

Industrial waste

Fact sheet

EPA VICTORIA

State Government Victoria

EPA Victoria's industrial waste fact sheets have been developed for individuals and industry who excavate, supply or receive waste soil and soils mixed with industrial waste.

PUBLICATION 1436
FEBRUARY 2012

Authorised and published by
EPA Victoria, 200 Victoria Street, Carlton.

The fact sheets offer basic information for all parties in the supply chain and will help you:

- understand what can legally be used as fill material
- assess materials suitability for reuse
- manage contaminated material
- understand your legal duties under the *Environment Protection Act 1970* (the Act) and the *Environment Protection (Industrial Waste Resource) Regulations 2009*.

Key steps

The three key steps in the waste management process are:

- site assessment
- waste characterisation
- determination of reuse or disposal options.

Further information

Further guidance relating to all aspects of industrial waste management and prescribed industrial waste management is available at:

www.epa.vic.gov.au/waste/industrial-waste-guidelines.asp



Not fill material

INDEX

1 Site assessment
2 Soil and fill management
3 Segregation
4 Engineered fill
5 Haul road construction
6 Definitions

The information provided in these fact sheets is intended as general guidance only and must not be relied upon solely as a basis for understanding legislative requirements.



Industrial waste

Fact sheet

EPA VICTORIA

State Government Victoria

1 Site assessment

Land development and construction projects that require the excavation of soils should undertake a site assessment. When excavating material from a site, even if it appears to be clean, it is difficult to know what has happened in the past or what may be buried.

PUBLICATION 1437
FEBRUARY 2012

Authorised and published by
EPA Victoria, 200 Victoria Street, Carlton.

Contaminated soil management

If a site assessment identifies a site as having the potential for chemically contaminated soil, refer to the following standards and guidelines to determine sampling and categorisation requirements.

For initial screening to determine what and where you need to test, see:

- Australian Standard 4482.1 (2005) – *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1 – Non-volatile and semi-volatile compounds*
- Australian Standard 4482.2 (1999) – *Guide to the sampling and investigation of potentially contaminated soil, Part 2 – Volatile substances*.

To determine suitable patterns for sampling and the number of samples to be taken to ensure the appropriate hazard categorisation is applied to soils being moved offsite for treatment or disposal, see EPA's **Soil sampling guidance** (publication IWRG702 in IWRG section 7).

To determine what you can do with the soil once analysis and sampling has been undertaken, see EPA's **Soil hazard categorisation and management** (publication IWRG621 in IWRG section 6.2).

Timing

EPA recommends that the developer or principal should complete the site assessment prior to the tender phase of a project. This would ensure that any future occupier is made aware of the site's waste management requirements. It would also provide clarity to everyone involved in the management of the site, and indicate the true costs of potential contamination and management prior to work beginning.

Consider site use

The first thing to do when undertaking the site assessment is to research a site's current and previous land uses. This information may be found from several sources, including:

- the current landowner
- local council
- the Public Record Office.

Note: If an EPA audit has been completed for the site, this will provide the information required to determine how to manage the site.



Potentially high-risk site requiring full investigation due to previous industrial use

The site assessment provides an understanding of the site to help to determine:

- whether previous or current land use has caused contamination on the site
- what the contaminants are and where they are located
- how materials on the site should be managed.

It is the responsibility of the person who is in occupational control of the site or the portion of the site from where the soil is excavated to ensure that it is managed according to the EPA requirements and that any waste is sent to an appropriate facility.

The site assessment may also be used by the receiver to ensure that the material is appropriate for the receiving site.

The information provided in these fact sheets is intended as general guidance only and must not be relied upon solely as a basis for understanding legislative requirements.

Industrial waste

Fact sheet
February 2012

Site assessment

The site assessment could record the following information:

- address/location and titles information
- current owner/occupier
- present condition of the site
- description of the ground cover across the site
- presence of above and below-ground services, storage tanks
- sample locations (if samples have been previously taken).

Note: Contamination may also be present on sites that:

- are close to industrial sites
- have historically received fill material.


Low-risk site


Potential hot spot

Inspect the site

Physically inspect the site. If the soil smells or is discoloured, there is evidence of industrial waste such as bricks and concrete, or you think the area could be contaminated for any other reason you should treat the area as potentially contaminated and take some samples for analysis.

In most cases, specialist advice will be required to assist with taking soil samples and interpreting the test results.

Get professional advice

If the previous steps cannot determine the types of waste on site, you may need to get advice from a suitably qualified environmental consultant.

The suitably qualified person would possess one or a combination of the following attributes: relevant qualifications, demonstrated professional experience, prior learning and membership of a professional organisation.

Example site assessment checklist

The following is an example of how to record your company's movement and receipt of industrial waste and fill material. The Civil Contractors Federation is developing a detailed template checklist for use in site assessment process.

Source of material (supplier) details		
Company:		
Address:		
Contact name:		
Contact number:		
Source site details		
Site name:		
Address of site:		
Recent and historical site history:		
Quantity of material being removed:		
Soil categorisation		
Type of soil	Physical description of the soil, e.g. colour of material, presence of odour.	
Low potential for contamination	Brief explanation of past/present land use, e.g. agricultural, industrial, domestic.	
Medium potential for contamination	Brief explanation of past/present land use, e.g. agricultural, industrial, domestic. Any sampling and analysis undertaken to determine the site management.	
High potential for contamination	Brief explanation of past/present land use, e.g. agriculture, industrial, domestic. Details of sampling and analysis undertaken to determine the site management.	
Supplier agreement		
The supplier agrees that the above information is an accurate assessment of the material they have provided.		
Supplier name	Supplier signature	Date
Attach copies of any soil reports, test results, planning and zoning overlays, environmental audit overlays.		

FAST FACTS

Where a site appears to be low-risk in regards to its previous use, be careful to ensure that any potential hot spots are identified.

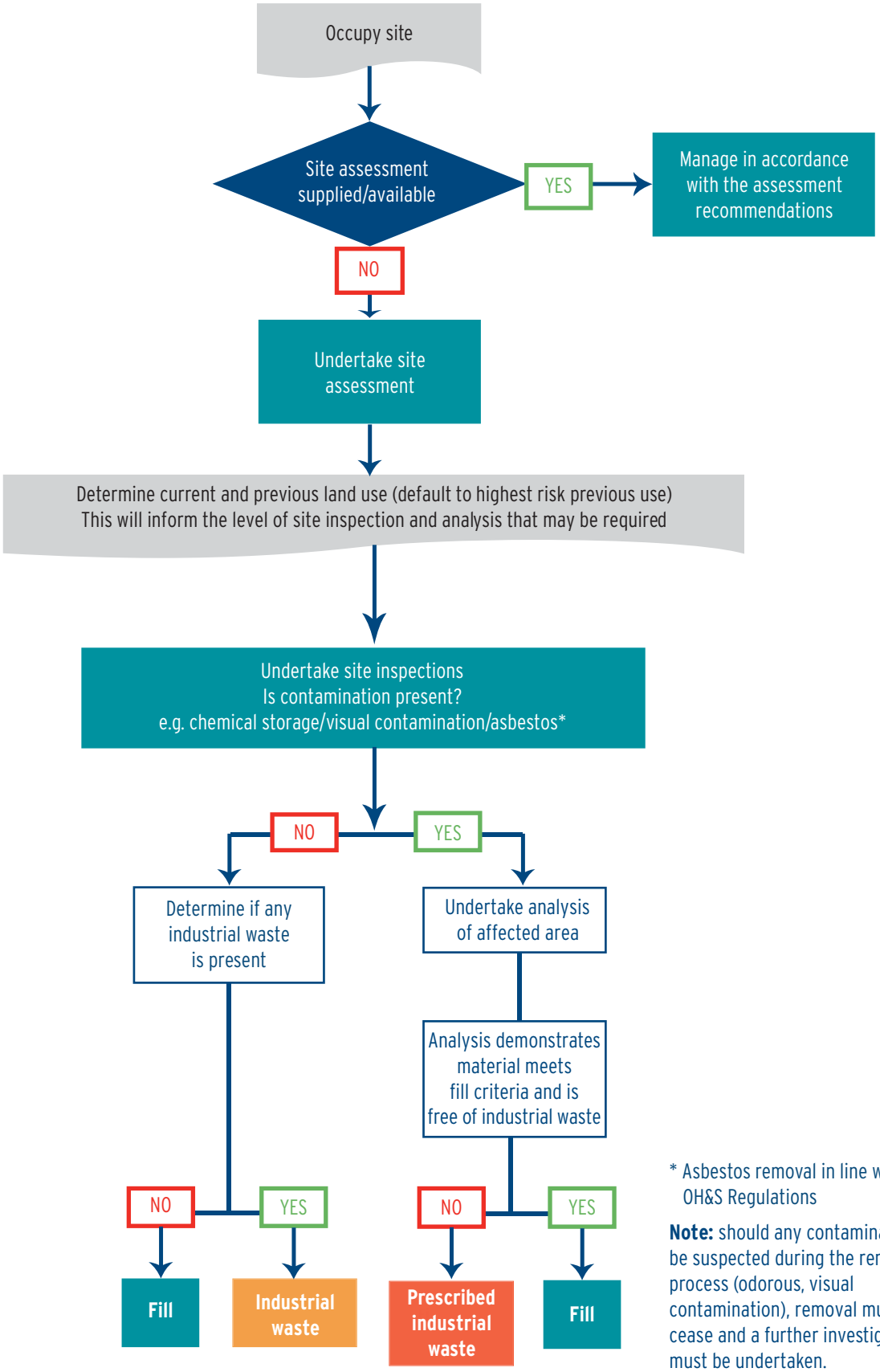
For example, farmland that has had sheep dips may lead to an area of high risk in an otherwise low-risk site.

Industrial waste

Fact sheet
February 2012

Site investigation flow chart

Site assessment



* Asbestos removal in line with OH&S Regulations

Note: should any contamination be suspected during the removal process (odorous, visual contamination), removal must cease and a further investigation must be undertaken.



Industrial waste

Fact sheet

EPA VICTORIA

State Government Victoria

2 Fill material management

PUBLICATION 1438
FEBRUARY 2012

Authorised and published by
EPA Victoria, 200 Victoria Street, Carlton.

Fill material is generated from large and small construction and demolition projects and during home renovations.

Surplus or waste soil is often referred to as 'clean fill' by industry.

Fill material is:

- any soils (including clay, silt, and/or sand) from which any industrial waste has been removed as far as is practicable
- any soils that have chemical contamination levels below the fill material criteria specified in **Soil hazard categorisation and management** (EPA publication IWRG621 in IWRG section 6).

Note: Soil with any elevated level of metals (such as arsenic) or other constituents that can be demonstrated to be of natural origin would also be considered fill material. It is important that their use is considered to ensure that the receiving environment is not affected.

Fill material is generally sourced from soil mixtures that lie beneath the 'topsoil' layer where there is little organic matter. It is important that organic matter is screened from fill material as, when it decomposes, it can create voids within the fill that can result in damage to structures when the land subsides underneath.

Decomposition of organic matter can also lead to the generation of landfill gases. Fill materials are not assessed or managed for landfill gas; therefore, it is important that organic matter is not included in fill material.

EPA would not consider incidental grasses removed as part of soil or silt excavation remedial works to be industrial waste. However, cut grass from mowing/clearing operations is not fill material by any definition.

Historical fill material deposited at sites that are to be excavated may not meet the EPA requirements for fill material without the removal of industrial waste items such as brick and tiles. If the profile shows that there is a mix of industrial waste, this waste may require segregation of the industrial waste, or be directed to landfill for disposal.

Historic fill may also have chemical contamination greater than the fill material criteria. This fill must be sent for treatment to destroy or remove the chemical contamination or be sent to landfill for disposal.



GENERATOR (SITE OCCUPIER) RESPONSIBILITIES

- Ensure that the fill material is not contaminated.
- Identify an appropriately approved receiving facility for the soils.
- Provide evidence to the receiving facility of the soil characterisation (e.g. site assessment).
- Keep accurate records of soil removed from site and details of the receiving facility.

FILL MATERIAL AND EPA

EPA does not regulate the use of fill material, but the *Environment Protection Act 1970* requires the generator to prevent adverse impacts on the receiving 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.

The information provided in these fact sheets is intended as general guidance only and must not be relied upon solely as a basis for understanding legislative requirements.

Industrial waste

Fact sheet
February 2012

Fill material management

Responsibilities of transporters

- Ensure that vehicles are in good condition and soil cannot leak during transport.
- Use tarp systems, or similar controls, to prevent dust escaping during transport.
- Keep records of soil movements.

Responsibilities of receiving facilities

- Ensure that appropriate approvals are in place to operate the site.
- Receivers should refuse any material until they are satisfied that the material meets their acceptance criteria.
- Ensure a copy of the site assessment documentation and any associated sampling is received before it is accepted.
- Receivers should inspect the load of soil before accepting it. If contamination is suspected (e.g. wastes are mixed in the load or an odour is detected), do not accept it.

Receiving facility site management

Sites receiving fill material should have a management plan in place to ensure soil receipt procedures are properly implemented and the site does not become contaminated.

A management plan for a clean fill site may include the following.

- pre-receipt procedures for soil, which includes assessment and/or analysis that provides evidence fill material is clean.
- staff training requirements.
- load inspection procedure.
- non-conforming load procedure.
- topsoil management.
- drainage and erosion control.
- community engagement (where appropriate).
- monitoring and maintenance.
- site security (to prevent unauthorised access).
- noise and dust-mitigation procedures.





Poor upper profile – not fill material

FAST FACTS

Historically, fill has included materials other than just soils.

Refer to Fact Sheet 1440 Engineered/Structural Fill to ensure that you understand your responsibilities in this area.



Industrial waste

Fact sheet

EPA VICTORIA

State Government Victoria

3 Segregation

PUBLICATION 1439
FEBRUARY 2012

Authorised and published by
EPA Victoria, 200 Victoria Street, Carlton.

Fill material is only those soils (including clay, silt, and/or sand) from which industrial waste has been removed as far as is practicable, and that have chemical contamination levels below the fill material criteria specified in EPA's **Soil hazard categorisation and management** (publication IWRG621 in IWRG section 6).

EPA understands that it is not always possible to segregate or screen soils from other wastes at the point of generation; however, this is the preferred option.

Sorting may occur at other locations, such as transfer stations and 'clean fill sites', but planning approvals from councils may be required and it is the operator's responsibility to check this requirement.

Segregation and screening maximises the use of soil as fill material, as well as the recovery of industrial wastes that may be processed and used as engineered fill.

In order to achieve the segregation of industrial waste from soil required for materials to be used as fill material, EPA recommends the use of a vibrating screen or trommel.

Segregation of the industrial waste from the soil is not considered a treatment to remove or destroy chemical contamination.

Segregation of industrial waste from contaminated soils (category A, B or C) at a site other than the site of generation will require approval from EPA.



Use of a vibrating screen or trammel is recommended for segregation

It is common for excavated soils generated by construction and demolition activities to be mixed with industrial wastes such as bricks, rubble and concrete.

This mixture must not be used as fill material until the industrial wastes are screened from the soil and the soil assessed for contamination.

The information provided in these fact sheets is intended as general guidance only and must not be relied upon solely as a basis for understanding legislative requirements.

Industrial waste

Fact sheet
February 2012

Segregation

Unsuitable fill material and management options

The table below lists waste materials that must not be deposited as fill material and provides some information on possible management options.

Fill material MUST NOT contain:	Management options
Industrial wastes such as concrete, brick, asphalt, pipe, plastics, metal or wood.	These wastes must be screened from soil to maximise the reuse and recovery potential of these materials. Industrial wastes that are free from contamination may be used as an engineered fill.
Organic matter.	Soils that contain quantities of organic matter are unsuitable to be used as fill, as decomposition of the organic matter can create voids and depressions within deposited material. Landfill gas generation must also be considered. Organic matter must be removed as far as practicable and may be used at appropriately licensed composting facilities.
Municipal/domestic waste.	Must be disposed of at licensed facilities.
Soil and water mixtures (slurries), e.g. produced from hydro-excavation activities.	When slurry mixtures cannot be deposited in the area from where they were excavated, they must be dewatered to separate the liquid component from the soil. Soil may be used as fill material when the site assessment or sampling and analysis (if applicable) determine it to meet the fill material criteria. The liquid portion may be reused in accordance with EPA publication **Industrial water reuse** (IWRG632) or managed as trade waste under a water authority agreement.
Asbestos or asbestos-contaminated soil.	Soil that contains asbestos need to be managed in accordance with WorkSafe OHS regulations and EPA's **Asbestos transport and disposal** (publication IWRG611 in IWRG section 6.1).
Soil with contaminant levels greater than fill material thresholds.	Soils categorised as prescribed industrial waste must not be used as fill material. Depending on the level and nature of the contamination, soil must be treated to destroy or remove the contaminants at an appropriately licensed facility, so that it may be used as fill material. If treatment is not possible, then disposal to a licensed landfill would be appropriate.
Category A, B, or C prescribed industrial waste.	This waste must be taken to a licensed facility for treatment or disposal.
Acid sulfate soil or rock.	Acid sulfate soils must be managed in accordance with EPA publication **Acid sulfate soil and rock** (publication 655.1 in IWRG section 6.2).



FAST FACTS

EPA acknowledges that the screened fines from processing have historically been used in various applications.

EPA will work with this industry sector to provide further guidance on this material.



Industrial waste

Fact sheet

EPA VICTORIA

State Government Victoria

4 Engineered/ structural fill

PUBLICATION 1440
FEBRUARY 2012

Authorised and published by
EPA Victoria, 200 Victoria Street, Carlton.

The use of soils or industrial wastes as engineered/structural fill is a positive outcome of the waste management hierarchy providing that the use is appropriate and takes account of the environmental and engineering issues as required.

This fact sheet provides information on the reuse and recycling of industrial wastes that have been demonstrated to be free from contamination. Those wanting to reuse industrial wastes should follow the practices outlined in these fact sheets to understand the distinction between the inappropriate disposal of industrial waste and appropriate reuse.

It is acceptable to use industrial wastes as engineered fill where it can be processed into products that are fit for purpose, of a consistent quality and that can be used as substitutes for new quarried materials.

These materials can be processed and reused when they meet a particular engineered specification. Acceptable specifications would include those produced by VicRoads or an individual specification that might be performance-based and can be assessed against an engineered standard.

Industrial wastes must not be stored or stockpiled for future processing and reuse as an engineered material without a clear understanding of the future need for their use.

It is the responsibility of the producer and user to ensure that the engineered fill meets the required specification and is geotechnically sound for the intended use.

When these materials are not reused appropriately, they remain industrial wastes and depositing these materials at sites that are not licensed to receive them is an industrial waste dumping offence under the *Environment Protection Act (1970)*.



RESPONSIBILITIES FOR PROCESSING OR USING ENGINEERED FILL

- ❑ Identification of an immediate market or clearly specified future use.
- ❑ Risk-based approach – risk has been assessed (including destination site).
- ❑ Need has been demonstrated.
- ❑ Process does not involve dilution.
- ❑ Materials are not contaminated.
- ❑ Specification is known, consistent and fit for purpose.
- ❑ Relevant engineering plans, specifications and reports have been produced.
- ❑ Details of source, destination and relevant stakeholders are known and records kept.
- ❑ Assured avoidance or minimised risk of harm to the environment or human health.
- ❑ Materials produced are assessed against the specification.

The information provided in these fact sheets is intended as general guidance only and must not be relied upon solely as a basis for understanding legislative requirements.

Industrial waste

Fact sheet
February 2012

Engineered/structural fill

Industrial wastes are listed in the *Environment Protection (Industrial Waste Resource) Regulations 2009*.

Those that are most suitable to be used as engineered fill are included below.

- biosolids managed in accordance with specifications acceptable to the Authority
- bitumen or asphalt
- brick
- cardboard
- concrete
- formed metal components
- glass fines

Note: It is important that each of these materials be assessed for its use in engineered fill as it may not be fit for the purpose.

FAST FACTS

Specifications should be in place to demonstrate material is appropriate as engineered fill.

There should be a demonstrated need for materials stockpiled on site.

Any engineered/structural applications should be assessed and managed by experienced and competent personnel.

If materials are used in a temporary capacity, they may need to be removed after they are no longer required.



Industrial waste

Fact sheet

EPA VICTORIA

State Government Victoria

5 Haul road construction

PUBLICATION 1441
FEBRUARY 2012

Authorised and published by
EPA Victoria, 200 Victoria Street, Carlton.

Certain permitted industrial wastes may be used in the construction of temporary haul roads when it can be demonstrated that there is a need for one.

These roads are often constructed within landfills and fill material sites to provide access for haulage of plant, equipment and/or materials onto the site or part of the site. Haul roads are often relocated across the site to provide access to new areas to be filled and must be kept to the minimum required to safely operate the delivery plant and equipment.

The temporary nature of these roads means that the requirements on their construction are less stringent than for a permanent road. However, the road must meet a design specification that demonstrates that it is fit for purpose.

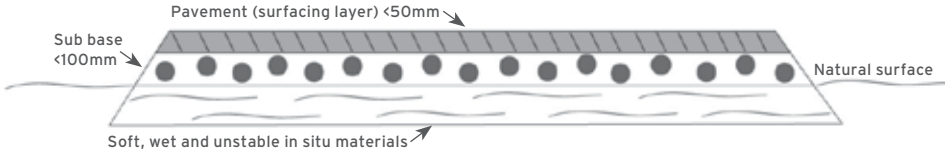
When the road is no longer required the materials used to construct the temporary haul road **must be removed** prior to the area being filled or used for other purposes.

Haul road construction should be completed to ensure the avoidance or minimisation of risk of harm to the environment or human health.

Construction requirements

- The haul road pavement (surface level) materials should have a maximum particle size not greater than 50 mm.
- Soil, broken rock, broken concrete, bricks, processed concrete and/or brick particles are permitted to be placed in temporary haul road formations, provided that no materials have a maximum particle dimension greater than 100 mm.
- Broken rock, broken concrete, bricks, processed concrete and/or brick particles may be used to mechanically stabilise soft, wet and unstable in-situ areas below the temporary road formation, provided that all materials have maximum particle dimensions no greater than 100 mm and that the particles can be fully embedded into the underlying material by compaction.

Haul road cross-section





Haul roads help avoid or minimise the risk of harm to the environment or human health

CHECKLIST FOR CONSTRUCTING A TEMPORARY HAUL ROAD

- ❑ The need for a temporary road has been demonstrated.
- ❑ Plans, specifications and reports have been produced.
- ❑ Details of the materials source(s) are provided.
- ❑ Materials to be used are not contaminated, are able to be assessed against the specification and are consistent and fit for purpose.
- ❑ The quantity of material to construct temporary roads is limited to that quantity required for construction.
- ❑ Stockpiling of material for future use is only permitted when the future use is clearly defined.
- ❑ Surplus materials to those required for temporary road construction must be removed from site.
- ❑ On completion of the use of a haul road, the formation and pavement materials containing industrial wastes must be removed from the site. The materials may be reused for another temporary road, provided they meet the requirements of this fact sheet.

The information provided in these fact sheets is intended as general guidance only and must not be relied upon solely as a basis for understanding legislative requirements.



Industrial waste

Fact sheet

EPA VICTORIA

State Government Victoria

6 Legal definitions

These definitions have been taken from the *Environment Protection Act 1970*, and associated Regulations and guidelines.

PUBLICATION 1442
FEBRUARY 2012

Authorised and published by
EPA Victoria, 200 Victoria Street, Carlton.

Waste

Includes:

- any matter whether solid, liquid, gaseous or radioactive which is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment
- any greenhouse gas substance emitted or discharged into the environment
- **any discarded, rejected, unwanted, surplus or abandoned matter**
- **any otherwise discarded, rejected, abandoned, unwanted or surplus matter intended for –**
  - **recycling, reprocessing, recovery or purification by a separate operation from that which produced the matter**
  - **sale**
- any matter prescribed to be waste.

Industrial waste

Includes:

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

Industrial wastes *(Schedule 1 Industrial Waste Resource Regulations)*

- biosolids managed in accordance with specifications
- bitumen or asphalt
- brick
- cardboard
- commercial food waste
- concrete
- formed metal components
- glass
- green waste
- industrial waste water managed in accordance with specifications acceptable to the Authority
- paper
- plastic
- textiles
- timber.

Fill material

Consists of soil (being clay, silt and/or sand), gravel and rock of naturally occurring materials and soil, when:

- an assessment will demonstrate that the material is not contaminated or
- contaminant levels are below those specified in IWRG **Soil hazard categorisation and management** or



This fact sheet highlights the key terms that relate to the management of industrial waste and soils.

EPA has purposely not used or referenced these definitions directly in the fact sheets.

These legal definitions are provided to put information in the fact sheets into context.

It is the intention that by providing these legal definitions that operators gain an understanding of the messaging within these guidance fact sheets.

The information provided in these fact sheets is intended as general guidance only and must not be relied upon solely as a basis for understanding legislative requirements.

Industrial waste

Fact sheet
February 2012

Definitions

- any elevated level of metals (such as arsenic) or other constituents that 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, they can be classified as fill material.



Occupier

In relation to any premises, includes a person who is in occupation or control of the premises, whether or not that person is the owner of the premises and, in relation to premises different parts of which are occupied by different persons, means the respective persons in occupation or control of each part.

Permit

A permit to transport prescribed waste or prescribed industrial waste issued under Part IXA.

Waste management facility

Includes a landfill, a transfer station, a composting facility, a facility to store or contain solid waste and a material recovery facility.

Industrial Waste Resource Guidelines

The 'Industrial Waste Resource Guidelines' published on the EPA website and as modified from time to time.

Prescribed industrial waste

Any industrial waste or mixture containing industrial waste other than industrial waste or a mixture containing industrial waste that–

(a) is a Schedule 1 industrial waste in the Environment Protection (Industrial Waste Resource) Regulation 2009 ; or

(b) has a direct beneficial reuse and has been consigned for use; or

(c) is exempt material; or

(d) is not category A waste, category B waste or category C waste.

Prescribed industrial waste producer

An occupier of premises from which prescribed industrial waste is produced and–

(a) disposed of on the premises; or

(b) transported from the premises, other than through a sewer.

Schedule 1 industrial waste

A waste or mixture of wastes listed in Schedule 1 of the *Industrial Waste Resource Regulations 2009*.

Secondary beneficial reuse

Use as an input or raw material substitute in a commercial, industrial, trade or laboratory activity following any form of treatment or reprocessing.

Soil thresholds

The table titled 'Soil hazard categorisation thresholds' in the Industrial Waste Guidelines.

Solid industrial waste thresholds

The table titled 'Solid industrial waste hazard categorisation thresholds' in the Industrial Waste Guidelines.