



New South Wales  
TREASURY

TOTAL ASSET MANAGEMENT

# Sustainable Development Guideline

September 2004

TAM04-13

# Sustainable Development Guideline

**September 2004**  
**TAM04-13**

ISBN 0 7313 3325 X (set)  
ISBN 0 7313 32903

1. Asset management – New South Wales.
2. Capital Investment.
3. Public administration – New South Wales
- I. Title. (Series : TAM 2004)

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This publication can be accessed from the Treasury's Office of Financial Management Internet site [<http://www.treasury.nsw.gov.au/>].

For printed copies contact the Publications Officer on Tel: 9228 4426.

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# SUSTAINABLE DEVELOPMENT GUIDELINE

## 1 Sustainable development

### 1.1 The purpose of this guideline?

This guideline advises NSW Government Agencies on the need for sustainable development to form part of their business planning and shows how it can be considered at each stage of the total asset management process.

### 1.2 What is Sustainable Development?

#### The principles of Sustainable Development

Fundamental to the philosophy of Sustainable Development is the fact that human communities and economies are not separate from the environment. An interdependence exists between the way humans manage the environment, the level of cohesion in a community and economic performance.

The concept of Sustainable Development promotes not only protection of the environment and creation of wealth but equitable distribution of that wealth within society.

Sustainable development seeks to ensure the present needs are met without compromising the ability of future generations to meet their needs.

Due to the present state of our technology and social systems, some limits on human activity will be necessary if the biosphere will be able to accommodate our activities. Within these limits on the development of both technology and social systems, growth can be expected to be based on responsible use of resources and to focus on investment, technology and technical development that will be wholly sustainable.

The following Sustainable Development principles ensure that ecological processes and human communities and economies can be sustained:

- the precautionary principle
- conservation of bio-diversity and ecological integrity
- intra and inter-generational equity, and
- internalisation of ecological and social impact costs.

The word “environment” will be used in the following guideline to encompass the ecological, socio/cultural and economic environments.

#### The objectives of Sustainable Development

Sustainable development has four primary objectives:

- Minimised risk of environmental damage arising from incomplete knowledge
- Ecological sustainability and environmental protection
- Socio/cultural sustainability recognising the needs of all
- Economic sustainability maintaining high and stable levels of economic growth and employment

An action which promotes one of these objectives at a rate which undermines the long term net viability of another is not sustainable development. **Table 1** shows the relationship between the principles and the objectives of sustainable development.

**Table 1 The Principles, Objectives and Strategies of Sustainable Development**

<b>Principles</b>	<b>Objectives</b>	<b>Strategies</b>
<p><b>The precautionary principle</b> Where there is a threat of serious or irreversible environmental damage, lack of full or complete knowledge should not be used as a reason for postponing mitigating measures.</p>	<p>Minimise the risk of environmental damage arising from incomplete knowledge</p>	<p>Organisations should identify the potential ecological, socio/cultural and economic impacts of proposals and activities through environmental and social impact assessments, and economic appraisals. They should then develop and implement strategies to overcome such impacts.</p>
<p><b>Conservation of bio-diversity and ecological integrity</b> The concept of bio-diversity covers species, habitat and genetic diversity. Lost diversity means loss of genetic information, lost ability for species to adapt, lost opportunities for cultural advances derived from nature, loss of cultural value and leads to instability in all ecosystems. Conserving bio-diversity and protecting eco-systems will help to ensure that natural processes and therefore human economies can be sustained.</p>	<p><b>Ecological Sustainability</b> To maintain the mechanisms by which natural processes operate.</p>	<p><b>Strategies for achieving ecological sustainability include:</b></p> <ul style="list-style-type: none"> <li>• Ecological protection: ecosystems, fauna and flora</li> <li>• Improving quality of air, water and soil</li> <li>• Waste avoidance and minimisation</li> <li>• Hazardous materials avoidance</li> </ul>
<p><b>Intra and Inter-generational Equity</b> The present generation should ensure that the health, diversity and productivity of economic, ecological and social environments are maintained or enhanced for the benefit of current and future generations. Inequity in the distribution of resources results in increased environmental degradation through lack of social coordination and un-managed resource use. Committing to intra and inter-generational equity will help maintain high levels of 'community well-being' and ensure efficient use of resources. Community well-being includes economic health, quality of life, and the networks, norms and trust that facilitate coordination and cooperation for mutual benefit within the community.</p>	<p><b>Socio/Cultural Sustainability</b> To maintain acceptable and equitable levels of community well being.</p>	<p><b>Strategies for achieving socio/cultural sustainability both now and in the future include:</b></p> <ul style="list-style-type: none"> <li>• A commitment to social justice <ul style="list-style-type: none"> <li>- Equity: ensuring equity in the distribution of resources</li> <li>- Rights: recognising individual rights</li> <li>- Access: providing fairer access to economic resources and services</li> <li>- Participation: providing opportunities for those who will be affected to participate in decision making</li> <li>- Ensuring equitable distribution of the costs and benefits of sustainable development</li> </ul> </li> <li>• Conserving aesthetic and cultural diversity, and heritage, in both society and the built environment</li> <li>• Conserving community resources</li> </ul>
<p><b>Internalisation of ecological and social impact costs</b> The economic stability of a community that is simply ignoring social issues and using up its natural resources is unsustainable. The cost of social and environmental impacts should therefore be considered in decision-making and built into or 'internalised' in the costs of goods and services. By internalising the costs of environmental and social impacts, a more accurate picture of economic and social health can be obtained and measures taken to ensure sustainability. Internalisation of ecological and social impact costs also contributes to Sustainable Development through improved valuation of community and natural resources.</p>	<p><b>Economic Sustainability</b> To achieve long-term economic stability for the community.</p>	<p><b>Strategies for achieving economic sustainability include:</b></p> <ul style="list-style-type: none"> <li>• A commitment to improvement not just growth</li> <li>• Internalisation of social and environmental impact costs</li> <li>• Conservation of resources eg. Energy, water, soil, materials</li> <li>• Using renewable or recycled resources and recycling</li> <li>• Efficient use of non-renewable resources</li> <li>• Supporting alternative technologies</li> </ul> <p><b>Ecological costing includes the concepts of:</b></p> <ul style="list-style-type: none"> <li>• Polluter pays</li> <li>• Full-cycle costing for goods and services, including the use of natural resources and assets and the disposal of wastes, and</li> <li>• Cost effective pursuit of environmental goals, via use of incentive structures - including market mechanisms</li> </ul>

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In some circumstances short term loss of benefit might be acceptable to achieve longer term benefits. For example, it may be desirable to shut down an industry that is clearly polluting the environment but if the industry were located in a small town and was a significant local employer, closure could have significant social consequences. It may be possible to implement a strategy that in the short term could be counter to one of the sustainable development principles but over the longer term would be sustainable. Careful consideration needs to be given to the context of the situation.

## Benefits of Sustainable Development

By adopting a sustainable approach to conducting business, agencies can ensure the activities pursued will benefit the community, the environment and the economy.

### 1.3 What is the history of Sustainable Development?

During the late 1970's and early 1980's, a number of independent scientists, activists and policy-makers attempted to address the conflict between preserving the environment and human development. They began to use the term "sustainability" to describe the goal of integrating economic development and ecological health.

In 1987, the United Nations' "World Commission on Environment and Development" released its report *Our Common Future* (or the Brundtland Report), which brought the terms "sustainability" and "sustainable development" into wide spread use. *Our Common Future* defined sustainable development as "development that meets the needs of the present without endangering the needs of future generations to meet their own needs." At the 1992 Earth Summit in Rio de Janeiro, more than 100 nations, including Australia, signed Agenda 21 - an international approach towards sustainable development.

When the concept of sustainable development was introduced in Australia, it was given an ecological focus - hence the term Ecologically Sustainable Development (ESD). The Commonwealth defined ESD in 1990 as "using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future can be increased." An Inter-Government Agreement finalised in 1992 included principles for a cooperative national approach to the environment and in the same year a National Strategy for Ecologically Sustainable Development (NSES) was announced. The NSES sets out the broad strategic and policy framework under which governments can take actions to pursue ESD in Australia.

### 1.4 Sustainable Development and the NSW Government

The NSW Government has the following key commitments:

- integrating environmental protection into all activities
- achieving greater social justice for all members of the community
- encouraging economic development and sustainable employment
- delivering more financially responsible programs that reduce public debt and unfunded liabilities.

In addition to these commitments the Government is a signatory to the National Strategy for Ecologically Sustainable Development and in accordance with the Inter-Governmental Agreement on the Environment, has adopted the four general principles of sustainable development.

### 1.5 Sustainable Development and Total Asset Management (TAM)

NSW Government agencies have a secondary service obligation to provide services in a manner that will not adversely affect ecological, socio/cultural and economic sustainability.

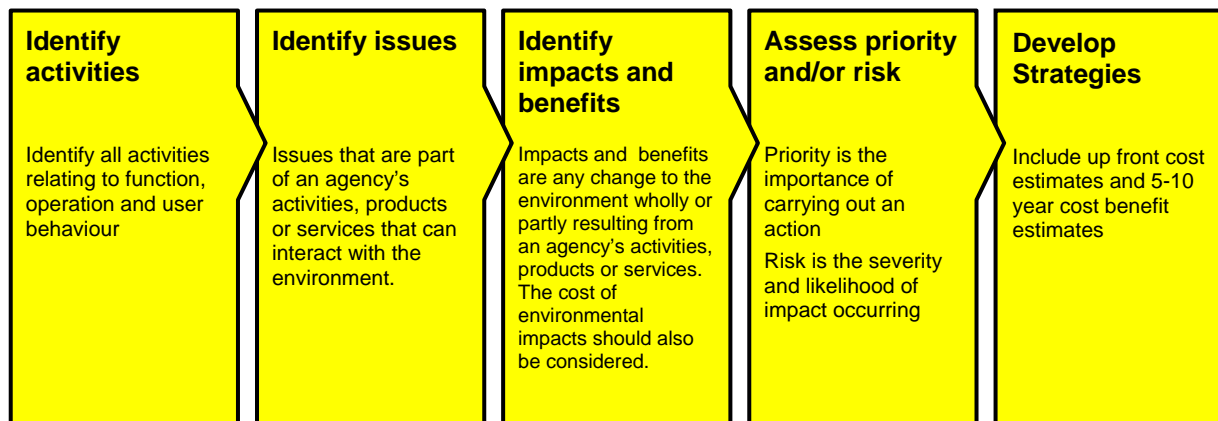
All agencies are required to integrate sustainable development objectives over the full spectrum of their business practices from Corporate Planning through to Service Delivery and Resource Planning

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as well as at the detailed implementation level (see Appendix F for a list of existing government requirements).

In TAM, sustainable development objectives are considered at each stage of the TAM process as illustrated in the diagram below.

## 2 Sustainable Development in the Total Asset Management process



### 2.1 Integrating Sustainable Development and TAM

TAM ensures that assets are managed to best support agency service delivery. As a secondary service obligation, agencies are expected to contribute towards sustainable development by the services they deliver and the way they are delivered.

For example, in providing training and education to a community, both economic and socio/cultural benefits are given to certain members of that community. The way in which it is provided, such as a new school, provides greater local employment, generates social interaction for the wider community and may require careful consideration of the affect on local ground water and environment.

Integrating Sustainable Development into Total Asset Management (TAM) will ensure that an agency's service provision and asset management support the objectives of sustainable development.

To enable Sustainable Development to be incorporated into TAM, a sustainable development implementation process has been developed. It is generic and applicable to each stage of Total Asset Management and can be used to identify and address the environmental impacts and benefits of agency activities.

In make more accurate decisions during the application of the generic Sustainable Development implementation process to TAM planning processes, agencies are encouraged to develop an Asset Environmental Management Plan (AEMP).

The AEMP is a tool for identifying, documenting and addressing the environmental impacts of an agency's activities, products or services. While the implementation of an AEMP may have initial up front costs, substantial cost savings can be obtained over time through better resource management, avoidance of environmental litigation costs, and minimised clean-up costs. Steps for implementing an AEMP are shown in Appendix B.

Where funding is available, agencies may choose to establish a full Environmental management system to identify and address environmental issues. ISO 14001 for example is an Environmental Management System currently adopted by organisations internationally.

The kind of impacts and benefits affecting **ecological sustainability** include air, water, soil, and noise pollution. Air, water and soil impacts are caused primarily through gaseous, liquid and solid wastes resulting from manufacturing processes, consumer use and disposal.

The impacts and benefits relating to **socio/cultural sustainability** include community impacts such as social justice, equitable access to services, diversity, economic stability, heritage, aesthetic and cultural issues and transportation.

Impacts and benefits that should be considered in relation to **economic sustainability** include methods of funding, the accrual of long term debt, continued funding of services either directly or by user pay principles and impacts on economic viability.

## 2.2 The Corporate Plan

Agencies should make a commitment to sustainable development in their corporate plans and develop corporate environmental policies. The commitment should be to both deliver services that support sustainability and to deliver them in such a way that supports sustainability.

## 2.3 Service Delivery Strategy

The Service Strategy translates the broad aims of the corporate plan into:

- The specific service outcomes the agency wants to achieve
- The service strategies to be adopted (i.e. how the agency proposes to achieve its service outcomes)
- The indicative resources (physical assets, people, information, financial) required as input to the development of the asset strategy.

To fulfil their secondary service obligation of contributing to Sustainable Development, agencies should include Sustainable Development objective and strategies in their Service Strategy. NSW Premier's Department has prepared guidelines on developing a service delivery strategy. The guidelines can be accessed electronically from *The Asset Strategy* section of the Total Asset Management manual.

The following section will show where to apply the generic Sustainable Development implementation process in the Service Strategy development framework and provide additional Sustainable Development considerations. Agencies that have their own planning model should apply the generic Sustainable Development implementation process to that model.

### The Process

The analytical stages where the generic Sustainable Development process should be used are indicated by an asterisk (\*). See Appendix H for a case study of the use of the process.

#### Stage 1 \*

Define intended service delivery outcomes. The Generic Sustainable Development process can be used here to develop detailed Sustainable Development objectives and strategies. Broad sustainable development objectives and strategies are shown in Table 1. (Page 4)

#### Stage 2

Forecast future demand and its impact on service delivery outcomes.

Future environmental considerations include changes in the environmental regulations, increased community demand for environmentally friendly practices and the effects of environmental.

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### Stage 3 \*

Assess current service performance and identify service delivery gaps. Determine whether the current service performance measures up against the Sustainable Development objectives identified in Stage 1. Strategies should then be developed to match performance with the Sustainable Development objectives and resource limits. These should be incorporated into service delivery strategy options.

### Stage 4 \*

Identify evaluate and select delivery strategies.

The generic Sustainable Development implementation process can be used here to evaluate the Sustainable Development performance of service delivery strategy options.

### Stage 5

Document Service Delivery Strategy.

Ensure that Sustainable Development evaluations are included.

## 2.4 Asset Strategy Planning

An agency uses an Asset Strategy Planning to match its asset portfolio to its service delivery requirements. It is the analytical step between the Service Strategy and the Capital Investment, Asset Maintenance and Asset Disposal strategy plans and determines how these plans interlink.

To fulfil their secondary service obligation of contributing to Sustainable Development, agencies should include Sustainable Development principles in their Asset Strategy Planning. The focus will be on the impacts the assets and their operation have on sustainable development. The Asset Strategic Development Framework in *The Asset Strategy Planning* Guideline is a system for achieving a better match between service delivery and assets by assessing asset need, utilisation levels, suitability of location, capacity, functionality, and condition.

The following section shows where to apply the generic Sustainable Development implementation process in the Asset Strategy Development framework and provides additional Sustainable Development considerations.

### The process

Before undertaking the Asset Strategy Planning process, the asset portfolio should be grouped and segmented. Segmenting could be by asset type, age, use or location. The generic Sustainable Development implementation process should be used here to determine the environmental impacts/benefits of particular asset groups. This can then be used as a basis for the Asset Strategy Development framework.

The generic Sustainable Development implementation process should be applied at all gates of the Asset Strategy process to:

- assess existing assets; and
- evaluate options for improvement identified during the process.

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\* *analytical stages where the generic Sustainable Development process should be used*

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## Gate1: Asset Service Dependency

*Can service delivery be made less asset dependent?*

This part of the process encourages agencies to assess whether they need a physical asset to deliver a service. Generally speaking, physical assets consume more natural resources than non-asset solutions over their life span.

Typical non-asset solutions include:

- Roads and Traffic Authority works depots procuring bitumen in bulk rather than 200 litre drums. While requiring a bulk tank and bunds surrounding it to control spillage, it reduced the number of storage buildings and the costs of handling and purchase. The sustainable development focus is providing materials on an economically viable basis, while protecting any risk of ecological damage.
- Department of Education and Training extending the bandwidth in which classes are held to accommodate more students in existing facilities. The sustainable development focus is on providing access to education rather than constructing more assets and the associated operational costs
- Department of Health provide telemedicine in a remote regional hospital to provide specialist medical services. The sustainable development focus is providing regular access to specialist services on an economically viable basis.

## Gate 2: Asset Utilisation

*Are assets fully used in service delivery?*

In most cases under-utilised assets waste natural resources. They consume, for example, materials, energy and water to remain operable. Strategies for using the assets more effectively should therefore be considered and evaluated using the Sustainable Development Generic process.

## Gate 3: Asset Location

*Are assets appropriately located for the effective service delivery?*

The Sustainable Development implications of the service being delivered in particular locations should be assessed. The provision of services may have socio/cultural and economic effects on the community and the regional Sustainable Development implications of the asset operating in a location should also be evaluated.

## Gate 4: Asset Capacity

*Have the assets sufficient capacity to provide the required services?*

Roads that become impassable in the wet may discourage growth of local markets or industry. Hospitals or schools that cannot support the delivery of particular services may result in poorer health or education standards being available. This in turn may cause excessive travel to other service locations.

Insufficient capacity suggests that desired service outcomes are not being achieved. The environmental impacts of this should be evaluated using the Sustainable Development Process. Before increasing asset capacity, non-asset solutions should be explored.

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## Gate 5: Asset Functionality

*Are assets suitable for the optimal delivery of services they are intended to support?*

Assets should not only function effectively enough to provide a service but also have high Sustainable Development performance.

For example, a road bridge must not only be capable of carrying the required traffic load but must not restrict flood waters. A school must not only support optimal education but also provide a safe and healthy environment.

## 2.5 Capital Investment Strategic Planning

Capital Investment Strategic Planning involves assessment of all investment options to meet service delivery requirements including purchase, lease, service contract, private sector involvement and non-asset solutions together with all the resources required (assets, financial, HR and IT)

The Capital Investment Strategic planning process in the *Capital Investment Planning Guideline* is a system for selecting the best procurement option for capital investment projects identified by the Asset Strategy.

The following section shows where to apply the generic Sustainable Development implementation process in the Capital Investment Strategic planning process and provides additional Sustainable Development considerations.

High Sustainable Development performance often equates with lower operating and maintenance life costs and reduces the likelihood of environmental fines or future clean-up costs.

### The Process

The analytical stages where the generic Sustainable Development process should be used are indicated by an asterisk (\*).

See Appendix H for a case study of the use of the process.

#### Stage 1\*

*Prepare service delivery functional analysis for each project.*

In this stage agencies are required to translate service delivery outcomes into detailed project objectives. Sustainable Development objectives should be included here and incorporated into the functional brief.

#### Stage 2\*

*Generate project options that meet service delivery functions.*

#### Stage 3\*

*Short list project options, develop each, and evaluate.*

#### Stage 4\*

*Compare project options and select preferred option.*

In Stages 2, 3 and 4 the Sustainable Development Performance of project options should be evaluated using the Sustainable Development Generic Process.

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\* analytical stages where the generic Sustainable Development process should be used

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## Stage 5

### *Prepare Capital Investment Plan.*

Criteria for ranking project proposals should include Sustainable Development principles. Those projects that offer the greatest environmental benefits to the user group and the wider community should therefore be given high priority.

## 2.6 Asset Maintenance Strategic Planning

The purpose of maintenance planning is to ensure the productivity and reliability of the asset by appropriately managing the risk of asset failure or deterioration.

The Asset Maintenance Strategic Planning process in the *Asset Maintenance Planning Guideline* is a structured and systematic process aimed at ensuring that an agency's portfolio of assets remains appropriate and productive at the lowest possible long-term cost.

Integrating Sustainable Development principles into maintenance planning relates both to minimising adverse environmental impacts of the asset, and ensuring all environmental benefits of the services delivered continues. The integration of Sustainable Development principles into asset operation focuses on:

- The health and safety of the asset users and the community
- Ensuring maintenance works are affordable and so service delivery remains affordable
- Improving efficiency in resource use and decreased waste production.

The integration of Sustainable Development principles into the implementation stages of asset maintenance is best facilitated by an Asset Environmental Management Plan. (See Appendix B) The following section shows where to apply the generic Sustainable Development implementation process in the Asset Maintenance Strategic Planning process and provides additional Sustainable Development considerations.

### The Process

The analytical stages where the generic Sustainable Development implementation process should be used are indicated by an asterisk (\*).

See Appendix H for a case study of the use of the process.

### Stage 1 Define and segment assets to meet service delivery strategy

Assets may be grouped by location, capacity, age or any other category that is significant to its service delivery support role. Major environmental impacts of assets could also be used to segment the portfolio, such as:

- Disaster relief communications
- Assets that contain asbestos or radioisotopes
- Assets located within environmentally sensitive regions

### Stage 2\* Determine required asset performance

Performance criteria that will allow the assets to perform as required should be assessed to ensure any Sustainable Development impacts are identified and those criteria amended.

Additional performance criteria may have to be developed to ensure the asset delivers Sustainable Development outcomes.

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\* *analytical stages where the generic Sustainable Development process should be used*

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Stage 3\*      Define maintenance resources and overall strategies

The Generic Sustainable Development process should be used here to evaluate the environmental impacts/benefits of resources (people, equipment and materials) and maintenance methods. Overall strategy options should also be evaluated using the Generic Sustainable Development Process.

Stage 4      Assess conditions of assets and recommend maintenance

Recommendations should be evaluated using the Sustainable Development Generic Process.

Stage 5      Prepare Maintenance Cost Plan

The cost plan should also include cost estimates for implementing environmental related changes. The impact of the proposed costs of maintenance should also be considered for its impact on sustainable development. If an asset is not economically viable, then the service it supports may be jeopardised.

Stage 6      Implement Maintenance Plan and programs

An Asset Environmental Management plan can be implemented as a stand-alone program or integrated into a maintenance planning program. Some agency's have begun with an Asset Environmental Maintenance Plan to accommodate a gradual shift in behaviour and later integrated the system into the overall maintenance program.

Stage 7 Monitor and review Maintenance Plan and programs

## 2.7 Asset Disposal Strategic Planning

Asset Disposal Strategic Planning involves continuous review of an agency's asset holdings to ensure they fit and support service delivery requirements.

The Asset Disposal Strategic Planning process in the *Disposal Planning Guideline* aims to ensure that an agency's asset portfolio comprises only those assets that effectively meet its service delivery requirements at the lowest cost to government.

The following section shows where to apply the generic Sustainable Development implementation process in the Asset Disposal Strategic Planning process and provides additional Sustainable Development considerations.

### The Process

The analytical stages where the generic Sustainable Development process should be used are indicated by an asterisk (\*).

See Appendix H for a case study of the use of the process.

Stage 1\*      Assets Surplus to Service Delivery

Determine Assets that are surplus to service delivery requirements both now and over the planning time frame.

Assets are considered surplus if they are not required to deliver services or no longer contribute to Sustainable Development objectives.

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\* *analytical stages where the generic Sustainable Development process should be used*

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Stage 2\*      Benefits of Disposal vs. Retention

Assess the advantages to Government, agency and the community in divesting assets.

The generic Sustainable Development process should be used to assess the environmental impact/benefits of disposal including ameliorating ecological contamination.

Stage 3\*      Value Maximisation

Identify opportunities for increasing asset value.

The value of the asset to both the community and the agency may be a combination of ecological, socio/cultural and economic value. Value maximisation strategies should be evaluated using the generic Sustainable Development process.

Stage 4\*      Disposal mechanism

Identify disposal requirements including probity considerations.

Options for disposal should be evaluated using the generic Sustainable Development process. Agencies should consider options that reflect Sustainable Development objectives such as re-use or recycling of the asset.

Stage 5      Prepare and implement the Disposal Plan and monitor performance

The cost plan should also include cost estimates for implementing environmental related changes. The impact of the proposed costs of maintenance should also be considered for its impact on sustainable development. If an asset is not economically viable, then the service it supports may be jeopardised.

Stage 6      Implement Maintenance Plan and programs

An Asset Environmental Management plan can be implemented as a stand-alone program or integrated into a maintenance planning program. Some agency's have begun with an Asset Environmental Maintenance Plan to accommodate a gradual shift in behaviour and later integrated the system into the overall maintenance program.

Stage 7 Monitor and review Maintenance Plan and programs

## Appendix A Application of Sustainable Development to TAM Planning processes

Table 2 gives an overall view of how Sustainable Development is linked to TAM and its relationship to each stage of the TAM strategy.

**Table 2**

<b>Sustainable Development Implementation process</b>	<b>Service Delivery Strategy</b>	<b>Asset Strategy</b>	<b>Capital Investment Strategic Planning</b>	<b>Asset Maintenance and Operation Planning</b>	<b>Asset Disposal Strategic Planning</b>
<b>Step 1</b> Identify activities	✓	✓	✓		✓
<b>Step 2</b> Identify environmental aspects			✓	✓	✓
<b>Step 3</b> Identify environmental impacts, benefits or potential improvements.	✓	✓	✓	✓	✓
Physical or Pollution (Air, Water, Soil, Noise)	✓	✓	✓	✓	✓
Biological (Fauna, Flora, Eco-Systems)	✓	✓	✓	✓	✓
Waste	✓	✓	✓	✓	✓
Resource Use	✓	✓	✓	✓	✓
Community resources	✓	✓	✓	✓	✓
Natural resources	✓	✓	✓	✓	✓
Community	✓	✓	✓	✓	✓
Social Factors	✓	✓	✓	✓	✓
Economic Factors	✓	✓	✓	✓	✓
Heritage, Aesthetic or Cultural impacts or benefits	✓	✓	✓	✓	✓
Transportation impacts or benefits	✓	✓	✓	✓	✓
<b>Step 4</b> Assess risk or feasibility	✓	✓	✓		✓
<b>Step 5</b> Develop objectives and strategies/actions to address impacts and maintain or enhance benefits	✓	✓	✓	✓	✓

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## Appendix B Asset Environmental Management Plan

An Asset Environmental Management Plan (AEMP) identifies, documents and addresses the impacts that assets and the way they were designed to operate have on the natural environment. Development of an AEMP can result in the following benefits:

- Cost savings through:
  - better resource management
  - avoidance of environmental litigation costs, and
  - minimised clean-up costs
- More accurate application of the generic Sustainable Development process to the TAM planning processes

The generic Sustainable Development implementation process can be used to develop an AEMP and a detailed process is shown. Agencies should develop their own specialised program by completing a pilot study of one or a number of typical assets. The RTA for example found that by conducting a pilot study, a set of procedures could be developed for dealing with proposed and existing assets.

Activities, aspects, impacts and actions should be determined by an agency's senior management or environmental manager and those preparing the plan. This information can then be used by staff associated with the operation of the asset. As an information system the AEMP can be:

- Linked to an intranet system to facilitate communication of the information to all staff
- Linked to an asset register

An AEMP will ideally fall under the umbrella of an Environmental Management System.

### **Other issues to consider in an Environmental Management System**

- legal requirements
- training, awareness and competence
- internal and external communication
- environmental management system documentation
- operational control
- emergency response
- environmental monitoring and measurement
- procedure for environmental non-conformances and corrective and preventative action.
- environmental management system audits and reviews.

### **Additional points to be considered within the generic Sustainable Development implementation process**

*Information generated during the following steps should be recorded on the AEMP Register and it is recommended that this is done electronically. Tables 2 and 3 on the following page give the suggested content of the AEMP Register.*

#### Step 1 Identify activities

Identify activities relating to the function of an asset and record on the Part A of the AEMP Register. Divide activities into the categories of general asset maintenance, operational issues and general activities relating to the function of the asset.

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## Step 2 Identify natural environmental aspects

Identify aspects of asset maintenance, operation or other activities that can interact with the natural environment. Record these on Part A of the AEMP Register. Include energy and water consumption and waste production.

## Step 3 Identify natural environmental impacts

Impacts refer to any change to the natural environment wholly or partly resulting from an agency's activities, products or services. Record this information on Part A of the AEMP Register.

## Step 4 Assess risk

See Table 5 Risk Ranking of Impacts for a suggested system.

## Step 5 Develop objectives and actions to address impacts

These should be listed on the Part B of the AEMP Register. Actions should then be implemented and the AEMP updated and reviewed annually through audits and self-assessment findings.

**Table 3 AEMP Register: Part A**

- |   |
|---|
| <ul style="list-style-type: none"><li>• Number</li><li>• Activity / Facility / Issue</li><li>• Environment Aspect (element of an activity)</li><li>• Environmental Impact/Benefits</li><li>• Current Environmental Condition: Notes</li><li>• Probability (A)</li><li>• Severity (B)</li><li>• Risk Ranking A x B</li></ul> |
|---|

**Table 4 AEMP Register: Part B**

- |   |
|---|
| <ul style="list-style-type: none"><li>• Number</li><li>• Activity / Facility</li><li>• Objective</li><li>• Action Target Date</li><li>• Estimated cost/time</li><li>• Estimated cost benefit (over 5 years)</li><li>• Performance Indicator</li><li>• Person responsible</li><li>• Monitoring schedule</li><li>• Date &amp; Signature</li></ul> |
|---|

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### Table 5 Risk Ranking of Impacts

**Probability (A)**

- 5 Common/Repeating Occurrence
- 4 Likely Occurrence
- 3 Moderate Occurrence
- 2 Unlikely Occurrence
- 1 Rare Occurrence

**Severity (B)**

- 5 Catastrophic: Major irreversible impact on environment
- 4 Major: Major reversible impact on environment
- 3 Moderate: Minor reversible impact on environment
- 2 Minor: Minimal effect - contained in a small area
- 1 Insignificant: Insignificant impact

**Risk Ranking equals A x B**

## Appendix C Example Sustainable Development objectives and strategies

This table can be used as a guide in developing broad Sustainable Development objectives and strategies within a corporate environmental policy, service delivery strategy or Environmental Strategic Plan.

**Table 6**

<b>Suggested Objectives</b>	<b>Example Strategies</b>
<p><b>Objective 1</b> Ensure that service delivery is <i>managed</i> in such a way as to minimise adverse ecological, socio/cultural and economic impacts.</p>	<ul style="list-style-type: none"> <li>• Behavioural change of users</li> <li>• Less asset dependent service delivery modes</li> <li>• Use of alternative technologies</li> <li>• Strategic environmental impact assessment of major programs</li> <li>• Strategic social impact assessment of major programs</li> <li>• Economic appraisal and value management of major programs with the cost of environmental and socio/cultural impacts included. (Discounting should be used to calculate future clean-up costs)</li> </ul>
<p><b>Objective 2</b> Ensure that adverse ecological, socio/cultural and economic impacts resulting from agency activities are minimised.</p>	<ul style="list-style-type: none"> <li>• Ensure that the agency's suppliers and contractors are environmentally responsible.</li> <li>• Ensure Environmental Impact Assessment (EIA) processes are comprehensive and regularly reviewed</li> <li>• Ensure environmental socio/cultural and economic mitigation policies lead continuous improvement of practice and are regularly reviewed.</li> <li>• Ensure the environmental and socio/cultural performance of agency activities are reviewed and reported.</li> </ul>
<p><b>Objective 3</b> Ensure that the consumption of natural resources by the agency's activities is reduced.</p>	<ul style="list-style-type: none"> <li>• Ensure trends in the use of natural resources and recycled materials are reported and reviewed; and that targets are set on an annual basis</li> <li>• Ensure the green office concept is promulgated and adopted.</li> <li>• Ensure that the Total Asset Management process is adopted</li> </ul>
<p><b>Objective 4</b> Ensure compliance with environmental legislation and government policy.</p>	<ul style="list-style-type: none"> <li>• Ensure agency staff and contractors have appropriate environmental awareness training</li> <li>• Develop and implement an Environmental Management System</li> <li>• Ensure comprehensive monitoring and review procedures are carried for all construction and maintenance works</li> <li>• Review works procedures at regular intervals.</li> <li>•</li> </ul>
<p><b>Objective 5</b> Ensure that the agency is a more open and consultative organisation.</p>	<ul style="list-style-type: none"> <li>• Ensure that all stakeholders are involved in agency environmental planning and decision making.</li> </ul>

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## Appendix D Example Sustainable Development considerations for buildings

See *Database of Environmental Objectives for Buildings* published by the Department of Public Works and Services (1998) for detailed descriptions of objectives. Each objective is numbered for easy reference to the database.

This list has been included to show the types of Sustainable Development issues and level of detail that should be considered. Many of the issues included in this section apply to a wider range of assets than just buildings. Agencies should develop similar guidelines for other asset types in their portfolio.

### D1 Environment Management - process objectives

- Consider alternatives such as the “no development” and other non-structural options
- Adopt environmental management plans through all phases of projects
- Evaluate site and local ecosystems using a structured Environment Impact Assessment (EIA) process
- Adopt an inter-disciplinary, integrated approach to environment design
- Carry out design reviews with the Client to ensure objectives are met or exceeded
- Apply EIA methods to demonstrate compliance with project objectives
- Demonstrate life cost paybacks for all incorporated environmental measures
- Provide constructive feedback to designers and suppliers
- Continually revise current design practice to encourage use of environmentally advanced materials
- Provide user education through operation manuals / training
- Require tenderers to validate operation and maintenance costs where tendering to performance specifications
- Establish the probity system for verifying environmental credentials of manufacturers, contractors and suppliers
- Continually revise leasing documents to ensure lessees comply with environment regulations
- Undertake post-occupancy evaluations of all developments to provide performance data against design targets
- At end of facility life prepare a dismantling and disposal plan

### D2 Protection of natural and cultural environment

#### Natural

- Preserve the physical viability of natural ecosystems
- Support the maintenance of biodiversity with site remediation activities
- Conserve viable site populations of all native species and maintain their habitats
- Preserve existing landscape features
- Ensure ongoing habitat protection
- Carry out endangered species habitat assessments
- Construct on previously used or reclaimed sites
- Incorporate permaculture principles in design and operation at appropriate sites
- Minimise the use of chemicals for landscape control
- Protect adjacent environments during construction
- Provide education packages for visitors re the environmental values of sites

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## Cultural

- Assess both the opportunities to reuse existing and the long-term viability of new facilities
- Carry out heritage assessments of proposed sites
- Identify and retain items of value to the local community
- Incorporate art in developments to enhance environment awareness
- Minimise physical and visual adverse impacts on nearby residents
- Promote multi-functional role of communal space and incorporate community services
- Consider the shared use or provision of adjacent facility infrastructures
- Consider social impacts through community participation
- Ensure social impacts of construction are equitably distributed
- Ensure appropriate access and facilities for disabled people
- Include environmental impacts in project cost benefit analysis
- Balance needs for privacy, security and social interaction
- Provide appropriate levels of privacy
- Provide appropriate levels of safety and security
- Maximise the opportunity for local internal-environment control by individuals.

## D3 Conservation of resources

### Energy

- Minimise energy demand by adopting passive design solutions as first priorities
- Document design options and energy consumption forecasts in an Energy Efficiency Statement
- Minimise impact of site location re new infrastructure and public transport
- Minimise energy demand by taking maximum advantage of site selection and planning
- Minimise energy requirement by optimising the building design
- Minimise energy consumption by optimising the engineering services design
- Where possible install renewable energy systems
- Where possible install refuelling facilities for alternative-fuel vehicles
- Ensure installed engineering services and energy efficient measures are properly commissioned and operated
- Carry out programmed preventative maintenance in all systems to ensure efficient operation
- Monitor energy use in operation and implement further opportunities for operational efficiency

### Water

- Minimise water use by installing water efficient appliances, fittings, and devices
- Decrease water requirements by adopting “water wise” landscape designs
- Install water usage monitoring and reporting devices
- Implement water consumption audit and leakage detection programs
- Minimise water imports
- Consider reuse of reclaimed water and greywater
- Minimise stormwater run-off and hydrologic impacts

### Soil

- Balance cut/fill and minimise importation of fill and topsoil
- Use site demolition or waste materials for on-site fill and avoid transport off-site
- Prevent soil erosion and siltation of waterways

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## Construction materials

- Consider environmental implications of construction materials
- Adopt life cycle costing principles for materials and systems selection
- Design for use of appropriate technology level
- Design for ease of future adaptability
- Reduce and avoid if possible, the use of rare and non-renewable resources
- Maximise the potential life cycle length of development
- Use recycled and recyclable materials where fit-for-purpose
- Consider reuse and recycling principles where temporary structures are required
- Assess natural disaster risk and adopt preventive measures
- Avoid use of rainforest timber and timber from Australian high conservation forests
- Design for use of engineered wood products in preference to solid wood
- Use industrial wastes in materials where possible and appropriate
- Aim to define the optimum intervention in existing structure and systems when refurbishing
- D4 Improve Quality of Air, Water and Soil

## Air

- Specify refrigerants and processes that minimise ozone depleting potential and greenhouse warming potential
- Use building materials free of Chlorofluorocarbons (CFC) and Hydro chlorofluorocarbons (HCFC)
- Consider optimum microclimate effects from site design
- Design and configure development to avoid undesirable wind effects
- Design to reduce the release of Carbon Dioxide (CO<sub>2</sub>) into the atmosphere
- Design to reduce the emission of the Oxides of Nitrogen (NO<sub>x</sub>) into the atmosphere
- Minimise air pollution and emissions from buildings
- Design buildings for controllable natural ventilation alone where possible
- Ensure daylight access for habitable areas
- Maintain high level of indoor air quality
- Maximise effectiveness of indoor air circulation
- Use local exhaust ventilation for specific indoor sources
- Consider adoption of a building flush-out prior to occupancy
- Control humidity in mechanically ventilated buildings
- Protect against release of microbial hazards into ambient air
- Consider the common denominators of Sick Building Syndrome
- Minimise toxic fume emissions in fit-outs within buildings
- Specify suitable diagnostics for system failure and ineffective performance
- Ensure reduction of construction contaminants in buildings prior to occupancy
- Exceed minimum dust control standards in construction
- Maintain existing CFC air-conditioning so as to reduce leakage
- Avoid use of hazardous materials such as asbestos and lead-containing products
- Select building materials to avoid pollutant release during fires
- Avoid risk of electro-magnetic radiation (EMR)

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## Noise

- Protect from noise pollution of sites
- Design site layout to separate noise generating activities from quiet activities
- Minimise noise emitted from external equipment
- Minimise noise transmission within multiple-occupancy buildings

## Light

- Avoid overshadowing of adjoining sites
- Design and site buildings to avoid hazardous or undesirable glare
- Design to minimise the impact of night lighting on adjacent areas

## Water

- Maximise rainwater infiltration by designing-in permeability
- Control contaminated run-offs from polluting sources such as parking areas
- Use artificial wetlands to remove pollutants
- Avoid standing water conditions that encourage the generation of bio-pollutants
- Protect water quality of adjacent environments during construction

## Soil

- Carry out contamination testing of sites
- Install and utilise composting facilities where appropriate
- Minimise use of chlorine-based products
- Manage the use and storage of hazardous substances and waste

## D4 Waste avoidance and minimisation

- Formally apply dimensional coordination of design where practical
- Give consideration to the ease of future recycling of materials and components
- Give consideration to incorporating occupant recycling equipment
- Include dedicated space requirements to support recycling activities
- Implement waste management project plans during project construction
- Make provision for transfer of reusable materials to recycling or reuse stations
- Adopt special procedures for disposal of hazardous materials
- Pay regard at all project phases and activities to cut paper consumption generally

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## Appendix E Example Sustainable Development considerations for small products

This section shows types of Sustainable Development issues that should be considered when *planning* to purchase items like office equipment, stationery, maintenance equipment etc. By applying the 4 R's methodology (Reduce, Reuse, Recycle and Recover) at each phase of the material life-cycle (planning, acquisition, operations, utilisation and maintenance, and disposal), procurement activities can be more environmentally responsible. When purchasing, environmental considerations should be integrated with other criteria such as performance, life expectancy, quality, and value for money (cost), as far as possible.

Many environmental practices can be phased in over time without additional costs. Although in some cases "green" products may cost more, the overall effect of adopting environmentally appropriate purchasing practices can result in significant savings when the total costs of purchasing, operation and disposal are considered.

To reduce the environmental impact of your acquisition, this checklist has been designed to help you ask the right questions at the PLANNING stage of your acquisition.

### E1 Acquisition

Have other options for meeting the needs been explored, for example:

- Have both departmental surplus and Crown Assets Disposal been checked to ensure that no comparable product is available internally?
- Have the feasibility of short-term rental or sharing the product been investigated as alternatives to purchasing?
- Is the quantity requested appropriate and sure to be used?
- Will the product be used to the end of its useful life? If not, can it be easily reallocated?

Once you have determined that a purchase should be made, there are a number of specific product characteristics that can help identify a "greener" item. Be wary of products with unsubstantiated claims. Look for qualifying statements such as the percentage of recycled content.

Is the product:

- Certified by an Environmental Labelling Program?
- Designed to minimise waste?
- Energy efficient (eg. Office equipment with a power-saving "sleep" mode)? If included in the Energy Star labelling program, does it compare favourably to other labelled products in the same category?
- Less polluting during its use than competing products (eg. Non-toxic, biodegradable cleaners)?
- Free from hazardous ingredients that would require special disposal (eg. Mercury)?
- Free from resources that come from environmentally sensitive regions (eg. Contains no lumber from tropical rainforests such as some teak or mahogany)?
- Free from banned and/or restricted, substances (eg. Contains no CFCs, Benzene, or Arsenic)?
- Manufactured from recycled materials, including a high percentage of post-consumer recycled content?
- 

Is the product packaging:

- Designed to minimise waste (eg. Bulk packaging)?

- 
- Reusable by the end-user?
  - Accepted by the supplier for reuse, recycling or recovery?
  - Recyclable locally?
  - Made from recycled materials?

## E2 Operation, utilisation and maintenance

Is the product:

- Durable, with a long service life?
- Accompanied by clear and comprehensive operating instructions? (this will help ensure that it is used efficiently)
- Easy to maintain in good operating condition?
- Economical to repair?
- Easy to upgrade?
- Reusable or does it include reusable parts (eg. rechargeable batteries)?

## E3 Disposal

Can the product or its parts:

- Be reused (eg. Furniture which can be refurbished) or reallocated?
- Be resold through Crown Assets Distribution?
- Be returned to the supplier for reuse, recycling or recovery?
- Be contributed to a waste exchange program?
- Be recycled locally?

The relative importance of each of these questions will vary between product categories. Choose the option that satisfies the greatest proportion of these criteria. Advise your suppliers that you will be evaluating products according to these factors.

When purchasing services, require your contractor to meet the same environmental standards.

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## Appendix F Existing government requirements

In support of their statement of sustainable development, principles the NSW Government is committed to the following practices under the Environmental Planning and Assessment, (EP&A) Act, 1979. Under the EP&A Regulation, it is necessary to justify proposals having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development (ESD)

### Comprehensive Environmental Impact Assessment (EIA)

An EIA will be conducted for all programs and projects and encompass all stages of asset development from inception through to operation and ultimately, decommissioning or demolition. All identified impacts will be eliminated or mitigated.

### Environmental Impact Statement (EIS)

An EIS must be prepared for proposals that have the potential to significantly affect the environment. The legal requirements for environmental impact assessment are included in the Act. The consent authority is normally the local council, but could be a Minister, the Director-General of Urban Affairs and Planning or another authority under certain circumstances. The applicant should consult the council to ascertain the consent authority.

It is the responsibility of the agency preparing the EIS to determine what approvals will be required as a result of the service delivery strategy and to demonstrate that the strategy can meet all approval and licensing requirements. In preparing the EIS, consultation with relevant parties should be undertaken early in the EIA process and their comments taken into account in the EIS.

### Social Impact Assessment

The NSW Government Cabinet Office, Social Policy Development Unit issued Guidelines for assessing Social Impacts in December 1997. The guidelines do not impose compulsory assessment requirements but provides agencies with tools to identify and evaluate the likely social impacts of policies and programs.

A number of assessment criteria relating to social impacts are already applied by government in specific policy areas. For example:

For projects which require an Environmental Impact Statement with an assessment of social impacts see *Is an EIS required - Best Practice guidelines for Part 5 of the Environmental Planning and Assessment Act 1979*, produced by the New South Wales Department of Urban Affairs and Planning The Cabinet Office Publication, *From red tape to results - Government Regulation: A guide to best practice*, provides guidance on both designing and evaluating proposals in terms of their impacts. Under the national Competition Principles Agreement legislation Review Program, agencies must review their legislation for anti-competition impact.

### Waste Reduction and Purchasing Plans (WRPP)

The NSW Government has introduced a Procurement Policy with environmental objectives and a Waste Reduction and Purchasing Policy. The Waste Reduction and Purchasing Policy requires all agencies to develop and implement a Waste Reduction and Purchasing Plan. The plans should reflect the significant impact the government's purchasing power can have on the market development for sustainable products.

### Government Energy Management Policy (GEMP)

The GEMP introduced in 1998 committed the NSW government to lower and sustainable levels of energy use. The commitment extends to all aspects of energy use in the Government's operations, from buildings to motor vehicles. Specific reduction targets are to reduce total energy consumption of government buildings by:

- 
- 15% of the 1995 level by 2001
  - 25% of the 1995 level by 2005

Agencies are encouraged to identify and implement energy management plans that will lead to energy saving outcomes. Under the policy agencies are required to monitor and report progress towards meeting the targets. To assist agencies the Energy Smart Government program was launched in 1996. To encourage agencies to invest in cost effective energy efficiency projects. The Sustainable Energy Development Authority (SEDA) provides a range of services and guidance to participating agencies.

## F1 Approvals or consultation that may be required

### Local Councils

Local Councils for development approvals under Part 4 of the EP&A Act and any building approval under the Local Government Act 1993, also for any alteration to local roads or buildings or trees of local heritage significance.

### Department of Urban Affairs and Planning

The Department of Urban Affairs and Planning (DUAP) is responsible for environmental planning issues including the coordination of State, regional coastal and metropolitan planning. Consult DUAP for concurrence if the proposal impacts on SEPP 14 - Coastal Wetlands, SEPP 26 - Littoral Rainforest, potential or actual koala habitat under SEPP 44 - Koala Habitat Protection.

### Environment Protection Authority

The EPA works with all levels of government, business and the community to help find nationwide solutions to Australia's environment problems. The EPA manages Commonwealth environment protection responsibilities, administers Commonwealth environment protection legislation and fulfils Australia's international environment protection obligations. For air, water and noise licenses, approvals and certificates of registration under relevant pollution control legislation; regulation of waste generation, transportation and disposal; licenses for transport of dangerous goods under the Dangerous Goods Act; licenses for chemicals subject to chemical control orders under the Environmentally Hazardous Chemicals Act.

### Department of Land and Water Conservation

The provision of water supply and sewerage services to country towns in NSW is the responsibility of local government under the Local Government Act, 1993.

Soil and Vegetation Management provides:

- information on soils
- information on design and construction of erosion and sediment controls, and rehabilitation
- approvals on protected lands

State Lands Services should be consulted:

- regarding effect of development on any Crown Land
- for leasing, license, or purchase of Crown Land
- whether the land is subject to Aboriginal land claim or Native Title legislation
- to determine if Crown Reserves and dedicated lands exist, whether a proposal is compatible with the stated public purpose.

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State Water Management should be consulted regarding impact on:

- ground or surface water resources
- clearing riparian vegetation
- works within 40 metres of a stream.

Coastal and Rivers Management should be consulted regarding flooding and coastal areas.

#### National Parks and Wildlife Service

The National Parks and Wildlife Service maintains registers of aboriginal sites and relics, and of historic places located on its own lands on behalf of all government agencies. NPWS manages heritage assets and protects large tracts of natural areas and endangered flora and fauna, including nature reserves. To be consulted if land clearing or impacts on natural vegetation are likely, (particularly in relation to the provisions of the *Threatened Species Conservation Act 1995* and *Native Vegetation Conservation Act 1997*) or if sites of Aboriginal heritage significance or land managed by the Service are likely to be affected.

#### Heritage Council of New South Wales

The Council was established in 1978 by the Heritage Act 1977. Its charter is to develop policies and programs to conserve the State's heritage and to promote community awareness of heritage and its value. It should be consulted if the proposal is likely to affect any place or building having State heritage significance, or if the proposal is affected by Interim Conservation Orders (ICO) or Permanent Conservation Orders (PCO). Agencies should also consult the *TAM Capital Works Investment Heritage Asset Management Guidelines* in order to prepare a Heritage Asset Management Strategy.

#### NSW Fisheries

- Threatened species of fish and marine vegetation are addressed under provisions of the Fisheries Management Act 1994.

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## Appendix G Consultation and Approvals

### G1 Special Legislative Requirements

#### Building and other Approvals from Council

Under the Environmental Planning and Assessment Act, building or activity approvals may need to be obtained from council for certain works:

- building erect/demolish building, install temporary structures etc
- waste management, transport and disposal
- certain activities on community land
- public roads lifting or hoisting goods over footways or roads, extending service pipes beyond road alignments.

#### Pollution Licences and Approvals from the EPA

Several Acts are intended to control and reduce pollution in order to protect the environment and human health.

- Pollution Control Act
- Clean Waters Act
- Noise Control Act
- Environmentally Hazardous Chemicals Act

Licenses and approvals may be needed for:

#### Water

- Discharge to any waters
- Install or modify equipment for waste treatment discharge

#### Air

- Emissions on scheduled premises
- Emissions and use of plant consuming more than 300 kg of fuel hour

#### Noise

- Noise conditions of operation on scheduled premises

#### Heritage and Aboriginal Items

Approval is needed from the Heritage Council under the Heritage Act to demolish, damage, remove or alter an item of heritage. There are also restrictions that can be placed on works that expose relics without consent.

For aboriginal relics and places, a licence is needed from the National Parks and Wildlife Services (NPWS) to damage, deface or remove any relics or places in the site of any works. Under the National Parks and Wildlife Act, there is a duty to notify NPWS of the discovery of such relics and places.

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## Vegetation Protection and Weed Control

Several Acts relate to the protection of vegetation, fauna habitats and soil.

### Protected Land

A permit is needed to injure, lop, or remove any tree, shrub or sapling on Protected Land under *the Soil Conservation Act*. Protected land is classified as land steeper than 18 degrees slope, environmentally sensitive land, land within 20m of certain prescribed rivers and lakes.

### Habitat of Endangered Flora or Fauna

If any works, including clearing, significantly affect the environment or habitat of endangered fauna or flora, an impact statement must be prepared and a licence be sought.

### Protected Plants

Native plants are protected under the National Parks and Wildlife Act. A licence is needed from the NPWS to pick certain plants.

### Mangroves, Sea Grasses and other Marine Vegetation

A permit is needed from NSW Fisheries to cut, remove, damage or destroy mangroves, sea grasses and other marine vegetation on public water or land, agricultural leases or foreshores. These are valuable habitats protected under *the Fisheries Management Act*.

### Noxious Weeds

Noxious weeds must be controlled and destroyed under the *Noxious Weeds Act*.

### Other Works on or Near Waterways

*The Rivers and Foreshores Improvements Act* aims to prevent erosion of land by waters and protect rivers, lakes and foreshores. Permits are likely to be needed under the Act to:

- excavate or remove material within 40m of protected waters
- reclaim or till land
- design, realign, or divert a channel
- cause any change to a river bed or bank

### Dredging and Reclamation

Under the *Fisheries Management Act* the Minister for Fisheries must be informed of any proposal to dredge or reclaim in any waters.

### Protection of Fish Passage

Under the *Fisheries Management Act*:

- No works are allowed to obstruct or strand fish across a bay, inlet, river, creek, or across and around a flat. This may apply to works that involve temporarily damming or diverting waters.
- If a dam or weir is to be constructed or altered, you must first consult the Minister of Fisheries on the need for a fishway.

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## Unhealthy/Contaminated Land

Approval is needed from the EPA under the Unhealthy Building Land Act to build on land declared as unhealthy. The EPA has control over contaminated sites under the *Environmentally Hazardous Chemicals Act* and may require a licence if an environmentally hazardous waste or declared chemical waste is to be transported.

## Storage, Transport and Disposal of Substances and Wastes

In addition to *Local Government Act* and pollution control laws, several other Acts aim to reduce waste to human health and the environment from dangerous substances.

## Environmentally Hazardous Chemicals

Under the *Environmentally Hazardous Chemicals Act*, a licence is needed from the EPA and safeguards are needed for storage, transport and disposal of certain chemicals.

## Dangerous Goods

Under the *Dangerous Goods Act* licenses are required from the WorkCover Authority for the storage or transport of dangerous goods.

## Waste Disposal

Under the *Waste Disposal Act* a license is needed to operate a waste depot, accept wastes from other sites, transport waste or create trade waste. The relevant authority is the EPA.

The release of the ISO 14000 series standards for life-cycle assessment and environmental management will increase pressure to give consideration to design and construction systems and the potential that these decisions have on the volumes of waste produced.

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## Appendix H Case Studies

### Neighbourhood Improvement Program

#### Developing Sustainable Communities

The Neighbourhood Improvement Program was born out of an acknowledgment that the large mono economic Public Housing had failed to deliver a sustainable living environment. Social indicators of sustainability showed the estates were failing to provide an acceptable level of amenity for thousands of public housing tenants who were expected to live in them.

The housing estates were developed using the principles of the Radburn Planning scheme, which aims to separate pedestrian and vehicle access. It emerged as a guiding philosophy for American town planners in the 1920's as a response to the introduction of the motorcar into residential neighbourhoods.

The Australian adoption of Radburn was based on a misinterpretation of the social and to some extent physical context needed to support such an initiative. American Radburn emerged in wealthy neighbourhoods where the upper middle classes were eagerly embracing the new technology of the domestic motor vehicle. Car courts were provided to the rear of the houses where garages housed the valuable family car. Access was provided to the front and back doors of the main house, the latter off pedestrian/bicycle paths that meandered through idyllic open space corridors that linked the residential areas to the town centres.

In contrast in the large housing estates in NSW the population is predominantly low-income earners or welfare recipients with little if any private ownership. Employment is not available locally, facilities are solely provided by government and the individualisation and appropriateness of the built form were not seen as issues that would concern public housing tenants. The result is whole suburbs of disenfranchised communities that are characterised by high rates of crime, poor health levels, low education retention rates, inter-generational poverty and welfare dependence that manifest as unstable populations with many households moving out of the area within the first or second year.

In other areas of Australia where these problems have been confronted the solutions have revolved around removing the problem housing and thereby moving the tenants by large-scale demolition or gentrification for re-use to private housing.

In NSW neither of these two options was pursued. Instead, the decision to develop sustainable communities was supported as the most appropriate method for re-positioning the public housing estates and their tenants within a broader more sustainable environment.

The basis of the change process had to be the tenants themselves, they in fact are the greatest resource available on the estates and historically the most under-utilised. This involves a huge paradigm shift from where the tenants are recipients of a patriarchal paternalistic construct to one of reciprocal responsibility where the tenants drive decisions and are partners in the process of defusing and maintaining their neighbourhoods as sustainable communities.

The nature of adopting sustainable practices often means extensive financial outlays at the beginning of an enterprise in return for greater longer term cost savings over the life of the project. In the case of the Neighbourhood Improvement Program housing funds have been directed from construction of new houses to re-planning and redesigning of existing non- sustainable communities.

The most obvious manifestation of sustainability is vacancy rates, i.e. the number of properties and the length of time each dwelling is vacant, especially when viewed against a waiting list of applicants who are in proven housing stress. In some estates the vacancy rate runs at 16% annually out of a portfolio of 1300 properties. To replace this lost housing opportunity off site would require funding assistance ten times that required to bring the existing resource up to a sustainable level.

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When employment creation is factored in to the cost scenario of achieving sustainable communities, demonstrated savings from a whole of government approach can contribute to a cross subsidised sustainable program, that is sustainability based on prevention of community disintegration. Inter-related savings can be achieved in the following areas:

- reduced vacancies
- reduced welfare payments
- reduced vandalism damage
- reduced use of emergency services
- reduced loss of rents
- reduced administration costs
- reduced crime
- improved property care
- improved asset values
- improved community satisfaction
- improved safety and security.

The Neighbourhood Improvement Program has already been assessed by the tenants as highly successful, the challenge now is to ensure the philosophy of community change and empowerment is continued and is not sacrificed to the processes of commoditisation.

The ultimate test of a community's sustainability lies in the physical, social, economic and cultural streams being integrated into a robust entity that can look to the future where the human resources available within a community are fully utilised. For low economic communities the environmental fabric could start to resemble the alternate technology, high labour initiatives of other less affluent cultures where employment is generated from meeting the needs of the local community.

If the economic focus is to change from the global to the local then legislative controls that prohibit or interfere in self-sufficiency will need to also change, as will the relationship between those commissioned with governing and those actively contributing to the development of sustainable communities.

While the Life Cycle Cost modelling for the projects is in a large part hypothetical, the basis of the methodology aims to capture the current costs in providing services to communities offset against the investment of funds into preventative and sustainable initiatives that impact on the need for income support, housing subsidies, cost of property damage, lost rents, reduced asset values, direct service provision from emergency services, cost of crime and ultimately cost of criminal justice including detention.

## Hypothetical Case Study

Organic Waste Services is a government agency currently collecting green and kitchen waste from households and agencies in the Tarrawarra area and transporting it to a landfill site. It currently services 20000 households and five government agencies. In light of the new NSW Government target to achieve a 60% reduction in waste to landfill by the year 2000, the agency has decided to review its current practices and integrate Sustainable Development principles into their service delivery strategy and asset management.

### Service Strategic planning

Stage 1            Define intended service delivery outcomes

Adopt the broad objectives and strategies of Sustainable Development contained in Table 1

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Stage 2 Forecast future demand and its impacts on service delivery outcomes

- Meeting the requirements of the Waste Minimisation and Purchasing Policy
- Increased community expectation for environmentally safe practices.
- Increased population in the South West of Tarrawarra by c. 5000
- Increased population densities in the inner city areas of Tarrawarra. (Higher densities means that users often lack a backyard which limits the use of on-site composting)

Stage 3 Assess current service performance and identify service delivery gaps

The agency is currently meeting service demands in the Tarrawarra area. It is not meeting new government requirements to minimise waste to landfill or to incorporate Sustainable Development principles into its business practices.

The tables show how to assess the Sustainable Development performance of current services and develop objectives and strategies to address environmental issues. Cost estimates, shown in the left table, should be included in order to compare long-term costs and benefits of each option.

Stage 4 Identify, evaluate and select strategies

*Option A: Compost waste at source:*

- Provide current service to users who cannot accommodate a compost bin
- Provide compost bins to organisations and households who can accommodate compost bins
- Give or sell waste to local worm farms

*Option B: Compost waste at depot and sell compost*

**Sustainable Development Evaluation of Current Service** (see page 3 for evaluation of resources)

Item	No.	price	Cost
<b>Waste</b>			
<b>Trucks</b>	20	50,000	1000000
Investment	3	50,000	-150000
Maintenance	20	2,000	-40000
Operation	20	4,000	-80000
Disposal	3	20000	60000
<b>Cars</b>	5	30,000	-150000
Investment	.5	30,000	-15,000
Maintenance	5	1000	-5000
Operation	5	5000	-25000
Disposal	.5	10000	5000
<b>Depot</b>			
Investment	400m <sup>2</sup>	720/m	
Maintenance			
Operation			
Disposal			
<b>Admin.</b>			
Investment			
Maintenance			
Operation			
Disposal			
<b>IT</b>			
Investment			
Maintenance			
Operation			
Disposal			
<b>HR</b>			
Salaries			
Transport			
Amenities			
<b>TOTAL</b>			

	Activity	Aspect	Environmental Impact/Benefit	Priority	Objectives	Potential Strategy
	Services		<ul style="list-style-type: none"> <li>The service itself contributes to Sustainable Development by ensuring that less desirable methods of waste disposal are avoided</li> <li>Current agency activities have medium to high levels of environmental impacts</li> </ul>		<ul style="list-style-type: none"> <li>Maintain environmental benefit</li> <li>Minimise environmental impacts</li> </ul>	Implement an Environmental Management System
1	Collection of waste	Parking	<ul style="list-style-type: none"> <li>Socio/cultural: parking may interrupt local transport disrupting access to houses and businesses</li> </ul>	Low	<ul style="list-style-type: none"> <li>Minimise impact on local transport routes</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the need to collect the waste</li> <li>Avoid peak hours</li> <li>Monitor problem areas</li> </ul>
2	Transport of waste	Driving	<ul style="list-style-type: none"> <li>Ecological: air emissions (CO2)</li> <li>Socio/cultural: increases traffic volume - more congestion on roads</li> <li>Economic: increases traffic volume- need for more roads and therefore increased use of natural resources</li> </ul>	Med	<ul style="list-style-type: none"> <li>Minimise ecological impacts</li> <li>Minimise use of roads</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the need to transport the waste</li> <li>Shorten transport routes: decentralise depot</li> <li>Look at alternatives to petrol and diesel</li> </ul>
3	Dumping of waste	Dumping of waste into landfill sites	<ul style="list-style-type: none"> <li>Ecological: ecosystems</li> <li>Socio/cultural: use of space</li> <li>Economic: use of a natural resource</li> </ul>	High	<ul style="list-style-type: none"> <li>Minimise waste to landfill to zero if possible</li> </ul>	<ul style="list-style-type: none"> <li>Compost waste at source by providing compost bins</li> <li>Compost waste at depot and sell compost</li> </ul>

## Sustainable Development Evaluation of Option A

Item	No.	Price	Cost
<b>Waste</b>			
<b>Trucks</b>	3	50000	1500000
Investment			
Maintenance	3	2000	6000
Operation	3	4000	12000
Disposal	1		
<b>Cars</b>	4	30000	120000
Investment			
Maintenance			
Operation			
Disposal			
<b>Depot</b>			
Investment			
Maintenance			
Operation			
Disposal			
<b>Admin.</b>			
Investment			
Maintenance			
Operation			
Disposal			
<b>IT</b>			
Investment			
Maintenance			
Operation			
Disposal			
<b>HR</b>			
Salaries			
Transport			
Amenities			
<b>TOTAL</b>			

Activity	Aspect	Environmental Impact/Benefit	Priority	Objectives	Potential Strategy
Services		<ul style="list-style-type: none"> <li>The service itself contributes to SD by ensuring that less desirable methods of waste disposal are avoided and that waste is recycled</li> <li>The activities associated with this option have minimal environmental impacts</li> </ul>		<ul style="list-style-type: none"> <li>Maintain environmental benefit</li> <li>Minimise environmental impacts</li> </ul>	Implement an Environmental Management System
<b>1</b>	Collection of waste Delivery and replacement of bins	Parking	Low	<ul style="list-style-type: none"> <li>Minimise impact on local transport routes</li> </ul>	<ul style="list-style-type: none"> <li>Avoid peak hours</li> <li>Monitor problem areas</li> </ul>
<b>2</b>	Transport of bins and waste	Driving	Low	<ul style="list-style-type: none"> <li>Minimise ecological impacts</li> <li>Minimise use of roads</li> </ul>	<ul style="list-style-type: none"> <li>Shorten transport routes: decentralise depot</li> <li>Look at alternatives to petrol and diesel</li> </ul>
<b>3</b>	Provision of bins	Material	Low	<ul style="list-style-type: none"> <li>Minimise ecological impacts</li> </ul>	<ul style="list-style-type: none"> <li>Ensure bins are environmentally safe and manufactured in an environmentally safe way.</li> <li>Ensure bins can be easily recycled</li> </ul>

## Sustainable Development Evaluation of Option B

Item	No.	Price	Cost	Activity	Aspect	Environmental Impact/Benefit	Priority	Objectives	Potential Strategy
<b>Waste</b>									
<b>Trucks</b>	3	50000	1500000	Services		<ul style="list-style-type: none"> <li>The service itself contributes to SD by ensuring that less desirable methods of waste disposal are avoided by recycling waste</li> <li>The activities associated with this option have low to medium environmental impacts</li> </ul>		<ul style="list-style-type: none"> <li>Maintain environ-mental benefit</li> <li>Minimise environ-mental impacts</li> </ul>	Implement an Environmental Management System
Investment									
Maintenance	3	2000	6000						
Operation	3	4000	12000						
Disposal	1								
<b>Cars</b>	4	30000	120000						
Investment									
Maintenance				<b>1</b>	Collection of waste	<ul style="list-style-type: none"> <li>Socio/cultural: parking may interrupt local transport disrupting access to houses and businesses</li> </ul>	Low	<ul style="list-style-type: none"> <li>Minimise impact on local transport routes</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the need to collect waste</li> <li>Avoid peak hours</li> <li>Monitor problem areas</li> </ul>
Operation									
Disposal									
<b>Depot</b>				<b>2</b>	Transport of waste and compost	<ul style="list-style-type: none"> <li>Ecological: air emissions (CO2)</li> <li>Socio/cultural: increases traffic volume - more congestion on roads</li> <li>Economic: increases traffic volume- need for more roads and therefore increased use of natural resources</li> </ul>	Med	<ul style="list-style-type: none"> <li>Minimise environ-mental impacts</li> <li>Minimise use of roads</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the need to transport waste</li> <li>Shorten transport routes: decentralise depot</li> <li>Look at alternatives to petrol and diesel</li> </ul>
Investment									
Maintenance									
Operation									
Disposal									
<b>Admin.</b>				<b>3</b>	Composting waste	<ul style="list-style-type: none"> <li>Ecological: waste production</li> </ul>	Low	<ul style="list-style-type: none"> <li>Minimise waste to landfill to zero if possible</li> </ul>	<ul style="list-style-type: none"> <li>Look at ways to use or sell compost</li> </ul>
Investment									
Maintenance									
Operation									
Disposal									
<b>IT</b>									
Investment									
Maintenance									
Operation									
Disposal									
<b>HR</b>									
Salaries									
Transport									
Amenities									
			<b>TOTAL</b>						

## Sustainable Development Evaluation of Current Resources

Activity	Aspect	Environmental Impact/Benefit	Priority	Objectives	Potential Strategies
<b>1 VEHICLES</b>					
Trucks and cars	Investment	Economic: non-renewable resource consumption	<b>Medium</b>	Reduce resource consumption	Look at alternative technologies Ensure vehicles are fuel efficient
	Maintenance	Ecological: soil, water, and some air contamination Economic: resource consumption		Contain ecological impacts	Implement an AEMP
	Operation	Ecological: air emissions -air quality, greenhouse gases emissions Economic: non-renewable resource consumption - fuel		Contain ecological impacts minimise fuel and oil consumption	Look at alternative fuels such as electricity and gas Minimise distances Implement an AEMP
	Disposal	Ecological: waste production.		Minimise waste to landfill	Reuse or recycle parts or whole asset
<b>2 ACCOMMODATION</b>					
Depot and admin office	Investment	Ecological: eco-system and air, water, soil, noise pollution during construction Socio/cultural: location, aesthetics Economic: natural resource consumption	<b>Medium</b>	Ensure building has high Sustainable Development performance	Include Sustainable Development objectives in brief and all project proposals
	Maintenance	Ecological: soil, water contamination		Contain ecological impacts	Implement an AEMP
	Operation	Ecological: waste production Economic: resource consumption - energy water		Minimise waste to landfill increase efficiency of resource consumption	Reduce, reuse, recycle waste Use recycled office equipment and stationary Conduct energy, water and waste audits and develop strategies for more efficiency Implement and EMS
	Disposal	Ecological: waste production.		Minimise waste to landfill	Reuse or recycle parts or whole asset
<b>3 IT</b>					
	Investment	Ecological: ecological impacts during manufacture, Economic: resource consumption - natural resources	<b>Low</b>	Purchase environmentally friendly, energy efficient, recyclable equipment	Ensure equipment is energy efficient eg.: sleep modes
	Maintenance	Economic: resource consumption - energy		Minimise energy consumption	
	Operation	Economic: resource consumption - energy		Minimise energy consumption	Institute energy saving initiatives such as turning equipment off when not in use
	Disposal	Waste production		Minimise waste to landfill	Ensure supplier has a take back system or remanufacturing program
<b>4 HR</b>					
	Transport	Economic: fuel consumption	<b>Medium</b>	Minimise fuel consumption	Provide incentives to use public transport
	Amenities	Ecological: waste production		Minimise waste production	Implement and EMS