Oparure Quarry South-Western Pit: Plant and Animal Pest Management Plan

Prepared for

Graymont (NZ) Limited

July 2026

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Quality Control Sheet

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1	26/6/26	Draft	Amber Simmonds	Blair Thornburrow	Blair Thornburrow
2	6/7/26	Final	Lexi Hunter	Cazz Grima	Blair Thornburrow

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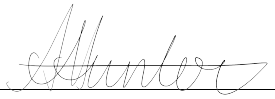
SIGNATURE 

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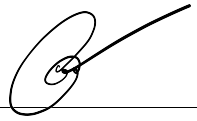
SIGNATURE 

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Limitations:

This report has been prepared by Pattle Delamore Partners Limited (PDP) including information provided by Graymont (NZ) Limited and Ecology New Zealand Limited. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of Graymont (NZ) Limited for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

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1.0 Introduction

Graymont (NZ) Ltd (Graymont) has engaged Pattle Delamore Partners (PDP) to prepare a Plant and Animal Pest Management Plan (PMP), in support of the Ecological Betterment Plan ('EcoBP') for the Oparure Quarry South-Western Pit ('SW Pit') at Oparure Road, Te Kuiti.

This plan incorporates previous information regarding pest control from Ecology New Zealand's Pest Plan (Ecology New Zealand, 2022) and provides practical methodologies to reduce the impacts of introduced pest animals and plants on the ecological values outlined in the EcoBP.

The objective of this management plan is improving biodiversity and ecosystem health of both vegetation and fauna habitat within the betterment areas, which will be aided by controlling pest animals and plants.

1.1 Background

This PMP outlines the first five years of management actions aimed at reducing pest populations and improving vegetation quality at each of the betterment sites. These management actions will be assessed after five years to determine what additional actions (if any) are needed to achieve the ecological benefits set out in the EcoBP.

The EcoBP recommends pest and predator management at:

- Camelot headwater streams;
- Identified cave entrances;
- Rocky outcrops which support terrestrial fauna; and,
- Tomos which support terrestrial fauna and flora.

Given the location of the betterment areas, connections to adjacent properties, and ongoing agricultural use, pest control is crucial to improve native biodiversity values. Full eradication is not feasible due to potential pest animal and plant re-invasion, so the focus will be on reducing populations and maintaining low densities while native vegetation establishes. After five years, the actions will be reviewed, allowing flexibility to respond to changing conditions.

2.0 General Methodology and Definitions

This PMP follows the framework set out in the *Waikato Regional Pest Management Plan* (WRPMP, 2022-32; WRC, 2022). All known pest plants and animals on the site have been classified in line with the WRPMP, and recommendations for control expectations and specific control methods are drawn from its guidance.

The definitions used in this PMP are based on the WRPMP, noting that the definition of a pest plant can vary depending on the context and the local environment. Management strategies have been tailored to consider both the official WRPMP status of a pest species and the actual effect of that species on the site.

To maximise the likelihood of successful pest control and native planting, works shall be implemented by a suitably qualified pest management professional. All pest control methods shall follow Waikato Regional Council guidelines (WRC, 2020a; WRC, 2022). Animal carcasses shall be left in the forest or buried (WRC, 2020b).

All machinery and equipment used in implementing this PMP shall be cleaned prior to being transported to the site to ensure that all seed and/or plant matter has been removed. Cleaning shall be documented in accordance with the National Pest Control Agencies A series best practice guidelines.

3.0 Pest Plants Control

The following sections provide instructions on how these pest plants are to be managed using best practice methodologies. It is important to note that the plant list is not intended to be exhaustive, and any additional pest plants that may be found when undertaking the works will also be controlled in alignment with the WRPMP.

- A **five-year** weed monitoring and control programme will be undertaken at planting sites to allow for successful establishment of native plants.
- **Initial weed control**: should be conducted to clear the site and prepare it for planting. Planting should occur soon after weed control to prevent weeds from reestablishing.
- **First three years**: Weed inspections and monitoring shall be undertaken once every three months with the focus being before and after Christmas as weeds grow faster over the summer months. Weed control should then be initiated if weeds are identified.
- **Post three years**: After year three, the weed monitoring can be reduced to twice a year. Weed monitoring shall be maintained for a minimum of five years to allow native plants to establish.

Weed control is to be undertaken by qualified contractors due to the variety and extent of weed issues that could present themselves across the site, which may require spraying or cut-stump control using specific chemicals, to be tackled effectively. All contractor field staff shall be trained in chemical application for weed control.

A schedule is displayed in Appendix A.

3.1 Control Methods and Expected Outcomes

Control techniques will differ between species and will depend on the nature and size of infestations. Methods that will be utilised include one or more of the following, as appropriate[1]: cutting and pasting, foliar spraying, hand-pulling and drill and fill. Table 1 summarises the recommended control methods and herbicide use for each species observed.

During the weed maintenance follow-ups, regular hand releasing around new plantings may be required to prevent long exotic grasses from smothering the new plants. This does not require complete removal of the grass, simply clearing the grass within a 30 cm diameter around the new plant to give it space to grow.

Pest plant species observed at the site have been summarised in Table 1 with their categorisation under the WRPMP and the expected control measures.

[1] As determined by a suitably qualified pest management professional.

Table 1: Pest plant species recorded on-site and management methodology.

Common Name	Scientific Name	WRPMP Category	Control Measure	Control Method
Barberry	*Berberis glaucocarpa*	Not listed	To zero density	Cut low at stump and apply 5g metsulfuron-methyl/L or drill and inject with 250ml glyphosate/L.
Blackberry	*Rubus fruticosus agg.*	Site-led (Wetlands)	To low density	Foliar spray (knapsack sprayer) using 60ml triclopyr/10L.
Chinese privet	*Ligustrum sinense*	Site-led (Wetlands)	To zero density	Cut low at stump and apply 5g metsulfuron-methyl/1L or foliar spray seedlings with 5g metsulfuron-methyl + penetrant/10L.
Crack willow	*Salix fragilis*	Site-led (Wetlands)	Multi-level approach	Cut stump and apply 250ml glyphosate/1L or drill and poison using 5g metsulfuron/L.
Field bindweed	*Convolvulus arvensis*	Not listed	To low density	Foliar spray (knapsack sprayer) using 60ml triclopyr/10L.
Gorse	*Ulex europaeus*	Sustained control	To zero density	Foliar spray (knapsack sprayer) using 60ml/10L triclopyr or cut stump low and paste with 60ml triclopyr/L.
Grey willow	*Salix cinerea*	Site-led (Wetlands)	Multi-level approach	Cut stump and apply 250ml glyphosate/1L or drill and poison using 5g metsulfuron/L.
Hawthorn	*Crataegus monogyna*	Not listed	To zero density	Cut and stump paste with 5g metsulfuron-methyl/1L or foliar spray (knapsack sprayer) with 5g metsulfuron-methyl + penetrant/10L.
Herb-robert	*Geranium robertianum*	Not listed	Multi-level approach	Foliar spray (knapsack sprayer) using 100ml glyphosate/10L.
Nodding thistle	*Carduus nutans*	Sustained control	To zero density	Grub out small infestations or foliar spray (knapsack sprayer) with 100ml glyphosate/10L or 3g metsulfuron/10L.
Old man's beard	*Clematis vitalba*	Progressive containment	To zero density	Cut thick stems 1m above ground level (to prevent stump resprouting and aerial roots attaching from hanging stems). Paint cut stumps with 250ml glyphosate/L or 5g metsulfuron-methyl/L or foliar spray (knapsack sprayer) with 200ml glyphosate/10L.
Pedunculate oak	*Quercus robur*	Not listed	Multi-level approach	Cut stump and apply 250ml glyphosate/1L or drill and poison using 5g metsulfuron/L.
Poplar	*Populus* sp.	Not listed	Multi-level approach	Grub out seedlings or foliar spray (knapsack sprayer) with 5g metsulfuron/10L or cut and stump paint with Vigilant gel or drill and inject with 10g metsulfuron/1L.
Radiata pine	*Pinus radiata*	Progressive containment	Multi-level approach	Pull or dig out small plants or drill and fill with 1g metsulfuron/50ml or foliar spray 200ml glyphosate/10L or 5g metsulfuron/10L.
Rose	*Rosa* sp.	Not listed	To zero density	Dig out small patches or cut stump and paint with 2.5g metsulfuron/1L or foliar spray (knapsack sprayer) with 5g metsulfuron/10L.

3.1 Agrichemical Use

Agrichemical use will be assessed by a suitably qualified pest management professional individually for each area and species, the intention being to minimise herbicide use as much as practicable, without compromising the efficacy of control. All herbicide application will be undertaken by a Registered Chemical Applicator or as a minimum by a Growsafe Approved Handler. Operators must apply industry best practice methods and be in alignment with the Management of Agrichemicals (NZS 8409:2004) guidelines.

Records of herbicide application shall be kept, including what has been used, the location, application rates, and date of application. A template for the pest plant control monitoring form is provided in Appendix B.

4.0 Pest Animal Control

Pest animal control will be undertaken using a site-wide approach (Appendix A). Management will be implemented for a period of five years, to increase the quality of habitat for native fauna and protect new plantings from pest browsing. Given the habitat and food source available on-site, and in the surrounding area, it is assumed that pest animals are present in at least low abundance on-site. Site investigations in 2019 and 2021 identified a range of pest animals on-site. These are summarised below in Table 2.

Table 2: Summary of pest animals

Scientific Name	Maori Name	Common Name	Listed in the WRPMP?	Control Method
Capra hircus	Nanenane	Feral goat	✓	Shooting
Family Cervidae	Tia	Feral deer	✓	Shooting
Erinaceus europaeus	Hetiheti	Hedgehog	-	Trapping Network
Felis catus	Ngeru	Feral cat	✓	Trapping Network
Lepus europaeus occidentalis /Oryctolagus cuniculus	Hea/rāpeti	European hare/common rabbit	✓	Bait Station Network/Shooting
Mustela spp.	Toriura, tori uaroa, tori hura	Mustelids (stoat, weasel, ferret)	✓	Trapping Network

Table 2: Summary of pest animals				
Scientific Name	**Maori Name**	**Common Name**	**Listed in the WRPMP?**	**Control Method**
Mus musculus	Kiore iti	House mouse	-	Trapping Network/ Bait Station Network
Rattus rattus / Rattus norvegicus	Kiore	Rats (ship and Norway)	-	Bait Station Network
Sus scrofa	Poaka	Feral pig	✓	Shooting
Trichosurus vulpecula	Paihamu	Possum	✓	Trapping Network

There is no single technique for successful pest animal control and methods can vary between and within each species. Often a combination of multiple methods can have the best outcome, and the plan below takes into consideration the most practical methods to meet the expected outcomes.

An experienced pest animal control professional will be appointed to implement pest animal control, commencing with trap instalment. Catch and bait take shall be recorded on the website/mobile application trap.nz[2] or recorded on a pest animal monitoring form. A template form is provided in Appendix B.

4.1 Trap and Baiting

Due to the close vicinity of domestic animals to the control areas, including farm dogs, poison/baiting shall be used cautiously using safe techniques. 'Philproof' bait stations will be used to reduce non-target animal poisoning. Baiting bags shall be used in stations to reduce bioaccumulation and second-generation anticoagulants (Brodifacoum) should be used to reduce the risk of genetic resistance. Good Nature A12 baits have been effective for possums on a number of sites and come with counters to monitor kill rates.

A summary of the trap and baiting is in Table 3. Appendix A provides a summary of the schedule for trap and bait checks.

[2] http://trap.nz

Table 3: Summary of pest control

Pest	Control Method	Trap/Station Rate and Spacing	Placement	Bait	Additional Instructions
Possums	AT220 Possum & Rat traps	1 trap per hectare, 100m apart (on lines 100m apart)	Place on largest tree or on a post if no mature trees available.	NZAutoTraps lure	Sprinkle blaze powder around trap to guide possums.
Rats and mice	Bait station network	2 stations per hectare, 50m apart (on lines 100m apart)	Along watercourses, bush lines, roads, ridges, and buildings.	Brodifacoum waxed bait	Place in areas where rodents are likely to travel.
Rabbits and hares	Rabbit bait stations	1 station per 150m, 300m apart (on lines 150m apart)	In grazed vegetation and areas of visible rabbit/hare activity.	Pindone pellets	Ensure bait is available daily for 10 days.
Mustelids, rats, and hedgehogs	DOC 200	1 trap per 20 hectares	In vegetation along watercourses, bush lines, roads, ridges, or sheltered fence lines.	Rabbit meat	-
Feral cats	Steve Allan SA2 kill traps	1 trap per 150 hectares	Target areas of high cat activity identified by tracking.	Rabbit meat	-

4.1.1 Maintenance of Traps and Bait Stations

It is important to maintain the traps and bait stations to ensure they are in working order during the pulse cycle. This involves clearing the area directly around traps (i.e., in front of the bait stations), checking the security of the bait stations and traps, and checking the trap's moving parts. This maintenance frequency shall be conducted as per the pulse cycles described in Appendix A, Table A1 by a suitably qualified pest management professional. DOC traps should be subject to weight testing prior to use and then checked and fully maintained annually.

4.2 Shooting

Deer, pigs, and goats are classified as pests under the WRPMP and can cause significant damage to plant communities as well as preying upon native ground nesting birds, lizards, frogs, and invertebrates. Pigs were not recorded on-site; however, if pigs are detected on-site, they will be controlled. The control of deer, pigs, and goats will occur by shooting. The implementing contractor will undertake appropriate surveys to determine the extent of hunting, timings, and tracking methodology required.

Feral pigs will be hunted during the early morning and late evening or anytime during overcast days with light rainfall from December to February. Deer shooting will take place during the evening when deer are more active. The implementing contractor will identify the deer species on-site and hunt during the appropriate season. Evening shooting will also target rabbits and hares opportunistically during other hunting activities. Goats can be active at any time of the day and will be targeted during all other hunting activities. Shooting will not be undertaken from May to August to reduce increasing bait shyness in rabbits and hares. Animal carcasses can be left in the forest or buried (WRC, 2020b).

5.0 Site Monitoring

It is important to undertake some form of monitoring to gauge the effectiveness and success of the pest management programme. Monitoring will be carried out regularly for the first five years, after which the results will be reassessed to determine what monitoring, if any, is required going forward. Refer to Appendix B for a template of the monitoring forms.

5.1 Weed Monitoring Schedule

As discussed in Section 3.0, a five-year weed monitoring and control programme should enable effective management of restoration areas. When weeding is performed, a record shall be kept that includes the following details: Target species, method of control (i.e., mechanical, physical, or chemical), nature of

reinfestation, herbicide used, application rates, and the quantity of concentrate used. A template of the monitoring form is provided in Appendix B.

This will enable effective tracking of weed control, assess method success, identify reinfestation trends, and ensure proper herbicide use.

5.2 Animal Pest Monitoring

The purpose of animal pest monitoring is to evaluate the effectiveness of control measures in reducing pest populations. Refer to Appendix B for templates of the tracking and trapping sheets.

5.2.1 Tracking

Tracking devices will be employed four times a year to monitor the effectiveness of pest control on-site for small mammals. The tracking tunnels and wax tags will be used to assess the effectiveness of pest animal control. Tracking devices will be activated for three nights in February and November (during fine weather). Tracking methodologies should be deployed at the same locations and activated at the same time each year for survey consistency. The locations will be determined by a suitably qualified pest management professional, with the coordinates of the locations recorded.

Tracking tunnels and wax tags will be deployed in lines of ten recording points. Tunnels will be baited with peanut butter to record rodents every 50 m. A second tunnel will be installed every 100 m and baited with rabbit meat to detect mustelids. Wax tags will also be deployed every 100 m to detect possums.

5.2.2 Tracking Rate

The tracking rate shall be estimated by calculating the average percentage of tracking devices that recorded pest animals for each species and for each season and year. These tracking rates will be compared yearly to ensure that pest animal control on-site is effective. If the tracking rates have not decreased by the end of the third year of pest animal control, methodologies will be reviewed and adjusted, and trapping shall continue for a further three years.

5.2.3 Trapping Records and Reporting

Trapping records document the types and numbers of pests captured, helping evaluate the effectiveness of trapping methods and identify trends in pest populations. This information informs adjustments to control strategies, such as trap placement or visit frequency, ensuring optimal pest management. Accurate records also support the assessment of overall control success.

Templates of the trapping and tracking sheets are provided in Appendix B.

A report will be produced annually by a suitably qualified pest management professional outlining the tracking devices, tracking rate and trapping records.

This report will be shared with Waikato Regional Council, Waikato District Council, and Tangata Whenua.

6.0 Conclusion

This PMP aims to provide Graymont with a control methodology to reduce introduced pest animal and plant populations at sites listed within the Ecological Betterment Plan for the site thereby improving the biodiversity and ecosystem health. These methods outlined are expected to increase the survival rate of restoration planting efforts at the betterment sites and within high values karst habitats, to restore and maintain the native biodiversity values surrounding the Pit.

7.0 References

Ecology New Zealand. (2022). Pakeho Pit, Graymont Quarry: Pest Management Plan. Prepared for Graymont NZ Ltd.

WRC (Waikato Regional Council). (2020a). Pest Plants. Waikato Regional Council. Available at: https://www.waikatoregion.govt.nz/Services/Regional-services/Plant-and-animal-pests/Plant-pests/. Accessed 14/08/2025.

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Appendix A: Control Schedule

Table A1: Pest Control Schedule

Year	Pest/Method	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	Possums										Pest animal network installation and services	Check	
	Rodent bait stations											2-3 nights for two weeks	
	Rabbit bait trap												
	DOC 200 & Steve Allan											Check fortnightly	
	Plant												
1-3	Possums		Check			Check			Check			Check	
	Rodent bait stations		2-3 nights for two weeks			2-3 nights for two weeks			2-3 nights for two weeks			2-3 nights for two weeks	
	Rabbit bait trap						Service for 10 consecutive days per month						
	DOC 200 & Steve Allan	Check fortnightly				Check monthly					Check fortnightly		
	Plant	Prepare planting sites				Weed			Weed			Weed	
4-5	Possums		Check			Check			Check			Check	
	Rodent bait stations		2-3 nights for two weeks			2-3 nights for two weeks			2-3 nights for two weeks			2-3 nights for two weeks	
	Rabbit bait trap						Service for 10 consecutive days per month						
	DOC 200 & Steve Allan	Check fortnightly				Check monthly					Check fortnightly		
	Plant		Weed									Weed	

Appendix B: Example Monitoring Forms

Table B1: Pest Plant Control Monitoring Form					
Location:	**Commencement Date**		**Completion Date:**		**Company:**
Target Species	**Method of Control (M/F/C/O)**	**Nature of Reinfestation**	**Herbicide Used**	**Application Rates**	**Quantity Used (Concentrate)**
Extra information (notable observation, future recommendations etc)				**Method of control**	
				M = Manual, F= Foliar Spray, C = Cut & Paste, O = Other (Specify)	

Table B2: Trap Data Recording Sheet								
Date	Line	Trap Type	Trap Number	Bait	Days Set	Catch	Sex	Notes

Table B3: Bait Uptake Record Sheet					
Date	**Line**	**Bait Station Number**	**Bait update (0/4, 1/4, 2/4, 3/4, 4/4 etc)**	**Bait replaced (Y/N)**	**Notes**

Table B4: Monitoring Card Data							
Date	**Line**	**Monitoring Tunnel Number**	**Species**	**Present (Y/N)**	**Absent (Y/N)**	**Abundance of footprints per species 0-100%**	**Notes**
			Mouse				
			Rat				
			Stoat				
			Weasel				
			Ferret				
			Hedgehog				
			Feral cat				
			Possum				
			Other (i.e. insect)				