



Waste policy options CBA

Options for adjusting ETS obligations for remediation of sites that have had verified HAIL activities taking place on them
Final Report

17 April 2026
Commercial In Confidence



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Preface

This report has been prepared for the Ministry for the Environment by Chelsea Steen-Jones and Stephen Knuckey from MartinJenkins (Martin, Jenkins & Associates Ltd).

For over 30 years MartinJenkins has been a trusted adviser to clients in the government, private, and non-profit sectors in Aotearoa New Zealand and internationally. Our services include organisational performance, employment relations, financial and economic analysis, economic development, research and evaluation, data analytics, engagement, and public policy and regulatory systems.

We are recognised as experts in the business of government. We have worked for a wide range of public-sector organisations from both central and local government, and we also advise business and non-profit clients on engaging with government.

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Established in 1993, we are a privately owned New Zealand limited liability company, with offices in Wellington and Auckland. Our firm is governed by a Board made up of Executive Partners and Independent Directors. Our Independent Directors are Jenn Bestwick and Chair David Prentice. Our Executive Partners are Sarah Baddeley, Nick Carlaw, Allana Coulon, Nick Davis, and Richard Tait. Michael Mills is also a non-shareholding Partner of our firm.

Summary

Under the current system, material disposed to landfill from remediated sites on which verified Hazardous Activities and Industries List activities have taken place incur the same ETS liability as new waste

Around New Zealand, there are instances when material that is decades old is relocated to a landfill, specifically in the case where councils need to remediate historic illegal dumping sites on the Hazardous Activities and Industries List (HAIL). Although this material is degraded, it is subject to being included in the landfill's Annual Emissions Return as if the material was new and requires New Zealand Units (NZUs) to be surrendered at a significant cost. In these instances, the NZ ETS puts at risk environmentally responsible remediation decisions, as forfeiting the cost of NZUs on top of remediation costs may make this work unfeasible for councils.

The Ministry for the Environment (MfE) has identified four options to respond to this, as shown in Table 1.

Table 1: Policy options being considered

Option	Description
Option 1	Status quo: existing ETS exemption applies for emissions derived from waste removed from closed landfills. All other waste emissions from remediated sites that have had HAIL activities take place on them are not covered by this exemption. Any future exemption applications must be done on a case-by-case basis through the existing legislative process
Option 2	ETS exemption for material disposed to landfill from sites that have had verified HAIL activities take place on them
Option 3	Authority to approve case-by-case exemptions
Option 4	Encourage compositional UEF use by landfill operators

Source: Ministry for the Environment

MartinJenkins has been commissioned to undertake cost-benefit analysis for these options, identifying where costs will fall, summarising the types of benefits expected, and indicating whether the overall impact on the economy, environment, and social wellbeing will be positive or negative.

Cost-benefit analysis suggests that Option 2 is the best solution

The largest benefit comes from sites that have had verified HAIL activities take place on them being remediated and land becoming both available and safe for public use. Any option that removes a cost barrier to taking action to remediate sites that have had verified HAIL activities take place on them will likely generate a net positive impact. Removing administrative complexities by having a blanket exemption has the advantage of providing councils certainty of the associated costs when planning a site remediation, where a case-by-case exemption may take more administration than planned or could end with an exemption application being declined, and a unique emission factor (UEF) has both an upfront measurement cost and a possible NZU cost (lower than the default rate).

Option 3 could be used in combination with Option 2 to provide a pathway for material from post-1991 sites on which a verified HAIL activity took place, or in other circumstances where the blanket assumption does not apply.

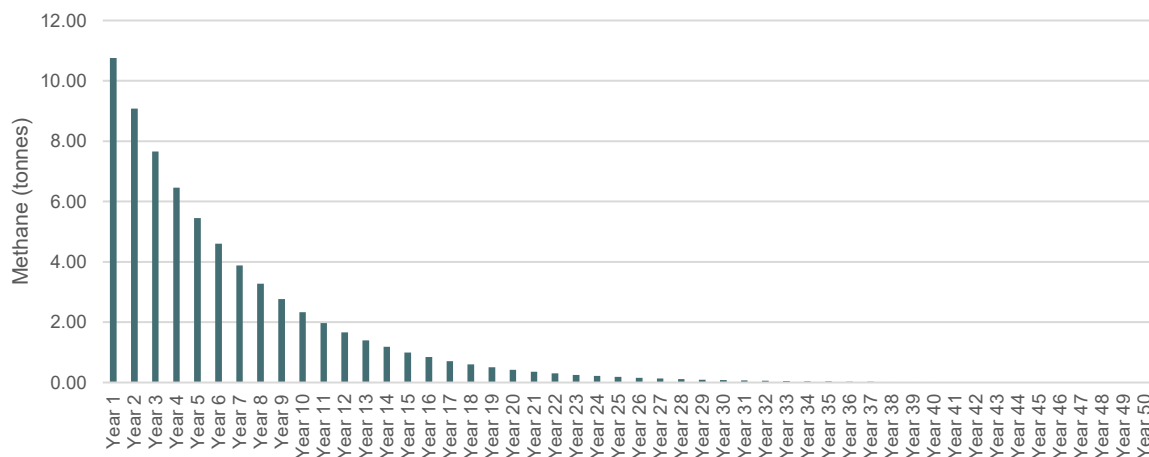
About this report

Background

When waste is landfilled, it is subject to the New Zealand Emissions Trading Scheme (NZ ETS) where NZUs need to be forfeited based on the volume of waste received. The calculated emissions per tonne of waste depends on if the facility is using the default emissions factor (DEF) of 1.023 or a unique emission factor specific to a participant or activity based on waste composition sampling.¹ Using the DEF, a tonne of waste requires 1.023 New Zealand Units (NZUs) be surrendered, costing \$72.63 (at the 2026 auction floor price of \$71).

Landfilled waste is subject to the NZ ETS because landfills are significant, measurable sources of methane emissions, and pricing those emissions creates incentives to reduce organic waste going to landfill, capture and destroy landfill gas, and shift behaviour across the system in a cost-effective way. However, the system assumes that all waste going to landfill is new waste which produces significant emissions over the first 20 years.

Figure 1: Methane emissions over time for one tonne of waste



Source: Applying the theoretical first order decay method using [IPCC guidelines](#) (Equation 3)

This issue is distinct from the relocation of waste from closed landfills (where exemptions already exist under clause 13B of the Climate Change (General Exemptions) Order 2009). The analysis in this report focuses on waste and material from historic contaminated sites that have had verified HAIL activities take place on them and that are not currently covered by such exemptions, which creates a gap in the ETS framework.

Precedents and Policy Context

Waitaki District Council remediation of material from sites on which HAIL-verified activities took place (2024)

In 2024, Waitaki District Council undertook the remediation of two historic illegal dumping sites on Beach Road (illegal dumping is an activity listed under the HAIL), which had been used between the 1950s and 1970s. The sites were threatened by coastal erosion, with waste visibly washing into the ocean. The remediation involved the removal of approximately 20,000 tonnes of degraded waste to the Palmerston Landfill. Under current NZ ETS settings, the Council faced an emissions liability of approximately NZ\$1.39 million (20,000 NZUs at 1.023 NZUs per tonne and an auction floor price of \$68 per tonne), despite the waste being over 50 years old and having negligible remaining methane potential. A one-off exemption was granted in May 2025 under section 60 of the Climate Change Response Act 2002. This case highlights the financial barriers posed by the status quo, as well as the inefficiency of relying on one-off exemptions – in this case the exemption required multiple Cabinet approvals and a regulatory amendment via public consultation, a lengthy process for a single site.

Fox Glacier Landfill Exemption (2019)

In 2019, flooding of the Fox River exposed approximately 750 tonnes of waste from the closed Fox Glacier landfill. The Government granted a section 60 exemption to the receiving landfill operator, recognising that the waste had minimal remaining emissions potential. This event led to the creation of a general exemption for redispersed waste from closed landfills under clause 13B of the Climate Change (General Exemptions) Order 2009. However, this exemption does not extend to contaminated material from sites on which a verified HAIL activity took place and that were never formal landfills, leaving a regulatory gap.

Government Policy and Funding Context

The Government has prioritised the remediation of contaminated and hazardous sites, recognising the increasing risks posed by climate change and land-use change. Funding mechanisms such as the Contaminated Sites and Vulnerable Landfills Fund (CSVLF) and the Waste Levy Waiver have been expanded to support remediation efforts. However, ETS liabilities can significantly offset or exceed available funding, undermining the effectiveness of these initiatives. Addressing ETS-related costs is thus critical to enabling timely and environmentally responsible remediation.

Scope of work

MartinJenkins was commissioned by MfE to undertake cost-benefit analysis for the four options identified by MfE. This includes a high-level assessment of the resourcing needed for each option, and an indicator of the benefits and disbenefits.

CBA approach

The cost-benefit analysis has been undertaken using a proportionate, high-level approach, consistent with the purpose of supporting consultation and early policy design rather than detailed implementation planning.

For each option, the analysis followed four main steps:

1. **Option definition and outcomes**

Each option was clearly defined, including its intended policy mechanism and expected outcomes. This provided a consistent basis for identifying relevant costs and benefits.

2. **Cost assessment**

Costs were estimated for government, facility operators, councils, businesses, and communities where applicable. Estimates are high-level and reflect:

- a. capital expenditure (for example, monitoring equipment for UEF)
- b. ongoing operating and compliance costs
- c. administrative and regulatory costs.

3. **Benefit assessment**

Benefits were identified and, where possible, quantified. These include:

- a. economic impacts
- b. environmental impacts
- c. social and wellbeing impacts where relevant.

4. **Impact summary and metrics**

Results are presented using:

- a. net present value (NPV) for estimated benefits and costs
- b. benefit-cost ratios (BCRs) over a 10-year and 25-year period.

All monetary values are expressed in real terms and discounted using standard rate of 2% (with sensitivity testing done at 8% discounting). Results should be interpreted as indicative, rather than precise forecasts.

List of options

The Ministry for the Environment (MfE) has identified four options.

- **Option 1: Status quo.** All waste and material that enters a landfill is considered new waste and is therefore subject to emissions charges regardless of its composition or age. An exemption exists for ETS costs from waste originating from closed landfills.

- **Option 2: ETS exemption for material disposed to landfill from sites that have had verified HAIL activities take place on them.** Exempts landfill operators from ETS costs for all material disposed at a landfill facility that was removed during the remediation of a site that has had verified HAIL activities take place on it, provided the HAIL activity occurred before 1991.
- **Option 3: Authority to approve case-by-case exemptions.** A process by which landfill operators can apply for an exemption from ETS costs on material removed during the remediation of a site that has had verified HAIL activities take place on it, on which the HAIL activity continued after 1991.
- **Option 4: Encourage compositional UEF use by landfill operators.** Landfill operators can apply for a waste composition Unique Emissions Factor which more accurately accounts for organic waste emissions.

CBA results

Overview

Table 2: Option cost-benefit analysis summary – scenarios

		Benefits	Costs	BCR
10-years, 2% discounting				
1	Status quo: existing ETS exemption applies for emissions derived from waste removed from closed landfills. All other waste emissions from remediated sites that have had HAIL activities take place on them are not covered by this exemption. Any future exemption applications must be done on a case-by-case basis through the existing legislative process	\$0.354m	\$0.982m	0.36
2	ETS exemption for material disposed to landfill from historic contaminated sites that have had verified HAIL activities take place on them	\$3.865m	\$0.972m	3.98
3	Authority to approve case-by-case exemptions	\$3.006m	\$2.573m	1.17
4	Encourage compositional UEF use by landfill operators	\$1.567m	\$1.160m	1.35
25-years, 2% discounting				
1	Status quo: existing ETS exemption applies for emissions derived from waste removed from closed landfills. All other waste emissions from remediated sites that have had HAIL activities take place on them are not covered by this exemption. Any future exemption applications must be done on a case-by-case basis through the existing legislative process	\$0.821m	\$1.930m	0.43
2	ETS exemption for material from historic contaminated sites that have had verified HAIL activities take place on them	\$8.063m	\$1.078m	7.48
3	Authority to approve case-by-case exemptions	\$6.271m	\$4.786m	1.31
4	Encourage compositional UEF use by landfill operators	\$3.433m	\$1.792m	1.92

		Benefits	Costs	BCR
25-years, 8% discounting				
1	Status quo: existing ETS exemption applies for emissions derived from waste removed from closed landfills. All other waste emissions from remediated sites that have had HAIL activities take place on them are not covered by this exemption. Any future exemption applications must be done on a case-by-case basis through the existing legislative process	\$0.431m	\$1.124m	0.38
2	ETS exemption for material disposed to landfill from sites that have had verified HAIL activities take place on them	\$4.523m	\$0.940m	4.81
3	Authority to approve case-by-case exemptions	\$3.518m	\$2.890m	1.22
4	Encourage compositional UEF use by landfill operators	\$1.868m	\$1.227m	1.52
25-years, 2% discounting, 5,000 tonnes per site (vs base case: 1,000 tonnes)				
1	Status quo: existing ETS exemption applies for emissions derived from waste removed from closed landfills. All other waste emissions from remediated sites that have had HAIL activities take place on them are not covered by this exemption. Any future exemption applications must be done on a case-by-case basis through the existing legislative process	\$0.821m	\$2.623m	0.31
2	ETS exemption for material disposed to landfill from sites that have had verified HAIL activities take place on them	\$10.771m	\$4.607m	2.34
3	Authority to approve case-by-case exemptions	\$8.378m	\$7.531m	1.11
4	Encourage compositional UEF use by landfill operators	\$34.035m	\$3.963m	1.02

Source: Assumptions set out for each option below.

Notes

- 1 Cost estimates include amounts paid by landfill operators that would be passed onto rate payers.

Estimating costs and benefits

We need to make assumptions on the reach, scale, and impact of each option in order to quantify results. The following assumptions are used to illustrate the possible costs and benefits across options:

- **There are ten sites impacted by this policy.** This is a hypothetical assumption that lets us test the scale of impacts, noting options will have different success rates in incentivising councils to remediate material.

- **The number of sites that will remediate material under each policy varies.**
 - **Option 1: one site remediates and disposes material to landfill.** It is unlikely that any council would act under the current policy with the added ETS costs on top of the direct material remediation costs. However, we assume that at least one site will need material to be remediated due to an external factor (for example, flooding, landslips, or land scarcity for a key infrastructure project).
 - **Option 2: nine sites remediate and dispose material to landfill.** This option removes a considerable cost barrier, and paired with MFE funding contributions through the Contaminated Sites and Vulnerable Landfills (CSLV) fund, councils would choose to act. We assumed that even with contributory funding, there may be a council that cannot afford to take action, either from the financial cost being too high, or the opportunity cost of putting funding into remediating the site is high as there are more urgent priorities.
 - **Option 3: seven sites remediate and dispose material to landfill.** This option is assumed to have a slightly lower uptake than Option 2, as on top of the opportunity cost for council budgets, the process to submit a case for an exemption will require time and resources that carries a further opportunity cost. There is also the possibility the MFE rejects an application for an exemption.
 - **Option 4:** four sites remediate and dispose material to landfill.
- **Each site has 1,000 tonnes of material that needs to be remediated and disposed to landfill.** The Waitaki case shows that the actual amount of material could range from 60 to 20,000 tonnes. The analysis summary also shows results for a scenario with 5,000 tonnes assumed.
- **Remediating and disposing material costs \$100 per tonne.** The actual cost will vary based on the distance for transport and local costs for excavation, stockpiling, and loading into trucks. We have used a low-end estimate, as further costs we assume would be covered by the CSVLF (excluded from this analysis).
- **Landfills have capacity.** We have not assumed the cost of pressure put on landfills from receiving remediated material. In practice, receiving significant volumes of material may bring forward the need for a new facility once the current site is full.
- **All the sites that are to be remediated are done in FY2027.** In practice, remediation work across sites would be staggered, but under this hypothetical, we assumed ten sites currently need remediation work and there is no cause for delay if the policy settings are right.
- **NZUs are purchased at the 2027 auction floor price using the current DEF.** This means that 1.023 NZUs are surrendered per tonne of waste, and NZUs cost \$75 each as of next year.
- **Not remediating a site leads to a \$10,000 annual monitoring cost.** We assume that for sites that are known risks, but remediation work isn't going ahead, that councils will want to continue to monitor the environmental risk through regular soil sampling or land surveys (particularly where there is the threat of erosion).

- **Options 3 and 4 have further implementation costs.** Option 2 is assumed to require no additional dedicated staff, as implementation can be managed within existing MfE resources. Option 3 is assumed to need an ongoing FTE for setting the exemption process and guidelines, plus assessing future exemption applications. The annual cost of an FTE is assumed to be \$180,000 including overhead costs. Option 4 requires operators to incur waste sampling data and results reports, which is assumed to cost \$20,000 per site.
- **The primary benefit of each option is the avoided cost for NZUs.** This is calculated as the theoretical number of NZUs that would have been needed under an option based on the number of sites taking action. Under the UEF option, it is taken as the difference between the DEF and an assumed UEF rate of 0.5115 (half of the DEF).
- **The secondary benefit of each option is an assumed value for environmental improvements when a site has been remediated.** The value of environmental improvements would depend on the nature of each site. As many former landfills are repurposed for parks and reserves, we assume that each remediated site will become available for communities to use for exercise and recreation. We value this using the CBAX impact for 'Adult – 30-150 minutes moderate to vigorous physical activity per week' and apply this to 50 people per site.
- **The benefit to the government from sale of NZUs is excluded.** In practice, this would be recorded as an economic benefit, netting off the cost as the purchase is a transfer of wealth from local government (as landfill operators) to central government. To offset this exclusion, we have not included the funding from or the administrative costs of the CSVLF.

Overall results

The cost-benefit analysis and the underpinning assumptions shows us that:

1. The cost of NZUs is around two thirds of the cost of the remediation and disposal work. We estimate that for each tonne of material that is remediated, there is at least \$100 in direct costs and \$68.25 in NZU costs.
2. The largest benefit comes from sites that have had verified HAIL activities take place on them being remediated and land becoming both available and safe for public use.
3. Any option that removes a cost barrier to taking action to remediate sites that have had verified HAIL activities take place on them will likely generate a net positive impact.

Conservative benefit estimates

The quantified environmental benefits are highly conservative. They exclude benefits such as avoided environmental costs (for example, soil and water contamination, leachate management), public health improvements (for example, reduced exposure to toxins and pathogens), land uplift value from remediated sites, and avoided emergency response costs. These unquantified benefits will strengthen the case for options 2 and 3.

Option 1: Status Quo

Under this option, all material that is disposed to a landfill is treated as new waste and is therefore subject to emissions charges regardless of its composition or age.

An exemption currently exists for waste from closed landfills under clause 13B of the Climate Change (General Exemptions) Order 2009. However, this does not apply to material from historic sites on which a HAIL verified activity took place but that were never formal landfills. Hence it includes material removed during remediation projects, even where that material has already degraded. As demonstrated by the Waitaki District Council case, such sites remain subject to full ETS obligations, despite the waste or material having negligible remaining emissions potential.

The status quo requires landfill operators to forfeit NZUs based on the volume of material received from sites other than closed landfills, such as historic sites on which a HAIL verified activity took place.

Table 3: Existing Benefits of Option 1: Status Quo

Stakeholder	Benefit type	Explanation	Model assumptions
Communities	Value of environmental improvements when a site has been remediated.	Value of leisure and play resulting from landfill being repurposed for a park and reserve. We've assumed under the status quo that one site will need material to be remediated due to an external factor (for example, flooding, landslips, or land scarcity for a key infrastructure project). This is an existing benefit.	• Value per person: \$885.18 (2025 value). • Lag: 1 year. • Volume: 50 people receive the benefit from the remediation of one affected site. • Duration: 25 years. • Value per year: \$44,259.

Note: there are no *additional* economic or financial benefits associated with this option.

Table 4: Existing costs of Option 1: Status Quo

Stakeholder	Economic and Financial Costs	Non-Financial Costs	Indirect Effects & Equity	Model assumptions
Local authorities & landfill operators	NZU purchase: under the status quo, operators must purchase NZUs for the material disposed to landfill from remediated sites at the full DEF, creating a large ETS liability (these are not new costs).	Resources diverted from other services due to waste-levy and ETS obligations. Continued liability discourages clean-up of illegal dumps and can leave environmental risks unaddressed.	May defer remediation of historic sites on which a HAIL verified activity took place because ETS costs make projects uneconomic.	NZU purchase: • DEF: 1.023. • NZU price: \$75 (2027 auction floor). • Volume: 1 site impacted, with 1,000 tonnes of waste at the site. • Duration: 1 year. Value: \$76,725.

Stakeholder	Economic and Financial Costs	Non-Financial Costs	Indirect Effects & Equity	Model assumptions
	Remediation cost: costs associated with excavation, stockpiling, loading and transport of material. Annual monitoring cost: cost to Councils of regular soil sampling or land surveys at sites with known risks. There are no new administrative costs beyond ETS reporting.			Remediation costs: • Cost of material remediation: \$100 per tonne. • Volume: 1 site impacted, with 1,000 tonnes of waste at the site. • Duration: 1 year • Value: \$100,000. Annual monitoring cost: • Monitoring costs: \$10,000 per year per site. • Volume: 9 out of 10 sites impacted. • Duration: 25 years. Value per year: \$90,000.
Central government	Receives ETS revenue (more NZUs surrendered). Faces future cost if un-remediated sites cause environmental harm.	No new administrative burden. Risk of policy misalignment with waste-reduction goals.	Maintains revenue stream but undermines environmental objectives. May erode public trust in ETS accuracy.	N/A
Communities	Pay rates or refuse disposal fees that include the passed through cost of ETS obligations.	Continue to bear environmental and health risks from un-remediated sites.	Inequity for rural communities (historic sites on which a HAIL verified activity took place are often in remote areas). Discourages community clean-ups.	N/A

Note: there are no *additional* economic or financial costs associated with this option.

Other considerations

Under the status quo, there are no additional regulatory changes or implementation requirements. This means there is no new compliance burden for regulators or operators, and existing systems, guidance, and processes remain unchanged. While this provides administrative simplicity in the short term, it also means that known issues with the treatment of legacy waste and legacy contaminated material under the ETS are not addressed.

Maintaining the status quo does not resolve concerns about the alignment between ETS obligations and actual emissions from historic waste. In particular, the current approach can result in ETS liabilities being applied to waste with little or no remaining methane potential, which may be perceived as unfair and inconsistent with the principle that the ETS should price real emissions. These issues may continue to generate stakeholder concern and reduce confidence in the integrity of the scheme.

There are also limited opportunities under the status quo to improve data quality, inventory accuracy, or incentives for remediation. Any contaminated site clean-ups that proceed would continue to face existing ETS costs, which may act as a barrier to remediation in some cases. Over time, this could result in delayed clean-ups, continued environmental and health risks at legacy sites, and ongoing pressure for ad-hoc policy interventions.

For the cost-benefit analysis, we assume that at least one site will need to be remediated urgently and that work cannot be deferred. This leads to the relevant environmental improvements with the full cost of NZUs at the default emission factor. The largest assumed cost under this option is that councils will need to continue to monitor all other sites that are not remediated. This cost may be relatively manageable each year, but adds up over time.

Option 2: ETS exemption for material from historic contaminated sites that have had verified HAIL activities take place on them

This option exempts landfill operators from ETS costs for all historic contaminated material disposed at a landfill facility that was removed during the remediation of a site that has had verified HAIL activities taking place on it, provided the HAIL activity occurred before 1991 (note: waste from closed landfills is already covered by an existing general exemption and is outside the scope of this option).

The 1991 cut-off date aligns with the introduction of the Resource Management Act 1991 and the establishment of more robust waste management and environmental protection frameworks. By 2026, waste from 1991 will be at least 35 years old, and scientific modelling indicates that such material is likely to have substantially degraded, with minimal residual methane emissions.

Table 5: Quantifiable Benefits of Option 2: ETS exemption for material disposed to landfill from historic contaminated sites that have had verified HAIL activities take place on them

Stakeholder	Benefit type	Explanation	Model assumptions
Landfill/facility operators	Value of avoided NZU purchase	Under the status quo, operators must purchase NZUs for the material disposed to landfill from remediated sites at the full DEF, creating a large ETS liability. Under option 2, affected operators can avoid this cost.	• DEF: 1.023. • NZU price: \$75 (2027 auction floor). • Volume: 9 sites impacted, with 1,000 tonnes of material at each site. • Duration: 1 year. • Value: \$690,525.
Communities	Value of environmental improvements when a site has been remediated.	Value of leisure and play resulting from additional landfills being repurposed for parks and reserves.	• Value: \$885.18 per person (2025 value). • Lag: 1 year. • Volume: 50 people receive the benefit from the remediation of 9 affected sites. • Duration: 25 years. • Value per year: \$398,332.

Table 6: Non-quantifiable Benefits of Option 2: ETS exemption for historic contaminated material disposed to landfill from sites that have had verified HAIL activities take place on them

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Avoided costs of inaccurate reporting	Eliminates overpayment for 'phantom' emissions – prevents charging NZUs for legacy waste and legacy contaminated material with negligible remaining methane potential. Operators avoid unwarranted ETS liabilities.	Operators can budget and plan with confidence, improving investment decisions. Removes disincentive that was stalling some cleanup projects.	Neutral in economic impact but large financial transfers involved – financial savings of around \$36 to \$46 per tonne of waste exempted, assuming the NZU price is around \$40 to \$50 per tonne of CO ₂ e and the emissions factor is 1.023 (Waitaki example resulted in \$1.39 million in ETS savings from 20,000 tonnes with the auction floor price of \$68 per tonne). This will likely result in tens of millions of dollars of savings over 30 years across multiple sites. However, this is a transfer – the reduction in operators costs should be passed on as lower costs to customers, and the Crown also forgoes revenue. From a financial benefit perspective we can show the transfers across parties, but need to know the average number of affected cases per year.
Fairness and regulatory integrity	Aligns ETS obligations with actual emissions – ensures legacy waste and legacy contaminated material is not charged as if it were new. Corrects a known distortion in the ETS settings.	Strengthens credibility and perceived fairness of the ETS – participants see that the system no longer penalises them for emissions that won't occur. Fewer potential disputes and complaints about unfair charges.	Qualitative but likely low-medium in impact. High confidence of improved ETS accuracy and integrity (legacy emissions largely zero). Supports NZ's reputation for sound climate policy aligned with science.
Environmental remediation and reuse	Removes a financial barrier to cleaning up old, contaminated sites. Many sites that have had verified HAIL activities take place on them can be remediated without incurring any ETS penalty, making previously uneconomical clean-ups now viable.	Accelerates remediation and landfill diversion – more orphaned or uneconomic contaminated site clean-ups proceed. Communities benefit from reduced leachate, odours, and fire risk at old dumps, and from eliminating health hazards. Remediated land can be reused for housing, recreation, or business uses.	Qualitative but medium-large in impact. Potentially high strategic value. Example: Exempting pre-1991 material from sites that have had verified HAIL activities take place on them could prompt cleanup of dozens of sites nationwide (NZ has hundreds of known contaminated sites). Each cleanup can increase land value (sometimes by millions of dollars for urban land) and avert long-term environmental costs (like pollution of soil and waterways).

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Administrative simplicity	Greater efficiency and clarity – one regulatory change covers all applicable sites. Easy for operators – no case-by-case paperwork or special monitoring needed for legacy waste and legacy contaminated material.	Faster implementation of clean-ups (no need to wait for approvals). This reduces delays and uncertainty for councils and developers. Regulatory agencies also spend less time on processing and can focus on oversight and guidance instead.	Qualitative and likely low-moderate in impact. Potentially could provide some estimates of cost savings - regulatory processing time could reduce by 30-50% compared to individual exemptions, with associated cost savings – avoids application prep and review costs (which can be tens of thousands of dollars per case – around \$20k-\$50k for the regulator and applicant per project); again need to know the number of average affected cases to estimate the value of this.
Fiscal integrity	Prevents the Crown from collecting ETS payments for non-emitting waste, aligning fiscal outcomes with climate outcomes.	Improves integrity of revenue – slight decrease in NZU revenue for government, but money foregone corresponds to emissions that aren't actually occurring. It also modestly relieves financial pressure on councils (and ratepayers) and businesses without undermining environmental goals.	Neutral as is a transfer - negative impact for Crown through reduced NZU payment (e.g. as above \$36 to \$46 per tonne of waste). However, this is not a real economic cost – it avoids overstating national emissions and imposing unreasonable costs on communities.
Inventory and data quality	Improves greenhouse gas inventory accuracy by formally differentiating pre-1991 waste emissions from new emissions. Ensures better documentation (robust registers of sites that have had verified HAIL activities taking place on them, for example, Selected Land Use Registers (SLUR), Land Use Registers, Listed Land Use Registers, HAIL Registers), which reduces uncertainty in national emissions reporting. Territorial authorities do regularly update these registers with new sites as they become established.	Better data on legacy vs. current waste helps policymakers and scientists refine emissions factors and focus efforts where they matter. Over time, NZ's waste-sector emission data becomes more granular and credible internationally	Qualitative but likely large impact. Greater accuracy in the national inventory (the uncertainty in landfill emissions estimates is lowered). For example, after updating factors to exclude legacy emissions, inventory uncertainty bands narrowed significantly, cutting waste-sector uncertainty.

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Market signalling and behaviour change	Sends a clear policy signal that the focus is on reducing emissions from current and future waste, rather than penalising legacy waste and legacy contaminated material. By removing ETS costs on inert wastes and materials, it highlights that active emissions are the priority for climate action.	Encourages better waste practices. Operators and councils are more likely to invest in modern landfill gas capture, waste diversion (recycling/ composting), and improved waste sorting for current operations, since they will be rewarded for actual emission reductions. Discourages any continued disposal of high-organic waste without mitigation, as only new emissions face costs.	Qualitative – likely medium in impact. Measured over time by increased uptake of methane capture and diversion technologies. The behaviour change will be gradual but foundational.
Economic and social outcomes	Local job creation and economic stimulus – remediation projects require workers (environmental engineers, construction, landscapers), potentially increasing new job creation. Cleaned sites open up land for productive use – leading to new housing, businesses or public facilities that contribute to local economies.	Communities experience an uplift as sites are cleaned up. This can improve community pride and mental health (living near green, safe spaces instead of hazardous sites). New parks or developments on former sites that have had verified HAIL activities take place on them provide amenities to locals.	Qualitative – likely medium benefit. Longer term economic and social potential, e.g., a remediated site (that otherwise would not have occurred) might stimulate new businesses or increase surrounding property values. Offshore case studies show there can be large GDP impacts locally from regenerative projects.
Health and amenity	Reduces health hazards by eliminating exposure pathways to legacy pollution (for example, soil contaminants, groundwater leachate, or airborne toxins from old dumps). Also improves local environmental quality – less smell, pests, and risk of uncontrolled methane fires from old material containing organic matter.	Cleaner soil and water translate into lower risks of illness for nearby residents (some sites that have had verified HAIL activities take place on them contain toxic substances that can affect health). Restored green spaces or redevelopment provide recreational opportunities, aesthetic value, and safer environments for communities. Mental health can improve when people live near green, usable spaces rather than dangerous wastelands.	Qualitative – likely medium benefit. Difficult to monetise, for example, reduction in complaints about odour or smoke, improved air quality (measured by drops in non-methane organic compound levels after remediation, and enhanced community satisfaction in surveys. Over time, remediated sites might result in higher local health indices or property values.

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Risk management and transparency	Clearly defines the boundary between legacy and new emissions, reducing ambiguity and legal risks. A blanket rule (with published criteria such as the 1991 cut-off and verification of sites that have had HAIL activities taking place on them) provides transparency – everyone knows which wastes are exempt upfront.	Greater transparency builds trust among stakeholders (local governments, waste operators, communities). It also likely reduces legal disputes and appeals; with less room for interpretation, there are fewer grounds for challenge. In turn, this predictability encourages more cooperative relationships between regulators and those undertaking clean-ups.	Qualitative but likely low in impact. Difficult to quantify, but there may be avoided legal/consultation costs. Other countries' experiences show that transparent carve-outs can result in broad stakeholder acceptance and fewer contentious cases

Costs

Table 7: Costs of Option 2: ETS exemption for historic contaminated material disposed to landfill from sites that have had verified HAIL activities take place on them

Stakeholder	Economic and Financial Costs	Non-Financial Costs	Indirect Effects & Equity	Model assumptions
Local authorities & landfill operators	Remediation cost: costs associated with excavation, stockpiling, loading and transport of material. Annual monitoring cost: cost to Councils of regular soil sampling or land surveys at sites with known risks. Minimal cost to note origin at weighbridge.	Must confirm HAIL status (some site investigation needed). Risk of misclassification; operators must apply the exemption accurately (high-trust system).	Encourages remediation of material from sites on which a HAIL-verified activity took place and contaminated sites. Fairness concerns arise for sites just after 1991 that remain liable.	Remediation costs: • Cost of material remediation: \$100 per tonne. • Volume: 9 sites impacted, with 1,000 tonnes of material at each site. • Duration: 1 year. • Value: \$900,000. Annual monitoring cost: • Monitoring costs: \$10,000 per year per site. • Volume: 1 site impacted. • Duration: 25 years. • Value per year: \$10,000.

Stakeholder	Economic and Financial Costs	Non-Financial Costs	Indirect Effects & Equity	Model assumptions
Central government	Reduced NZU surrender obligations mean foregone ETS revenue for the Crown (a reduction in government income). This is a direct fiscal cost to government, reflecting that fewer units are purchased and surrendered. However, this policy also ensures emissions accounting is more accurate (since minimal actual emissions are being exempted), which improves the integrity of the ETS – a benefit discussed elsewhere. Administrative overhead is low – primarily one-off cost of developing and enacting the regulatory change (policy development, drafting the exemption regulation, stakeholder consultation).	Needs to ensure operators follow the rules. Limited enforcement cost because exemption applies only to verified pre-1991 sites.	Aligns ETS with actual emissions potential (few emissions from old material containing organic matter). Helps meet waste remediation and climate goals without overcharging.	N/A
Communities	Rates not increased to cover large ETS charges. Potentially lower landfill fees.	Expectation that councils will be responsible for remediating historic dumpsites. Benefits from reduced environmental hazards.	Slight inequity for communities near post-1991 sites (still subject to ETS liabilities). Risk of perception of a "carve-out" for older sites, though justified by emissions data.	N/A

Other considerations

A blanket exemption provides strong regulatory clarity once eligibility criteria are established. By clearly defining pre-1991 sites that have had verified HAIL activities take place on them as exempt, this option minimises ongoing compliance effort and creates a high certainty environment for councils, developers, and regulators. It reduces the need for case-by-case decisions and avoids repeated regulatory amendments or bespoke approvals.

This option also raises broader considerations about fairness and integrity of the ETS. Exempting clearly defined legacy waste and legacy contaminated material aligns ETS obligations with current scientific understanding that older waste has minimal remaining methane potential. This can improve trust in the ETS by demonstrating that it targets real emissions rather than historical activities that no longer contribute to climate impacts.

However, a blanket approach relies heavily on robust verification of site eligibility. Maintaining accurate and up-to-date registers (for example, Selected Land Use Registers (SLUR), Land Use Registers, Listed Land Use Registers, HAIL Registers) becomes critical to prevent misuse or unintended exemptions. While the administrative burden is low once implemented, strong upfront governance and transparency arrangements are needed to support confidence in the exemption and manage any perceived risks of over-inclusion.

While this option does not capture any residual emissions from pre-1991 waste, modelling indicates that waste over 50 years old retains only approximately 3% of its original methane potential. To manage this risk, the 1991 cut-off could be reviewed periodically (for example, every 5–10 years) to ensure continued alignment with scientific evidence on waste degradation. Over time, the accuracy of this exemption improves as the age of eligible waste increases.

Option 3: Authority to approve case-by-case exemptions

Option 3 would establish a case-by-case exemption process for material disposed to landfill from historic contaminated sites on which verified HAIL activities took place, where the hazardous activity continued after 1991. This option complements Option 2 by providing a pathway for post-1991 sites that can demonstrate low or negligible emissions potential. Applications would be assessed by the Chief Executive of MfE (or delegated authority) based on evidence such as waste composition, age, and degradation level.

Table 8: Quantifiable Benefits of Option 3: Authority to approve case-by-case exemptions

Stakeholder	Benefit type	Explanation	Model assumptions
Landfill/facility operators	Value of avoided NZU purchase.	Under the status quo, operators must purchase NZUs for the material disposed to landfill from remediated sites at the full DEF, creating a large ETS liability. Under option 2, affected operators can avoid this cost.	• DEF: 1.023 • NZU price: \$75 (2027 auction floor). • Volume: 7 sites impacted, with 1,000 tonnes of waste at each site. • Duration: 1 year. • Value: \$537,075.
Communities	Value of environmental improvements when a site has been remediated.	Value of leisure and play resulting from additional landfills being repurposed for parks and reserves.	• Value: \$885.18 per person (2025 value) • Lag: 1 year • Volume: 50 people receive the benefit from the remediation of 7 affected sites • Duration: 25 years • Value per year: \$309,814

Table 9: Non-quantifiable Benefits of Option 3: Authority to approve case-by-case exemptions

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Avoided costs of exemptions	Partial – formal process reduces need for repeated law changes, so is faster and more flexible. Provides a standing mechanism instead of ad-hoc Cabinet decisions for each case (shift burden from new regulations to individual decisions).	Can provide a quicker response in urgent or niche cases (for example, if an unexpected contamination issue arises, relief can be granted promptly without waiting for Ministerial decisions). Over time, the process could allow programme based handling of similar sites.	Qualitative but likely low impact on balance. Avoids some of the uncertainty of ad-hoc policymaking (stakeholders know a process exists). However, still involves case-by-case work (no significant labour saving for each project, unlike Option 1). Each exemption still requires processing time (for example, 50-100 hours of staff time per case or \$10k-\$20k, plus applicant effort). Over time, if criteria are clear, some efficiencies may emerge (e.g., faster decisions on similar cases, batched applications).

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Avoided costs of inaccurate reporting	Prevents overestimating emissions and overcharging for all approved projects – no NZUs required for material that fails to generate further methane.	Improved financial planning for operators or councils that get an exemption – do not need to spend funding on unwarranted NZU purchases, which can be redirected to remediation activities or other projects.	Case-specific savings. Similar magnitude per tonne as Options 1 and 2 (around \$36 to \$46 per tonne). Net effect depends on uptake – could relieve significant costs for some projects, while the Crown forgoes equivalent revenue. Is a transfer, not counted as net societal gain, but does improve economic viability of remediation projects.
Regulatory accuracy and integrity	Scientifically rigorous alignment of ETS costs with true emissions. Each exemption is subject to criteria (such as proof that remaining degradable organic carbon or methane potential is below a threshold), minimising the risk of any real emissions slipping through and not being priced.	Bolsters the environmental credibility of the ETS – demonstrates that climate policy can be principled and flexible. May set a precedent for using empirical data in other areas of the ETS (or other environmental regulations) to improve accuracy.	Qualitative but potentially moderate impact. The benefit is primarily in terms of the quality of policy. The option eliminates excess emissions reporting for legacy waste and legacy contaminated material, while still accounting for any meaningful emissions from more 'near legacy' waste and contaminated material that doesn't qualify.
Expanded remediation of contaminated Sites	Incentivises cleanup of a broader range of sites. Projects involving later period or borderline material can also receive ETS relief if they demonstrate low emissions. This means projects that would be left out under Option 1 could still get relief under this option (by linking exemptions to evidence rather than an arbitrary date, some post-1990 sites with minor residual organics can be treated like true legacy sites).	Wider environmental & social benefits as more contaminated sites become feasible to address. This could include industrial dumps from the 1990s or 2000s that pose local pollution risks (chemicals, heavy metals) but now can be affordably remediated if their organic content is low. Communities living near these sites would then benefit from reduced health risks and visual pollution. Additionally, tackling issues sooner (rather than delaying for decades) can reduce future liability and emergency costs (e.g. preventing future leaching or collapse due to climate-related events).	Qualitative (but potentially quantitative if had appropriate case examples). Potentially medium-high impact. Each additional site remediated avoids long-term costs of contamination (which can be very large if spills or exposure occurs). Land value gains from remediating a single urban site can reach millions of dollars in increased property value and new economic activity.

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Transparency and accountability	Greater transparency - introduces a clearly defined process with published criteria and documentation for each exemption. Decisions are based on evidence and recorded officially, improving governance.	Public confidence increases knowing that exemptions are not automatic but earned through meeting strict conditions. Stakeholders (environmental groups, communities) can be reassured that each exempted project had to prove its merit, which may reduce any opposition to the policy.	Qualitative and potentially medium impact. A formal application pathway can incorporate public or iwi consultation steps for contentious sites, helping to address local concerns in the decision process. Accountability is enhanced – decisions can be audited or revisited if conditions change.
Policy improvement	The process provides a mechanism for policy learning and improve its effectiveness over time. By reviewing several applications over time, the government can gather feedback on where the criteria might be too strict or too lenient and then refine the exemption rules accordingly (since the process is established in regulation, criteria can be adjusted through standard updates).	Patterns in applications could reveal that certain types of material or site conditions consistently yield low emissions – leading to potential updates in guidelines or threshold values.	Qualitative and potentially low-moderate impact. The value is better long-term policy effectiveness.
Innovation	The application process could be an innovation test-bed for new remediation techniques and measurement methods. Applicants have an incentive to propose and document advanced methods to prove low emissions and strengthen their case for exemption.	May spread good practice – as novel techniques are proposed in exemption applications, regulators and industry learn about them. If an applicant successfully uses an innovative method to reduce emissions or better measure them, that approach can be publicised and potentially adopted by others in future projects.	Qualitative and potentially moderate impacts. Value will be in long run as certain pilot approaches become mainstream. For instance, if a particular gas capture technology or contaminated soil treatment is featured in an application and proves successful, it could be replicated at other sites (leading to more emission reductions or cost savings industry-wide).

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Stakeholder buy-in	Potential opportunity for collaborative design of the criteria and process (policymakers can involve local government, iwi/Māori, industry representatives, and community stakeholders in defining the exemption criteria and application procedure).	Broadens support – co-designing the rules means they are more likely to be accepted and understood by those who will use them, and they are more likely to encourage others to participate, leading to greater benefits. It also ensures the criteria reflect realities on-the-ground.	Qualitative but low-moderate impact. Difficult to value but a cooperative process can lead to smoother implementation (fewer conflicts, more effective communication, higher trust). It may also result in more creative solutions or criteria than regulators alone might have identified.

Table 10: Costs of Option 3: Authority to approve case-by-case exemptions

Stakeholder	Economic and Financial Costs	Non-Financial Costs	Indirect Effects & Equity	Model assumptions
Local authorities & landfill operators	Remediation cost: costs associated with excavation, stockpiling, loading and transport of material. Annual monitoring cost: cost to Councils of regular soil sampling or land surveys at sites with known risks. Compliance cost: Must prepare and fund detailed applications (site investigations, sampling, consultancy reports) to prove low emissions. Avoid ETS costs only if exemption is granted; otherwise, they either pay full DEF or the landfill operator could still explore applying any existing UEF of the receiving landfill to this material, if available. This could lower the ETS cost compared to the default factor – though some ETS liability would remain unless an exemption is granted.	Longer project timelines. Uncertainty about approval may delay remediation. Requires technical capability to compile evidence. Small councils/operators may find process burdensome.	Only operators who invest in preparing applications can benefit, which may favour larger organisations. Could deter some from applying, leading to uneven uptake.	Remediation costs: • Cost of material remediation: \$100 per tonne. • Volume: 7 sites impacted, with 1,000 tonnes of material at each site • Duration: 1 year • Value: \$700,000 Annual monitoring cost: • Monitoring costs: \$10,000 per year per site. • Volume: 3 out of 10 sites impacted. • Duration: 25 years. • Value per year: \$30,000

Stakeholder	Economic and Financial Costs	Non-Financial Costs	Indirect Effects & Equity	Model assumptions
Central government	Administrative costs: include costs of establishing process and evaluating applications (staff time, expert review). May need to develop guidelines and maintain a decision-making process. Could be challenged on fairness if decisions vary. Loss of ETS revenue for approved cases.	Must manage perceptions of fairness and ensure consistent decisions, requiring clear criteria. Risk of being inundated with applications or facing appeals.	Provides case-by-case accuracy and flexibility. Encourages operators to remediate by offering a path to exemption, but complexity may impede uptake.	Administrative cost: Volume: 1 new FTE for reviewing applications and setting frameworks and guidance (ongoing). Duration: 25 years. Value: \$180,000 per year including salary and overhead costs.
Communities	Potentially lower rates if exemptions reduce councils' ETS bills.	May experience delays in site remediation as councils compile evidence. Could be frustrated by slow or inconsistent government decisions.	Perceived fairness (post-1991 sites considered) balanced against slower cleanup due to bureaucratic hurdles.	

Other considerations

A bespoke exemption process provides greater precision and flexibility than a blanket approach. By assessing exemptions against defined scientific and technical criteria, this option allows ETS relief to be targeted only to waste streams that demonstrably have negligible emissions. This improves regulatory accuracy and reduces the risk that any material emissions go unpriced.

From a governance perspective, a formal application pathway improves transparency and accountability compared with ad-hoc decisions. Decisions are evidence-based, documented, and can be audited over time. This may increase public and stakeholder confidence, particularly where exemptions are contentious or involve sites of community or cultural significance.

The main trade-off is complexity. Case-by-case assessment requires ongoing administrative effort for both applicants and regulators, and per-project compliance costs remain. While clearer criteria and learning effects may improve efficiency over time, this option does not deliver the same level of administrative simplicity as a blanket exemption and may still act as a barrier for smaller or lower-value remediation projects.

If uptake of this option is high, the Ministry for the Environment and the EPA may face capacity constraints in processing exemption applications (and higher administrative costs). Implementation should include resource planning and the establishment of service standards (for example, maximum 90-day processing times) to ensure timely decision-making and provide certainty for applicants.

Option 4: Encourage compositional UEF use by landfill operators

Option 4 would allow landfill operators to apply for a waste-composition-specific UEF to more accurately reflect the emissions potential of material disposed to landfill from remediated sites. However, because obtaining a UEF requires around 12 months of waste sampling data before approval, this approach would entail significant delays and costs for urgent remediations. In practice, a council could still proceed to dispose of material in an emergency, but it would have to pay standard ETS costs until the UEF is approved – making this option feasible in theory but financially undesirable for urgent situations.

Table 11: Quantifiable Benefits of Option 4: Encourage compositional UEF use by landfill operators

Stakeholder	Benefit type	Explanation	Model assumptions
Landfill/facility operators	Value of avoided NZUs purchase	Under the status quo, operators must purchase NZUs for the material disposed to landfill from remediated sites, creating a large ETS liability. Under option 2, affected operators can avoid this cost.	• DEF: 1.023. • NZU price: \$75 (2027 auction floor). • Volume: 4 sites impacted, with 1,000 tonnes of material at each site. • Duration: 1 year. • Value: \$153,450.
Communities	Value of environmental improvements when a site has been remediated	Value of leisure and play resulting from additional landfills being repurposed for parks and reserves.	• Value: \$885.18 per person (2025 value). • Lag: 1 year. • Volume: 50 people receive the benefit from the remediation of 4 affected sites. • Duration: 25 years. • Value per year: \$177,036.

Table 12: Non-quantifiable Benefits of Option 4: Encourage compositional UEF use by landfill operators

Benefit type	Direct Benefits	Associated Indirect Benefits	Potential Economic Value
Avoided costs of inaccurate reporting	Improves accuracy of ETS obligations for material from remediated sites that have had verified HAIL activities take place on them. Using UEFs ensures reported emissions reflect actual organic content and methane capture, avoiding overestimation. Operators no longer purchase excess NZUs for decay that has already occurred.	More accurate data in the ETS means policy decisions can be better targeted (e.g., identifying actual high-emitting sites). Companies that adopt UEFs can forecast their carbon costs more reliably, supporting better financial planning and potentially enabling lower waste disposal fees passed on to customers.	Case-specific savings. If a HAIL remediation project's material is found to have, say, 70% less degradable carbon than assumed, the operator's ETS liability drops proportionally (70% for that material or around \$28 per tonne of material treated. For example, \$420,000 saved on a 15,000 tonne project). Over multiple sites, this could add up to substantial savings. However, this is a transfer as there are equivalent reductions in Crown NZU revenue.
Accuracy and data quality	High confidence in emissions reporting. UEFs are derived from on-site data (compositional sampling), so the emissions calculated for the disposal of material from remediated sites that have had verified HAIL activities take place on them are much closer to reality than using the default factor.	Better alignment of NZ's reported emission figures with true emissions. Over time, as each landfill applies for a UEF based on sampling of material entering the landfill over the remediation period (although would then revert to the DEF in the following year), the aggregate ETS data for the waste sector becomes more accurate, potentially informing updates to the national inventory and default factors. In addition, unanticipated high-emission waste streams may be discovered, prompting mitigation (e.g. extra gas capture) with environmental benefits.	Qualitative but potentially large impacts. Contributes to long-term system integrity and credibility. More precise data can reduce the uncertainty in the waste sector's emissions. New Zealand's landfill emissions estimates have historically had wide uncertainty bounds, so increased UEF usage should improve this accuracy.

Table 13: Costs of Option 4: Encourage compositional UEF use by landfill operators

Stakeholder	Economic and Financial Costs	Non-Financial Costs	Indirect Effects & Equity	Model assumptions
Local authorities & landfill operators	UEF calculation costs: operators must fund waste composition surveys, and consultants to calculate a UEF. ETS savings occur only if the UEF is lower than the DEF, which is likely for old or inert material. NZU purchase: Operators impacted are assumed to purchased NZUs at the UEF rate. Remediation cost: costs associated with excavation, stockpiling, loading and transport of material for impacted operators. Annual monitoring cost: cost to other Councils of regular soil sampling or land surveys at sites with known risks.	Administrative effort to design sampling, manage data, and file applications. Skills/capacity required; small operators may lack resources.	Provides accurate emissions accounting and potential cost reductions, but only those who can afford the studies will benefit. Could widen cost difference between large and small operators.	UEF calculation costs: • Cost per site: \$20,000. • Volume: 4 sites. • Duration: 1 year. • Value: \$80,000. NZU purchase costs: • UEF rate: assumed as half the DEF at 0.5115. • NZU price: \$75 (2027 auction floor). • Volume: 4 sites impacted, with 1,000 tonnes of material at each site. • Duration: 1 year. • Value: \$153,450. Remediation costs: • Cost of material remediation: \$100 per tonne. • Volume: 4 sites impacted, with 1,000 tonnes of material at each site. • Duration: 1 year. • Value: \$400,000. Annual monitoring cost: • Monitoring costs: \$10,000 per year per site. • Volume: 6 out of 10 sites impacted. • Duration: 25 years. • Value per year: \$60,000

Stakeholder	Economic and Financial Costs	Non-Financial Costs	Indirect Effects & Equity	Model assumptions
Central government	Processing time for UEF applications but is assumed to be absorbed within existing resources. Provide technical guidance and auditing.	Must ensure UEF methodologies are robust and comparable, and avoid misuse.	Improves accuracy of emissions reporting. Encourages operators to monitor waste composition, which may indirectly prompt more organics diversion or gas capture.	N/A
Communities	May indirectly pay through rates if councils invest in UEF applications. Could benefit if savings reduce landfill fees.	None beyond awareness that waste is being monitored.	Encourages better data on waste composition, supporting wider waste-reduction strategies.	N/A

Other considerations

Encouraging or requiring UEFs shifts the focus from exemptions to improved measurement and accuracy. This option strengthens the link between ETS costs and actual emissions by relying on site-specific data rather than default assumptions. Over time, broader UEF use can significantly improve emissions data quality and support more credible national inventory reporting.

This approach improve fairness, cost alignment and operational management. Operators only pay for the emissions actually generated by the remediated material, and better waste composition data from the UEF process can improve planning and waste management.

However, UEFs introduce additional upfront costs and capability requirements, particularly for sampling, analysis, and verification. Without complementary support, this may limit uptake among smaller operators or councils. Strong oversight is also required to manage risks of selective sampling (operators could time sampling to periods of lower organic content, potentially underreporting emissions) or inconsistent application, meaning this option trades administrative simplicity for improved accuracy and long-term system integrity.

Recommendation

Based on the cost-benefit analysis and the qualitative assessment of implementation, equity, and policy integrity, we recommend Option 2: a blanket ETS exemption for historic contaminated material disposed to landfill from pre-1991 sites that have had verified HAIL activities take place on them, with Option 3 (a case-by-case exemption pathway) implemented as a complementary mechanism for circumstances where the blanket exemption does not apply.

While the status quo is the easiest to implement, Option 1 disincentivises councils from taking action. It keeps misalignments between ETS costs and emissions and results in negative economic, environmental and social impacts. Over time, this option risks higher monitoring costs, delayed clean-ups, and continued environmental and health risks for communities.

The analysis demonstrates that Option 2 delivers the largest net benefit across different time horizons and discount rates. The primary driver of benefits is the increased likelihood that contaminated sites that have had verified HAIL activities take place on them are remediated, enabling land to become safe and available for community use.

Option 2 directly removes a significant barrier to remediation by eliminating ETS liabilities for material with negligible remaining methane potential. The current application of the ETS assumes remediated material behaves like new waste, despite strong scientific evidence that pre-1991 material has largely exhausted its emissions profile. A blanket exemption addresses this and aligns ETS obligations with actual emissions outcomes, improving fairness, regulatory integrity, and confidence in the ETS.

Compared with the other options, Option 2 also performs strongly on administrative simplicity and certainty. Councils and landfill operators can plan remediation projects with confidence over total costs, and this certainty is particularly important for local authorities, where ETS costs can be large relative to remediation budgets and any unplanned cost puts an added burden on ratepayers.

Climate change impacts are expected to increase the frequency of landfill and contaminated site remediations due to coastal erosion, flooding, and extreme weather events. The acceleration of remediation needs underscores the importance of a systematic policy solution, such as Option 2, rather than relying on ad hoc, case-by-case exemptions that create uncertainty and delay.

However, Option 3 provides a valuable complementary safeguard, allowing exemptions to be considered for sites that fall outside the pre-1991 threshold but can demonstrate, through evidence, that remediated material has negligible remaining emissions. This improves regulatory precision and ensures that councils are not left without a pathway where the blanket exemption is not appropriate. Option 3 plays an important role alongside Option 2 in managing edge cases and supporting equitable treatment across different sites.

Taken together, Option 2 supported by Option 3 provides the best balance between simplicity, certainty, accuracy, and fairness. The blanket exemption addresses the majority of legacy sites that have had verified HAIL activities take place on them efficiently and at scale, while the case-by-case pathway ensures flexibility where strict eligibility criteria would otherwise lead to inequitable or inefficient outcomes. We note that implementing Options 2 and 3 together provides a comprehensive solution from the outset, but is more complex to design and establish. In practice, these could be implemented sequentially to allow learning from Options 2 implementation to be incorporated into the launch of Option 3. However, this means post-1991 cases would need to wait and continue to require ad hoc exemptions in the short-term, suggesting that concurrent implementation is preferable.

Overall, this approach best meets the policy objectives of:

- enabling timely remediation of contaminated sites that have had verified HAIL activities take place on them,
- aligning ETS obligations with actual emissions,
- providing certainty for councils and landfill operators, and
- delivering the greatest net benefit to communities, the environment, and the economy.

While Option 4 is not recommended as a primary policy mechanism due to its complexity and implementation delay, it should remain available as a voluntary pathway for landfill operators who prefer site-specific emissions accuracy and have the capacity to undertake the testing process. This preserves flexibility without imposing additional administrative burden on the majority of remediation projects.

Appendix 1: Glossary

Benefit–Cost Ratio (BCR)	A ratio that compares the present value of benefits to the present value of costs to indicate whether an option delivers net benefits.
Cost-Benefit Analysis (CBA)	A structured approach to comparing the costs and benefits of different policy options to support decision-making.
Case-by-case exemption	An ETS exemption assessed individually against defined criteria, rather than applying automatically to a class of waste or sites.
Commercial in Confidence	A classification indicating that information is sensitive and should not be disclosed beyond authorised audiences.
Contaminated site	Land affected by hazardous substances at levels that pose, or may pose, risks to human health or the environment.
Default Emissions Factor (DEF)	The standard emissions factor applied under the ETS when no site-specific emissions factor is used. Current DEF: 1.023.
Discount rate	The rate used to convert future costs and benefits into present values in a cost-benefit analysis.
Emissions Trading Scheme (ETS)	New Zealand's market-based mechanism for pricing greenhouse gas emissions and incentivising emissions reductions.
Greenhouse gas inventory	The national account of greenhouse gas emissions and removals reported by New Zealand under international agreements.
Hazardous Activities and Industries List (HAIL)	A nationally maintained list of activities and industries that are likely to cause contamination and/or are known to be hazardous.
Landfill gas	Gas generated from the decomposition of organic waste in landfills, primarily methane and carbon dioxide.
Legacy waste and legacy contaminated material	Waste and contaminated material deposited many decades ago that has largely completed its methane-generating lifecycle.
Methane (CH₄)	A potent greenhouse gas produced during the anaerobic decomposition of organic material in landfills.
Net Present Value (NPV)	The difference between the present value of benefits and costs over a defined time period.
New Zealand Unit (NZU)	The tradable unit used in the New Zealand ETS, representing one tonne of carbon dioxide equivalent.

Phantom emissions	Emissions that are assumed under modelling or default factors but do not occur in reality.
Pre-1991 material	Material generated before 1991, used as a proxy for material with minimal remaining methane potential.
Regulatory integrity	The extent to which regulatory settings are consistent, evidence-based, and aligned with policy objectives.
Remediation	The process of removing, containing, or treating contaminated material to reduce risks to people and the environment.
Shadow price of carbon	An estimate of the social cost of carbon used for appraisal, distinct from the market price of NZUs.
Status quo	The baseline option where no policy changes are made and existing ETS settings continue to apply.
Unique Emissions Factor (UEF)	A site-specific emissions factor approved under the ETS regulations. For landfill emissions, a UEF is typically based on direct analysis of waste composition (through sampling of waste inputs) to determine actual emissions potential (other methods, such as measuring landfill gas collection efficiency combined with modelling, can also be used to derive a UEF, but are less applicable for one-off remediation projects).
Waste composition	The physical and chemical makeup of waste, including the proportion of degradable organic material.
Waste diversion	Actions that reduce the amount of waste sent to landfill, such as recycling or composting.

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