

Composting and Related Facilities

E I S G u i d e l i n e

**New South Wales
Department of Urban Affairs and Planning**

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Executive summary

This guideline identifies some important factors to be considered when preparing an environmental impact statement (EIS).

The preparation of the EIS should be preceded by early effective consultation and technical discussions with relevant government agencies and councils.

A high priority should be given to:

- considering environmental factors in site selection
- evaluating alternative sites
- ascertaining the suitability of the intended location.

There should be an early evaluation of alternatives, taking into consideration the factors in Part 4 of this guideline.

The analysis of alternative design, processing and management practices should consider the environmental implications of options. The justification for the selection of the preferred options should consider biophysical, social and economic factors, and the consistency with ecological sustainability principles.

The assessment process should focus on key environmental issues. These issues should be identified early in the environmental impact assessment (EIA) process, usually at a planning focus meeting and through consultation with the community. The assessment process should clearly identify the environmental (including biophysical, social and economic) costs and benefits of the proposal.

Key issues for composting facilities usually include:

- air quality issues, especially odour
- surface water and groundwater protection
- transport and traffic issues.

The EIS should outline commitments to the ongoing environmental management of the proposal, including monitoring.

The level of analysis of individual issues in the EIS should reflect the level of significance of their impacts. The analysis should focus on key issues. The information in the EIS should be accurate and presented clearly and concisely. There should be emphasis on quality and not quantity. The EIS need not be long.

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1. Purpose and scope of the guideline

1.1 Background

A major function of an environmental impact statement (EIS) is to provide information on the potential environmental impacts of a proposal. This guideline outlines the matters which an EIS may need to include for a composting or related facility to fulfil this function. The details in the EIS should reflect the level of significance of the potential impacts on the environment. The guideline will also be relevant for composting proposals requiring a lesser degree of environmental assessment. As well as providing advice to applicants of composting proposals, the guideline will also help government authorities responsible for the approval or regulation of composting facilities.

This guideline provides advice concerning the following specific matters relating to composting facilities:

- review of the planning and consultation process applying to composting proposals
- site selection principles
- environmental factors to consider in an EIS for composting facilities.

Composting is a biological process used to manufacture an important component of soil conditioners, mulches, or as a growing media for the horticultural, agricultural, landscaping, nursery or mushroom industries. The intended use of the end product usually determines the raw materials used in the processes. It also dictates the specific design and operational controls required to manufacture a product with specific characteristics to meet the end users' requirements. As an example, the organic materials used in mushroom compost mix are specifically selected and monitored to ensure compliance with a high quality substrate designed to maximise mushroom cultivation.

Composting is also an important aspect of the NSW Government's waste management strategy. This policy, which involves the reduction, reuse and recycling of wastes, is underpinned by the concept of ecologically sustainable development

(ESD). As organic wastes constitute the largest fraction of the waste stream going to landfill, the composting of these materials will serve to reduce the demands on landfills and recycle resources to produce compost and other materials.

However, composting has the potential to cause significant environmental impacts on groundwater and surface water and on the amenity of the community. Carefully selected site, design and management practices are necessary to ensure that facilities operate in an ecologically sustainable manner.

The degree of relevance of matters in the guideline to a particular composting proposal will depend upon the proposed location, the quantity and nature of the material processed and the proposed operational regime. The greater the potential environmental impacts, the more carefully the site, design and operational practices must be considered and the greater the attention paid to environmental assessment.

1.2 Composting facilities covered by the guideline

Composting is the process of the controlled biological conversion of organic material into stable cured humus-like products. This biological process can be characterised according to the use of oxygen by the organisms:

- **aerobic composting** is a relatively highly controlled, rapid process involving the use of oxygen by aerobic organisms, and usually involves both mesophilic (15-45°C) and thermophilic (45-70°C) phases, with the production of minor quantities of odorous gases (unless the process becomes anaerobic)
- **anaerobic composting** (also called fermentation or biofermentation) is a relatively low maintenance, slow process requiring the exclusion of oxygen (usually in-vessel) and involving the use of anaerobic organisms with no elevation in temperature (unless external sources are applied), and the production of large quantities of odorous gases (which can be used for the generation of energy).

The term 'composting' is intended to include all related or similar processes (whether the process is called composting, bioprocessing, bioconversion, bioremediation, biodigestion, biohydrolysis, biofermentation or other names). Most composting facilities are aerobic, although anaerobic composting operations are technically, environmentally and economically feasible. Typically, aerobic composting procedures involve stacking and turning material in outdoor elongated windrows. Other composting facilities undertake all or some of the processing enclosed in sheds, silos, tunnels or other forms of enclosed units. Composting may also include the use of worms in addition to microbial organisms (this process is known as vermiculture or vermicomposting).

A range of organic materials can be composted. This guideline covers composting of the following categories of organic material listed in table 1.

The higher the class of material used in the compost, the more likely it is that there will be environmental impacts if the operation is undertaken outdoors. Composting of mixed domestic waste is extremely difficult to manage and is not recommended outdoors. In this regard, advice should be sought from the EPA. Materials such as glass, plastics or hazardous materials

should be specifically excluded from the composting stream. The guideline applies to all proposals which meet the above 'process' definition and use one or more of the above organic materials. The guideline applies for new facilities, or significant alterations to existing facilities.

The construction and operation of composting proposal may include facilities for:

- transport, receipt, inspection, transfer and storage of raw materials; access, internal road systems, parking, unloading areas, vehicle cleaning facilities
- pre-processing such as shredding, sorting, mixing, pre-wetting or aerating materials
- composting including facilities for mixing, turning, aerating, adding inorganic or organic materials or organisms, monitoring
- post-composting including sieving, mixing, batching, bagging, dispatching or storing of products
- managing odour and leachate, drainage and stormwater including lining of storage and work areas and the storage, treatment, use or disposal of water and leachate
- administration, maintenance or storage of plant, equipment and chemicals; security systems including fencing, lights and fire fighting facilities.

Table 1. Organic Material

Class	Category	Examples of organic material
1.	<ul style="list-style-type: none"> • Garden and landscaping material • Untreated timber • Natural fibrous material • Processed fibrous material 	<ul style="list-style-type: none"> • Grass, leaves, plants, loppings, branches, tree trunks and stumps • Sawdust, shavings, timber offcuts, crates, pallets, wood packaging • Peat, seed hulls/husks, straw, bagasse, other natural fibrous material • Paper, cardboard, paper processing sludge, non-synthetic textiles
2.	<ul style="list-style-type: none"> • Other natural or processed vegetable material • Biosolids and manures 	<ul style="list-style-type: none"> • Vegetables, fruit and seeds and associated processing sludges and wastes, brewery, wine and distillery sludges and wastes, non-fatty food wastes • Sewage biosolids, animal manure, mixtures of manure and biodegradable bedding materials
3.	<ul style="list-style-type: none"> • Meat, fish, fatty foods • Fatty and oily sludges and wastes 	<ul style="list-style-type: none"> • Animal and fish carcasses and parts of carcasses, blood, bone, fatty processing or food wastes • Dewatered grease trap wastes, fatty and oily sludges

1.3 When is an EIS required?

A composting proposal may be subject to assessment under Part 4 or Part 5 of the *Environmental Planning and Assessment (EP&A) Act 1979*.

Part 4 of the Act applies when a proposal requires development consent under a local environmental plan or other planning instrument. For these types of developments, an EIS is required if they meet the designated developments criteria listed in Schedule 3 of the EP&A Regulation 1994 or any planning instrument. Schedule 3 lists composting facilities (see Appendix 6). The designation criteria are based on the quantity of organic material processed as well as locational factors. It is the responsibility of the consent authority to determine if a proposal is designated development. Usually, the local council is the consent authority.

If a composting proposal is designated development, an EIS must be prepared and submitted with the development application. If a composting proposal is not designated, a statement of environmental effects (SEE) must be submitted with the development application. Whatever document is prepared, it should address all relevant issues in sufficient detail so that the consent authority can make an informed judgement about the environmental impacts of the proposal. Therefore, this guideline is equally applicable for identifying the issues which may need to be addressed in an EIS or a SEE. Appendix 2 provides a summary of the development assessment process.

Most proposals requiring an EIS will fall within Part 4 of the Act. For facilities being considered under Part 4 of the Act (i.e. those which require development consent) and for which an EIS has been prepared, the following procedures apply after the DA has been lodged with the consent authority:

- the DA and EIS are exhibited for a minimum period of 30 days. During the exhibition period, the public is able to make submissions
- at the completion of the exhibition period, the consent authority forwards copies of the submissions to the Department of Urban Affairs and Planning. The Department reviews

the submissions and the EIS, and advises the consent authority whether it can determine the application (with or without seeking further information), or whether the proposal should be determined by the Minister following a Commission of Inquiry

- when the consent authority determines the application, it does so having regard to the heads of consideration included in Section 90(1) of the EP&A Act 1979
- the proposal can be refused by the consent authority, or approved with or without conditions
- the applicant can appeal to the Land and Environment Court against a decision of the consent authority to refuse an application, or against any condition of consent. Third party appeal rights are available to anyone who made a submission of objection to the proposal.

For composting facilities not requiring an EIS but still requiring planning consent, the consent authority must consider Section 90 of the Act when determining the application. Although there is no formal requirement for the exhibition of such proposals, the consent authority usually treats them as advertised development. This will provide opportunity for public notification and input into such proposals. In such cases, the proposal is exhibited for a minimum of 14 days. There are no third party merit appeal rights for advertised development.

Part 5 of the EP&A Act applies to any proposals not requiring development consent but requiring an approval from the EPA or another government authority (a determining authority). Under Part 5, a determining authority must consider whether the proposal has the potential to significantly affect the environment. If significant impacts are likely, an EIS must be considered before an approval is granted. The document *Is an EIS required?* (Department of Planning, 1995) provides advice on whether an EIS is required under Part 5 of the Act. If an EIS is not required, a review of environmental factors (REF) should be prepared to assess impacts and proposed mitigation strategies. This guideline is equally applicable for identifying issues which may need to be addressed in a REF prior to granting an approval.

1.4 Application of SEPP 33

For proposals falling under Part 4 of the Act, the applicability of SEPP 33 should be discussed with council. If a proposed development is considered to be potentially offensive (in accordance with SEPP 33), the applicant should consult the EPA (or other appropriate authority) and develop the necessary control measures for obtaining the appropriate licences under the relevant Acts such as the Clean Air Act. If a development cannot meet the requirements to be licenced, it will be considered offensive. Such developments would usually be prohibited in most zones.

If the proposal is considered potentially hazardous under SEPP 33, a preliminary hazard analysis (PHA) must be submitted with the EIS or with a SEE accompanying the development application. Where appropriate, a PHA may also be required by the Department of Urban Affairs and Planning when the Director-General is formally consulted for Director-General's requirements for an EIS.

The PHA should be prepared in accordance with the *Hazardous Industry Planning Advisory Paper (HIPAP) No.6 — Guidelines for Hazard Analysis* (Department of Planning, 1992a), which sets out the general requirements for the preparation of a PHA. The purpose of the PHA is to:

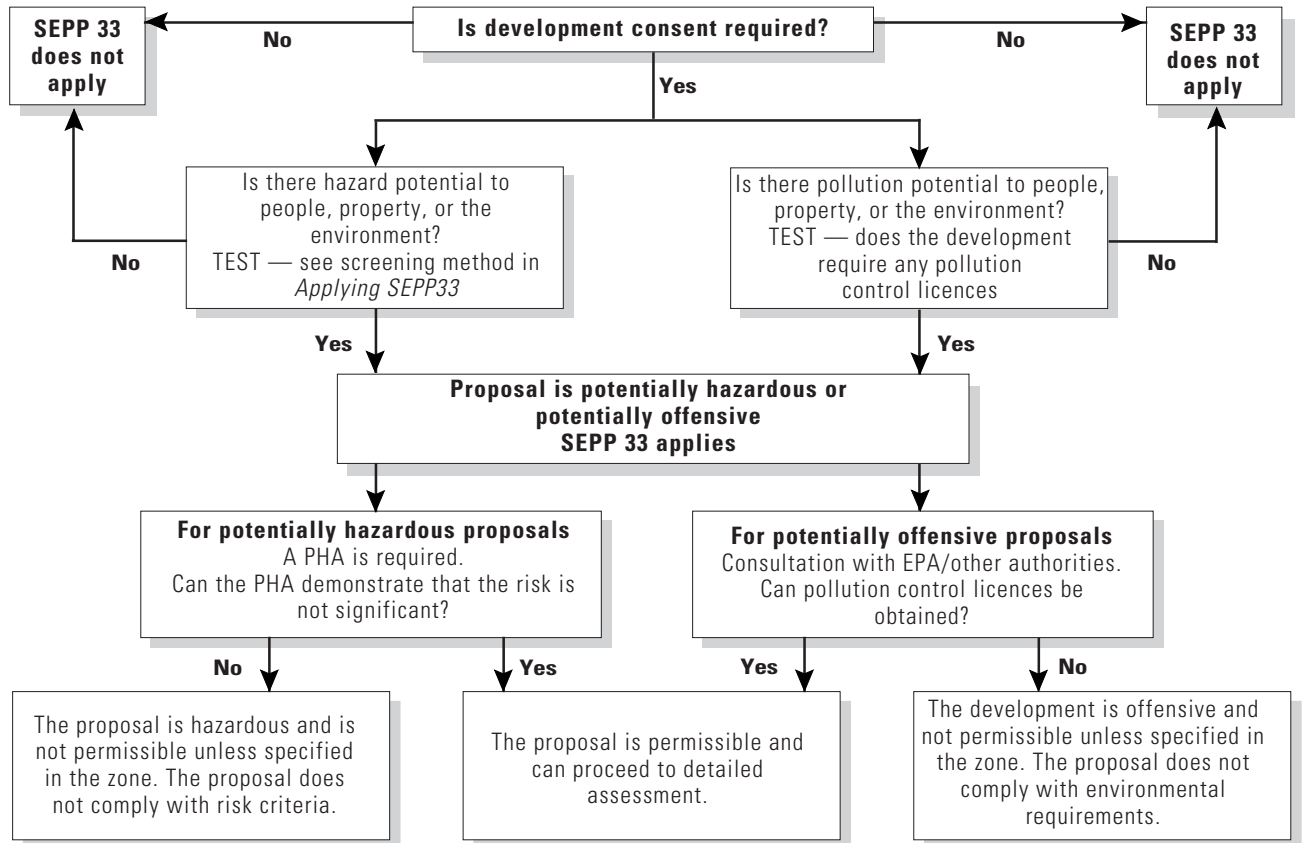
- identify all potential hazards associated with the proposal

- analyse all hazards in terms of their consequences (effects) on people and the biophysical environment, and their likelihood of occurrence
- quantify resulting risks to surrounding land uses and the environment
- assess the risks in terms of the location, land use planning implications and existing criteria, ensure that the proposed safeguards are adequate, and thus demonstrate that the operation will not impose an unacceptable level of risk.

If the PHA demonstrates that the risks to people, property or the biophysical environment are unacceptable in terms of the criteria adopted in NSW and set out in detail in *Hazardous Industry Planning Advisory Paper (HIPAP) No. 4 — Risk Criteria for Land Use Safety Planning* (Department of Planning, 1992b), the development will be considered hazardous. Such developments would usually be prohibited in most zones.

Figure 1 outlines the assessment procedures for the application of SEPP 33. For proposals assessed under Part 5 of the EP&A Act, even though SEPP 33 does not strictly apply, the procedures set out in the guidelines should be considered to be 'best practice' and should be followed when appropriate.

Figure 1. The SEPP 33 Process for Potentially Hazardous and Potentially Offensive Development



2. Factors to consider when preparing an EIS

The aim of environmental impact assessment (EIA) is to enable the approving authority, the public, the local council, government authorities and the proponent to properly consider the potential environmental consequences of a proposal. It is important to provide sufficient information for the approving authority to make a decision on whether to approve a proposal and if so, under what conditions. The EIS provides the basis for sound ongoing environmental management.

It is the proponent's responsibility to identify and address, as fully as possible, the matters relevant to the specific proposal and to comply with the statutory requirements for EIS preparation. The following factors are important when preparing an EIS.

2.1 Early consideration of the strategic context

The need for the proposal should be clearly identified along with its relationship to broader strategic plans and goals. Consideration of the strategic context is essential when selecting options for the proposal. Strategic mechanisms such as policies and plans which illustrate how the proposal has been developed, should be discussed in the EIS so that the information is available and relevant. It is not the role of the project EIS to undertake an environmental assessment of strategic mechanisms related to the proposal. However the EIS should report upon and apply them to the proposal.

Any existing relevant cumulative or strategic environmental studies should be considered when formulating and justifying undertaking a proposal. Air and water quality studies, state of the environment reports and local and regional environmental studies should also be taken into consideration as applicable.

2.2 Early assessment of options

The objectives for the proposal should be developed to fulfil any identified need and should encompass the principles of ecologically sustainable development (ESD). ESD principles (outlined in Appendix 1) should be considered when identifying options for all aspects of the proposal. All feasible alternatives that could satisfy the objectives of the proposal should be considered. When weighing up options, the biophysical, economic and social costs and benefits throughout the whole life cycle of the proposal should be considered. The 'do nothing' option should also be included in these considerations.

Careful option selection can lower community concerns and reduce potential costs of mitigation and management required to control environmental (including social) impacts. Early adoption of ecologically sustainable strategies can reduce possible conflicts, and additional costs and delays at later stages of the approval process.

2.3 Identifying issues

The general framework for an EIS is prescribed in Schedule 2 of the EP&A Regulation (see Appendix 1). The Director-General's requirements provide specific matters to be addressed in an EIS. In addition to the specific legal requirements, the proponent has a broader responsibility to consider all potential environmental issues in relation to the proposal.

As a precursor to identifying potential environmental issues, the proponent must be able to outline:

- the important characteristics of the project which will determine the scope of the potential impacts
- the proposed site and a preliminary assessment of the sensitivity of the site.

If either the project characteristics or the site should change, then the potential impacts may also change. If at any time changes occur, the scoping process for the EIS should be reviewed. If major changes occur, the Director-General may need to be reconsulted to amend their requirements.

In addition to the issues outlined in this guideline, other sources of information which may assist in the identification of potential issues include:

- any relevant guidelines produced by other NSW government authorities, e.g. *Environmental Noise Control Manual* (EPA, 1994a), other States or overseas
- EISs for similar projects, and any relevant commission of inquiry report, determination report and conditions of approval
- relevant research and reference material on similar proposals.

There are a number of approaches or mechanisms which help identify issues relating to a particular proposal in a particular location. They may involve fairly unstructured mechanisms with a low level of consultation or a structured process with a high level of consultation with all stakeholders. The choice of the approach should depend on the scale and type of proposal and the sensitivity of the environment. These may include:

- consultation outlined in Part 3
- checklist, matrix, network, GIS or overlay methods or similar approaches such as the tables in *Is an EIS required?* (Department of Planning, 1995)

2.4 Prioritising issues

The EIA process generally will benefit from focusing attention on key issues of concern. Not all issues identified will have the same degree of relevance for all proposals. The relative importance placed on different issues will vary from case to case, and is a function of the type and size of the proposal and the sensitivity of the receiving environment. Issues should therefore be prioritised according to their importance in the decision-making process.

When prioritising issues, consideration should be given to the potential severity, temporal and spatial extent of any beneficial and adverse

effects; their direct impacts as well as any indirect, secondary, tertiary or cumulative impacts; and whether the effects are continuous or intermittent, temporary and reversible or permanent and irreversible.

The outcome of the identification and prioritisation process should result in:

1. a list of all issues with a preliminary estimate of the relative significance of their impacts
2. identification of the key issues
3. an explanation as to why other issues are not considered to be key.

The EIS should address the key issues as fully as practicable. However the level of analysis should reflect the level of significance of the impacts and their importance for the proposal. Lesser attention should be given to those issues which have lesser significance. For these latter issues, there should be sufficient analysis to develop a sustainable mitigation strategy for any potential adverse impacts.

2.5 Impact analysis, prediction and presentation

Discussion of likely impacts should include predictions of the nature and extent of potential impacts and the effectiveness of mitigation strategies. This information is fundamental to deciding the potential ecological sustainability and hence the acceptability of a particular proposal.

a) Presentation

Information provided should be clear, succinct, objective and where appropriate, supported by maps or other descriptive detail. Repetitive or general non-specific data is distracting and is not relevant to the decision-making process. The use of jargon should be avoided. It is recommended that the EIS be edited to ensure consistency of style and accuracy of transference of information from any appendices to the main document. External review of technical analysis will help ensure that the information to be included is relevant.

The EIS should make reference to all relevant studies and investigations that have been carried out in support of the proposal or other studies, reports or literature used in the EIS. These should be made available during the public display of the EIS.

b) Baseline information

Where baseline data is to be collected first-hand, careful consideration must be given to the design of the sampling program. Matters to consider include:

- the degree of understanding of the processes in question
- the reasons for the data collection program
- sampling program design
- data collection procedures
- data analysis methodologies
- relevant quality assurance procedures.

The need for long-term sampling to discern the variability of the environment should also be assessed as early as possible so that it is not overlooked or avoided due to time constraints. Assumptions and extrapolations used to draw conclusions from the data should be justified.

In some circumstances, there may be sufficient existing data available for assessment purposes without the need for additional data collection. Where existing data is used, its adequacy and appropriateness for impact assessment of the proposal should be reviewed and discussed, taking into consideration the above points for first-hand data collection. Shortfalls or uncertainty in knowledge should be clearly identified.

In all cases, sampling programs and analysis procedures should reflect current scientific approaches. Peer review of study design, sampling methodology, data analysis and interpretation of results may help identify inadequacies.

c) Predictions of impacts and mitigation

Impact prediction should consider magnitude, duration, extent, direct and indirect effects, beneficial and adverse effects and whether impacts are reversible or permanent. All predictions of impacts and the likely success of mitigation strategies have an element of uncertainty associated with them. The proponent should identify and, where possible, indicate the

level of uncertainty associated with these predictions and mitigation measures. This information is fundamental in developing appropriate management strategies and informs the proponent, community, government agencies and the decision-maker of the degree of risk associated with the proposal and the importance of that risk.

When predicting impacts, a clear distinction must be made between those impacts which can be assessed quantitatively and those for which only a qualitative assessment can be made. Predictive models used should be justified in terms of appropriateness for the task, outlining its strengths and weaknesses. Whenever conclusions and recommendations have been made based substantially on judgements instead of facts or objective analytical results, the basis of the judgements should be clearly identified. A precautionary approach should be adopted where there is a significant chance a proposal may lead to irreversible consequences.

d) Reference to standards or indicators

Where possible, discussion of impact assessment and mitigation measures should make reference to recognised standards or indicators for sustainability. Standards such as the *Australian Water Quality Guidelines for Fresh and Marine Waters* (ANZECC, 1992) will provide a useful reference against which to measure the acceptability of potential outcomes. In some cases, indicators may have been developed for a region or area, for instance by the Healthy Rivers Commission for specific catchments. In other cases they may be developed as a result of regional strategic environmental or cumulative studies. Some indicators for sustainability may relate to the specific characteristics of the location and can only be developed as a result of the analysis undertaken in the EIS.

e) Mitigation strategies

Mitigation strategies must be considered both in relation to individual impacts and collectively for all impacts. This helps to avoid conflict between mitigation strategies and ensures that measures applied with respect to one (or more) potential impacts do not increase the magnitude or significance of other likely impacts. The mitigation strategy should include the

environmental management principles which would be followed in the planning, design, construction and operation of the proposal and include:

- a compilation of locational, layout, design or technology features described in the EIS
- an outline of ongoing environmental management and monitoring plans.

Predictions made in the EIS should be monitored in an environmental management plan (EMP). With projects with potentially controversial environmental impacts, it may be appropriate to:

- consult with government authorities, council and the community when preparing the EMP
- establish a community committee to consult in relation to the ongoing management of the proposal
- exhibit an annual environmental management report outlining the environmental performance of the proposal.

It is not expected that a detailed EMP be prepared for the EIS. However an outline of the content and structure and commitment to prepare an EMP is required.

2.6 A question of adequacy

The NSW Land and Environment Court has made a number of observations about the adequacy of EISs during its judgements (see Gilpin, 1995). Gilpin's summary of the Court's observations includes:

- The purpose of an EIS is to bring matters to the attention of members of the public, the decision-maker, and the Department of Urban Affairs and Planning so the environmental consequences of a proposal can be properly understood
- The purpose of the EIS is to assist the decision-maker. An EIS is not a decision-making end in itself, but a means to a decision-making end

- The EIS must be sufficiently specific to direct a reasonably intelligent and informed mind to possible or potential environmental consequences
- The EIS should be written in understandable language
- The EIS should contain material which would alert both lay persons and specialists to potential problems
- An EIS would be unacceptable if it was superficial, subjective or non-informative
- An EIS would be acceptable if it was objective in its approach and alerted relevant parties to the environmental effects and community consequences of carrying out or not carrying out the proposal.

2.7 Ecologically sustainable development

Under the EP&A Regulation, it is necessary to justify the proposal having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development (ESD).

Ecological sustainability requires a combination of good planning and an effective and environmentally sound approach to design, operation and management. The proponent should have regard to the principles of ESD throughout the whole project life cycle, and especially:

- when developing the objectives for the project
- during project formulation, planning and design
- when considering project options and alternatives
- during construction
- for the operational life of the proposal
- afterwards during decommissioning, site rehabilitation and reuse.

Continual reference should be made to the question 'Is this proposal ecologically sustainable?'

3. Consultation

Early consultation with the local community, industry, councils and government agencies can be of great assistance in making a preliminary assessment of the potential viability of a proposal at a particular site. It can also assist in ensuring that the EIS is focused on those matters which will add value to the decision-making process.

Effective consultation should enable an applicant to:

- clarify the objectives for the proposal in terms of community needs and concerns, and the relationship of the proposal to any relevant strategic plans, government policy directions and statutory or planning constraints
- identify feasible alternatives (in particular alternative sites) and clarify their relative merits in terms of biophysical, social and economic factors
- identify environmental issues to:
 - prioritise the issues and identify those key to the decision-making process
 - establish the scope of the studies for key issues so that there will be adequate information for the decision-making process
 - where possible, identify performance objectives or indicators for key issues
 - when appropriate, identify experts (in government agencies or from other sources) who can assist in guiding the assessment of a key issue or peer review the assessment
- if appropriate, identify processes for continued community involvement.

The following consultation procedures are recommended:

3.1 Consultation with government agencies

It is intended that this guideline should replace the need to undertake routine consultation with government agencies on general matters to be included in an EIS, statement of environmental effects (SEE) or review of environmental factors (REF).

However, consultation with councils and relevant government agencies is recommended to help identify alternatives and to provide a preliminary view on their acceptability within the strategic context. To maximise the benefits of consultation with government authorities, requests for advice should be accompanied by adequate information on the proposal and proposed locations. The consultation request should be targeted towards identifying key issues, and should specifically relate to the particulars of the location, design and operation of the proposed facility.

To facilitate consultation with relevant government agencies, it may be appropriate to hold a planning focus meeting (PFM). The Department recommends that PFMs be held for all major or potentially controversial proposals. The principal approval authority would usually be responsible for organising the PFM. In addition to including government authorities which have an approval role, other agencies with expertise in the area, catchment management committees or independent technical experts may also need to be included depending on the location, site characteristics and management options.

For a composting proposal, the following organisations should be invited to a PFM or otherwise consulted:

- relevant local councils
- Department of Urban Affairs and Planning
- Environment Protection Authority
- Department of Land and Water Conservation
- NSW Health Department
- any relevant waste management authority or regional waste board.

Appendix 4 lists other organisations who may need to be consulted to identify key issues for particular proposals.

For smaller projects, less formal meetings or discussions with relevant authorities, particularly the local council, should be undertaken. Issues such as whether a proposal is consistent with the council's strategic plan for the area and is permissible at the particular site should be clarified at the outset.

3.2 Formal consultation required under legislation

Under the provisions of the EP&A Regulation, an applicant or proponent must formally consult the Director-General of the Department of Urban Affairs and Planning (DUAP) regarding the content of an EIS. It is recommended that the PFM or preliminary discussions with council occur before the proponent consults the Director-General and that the minutes of the PFM or issues canvassed in the discussions be forwarded to DUAP when the Director-General's requirements are requested.

If a proposal is on land that contains a 'critical habitat' or is likely to significantly affect threatened species, populations or ecological communities or their habitats, the Director-General of National Parks and Wildlife should be consulted regarding the contents of a species impact statement (see Appendix 3 for further information).

3.3 Consultation with the community

The community likely to be affected, whether directly or indirectly, should be informed of the proposal and consulted early in the EIA process. Consultation should aim to include affected individuals, community groups and groups with special interests such as local Aboriginal Land Councils.

For major or controversial projects, a program of community consultation may need to be undertaken as part of the preparation of the EIS. This program would usually include two phases, one seeking to inform the community (for instance involving public meetings, public displays or newsletters) and one seeking to gain input on issues of community concern, to identify community values and to identify and evaluate alternatives (for instance involving community focus meetings, 'issues' workshops and community surveys).

4. Site selection procedures

Principles of site selection for composting proposals

Consideration must be given to whether:

- the land use is permissible
- environmentally sensitive areas are avoided
- the use is compatible with nearby land uses
- initial site investigations indicate the site is fundamentally suitable for a composting operation

4.1 Site selection

The appropriate location of a composting facility is one of the most effective environmental management tools available to an applicant. While operational and market considerations are important factors when selecting sites, a high priority must be given to the environmental and social characteristics of the location. Appropriate site selection can avoid or reduce many of the environmental problems inherent with composting proposals, and:

- reduce the need for technically based environmental mitigation measures and ongoing management measures
- result in substantial savings in establishment and operation
- reduce levels of public concern
- avoid potential delays in approval processes.

A systematic and rigorous approach to site selection based on '4 locational principles' is therefore recommended as set out in Figure 2.

It is recommended that this site selection procedure be adopted for all composting facilities. The EIS (or statement of environmental effects) should summarise the results of the site selection process and should clearly explain the rationale for concluding that the selected site is fundamentally suitable for composting. At the time of site selection, community factors should

Figure 2. Site Selection

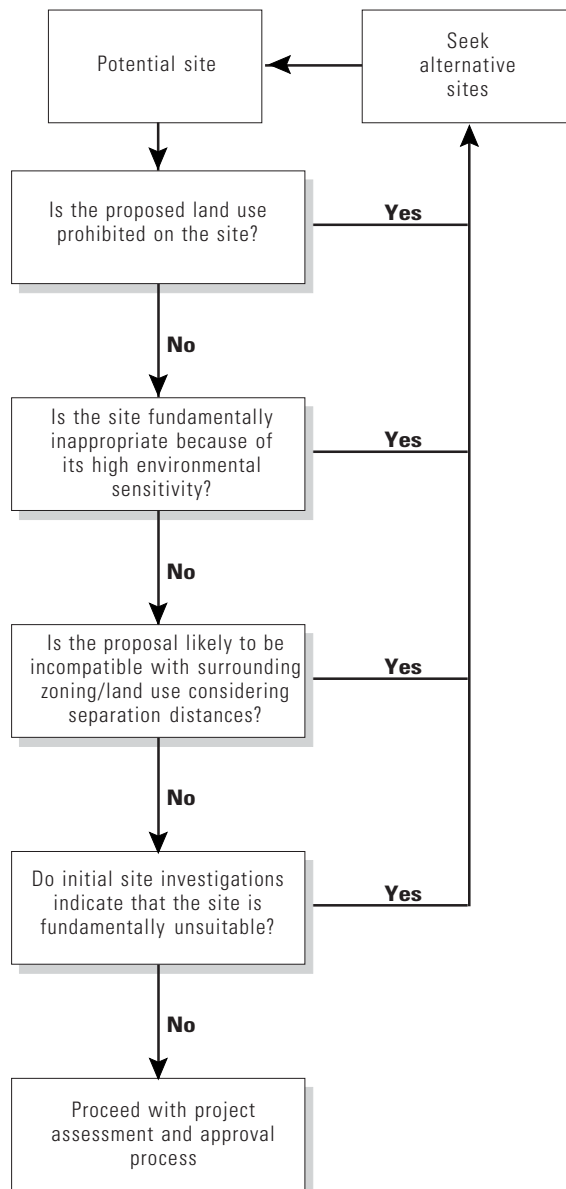


Table 2. Environmentally Inappropriate Areas for Composting Facilities

AREA	OBJECTIVE
<p>A site located within an area of significant environmental or conservation value identified under relevant legislation or a planning instrument, including:</p> <ul style="list-style-type: none"> • national parks • historic and heritage areas, buildings or sites • any reserves for environmental protection, e.g. aquatic, marine, nature, karsts • areas covered by a conservation agreement • wilderness areas identified or declared under the <i>Wilderness Act 1987</i> • other areas protected under the <i>National Parks and Wildlife Act 1974</i> • world heritage areas • areas on the register of the National Estate • SEPP 14 — Wetlands, SREP 20 — Hawkesbury–Nepean, SEPP 26 — Littoral Rainforests • areas zoned under a LEP or REP for environmental protection purposes e.g. high scenic, scientific, cultural or natural heritage 	<p>To avoid the risk of damaging areas of high environmental value</p>
<p>Sites within an identified drinking water catchment (surface water or groundwater) e.g. any lands nominated as special or protected areas by local water supply authorities (such as Sydney Water, Hunter Water, council) or in the vicinity of a groundwater bore used as drinking water</p>	<p>To avoid the risk of polluting drinking water</p>
<p>Sites located in an area overlying an aquifer which contains drinking water quality groundwater which is vulnerable to pollution (consult DLWC for criteria to determine the vulnerability of groundwater)</p>	<p>To protect groundwater and surface water resources</p>
<p>Sites where the substrata is prone to land slip or subsidence</p>	<p>To avoid sites which may have unsuitable substrata</p>
<p>Sites on floodplains which may be subject to washout during major flood events (councils should be consulted for information about local flooding characteristics)</p>	<p>To avoid washout risk if a significant flood event occurs</p>

be considered. Conflicts often arise when the environmental amenity is threatened by air or water quality impacts. Any potential conflicts and possible options for reducing or preventing conflicts should be considered, in particular, the adequacy of separation distances between the facility and other sensitive land uses. In general, if composting facilities are capable of controlling odour, there will be wider locational options.

4.2. Permissibility of the proposal

At an early stage in the site selection process, it is essential to consult with the local council to ensure that the proposal is a permissible use under the relevant planning controls. If the proposal is not permissible, then discussions should be held with council with a view to amending the zoning of the site, or an alternative site should be sought.

4.3 Environmentally sensitive areas

At an early stage, the site selection process should also determine whether a potential site is likely to adversely affect areas of such high environmental value or sensitivity that the site should be excluded from any further consideration. Table 2 identifies areas which are considered to be inappropriate for composting proposals and should be excluded from consideration. This list is not exhaustive, as a site investigation may indicate other inappropriate areas.

4.4 Compatibility with land uses

An important consideration in site selection is the compatibility of the proposal with existing or proposed surrounding land use. Conflicts commonly arise when the community's amenity is threatened by odour, water quality, traffic or

Table 3. Appropriate Separation Distances from Certain Land Uses

Land Use	Performance Objectives	Factors for Determining Appropriate Separation Distances
Residential areas, hospitals or schools	<ul style="list-style-type: none"> Protect residential amenity and health: odour, visual amenity, noise, dust, seepage 	<ul style="list-style-type: none"> What is the likelihood of performance objectives being achieved by mitigation measures alone? What is the likelihood of mitigation measures failing? What is the likelihood of an 'incident' (e.g. accident, system failure, natural disaster) which will result in a failure to meet the performance objectives? What 'back-up' mitigation measures are available? What is the likely geographic extent of impacts taking into consideration the proposed performance of mitigation measures and the local environment (topography, climate etc)? What is the likely geographic extent of impacts if mitigation measures fail or an 'incident' occurs taking into consideration the local environment (topography, climate etc)? What separation distances are required to achieve the performance objective: <ul style="list-style-type: none"> under normal operational and mitigation performance conditions if mitigation measures fail or an 'incident' occurs?
Surface waters	<ul style="list-style-type: none"> Ensure that surface waters are protected from pollutants in the waste Ensure that no existing or likely future uses of surface waters are compromised Ensure that no significant impacts occur to flora and fauna which use the waters Ensure that the ecological value of the waters will be maintained 	
Groundwater recharge zones	<ul style="list-style-type: none"> Ensure that there is no deterioration in the quality of the groundwater Ensure that no existing or likely future uses of groundwater are compromised 	
Environmentally sensitive areas (Table 1)	<ul style="list-style-type: none"> Ensure that environmental qualities of the particular area are not compromised 	

noise impacts. Any potential conflicts and possible options for reducing or preventing conflicts should be considered, in particular, the adequacy of separation distances from sensitive land uses.

If the proposal is potentially incompatible, consideration should be given to acquiring sufficient land to provide adequate on-site separation from nearby land uses. Such separation can help minimise impacts and maintain the amenity of other land uses. Factors to consider when determining appropriate separation distances include:

- the nature of the material being processed (the higher the class of the material, the greater potential for odour)
- the composting process and 'housing' facilities (in particular, whether indoor or outdoor composting is to be used)
- the estimated odour emission rate and proposed odour reducing management
- the level of expertise with the technology or management

- the sensitivity of the receiving environment
- climatic and topographical conditions.

Odour dispersion modelling techniques such as AUSPLUME can be used to determine appropriate separation distances. In locations where calm wind conditions are common and odour is likely to drift down the slope, significant effects are likely because of lack of dispersion. These conditions are most likely to occur during mornings and evenings with the worst times of the year being late autumn and winter. If calm conditions are a characteristic of a location, it is advisable that an appropriate buffer zone be maintained from any nearby residential areas.

The extent of separation distances should be determined on a case-specific basis. Council's views on the appropriate buffer distance should also be sought, having regard to likely future development pressures in the area. In particular, council's view on the likelihood of future development encroaching on the proposed composting facility should be sought, and buffer

distances determined accordingly. Table 3 suggests land uses which might require separation from the composting facility and suggests performance objectives which could be used to determine an appropriate separation distance.

If the proposal is potentially incompatible with surrounding land uses, consideration should be given to acquiring sufficient land to provide adequate on-site separation from nearby land uses. Where possible, the buffer area should be owned or controlled by the owner of the facility. As the establishment of buffer areas around facilities can lead to unacceptable land sterilisation, separation distances should not be viewed as a primary means of ameliorating impacts. Instead, separation distances should be seen as a backup to ensure the amenity of existing land uses can be maintained. The EPA does not accept impact reduction by separation distances for air or water pollution. The role of site separation as an impact mitigation measure should simply reinforce the impact mitigation measures provided by other means.

4.5 Initial site investigations

The purpose of preliminary site investigations is to provide an early evaluation of the suitability of the proposed site in terms of operational and

environmental factors (Table 4). The initial site investigations also provide a basis for a comparative evaluation of a number of potential sites, and can serve as a cost-effective device to determine if any particular sites should be excluded from further consideration based on environmental factors.

These preliminary investigations can help provide confidence that a potential site is fundamentally suitable for use for composting before proceeding with a more detailed assessment. The level of detail at the initial investigation stage should be commensurate with the scale of the proposal, the potential environmental risks associated with the proposal and the potential sensitivity of the location.

In considering the issues arising from the initial site investigations, their fundamental purpose of excluding unsuitable sites should be paramount. A balanced judgement should be made, taking into consideration:

- the views of relevant councils and Government authorities
- the relative merits of alternative sites
- the likely significance of any site deficiencies.

The availability of mitigation measures alone to ameliorate serious site deficiencies should not be used to conclude that a site is suitable.

Table 4. Matters to be Considered in Initial Site Investigations

Operational requirements	<ul style="list-style-type: none"> • Does the site provide sufficient flat land for present and future requirements? • Is there easy access and transport networks of an appropriate standard? • Is this an efficient site relative to the market and raw material sources?
Water issues — surface water and groundwater	<ul style="list-style-type: none"> • Are there risks of surface water pollution because of the proximity or pathways to watercourses (including groundwater as a pathway to surface water courses) and wetlands, in particular waterbodies used for drinking water or aquaculture? • Are there risks to groundwater because of shallow or rising groundwater tables, or because of the proximity to groundwater recharge areas or to areas classified as having a high vulnerability to pollution? (This will require consultation with the Department of Land and Water Conservation.) • Is the site subject to flooding? Will run-off from land at higher elevations cause problems? • Can any separation requirements from waterbodies (under any relevant legislation or guidelines) be complied with?
Soils and topography issues	<ul style="list-style-type: none"> • Are the soils capable of suitable drainage and sedimentation management? • Are there risks of leachate infiltration to groundwater because of highly permeable soils e.g. on sandy, gravelly or alluvial soils, within a coastal dune field? • Are there environmental risks associated with the underlying strata (eg significant seismic risk, landslip, subsidence or other structural instability)? • Are there existing soils problems e.g. contaminated soils or where acid sulfate or saline soils are located? Does the soil have a high phosphorus sorption rating and low pH? • Are there any natural topography characteristics which will assist in minimising impacts?
Flora and fauna issues	<ul style="list-style-type: none"> • Can the clearing of natural vegetation be avoided? • Can clearing of vegetation of high significance be avoided, e.g. riparian vegetation, vegetation used as corridors for the movement of fauna, vegetation communities containing endangered flora or serving as a habitat to endangered fauna or used for visual screening? • Is a development application required under SEPP 46? • Are any 'threatened species, populations or ecological communities' as defined in <i>the Threatened Species Conservation Act 1995</i> likely to be affected (refer Appendix 3). Is an SIS required?
Transport issues	<ul style="list-style-type: none"> • Can the standard and capacity of the road network accommodate traffic likely to be generated by the proposal? • Can truck traffic avoid residential areas? • If inadequacies exist, can the road network or traffic management be changed to minimise any impacts, particularly on residential areas?
Odour issues	<ul style="list-style-type: none"> • Is the prevailing wind direction likely to cause odour management difficulties? • Are the local climatic conditions (e.g. air movement, rainfall) in combination with the topography likely to result in microclimatic conditions which will adversely increase odour (or other community amenity impacts)? • Are there any nearby land uses likely to be particularly susceptible to odour impact? • Are adequate odour control measures available?
Other community amenity issues	<ul style="list-style-type: none"> • Is the proposal likely to be compatible with surrounding existing or proposed land uses, particularly residential zones, dwellings and any special land uses such as hospitals or schools? • Is there likely to be a problem in meeting sustained compliance with odour, noise, water quality or health requirements? Is the proposal likely to pose health risks, including from air or water pollution or through contamination of produce from surrounding agricultural land? • Is the proposal likely to affect the heritage significance of any Aboriginal or non-Aboriginal heritage items found or likely to be found on the site? • Have the views of the community been considered?
Cumulative issues	<ul style="list-style-type: none"> • Is the proposal at this site likely to contribute to any existing cumulative problems?

5. Summary of EIS requirements

The statutory requirements for an EIS are prescribed in Schedule 2 of the EP&A Regulation (Appendix 1).

A summary of the specific requirements for an EIS for a chemical facility are provided in the box on the right. These requirements are discussed in detail in Part 6. All issues nominated will not have the same degree of relevance for all proposals. Depending on the characteristics of the proposal, some of the requirements may be more relevant than others, while others will not be applicable at all. The EIS should be tailored to the specific proposal and should focus on the key issues.

Summary of requirements

A. Executive summary

B. The proposal

1. Objectives of the proposal
2. Materials for composting
3. Products of the composting process
4. Composting operation and management
5. Site preparation and layout
6. Consideration of alternatives and justification for the preferred option

C. The location

1. Planning context, site description and locality information
2. Overview of the affected environment

D. Identification and prioritisation of issues

1. Overview of the methodology
2. Outcomes of the process

E. The environmental issues

1. Air quality issues
2. Water issues
3. Soil issues
4. Transport and traffic issues
5. Noise issues
6. Energy issues
7. Social issues
8. Health issues
9. Visual issues
10. Flora and fauna issues
11. Hazards issues
12. Heritage issues
13. Economic issues
14. Cumulative issues

F. List of approvals and licences

G. Compilation of mitigation measures

H. Justification for the proposal

6. Specific requirements for an EIS

A. Executive summary

An executive summary should be provided in the EIS and should be available separately for public information. The summary should give a short overview of the proposal and the potential environmental impacts, and should include a clear map or aerial photograph of the location. It should be written in non-technical language to facilitate understanding of the proposal by the general public.

B. The proposal

1. Objectives of the proposal

The objectives of the proposal should be clearly stated and justified in terms of ecological sustainability. The statement should refer to:

- a) the anticipated level of performance in meeting present and future horticultural, agricultural, landscaping, nursery or mushroom industry needs
- b) the role of the proposal in any recycling or waste minimisation strategy; the proposed catchment area; the consistency with any local or regional waste strategy
- c) the anticipated level of performance in meeting environmental goals
- d) any relevant government policies.

2. Materials for composting

The following information should be included:

- a) the quantity and characteristics of raw materials to be used (organic materials and other additives — for organic materials provide classification, as per Table 1, Part 1)
- b) the potential source of organic materials
- c) if relevant, the characteristics of organic materials which will be specifically excluded, e.g. material which may contain, or be contaminated by, plastics, glass or hazardous chemicals, chemically treated timber or vegetation contaminated with pesticide; nominate a maximum level of unacceptable material in any source material

- d) if relevant, any contractual agreements with organic material sources, generators or local councils to receive organic material.

3. Products of the composting process

The following information should be included:

- a) the quantity and quality of products or by-products; the proposed end user of the products; the proposed demand for the products
- b) any quality standards (such as Draft Standard No. 95301 — Composts Other Soil Conditioners and Mulches) or protocols which apply to the products, including physical, chemical or biological parameters
- c) the suitability of the products for the proposed use, and the ability of the products to comply with all relevant standards or protocols taking into consideration parameters such as pH, nutrient levels, ash, moisture content, chemical or biological contamination levels.

4. Composting operation and management

The following information should be included:

material reception procedures:

- a) procedures for receiving and unloading organic materials
- b) if relevant, inspection, testing and screening procedures, and procedures for handling unacceptable material if discovered, and record-keeping

materials storage procedures:

- a) storage arrangements for all organic material; the anticipated length of storage before composting
- b) quantities and storage arrangements for any chemicals, disinfectants, fertilisers, fuels or other substances used in or associated with the process; if relevant, their dangerous goods classification
- c) any arrangement for final product storage
- d) any measures to prevent or manage air, soil or water impacts

composting procedures:

- a) a description of any pre-processing, particularly any shredding, pre-wetting, screening, treatment or covering of organic material
- b) a description of the composting process including:
 - i) the method of composting
 - ii) the stages in the biological conversion process, and the use of additives such as biological or chemical agents; the timing of particular stages, and methods for controlling stages for quality assurance and minimising impacts
 - iii) identifying the equipment or facilities to be used in all stages of the process; the procedures for mixing, adding materials or chemicals, aerating, watering, temperature, odour and leachate control
 - iv) procedures for monitoring and testing the compost and composting procedures to ensure that they meet relevant standards or quality assurance objectives
- c) the post composting stages including storage, sieving, blending, packaging, loading and transporting of products

emissions management:

- a) requirements for collection, treatment and disposal of solid material from the process
- b) gas emission generation potential at the various stages of the process; the impact of high rainfall and other variables on the potential generation of gas; major constituents of the gas; proposals for action to address gas emission problems
- c) leachate emission generation potential at the various stages of the composting process; the impact of high rainfall and other variables on the potential production of leachate; the major constituents of the leachate; proposals for the collection, treatment, use and disposal of leachate including:
 - i) the barrier system for the work and storage area such as clay, modified soil or flexible membrane liners
 - ii) the drainage system, design capacity and characteristics of the collection network and storages; the capacity of the system to handle major storm events
 - iii) methods for the treatment of the leachate prior to disposal — specify the effluent quality standards for any leachate to be discharged to the sewer or the natural environment

- iv) proposals for recycling and reusing the leachate (treated or untreated as appropriate) on site where possible
- v) proposals for remedial action should containment of the leachate fail

surface water management system:

- a) bunding or other measures to prevent off-site surface water running onto any pre-processing, processing or storage areas
- b) the parameters of any first flush or storage systems, and measures to contain, collect and manage surface water within any working or storage areas
- c) the proposed use or disposal of surface water collected on the site
- d) the proposed quality of water to be discharged to the sewer, recycled, reused, irrigated or discharged to a natural waterbody
- e) any proposed water treatment system

other relevant issues:

- a) access roads, parking areas, weighbridges, administration, maintenance compound, stores, washdown area and any other infrastructure needs
- b) security facilities, including gatehouse, fencing, lights
- c) landscaping and bunding for visual and noise barriers
- d) employment and site operating hours
- e) the establishment of a network of monitoring stations, including any computer management system
- f) facilities or systems to deal with incidents or emergencies such as spills, fires, floods
- g) any environmental management systems which apply.

5. Site preparation and layout

Consider the following (include plans where appropriate):

- a) existing site contours, significant environmental features including all drainage lines, significant vegetation, items of heritage significance to be disturbed, soil contamination resulting from previous land uses
- b) all components of the facility, including the location of:
 - i) receival areas; access and internal road system including parking areas, gatehouse, weighbridge, tipping areas, wash-down areas

- ii) impermeable areas for the storage of materials, fuels, chemicals and products; windrows, sheds, tunnels or other structures, and other composting structures and transfer facilities
- iii) the drainage network, bunds and ponds; a schematic overview of the water and leachate management system, including stormwater, sedimentation and leachate dams, bunds, leachate treatment and management facilities; any irrigation areas
- iv) security facilities, fencing, lights, fire fighting equipment
- v) landscaping and on-site areas to remain undisturbed
- vi) monitoring locations
- vii) administration and maintenance buildings
- viii) any proposed buffer areas separating the facilities and nearby land uses.

6. Consideration of alternatives and justification for the preferred option

Consider the environmental impacts or consequences of adopting alternatives, including:

- a) alternative composting process options including:
 - i) alternative organic material mix, sources, additives
 - ii) alternative processes such as an enclosed process, other staging or timing, anaerobic composting or vermicomposting
 - iii) alternative leachate and gas emission containment, use or disposal, in particular, cover and barrier options
 - iv) alternative odour, dust and visual impact management and monitoring options
- b) alternative site locations or site configurations
- c) alternative transport options, including access routes
- d) alternative waste management strategies including recycling and reprocessing options
- e) the do-nothing option — the consequences of not proceeding with the proposal should be considered.

Some of the issues which may need to be considered in the analysis and justification for the selection of a preferred option are:

- a) the ability to satisfy the objectives of the proposal
- b) the acceptability of environmental impacts

- including biophysical, economic and social (including health) impacts
- c) the acceptability of any environmental risks or uncertainties particularly in relation to leachate and gas emissions containment; the reliability of the processing options to meet acceptable environmental standards and to minimise environmental risks; the reliability of individual environmental impact mitigation
- d) the ability of the options to handle abnormal events such as fires, stormwater intrusion, flooding or accidental discharge of chemicals
- e) the efficient use of land, energy, water and other resources
- f) the efficiency of the proposal in supplying markets for the product
- g) the opportunity to maximise recycling and reuse
- h) the proposal's consistency with any regional waste planning objectives, and the role of the proposal in meeting government waste reduction targets.

C. The location

1. Planning context, site description and locality information

The following information should be provided:

- a) zonings, permissibility
- b) the compatibility of the proposal with any planning provisions or land use constraints including:
 - i) any easements or other restrictions affecting the site, including any heritage or environmental protection provisions
 - ii) any relevant provisions of any state environmental planning policy, regional or local environmental plans, or development control plan
 - iii) any relevant catchment management plans, regional strategies or plans of management for the area
- c) title details; land tenure; owner's consent (if not the proponent)
- d) where Crown land is involved, any constraint associated with the form of lease or tenure: where appropriate, the Native Title status of the land should be addressed and an outline provided of the procedures to be followed to satisfy the requirements of the Commonwealth's *Native Title Act (1993)*

- e) maps, plans or aerial photographs clearly identifying the location of the proposal in relation to:
 - i) the surrounding roads, adjoining communities or dwellings and any land use or natural features likely to be affected by the proposal, in particular any nearby airports or water supply resources (ground or surface)
 - ii) utilities including transmission lines, pipelines, cables or easements
 - iii) sight-lines from dwellings or public places such as roads
 - iv) other activities (particularly other composting or waste management facilities) which in combination with the facility have the potential to generate significant cumulative impacts (such as traffic, air, noise or water impacts).

2. Overview of the affected environment

An overview of the environment should be provided in order to place the proposal in its local and regional environmental context. This overview should be general. Specific details should be provided when assessing the environmental impacts of the proposal.

General information to be provided includes an overview of:

- a) meteorological characteristics which may influence flooding, erosion, evaporation, dust, odour or noise impacts — these may include wind direction and intensity, rainfall intensity, frequency, duration and seasonal distribution
- b) the geomorphological factors such as major landform features; slope gradients and geological characteristics which may affect drainage and air quality impacts
- c) the use and vulnerability of any natural water bodies including wetlands and estuaries likely to be affected by the proposal; if relevant, general hydrological and water quality characteristics
- d) the use and vulnerability of groundwater; if relevant, general hydrological and water quality factors
- e) characteristics of land likely to be affected in terms of general soil characteristics; any existing soil problems including salinity, acid sulfate soils potential or erosion problems

- f) predominant vegetation communities in areas to be disturbed, their potential habitat and conservation values
- g) the heritage, conservation, archaeological, historical, cultural, scientific, or scenic significance of any buildings, items, places or areas likely to be affected by the proposal.

D. Identification and prioritisation of issues

1. Overview of the methodology

Outline the procedures or methodology used to identify and prioritise issues. Factors to consider may include:

- a) the outcome of a review of relevant sources of information on potential issues including:
 - i) any relevant guidelines produced by NSW government authorities, relevant guidelines or standards from other States or overseas
 - ii) other similar projects particularly if operating in similar locations, EISs for similar projects, any relevant commission of inquiry reports, determination reports and conditions of approval
 - iii) relevant research and reference material
 - iv) relevant strategic plans or policies (SEPPS, REPs, LEPs, regional waste plans or other waste management plans)
 - v) relevant preliminary studies or pre-feasibility studies
- b) the outcome of consultation with stakeholders including:
 - i) planning focus meetings, community focus meetings, community workshops or issues groups
 - ii) meetings with stakeholders (e.g. government agencies, particularly EPA, councils, major market representatives, major material sources or generators)
- c) the use of methodology such as checklists, matrixes or similar approaches e.g. *Is an EIS required?* (Department of Planning, 1995)

2. Outcomes of the process

Summarise the outcome of the identification and prioritisation process including:

- a) all the issues identified
- b) the key issues which will need a full analysis in the EIS (including comprehensive baseline assessment)

- c) the issues which will not need a full analysis in the EIS though they may be addressed in the mitigation strategy; the justification for the proposed level of analysis.

E. The environmental issues

The following specific issues are nominated as being potentially important when assessing impacts, and for decision-making in relation to composting facilities. The outline of the issues is not exhaustive and the degree of relevance of each will vary. The EIS should only deal with relevant issues as applicable to the particular proposal.

Assessment of potential impacts

The following should be included for any potential impact which is relevant for the assessment of a specific proposal:

- a description of the existing environmental conditions (baseline conditions)
- a detailed analysis of the potential impacts of the proposal on the environment; the analysis should indicate the level of confidence in the predicted outcomes and the resilience of the environment to cope with the impacts
- the proposed mitigation, management and monitoring program, including the level of confidence that the measures will effectively mitigate or manage the impacts.

With each issue, the level of detail should match the level of importance of the issue in decision-making.

1. Air quality issues

Dust and particulate matter

Issues to consider include:

- a) the likely impacts from:
- i) dust generated during the construction or operation of the facility, including different stages of the composting process (particularly the initial and final screening and blending of compost; dust generated from stockpiles and traffic movements)
 - ii) airborne plant material including means to prevent plant material being blown off-site
- b) if impacts are likely to be significant, the baseline conditions, the sensitivity of the environment to impacts and the likely frequency and severity of impacts or incidents
- c) the adequacy of proposed mitigation measures, such as:
- i) water spraying and covering of stockpiles and windrows, and other control measures on stockpiles, working and unloading areas; enclosing composting operations
 - ii) ceasing dust or smoke generating activities during unfavourable meteorological conditions
 - iii) sealing roads and parking areas or watering roads
 - iv) rehabilitating, grassing or landscaping to reduce wind impacts.

Gas and odour impacts

Issues to consider include:

- a) considering the characteristics of gases likely to be emitted given the raw materials, storage, and procedures; consider:
- i) the materials used; the size and composition of mix; any rapidly biodegradable material (e.g. Class 3 materials)
 - ii) the composting and preprocessing procedures
 - iii) waste disposal operations
- b) assessing the potential for the production of methane or other greenhouse or odorous gases (particularly those responsible for odours); emissions during normal operations and when incidents or abnormal operational conditions occur; consider
- i) the gas production potential during storage, preprocessing, processing
 - ii) the likelihood of incidents or abnormal operational conditions occurring which would result in uncontrolled emission of gases and odour
 - iii) predicted quantities of methane and other gases likely to be generated under normal and abnormal conditions
 - iv) the adequacy of proposals for collection, treatment, use or disposal of methane or other gases
- c) if impacts are likely to be significant:
- i) the baseline conditions including meteorological data (wind speed, wind direction, sigma theta and temperature); nearby land uses likely to be affected by noise from the facility; the sensitivity to

- impacts and separation distances which will influence the impacts
- ii) the likely frequency and severity of impacts or incidents, considering the local topography and meteorological conditions (particularly katabatic drift) — this may involve the preparation of odour flux measurements at the points of emission during each stage of the composting process; odour dispersion characteristics, using an odour dispersion model should also be developed — see the draft protocol entitled *Procedures for Dynamic Olfactometry* (EPA and Sydney Water Corporation, 1994)
 - d) assessing the adequacy of control measures to minimise gas emissions and odours including measures to:
 - i) manage organic material likely to cause odour problems, including storage and processing procedures
 - ii) prevent uncontrolled anaerobic conditions occurring
 - iii) collect, use and treat odorous and greenhouse gases
 - iv) separate operations from sensitive environments
 - e) if odour impacts are likely, gas and odour monitoring programs including:
 - i) proposed locations (including strategic locations) and frequency of monitoring
 - ii) meteorological information such as wind speed and direction, temperature and standard deviation of the horizontal fluctuation in wind direction
 - iii) records of odour complaints, records of any incidents on the site likely to generate odour and the delivery of any Class 3 organic materials
 - iv) identification of threshold detection levels for methane or any 'marker' gases
 - v) proposals for remedial action if the threshold levels are exceeded.
 - b) the efficient use of water in the operation of the facility taking into consideration any proposed water recycling proposal
- water quality impacts:**
- a) identifying characteristics and potential sources of water pollution, such as:
 - i) runoff from stockpiles, windrows or other composting areas, roads, parking areas, or other disturbed areas; failure or overload of the leachate or on-site surface water drainage or storage systems
 - ii) sediment from erosion of disturbed areas
 - iii) accidental spillage or discharges of chemicals, fuels or fertilisers; wastes from workshops, washing down facilities, plant and equipment, fuel and chemical storage
 - iv) flood inundation
 - b) the location of waterbodies or water catchment areas relative to the site; drainage pathways to the waterbodies; the use of the waterbodies
 - c) assessing the risk of contamination from the proposal under normal operational conditions, when there is an incident or under abnormal conditions; the impacts of pollution on the waterbody and existing uses; if impacts are likely to be significant, a baseline study on the existing water quality and flow characteristics
 - d) assessing the adequacy of mitigation measures, including systems to:
 - i) prevent uncontaminated stormwater flowing onto the process or storage areas
 - ii) prevent soil erosion and sedimentation
 - iii) collect, treat, use or dispose of on-site water or leachate considering site contours, drainage lines, storage and treatment facilities
 - iv) handle water from major flood events
 - v) if relevant, monitor impacts on affected waterbodies; take remedial action if monitoring detects contamination

groundwater impacts:

- a) the depth to groundwater aquifers; overlying geological characteristics and the vulnerability of the aquifer
- b) for all aquifers at risk, the:
 - i) groundwater gradients; rates and directions of flow, location of any recharge areas, seeps or springs
 - ii) baseline water quality assessment

2. Water issues

Consider water management issues in relation to:

water supply issues:

- a) the impact of the proposal on the local water supply system, including the need to upgrade or augment the water supply or reticulation system

(specific analysis requirements and sampling program may be established at the planning focus meeting or in consultation with the EPA)

- c) assessing the risk of contamination of the groundwater given the location, design and management of the proposal under normal operational conditions and when abnormal conditions or an incident occurs — this should consider both movement of leachate and surface runoff into the groundwater
- d) assessing the adequacy of means to prevent transmission of leachate to the groundwater
- e) if contamination is likely, proposals for monitoring groundwater; proposals for remedial action if monitoring detects contamination

stormwater management issues:

- a) reviewing those aspects of the proposal which will result in increased stormwater impacts on neighbouring properties
- b) assessing the need for augmentation of stormwater management infrastructure or the diversion of natural flow

flooding issues:

- a) flooding status, including the likely frequency of flooding
- b) if flood liable:
 - i) the direction of flood flow
 - ii) assessing the vulnerability of the compost processing, storage and pond facilities to inundation or damage
 - iii) the potential impacts from inundation of the facility on the composting process and storage material
 - iv) assessing the adequacy of measures to prevent breakthrough during floods into the composting area, and washout of material into waterways; provisions for dewatering the site after flooding
- c) the potential for the proposal to increase the flood liability of surrounding land by any land formation or levelling, construction of dams or bunding; assessing the potential impacts of any increased flooding levels
- d) any future proposed flood mitigation systems that may influence the impacts of the proposal on the environment.

3. Soil issues

This section is particularly important if major earthworks are to be undertaken; if hazardous chemicals have previously been used on the site or are to be used on site; if effluent is to be applied to the land; if acid sulfate soils are to be disturbed; or if the soils are highly erodible.

Issues to consider include:

- a) a brief description of existing surface characteristics, including contours, terrain stability, slope gradient and length, the susceptibility to landslip or subsidence
- b) a soil survey of areas to be affected by the proposal, indicating any soil profile characteristics which may be relevant to the sustainable management of the proposal; if impacts are likely to be significant, a map of soil units and soil landscapes should be prepared
- c) the potential direct or indirect effects on soils, and any constraints on the proposal due to soils characteristics, including:
 - i) the potential for erosion or structural damage
 - ii) potential permeability and surface sealing characteristics
 - iii) the likelihood of vertical or lateral seepage or flow through the soil of leachate to neighbouring properties, groundwater or water bodies
 - iv) if relevant, the presence of acid sulfate soils — see *Assessing and Managing Acid Sulfate Soils* (EPA, 1995a)
 - v) if relevant, the suitability of the soils for leachate or effluent disposal by irrigation, considering soil fertility, P sorption, pH, potential to develop salinity — see *The Utilisation of Treated Effluent by Irrigation: Draft Environmental Guidelines for Industry* (EPA, 1995c)
 - vi) if relevant, the suitability of the soil given the existing soil contamination (type and extent of contamination); the level of remediation required
- d) proposed measures to manage and monitor impacts, including:
 - i) the proposed management program to mitigate potential impacts from erosion and sedimentation, including drainage and

- sediment control, stabilisation works including wind and water erosion control measures; a maintenance program of all erosion control works
- ii) measures to avoid causing site contamination during the operation of the composting facility, and remediation measures if contamination occurs
 - iii) if relevant, the proposed management program to mitigate potential impacts from disturbance of acid sulfate soils, including minimisation of disturbance of the material or the watertable; treatment of disturbed soils or acid water; the monitoring program and response strategies should deleterious impacts be observed
 - iv) if relevant, the proposed management program to mitigate potential impacts from any irrigation scheme, including the monitoring program of soil and crop responses, and response strategies should deleterious impacts be observed
 - v) if relevant, proposed methods to be used to remediate the site; the potential impacts from the remediation works.

4. Transport and traffic issues

A road traffic impact study should be undertaken for all proposals involving significant numbers of vehicle movements during establishment or operation, including:

- a) current traffic on roads leading to the site, including volumes and vehicle types
- b) the estimated average and maximum hourly, daily and weekly truck movements to be generated by the proposal
- c) an assessment of the adequacy of the road network to deal with additional traffic, and an identification of any road upgrading which may be required
- d) the identification of noise and odour sensitive land uses along the route such as schools, hospitals, nursing homes
- e) the assessment of the potential impacts on the land uses, and proposed mitigation measures
- f) road safety issues including:
 - i) potential conflicts (particularly if truck routes are used by school buses) or areas of high risk including any sight distance constraints, existing congestion or poor road standards

- ii) potential risks associated with the transport of any hazardous substances given the road and traffic regime
- iii) measures to improve safety; the need for turning bays, additional traffic management devices and road upgrades.

5. Noise issues

Consider noise impacts in relation to:

- a) the existing acoustic environment including meteorological conditions, topographical features; nearby land uses likely to be affected by noise and separation distances, which will influence the noise impacts
- b) potential fixed and mobile noise sources during:
 - i) construction of the facility,
 - ii) operation of the facility, including sound power levels of all sources and their worst case positions relative to receivers
 - iii) the proposed hours of operation, in particular vehicle movement proposed
- c) estimated noise levels; if impacts are likely to be significant, predict noise levels at sensitive locations
- d) the adequacy of mitigation and management measures to control the generation of noise to meet appropriate noise standards, for instance:
 - i) the alternative location of site access and ancillary noise generating activities, design or management strategies to reduce impacts such as bunding (size, type and location) or noise barrier proposals
 - ii) use of equipment with silencers
 - iii) control of hours of operation
- e) if relevant, a monitoring program including the location of monitoring sites.

6. Energy issues

The following should be considered:

- a) energy requirements
- b) the electricity supply for the operation of the composting facility and ancillary facilities, including standby electricity supply provisions; any new or upgraded transmission facilities including lines and substations; potential impacts from the provision of these services
- c) the efficiency of energy use
- d) a consideration of alternatives with respect to energy use management and design measures, co-generation

- e) potential greenhouse implications
- f) the potential of the proposal to generate electricity, and its potential for use.

7. Social issues

Issues to consider include:

- a) a review of the community consultation process which occurred; any relevant issues raised in community consultation and how it is proposed to address these issues
- b) assessing the affect of the proposal on future development in the area; the potential impact on the community's profile, structure or cohesion
- c) the potential impacts of the construction or operation on the amenity of the area considering factors such as noise, dust, odour, traffic or health issues
- d) social equity considerations, such as the means to offset any inequities from loss of amenity.

8. Health issues

Consideration of health issues should include:

- a) assessing potential health implications of the proposal and the use of its products, including potential chronic and acute risks associated with:
 - i) air quality, water quality, soil contamination, road safety and the potential for the transmission of pathogens likely to affect health
 - ii) potential exposure pathways
 - iii) the sensitivity of the receiving environment, including any nearby land uses (such as hospitals, or aged housing) which may be susceptible to health impacts
 - iv) quality standards which apply, particularly the draft *Australian Standard for Comment: Composts, Other Soil Conditioners and Mulches* (Standards Australia, 1995), and a demonstration that the product will comply with relevant standards in terms of the presence of harmful or potentially harmful organisms or chemical contaminants
 - v) the mitigation measures which will be used to mitigate any potential health impacts — also demonstrate that the proposal will comply with all relevant NSW WorkCover guidelines, and any matters identified by NSW Health
- b) if relevant, an assessment of the need for

management measures to mitigate impacts, including:

- i) modifying the composting procedures including enclosing the operation and the batching and bagging of the product
- ii) buffer areas.

9. Visual issues

For composting facilities located in areas where visual impacts are a concern, issues to consider include:

- a) the facility's visibility from the surrounding areas; consideration of the site in the context of any landscapes of local or regional significance
- b) visual impacts (from strategic viewpoints adjacent to and in the vicinity of the site) caused by the clearing of vegetation, composting operations, stockpiles or other structures, lights, litter on access roads, the intermediate and final landform and final use for the site
- c) proposed mitigation and management measures to reduce visual impacts such as
 - i) layout, design or visual treatment
 - ii) landscaping
 - iii) processing protocols to minimise on-site litter
 - iv) protocols for transport vehicles and for the removal of windblown litter.

10. Flora and fauna issues

If land is to be cleared, or vegetation or fauna habitats are likely to be disturbed, issues to consider include:

- a) identifying plant and animal habitats and ecological communities and, where appropriate, populations and species in areas that may be directly or indirectly affected by the proposal
- b) indicating the local and regional scarcity of these habitats, ecological communities, populations and species — if relevant, identify the following, indicating their incidence on the site:
 - i) threatened species, populations or ecological communities listed in Schedule 1 or 2 of the *Threatened Species Conservation Act 1995* (see Appendix 3)
 - ii) rare plant species listed in *Rare or Threatened Australian Plants (ROTAP)* (Briggs J.D., 1988)

- iii) areas protected under SEPP 14 — Coastal Wetlands, SEPP 26 — Littoral Rainforest, SEPP 44 — Koala Habitat Protection, REP 20 — Hawkesbury Nepean River or other environmental planning instruments
- iv) vegetation or fish species protected under the *Fisheries Management Act 1994*; the economic significance of any potentially affected fish species
- v) trees listed in councils' Significant Tree Registers
- c) the potential impacts on species, populations or ecological communities or their habitats:
 - i) directly, through removal by clearing
 - ii) indirectly, through changes in water quantity, quality or groundwater regime
 - iii) through impacts on the number, distribution and size of habitats
- d) the sensitivity of species or communities to disturbance; the potential impacts of disturbance on biodiversity; the potential for recolonisation following rehabilitation — if relevant, assess the significance of the area for koalas under the provisions of SEPP 44 — Koala Habitat Protection
- e) the significance of flora or fauna for other biota, including biota not directly affected by the proposal but which interact with potentially disturbed flora and fauna
- f) landscaping and rehabilitation proposals, and their role in mitigating impacts such as compensatory rehabilitation with indigenous species; the provision of new appropriate habitats; opportunities for colonisation; timing of major disturbances
- g) identifying potential weed and introduced species, and pest species such as fruit fly or plant or soil diseases, and describing measures to control and prevent infestations at the site and to control spread into localities adjacent to the proposal
- h) identifying potential vermin, feral and introduced species including silver gulls, and the impact of 'pest' species on native populations; a description of measures to control and prevent infestations at the site and to control spread into localities adjacent to the proposal
- i) proposed monitoring to determine the effectiveness of mitigation and to verify predictions.

Note: Appendix 3 provides guidance on determining when a species impact statement (SIS) is required. An SIS must accompany any proposal in critical habitats or where there is likely to be a significant effect on threatened species, populations or ecological communities or their habitats.

11. Hazards issues

Consider the following potential hazards:

- a) the accidental release of toxic substances, explosions or fires
- b) natural events (including bushfire, landslip, flooding or subsidence).

All potential hazards and associated scenarios should be identified, and the significance of their consequences assessed.

For composting facilities with a risk of fire, explosion or release of chemical substances, the need for a preliminary hazard analysis (PHA) should be considered. In considering the need for a PHA, the procedure identified in *Applying SEPP 33* (Department of Planning, 1995) should be considered. If a PHA is required, it should be prepared in accordance with *Hazardous Industry Planning Advisory Paper (HIPAP) No 6 — Guidelines for Hazard Analysis* (Department of Planning, 1992a) and *HIPAP No 4 — Risk Criteria for Land Use Safety Planning* (Department of Planning, 1992b). The most important elements of a PHA include:

- a) a list of all substances to be used, stored or disposed of on-site which have a dangerous goods classification, and their quantities
- b) an identification of the hazard scenarios associated with the use or storage of these substances and the likelihood of occurrence
- c) the consequences in relation to public safety or impact on the environment if a hazardous event were to occur
- d) a quantified risk assessment
- e) an identification of hazard mitigation measures; an assessment of the adequacy of operational and emergency procedures involving dangerous and hazardous goods.

For a composting facility located in areas of natural risks, including high bushfire or flood

risks the following issues should be considered:

- a) an assessment of the risks given the climate, surrounding topography, vegetation, geological formation and on-site management practices
- b) an assessment of the likely performance of the composting facility and potential environmental impacts during exposure to natural hazards, taking into consideration:
 - i) design and layout
 - ii) protocols to reduce the risks of on-site fires including firebreaks; provision for firefighting on the site including access, water supply and firefighting equipment
 - iii) provision for training and maintenance
- c) hazard mitigation measures — these will be dependent upon the extent of the hazards identified

12. Heritage issues

This section is relevant if land clearing, earthworks, disturbance of existing items (buildings, works, relics or places) or reduction of the heritage curtilage will occur as a result of the proposal. Issues which may need to be considered include:

- a) identifying any items of heritage significance on the site (including underwater) and in the area affected by the proposal. This should include two steps:

Step 1: collate information from any relevant heritage study or conservation plan for the site or area — this source may need to be supplemented with information from the following:

 - i) relevant historical research on the area
 - ii) consultation with the Aboriginal Land Council, local historical societies and the local council
 - iii) inspection of heritage registers, schedules, databases or lists, Heritage Council Register, heritage and conservation registers (various government agencies), local or regional environmental plans, archaeological zoning plans, Aboriginal Sites Register (National Parks and Wildlife Service (NPWS)), National Estate Register (Australian Heritage Commission), other registers (National Trust, Institution of Engineers Australia, Royal Australian Institute of Architects)

Step 2: survey the area likely to be affected, to identify any items of potential heritage significance.

For non-Aboriginal heritage:

- a) assess the significance of any non-Aboriginal heritage items identified on the site, using criteria for assessing heritage significance published in the *NSW Heritage Manual 1996*
- b) assess the potential impacts of the proposal on the heritage significance — non-Aboriginal heritage items, protected under the *Heritage Act 1977* or a conservation instrument, require approval from the Heritage Council before disturbance can be undertaken; items identified in planning instruments require the consent of the nominated consent authority (usually council); shipwrecks protected under the *Historic Shipwrecks Act 1976* require the approval of the Director of the NSW Heritage Office
- c) propose measures to mitigate impacts to conserve items of heritage significance — if items of significance are to be disturbed a conservation management plan may need to be prepared in consultation with the Heritage Office.

For Aboriginal heritage:

- a) assess the archaeological and anthropological significance of any Aboriginal relic or place identified on the site in consultation with the Land Council, Department of Aboriginal Affairs and NPWS
- b) assess the potential impact of the proposal on the heritage significance; Aboriginal relics or places cannot be disturbed without written consent from the Director-General of National Parks and Wildlife
- c) propose measures to mitigate impacts or to conserve the heritage significance of the area, relic or place — if items of significance are to be disturbed, a conservation management plan may need to be prepared in consultation with the NPWS, Land Councils, the Department of Aboriginal Affairs and the Heritage Office.

For natural heritage:

- a) assess the heritage significance of any natural areas including geological or palaeontological features or ecological communities

- b) assess the potential impact of the proposal on the heritage significance (note: items identified in planning instruments or in conservation areas require the consent of the nominated approval authority)
- c) propose measures to mitigate impacts or to conserve the heritage significance — if natural areas of heritage significance are to be disturbed a conservation management plan may need to be prepared in consultation with the relevant authorities.

Consider the acceptability of impacts on heritage significance and assess the adequacy of the measures to mitigate impacts during all stages of the proposal.

13. Economic issues

Issues to consider include:

- a) the cost and benefits of providing, operating and maintaining the facility; the costs and benefits of the environmental impacts identified in the EIS as well as the project factors — significant non-monetary costs and benefits should be described and qualitatively assessed; if relevant, the economic analysis should consider:
 - i) potential impacts from the recycling of organic materials
 - ii) potential impacts on industries using the products
 - iii) flow-on impacts from the need to augment any infrastructure; considering the offset of s. 94 contributions or other contributions for the provision or upgrading of infrastructure
 - iv) any additional employment as a result of the proposal
 - v) the potential impact on property values; considering the economic impact of land sterilisation, or otherwise restricting uses by establishing buffer zones
 - vi) any impacts on economic activities in the region, such as industrial development, agriculture or activities likely to be affected by the proposal
- b) any proposal for a performance bond or financial assurance — such a bond could consider failure of safeguards resulting in a significant environmental impact

14. Cumulative issues

Cumulative impacts may result from a number of activities with similar impacts interacting with the environment in a region. They may also be caused by the additive, synergistic and antagonistic effects of different individual impacts interacting with each other. They may be due to the temporal or spatial characteristics of the activities and impacts. Issues to consider that relate to composting proposals include:

- a) the potential for cumulative impacts from
 - i) other existing or planned composting facilities in the area or region
 - ii) other nearby point or non-point activities with similar impacts
- b) any advantages or disadvantages from clustering similar industries in this area considering the environmental characteristics
- c) any likely long-term and short-term cumulative impacts having regard to surface water and groundwater quality issues, air quality, noise or traffic disturbance, public health, visual impacts or loss of heritage items, vegetation or fauna habitat
- d) considering the receiving environment's ability to achieve and maintain the water quality objectives established for that system.

F. List of approvals and licences

All approvals and licences required under any legislation must be identified. This is to alert other relevant authorities as early as possible to their potential involvement in the project and to ensure an integrated approach to the granting of approvals. This list also identifies for the community the relevant authorities involved in the assessment and regulation of the proposal.

G. Compilation of mitigation measures

A critical component in the EIS is the mitigation strategy to demonstrate how the proposal and its environmental safeguards can be implemented and managed in an ecologically sustainable manner. At this stage of the process, it is essential that the applicant can demonstrate that the proposal is capable of complying with statutory obligations under other licences or approvals.

The mitigation strategy should include the environmental management principles which would be followed when planning, designing, constructing and operating the proposal, and include:

- locational, layout, design or technology features (which should be described in detail in other sections of the EIS)
- an outline of ongoing management and monitoring plans (see below).

An environmental management plan (EMP)

This outline in the EIS should form the basis for an environmental management plan (EMP) for the proposal. An EMP is a tool to ensure that the commitments in the EIS, subsequent assessment reports and approval or licence conditions are fully implemented. It is usually a comprehensive technical document which is finalised during or following detailed design of the proposal after approval of the development application. This level of detail is not considered necessary for the EIS or SEE, although it should contain enough detail to satisfy the consent authority that such a plan can be developed and that it can deliver appropriate environmental outcomes. It is likely that the EMP outline can be based on the impact mitigation measures developed during the preparation of the EIS.

The outline should provide a framework for managing or mitigating environmental impacts for the life of the proposal. Mitigation strategies for the construction and operation stages of the project should be clearly identified. In some circumstances, it may be appropriate to prepare separate construction and operational environmental management plans.

With projects with potentially controversial environmental impacts, it may be appropriate to:

- consult with relevant government authorities, council and the community when preparing the EMP
- undertake a trial to demonstrate the effectiveness of the proposed mitigation measures in the EMP
- develop contingency measures to deal with impacts should mitigation measures not deliver the predicted outcomes
- establish a community committee to consult in relation to the ongoing management and monitoring of the proposal

- exhibit an annual environmental management report outlining the environmental performance of the proposal.

The EMP should also contain two sections: one setting out the program for managing the proposal (section a. below) and the other outlining the monitoring program with a feedback loop to the management program (section b. below).

a) Environmental management outline

The management strategy should demonstrate sound environmental practice during the construction, operation and decommissioning of the proposal including:

- i) management of construction impacts; if appropriate include erosion, sedimentation and revegetation plans for areas disturbed by construction activities
- ii) management of operational impacts; if appropriate include provisions for:
 - management of water, air emissions, organic material, chemicals and fuel, and the composting process
 - maintenance plans
 - contingency plans to respond to emergencies, incidents and operational abnormalities or any breakdown in environmental performance
- iii) strategies to feed information from the monitoring program back into the management practices and action plans to improve the environmental performance and sustainability of all components of the proposal
- iv) training programs for operational staff and incentives for environmentally sound performance
- v) an indication of how the plan can be integrated into the organisation's broader environmental management framework
- vi) an indication of how compliance with licensing and approval requirements will be achieved and due diligence attained
- vii) if applicable, a reporting mechanism on environmental performance.

b) Monitoring outline

This program should be carefully designed and related to the predictions made in the EIS and to the key environmental indicators which would demonstrate the potential ecological sustainability of the proposal. The EIS should outline the need for and use of any proposed monitoring,

monitoring intervals and reporting procedures.

Parameters which may be relevant include:

- i) raw material quality
- ii) parameters which can indicate occurrence of critical operational problems or abnormalities including:
 - air emissions indicators
 - leachate characteristics and, if relevant, changes in surface and groundwater quality.

The program outline should describe the following monitoring details:

- i) the key information that will be monitored, its criteria and the reasons for monitoring (which may be compliance with regulatory requirements)
- ii) the monitoring location, intervals and duration
- iii) procedures to be undertaken should the monitoring indicate a non-compliance or abnormality
- iv) internal reporting procedures and links to management practices and action plans
- v) reporting procedures to relevant authorities, and if appropriate, to the consent authority and the community.

H. Justification for the proposal

Reasons justifying undertaking the proposal in the manner proposed should be outlined, considering potential health, biophysical, economic and social impacts, including costs and benefits and the compliance with the principles of ecologically sustainable development.

The principles of ecologically sustainable development include:

- a) the precautionary principle — namely, that if there are threats of serious or irreversible

environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation

- b) inter-generational equity — namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- c) conservation of biological diversity and ecological integrity
- d) improved valuation and pricing of environmental resources.

The sustainability of the proposal should be outlined in terms of the ability of the proposal to:

- a) meet objectives
- b) demonstrate economic efficiency in meeting the short- and long-term industry needs or community requirements for waste recycling
- c) meet environmental performance requirements, including improved conservation or protection of natural resources and reduced environmental costs
- d) meet site specific environmental performance requirements considering the vulnerability of the groundwater, surface waters, soil, ecological communities, heritage or social factors
- e) safeguard public health.

Other issues to consider include:

- a) the extent to which the facility will contribute to government waste reduction objectives
- b) the extent to which the facility and products will contribute to the production of high quality compost products and the development of a stable industry
- c) any other local or regional benefits.

Appendix 1. Schedule 2 — Environmental Impact Statements

This appendix contains an extract from the *Environmental Planning and Assessment Regulation 1994*. Schedule 2 outlines the matters that must be addressed in an EIS pursuant to clauses 51 and 84 of the EP&A Regulation.

1. A summary of the environmental impact statement.
2. A statement of the objectives of the development or activity.
3. An analysis of any feasible alternatives to the carrying out of the development or activity, having regard to its objectives, including:
 - a) the consequences of not carrying out the development or activity; and
 - b) the reasons justifying the carrying out of the development or activity.
4. An analysis of the development or activity, including:
 - a) a full description of the development or activity; and
 - b) a general description of the environment likely to be affected by the development or activity, together with a detailed description of those aspects of the environment that are likely to be significantly affected; and
 - c) the likely impact on the environment of the development or activity, having regard to:
 - i) the nature and extent of the development or activity; and
 - ii) the nature and extent of any building or work associated with the development or activity; and
 - iii) the way in which any such building or work is to be designed, constructed and operated; and
 - iv) any rehabilitation measures to be undertaken in connection with the development or activity; and
 - d) a full description of the measures proposed to mitigate any adverse effects of the development or activity on the environment.
5. The reasons justifying the carrying out of the development or activity in the manner proposed, having regard to biophysical,

economic and social considerations and the principles of ecologically sustainable development.

6. A compilation (in a single section of the environmental impact statement) of the measures referred to in item 4 (d).
7. A list of any approvals that must be obtained under any other Act or law before the development or activity may lawfully be carried out.

Note: For the purposes of this Schedule, “the principles of ecologically sustainable development” are as follows:

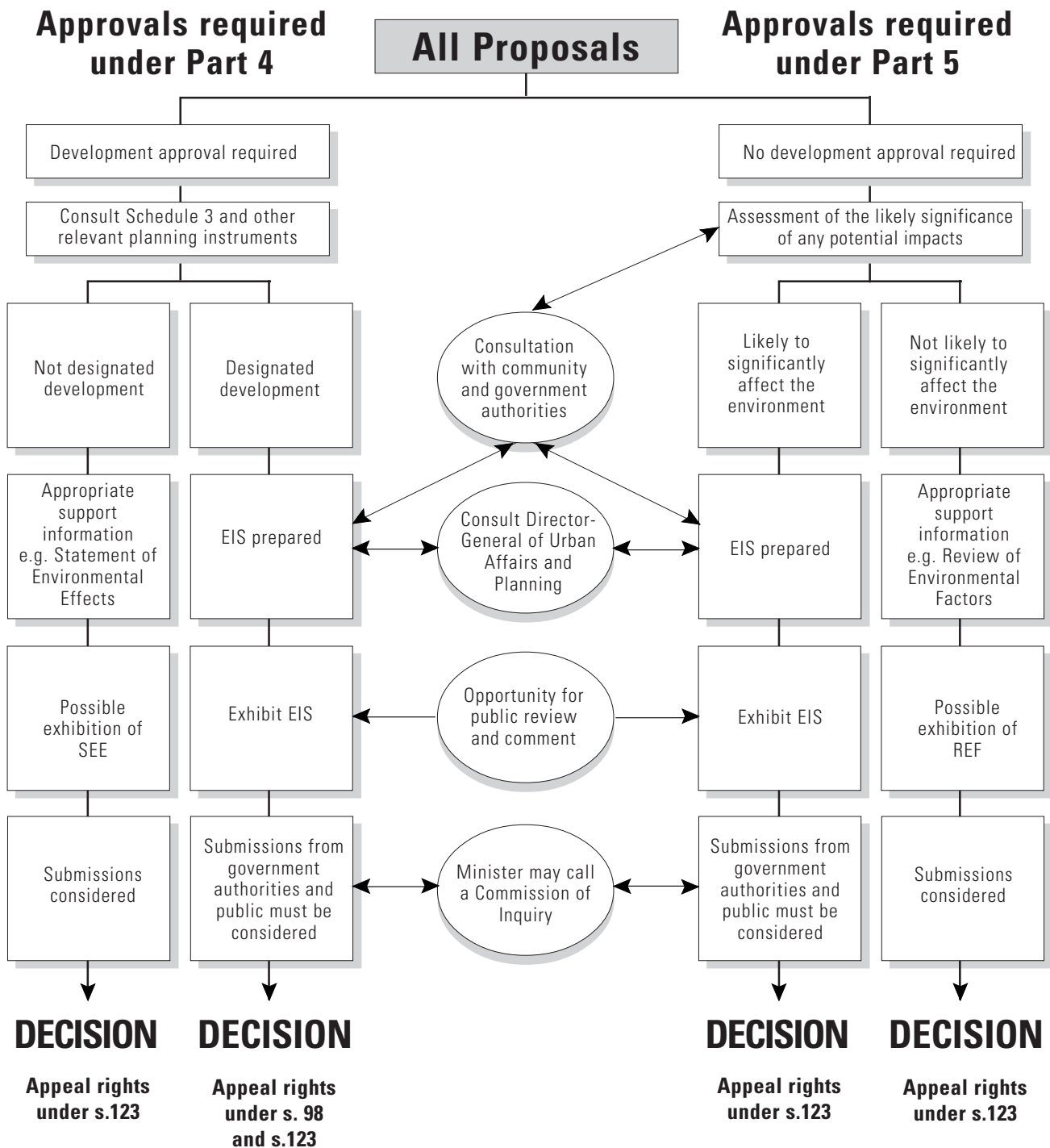
- a) The precautionary principle — namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- b) Inter-generational equity — namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- c) Conservation of biological diversity and ecological integrity.
- d) Improved valuation and pricing of environmental resources.

Note: The matters to be included in item 4 (c) might include such of the following as are relevant to the development or activity:

- a) the likelihood of soil contamination arising from the development or activity;
- b) the impact of the development or activity on flora and fauna;
- c) the likelihood of air, noise or water pollution arising from the development or activity;
- d) the impact of the development or activity on the health of people in the neighbourhood of the development or activity;
- e) any hazards arising from the development or activity;
- f) the impact of the development or activity on traffic in the neighbourhood of the development or activity;

- g) the effect of the development or activity on local climate;
- h) the social and economic impact of the development or activity;
- i) the visual impact of the development or activity on the scenic quality of land in the neighbourhood of the development or activity;
- j) the effect of the development or activity on soil erosion and the silting up of rivers or lakes;
- k) the effect of the development or activity on the cultural and heritage significance of the land.

Appendix 2. EIA procedures under the EP&A Act



Appendix 3. Threatened Species Conservation Act

This appendix contains an extract from the *Threatened Species Conservation Act 1995* and the provisions for assessing impacts on the conservation of critical habitats and threatened species, populations or ecological communities and their habitats.

What are critical habitats, threatened species, populations or ecological communities and threatening processes?

Critical habitats are prescribed in Part 3 of the *Threatened Species Conservation (TSC) Act 1995*. Threatened species, populations or ecological communities and threatening processes are prescribed in Part 2 and Schedules 1 and 2 of the TSC Act.

When is a Species Impact Statement required?

Under section 77 (3) (d1) and section 112 (1B) of the EP&A Act, if a proposal:

- is on land that contains a "critical habitat" or
- is likely to significantly affect threatened species, populations or ecological communities, or their habitats,

a species impact statement (SIS) must be prepared in accordance with Division 2 of Part 6 of the *TSC Act*.

Factors when deciding if an SIS is required

The following factors must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats:

- a) in the case of a threatened species, whether the life cycle of the species is likely to be

disrupted such that a viable local population of the species is likely to be placed at risk of extinction,

- b) in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised,
- c) in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed,
- d) whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community,
- e) whether critical habitat will be affected,
- f) whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region,
- g) whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process,
- h) whether any threatened species, population or ecological community is at the limit of its known distribution.

Form and content of an SIS

Under section 110 of the TSC Act, the general requirements on the form and content of an SIS are as follows.

General information

1. A species impact statement must include a full description of the action proposed, including its nature, extent, location, timing and layout and, to the fullest extent reasonably practicable, the information referred to in this section.

Information on threatened species and populations

2. A species impact statement must include the following information as to threatened species and populations:
 - a) a general description of the threatened species or populations known or likely to be present in the area that is the subject of the action and in any area that is likely to be affected by the action,
 - b) an assessment of which threatened species or populations known or likely to be present in the area are likely to be affected by the action,
 - c) for each species or population likely to be affected, details of its local, regional and State-wide conservation status, the key threatening processes generally affecting it, its habitat requirements and any recovery plan or threat abatement plan applying to it,
 - d) an estimate of the local and regional abundance of those species or populations,
 - e) a general description of the threatened species or populations known or likely to be present in the area that is the subject of the action and in any area that is likely to be affected by the action,
 - f) a full description of the type, location, size and condition of the habitat (including critical habitat) of those species and populations and details of the distribution and condition of similar habitats in the region,
 - g) a full assessment of the likely effect of the action on those species and populations, including, if possible, the quantitative effect of local populations in the cumulative effect in the region,
 - h) a description of any feasible alternatives to the action that are likely to be of lesser effect and the reasons justifying the carrying out of the action in the manner proposed, having regard to the biophysical, economic and social considerations and the principles of ecologically sustainable development,
 - i) a full description and justification of the measures proposed to mitigate any adverse effect of the action on the species and populations, including a compilation (in a single section of the statement) of those measures,

- j) a list of any approvals that must be obtained under any other Act or law before the action may be lawfully carried out, including details of the conditions of any existing approvals that are relevant to the species or population.

Information on ecological communities

3. A species impact statement must include the following information as to ecological communities:
 - a) a general description of the ecological community present in the area that is the subject of the action and in any area that is likely to be affected by the action,
 - b) for each ecological community present, details of its local, regional and State-wide conservation status, the key threatening processes generally affecting it, its habitat requirements and any recovery plan or any threat abatement plan applying to it,
 - c) a full description of the type, location, size and condition of the habitat of the ecological community and details of the distribution and condition of similar habitats in the region,
 - d) a full assessment of the likely effect of the action on the ecological community, including, if possible, the quantitative effect of local populations in the cumulative effect in the region,
 - e) a description of any feasible alternatives to the action that are likely to be of lesser effect and the reasons justifying the carrying out of the action in the manner proposed, having regard to the biophysical, economic and social considerations and the principles of ecologically sustainable development,
 - f) a full description and justification of the measures proposed to mitigate any adverse effect of the action on the ecological community, including a compilation (in a single section of the statement) of those measures,
 - g) a list of any approvals that must be obtained under any other Act or law before the action may be lawfully carried out, including details of the conditions of any existing approvals that are relevant to the ecological community.

Credentials of persons undertaking an SIS

4. A species impact statement must include details of the qualifications and experience in threatened species conservation of the person preparing the statement and of any other person who has conducted research or investigations relied on in preparing the statement.

State-wide conservation status

5. The requirements of subsections (2) and (3) [above] in relation to information concerning the State-wide conservation status of any species or population, or any ecological community, are taken to be satisfied by the information in that regard supplied to the principal author of the species impact statement by the NPWS, which information that Service is by this subsection authorised and required to provide.

Procedures for preparing an SIS

Under Section 111 of the TSC Act, the Director-General of National Parks and Wildlife must be consulted in writing for the requirements for an SIS. These requirements must be provided within 28 days from when a request is made.

Because of the circumstances of the case, the Director-General of National Parks and Wildlife may limit or modify the extent of matters prescribed in section 110. In other cases if the impacts are considered to be trivial or negligible, the Director-General of National Parks and Wildlife may dispense with the requirement for an SIS to be prepared.

An SIS may be prepared as a separate document or incorporated in an EIS. If the SIS is separate to the EIS, it must be exhibited concurrently with the EIS.

The SIS must be in writing and be signed by the principal author of the document and the applicant/proponent.

Appendix 4. Consultation and approvals

It is the responsibility of the person preparing the EIS to determine what approvals will be required as a result of the proposal and to demonstrate that the proposal 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.

Approvals or consultation which may be required include:

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 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 for air, water and noise licences, approvals and certificates of registration under relevant pollution control legislation; regulation of waste generation, transportation and disposal; licences for transport of dangerous goods under the Dangerous Goods Act; licences for chemicals subject to chemical control orders under the Environmentally Hazardous Chemicals Act

Department of Land and Water Conservation Soil and Vegetation Management for information on soils; design and construction of erosion and sediment controls and rehabilitation; approvals on protected lands; State Lands Services regarding effect of development on any Crown land; for leasing, licence, or purchase; whether the land is subject to Aboriginal land claim or Native Title legislation; if Crown Reserves and dedicated lands exist, whether the proposal is compatible with the stated public purpose; State Water Management regarding impact on ground or surface water resources; clearing riparian vegetation; works within 40 metres of a stream;

Coastal and Rivers Management regarding flooding and coastal areas; Water Services Policy regarding approvals under the *Local Government Act 1993*

relevant service authorities such as water, electricity, gas, telecommunication, drainage, flood mitigation, sewerage or other utility organisations

National Parks and Wildlife Service if land clearing or impacts on natural vegetation are likely, particularly in relation to the provisions of the Threatened Species Conservation Act; or if sites of Aboriginal heritage significance or land managed by the Service are likely to be affected

NSW Fisheries if fish or fish habitat is affected (including dredging or reclamation works, impeding fish passage, damaging marine vegetation, desnagging, use of explosives or other dangerous substances in or adjacent to a waterway which may result in fish kills)

NSW Agriculture if the proposal is on land with high agricultural value or will cause dislocation to the agricultural industry

NSW Health Department with regard to the potential health hazard caused by the operation and siting of the facility

WorkCover for responsibilities regarding handling of dangerous goods and hazardous substances

Heritage Council of NSW 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)

Department of Aboriginal Affairs if the proposal is in an area of significance to the Aboriginal community

Department of Mineral Resources if a resource management plan applies or if the proposal is in an area of important mineral resources, concerning its responsibilities under Sydney REP No 9 — Extractive Industry, and for safety and blasting

Mining Subsidence Board if the proposal is in an underground mining area

State Rail Authority (SRA) if the proposal impacts on SRA operations

Office of Marine Safety and Port Strategy on any activities on navigable waters

Roads and Traffic Authority if the proposal is likely to result in significant traffic impacts

State Forests of NSW in relation to impacts on State Forests

Department of Bushfire Services if the area is in a location of bushfire hazard

Catchment Management Committees or Trusts

Local Aboriginal Land Councils

relevant industry organisations

Commonwealth EPA, if Commonwealth land is likely to be affected or if Commonwealth funding applies

the owner or operator of any nearby airports and airport safety organisations.

Appendix 5. References

The following are some references that may be of assistance in preparing an EIS for composting proposals. This list is by no means exhaustive.

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USA Environmental Protection Authority (1991b) *Solid Waste Disposal Facility Criteria; Final Rule Parts 257 and 258 Federal Register*, US Government Printing Office

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Waste Management Association of Australia *Draft Interim best Practice procedures for Organics recycling Plants and Recycled Organics Quality*

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Appendix 6. Schedule 3 — Designated development

This appendix is an extract from Schedule 3 of the EP&A Regulation 1994 and prescribes composting facilities which are designated under Part 4 of the EP&A Act. This designation only applies to proposals which require development consent under the provisions of a planning instrument.

Composting facilities or works that:

- 1) process more than 5,000 tonnes per annum of organic materials, or
- 2) are located:
 - a) in or within 100 metres of a natural waterbody, wetlands, coastal dune fields or an environmentally sensitive area; or
 - b) in an area of high watertable, highly permeable soils, acid sulphate, sodic or saline soils; or
 - c) within a drinking water catchment, or
 - d) within a catchment of an estuary where the entrance to the sea is intermittently open; or
 - e) on a floodplain; or
 - f) within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the opinion of the consent authority, having regard to topography and local meteorological conditions, are likely to significantly affect the amenity of the neighbourhood by reason of noise, visual impacts, air pollution (including odour, smoke, fumes or dust), vermin or traffic.

Are alterations or additions designated development?

Is there a significant increase in the environmental impacts of the total development?

1. Development involving alterations or additions to development (whether existing or approved) is not designated development if, in the opinion of the consent authority, the alterations or additions do not significantly increase the environmental impacts of the

total development (that is the development together with the additions or alterations) compared with the existing or approved development.

Factors to be taken into consideration

2. In forming its opinion, a consent authority is to consider:

- a) the impact of the existing development having regard to factors including:
 - i) previous environmental management performance, including compliance with:
 - conditions of any consents, licences, leases or authorisations by a public authority; and
 - any relevant codes of practice; and
 - ii) rehabilitation or restoration of any disturbed land; and
 - iii) the number and nature of all past changes and their cumulative effects; and
- b) the likely impact of the proposed alterations or additions having regard to factors including:
 - i) the scale, character or nature of the proposal in relation to the development; and
 - ii) the existing vegetation, air, noise and water quality, scenic character and special features of the land on which the development is or is to be carried out and the surrounding locality; and
 - iii) the degree to which the potential environmental impacts can be predicted with adequate certainty; and
 - iv) the capacity of the receiving environment to accommodate changes in environmental impacts; and
- c) any proposal:
 - i) to mitigate the environmental impacts and manage any residual risk; and
 - ii) to facilitate compliance with relevant standards, codes of practice or guidelines published by the Department of [Urban Affairs and] Planning or other public authorities.