

Improved Landfill Management

Site Selection, Planning and Approvals

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Landfill Site Selection

- Appropriate siting is the primary environmental control
- Preliminary investigation of possible sites to identify those with the best potential for development with minimum risk to the environment
- More suitable sites require fewer engineering and management controls
- Rank sites in preference order

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Landfill Site Selection

- Screen potential sites
- Extractive industry sites (quarries, mines)
- Sites suitable for trench and fill or mound landfills
- Consider type of landfill:

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Types of Landfill

Class	Name	Premises	Liner	Waste
I	Inert	Category 63	Unlined	Inert
II	Putrescible	Category 64 or 89	Unlined	Putrescible and inert
III	Putrescible	Category 64	Lined (may collect leachate)	Putrescible and inert
IV	Secure	Category 65	Double lined with leachate collection	Contaminated soils, sludges and encapsulated waste
V	Intractable	Category 66		Toxic, difficult to dispose of or treat

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Aspects to consider

- Community needs
- Landfill type
- Groundwater
- Alternative potential uses for the site
- Buffer distances
- Geology
- Flora and fauna
- Infrastructure
- Surface water
- Land ownership

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Landfill Types

- Area method, where an existing hole such as a former quarry is filled - preferred
- Trench-and-fill method, where a hole is dug and backfilled with waste using the excavated material as cover - alternative
- Mound method, where most of the landfill is located above the natural ground level - avoid
- Valley or change of topography fill method, where a natural depression is filled - avoid

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Area method landfill



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Trench and fill method

- Trench filled, compacted and covered periodically



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Cairns Regional Landfill



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Mound landfill

- Sydney Olympic Park



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Groundwater

- Leachate contamination of groundwater difficult to remediate
- Avoid areas where groundwater is beneficially used
- Landfill should not be below water table
- Preferably >2 metres above water table
- Naturally attenuating clay soils preferred

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Consider alternative uses

- Other land use than landfill may be preferable
- Potential for utilisation and rehabilitation of former extractive industry sites



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Buffers

- To manage odours and landfill gas risks
- Fire, noise, litter, safety
- Consider possible future zoning changes of surrounding land during likely life of landfill
- Consider buildings and structures

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Buffers

- Maintain appropriate buffer distances to sensitive receptors:
- Not suitable in drinking water source areas
- Separation from water table (2-3 metres minimum)
- Class II/III landfills not within 100 metres of surface waters or in 1 in 100 year ARI flood plains
- At least 700 metres downgradient of groundwater bores
- Suitable buffers from building or structures (200-500 metres)
- Suitable buffers from airfields (1.5-3.0 kilometres)

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Geological setting

- Require stable landform
- Long term integrity of liner and cap
- Avoid faulted and earthquake prone areas
- Consider slope stability
- Avoid Karst (limestone) areas
- Avoid shrink-swell clays

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Other considerations

- Flora and fauna
- Infrastructure availability; road, rail access, traffic, power, water
- >100 metres from surface waters
- Avoid >1%AEP (1 in 100 year) flood areas
- Land ownership
- Community engagement

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Approval

Requires:

- Best practice design
- Best practice operation
- Best practice rehabilitation and aftercare

- Planning and approval takes a long time
- Is costly
- A diminishing number of sites are approved

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Swanbank landfill, QLD – former coalmine



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NIMBY - Protesters

- No tip near Arthur's Seat, VIC



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