



## INFORMATION BULLETIN

## EPA PUBLICATION 448 CLASSIFICATION OF WASTES

Publication 448.3\* May 2007

## 1. INTRODUCTION

The Environment Protection Authority is responsible for ensuring the proper storage, transport, treatment and disposal of waste in Victoria. This bulletin sets out the management requirements for different wastes taken off-site for reuse, treatment or disposal. It also provides guidance on classifying contaminated soils into one of three categories (Category A, B or C) according to their level of hazard. Allowable contaminant levels for fill material are also specified.

From 1 July 2007, all prescribed industrial wastes must be classified by hazard category prior to being accepted at landfills. EPA publication 996, *Guidelines for hazard classification of solid prescribed industrial wastes*, provides guidance on determining the hazard category of prescribed industrial wastes that are not contaminated soils.

As set out in the *Environment Protection Act 1970*, all wastes should be managed in the following order of preference:

- avoidance
- reuse
- recycling
- recovery of energy
- treatment
- containment
- disposal.

This bulletin does not address trade waste, which is disposed of to sewer.

## 2. WASTE TYPES

Wastes can be classified as one of five types (Table 1) to determine EPA requirements for off-site disposal and to choose an appropriate management option. If doubt exists as to which waste type applies, seek advice from EPA.

## 2.1 Fill material

This classification consists of soil (being clay, silt and/or sand), gravel and rock of naturally occurring materials. Fill material, often referred to as 'clean fill' by industry, may be suitable for site filling or levelling depending on an assessment of contaminant levels

and intended use<sup>1</sup>. Fill material does not require in accordance with the *Environment Protection (Prescribed Waste) Regulations 1998*, and can be reused without written EPA approval. However, local councils may have requirements and advice should be sought.

An assessment of soil, including site history<sup>2</sup>, will determine whether the material has been potentially contaminated as a result of industrial, commercial, construction or agricultural activities, or contaminated with manufactured chemicals; and/or where material has been placed as filling or has been mechanically disturbed.

Soil may be classified as fill, when:

- an assessment of soil (as discussed above) will demonstrate that the material is not contaminated

or

- contaminant levels in the soil are below those specified in Table 2, and without potential amenity effects, e.g. highly odorous

or

- any elevated level of metals (such as arsenic) or other constituents can be demonstrated to be of natural origin. Where it can be demonstrated that the constituents of concern are naturally elevated, EPA does not consider these soils to be 'contaminated' and therefore can be classified as fill material.

EPA does not regulate the use of fill material. However, the *Environment Protection Act 1970* places general obligations to prevent adverse impacts on the environment and human health. Where there is potential for adverse impacts from the deposit of fill material, advice should be sought from EPA. EPA may require information such as the origin of the soil, site history, sampling and analytical results of contaminants or other constituents, the nature of the elevated contaminants and the location of sites where the soil is to be reused.

Landfill operators may require analytical results to demonstrate that the fill material meets the relevant criteria set out in their licence.

\* This document replaces EPA publication 448.1 (issued May 2004) and takes effect from 1 July 2007.

<sup>1</sup> The Victorian Department of Primary Industries can provide advice on organochlorine pesticide thresholds in soil for cattle grazing.

<sup>2</sup> Australian Standard 4482.1, published by Standards Australia, provides information on conducting preliminary site investigations.

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Table 1: Summary of waste types

Category	Description	Management option	EPA requirements for off-site disposal
Fill Material	Soil where: <ul style="list-style-type: none"> <li>the site assessment demonstrates the soil is not contaminated</li> </ul> or <ul style="list-style-type: none"> <li>contamination concentrations do not exceed those specified in Table 2 and without potential amenity effects, e.g. highly odorous</li> </ul> or <ul style="list-style-type: none"> <li>any elevated levels of metals or other constituents can be demonstrated to be of natural origin.</li> </ul>	Use as fill material, e.g. site filling/levelling.	No licence required. However, reuse must not give rise to environmental or health impacts.
Solid Inert	Building/demolition material, e.g. concrete, bricks, dry timber, plastic, glass, metals, bitumen; and shredded tyres.	<ul style="list-style-type: none"> <li>Reuse</li> <li>Recycling</li> <li>Landfill</li> </ul>	<ul style="list-style-type: none"> <li>Non-municipal landfills must be licensed.</li> <li>When disposing to municipal landfill serving &gt;5000 persons site must be licensed.<sup>1</sup></li> </ul>
Putrescible	Food or garden wastes from commercial or industrial sources, e.g. vegetable processing, butchers and domestic garbage.	<ul style="list-style-type: none"> <li>Composting</li> <li>Stockfood<sup>2</sup></li> <li>Recovery of energy</li> <li>Landfill</li> </ul>	<ul style="list-style-type: none"> <li>Non-municipal landfills must be licensed.</li> <li>When disposing to municipal landfill serving &gt;5000 persons site must be licensed.<sup>1</sup></li> </ul>
Prescribed waste <sup>3</sup>	As listed in Table 5, reproduced from the <i>Environment Protection (Prescribed Waste) Regulations 1998</i> .	Various treatment and disposal methods depending on waste type and hazard category.	<ul style="list-style-type: none"> <li>No disposal of Category A waste to landfill.</li> <li>Disposal of hazard category B or C waste to a licensed site.<sup>1</sup></li> <li>EPA transport certificates must be used.</li> <li>Vehicles must hold EPA permit (unless exemption issued).</li> </ul>
<b>Prescribed waste (contaminated soil)</b>			
Category A Contaminated soil <sup>4</sup>	Contaminated soil with any contaminant concentration or leachable concentration greater than those specified in Table 4 or soil that displays any hazard characteristic listed in Table 6.	<ul style="list-style-type: none"> <li>On-site remediation</li> <li>Off-site remediation</li> <li>Storage pending availability of treatment</li> </ul>	<ul style="list-style-type: none"> <li>No disposal to landfill.</li> <li>EPA transport certificates must be used.</li> <li>Vehicles must hold EPA permit (unless exemption issued).</li> </ul>
Category B Contaminated soil <sup>4</sup>	Contaminated soil with any contaminant concentration or leachable concentration greater than those specified in Table 3, but not exceeding both the contaminant and leachable concentrations specified in Table 4.	<ul style="list-style-type: none"> <li>On-site remediation</li> <li>Off-site remediation</li> <li>Licensed facility</li> </ul>	<ul style="list-style-type: none"> <li>Disposal to licensed facility.<sup>1</sup></li> <li>EPA Transport certificate system must be used.</li> <li>Vehicles must hold EPA permit (unless exemption issued).</li> </ul>
Category C Contaminated soil <sup>5</sup>	Contaminated soil with any contaminant concentration greater than those specified in Table 2, but not exceeding both the contaminant and leachable concentrations specified in Table 3.	<ul style="list-style-type: none"> <li>On-site remediation</li> <li>Off-site remediation</li> <li>Licensed landfill</li> </ul>	<ul style="list-style-type: none"> <li>Disposal to licensed landfill.<sup>1</sup></li> <li>EPA Transport certificate system must be used.</li> <li>Vehicles must hold EPA permit (unless exemption issued).</li> </ul>

<sup>1</sup> Facilities must be licensed to receive the specific waste type, and for prescribed industrial waste, the specific hazard category.

<sup>2</sup> The Victorian Department of Primary Industries can provide advice on the suitability of commercial waste as stockfeed.

<sup>3</sup> EPA Publication 996, *Guidelines for hazard classification of solid prescribed industrial wastes*, provides further guidance to attribute a hazard category (Category A, B or C) for prescribed industrial waste (non-soil).

<sup>4</sup> From 1 July 2007, 'Contaminated soil' defined in EPA Publication 448.1 will be reclassified as Category B (Contaminated soil) or Category A (Contaminated soil).

<sup>5</sup> From 1 July 2007, "Contaminated soil (low-level)" as hitherto defined in EPA Publication 448.1 will be reclassified as Category C (Contaminated soil).



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### 2.2 Solid inert waste

Solid inert waste is defined in the *Industrial waste management policy (Prescribed industrial waste)* as 'hard waste which has negligible activity or effect on the environment'. Landfills licensed by EPA to accept only solid inert waste usually have less stringent operating and monitoring requirements than other landfills.

Reuse and recycling options should be investigated for this type of waste, as in many cases solid inert waste, such as building materials, can be reused or recycled. Proponents should seek advice from EPA if in doubt about the appropriateness of the reuse and recycling options.

### 2.3 Putrescible waste

Putrescible waste is defined in the *Industrial waste management policy (Prescribed industrial waste)* as 'waste able to be decomposed by bacterial action'. Putrescible waste may be suitable for composting or recycled for stockfeed (which includes food wastes from residential, industrial or commercial sources such as restaurants, food markets, supermarkets, and butchers).

Problems associated with putrescible waste landfills or reprocessing facilities (e.g. composting facilities) often include vermin, seagulls, dust, odour, flies and other insects, fires, litter, as well as surface and groundwater contamination by leachate. Accordingly, the design and operating requirements for facilities accepting putrescible waste are generally more stringent than for sites accepting solid inert waste only.

### 2.4 Prescribed waste

Prescribed wastes have the potential to adversely impact on human health and the environment, or impact on public amenity (for example odorous waste).

Prescribed wastes are listed in the *Environment Protection (Prescribed Waste) Regulations 1998* (see Table 5 for listing). The only prescribed waste of domestic origin is grease interceptor trap waste arising from domestic premises. All others are of industrial origin, or arise from trade or commercial activity.

All prescribed industrial wastes must be transported in accordance with the *Environment Protection (Prescribed Waste) Regulations 1998*, and solid prescribed industrial wastes must be classified by hazard before disposal. EPA publication 996, *Guidelines for hazard classification of solid prescribed industrial wastes*, provides guidance to waste generators and treaters in classifying the hazard category (A, B or C) of their solid prescribed industrial wastes from manufacturing sources. Guidance on the classification of contaminated soil is provided below.

### 2.5 Prescribed waste (contaminated soil)

Prescribed industrial waste producers must classify their waste into one of three hazard categories (Category A, B or C) to determine which facility may accept the waste. If the generation of contaminated soil cannot be avoided, then generators must seek to reuse, recycle or recover energy if these options are practicable.

The contaminants listed in Tables 3 and 4 represent a broad range of common contaminants analysed in contaminated soil (Note: individual contaminants are listed in the notes to Tables 2, 3 and 4). An assessment of the soil, including site history, will identify which contaminants to analyse to determine the hazard category, but does not preclude the analysis of other contaminants that are not listed in Tables 3 and 4. If the waste contains a contaminant that is potentially poisonous (acute), toxic (delayed or chronic) and/or ecotoxic and is not listed in Tables 3 or 4, the waste generator must apply to EPA for a determination of hazard category.

#### Hazard categories

Category A contaminated soil is contaminated soil with any contaminant concentration or any leachable concentration greater than those specified in Table 4, or that displays any hazard characteristic listed in Table 6.

Category B contaminated soil is contaminated soil with any contaminant concentration or any leachable concentration greater than those specified in Table 3, but not exceeding both the contaminant and leachable concentrations specified in Table 4.

Category C contaminated soil is contaminated soil with any contaminant concentrations greater than those specified in Table 2, but not exceeding both the contaminant and leachable concentrations specified in Table 3.

In determining a hazard category, contaminated soil must first be considered and excluded from Category A, then considered and excluded from Category B, before it can be considered as Category C. Figure 1 shows a decision flowchart for classifying waste soils.

If doubt exists as to which hazard category applies to a soil, seek advice from EPA.

Landfill operators will require analytical results to demonstrate that the contaminated soil meets the relevant criteria set out in their licence.



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Table 2

Maximum contaminant concentrations allowed in soil to be disposed of as fill material.

Contaminant	Concentration (total) mg/kg dry weight
Arsenic	20
Cadmium	3
Chromium (VI)	1
Copper	100
Lead	300
Mercury	1
Molybdenum	40
Nickel	60
Tin	50
Selenium	10
Silver	10
Zinc	200
Cyanide	50
Fluoride	450
Phenols (halogenated) <sup>2</sup>	1
Phenols (non-halogenated) <sup>3</sup>	60
Monocyclic aromatic hydrocarbons <sup>4</sup>	7
Benzene	1
Polycyclic aromatic hydrocarbons <sup>5</sup>	20
Benzo(a)pyrene	1
Total petroleum hydrocarbons C <sub>6</sub> to C <sub>9</sub>	100
Total petroleum hydrocarbons C <sub>10</sub> to C <sub>36</sub>	1000
Polychlorinated biphenyls <sup>6</sup>	2
Chlorinated hydrocarbons <sup>7</sup>	1
Organochlorine pesticides <sup>9</sup>	1

Table 3

Maximum contaminant concentrations and leachable concentrations allowed in soil to be disposed of as Category C (Contaminated soil).

Contaminant	Concentration (total) mg/kg dry weight	Leachable concentration ASLP <sup>1</sup> mg/L
Arsenic	500	0.7
Cadmium	100	0.2
Chromium (VI)	500	5.0
Copper	5000	200
Lead	1500	1.0
Mercury	75	0.1
Molybdenum	1000	5.0
Nickel	3000	2.0
Tin	500	-
Selenium	50	1.0
Silver	180	10
Zinc	35 000	300
Cyanide	2500	8.0
Fluoride	10 000	150
Phenols (halogenated) <sup>2</sup>	10	2
Phenols (non-halogenated) <sup>3</sup>	560	14
Monocyclic aromatic hydrocarbons <sup>4</sup>	70	-
Benzene	4	0.1
Polycyclic aromatic hydrocarbons <sup>5</sup>	100	-
Benzo(a)pyrene	5	0.001
Total petroleum hydrocarbons C <sub>6</sub> to C <sub>9</sub>	650	-
Total petroleum hydrocarbons C <sub>10</sub> to C <sub>36</sub>	10 000	-
Polychlorinated biphenyls	see note 6	-
Chlorinated hydrocarbons		
Hexachlorobutadiene	2.8	0.07
Vinyl chloride	1.2	0.03
Other chlorinated hydrocarbons <sup>8</sup>	10	-
Organochlorine pesticides		
Aldrin + Dieldrin	1.2	0.03
DDT + DDD + DDE	50	2.0
Chlordane	4	0.1
Heptachlor	1.2	0.03
Other organochlorine pesticides <sup>10</sup>	10	-

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**Table 4: Maximum contaminant concentrations and leachable concentrations allowed in soil to be disposed of as Category B (Contaminated soil).**

Contaminant	Concentration (total) mg/kg dry weight	Leachable concentration ASLP <sup>1</sup> mg/L
Arsenic	2000	2.8
Cadmium	400	0.8
Chromium (VI)	2000	20
Copper	20 000	800
Lead	6000	4.0
Mercury	300	0.4
Molybdenum	4000	20
Nickel	12 000	8.0
Selenium	200	4.0
Silver	720	40
Zinc	140 000	1200
Cyanide	10 000	32
Fluoride	40 000	600
Phenols (halogenated) <sup>2</sup>	320	8
Phenols (non-halogenated) <sup>3</sup>	2200	56
Monocyclic aromatic hydrocarbons <sup>4</sup>	240	-
Benzene	16	0.4
Polycyclic aromatic hydrocarbons <sup>5</sup>	400	-
Benzo(a)pyrene	20	0.004
Total petroleum hydrocarbons C <sub>6</sub> to C <sub>9</sub>	2600	-
Total petroleum hydrocarbons C <sub>10</sub> to C <sub>36</sub>	40 000	-
Polychlorinated biphenyls	See note 6	-
<b>Chlorinated hydrocarbons</b>		
Hexachlorobutadiene	11	0.28
Vinyl chloride	4.8	0.12
Other chlorinated hydrocarbons <sup>8</sup>	50	-
<b>Organochlorine pesticides</b>		
Aldrin + Dieldrin	4.8	0.12
DDT + DDD + DDE	50	-
Chlordane	16	0.4
Heptachlor	4.8	0.12
Other organochlorine pesticides <sup>10</sup>	50	-

 EPA PUBLICATION 448 CLASSIFICATION OF WASTES**Notes to Tables 2, 3 and 4:**

1. Australian Standard Leaching Procedure (acetate buffer) as specified in Australian Standards 4439.2 and 4439.3.
2. Total sum of 4-chloro-3-methylphenol, 2-chlorophenol, 2,4-dichlorophenol, 2,6-dichlorophenol, pentachlorophenol, 2,3,4,5-tetrachlorophenol, 2,3,4,6-tetrachlorophenol, 2,3,5,6-tetrachlorophenol, 2,4,5-trichlorophenol, and 2,4,6-trichlorophenol.
3. Total sum of phenol, 2-methylphenol (o-cresol), 3-methylphenol (m-cresol), 4-methylphenol (p-cresol), 2,4-dimethylphenol, 2,4-dinitrophenol, 2-methyl-4,6-dinitrophenol, 2-nitrophenol, 4-nitrophenol, 2-cyclohexyl-4,6-dinitrophenol and dinoseb.
4. Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene.
5. Total sum of naphthalene, acenaphthylene, acenaphthene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluorene, fluoranthene, indeno(1,2,3-c,d)pyrene, phenanthrene and pyrene.
6. Soils containing polychlorinated biphenyls must be managed in accordance with the Notifiable Chemical Order for Polychlorinated Biphenyls. EPA publication 693, *Guidelines for the management of polychlorinated biphenyls* provides further information.
7. Total sum of carbon tetrachloride, chlorobenzene, chloroform, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene, dichloromethane (methylene chloride), 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene, vinyl chloride and hexachlorobutadiene.
8. Total sum of carbon tetrachloride, chlorobenzene, chloroform, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene, dichloromethane (methylene chloride), 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1,2-trichloroethane and trichloroethene.
9. Total sum of aldrin, hexachlorobenzene, alpha BHC, beta BHC, gamma BHC (lindane), delta BHC, chlordane, DDT, DDD, DDE, dieldrin, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, methoxychlor and endosulfan (includes endosulfan I, endosulfan II and endosulfan sulphate).
10. Total sum of hexachlorobenzene (HCB), alpha BHC, beta BHC, gamma BHC (Lindane), delta BHC, chlordane, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, methoxychlor, and endosulfan (includes endosulfan I, endosulfan II and endosulfan sulphate).

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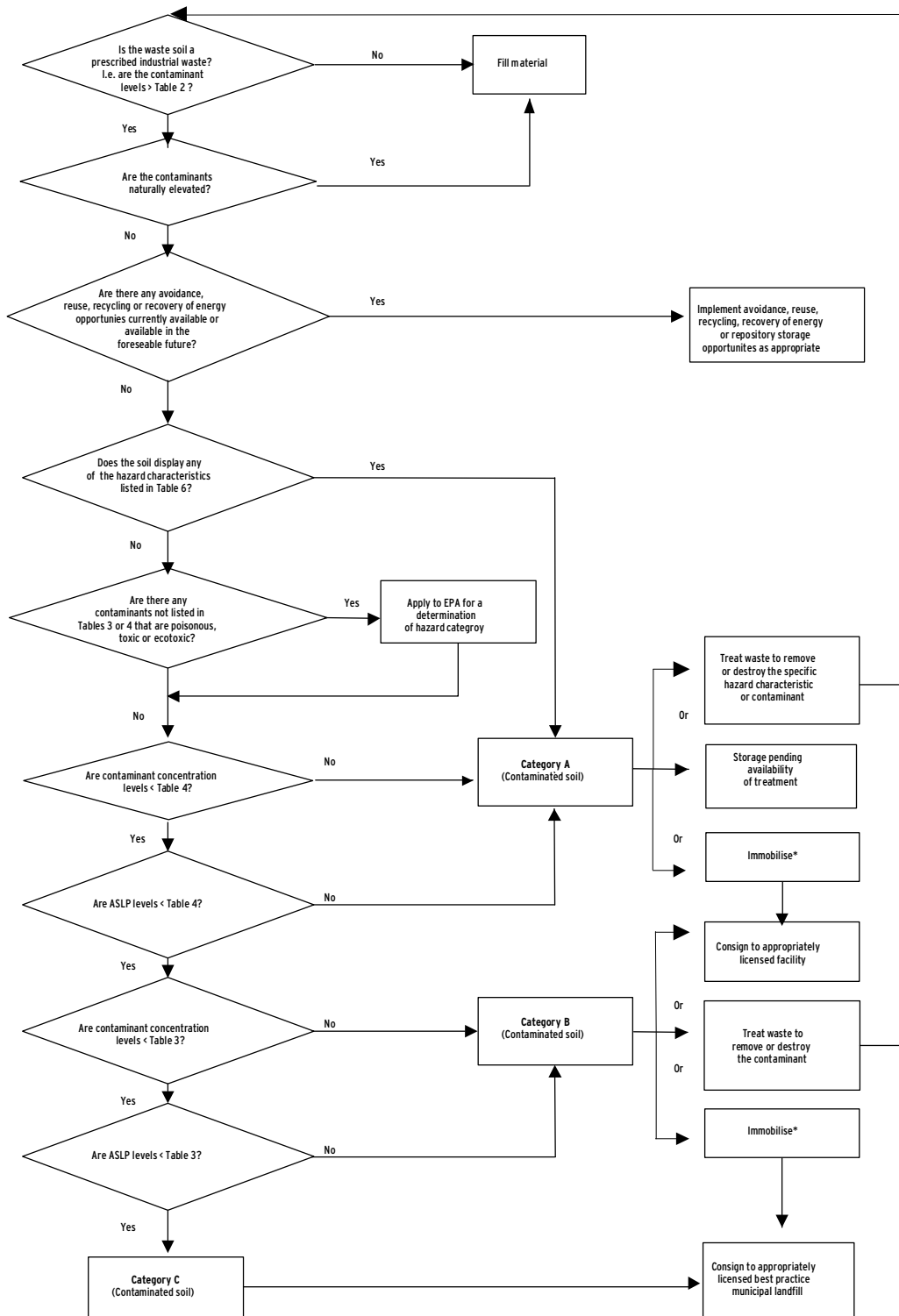


Figure 1: Decision flowchart for waste soil

\* Immobilisation is a process whereby the solubility, leachability, availability or reactivity of a waste and its components is reduced by chemical reaction and/or physical encapsulation in a solid matrix, and must be managed in accordance with EPA publication 996, *Guidelines for hazard classification of solid prescribed industrial wastes*.

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### Management requirements

Category C (Contaminated soil) and Category B (Contaminated soil) can be accepted at a landfill or facility licensed by EPA to accept such waste.

Category A (Contaminated soil) will require treatment to reduce or control the hazard before meeting acceptance criteria for disposal at an appropriate EPA-licensed facility.

Generators of contaminated soils may wish to seek a new classification for EPA approval, where it can be demonstrated that a different category from that outlined above is appropriate for a particular contaminant or group of contaminants in soil. For example, a contaminant that is intrinsically immobilised may display a low hazard because of the very low leachable concentration, despite a relatively high total concentration. Applications will need to provide justification why the proposed new classification is consistent with the *Industrial waste management policy (Prescribed industrial waste)*, and achieves the best environmental outcome.

Under the *Environment Protection (Prescribed Waste) Regulations 1998*, contaminated soils are prescribed industrial wastes, and must be managed in accordance with all the requirements of these regulations. When transporting contaminated soils, transport certificates (or an appropriate exemption issued in accordance with the Regulations) must be used. Vehicles transporting contaminated soils must also have a current EPA waste transport permit (or an appropriate exemption issued in accordance with the Regulations). All loads should be covered to prevent leaks or spills of contaminated material to the environment.

Waste generators must classify contaminated soil by hazard category in order to determine which facility is licensed to accept the waste. If the waste does not meet the acceptance criteria, further treatment or stabilisation will be required.

Soil sampling should be conducted in accordance with *Soils sampling guideline (off-site management and acceptance)*, currently available in draft format as EPA publication 1121. Soil analysis should be performed in accordance with EPA publication 441, *A guide to the sampling and analysis of waters, wastewaters, soils and wastes*. The leaching test to be used is the Australian Standard Leaching Procedure as specified in Australian Standards 4439.2 and 4439.3.

### Classification by management – contaminated soils mandated for reuse and recycling

EPA has classified certain types of soil contaminated with organic compounds as wastes for which opportunities for reuse, recycling, recovery of energy and treatment will be available in the foreseeable future. Requirements for the management of these soils are detailed in EPA publication 878, *Classification for contaminated soil*.

### 2.6 Other wastes

There are certain waste types which warrant mention here.

**Industrial waste** is defined under the *Environment Protection Act 1970* as:

- a. any waste arising from commercial, industrial, or trade activities or from laboratories; or
- b. any waste containing substances or materials which are potentially harmful to human beings or equipment.

Industrial waste includes waste arising from all commercial, industrial, building and demolition activities, including:

- manufacturing activities
- wholesale/retail trade
- commercial services including services provided to households (e.g. gardening services, skip/bin hire etc.)
- accommodation, cafes, restaurants
- building/demolition waste from building construction, renovations or repairs and road construction and maintenance
- waste from primary industries including agricultural, forestry and fishing.

**Municipal waste** is defined under the *Environment Protection Act 1970* as 'any waste arising from municipal or residential activities, and includes waste collected by, or on behalf of, a municipal council, but does not include any industrial waste'.

Therefore municipal waste is associated with the day-to-day activities of households and the maintenance of a clean municipality, and includes:

- garbage and domestic household waste
- residential kerbside collections
- residential hard waste collections
- residential self-haul waste
- residential garden waste
- municipal litter collections
- municipal street sweepings
- park waste.

The *Waste management policy (Siting, design and management of landfills)* applies to all landfills in Victoria receiving solid waste. The requirements for sites receiving industrial and municipal wastes are detailed in EPA publication 788, *Best practice environmental management (Siting, design, operation and rehabilitation of landfills)*.

**Waste asbestos:** the transport and disposal of asbestos wastes needs to be carried out under strictly controlled conditions. EPA has produced a separate





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guideline, EPA publication 364, *The transport and disposal of waste asbestos*, regarding these wastes.

**Mining and extractive industry wastes** include a range of wastes (overburden, rock, tailings) with varying contamination levels. Sites used for the deposit of waste not in accordance with the *Extractive Industries Development Act* or *Mineral Resources Development Act* require a licence. Tailings, sand or waste rock deposits resulting from the extraction and processing of gold-bearing ore containing arsenic must be managed in accordance with the Notifiable Chemical Order for Arsenic and Arsenic compounds. EPA publication 545, *Control of arsenic in mine tailings, sand and rock*, provides further information.

**Scheduled wastes** are wastes that are difficult to safely dispose of without special technologies and facilities. Australian governments have agreed to implement a national approach for the management of scheduled wastes. Examples of these are polychlorinated biphenyls (PCBs), organochlorine pesticides and hexachlorobenzene. There are some facilities available for these wastes and further information is available. Contact EPA for further advice.

**Acid sulfate soils** includes any soil, sediment, unconsolidated geological material or disturbed consolidated rock mass containing metal sulfides exceeding criteria published in EPA publication 655, *Acid sulfate soil and rock*. If managed inappropriately, waste acid sulfate soils may oxidise to produce acid which poses a risk to human health and the environment.


**EPA PUBLICATION 448 CLASSIFICATION OF WASTES**
**Table 5: Prescribed waste list****General prescribed wastes**

Grease interceptor trap effluent arising from domestic premises

**Prescribed industrial wastes**

Acids in a solid form and acidic solutions with a pH value of 4 or less

Alkaline solids and alkaline solutions with a pH value of 9 or more

Animal and vegetable oils and derivatives

Animal effluent and residues including abattoir effluent, poultry and fish processing wastes

Antimony and antimony compounds

Any congener of polychlorinated dibenzo-furans (PCDFs)

Any congener of polychlorinated dibenzo-p-dioxins (PCDDs)

Arsenic and arsenic compounds

Asbestos (all forms)

Barium and barium compounds

Beryllium and beryllium compounds

Boron and boron compounds

Cadmium and cadmium compounds

Caustic neutralised wastes containing metallic constituents

Ceramic based fibres with physico-chemical characteristics similar to those of asbestos

Chromium compounds

Clinical and related wastes (not otherwise specified)

Cobalt and cobalt compounds

Contaminated soil that is either Category A waste, Category B waste or Category C waste, as defined in the *Environment Protection (Prescribed Waste) Regulations 1998*.

Copper compounds

Cyanides (inorganic)

Cyanides (organic)

Detergents and surface active agents (surfactants)

Filter cake

Fly ash

Grease interceptor trap effluent

Halogenated organic chemicals (not otherwise specified)

Halogenated organic solvents

Heterocyclic organic compounds containing oxygen, nitrogen or sulphur

Highly odorous organic chemicals (including mercaptans and acrylates)

Highly reactive chemicals (not otherwise specified)

Inert sludges or slurries

Inorganic chemicals (not otherwise specified)

Inorganic fluorine compounds (excluding calcium fluoride)

Inorganic sulphur containing compounds

Isocyanate compounds

Lead and lead compounds

Mercury and mercury compounds

Metal carbonyls

Nickel compounds

Non-halogenated organic chemicals (not otherwise specified)

Non-toxic salts

Organic solvents (excluding halogenated solvents)

Oxidising agents including chlorates, perchlorates, peroxides

Phenol and phenol compounds (including halogenated phenols)

Phosphorus and phosphorous compounds

Prescribed industrial wastes that are encapsulated, chemically fixed, solidified or polymerised

Residues from industrial waste treatment or disposal operations (not otherwise specified) including filter backwash waters

Selenium and selenium compounds

Silver and silver compounds

Spent catalysts

Tannery wastes (not otherwise specified) including leather dust, ash, sludges and flours

Tellurium and tellurium compounds

Textile effluent and residues (not otherwise specified)

Thallium and thallium compounds

Vanadium compounds

Vegetable, fruit, food processing effluent

Vehicle, machinery and industrial washwaters with or without detergents

Waste chemical substances arising from research and development or teaching activities (not otherwise specified), that are new or unidentified substances with unknown human health or environmental effects

Waste from the production, formulation and use of:

- biocides and phytopharmaceuticals (not otherwise specified)
- inks, dyes, pigments, paints, lacquers and varnish (not otherwise specified)
- organic solvents (not otherwise specified)
- photographic chemicals and processing materials
- resins, latex, plasticisers, glues and adhesives (not otherwise specified) excluding solid inert polymeric materials
- wood-preserving chemicals (not otherwise specified)
- pharmaceutical products (not otherwise specified)

Waste oils unfit for their original intended use

Waste oil and water mixtures or emulsions and hydrocarbon and water mixtures or emulsions

Waste resulting from surface treatment of metals and plastics

Waste substances or articles containing or contaminated with polychlorinated biphenyls (PCBs) or polybrominated biphenyls (PBBs)

Waste tarry residues arising from refining, distillation, and any pyrolytic treatment

Wastes of an explosive nature not subject to any other legislation including azides

Wool scouring wastes

Zinc compounds


**EPA PUBLICATION 448 CLASSIFICATION OF WASTES**
**Table 6: Specific hazard characteristics**

Any solid prescribed industrial waste which displays one or more of the hazard characteristics listed in the following table is classified as Category A.

<b>Hazard characteristic</b>	<b>Definition<sup>1</sup></b>
<b>Explosive wastes</b>	An explosive waste is a solid waste (or mixture of wastes) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings.  Note: These are wastes classified as 'Class 1' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> and/or classified as 'Goods too dangerous to be transported' under the Australian Dangerous Goods Code.
<b>Flammable<sup>2</sup> solid wastes</b>	Waste solids, other than those classified as explosives, which under conditions encountered in transport or containment are readily combustible, or may cause or contribute to fire through friction.  Note: These are wastes classified as 'Class 4.1' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> .
<b>Wastes liable to spontaneous combustion</b>	Wastes which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up in contact with air, and being then liable to catch fire.  Note: These are wastes classified as 'Class 4.2' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> .
<b>Wastes which, in contact with water, emit flammable gases</b>	Wastes which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.  Note: These are wastes classified as 'Class 4.3' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> .
<b>Oxidising wastes</b>	Wastes which, while in themselves not necessarily combustible, may, generally by yielding oxygen, cause or contribute to, the combustion of other materials.  Note: These are wastes classified as 'Class 5.1' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> .
<b>Organic peroxide wastes</b>	Organic wastes which contain the bivalent-O-O-structure and which are thermally unstable and may undergo exothermic self-accelerating decomposition.  Note: These are wastes classified as 'Class 5.2' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> .
<b>Infectious wastes</b>	Wastes containing viable microorganisms or their toxins which are known or suspected to cause disease in animals or humans.  Note: These include clinical and related wastes as prescribed in the <i>Environment Protection (Prescribed Waste) Regulations 1998</i> and is waste classified as 'Class 6.2' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> .
<b>Corrosive wastes</b>	Wastes which, by chemical action, will cause severe damage when in contact with living tissue, or in the case of leakage, will materially damage, or even destroy, other goods or the means of transport or containment; they may also cause other hazards.  Note: This includes wastes classified as 'Class 8' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> .
<b>Wastes that liberate toxic gases in contact with air or water</b>	Wastes which, by liberation with air or water, are liable to give off toxic gases in dangerous quantities.  Note: These are wastes liable to give off toxic gases that are classified as 'Class 2.3' under the provisions of the <i>Road Transport (Dangerous Goods) Act 1995</i> .

<sup>1</sup> Definitions are adopted from the *Industrial Waste Management Policy (Movement of Controlled Wastes between States and Territories) 2001*.

<sup>2</sup> In this document the word 'flammable' has the same meaning as 'inflammable'. Flammable liquid wastes are waste liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc.) which give off flammable vapour at temperatures of not more than 60.5 °C (closed-cup test), or not more than 65.6 °C (open-cup test). Note: The definition of flammable liquid wastes are those wastes classified as 'Class 3' under the provisions of the *Road Transport (Dangerous Goods) Act 1995*.



## EPA PUBLICATION 448 CLASSIFICATION OF WASTES

### 3. FURTHER READING

- Australian Standard 4439.2 – 1997, *Wastes, sediments and contaminated soils. Part 2: Preparation of leachates – Zero headspace procedure*
- Australian Standard 4439.3 – 1997, *Wastes, sediments and contaminated soils. Part 3: Preparation of leachates – Bottle leaching procedure*
- Australian Standard 4482.1 – 2005, *Guide to sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*
- *Environment Protection (Prescribed Waste) Regulations 1998*
- EPA publication 1121, *Draft soils sampling guideline (off-site management and acceptance)*
- EPA publication 996, *Guidelines for hazard classification of solid prescribed industrial wastes*
- EPA publication 878, *Classification for contaminated soil*
- EPA publication 788, *Best practice environmental management (Siting, design, operation and rehabilitation of landfills)*
- EPA publication 693, *Guidelines for the management of polychlorinated biphenyls (PCBs)*
- EPA publication 655, *Acid sulfate soil and rock*
- EPA publication 545, *Control of arsenic in mine tailings, sand and rock*
- EPA publication 441, *A guide to the sampling and analysis of waters, wastewaters, soils and wastes*
- EPA publication 395, *Instructions for completion of transport certificates*
- EPA publication 364, *The transport and disposal of asbestos*
- EPA publication 344, *Transport and management of used containers*
- *Industrial waste management policy (Movement of controlled wastes between States and Territories)*
- *Industrial waste management policy (Prescribed industrial waste)*
- *Waste management policy (Siting, design and management of landfills)*