



SPREP
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FACTSHEET

Costs Associated with the Design, Construction, and Operation of a Landfill Cell in Pacific Island Countries



To adequately manage Asbestos Containing Materials (ACM) in local landfills in the Pacific, very specific activities are required to ensure the safety of the local community and environment. Management of ACM requires controls for its collection, handling, and disposal; to meet accepted international health and environmental requirements.

A PESTLE assessment of ACM management options has found that local landfilling is the most appropriate option, and that there are two practical ways to landfill ACM in the Pacific context:

ACM Waste Cell

A separate landfill cell is developed for ACM waste. As asbestos is a natural mineral and does not break down, this is only a containment measure to ensure zero fibre release. It is not necessary to have an expensive plastic liner system although the base of the cell should be lined with inert material (such as clay) and compacted. The cell should be permanently capped.

Co-disposal

ACM waste is mixed with other waste in the landfill. This approach can be used if landfill space is limited, good landfill management practices are used, and little cover material is available. The ACM waste is placed in the landfill with other waste, ensuring the waste containment is not compromised and the ACM waste is well covered (at least 300mm) by other waste. Any compaction should avoid disturbing the waste covering the ACM.



Cost Components of Developing a Landfill Cell

Nauru Scenario



Site Selection and Construction

Landfilling of ACM requires the landfill to be at least 1m above groundwater and free from erosion due to storms and seawater intrusion.

Indicative cost estimates for a dedicated ACM landfill Cell

Main Activity	Description	Estimated Cost (USD)
Site Selection	Specialist consultant to be engaged (estimate of 30 days at US\$600/day).	\$18,000
	Staff engagement, meetings, contract management, review, etc.	\$10,000
	Stakeholder engagement	~\$24,000
Site Selection Indicative Costs		~\$50,000
Landfill Cell Construction	<p>Estimate of the amount of ACM to be managed in Nauru (dictates the size of landfill cell needed).</p> <ul style="list-style-type: none"> Estimated 2,120 tonnes of asbestos containing materials, which converts to 3,030 m³. Estimated 300 m³ of asbestos contaminated soils. <p>TOTAL volume for disposal = 3,330m³</p>	
	<p>Estimated Earthworks costs</p> <p>Based on standard industry rates of US\$40/m³ for the costs associated with an excavator, trucks, etc. to undertake the works.</p> <p>To effectively manage the estimated ACM and contaminated soil, five cells, each 15m x 15m x 3m would be required (total of 3,375m³) assuming filled at one time and no intermediate cover was required.</p> <p>Cells to be capped in concrete to manage moisture ingress, and ensure the ACM is not disturbed in the future.</p>	<p>Excavation Costs \$135,000</p> <p>Concrete capping costs \$200,000</p> <p><i>The above calculations suggest construction and closure costs are roughly US\$100/m³ or US\$140/tonne</i></p>
Landfill Cell Lining	As asbestos is not a significant water pollutant, it is considered unnecessary to line the cells. The cost does, however, include compaction of the base, including using clay for the compaction if it is available.	Not included in the calculation.
Landfill Construction & Capping Indicative Costs		~\$335,000
Operating Costs	<p>This will vary considerably depending on quantities and how often ACM is buried. The components of the operating costs are:</p> <ul style="list-style-type: none"> Labour costs (including site management and operational machinery) Staff training Personal Protective Equipment (PPE) Cover material (the ACM waste should be covered after each placement) Machinery costs (excavator / loader) 	<p>It is estimated for Nauru that the operation of the landfill cells would be US\$50,000 for a 10-year period, assuming the disposal of 333 m³/yr.</p> <p>US\$150/m³/yr (US\$215/tonne)</p>
Operating Indicative Costs		~\$50,000
Indicative Total Costs for a Dedicated ACM Cell		~\$435,000

Costs of managing a co-landfill process will be less as site selection work would not be necessary. Consultation and local approvals may be required, construction costs would be unnecessary and operating costs would be included in existing operational budgets.