distinct types of councils – city, district, regional and unitary. While each of these types of council fulfils a different role with regard to the governing of New Zealand, all are engaged to some degree in activities aimed at protecting the environment and promoting sustainable use of resources.

#### **B.1.1 City councils**

There are 15 city councils in New Zealand, ranging from Auckland City, with a population of 367,734, to Upper Hutt City, with a population of 36,369 (figures taken from the 2001 Census usually resident population final count). City councils are primarily charged with providing the essential utilities and infrastructure which enable cities to function. Utilities within the scope of the EPE account that should be provided by all city councils are waste management, sewage and stormwater. In some cases, the actual work is undertaken by an outside contractor.

Under the RMA, all city councils are also responsible for the processing and authorising of resource consents within their boundaries, and any appeals that may eventuate. The RMA also requires all councils to produce an annual district plan that outlines its future plans, mainly those impacting on the natural and physical environment. The other function of city councils classified as EPE that should be included in all council plans is the management of parks and reserves. This is included under the NRM sub-account. In addition to these key EPE roles of city councils, individual councils may also engage in a number of other EPE activities specific to the individual character of their city, such as restoration of landfill sites, or protection of the coastal environment.

#### **B.1.2 District councils**

District councils are quite varied in nature, ranging from mainly urbanised, highly-populated councils, such as Rodney and Papakura District Councils, to remote rural councils with very small populations, such as Mackenzie and Westland District Councils. District councils are charged with providing the same key EPE functions as city councils – waste management, sewage, stormwater, resource consents, district plans, and parks and reserves. Due to their smaller size, district councils often do not have the dedicated planning and resource management staff of city councils. As a result, their financial accounts often reflect a more reactive type of spending, rather than the planning-based spending seen in city councils. District councils also have individual areas of EPE similar to city councils, such as restoration of landfill sites, or protection of the coastal environment.

#### **B.1.3 Regional councils**

The roles of the 12 regional councils in New Zealand are quite different from those of city and district councils and therefore the types of EPE are also quite different. Regional councils primarily have a strategic planning and monitoring role, with a focus on regional transportation and the protection of the natural environment, including harbours. They are also more involved with promotion of sustainable land use than city or district councils. Regional councils are not involved in the provision of essential utilities such as refuse collection and sewage disposal.

Regional, city and district councils all share the same resource consent process. They are jointly responsible for all consent applications made in New Zealand. Regional councils are responsible for consents of regional importance mainly concerned with the use and management of natural and physical resources, such as water bodies or forests. City and district councils are mostly charged with control of changes in land use and subdivision.

Regional councils face different issues from each other and may have different spending patterns. For instance, one council might emphasise soil conservation, while another might focus on coastal protection. However, there are a number of activities that should be present in all of their financial accounts. These are resource consent processing, sustainable land management, management of inland water, and pest control (both flora and fauna).

### **B.1.4 Unitary councils**

For the EPE account, four councils – the Chatham Islands, Gisborne, Marlborough and Tasman – have been defined as unitary councils (the Nelson unitary authority has been included as a city council due to its structural and functional composition). Unitary councils fulfil the functions of both a district council and a regional council. Spending occurs, therefore, on both the provision of essential utilities, similar to a district council, and on activities that are the responsibility of regional councils, such as pest control and inland water management.

## **B.2 Central government**

Central government spending on environmental protection in New Zealand can generally be separated into three types of expenditure: -

### **B.2.1 Departmental output classes**

These are costs incurred by various government departments and offices of parliament on the provision of environmental goods and services. They mainly involve the Department of Conservation (DOC) and the Ministry for the Environment (MFE), but also include significant expenses incurred by the Ministry of Agriculture and Forestry (MAF), the Ministry of Fisheries (MFish), and the Office of the Parliamentary Commissioner for the Environment.

### **B.2.2 Non departmental output class**

These are costs incurred by the Crown when purchasing goods and services from Crown entities, state-owned enterprises, or other third parties. Crown entities include the Energy Efficiency and Conservation Authority (EECA), the agency set up by the government under the Energy Efficiency and Conservation Act in 2000, and the Environmental Risk Management Authority (ERMA). An example of a payment made to a third party included under central government expenditure is that paid to companies involved in the clean up of orphan Crown contaminated sites such as at Mapua, near Nelson.

### **B.2.3 Other expenses incurred by the Crown**

There are also environmental expenses that must be met directly by the Crown. These include subscriptions to a number of international organisations and conventions, such as the United Nations environment program and the Montreal Protocol on Ozone Protection. The Crown also incurs various costs from specific legal obligations, for example esplanade reserve compensation, where obligatory compensation payments are made under the Local Government Act 1974 when esplanade reserves are created; and payments made under the Lake Waikaremoana Act for the lease of its lakebed and foreshore for conservation purposes.

## **B.3 Private sector**

The private sector plays a significant role in EPE. While the private sector is involved in almost as wide a range of activities as the public sector, in general the actual activities are markedly different. The private sector has a far greater focus on resolving and mitigating specific issues relating to the industry concerned, instead of the broader, more general, activities of the public sector. For example, a company which produces high levels of gaseous emissions will focus expenditure on end-of-pipe solution to reduce air pollution, while a farmer may target expenditure at preventing run-off from dairy cattle entering the local water course.

The overall contribution the private sector makes to total spending on environmental protection activities in New Zealand is thought to be substantial, although this cannot be quantified at present due to lack of available data. In the Australian EPE account for 1997 (the latest published account), the private sector accounted for approximately 32 percent of total EPE consumption. More than half the spending was for purchasing waste management services. A similar picture could be expected for New Zealand, although the significance of some non-essential components of EPE will vary between the two countries because the composition of the private sector is markedly different. For example, heavy industry in New Zealand is on a much smaller scale than in Australia, so will play a smaller role, although the EPE activities engaged in will be similar, such as actions aimed at reducing air and water pollution. EPE activities related to agriculture, such as pest control, may play a more significant role in private sector EPE in New Zealand than in Australia.

If the significance of the private sector to the total EPE in New Zealand is of a similar proportion to the private sector in Australia, we would expect the private sector EPE intermediate consumption total in New Zealand to be in the range of \$200 to \$300 million for 2001.

## **B.4 Household sector**

While households are the end beneficiaries of many EPE activities, they are often not responsible for the actual consumption of the goods and services involved. For many services consumed by households, most notably the consumption of waste and wastewater management services, it is local government that purchase the goods and services for the common good of the community. For this reason, the household sector is thought to make a much smaller contribution to the total EPE figure than either the private or the public sector.

There are a number of areas where household spending on EPE does occur, however. An example is the additional expense incurred by households when environmentally-friendly cleaning products are purchased, instead of the standard alternative, or the extra cost of purchasing low energy light bulbs compared with standard light bulbs. A second example is expenditure aimed at maintaining the garden habitat, which is particularly significant in large urban areas.

A potentially significant area that should also be included under household expenditure is the sum of all donations by households to charities with an environmental cause, such as Greenpeace and Forest and Bird.

## **C. An overview of EPE accounts for New Zealand**

---

The objectives of this report are twofold. Firstly, to present an estimate of EPE in New Zealand for the 2000/01 financial year from readily available expenditure data. Secondly, to research and present a proposal on how a full account for EPE can be collected in future years. When reading this report, it is important to bear in mind this dual role. The tables in this report form part of the provisional account and provide only an estimate of environmental expenditure by one sector of the economy. They do, however, have a second, but equally significant, role in showing the general structure and appearance a full EPE account would take.

If the decision is made to compile a full EPE account, the focus of identifying data sources will shift from using readily available sources to using sources that will provide the highest degree of accuracy. If the full account is compiled in line with the recommendations in this report, any concerns over accuracy caused through the use of draft annual plan estimates of expenditure in the provisional account will be removed, as figures will be revised using accurate data, collected and compiled in line with the proposed methodology of the full account, outlined in Section C.2.

### **C.1 Overview of the Provisional Environmental Protection Expenditure Account 2000/2001**

#### **C.1.1 Scope of the provisional account**

The Provisional Environmental Protection Expenditure Account 2000/2001 covers expenditure details for the public sector only. Neither the private sector nor the household sector is covered due to the lack of available data. The way local government data is published also prevented any estimate of revenue generated by the public sector. It was, however, possible to collect capital expenditure data for the public sector, allowing an accurate estimate of the sector's gross fixed capital formation to be calculated.

An estimate of household expenditure has not been included due to the level of detail of available expenditure data. Through analysis of available data, including Statistics New Zealand's Household Economic Survey (HES), it became apparent that the significance of household sector expenditure, compared with public sector expenditure in terms of final consumption, was relatively low due to the reason stated in Section B.4.

#### **C.1.2 Data source options for the provisional account**

For details of local government expenditure on environmental protection, two possible options were investigated – use of local authority annual plans and use of local authority annual reports. Annual reports have the advantage of providing the most accurate figures, as they include actual expenditure figures for the year. They do not, though, provide sufficient detail of the specific services and activities the spending refers to. In contrast, while annual plans provide only predicted levels of expenditure for the coming year, they provide much more detail of the services and activities being funded.

In practice, the issue of accuracy when using annual plan figures is not a major concern. This is because much of the expenditure included is already committed to, especially in more significant areas of spending, such as maintaining waste and wastewater systems, and salaries of employees engaged in environmental activities. An examination of a sample of annual plan and annual report operating expenditure totals for selected activities showed a difference between the plans and reports of only 1 percent for waste management, 2.6 percent for stormwater and 0.4 percent for resource consent processing. For this type of expenditure, the annual plans provide a good estimate of expenditure in the following year. Quality of data would only become an issue if the account relied on the use of projected figures that were several years after the year of the plan they were published in, due to the increased possibility of unforeseen expenditure. (See Section E.1.1 for details of source figures used in the tables in this report). Annual plans also have the

advantage of being more timely, being published by the authority approximately 18 months before the annual report for the corresponding year. It was decided, therefore, that the most appropriate option for measuring local government EPE was the use of annual plans. The actual methodology for using the plans is discussed in Section E.

Two data source options were also available for central government. The first involved annual reports highlighting expenditure for the year, which government departments and agencies, like local authorities, are required to publish by law. The second option, and the one chosen, was use of the *Estimates of Appropriations for the Government of New Zealand*, a document published annually by the Minister of Finance following the annual Budget announcement in May. This is complemented by the *Supplementary Estimates of Appropriations for the Government of New Zealand*, published at the same time, but relating to the previous financial year, to show any adjustments made to the original estimates in the intervening period. The advantages of the appropriations documents are that the information is published in the same timeframe as local authority annual plans, and the layout of the publication is such that it is unlikely any expenditure on environmental protection will be missed, which might be the case were individual department and agency annual reports used. (See Section E.2.1 for more details of the appropriation publication structure).

The accuracy of appropriations compared with total expenditure published in annual reports was investigated, and proved to be very high. Total Votes administered by the MFE amounted to \$15,918,000 for the year ended June 2000, with the corresponding total expenditure in the 1999/2000 annual report being \$15,893,000. DOC showed a total Vote of \$153,263,000 and an annual report expenditure total of \$149,030,000 for the same period.

### **C.1.3 Significance of information gaps**

There are three main information gaps in the Provisional Environmental Protection Expenditure Account 2000/2001 – the absence of data relating to household expenditure, the absence of data relating to private sector expenditure, and lack of suitable revenue data for all sectors of the economy.

The absence of household expenditure is seen as the least significant when compared with public and private sector expenditure. An accurate estimate is also the most difficult to collect. Some information is available from the HES, and this may eventually form the basis of the household sector estimate. But its current coverage is not sufficient to enable an estimation to be made. Analysis of the EPE accounts published by the ABS showed that outside of waste and wastewater charges, household EPE was limited. In the 1996/97 financial year, EPE by households, excluding waste and wastewater charges, accounted for 3.8 percent of the total consumption of EPE goods and services in Australia. It is also likely that any estimation of household EPE will be understated. While it is possible to collect data for some forms of expenditure, such as waste and wastewater services, or installing double glazing, it is more difficult to collect data on additional costs incurred by households purchasing ‘the greener option’, such as a new washing machine or dryer with a higher energy rating than a cheaper model with a lower rating. The Australian estimates indicate, however, that the monetary values involved are likely to be relatively insignificant.

The lack of available private sector data is of greater significance, as its absence prevents the calculation of an intermediate consumption estimation. The implications of this are discussed in the next section.

Revenue data is required to enable the compilation of supply and use tables (or input/output tables). The production of combined supply and use tables is seen as the desired end goal for EPE accounting (discussed in the next section), so the absence of revenue data is significant in the longer term. For the purposes of the provisional account, however, it is not seen as significant as the absence of private sector data, as worthwhile statistics such as the contribution of EPE to total GDP can be calculated without it.

## C.2 Overview of the proposed full EPE account

As observed in the previous section, the end goal of a full EPE account is to produce integrated supply and use tables that provide complete coverage of all environmental protection activities and natural resource management occurring in the economy.

The supply table will show which sectors and industries are providing which products and services. While environmental protection services are usually supplied domestically, the supply table will also include imports of any environmental protection products. The SEEA also notes that to compile total supply “it is necessary to add domestic output and imports and also include taxes on products and imports as well as any trade and transport margins which the purchaser must pay to take delivery of the products.”

For each type of product and service identified in the supply table, the use table shows the corresponding consumption. This will be classified as either ‘intermediate consumption’ by industries or as the ‘final consumption’ by households or general government. The supply and use tables can be reconciled to produce input-output tables, which provide more detailed information on the flow of environmental goods and services throughout the economy.

The basic supply/use framework can then be expanded to provide still more useful EPE information. Accounts for the suppliers of environmental services could be extended to include their intermediate costs, as well as the value of their output. This would allow value added (GDP) to be estimated for those activities. Similarly, the use tables could be extended to show the number of workers (and their wages) associated with this consumption, thus revealing the role of EPE activities in the labour market.

The supply and use framework can be augmented to form a complete set of environmental accounts. This involves extending the analysis to show how the expenditure is funded and what the net cost is to each sector of the economy.

National expenditure on environmental protection is a measure of the economic resources used by resident units to protect the environment and to improve the management of natural resources. EPE accounts can be used to produce estimates of national expenditure on environmental protection.

The various aggregates that enter the national expenditure aggregate can be compared with the corresponding aggregate in the national accounts. For example, final consumption on environmental protection can be compared with total final consumption. National expenditure can be compared with GDP to give an indication of the national effort in favour of environmental protection. For such a comparison to be valid, several assumptions have to be made, for instance, that the environment protection embodied in exports and imports are approximately equal and can be ignored. If these assumptions are valid, then national expenditure can be compared with GDP.

Environmental protection information can also be presented showing how environmental protection is financed. This shows who actually bears the ultimate cost of this expenditure. An example of this is government spending. When it is the government that provides and pays for the services but households that benefit, the expenditure is treated as being financed by government. For market producers, the financing of expenditure is mainly provided by the customers of the products.

### C.2.1 Options for compiling a full account

It is possible to make only a very broad general estimate of the contribution of the private sector to EPE in New Zealand, as there is no environmental protection revenue or expenditure data collected in existing Statistics New Zealand’s business surveys. To enable future accounts to include an estimate for the private sector, seen as the most significant gap in currently available data, a number of possible options for collecting details were investigated.

One option with potential is the addition of supplementary EPE questions to Statistics New Zealand’s Annual Enterprise Survey (AES) for selected industries. As the AES is already well established, this would

be easier to implement than a completely new survey. The experience of the ABS, which has 10 years of experience collecting EPE data, indicates however, that this is not a good option. It found when it used this approach, that responses were of poor quality. Zero values were often provided where there should have been some revenue or expenditure. The ABS found the problem lay in the fact that EPE was quite difficult conceptually for respondents to grasp. This was compounded by the limited space available on a survey form to explain the exact nature of what was being requested. Respondents required prompting into which activities were included within the scope of a question. (See example in Appendix (iii), which compares a question taken from the ABS stand-alone EPE survey and the same question hypothetically added to an AES).

A second option, a stand-alone EPE survey, would have more space for examples of types of EPE. This would clarify to the respondent what information was being collected. Also, an EPE questionnaire could be tailored to particular industries. For example, an EPE survey of the mining industry could ask a question on how much the industry had spent on cleaning up tailings. This reduces the need for the respondent to have a conceptual understanding of EPE when they fill out the questionnaire.

With regard to the public sector, although some detailed financial information is available from annual plans and reports, complete data is not available and some information, detailed in section E.1.4, has to be estimated. Compounding this is the fact that council plans are not consistent in their presentation of accounts and classification of transactions. A survey of local authorities would collect EPE information on a consistent basis, and enable a more accurate split of expenditure between the various categories and sub-categories of the EPE account.

An EPE survey of local authorities is the only method that can provide sufficiently detailed and accurate revenue information to enable full EPE accounts to be compiled. Revenue details in the plans and reports are generally good in relation to external revenue from user charges, fees, fines, etc. This varies between councils however. Separate rates for wastewater and for solid waste are reasonably well reported. The principal problem lies with the general rate contribution to an activity or service. The portion of this revenue that is EPE is often difficult, if not impossible, to determine.

Revenue and expenditure details for central government departments and agencies engaged in EPE activities are sufficiently well reported in available data sources. But if all local government information is gathered through survey questionnaires, it would be sensible to also collect central government information by survey. This would increase the accuracy of central government estimates with minimal additional cost or workload. A public sector questionnaire would be sent to all departments and agencies responsible for any EPE. A list of departments and agencies could be drawn from the *Estimates of Appropriations* document.

To be accurate and cost effective, a single EPE survey could be utilised, with separate questionnaires for public sector organisations and for the private sector. The sample size and frequency of the survey would need to be determined, together with a methodology to estimate figures for the intervening years if an annual survey were not deemed necessary. The survey would request revenue and expenditure details for the financial year 12 months prior to the year of the survey. For example, 2001/02 data would be collected in 2003. This would reduce respondent burden, as much of their account work would have already been done for their annual reports. Timeliness could be improved, but respondent burden would be increased.

A further option for the collection of private sector data, and possibly public sector data, is through the use of a simple generic questionnaire sent to all enterprises taking part in the survey, supported by a website providing technical support. This was the approach used in the 2000 EPE survey in the United Kingdom. There are a number of advantages to this approach, the two main ones being the simplicity of the questionnaire and the accuracy of the data collected. Because the questionnaire is supported by the website, it is not necessary to describe what each question involves, or to give examples. Therefore, the form is kept simple, speeding up processing and reducing printing costs. The high level of accuracy achieved by using this approach occurs because the website is not limited by space, so each industry can be described in detail in terms of what is included and excluded for each question. The United Kingdom website provides a separate page of technical notes for each separate industry (36 in total). For each industry the webpage provides a description of each question and provides examples specific to that industry of what should be included and excluded. The main disadvantage of this approach would be the set up costs. Development of the website would be both time consuming and costly.

An approach also considered for the collection of local government sector data was the promotion of a standard accounting framework for presenting financial accounts in the annual plans and reports. The problems encountered in the collection of local government data for the provisional EPE account were mainly due to the highly variable nature of the accounting, both in terms of the level of aggregation and scope. If all local government accounts were presented in a standard format that provided the necessary detail, there would be no need to survey, as EPE data could be taken straight from the plans or reports. Other users of multiple plans or reports would also see the benefits of a standard format. In terms of the EPE account, however, the use of a stand-alone survey would enable data to be collected for both the private and public sectors with little difference in cost or time; hence this would be a more preferable option.

Whichever method is chosen to collect EPE information from the public and private sectors, it will be important to express the benefits to potential data providers to ensure high response rates. Details of the potential benefits will become more apparent during the design phase of the chosen surveying method. They should include, though, the supply of relevant results and analysis to each of the contributing public sector institutions and private sector businesses.

While the relative importance of the household sector in terms of its contribution to total expenditure is small, it is an important aspect of a full account. The options available for collecting data are limited, with the most likely option being the addition of questions to the current HES.

### **C.2.2 Stand-alone survey costings**

The cost of a stand-alone survey was calculated by the Survey Design and Development Division at Statistics New Zealand.

The following industries were determined as the target population for the private sector questionnaire: agriculture; forestry; mining; fisheries; and electricity, gas and water providers. The target population for the public sector questionnaire would be all territorial and regional authorities, as well as central government departments and agencies involved in EPE, determined from the *Estimates of Appropriations for the Government of New Zealand*.

The calculations were based on an indicative sample size of 2,500 enterprises for the private sector, and of 100 organisations for the public sector. Small changes to the sample size would not greatly alter the overall cost of the survey.

Based on this information, the division calculated the cost of a one-off, stand-alone survey to be approximately \$475,000, exclusive of GST. The cost for a subsequent survey would be approximately \$120,000, due to many of the development costs being removed.

## D. Classifications and definitions

### D.1 Classification system used for the EPE account

1 <sup>st</sup> Tier	2 <sup>nd</sup> Tier	Definitions
<b>Waste management</b>	Collection and transportation	Involves the collection and removal of both industrial and domestic refuse. Also includes the cleaning and sweeping of streets, parks, markets, etc.
	Treatment and disposal	Treatment includes any method or process designed to change the physical, chemical or biological character of the waste to render it non-hazardous, transportable, storable, or enable recovery or recycling. Disposal involves the final placement of waste where no future uses are foreseen by landfill, containment, underground disposal, dumping at sea, etc.
	Other activities	Any other activities relating to waste management. Includes the prevention of pollution through modifications designed to reduce the level of waste produced. Also includes the management and disposal of hazardous waste.
<b>Wastewater management</b>	Sewage networks	Includes the construction and maintenance of a system of reticulation for all domestic and industrial wastewater. Also includes the treatment of collected sewage through any mechanical, biological or advanced process to render wastewater fit to meet applicable environmental standards. Also includes the treatment of cooling water, and methods to reduce the amount of sewage produced
	Stormwater networks	Involves the construction and maintenance of a system of reticulation for all urban stormwater.
<b>Pollution abatement</b>	Protection of ambient air and climate	Comprises any activities relating to ambient air and climate protection, including the monitoring and prevention of pollution through modifications designed to reduce the level of greenhouse gases and other emissions produced.
	Soil and groundwater protection	Consists of any processes designed to prevent pollutants from entering the ground water supply or the soil environment. Also includes methods or processes designed to reduce or remove pollutants from the soil.
	Noise and vibration abatement	Includes all measures to monitor and control noise and vibration pollution, including the construction of noise screens and banks, both natural and artificial, to reduce pollution caused by road, rail, air traffic and industrial processes.
	Protection against radiation	Involves all actions aimed at protecting the environment from radiation. Excludes nuclear power stations and military installations.
	Other activities	Includes all other expenditure aimed at pollution abatement, or where expenditure can not be separated into the above categories.
<b>Protection of biodiversity and landscape</b>	Landscape and habitat protection	

	Biosecurity	Involves all actions aimed at safeguarding the natural environment from non-native pest species and diseases. Does not include the control of Tb vectors affecting domesticated livestock.
	Coastal protection	Includes all activities aimed at safeguarding the coastal environment, both its landscape and ecological value.
	Other activities	Includes all other activities involving the management of landscapes and ecosystems to protect both their aesthetic and ecological value.
	Species protection	Includes all measures taken to protect both flora and fauna.
	Rehabilitation of species populations and landscape	Includes the reintroduction of endangered or extinct species. Also landscape restoration, for example mine and quarry sites.
	Restoration and cleaning of water bodies	Comprises all processes designed to return lakes and rivers to their natural state through physical, chemical or biological activities.
<b>Research and development</b>		Consists of all activities engaged in applied research and experimental development related to environmental protection.
<b>Environmental protection not classified elsewhere</b>	General administration	Comprises management of environmental protection, including budget and policy advice. Also includes subscriptions to a number of international environment programmes and conventions.
	Education, training and information services	Includes all activities designed to increase awareness and expertise in the area of environmental protection.
	Other activities	Any other activities relating to environmental protection not classified elsewhere.

### D.1.1 Rationale behind EPE classification system

There were two key considerations in the construction of the classification system for environmental protection activities in New Zealand. Firstly, there was the need to ensure maximum compatibility with other classifications used within New Zealand (principally by Statistics New Zealand) to report economic activity, the main two being the Classification of the Functions of Government (COFOG), used to categorise all public sector expenditure, and the SNA, used to produce GDP estimates. This was deemed essential if the account was to become a satellite account to the core accounts produced under the SNA framework. Secondly, it was important to follow an internationally-recognised classification system (CEPA) to enable international comparison.

Appendix (i) shows a comparison between the classification system devised to report environmental protection activities in New Zealand and the SEEA (CEPA 2000) and COFOG classifications.

## D.2 Classification system used for the NRM account

1 <sup>st</sup> Tier	2 <sup>nd</sup> Tier	Definitions
<b>Regulatory control</b>		Involves all planning, policy and enforcement of natural resource management, mainly in the form of resource consents and district and regional plans under the RMA.
<b>Inland water management</b>		All inland water management activities aimed at sustainable use, including catchment works, flood protection works and hydrological monitoring.
<b>Land management</b>		All land management activities aimed at sustainable use. Includes expenditure on all open areas for recreation, principally sports fields, parks, and Crown land not reserved for native biodiversity.
<b>Other resource management</b>	Energy efficiency programmes	Includes all activities aimed at improving the use of existing energy sources, or switching to more efficient energy sources. Also includes activities aimed at reducing energy demand, from installing insulation to schemes aimed at reducing travel at work.
	Mining efficiency programmes	Includes all activities aimed at increasing efficiency of mining operations, and reducing the level of residuals produced.
	Education, training and information services	Includes all activities designed to increase awareness and expertise in the area of natural resource management and sustainability.
	Other activities	Any other activities relating to managing natural resources and sustainable land use not classified elsewhere.

### D.2.1 Rationale behind NRM classification system

As there is not an internationally agreed classification for NRM activities, nor are they included under the COFOG or SNA classifications, the considerations of the EPE classification system do not strictly apply. Nonetheless, the principles of needing to be compatible, both nationally and internationally, are still applicable.

To enable the desired international comparisons, the classification system devised to classify NRM activities in New Zealand was based both on the categories recommended in SERIEE, and the categories defined in the ABS's NRM account. The categories decided upon do not directly feed into the COFOG or SNA classifications, but they could easily be made consistent with those classifications if necessary.

## **E. Sources and methods for the provisional account**

---

---

### **E.1 Sources and methods for local government**

#### **E.1.1 Details of data sources**

Expenditure figures were taken from the individual annual plans of local authority councils for the 2000/01 financial year. The figures primarily came from the plans for 2001/02, as these were deemed to provide the most accurate figures due to their retrospective inclusion of 2001 expenditure. Where the 2001/02 plan was either unavailable or did not include 2001 figures, the 2000/01 plan was used.

Where neither the 2001/2002 nor the 2000/2001 annual plan was able to provide the necessary information, alternative data sources were sought. Some councils, particularly larger ones, publish, in addition to the annual report, an annual supplementary or financial report.

In isolated instances, where the published data was insufficient to provide the necessary details of EPE, the finance department of the council concerned was contacted directly. Although these councils were not always able to provide the more detailed information requested, they were able to clarify the exact nature of ambiguous expenditure in the plans, thus allowing expenditure to be allocated to the category level, if not to the sub-category level.

#### **E.1.2 Inclusions and exclusions**

##### **E.1.2.1 Current expenditure**

This is often referred to as operating expenditure in annual plans. All expenditure associated with actually providing the ongoing EPE activity or service, including staffing, infrastructure and management costs, is included as current expenditure. Expenditure outside the scope of EPE includes all incumbent costs incurred by providing the service or activity, with the principal elements being interest payments and depreciation. Other elements of the councils' financial plans that should not be incorporated include debt servicing, transfers to reserves, and transfers to sinking funds, as they are not direct expenditure for the benefit of the environment.

##### **E.1.2.2 Capital expenditure**

Capital expenditure generally falls into two main types, purchase of new assets and renewal of existing assets, both of which are included in the EPE account.

##### **E.1.2.3 Removal of depreciation and debt servicing**

To enable accurate estimates of local government EPE, the depreciation element of operating expenditure was removed. This was not a simple task, as many councils do not itemise depreciation in their operating expenditure.

The first step in calculating depreciation was to identify plans where depreciation was separately identifiable. Through examination of these plans it was possible to obtain a separate mean percentage value for each of the separate activities that displayed significant depreciation. This mean percentage value is the proportion of total expenditure identified as depreciation. Expenditure totals in the summary table for the selected activities were then reduced by this calculated percentage value. The areas of activity where an adjustment was made were 'treatment and disposal' in the waste management category, and both 'sewage' and 'stormwater networks' in the wastewater category. These activities have a high level of capital expenditure associated with them and a depreciation adjustment was justified.

While some other areas of activity also had some depreciation, an adjustment was not made, as the amount of depreciation was minimal and levels were not consistent across all councils of a particular type. Under the proposals for future developments discussed later, the discrepancies caused by depreciation should be eliminated.

Debt servicing identified in the annual reports was not included in the expenditure figures, as it is outside the scope of EPE. Although some debt servicing may have been missed and included in the estimates, this will not be significant, as debt servicing was generally well reported in the plans. As with depreciation, any discrepancies should be eliminated in future years.

Expenditure figures in annual plans and reports are GST exclusive, so no adjustment for this is necessary.

### **E.1.3 Compiling the raw data**

To enable a more manageable and accurate examination of EPE within the local government sector, the individual councils of New Zealand were examined within four separate spreadsheets, one for each of the four types of council – city, district, regional and unitary. Within each spreadsheet, the various EPE categories and sub-categories were placed across the columns, and the relevant councils placed in the rows.

Each council's annual plan was examined, with expenditure figures, once any aggregations or exclusions were made, being placed in the corresponding cell in the spreadsheet. For example, expenditure for 'the collection of household and commercial refuse' would be added to the expenditure 'for the maintenance of litter bins' to provide the figure to be placed in the 'Collection and Transportation' cell for waste management. The 'management of local authority forests' figure would be added to 'parks and reserves' expenditure to place in the relevant council's land management cell. At this stage, whole figures were included as they appeared in the plan. No assumptions or proportioning were made to separate expenditure into sub-categories if this was not readily possible. Once all the councils had been examined and as many cells as possible contained data, the spreadsheets were re-examined.

Capital expenditure by the various councils was recorded in separate tables to enable individual capital expenditure figures to be produced. In practice, capital expenditure was a lot easier to both define and identify in the plans. Often a list of all the individual 'projects' for a given year were outlined with the expenditure involved, enabling figures to be directly transposed to the corresponding cell in the table. The only issue relevant to capital expenditure is that the figures were often obtained from the 2000/01 plan, rather than the 2001/02 plan used for current expenditure, and were therefore projected figures.

### **E.1.4 Estimates for gaps in data**

Each spreadsheet was analysed in turn. Where figures were absent, too aggregated, or appeared inaccurate, further investigations were undertaken and figures revised. A number of methods were used to achieve this.

The first step was to establish whether the council concerned had published any additional budget or financial reports that could provide a more detailed account of expenditure. This was achieved by searching the council's website, or by requesting documents directly from the council. Where supplementary reports were available, in all instances they were able to complete any gaps in the data.

For councils with missing data in categories where expenditure would be expected (for example, waste management for city or district councils) and which had not published any supplementary information, the council's finance department was contacted directly. Often, especially in the case of city councils, the gaps were due to the specific services being tendered out. In these cases, the contractor was contacted and the expenditure information obtained directly from them. It was then included in the spreadsheet for the relevant council. This prevented understating for the given authority. Expenditure figures were usually provided by contractors only at an aggregated level, such as a total waste management expenditure figure.

Through these methods, it was possible to obtain a figure for all councils for all the main categories.

The next step was to estimate values for gaps at the sub-category level for the key essential services of waste and wastewater management. This was not applicable to regional councils, as the provision of these services is not their responsibility. Each of the three remaining types of councils – city, district and unitary – were again analysed separately. For each council type, the proportion that each sub-category comprises of the category total was determined using figures from councils identifying a complete breakdown of expenditure in their plan, and then applying the ratio to councils with only an aggregated category total. For example, using the available data for city councils, it was determined that the ‘Collection and Transport’ sub-category was estimated as being 27.3 percent of the ‘Waste Management’ total for city councils, while 72.7 percent went to ‘Treatment and Disposal’. These ratios were then used to estimate the missing data in city council spreadsheets for current expenditure on waste management.

Gaps in capital expenditure could not be estimated due to the highly variable nature of the expenditure. In practice, this was not considered a significant problem, as large items of capital expenditure were identified and discussed in the council plans and reports.

The final step in the process was a review of all cells in the four spreadsheets to ensure, firstly, that cells which should contain data did so, and that it was accurate. For example, to see that all city, district and unitary councils contained figures for the collection and transportation of waste, the treatment and disposal of waste, as well as sewage and stormwater networks. Secondly, to ensure that empty cells were the result of a lack of expenditure, not due to missing data, be it an actual figure or an estimated figure.

### **E.1.5 Reviewing and reconciling the output figures**

To estimate the accuracy of the figures in the provisional EPE account 2000/2001, they were compared with those from the latest council annual reports. The Government Sector Division at Statistics New Zealand produces an annual breakdown of all local government expenditure by the COFOG classification system, based on individual council annual reports and on a quarterly survey of local government. As the annual reports do not become available until approximately 12 months after the end of any financial year, the most recent figures are for the 1999/2000 year. While classification by COFOG provides figures at the first tier only (see Appendix (i)), comparisons suggest that the level of accuracy of the 2000/01 account is high, with both the relative increase in expenditure for each domain and the proportional split across domains comparing very favourably. The biggest change was in wastewater management, which comprised 66.2 percent of the total EPE figure under the COFOG classification in 1999, and 64.6 percent in the 2001 EPE account. The difference in all other categories was within one percent across the two accounts.

## **E.2 Sources and methods for central government**

### **E.2.1 Details of data sources**

The most timely and accurate estimations of central government expenditure for the financial year 2001 can be found in the *Supplementary Estimates of Appropriations for the Government of New Zealand*, published by the Minister of Finance. The supplementary estimates are adjustments to the main estimates in the *Estimates of Appropriations for the Government of New Zealand* publication and reflect changes in appropriations sought by Ministers since the initial publication. The *Estimates of Appropriations* do not actually identify planned estimated expenditure for the given year in the various areas of government interest. What they do identify, however, is the total funds available from both central government and other sources to fund expenditure in these various areas of interest. The actual expenditure figures do not become available until the individual department or agency publishes its annual report. For government departments, these usually become available within 6–8 months, but those for Crown research institutes and state owned enterprises may take up to 12–14 months from the end of the financial year concerned.

The *Estimates of Appropriations* documents are separated into individual Votes, such as 'Biosecurity', 'Crown Research Institutes', and 'Education', rather than by departments and agencies. For each Vote, there is a detailed table of the individual appropriations, further split by the department or agency responsible for their administration. For example, under the ‘Biosecurity’ Vote, there is an appropriation for 'Crown Pest/Weeds Exacerbator Costs' to be administered by the Department of Conservation, and 'Border Inspection' administered by the Ministry of Agriculture and Forestry. Each individual appropriation relevant to the EPE account was included in the central government data.

## **E.2.2 Inclusions and exclusions**

All EPE related information available from the *Estimates of Appropriations* was included. Figures in the appropriations include the GST component, which was removed before figures were added to the EPE account.

Separate figures are provided for current and capital expenditure.

## **E.2.3 Compiling the raw data**

The individual Vote, minus the GST element, for each individual appropriation was placed in a spreadsheet under the relevant category or sub-category of the EPE classification system. The detail tables in the *Estimates of Appropriations* include a description outlining the exact nature of the appropriation, which was used to ensure the expenditure was placed in the appropriate category. For example, under the 'Environment' Vote was an appropriation for 'Marlborough Fires'. The description of the appropriation reads "to provide funding for the rehabilitation of pastoral land affected by fire in the Awatere Valley and surrounding areas." Through using the description, the spending can be correctly classified in the 'Rehabilitation of Species, Populations, and Landscapes' category.

Although there is minimal capital expenditure by central government for EPE, a separate table for capital expenditure was compiled.

## **E.2.4 Estimates for gaps in data**

There was not expected to be any significant gaps in the central government data due to the use of the *Estimates of Appropriations* document. There are, therefore, no estimated figures for central government included in the EPE account for 2001/02.

## **E.2.5 Reviewing and reconciling the output figures**

As the appropriations represent only the maximum available funds for each activity, it was important to determine how well they reflected actual expenditure. From comparisons of the 1999/2000 appropriations and figures in the 1999/2000 annual reports, it appears that by using appropriation figures there will be only a small overstating of central government EPE in the provisional figures published in this report. It is important to remember that the figures published in the *Estimates of Appropriations* are inclusive of GST, while the annual report figures are GST exclusive. The GST element has been removed from the figures in this report, as this is not within the scope of the EPE account.

## F. New Zealand's environmental protection activities expenditure by domain

### F.1 Summary table of environmental protection activities expenditure for the year ended June 2001

	Waste Management	Wastewater Management	Pollution Abatement	Biodiversity and Landscape	Research and Development	EPE n.c.e.	Total
	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)
<b>Operating Expenditure</b>							
Local Government	188,452	304,165	13,123	38,804	1,129	12,863	558,536
Central Government	7,526	0	3,894	184,487	74,670	15,194	285,771
<b>Total</b>	<b>195,978</b>	<b>304,165</b>	<b>17,017</b>	<b>223,291</b>	<b>75,799</b>	<b>28,057</b>	<b>844,307</b>
<b>Capital Expenditure</b>							
Local Government	25,572	276,292	17	4,819	13	451	307,164
Central Government	0	0	0	6,685	0	10	6,695
<b>Total</b>	<b>25,572</b>	<b>276,292</b>	<b>17</b>	<b>11,504</b>	<b>13</b>	<b>461</b>	<b>313,859</b>
<b>Total</b>	<b>221,550</b>	<b>580,457</b>	<b>17,034</b>	<b>234,795</b>	<b>75,812</b>	<b>28,518</b>	<b>1,158,166</b>

Both local and central government are heavily involved in a wide range of activities aimed at protecting the environment. But the two sectors differ in their focus. The provision of waste management, wastewater management and pollution abatement services is predominately the role of local government, whereas the protection of biodiversity and landscape, and the applied research and development aimed at protecting the environment in the future, are mainly funded from central government sources. Local government is also more directly involved in investment of environmental infrastructure. The figures for capital expenditure demonstrate this, with 98 percent of all capital spending being made by local authorities. Expenditure patterns for individual domains are examined in the following tables.

## F.2 Appraisal of data by domain

### F.2.1 Waste management expenditure for the year ended June 2001

	Collection and Transportation	Treatment and Disposal	Other Activities	<b>Total</b>
	\$ (000)	\$ (000)	\$ (000)	\$ (000)
<b>Operating Expenditure</b>				
Local Government	61,634	124,130	2,688	188,452
Central Government	0	0	7,526	7,526
<b>Total</b>	<b>61,634</b>	<b>124,130</b>	<b>10,214</b>	<b>195,978</b>
<b>Capital Expenditure</b>				
Local Government	50	25,076	446	25,572
Central Government	0	0	0	0
<b>Total</b>	<b>50</b>	<b>25,076</b>	<b>446</b>	<b>25,572</b>
<b>Total</b>	<b>61,684</b>	<b>149,206</b>	<b>10,660</b>	<b>221,550</b>

Waste management in New Zealand falls into two main types – the collection, treatment and disposal of non-hazardous waste; and the collection, treatment and disposal of hazardous waste. Of these, non-hazardous waste is by far the most significant in terms of scale, accounting for approximately 96 percent of the total waste management expenditure figure (based on the hazardous waste figures that are available).

Although only hazardous waste is directly harmful to the environment due to either toxins or radioactivity, both types of waste are included within the EPE account. If non-hazardous waste was not collected and disposed of, it would soon accumulate, leading to a degradation of the environment, as well as the associated increase in disease and pest species harmful to both man and other organisms that may be present in the affected area.

Waste management activities accounted for 23.2 percent of the total expenditure for the protection of the environment in the year ended June 2001. The majority of the spending was for the collection, treatment and disposal of non-hazardous waste from private households. The majority of capital was purchased for the maintenance of landfill sites.

Expenditure for the transport, processing and disposal of hazardous waste comprises the majority of the 'Other Activities' sub-category figure. The figure also includes some spending on the establishment and running of waste minimisation schemes.

#### Local government

The collection, treatment and disposal of waste are core functions of all district, city and unitary councils. A number of councils tender these waste management services out to private contractors, however, and this is particularly the case with city councils. Where this situation occurred, details of the contractors' expenditure

were used to derive the figures in the table so that waste management expenditure was not understated for the locality concerned.

The provision of waste management utilities are not within the scope of regional councils, with the only involvement of regional councils being expenditure related to the control of hazardous substances.

**Central government**

The only involvement of central government in the provision of waste management services is in the control of hazardous substances through the government agency ERMA, and through subscription to the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal.

## F.2.2 Wastewater management expenditure for the year ended June 2001

	Sewage Networks	Stormwater Networks	Total
	\$ (000)	\$ (000)	\$ (000)
<b>Operating Expenditure</b>			
Local Government	249,085	55,080	304,165
Central Government	0	0	0
<b>Total</b>	<b>249,085</b>	<b>55,080</b>	<b>304,165</b>
<b>Capital Expenditure</b>			
Local Government	175,598	100,694	276,292
Central Government	0	0	0
<b>Total</b>	<b>175,598</b>	<b>100,694</b>	<b>276,292</b>
<b>Total</b>	<b>424,683</b>	<b>155,774</b>	<b>580,457</b>

The most common perception of wastewater is that it refers to the collection and disposal of sewage. However, the wastewater management domain also includes the collection and disposal of stormwater. This is due to the significant environmental impact stormwater would have if it was not channelled and transferred to a more suitable discharge point. If wastewater was not managed, the result would be a contamination, and possible eutrophication, of virtually all freshwater and marine ecosystems downstream of the outfall point.

Of all the activities included within the scope of environmental protection, the provision of wastewater management services results in the highest level of expenditure, accounting for 36 percent of the total environmental protection activities figure. Also of note, is the high percentage of the total expenditure figure due to capital expenditure. This is due to the high maintenance and replacement costs associated with provision of both sewage and stormwater reticulation.

### Local government

The situation with wastewater management is similar to that of waste management, with the responsibility for its provision lying with district, city and unitary councils. As with waste management, some city councils contract this service to external parties, particularly in the Auckland region.

### Central government

Central government is not involved in wastewater management.

### F.2.3 Pollution abatement expenditure for the year ended June 2001

	Protection of Air and Climate	Soil and Groundwater Protection	Noise and Vibration Abatement	Protection Against Radiation	Other Activities	<b>Total</b>
	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)
<b>Operating Expenditure</b>						
Local Government	6,424	3,992	125	0	2,582	13,123
Central Government	3,439	455	0	0	0	3,894
<b>Total</b>	<b>9,863</b>	<b>4,447</b>	<b>125</b>	<b>0</b>	<b>2,582</b>	<b>17,017</b>
<b>Capital Expenditure</b>						
Local Government	0	0	15	0	2	17
Central Government	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>2</b>	<b>17</b>
<b>Total</b>	<b>9,863</b>	<b>4,447</b>	<b>140</b>	<b>0</b>	<b>2,584</b>	<b>17,034</b>

While pollution is an issue for all regions in New Zealand, many polluting activities are concentrated within the main urban centres. This is reflected in the pattern of expenditure, with 72 percent of all expenditure being made in the Auckland, Wellington and Canterbury regions. This is to be expected due to higher levels of car emissions and burning of fossil fuels within these areas.

Although the government directs significant resources and focus towards the minimisation and remediation of pollution in New Zealand, its expenditure is relatively low, accounting for only 2 percent of the total expenditure on environmental protection activities. This can partly be explained by it playing more of a monitoring type role, which has minimal capital costs. There could also be problems in identifying this specific expenditure, as discussed below.

#### Local government

From examination of annual plans it was apparent that reporting of expenditure on the prevention and reduction of various forms of pollution varied widely, with some aspects being well reported while other known activities were not reported. Pollution abatement in the public sector is predominantly the role of regional councils, mainly in a monitoring and advisory role, to protect the major elements of the natural environment, ie land, air, inland water and the coastal environment. Legislation in New Zealand requires all regional councils to produce an annual 'state of the environment' report for their region and this was seen in all their annual plans. While approximately half the councils provided the necessary detail to allow expenditure to be placed in the relevant categories, ie air, water, land and coast, other councils provided only a total 'state of the environment' figure that included aspects of pollution abatement together with aspects of other categories and thus had to be recorded in the catch-all category 'EPE not classified elsewhere'. The result of this will be an understating of pollution abatement by \$6–8 million (the proportion of the 'Other Activities' in the 'EPE not classified elsewhere' category that is thought to be for pollution abatement, but which may include other elements of water and land monitoring).

The role of city and district councils in pollution abatement mainly involves monitoring and enforcement with regard to noise pollution. While all councils have this role, very few separate their expenditure for its provision in their annual plans. Noise pollution may sometimes be mentioned in the description of significant activities regarding 'environmental health', but spending will be aggregated under the environmental health total. Noise pollution expenditure is, therefore, understated in the summary totals, although it is included in the total EPE figure.

### **Central government**

The only direct expenditure incurred by central government in this category is in the 'Protection of Ambient Air and Climate' sub-category. The costs are in the form of subscriptions to the Framework Convention on Climate Change and the Montreal Protocol on Ozone Protection.

The government also provides some funding contributions to third parties to assist in the clean up of orphan contaminated sites, such as at Mapua.

## F.2.4 Protection of biodiversity and landscape expenditure for the year ended June 2001

	Landscape and Habitat Protection				Species Protection	Rehabilitation of Species Populations and Landscapes	Rehabilitation and Cleaning Of Water Bodies	Total
	Biosecurity	Coastal Protection	Other Activities	Sub-total				
	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)
<b>Operating Expenditure</b>								
Local Government	26,928	5,379	2,124	34,431	36	4,337	0	38,804
Central Government	80,571	27	66,843	147,441	36,899	147	0	184,487
<b>Total</b>	<b>107,499</b>	<b>5,406</b>	<b>68,967</b>	<b>181,872</b>	<b>36,935</b>	<b>4,484</b>	<b>0</b>	<b>223,291</b>
<b>Capital Expenditure</b>								
Local Government	241	1,507	856	2,604	0	2,215	0	4,819
Central Government	0	30	6,160	6,190	495	0	0	6,685
<b>Total</b>	<b>241</b>	<b>1,537</b>	<b>7,016</b>	<b>8,794</b>	<b>495</b>	<b>2,215</b>	<b>0</b>	<b>11,504</b>
<b>Total</b>	<b>107,740</b>	<b>6,943</b>	<b>75,983</b>	<b>190,666</b>	<b>37,430</b>	<b>6,699</b>	<b>0</b>	<b>234,795</b>

One of the biggest environmental challenges that New Zealand faces is the protection of what remains of our natural habitats and landscapes. While the international perception of New Zealand is 'crystal clear lakes and natural forests', the truth is that many of our natural ecosystems are under threat. For example, lowland forests in many parts of the country have become fragmented. Without substantial management, they will no longer be able to sustain the biodiversity they contain. Individual species are also under threat, particularly some of our endemic bird populations. Again, without extensive management, they could soon cease to exist.

It is for these reasons that expenditure on the protection of biodiversity and landscape accounts for 26.4 percent of the total spent on environmental protection activities. Expenditure figures in the table above show that central government plays the dominant role in the protection of biodiversity and the landscape, with more than 80 percent of all spending, including virtually all spending on species protection.

New Zealand's geographical location, an island group more than 2,000 kilometres from the nearest major landmass, has historically prevented many of the world's more prolific diseases and pests species from reaching its endemic population. Today the risk to New Zealand's biosecurity is far greater, with ships arriving in our ports, and freight arriving by air, daily, all potentially carrying organisms that could have large-scale impacts on our biodiversity and endemic populations. For this reason, the New Zealand Government spends 45.9 percent of all funds available in this domain on biosecurity.

### **Local government**

As with pollution abatement, regional councils are responsible for the majority of expenditure. This is predominately within the biosecurity sub-category, in the form of both pest animal and pest plant control, with all regional councils showing significant spending.

Two other activities that incur significant spending are coastal protection and rehabilitation of disused landfill sites. Both city and district councils are also involved in these activities, with expenditure based more on the individual characteristics of the area rather than the type of council responsible.

### **Central government**

Central government spends 65.4 percent of the total funds it directs at environmental protection and natural resource management on the protection of biodiversity and landscape. Spending is across a wide range of departments and agencies. Biosecurity appears to be a fundamental role of central government's expenditure, especially the prevention of exotic pest species and diseases entering the country, with both MAF and MFish heavily involved. While DOC is also significantly involved with biosecurity, the majority of its expenditure is for the management of the extensive estates under its control.

DOC is the only central or local government institution significantly involved in the protection of individual species, spending just over 21 percent of its total budget on services related to the maintenance and recovery of protected species and island habitats, management of marine mammals, and activities related to trade in endangered species legislation.

## F.2.5 Research and development expenditure for the year ended June 2001

<b>Total</b>	
	\$ (000)
<b>Operating Expenditure</b>	
Local Government	1,129
Central Government	74,670
<b>Total</b>	<b>75,799</b>
<b>Capital Expenditure</b>	
Local Government	13
Central Government	0
<b>Total</b>	<b>13</b>
<b>Total</b>	<b>75,812</b>

Expenditure on environmental research and development accounts for 9 percent of the total environmental protection activities figure. The central government expenditure estimate will be accurate due to the method of reporting in the *Estimates of appropriations* publications. The expenditure on applied environmental research and development by local government, particularly by regional authorities, however, is likely to be understated due to the low amount of spending that can be identified. Expenditure may be hidden under more generic headings such as 'air quality monitoring' and 'groundwater investigations' and is therefore being included in other categories.

### Local government

The only spending on research and development that could be identified in local government annual plans for the year ended June 2001 was some spending by regional and unitary councils to fund graduate research projects. It is expected, however, that at least some of the larger councils, especially regional councils, would be involved in their own applied research into environmental issues affecting areas under their governance.

### Central government

Central government spends approximately 18 percent of the total Vote: Research, Science and Technology on environmental research. The majority of this will most likely be through Crown research institutes and educational establishments, although this is not stated in the description of the environmental research appropriation.

## F.2.6 Environmental protection (not classified elsewhere) expenditure for the year ended June 2001

	General Administration	Education, Training and Info. Services	Other Activities	<b>Total</b>
	\$ (000)	\$ (000)	\$ (000)	\$ (000)
<b>Operating Expenditure</b>				
Local Government	175	776	11,912	12,863
Central Government	9,749	780	4,665	15,194
<b>Total</b>	<b>9,924</b>	<b>1,556</b>	<b>16,577</b>	<b>28,057</b>
<b>Capital Expenditure</b>				
Local Government	0	0	451	451
Central Government	0	0	10	10
<b>Total</b>	<b>0</b>	<b>0</b>	<b>461</b>	<b>461</b>
<b>Total</b>	<b>9,924</b>	<b>1,556</b>	<b>17,038</b>	<b>28,518</b>

This is the residual category and is made up of expenditure that was either too aggregated to place in any one category, or its description did not meet the criteria of any other category. It accounts for 3.3 percent of the total environmental protection activities figure.

### Local government

The majority of expenditure placed in this category was that spent by regional and unitary councils on monitoring the state of the environment, where figures were too aggregated to place in a category, such as air or groundwater. It accounts for between \$6-8 million of the 'Other Activities' figure. The remaining expenditure is for environmental indicator work and general environmental enhancement.

### Central government

Expenditure in this category for central government is for policy advice and ministerial services in relation to the environment by DOC and the Office of the Parliamentary Commissioner for the Environment. It also includes New Zealand's contribution to the United Nations Environment Program.

## G. New Zealand's NRM expenditure by domain

### G.1 Summary table of NRM expenditure for the year ended June 2001

	Regulatory Control	Inland Water Management	Land Management	Other Resource Management	<b>Total</b>
	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)
<b>Operating Expenditure</b>					
Local Government	189,035	60,478	248,892	9,199	507,604
Central Government	25,201	1,231	43,861	88,374	158,667
<b>Total</b>	<b>214,236</b>	<b>61,709</b>	<b>292,753</b>	<b>97,573</b>	<b>666,271</b>
<b>Capital Expenditure</b>					
Local Government	2,169	16,245	81,778	116	100,308
Central Government	0	0	0	1,445	1,445
<b>Total</b>	<b>2,169</b>	<b>16,245</b>	<b>81,778</b>	<b>1,561</b>	<b>101,753</b>
<b>Total</b>	<b>216,405</b>	<b>77,954</b>	<b>374,531</b>	<b>99,134</b>	<b>768,024</b>

While both central and local government are actively involved in the sustainable management of natural resources in New Zealand, the table above shows that nearly 80 percent of total expenditure is due to local government activity.

Local authorities have a strong focus on the sustainable use of land and inland water resources, through regulatory control, qualitative and quantitative monitoring, and practical management activities. By contrast, central government has a wider focus. While still spending a significant proportion of its budget on land and inland water management, it spends more than 50 percent on other resource activities that are not within the remit of territorial and regional authorities.

As is the case with environmental protection, capital expenditure by central government is minimal. The only expenditure is a capital contribution to the establishment of the EECA as a Crown entity, and a capital contribution to the Crown Energy Efficiency Loan Scheme.

## G.2 Appraisal of data by domain

### G.2.1 Regulatory control expenditure for the year ended June 2001

<b>Total</b>	
	\$ (000)
<b>Operating Expenditure</b>	
Local Government	189,035
Central Government	25,201
<b>Total</b>	<b>214,236</b>
<b>Capital Expenditure</b>	
Local Government	2,169
Central Government	0
<b>Total</b>	<b>2,169</b>
<b>Total</b>	<b>216,405</b>

When the RMA came into force in 1991 it brought together a myriad of laws governing natural resource use in New Zealand. For the first time, a harmonised legislative approach to the sustainable use of natural resources was possible, and this approach forms the basis of the regulatory control domain.

Expenditure in the year ended June 2001 on the regulatory control of natural resources stems primarily from the RMA, with spending falling into two main areas – statutory planning and policy relating to natural resources; and spending associated with the resource consent process. Expenditure on regulatory control accounted for 28.2 percent of NRM total expenditure for 2000/01. Territorial and regional authorities were responsible for nearly 90 percent of this regulatory control figure due to their statutory responsibilities.

#### Local government

All local government councils in New Zealand have a responsibility for regulatory control of the natural environment under the RMA. Their remit varies, however. Territorial authorities are responsible for processing and decision-making relating to localised land use and subdivision applications. Regional authorities are responsible for applications of regional importance, which usually pertain to changes in management of natural and physical resources, such as water bodies and forests.

A second statutory responsibility is the production and publication of plans stating the intent of the authorities in the areas they govern. All territorial authorities must publish a district plan. Regional authorities are responsible for the production and publication of regional policy statements, regional coastal plans, and optional regional plans. While the statutory requirement is for plans to be produced on a 10-year cycle, they are the result of ongoing work, and therefore significant associated expenses were seen for all councils for the financial year 2000/01.

**Central Government**

DOC is responsible for the majority of spending on regulatory control by central government. This is for the management of statutory actions, leases, licences and other concessions, and for statutory planning responsibilities under the RMA.

## G.2.2 Inland water management expenditure for the year ended June 2001

<b>Total</b>	
	\$ (000)
<b>Operating Expenditure</b>	
Local Government	60,478
Central Government	1,231
<b>Total</b>	<b>61,709</b>
<b>Capital Expenditure</b>	
Local Government	16,245
Central Government	0
<b>Total</b>	<b>16,245</b>
<b>Total</b>	<b>77,954</b>

Inland water plays a major role in everyday New Zealand life. It provides 75 to 80 percent (MFE 1997) of our electricity through hydro power; mains drinking water supplies to 85 percent (MFE 1997) of the population; and numerous recreation and navigation opportunities. For these reasons, it is vital that both the quality and quantity of inland water is sustained for future generations. Because of this, considerable expenditure is seen in this domain.

Inland water management expenditure is predominantly the role of regional authorities. It has such a key role that boundaries between many regional councils were drawn according to major catchment areas. Inland water management accounts for 10.1 percent of total NRM expenditure

### Local government

The scope of local government is diverse, with spending on catchment works, flood protection, resource and quality monitoring being some of the more prevalent areas. Although the majority of expenditure is by regional councils, spending by city and district councils is significant, with expenditure being concentrated on those councils responsible for areas containing the larger lakes, such as Rotorua, Taupo and Queenstown District Councils.

### Central government

Inland water management is not a significant area of central government responsibility, with only a relatively small amount being spent on residual catchment works.

### G.2.3 Land management expenditure for the year ended June 2001

<b>Total</b>	
	\$ (000)
<b>Operating Expenditure</b>	
Local Government	248,892
Central Government	43,861
<b>Total</b>	<b>292,753</b>
<b>Capital Expenditure</b>	
Local Government	81,778
Central Government	0
<b>Total</b>	<b>81,778</b>
<b>Total</b>	<b>374,531</b>

Due mainly to a low population density, New Zealand enjoys a relatively green and healthy outdoor lifestyle. If this lifestyle is to be available for future generations to enjoy, we must continue to manage and maintain the green spaces we use on a daily basis, adopt new sustainable management practices in the rural environment, and ensure natural assets, such as timber, are replaced as they are taken. This is the focus of expenditure within this domain.

Expenditure on the sustainable management of land accounts for nearly half (48.8 percent) of all spending on NRM activities. A significant proportion of the spending is by territorial authorities for the management and upkeep of local parks and reserves. While the primary purpose of much of this work is to provide recreational opportunities, there are substantial secondary benefits to the environment. Hence, expenditure on these activities is within the scope of sustainable land management.

#### **Local government**

High levels of spending are incurred by all councils on land management, with the nature of the spending varying considerably among different councils. City and district councils have the role of providing and maintaining the parks and reserves for the areas they administer. Regional council expenditure for land management is predominantly for implementing sustainable land use practices and monitoring the impacts of land use.

#### **Central government**

Central government also plays a significant role in land management. Expenditure is mainly by DOC, which spends sizeable amounts on the provision of recreational opportunities, access facilities and land services within their estates.

## G.2.4 Other resource management expenditure for the year ended June 2001

	Energy Efficiency Programs	Mining Efficiency Programs	Education, Training and Info. Services	Other Activities	Total
	\$ (000)	\$ (000)	\$ (000)	\$ (000)	\$ (000)
<b>Operating Expenditure</b>					
Local Government	1,240	807	4,795	2,357	9,199
Central Government	11,050	0	20,977	56,347	88,374
<b>Total</b>	<b>12,290</b>	<b>807</b>	<b>25,772</b>	<b>58,704</b>	<b>97,573</b>
<b>Capital Expenditure</b>					
Local Government	0	0	51	65	116
Central Government	1,445	0	0	0	1,445
<b>Total</b>	<b>1,445</b>	<b>0</b>	<b>51</b>	<b>65</b>	<b>1,561</b>
<b>Total</b>	<b>13,735</b>	<b>807</b>	<b>25,823</b>	<b>58,769</b>	<b>99,134</b>

The 'Other Resource Management' domain comprises a number of fairly diverse activities that collectively account for 12.9 percent of the total NRM figure. Due to New Zealand's extensive territorial waters, much of the expenditure is for the sustainable management of coastal waters and fisheries and lies in the 'Other Activities' sub-category

### Local government

The energy efficiency figure for local government is most likely understated, as it is presumed that all councils will promote energy efficiency to some degree. Only Christchurch City and the Canterbury Regional Council highlight expenditure in their plans. Mining efficiency expenditure was identified for the West Coast and Hawkes Bay Regional Councils. The other main area of spending by local authorities is under the sub-category 'Education, Training and Information Services' for the promotion of sustainable land use. This was carried out by all types of councils and appears to reflect forward thinking by individual councils, rather than a specific duty.

### Central government

Central government is heavily involved in a number of resource management activities recorded under this category. The three main areas are energy efficiency, public information and the sustainable management of New Zealand's fisheries.

Expenditure by central government for energy efficiency occurs through the provision of policy advice to the government on energy and resource issues by the Ministry of Economic Development (MED), the MFE and the EECA.

DOC spends more than 10 percent of its operating budget on the management of visitor and public information services, recorded under the sub-category of 'Education, Training and Information Services'.

Sustainable management of New Zealand's fisheries is administered through MFish and covers expenditure on activities such as policy advice, monitoring of fisheries, and enforcement and prosecutions under the fisheries policy framework. This work accounts for 90.1 percent of the total expenditure recorded under the 'Other Activities' sub-category.

## H. Future developments

---

### H.1 Development of classification categories

During compilation of the Provisional Environmental Protection Expenditure Account 2000/2001, it became apparent that a number of categories could provide more detailed and relevant information if there was a further breakdown when data was collected under the proposed survey. Expansion of categories would mainly be within the NRM sub-account. If an internationally agreed classification is later adopted, the proposed changes could be modified to account for this.

The following are proposed possible changes: -

- An additional sub-category to be added to 'Waste Management' for 'Hazardous Waste Management'. In the 2001 account, this makes up a significant proportion of the 'Waste – Other Activities' total. Its significance to the account and its impact on society is also deemed sufficient to justify a separate category in future accounts.
- Regulatory control to be split into three sub-categories – 'RMA Planning and Policy', 'RMA Consents', 'Other Activities'. Nearly 30 percent of NRM expenditure currently falls within the regulatory control category. The use of annual plan data prevents this from being further split, but the use of a survey would enable data to be collected for the three proposed sub-categories.
- 'Inland Water Management' to be split into a number of sub-categories. Further research would be required to determine what sub-categories would be desirable and also possible to collect data for, but would probably include 'Flood Protection', 'Catchment Activities' and 'Water Quality Activities'.
- 'Land Management' could also be split into a number of sub-categories. Again further research would be required to determine the exact sub-categories, but they would probably include 'Sustainable Forest Management', 'Informal Parks and Reserves' and 'Formal Parks and Recreation Grounds'.
- The importance of sustainable management of New Zealand's fisheries can be seen in the figures in this report. It is therefore likely that this would be included as a separate sub-category under 'Other Resource Management'.

### H.2 Expanding the scope of the accounts

As stated in the introduction, the SEEA suggests a number of other sub-accounts that can be established to complement the EPA and NRM sub-accounts. It is unlikely that these will be developed until the two initial sub-accounts are fully established.

This section also discusses expanding the scope of the account to produce a satellite account to the National Accounts.

#### H.2.1 Natural hazard account

The SEEA suggests calculating the expenditure on activities aimed at minimising natural hazards and their impacts. This data could then be used to produce an indicator estimating the effects of changes to the landscape and water systems, and the impact of global warming.

## **H.2.2 Exploitation of natural resources account**

An exploitation account is used to provide an indicator of the amount of natural resources consumed. It would be used in conjunction with the natural resource accounts, currently in development, to determine if activities are being managed sustainably or not. The SEEA suggests the following areas be included – exploration and extraction of subsoil assets; extraction and use of water supplies for drinking water, irrigation, and industrial processes; forest resources; and the harvesting, fishing and hunting of wild flora and fauna.

## **H.2.3 Environmental taxes account**

No data is currently available to allow an environmental tax account to be compiled, largely as a result of very limited use of eco-taxes in New Zealand. Should circumstances change and eco-taxes become more widely used, as they are in Europe, then this account would provide the basis for the environmental tax indicator that is part of the proposed socio-economic indicator programme. This indicator will show the change in focus of the government in using eco-taxes to mitigate or reduce adverse environmental impacts from human-induced pressures relating to the economy.

## **H.2.4 Environmentally beneficial activities account**

The SEEA states that environmentally beneficial activities are activities that are primarily carried out for economic reasons, but also provide significant environmental benefits. Examples suggested by the SEEA include investments in energy, or material-saving equipment such as insulation, double-glazing and packaging.

# I. Glossary

---

**Appropriation:** A sum of money set aside for a particular purpose. In the context of central government appropriations, it relates to the sum of funding that has been allocated to a particular activity or service for a given year.

**Classification of the Functions of Government (COFOG):** A classification used to identify the socio-economic objectives of current transactions, capital outlays and acquisition of financial assets by general government and its sub-sectors. (*System of National Accounts, 1993*)

**Domain:** The term defined by the SEEA for the top level of categories used to classify EPE, such as 'Wastewater Management' and 'Pollution Abatement'. It is synonymous with the word 'category' when used in the report.

**Depreciation:** The method of allocating the costs of past expenditures on fixed assets over subsequent accounting periods to allow for the fall in value of the asset during the course of its working life.

**Environmental taxes (eco-taxes):** Eco-taxes are focused taxes charged on activities that directly impact the environment, such as industrial discharges into rivers. Monies collected from eco-taxes can either be directed back towards helping to alleviate the impacts of the activity from where they were collected, or placed in a more general fund for environmental protection services.

**Final consumption:** Final consumption consists of goods and services used by individual households or the community to satisfy their individual or collective needs or wants.

**Household Economic Survey (HES):** The HES is a highly detailed survey of all aspects of household expenditure. It is conducted on a three-yearly cycle and surveys the spending patterns of 3,000 households across New Zealand. The results are used to represent total household expenditure for the country.

**Intermediate consumption:** Defined in the SNA as the value of the goods and services consumed as inputs by a process of production, excluding fixed assets whose consumption is recorded as consumption of fixed capital.

**Resident unit:** Defined in the United Nations economic glossary as: "An institutional unit is resident in a country when it has a centre of economic interest in the economic territory of that country".

**System of Environmental and Economic Accounts (SEEA):** The SEEA was developed by the United Nations Statistical Division as a satellite system to the System of National Accounts (SNA) for the incorporation of environmental concerns (environmental costs, benefits and assets) in the national accounts. The SEEA is intended to be a system with global application and standards, suitable for all countries and all aspects of the environment.

**System of National Accounts (SNA):** An international accounting framework consisting of a coherent, consistent and integrated set of macro-economic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules. It provides a comprehensive accounting framework within which economic data can be compiled and presented in a format that is designed for the purposes of economic analysis, and decision and policy making. (*System of National Accounts, 1993*)

**Vote:** In the context of central government, a Vote is a grouping of one or more appropriations that are the responsibility of one Minister of the Crown and are administered by one government department.

## J. Bibliography

---

---

Australian Bureau of Statistics (1999). *Environment Protection Expenditure, Australia, 1995-96 and 1996-97*, Australian Bureau of Statistics, Canberra.

Eurostat (2001). *SERIEE Environmental Protection Expenditure Accounts Compilation Guide*, Eurostat, Luxembourg.

Minister of Finance (2000). *The Estimates of Appropriations for the government of New Zealand for the year ending 30 June 2001. (Volumes I and II)*, Crown Treasury, Wellington.

Minister of Finance (2000). *The Supplementary Estimates of Appropriations for the government of New Zealand for the year ending 30 June 2001*, Crown Treasury, Wellington.

Minister for the Environment (1997). *The State of New Zealand's Environment 1997*, GP Publications, Wellington.

*System of Environmental and Economic Accounting (SEEA) manual* (Draft for the Statistical Commission, 2002) United Nations, World Bank, Organisation for Economic Co-operation and Development, and Statistical Office of the European Community (Eurostat).  
[<http://www4.statcan.ca/citygrp/london/publicrev/pubrev.htm>]

For local government data, individual council annual plans and annual reports were used. These were from a number of years, but principally for the years 2000/01 and 2001/02, published both in hard copy format and on the Internet.

## K. Appendices

(i) Comparison table of classification system used with SEEA (CEPA 2000) and COFOG classifications

EPE Account		COFOG (05. Environment Protection)	SEEA (CEPA 2000) <sup>1</sup>
1 <sup>st</sup> Tier	2 <sup>nd</sup> Tier		
Waste Management	Collection and Transportation	05.1.0 Waste Management	3. Waste Management
	Treatment and Disposal		
	Other Activities		
Wastewater Management	Sewage Networks	05.2.0 Wastewater Management	2. Wastewater Management
	Stormwater Networks		
Pollution Abatement	Protection of Ambient Air and Climate	05.3.0 Pollution Abatement	1. Protection of Ambient Air and Climate
	Soil and Groundwater Protection		4. Protection and Remediation of Soil, Groundwater and Surface water
	Noise and Vibration Abatement		5. Noise and Vibration Abatement
	Protection against Radiation		7. Protection against Radiation
	Other Activities		
Protection of Biodiversity and Landscape	Landscape and Habitat Protection	05.4.0 Protection of Biodiversity and Landscape	6. Protection of Biodiversity and Landscapes
	Species Protection		
	Rehabilitation of Species Populations and Landscape		
	Restoration and Cleaning of Water Bodies		
Research and Development		05.5.0 Research and Development Environment Protection	8. Research and Development
EPE n.e.c.	General Administration	05.6.0 Environment Protection n.e.c.	9. Other Environmental Protection Activities
	Education, Training, and Information Services		
	Other Activities		

1 Classification of Environmental Protection Activities and Expenditure, 2000

**(ii) Comparison of the composition of environmental protection activity expenditure between New Zealand and Australia**

	Waste Management	Wastewater Management	Pollution Abatement	Biodiversity and Landscape	Research and Development	EPE n.c.e.	Total
<b>New Zealand 2000/2001</b>							
\$ (NZ) '000	195,978	304,165	17,017	223,291	75,799	28,057	844,307
Domain as a percentage of the total	23.2%	36.0%	2.0%	26.4%	9.0%	3.3%	
<b>Australia 1996/1997</b>							
\$ (AUS) '000	886,786	1,957,976	245,862	1,056,942	0	389,431	4,536,997
Domain as a percentage of the total	19.5%	43.2%	5.4%	23.3%	0.0%	8.6%	

The Australian figures are taken from the ABS's *Environment Protection Expenditure, Australia, 1996-97* publication (the most recently published). In the table above, the 'Waste Management' and 'Wastewater Management' categories use the published figures for total final consumption (general government final consumption plus household final consumption). The other ABS categories use total published general government final consumption only. This compares with the purely public sector figures in the New Zealand estimates for all categories.

This is the most appropriate comparison between the New Zealand and ABS EPE estimates. The ABS uses a slightly different methodology to Statistics New Zealand in that they categorise most waste and wastewater expenditure as household expenditure, identified through separate rates. This methodological treatment is based on the SERIEE, which the ABS uses for its EPE accounts. As noted previously, the New Zealand EPE accounts use the SEEA approach, where such expenditure is allocated to government. The SERIEE and the SEEA are two broadly similar systems, but which have some minor conceptual differences. The ABS totals in the table above are therefore estimated to be as comparable as possible to the New Zealand estimates.

Given the above, the New Zealand data seems quite comparable with the Australian, with both countries having broadly similar EPE spending patterns, with Australia's overall level of spending obviously being higher than New Zealand's.

**(iii) Example of the same question appended to an AES survey and on a stand-alone EPE survey**

Example of question on a stand-alone survey, taken from the Australian Bureau of Statistics survey of the manufacturing industry 2000-2001.

**Part 4 - Liquid waste and waste water management**

- Liquid waste and waste water management refers to the storage, handling, treatment, transport, re-use, recycling and/or disposal of hazardous and non-hazardous liquid wastes and waste water. These are wastes which are of no further immediate value for the purpose for which they were used or produced because of the quality, quantity or timing of their occurrence in the manufacturing process.
- Liquid waste and waste and waste water includes recyclables and by-products.
- If exact figures are not readily available, please provide estimates.

Tick all that apply

**8 Which of the following liquid wastes were generated by this business?**

Industrial effluent, trade waste and waste water .....  
 Oils and fuels .....  
 Coolants and lubricants .....  
 Thinners and solvents .....  
 Acids and alkalis .....  
 Paints, dyes and inks .....  
 Other liquid waste (please specify) .....  
 None of the above .....

**9 Please estimate the payments to other organisations for liquid waste and waste water management**

<b>Including</b>	<b>Excluding</b>
<ul style="list-style-type: none"> <li>Payments to water authorities for the disposal of liquid waste and waste water</li> <li>Research and development on liquid waste and waste water management</li> </ul>	<ul style="list-style-type: none"> <li>Capital expenditure on liquid waste and waste water management (include in question 10)</li> <li>Payments to water authorities for the supply of water (e.g. via mains)</li> </ul>

Payments to other businesses ..... \$ \_\_\_\_ , \_\_\_\_ , \_\_\_\_  
 Payments to government organisations ... .. \$ \_\_\_\_ , \_\_\_\_ , \_\_\_\_

**10 Please estimate the capital expenditure on liquid waste and waste water management**




<b>Including</b>	<b>Excluding</b>
<ul style="list-style-type: none"> <li>Expenditure on the acquisition of plant machinery, equipment and land.</li> <li>Purchase of filtration and waste water treatment equipment (e.g. grease traps, oil separators and chemical scrubbers).</li> <li>Capitalised wages and salaries.</li> </ul>	<ul style="list-style-type: none"> <li>Capital expenditure not specifically for liquid waste and waste water management.</li> </ul>

\$ \_\_\_\_ , \_\_\_\_ , \_\_\_\_

Example of a hypothetical question in an AES survey attempting to collect the same information. The information in the question is limited by space restrictions.

**17 Charges and fees paid to other businesses or government organisation for liquid waste and waste water management**

**Include items such as:**

-  Industrial effluent, trade waste and waste water
-  Oil, fuels, coolants and lubricants
-  Paints, dyes and inks

\$ \_\_\_\_ , \_\_\_\_ , 000

**Please describe the main activities and services involved.**