

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

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1. OVERVIEW

The *Industrial Waste Management Policy (Prescribed Industrial Waste)* (the policy) provides a framework for classifying prescribed industrial wastes¹ based on their hazard. The policy provides for the acceptance of Category C prescribed industrial wastes at a 'best practice' municipal landfill (BPML). Category C prescribed industrial wastes are prescribed wastes which pose a low hazard or exhibit offensive aesthetic properties.

The *Waste Management Policy (Siting, Design and Management of Landfills)* and EPA Publication 788, *Best practice environment management: siting, design, operation and rehabilitation of landfills* (the BPEM) set requirements for the siting, design, operation and rehabilitation of landfills.

This draft document sets out additional specific requirements for landfills accepting Category C prescribed industrial wastes.

Landfill operators that are not currently licensed to accept Category C prescribed industrial wastes must apply to EPA Victoria for a works approval and licence if they wish to accept these wastes. Such applications will need to demonstrate how best practice requirements would be met. Landfills currently accepting Category C prescribed industrial

wastes will need to implement best practice requirements over time.

1.1 Invitation to comment

EPA requests written comment on this draft guideline. Written submissions can be made to:

IWMP (PIW) Implementation Team
EPA Victoria
GPO Box 4395QQ
MELBOURNE VIC 3001

Email: iwmp.piw@epa.vic.gov.au

The closing date for comments is 30 June 2006.

2. BACKGROUND

Category C prescribed industrial wastes are subdivided into two classes, which the policy defines as follows:

- Category C(1) wastes (wastes with potential amenity effects, non-persistent organic wastes)
- Category C(2) wastes (other low environmental risk wastes).

Category C(1) wastes include wastes that are highly odorous and/or are dusty. These wastes are largely food processing wastes.

Category C(2) wastes include:

¹ Prescribed industrial wastes are listed in the *Environment Protection (Prescribed Waste) Regulations 1998*.

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

- prescribed industrial wastes with low contaminant levels which are largely from industrial or manufacturing activities (these wastes will be referred to as low-hazard industrial wastes)
- treated (or immobilised) prescribed industrial waste which, prior to treatment, was a Category B waste (these wastes will be referred to as Category C immobilised waste)
- low-level contaminated soils
- waste asbestos from industrial sources, or that has been removed by a licensed asbestos removalist, that has been double wrapped in plastic sheets as required by EPA Publication 364, *The transport and disposal of waste asbestos*.

EPA has developed the *Guidelines for hazard classification of solid prescribed industrial wastes* (EPA Publication 996). These guidelines provide the criteria (namely, contaminant levels and other criteria) against which prescribed industrial wastes from industrial or manufacturing sources should be assessed to determine the hazard posed by the waste. This then allows wastes to be assigned a hazard classification (Category A, B or C).

The treatment and management of Category C immobilised waste is subject to strict EPA regulation. The *Guidelines for hazard classification of solid prescribed industrial wastes* set requirements for waste immobilisation and require that proposals for waste immobilisation are approved by EPA via 'immobilised waste classifications'.

EPA Publication 448, *Classification of wastes*, provides the criteria against which waste soil must be assessed and includes the criteria that define low-level contaminated soils.

Requirements for the management of waste asbestos are outlined in EPA Publication 364, *The transport and disposal of waste asbestos*. Best practice requirements for disposal of asbestos to landfill include ensuring that the asbestos is double wrapped in plastic sheets prior to disposal, and that the wrapped asbestos is immediately covered with soil when placed in a landfill cell. Best practice requirements for disposal of waste asbestos to landfill are designed to ensure that asbestos dust is not generated. EPA also requires that landfill operators maintain a record of where in a landfill cell asbestos has been placed. Publication 364 lists those landfills that are licensed to receive waste asbestos and is updated from time to time.

At present, low-level contaminated soils and some other low-hazard prescribed industrial wastes (such as food processing waste and foundry sands) are managed at 25 landfills across the State, which are specifically licensed to receive one or more of these waste types. Most of these landfills are also licensed to receive municipal waste and/or solid inert waste. It is expected that other landfill operators may wish accept Category C prescribed industrial wastes at their landfills. New landfills could also be developed for the receipt of Category C prescribed industrial waste.

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

3. BEST PRACTICE MUNICIPAL LANDFILL

3.1 General

The *Industrial Waste Management Policy (Prescribed Industrial Waste)* 2000 (the policy) provides a framework for classifying prescribed industrial wastes based on their hazard. The policy provides for the acceptance of Category C prescribed industrial wastes at a 'best practice' municipal landfill (BPML). Category C prescribed industrial wastes are prescribed wastes which pose a low hazard or exhibit offensive aesthetic properties.

A BPML must meet the requirements outlined in the policy. The policy states that a BPML 'reflects the best available technology for a municipal landfill in siting, design, construction, operation, maintenance and post-care'. The policy also states that a BPML must be 'operated in accordance with an appropriate management system that ensures adequate supervision, control on waste receipt, safe handling, record keeping and placement of prescribed industrial waste in accordance with requirements for that waste'.

A BPML must meet the requirements in the *Waste Management Policy (Siting, Design and Management of Landfills)*, which applies to landfills receiving municipal, general commercial and industrial wastes, and Category C prescribed industrial wastes.

A BPML must also meet the objectives and each required outcome contained in EPA Publication 788, *Best practice environment management: siting, design, operation and rehabilitation of landfills* (the BPEM), as amended from time to time. The

objectives and required outcomes relate to the siting, design, construction, operation, and rehabilitation and aftercare of a landfill. A landfill should use the suggested measures outlined in the BPEM to demonstrate that the objectives and required outcomes will be met. If alternative measures to those suggested are proposed, the Authority must be satisfied that the alternative measures provide at least an equivalent environmental outcome to that provided by the suggested measures.

A BPML for the acceptance of Category C prescribed industrial waste must also meet the additional specific requirements outlined in this document.

3.2 Siting

A landfill that wishes to become licensed to receive Category C prescribed industrial waste must ensure that sufficient buffer is available for the life of the landfill. The recommended buffer distances outlined in the BPEM should be provided. Where this buffer is not available, management practices need to be significantly increased to provide the same level of protection to sensitive land uses.

The *Waste Management Policy (Siting, Design and Management of Landfills)* places restrictions on where landfills may be established, based on groundwater quality. This policy also has requirements related to the distance between groundwater and where waste may be deposited.

Landfill sites wishing to receive Category C prescribed industrial wastes must not be

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

established or extended into any area where an aquifer contains Segment A² groundwater, unless:

- the landfill operator satisfies the Authority that sufficient additional design and management practices will be implemented
- the Authority determines that regional circumstances exist that warrant the development of a landfill in the area.

All landfill sites wishing to accept Category C prescribed industrial wastes must deposit waste at least two metres above the long-term undisturbed depth to groundwater, unless:

- the landfill operator satisfies the Authority that sufficient additional design and management practices will be implemented
- the Authority determines that regional circumstances exist that warrant the development of the landfill.

3.3 Landfill cell design

Alternatives to the landfill designs described below may be approved provided that the Authority is satisfied that the alternative provides at least an equivalent environmental outcome.

Requirements for a cell liner and leachate collection system will be greater than those described below if the hydrogeological and/or meteorological conditions in which a landfill is located require a higher level of cell design to ensure protection of groundwater.

² Segment A groundwater is defined in the *State Environment Protection Policy (Groundwaters of Victoria) 1997*. Segment A groundwater has total dissolved solids between 0 and 1000 mg/L and is therefore suitable for human consumption.

Asbestos

Each cell within a BPML that is to receive asbestos must be designed in accordance with requirements contained in the BPEM for a Type 3 landfill. This should include the following suggested measures:

- a leachate collection system comprising not less than 300 mm thick gravel, or other approved drainage material, placed over the liner with leachate collection pipes and a leachate extraction system
- a liner consisting of compacted clay not less than 1 m thick with hydraulic conductivity not more than 1×10^{-9} m/s, or other approved mineral layer.

If other wastes that are placed in the same cell as asbestos present a higher risk to underlying groundwater than asbestos, then a higher level of cell design is required.

Food processing and low-hazard industrial waste, and low level contaminated soil

Each cell within a BPML that is to receive food processing waste, low-hazard industrial waste or low-level contaminated soil must be designed in accordance with the requirements contained in the BPEM for a Type 2 landfill and consist of at least a composite barrier liner and leachate collection system. This should include the following suggested measures:

- a leachate collection system comprising not less than 300 mm thick gravel, or other approved drainage material, placed over the composite liner with leachate collection pipes and a leachate extraction system

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

- a composite liner consisting of HDPE membrane not less than 2 mm thick, or other approved geomembrane, and compacted clay not less than 1 m thick with hydraulic conductivity not more than 1×10^{-9} m/s, or other approved mineral layer
- geotextiles to protect the geomembrane and the leachate collection layer.

Category C immobilised waste

Each cell within a BPML that is to receive Category C immobilised waste must include at least primary and secondary composite liners, and primary and secondary leachate detection and collection systems. This should include the following suggested measures:

- a primary leachate collection system comprising not less than 300 mm thick gravel, or other approved drainage material, placed over the composite liner with collection pipes and an extraction system
- a primary composite liner consisting of HDPE membrane not less than 2 mm thick, or other approved geomembrane, and compacted clay not less than 1 m thick with hydraulic conductivity not more than 1×10^{-9} m/s, or other approved mineral layer
- a secondary leachate detection and leachate collection system comprising not less than 300 mm thick gravel, or other approved drainage material, placed over the secondary composite liner with collection pipes and an extraction system
- a secondary composite liner consisting of HDPE membrane not less than 2 mm thick, or

other approved geomembrane, and compacted clay not less than 1 m thick with hydraulic conductivity not more than 1×10^{-9} m/s, or other approved mineral layer

- geotextiles to protect the geomembranes and the leachate detection and collection layers.

Management of gaseous emissions

Gaseous emissions must be managed through appropriate design, including gas capture and treatment if required.

Landfill cap

Each cell within a BPML must be capped and rehabilitated once filled with waste. The cap must be designed so that seepage through the cap is no more than 75 per cent of the anticipated seepage rate through the liner. This is required regardless of the type of Category C prescribed industrial wastes that the cell has received. The design of a cap should be consistent and compatible with the suggested measures for basal liner systems described above.

Question for stakeholders: EPA is particularly interested in stakeholder comments on the landfill cell design requirements outlined above. Are these requirements practical and do they provide an acceptable level of protection for human health and the environment from the hazards posed by managing Category C wastes at landfills?

3.4 Construction Quality Assurance Plan

The operator of a BPML must develop a Construction Quality Assurance plan prior to the construction of a new landfill cell and have it approved by EPA. The Construction Quality Assurance plan is designed to

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

ensure that the landfill is constructed in accordance with its design specifications. An environmental auditor appointed under the *Environment Protection Act 1970* must prepare an environmental audit report that confirms that the landfill cell has been constructed in accordance with this approved Construction Quality Assurance plan. Category C prescribed industrial waste must not be placed in the landfill cell until the environmental audit report has been submitted to and approved by EPA.

3.5 Waste disposal

Some types of Category C prescribed industrial wastes should not be co-disposed with putrescible wastes³.

Disposal of Category C prescribed industrial wastes should only be done in accordance with the following suggested measures:

- Category C immobilised wastes must not be disposed of in the same cell as putrescible wastes.
- Category C immobilised wastes may be placed in the same cell as low-hazard industrial waste and low-level contaminated soil if the landfill is accepting more than one type of these wastes and EPA assesses these wastes as compatible.
- Any Category C prescribed industrial waste with specific disposal requirements must be

³ Putrescible waste is waste that can be decomposed by bacterial action and includes components of municipal/kerbside collected waste and food processing wastes. The leachate produced by the decomposition of putrescible waste may mobilise metals and other contaminants found in other wastes, and may reverse waste immobilisation processes.

identified and appropriate disposal methods developed⁴.

- Food processing wastes may be deposited with other putrescible wastes, such as municipal waste, if the landfill is licensed to receive these wastes.

3.6 Waste receipt

A BPML must be operated in accordance with an Environment Improvement Plan (EIP) that has been approved by EPA. The EIP must include procedures for the adequate supervision, control of waste receipt, safe handling, record-keeping and placement of Category C prescribed industrial waste in accordance with requirements for that waste.

Procedures developed should include the following suggested measures:

- inspections and sampling of waste loads
- staff training requirements
- procedures to deal with the management of non-conforming wastes.

Procedures for control of waste receipt should also include provision for appropriate communication with waste generators and/or treaters to ensure that waste received at the landfill meets the relevant criteria for the particular waste type. Waste testing results must be provided by the waste generator and/or treater to demonstrate that the waste meets the relevant criteria. The landfill operator is also expected to take its own samples for a proportion of

⁴ Specific disposal requirements will need to be assessed on a case-by-case basis and may include, for example, ensuring that chromium waste is not be placed with any waste that may result in the conversion of chromium to the more hazardous chromium (VI). Situations where this may occur will need to be identified and an appropriate disposal methodology developed.

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

incoming waste loads, to validate the supplied waste testing results. Properly completed transport certificates must also accompany all loads of waste delivered to the landfill. Procedures on control of waste receipt must include quality control, auditing provisions and reporting.

A BPML operator must engage an environmental auditor appointed under the *Environment Protection Act 1970* to prepare environmental audit reports on a regular basis that assess waste receipt practices against the EPA-approved EIP.

A BPML must have gatehouse and weighbridge facilities. A gatehouse is required to ensure that waste receipt procedures can be properly implemented (for example, by providing facilities for the storage of relevant documents and waste samples). A weighbridge is also required so that the amount of Category C prescribed industrial waste accepted at the landfill can be accurately measured and recorded. A BPML must also be staffed at all times when it is open for the receipt of waste.

3.7 Monitoring

The operation, maintenance and post-closure care of a landfill receiving Category C prescribed industrial waste must be monitored so that the environmental performance of the landfill can be assessed and reported to EPA and the wider community. Monitoring should include the following suggested measures:

- monitoring of leachate, groundwater and air quality
- monitoring of surface water and landfill gas if relevant to the landfill and/or the wastes placed in the landfill

- documentation of monitoring procedures in the landfill EIP.

Any landfill that wishes to accept Category C immobilised waste will need to provide a higher level of monitoring than landfills accepting other types of Category C prescribed industrial waste. This higher level of monitoring must be appropriate to the risk posed by Category C immobilised waste and include measures to monitor the continued effectiveness of the waste immobilisation processes once the waste has been placed in the landfill.

A BPML operator must engage an environmental auditor appointed under the *Environment Protection Act 1970* to prepare environmental audit reports on a regular basis that assess the risk of harm or detriment to the environment, with particular focus on groundwaters beneath the landfill, as well as assessing monitoring practices against the EPA-approved EIP.

3.8 Reporting

A BPML operator must prepare 'annual environmental performance reports' in accordance with the policy. This report must include the results of the audits required by sections 3.6 and 3.7 of these draft Guidelines.

3.9 Community involvement

A BPML operator must consult with the community about its intent to accept Category C prescribed industrial waste. The community includes interested local residents and businesses, and may also include residents or businesses from outside the local area with an interest in the landfilling of these wastes. It is also suggested that a community

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

liaison committee be established where one does not already exist, and that it should meet at least twice yearly.

The operator of a BPML must regularly report to the community on, amongst other things, the performance of the landfill in general and in particular as it relates to the acceptance of Category C prescribed industrial waste, and any other issue of interest to the community. This reporting could be via regular meetings of the community liaison committee, newsletters and/or any other method agreed to with the community.

3.10 Financial assurance

A landfill that wishes to accept Category C prescribed industrial waste must have in place or provide to EPA an adequate financial assurance. The level of financial assurance must be appropriate to the risk posed by the wastes to be accepted at the landfill. A landfill that wishes to accept Category C immobilised waste is likely to need to provide a greater amount of financial assurance than landfills accepting other Category C prescribed industrial wastes.

4. MANAGEMENT OF LANDFILLS CURRENTLY RECEIVING CATEGORY C WASTES

Those landfills that currently receive Category C prescribed industrial wastes and that do not meet the requirements in the *Industrial Waste Management Policy (Prescribed Industrial Waste)*, the *Waste Management Policy (Siting, Design and Management of Landfills)*, EPA Publication 788 (*Best practice environment management: Siting, design,*

operation and rehabilitation of landfills) or the additional specific requirements outlined in this draft Guideline must improve landfill cell design and/or management systems in order to meet these requirements. EPA will work with existing landfill operators to make these improvements.

In particular, best practice requirements must be incorporated into the design and construction of all new cells or within 24 months for existing large cells – whichever is sooner – at landfills that currently receive Category C prescribed industrial wastes.

Management systems, including those related to waste receipt and monitoring, must be reviewed no later than at the time that the landfill's EIP is reviewed and improvements made to management systems if required. If a landfill's EIP is not reviewed annually then a review of the EIP must occur no later than 12 months from finalisation of this draft Guideline to ensure compliance with best practice requirements.

Licences will be amended to ensure that landfills that currently accept Category C prescribed industrial waste are consistent with best practice requirements.

5. SUMMARY OF BEST PRACTICE REQUIREMENTS

To summarise, best practice requirements for the receipt of Category C prescribed industrial waste at a municipal landfill include:

- meeting the requirements in the *Industrial Waste Management Policy (Prescribed Industrial Waste)*

DRAFT BEST PRACTICE REQUIREMENTS FOR LANDFILLS RECEIVING CATEGORY C PRESCRIBED INDUSTRIAL WASTE

- meeting the requirements in the *Waste Management Policy (Siting, Design and Management of Landfills)*
 - meeting the objectives and each required outcome contained in EPA's *Best practice environment management: Siting, design, operation and rehabilitation of landfills*
 - not establishing or extending into any area where an aquifer contains Segment A groundwater unless special circumstances exist to warrant otherwise
 - depositing wastes at least two metres above the long-term undisturbed depth to groundwater unless special circumstances exist to warrant otherwise
 - constructing cells in accordance with an EPA-approved Construction Quality Assurance plan and requiring an EPA-appointed auditor to confirm that the landfill cell has been constructed in accordance with the plan
 - operating in accordance with an EPA-approved Environment Improvement Plan that includes procedures for the adequate supervision, control of waste receipt, safe handling, record-keeping and placement of Category C prescribed industrial waste
 - being audited by an EPA-appointed auditor on a regular basis against the waste receipt procedures documented in the EIP
 - having a gatehouse and weighbridge facilities
 - monitoring environmental performance
 - engaging an EPA-appointed auditor to regularly audit the monitoring program and to assess the risk posed by the landfill on the environment with particular focus on groundwaters beneath the landfill
 - preparing 'annual environmental performance reports' in accordance with the policy
 - involving the community by consulting about proposals to accept Category C prescribed industrial waste, and involving the community through the life of the landfill
 - having an adequate financial assurance.
- Additionally:
- each cell within a BPML that is to receive food processing waste, low-hazard industrial waste or low-level contaminated soil must consist of at least a single composite barrier liner and a leachate collection system
 - each cell within a BPML that is to receive Category C immobilised waste must include at least primary and secondary composite liners, and primary and secondary leachate detection and collection systems
 - Category C immobilised wastes must not be disposed of in the same cell as putrescible wastes
 - the cap must be designed so that seepage through the cap is no more than 75 per cent of the anticipated seepage rate through the liner, and the design of a cap should be consistent and compatible with the landfill cells' basal liner.